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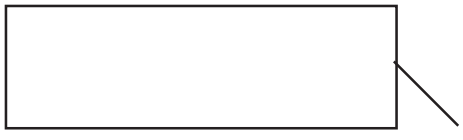
A study into Western Australia's open access and wetline fisheries

F. Crowe, W. Lehre and R.C.J. Lenanton

Integrating fisheries management



FISHERIES
WESTERN AUSTRALIA

Fish for the future

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Fisheries research in Western Australia
The Fisheries Research Division of Fisheries Western Australia is based at the Western Australian Marine Research Laboratories, P.O. Box 20, North Beach (Perth), Western Australia, 6020. The Marine Research Laboratories serve as the centre for fisheries research in the State of Western Australia.

Research programs conducted by the Fisheries Research Division and laboratories investigate basic fish biology, stock identity and levels, population dynamics, environmental factors, and other factors related to commercial fisheries, recreational fisheries and aquaculture. The Fisheries Research Division also maintains the State data base of catch and effort fisheries statistics.

The primary function of the Fisheries Research Division is to provide scientific advice to government in the formulation of management policies for developing and sustaining Western Australian fisheries.

Contents

A study into Western Australia's open access and wetline fisheries.

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Disclaimer

Under Regulation 64 of the *Fish Resources Management Regulations 1995* fishing returns must be submitted by all holders of a fishing boat licence. This study has used data provided by commercial fishermen under the Act and the Regulations.

This data is as accurate as the information provided by the fisherman themselves and it is the legislated responsibility of the fishing industry to provide accurate and timely fishing returns.

The data provided and entered into the Catch and Effort Statistics (CAES) System is regularly reviewed by Fisheries WA research staff. Occasionally data may be modified in response to advice from fishermen that earlier statistical returns have been misinterpreted, or that the data recorded in those returns was incorrect, or that errors were made in the process of data entry.

This study is based on CAES data taken from the database on 28 April 1999.

In addition, recreational fishing surveys are based on boat ramp and beach interviews and direct catch checking.The recreational catches quoted in this study are based on the information provided to Fisheries WA researchers by the recreational fishing community.

Executive summary

Western Australia's wetline fishery potentially includes every licensed fishing boat in the State and encompasses a number of inter-relationships between various boats and commercial fisheries. This study covers the 'wetline' or open access fishery, which encompasses those activities associated with the unrestricted Western Australian fishing boat licence (FBL). The activities associated with this fishery involve any commercial fishing which is not covered by fisheries legislation.

A separate section entitled 'So you want to go wetlining?' is provided at page 101 as an easy reference guide to industry and others interested in wetline fishing. It is recommended that it be read by those who require a more personalised explanation of wetline fishing.

When reading the report, also consider that many licensed fishing boats operating in the wetline fishery are also authorised to fish in one or more other fisheries.

The reported catch of the wetline fishery (excluding the Pilbara demersal line fishery, which is being placed under management in the near future) during the 1997-98 financial year was 2,270 tonnes. It was worth around $11.25 million, which represents about two per cent of the total value of the Western Australian catch or harvest value of $538 million.

As it is easy to confuse terms such as 'wetline only' and 'wetline fleet' and to assist with understanding this paper a glossary of terms has been provided and follows this Executive Summary.

Executive summary introduction

On 3 November 1997, Fisheries Western Australia announced a study would be undertaken into the activities associated with the unrestricted Western Australian fishing boat licence and its associated wetline fishery.

The reasons for the study were that there was a need to :

- determine the activities of the 'residual' WA fishing fleet after a decade of active management and place the majority of other licensees into more specific management arrangements, in order to determine future strategic directions for management;
- obtain data on the impact of this sector/fishery on finfish species such as dhufish and Spanish mackerel, about which there are sustainability concerns; and
- obtain data on the geographical range of the fleet's activities and its take of finfish, to help the resource sharing debate with the recreational marine angling and charter sectors.

As the management of wetline fishing in the Pilbara (the Pilbara demersal line fishery) is already being considered, this analysis focused on fishing boats operating south of North West Cape, except for those licensed fishing boats targeting pelagic species.

Objective of study

The objective of this study is to examine the historic and current status and dynamics of wetline fishing, and to compare this with catches from the recreational and charter sectors of the fishery. This will enable the Minister for Fisheries to explore options for management of the wetline fishery and determine an appropriate, cost effective approach that can address resource sustainability and allocation.

Executive summary section 1 - Main findings of study

This study provides a 'snapshot' profile of the wetline activities of the Western Australian fishing fleet as at 30 June 1998. It aims to determine the 'how', 'who', 'what', 'where' and 'when' of wetline fishing, to allow decisions to be made on future strategic directions for management of wetlining in the state.

One of the study's major findings is that over half (720 licensed fishing boats/fishing units) of Western Australia's commercial fishing fleet of 1,361 licensed fishing boats/units as at 30 June 1998 had taken part in wetlining in the past seven financial years.

Over the seven year period studied, dhufish, pink snapper and Spanish mackerel were the most targeted line caught species of the wetline fleet, with catches of 201, 230 and 536 tonnes in the 1997-98 financial year, respectively. Two net caught species, Australian herring and whitebait, were also consistently over 100 tonnes. The 1997-98 catches for these two species were 112 tonnes and 48 tonnes[1] respectively.

The study also determines the geographical range of wetline fishing. While much wetlining takes place in the inshore areas of the Perth metropolitan area and the South West, the Abrolhos Islands line caught wetline catch is about two thirds of both these areas combined. Fisheries WA and the State's fishing sectors must now make policy decisions on whether or not this situation should be permitted to continue.

Most of the net caught open access fishing takes place in the south west and south coast. Only a small amount of inshore line wetlining also takes place along the south coast of the State and most of this catch is net caught species, such as Australian herring.

The resource sharing implications of the inshore fishing activities of the wetline fleet need to be examined.

The first six years of study catch data did not confirm a commonly held myth that large amounts of finfish were taken by the rock lobster fleet by wetlining. In fact, during this period most of their reported wetline catches were relatively small and only about a third of the rock lobster fleet reported having wetlined at all.

However, during 1997-98 this pattern of reported catches changed and a much larger proportion of certain species of the wetline catch was taken by the rock lobster fleet. For instance, reported catches of dhufish during 1997-98 revealed nearly a 150 per cent increase, with 28 rock lobster boats reporting catches of dhufish for the first time in 1997-98. However, the rock lobster fleet still only took seven per cent of the total wetline catch in 1997-98. Also of interest in the rock lobster wetline fishing pattern were the zonal differences.

The question of latent wetline fishing effort by the rock lobster fleet was examined and although it was found that the average price of rock lobster did not affect the amount of wetline fishing being carried out during the first six years of the study, this was not the case during 1997-98. The concern that Government was about to rationalise the future of wetline access is also a consideration in the increase of wetlining by the rock lobster fleet during this period.

1 Note that the whitebait catch for 1997-98 was its lowest for several years, down from 256 tonnes in 1996-97.

Executive summary section 2 - Profile of the wetline fleet

How wetline catch is taken

- The usual methods are hand lining, drop lining, trolling and hand-hauled netting - mostly beach seining.
- Other methods identified were beam tide trawling (in certain areas), drop netting, squid jigging, lift netting and diving.

Identification of the wetline fleet as at 30 June 1998

- 720 licensed fishing boats, or about half of the fishing fleet of 1,361 fishing units reported wetlining in the last seven financial years ie. from 1991-92 to 1997-98. Usually between 370 and 400 boats fished each year.
- About 90 'wetline only' boats fished each year during the seven year period, while 21 'wetline only' fishing units did not fish during the period.
- 201 West Coast Rock Lobster boats reported wetlining during the last seven financial years, with usually between 70 and 100 boats reporting wetlining each year (124 wetlined during 1997-98).
- 60 of the 1,361 licensed fishing boats/fishing units which reported wetlining during the last seven years have been sold to the Fisheries Adjustment Scheme.
- Most estuarine fishing units report wetlining during the last six financial years.
- Relatively few trawlers report wetlining.

Identification of the wetline catch

- The total reported wetline catch has been around 2,000 tonnes for the last four financial years, although in 1997-98 this had reached 2,270 tonnes.
- The reported wetline catches of three line caught species exceed 100 tonnes *per annum* over the last seven financial years. The 1997-98 catches of these species were:
  - dhufish (201 tonnes);
  - Spanish mackerel (536 tonnes); and
  - pink snapper (230 tonnes).
- The reported wetline catches of two net caught species usually exceed 100 tonnes *per annum* over the last seven financial years. The 1997-98 catches were :
  - Australian herring (112 tonnes); and
  - whitebait (48 tonnes).

Where the wetline catch is taken

- Many of the 'wetline only' fleet are highly mobile, except where ownership has remained stable.
- Depending on the nature of their licence conditions, licensed fishing boats operating under licence conditions tend to report wetlining in or close to the areas permitted under their licence, in particular estuarine boats.

- Generally, licensed fishing boats holding managed fishery licences tended to report wetlining near the geographical area of that managed fishery.
- The major areas of reported wetlining are the Kimberley and Pilbara (where almost all the Spanish mackerel are taken), the Abrolhos Islands (over 200 tonnes taken during 1997-98), the west coast, the metropolitan area (around 170 tonnes taken during 1997-98), and the south west coast (between 240 and 350 tonnes usually taken).

Seasonal variations in the wetline catch

- Spanish mackerel and whitebait dominate the wetline catches. Spanish mackerel catches are very low in summer, while large net caught catches of whitebait and Australian herring in the South West and south of Western Australia are taken during the summer.
- The rock lobster fleet records higher wetline catches during August, September and October, which coincides with the closed season for the rock lobster fishery.
- Other managed fisheries, such as the Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (hereinafter referred to as the Southern Demersal Gillnet and Demersal Longline Fishery), also exhibit some seasonal variation, with more recorded wetline catches in the summer months.

Executive summary section 3 - Effect of wetline fishing by species

This section examines the three line caught fish species where over 100 tonnes each year is taken by wetline activities, and also baldchin groper and blue groper, species that are popular with recreational fishers.

Australian herring and whitebait are not examined because they have been studied elsewhere in recently published Fisheries WA research papers.

*Dhufish (*Glaucosoma hebraicum*)*

Although difficult to assess with certainty, it appears that there are no immediate concerns about the overall status of Western Australian dhufish.

The total commercial catch of dhufish in 1997-98 was 232 tonnes, with 202 tonnes reported as being caught by the wetline fleet. An estimated 132 tonnes was taken by recreational fishers during 1996-97 from Kalbarri to Augusta.

How dhufish are caught?

- Dhufish are caught by hand line and drop line by the wetline fleet.

Who targets dhufish

- Dhufish are subject to heavy and increasing fishing pressure from the commercial sector (wetline and demersal gillnet and longline fisheries) and the recreational and charter sectors.
- Two thirds or 442 of the wetline fleet have reported taking dhufish in the last seven financial years.
- The catches of the 'wetline only' fleet (97 boats in the last seven years) reflect a pattern of small catches, with only 27 taking more than one tonne a year for more than three of the last seven years.

- 113 Zone C, 42 Zone B and 23 Zone A rock lobster boats reported taking dhufish by wetlining.
- A variety of licensed fishing boats from other fisheries also take dhufish.

Geographical distribution of dhufish catches

- Dhufish is found predominantly in waters deeper than 20 metres with the wetline catch extending from Kalbarri to near Esperance.
- There has been a large increase in the reported wetline catch of dhufish in the Abrolhos Islands over the last six years.
- Few dhufish are taken by wetlining on the south coast.

When dhufish are caught

- Most recorded wetline catches of dhufish are in the summer months.

*Spanish mackerel (*Scomberomorus commerson*)*

There is limited data available on which to base an assessment of the status of Spanish mackerel in Western Australian waters. However, according to scientific advice, at present it appears that there are no immediate concerns about the stock.

The total commercial catch in 1997-87 was 560 tonnes, with 536 tonnes reported being taken by the wetline fleet. This is an increase of 135 per cent over the last seven financial years. A rough estimate of the recreational catch during this period is about 150 tonnes.

How Spanish mackerel are caught

- They are mainly caught using troll lines (baits and lures) or drifting baits.
- Dedicated mackerel fishing boats use a 'mother' boat and dories (dinghies) when trolling.

Who targets Spanish mackerel?

- 163 licensed fishing boats have reported targeting Spanish mackerel by wetline methods in the last seven financial years, of which seven boats consistently recorded catches of between 20 and 100 tonnes in three of the last seven years.
- There are a large number of opportunistic operators from other managed fisheries targeting Spanish mackerel.

Geographical distribution of Spanish mackerel catches

- The heaviest reported wetline fishing takes place in the northern Kimberley, with other large catches occurring between Port Hedland and Broome. Some trolling also takes place off Quobba, in the Shark Bay area.

When Spanish mackerel is caught

- There are marked seasonal variations in the Spanish mackerel catch, with the vast majority being caught in the winter months.

*Pink Snapper (*Pagrus auratus)

The total commercial catch of pink snapper was 764 tonnes in 1997-98, with 230 tonnes being reported as taken by the wetline fleet. The preliminary estimates of the recreational catch from Kalbarri to Augusta was estimated to be around 27 tonnes during 1996-97.

Who targets pink snapper?

- Around 466 boats have reported taking pink snapper by wetlining in the last six financial years, of which 103 were 'wetline only' boats and 165 were rock lobster boats.
- Only 45 boats have recorded taking more than one tonne in three of the last six years.

How pink snapper are caught

- Pink snapper are caught by hand line and drop line.

Geographical distribution of pink snapper catches

- The major wetline snapper catches are out of Kalbarri, the Abrolhos Islands and Geraldton.

When pink snapper are caught

- The highest reported pink snapper wetline catches are around August and March and April.

*Baldchin Groper (*Choerodon rubescens*)*

The total commercial catch for baldchin groper was 42 tonnes in 1997-98, with 35 tonnes being taken by the wetline fleet. Preliminary estimates of the wetline catch between Kalbarri and Augusta were around 30 tonnes. 46 per cent of the baldchin groper catch comes from the Abrolhos Islands.

How baldchin groper are caught

- Baldchin groper are taken by hand line and drop line by the wetline fleet.

Who targets baldchin groper?

Altogether 291 licensed fishing boats/fishing units reported taking baldchin groper by wetline methods, the breakdown is as follows :

- 86 'wetline only' boats have recorded taking baldchin groper in the last seven financial years.
- 67 Zone C, 29 Zone B and 20 Zone A rock lobster boats have reported taking baldchin groper in the last seven years.
- Assorted other boats have also taken them.
- Only seven boats, all but one 'wetline only', have taken over one tonne a year for three or more of the last seven financial years.

Geographical distribution of baldchin groper catches

- Around 46 per cent of baldchin groper is reported as being taken from the Abrolhos Islands, with the rest distributed between the Perth metropolitan area and Ningaloo.

When baldchin groper are caught

- Although there is little seasonal variation, slightly more are reported taken in March, April and May, coinciding with the opening of Zone A of the West Coast Rock Lobster Managed Fishery.

*Blue Groper (***Achoerodus gouldii***)*

There is little biological information and no stock assessments on western blue groper (blue groper). The total reported commercial catch is around 35 tonnes in 1997-98, with seven and a half tonnes being caught by the wetline fleet. There is no estimate of the recreational catch.

How blue groper are caught

- Blue groper are reported taken by handline, dropline and hand hauled gillnets by the wetline fleet.

Who targets blue groper?

- 178 boats have reported taking blue groper. Most are from the south or south west coast, from a variety of fisheries.
- Only one boat, a 'wetline only' boat, have reported taking over one tonne a year for three of the last six financial years.

Geographical distribution of blue groper catches

- Small catches have been recorded from Geraldton to the Great Australian Bight in virtually every inshore block.

When blue gropers are caught

- More blue groper are caught in the summer months than the winter months.

Executive summary section 4 - Major geographical areas for wetline fishing

This section examines the major wetline fishing areas of the Houtman Abrolhos Islands, the Perth metropolitan area and the South West.

As relatively little reported wetlining takes place along Western Australia's south coast, this area has not been included as a detailed study.

Wetlining in the Abrolhos Islands

There are large and increasing reported wetline catches of a number of species in the Abrolhos Islands, with over 200 tonnes being taken in the last three financial years.

Species taken by wetlining in the Abrolhos Islands

- There are a variety of finfish taken by hand line and drop line. The major species include pink snapper, baldchin groper, dhufish, Spanish mackerel and coral trout.
- Dhufish catches rose from 11.9 tonnes in 1992-93 to 46.9 tonnes in 1997-98. While pink snapper catches rose from 17.6 tonnes in 1992-93 to 53.2 tonnes in 1997-98.
- The Abrolhos Islands are the main breeding area for coral trout south of Ningaloo Reef.
- Around 46 per cent of the total baldchin groper catch is taken by wetlining in the Abrolhos Islands.

Who wetlines in the Abrolhos Islands?

- 92 licensed fishing boats have reported wetlining in the waters surrounding the Abrolhos Islands during the last six financial years, with 25 additional licensed fishing boats fishing in the area in the last two years.
- Most boats demonstrate a sporadic pattern of wetline fishing.
- 38 'wetline only' boats have fished in the last six financial years, with 14 having fished for three or more of the last six years.
- Three Zone C, three Zone B and 20 Zone A West Coast Rock Lobster licensed fishing boats have wetlined, with most reporting only small catches of fish.
- Five Shark Bay Snapper licensed fishing boats of which four have fished for three or more of the last six years, have wetlined.
- Assorted other fishing boats also wetline.
- Most boats demonstrate a sporadic pattern of wetline fishing in the Abrolhos. Only 26 of the licensed fishing boats have fished for three or more of the last six years.

When wetlining takes place in the Abrolhos

- There is not a very marked seasonal pattern of wetlining. However, more fishing takes place in the spring and autumn months than the winter and summer months.

Wetlining near the Perth metropolitan area (Blocks 31150 and 32150)

There is a large but generally declining wetline catch reported from the inshore blocks between Mandurah and Lancelin. The reported wetline catch has declined by a third from 247 tonnes in 1991-92 to 171 tonnes in 1997-98.

Species taken by wetlining near the Perth metropolitan area

The wetline fleet reports taking a wide variety of species from the waters of the Perth metropolitan area. The largest wetline catches in 1997-98, taken as being over five tonnes, were as follows :

- Dhufish, 39 tonnes;
- Sea mullet, 13.3 tonnes;
- Sand crabs, 10.9 tonnes;
- Samsonfish, 20 tonnes;
- Various shark species, 29.6 tonnes; and
- Pink snapper, 21.2 tonnes.

Who wetlines in the Perth metropolitan area?

- Over the last six financial years 241 licensed fishing boats have wetlined in this area. The breakdown is as follows :
  - 84 rock lobster boats
  - 52 'wetline only' boats
  - 24 various Cockburn Sound Managed Fisheries boats
  - 13 Estuarine boats, mainly from the Mandurah and Swan-Canning Estuaries
  - Assorted other licensed fishing boats.
- Usually between 80 and 100 boats wetline each year.
- Only 34 boats have reported taking catches of over one tonne *per annum* for three or more of the last six financial years. Most boats wetlining in the Perth area record small, sporadic catches.

When wetlining takes place in the waters off the Perth metropolitan region

- Generally, more wetline fishing takes place in the summer and autumn months than in the winter.

Wetlining in the South West Region

The reported wetline catch of Western Australia's South West region is highly variable, depending on the whitebait and Australian herring catches. The total recorded wetline catch ranges from 312 tonnes in 1991-92, to 426 tonnes in 1996-97, to 243 tonnes in 1997-98. (The Australian herring and whitebait component of these wetline catches were 45.2 and 47 tonnes respectively in 1997-98).

Species taken by wetlining in the South West Region

- There is a large range of species reported taken in the South West. The major 1997-98 catches were as follows :
  - Australian herring, 45.2 tonnes, taken by beach seine;
  - Whitebait, 47.8 tonnes, taken by beach seine;
  - Dhufish, 25 tonnes, taken by hand line and drop line;
  - Sand crabs, 25.7 tonnes, taken by drop net;
  - Sea mullet, 12.5 tonnes taken by beach seine and haul nets; and
  - Pink snapper, 7.3 tonnes, taken by hand line and drop line.

Who wetlines in the South West Region?

- Although 71 boats reported wetlining in the area, there is a core of about 35 boats which regularly wetline in the South West Region. Of those 35 boats, 27 regularly take over two tonnes of fish, with most taking between five and 25 tonnes, reflecting the whitebait component of the catch.

- Most of the core boats are either 'wetline only', estuarine, South West Salmon or Southern Demersal Gillnet and Demersal Longline boats, or a combination of these and other authorisations.
- The breakdown of licensed fishing boats reporting wetlining in the South West between 1991-92 and 1997-98 is as follows :
  - 16 'wetline only' boats;
  - 12 South West Salmon boats;
  - five estuarine licensed fishing boats;
  - 15 Southern Demersal Gillnet and Demersal Longline boats;
  - Nine Zone C West Coast Rock Lobster boats; and
  - Assorted other licensed fishing boats.

When wetlining takes place in the waters off the South West Region

- There are marked seasonal variations in the reported wetline catches of the South West, reflecting the Australian herring and whitebait catch. Without Australian herring and whitebait there would still be a slight increase in wetline catches over the summer months.

Glossary of terms

Authorisation: A licence or permit.

Commercial fishing: Fishing for a commercial purpose.

Commercial fishing licence: A licence authorising a person to engage in commercial fishing.

Condition: See licence condition.

Demersal: Found on or near the bottom of the sea.

Dinghy: A licensed fishing boat less than 6.5 metres in length, usually attached to a lead or 'mother' boat in a fishing unit.

Dory: The name for a dinghy when it is used in conjunction with a 'mother' boat for troll lining when targeting Spanish mackerel.

Endorsement: A colloquialism used to describe either a managed fishery licence, an interim managed fishery licence, or a licence condition.

Estuarine fishery: An estuarine fishery is one where the number of boats or fishermen authorised to fish in an estuary is controlled by putting a ceiling on the numbers licensed, and the transfer of entitlements is not permitted or is partially restricted for policy reasons. Control is usually formally achieved by special conditions on licences. Examples of an estuarine fishery are the Mandurah Estuarine Fishery and the South Coast Estuarine Fishery.

Fishery: A fishery means one or more fish stocks or parts of stocks, that can be treated as a unit for the purposes of conservation or management. For example this could mean a managed fishery such as the West Coast Rock Lobster Fishery, or a class of fishing activities in respect of those stocks or parts of stocks of fish, such as the Southern Demersal Gillnet and Demersal Longline Fishery.

Fishing boat licence: A fishing boat licence means a licence (granted under the fisheries regulations) authorising a person to use a boat for commercial fishing.

Fishing unit: Usually a fishing unit means a single fishing boat, for example a rock lobster boat, but the term is also used to describe a group of boats which together make a fishing unit. For example, the combination of a 'mother' (or lead) boat plus its dinghies used in an estuarine fishery is regarded as a single fishing unit. In some cases where a boat is not actually used for fishing, the fishing unit is the individual fisherman, eg. in the Marine Aquarium Fishery.

Interim Managed Fishery: A fishery declared by a management plan to be an interim managed fishery.

Licence condition: The ability to fish in certain fisheries (such as in an estuarine fishery), or to use certain fishing gear, (such as power operated net haulers or fish traps), or to take certain species of fish (such as mud crabs) is regulated by licence conditions on fishing boat licences.

Managed fishery: A fishery declared by a management plan to be a managed fishery.

Management plan: A management plan is the rules and regulations governing a managed or interim managed fishery.

Open access fishery/fishing: 'Open access' is a colloquialism to describe those fisheries or fishing activities (within the total number of licensed fishing boats in the overall fishery) for which there are no restrictions on the number of vessels with access or on the use of specific types or quantities of fishing gear by those boats. For example, hand lining, drop lining, troll lining and squid jigging are all methods associated with the 'open access' or 'wetline' fishery.

Pelagic: Found near the surface or middle depths of the sea.

Recreational fishing: Fishing for pleasure, to get a feed for oneself or one's family and friends.

Supplementary licence: Supplementary licences were usually issued at the time when a fishery became a managed fishery and the criteria for full access were not met by some fishers who were subsequently issued with supplementary licences. A supplementary licence may specify the means, time period, area, or other requirements in respect of when fish, or a group of fish, in a fishery may be taken.

Wetfish: Cartilaginous fish (for example, sharks and rays) and scale or finfish (for example, dhufish and snapper).

Wetfish fishery/fishing: Any fishery or fishing activity which targets cartilaginous fish and finfish, (for example, it can include participants in managed fisheries such as the Shark Bay Snapper Fishery, the Southern Demersal Gillnet and Demersal Longline Fishery and the open access fishery).

Wetline fishery/fishery: See open access fishery/fishing above.

Wetline fleet: The wetline fleet means all those licensed fishing boats which participate in wetline fishing.

'Wetline only' fleet: Those licensed fishing boats which only have access to the wetline fishery.

Introduction

On 3 November 1997, Fisheries Western Australia announced a study would be undertaken into the activities associated with the unrestricted Western Australian Fishing Boat Licence (FBL) commonly known as 'wetline' or 'open access' fishing and its associated wetline fishery (Appendix 1).

Around 2,270 tonnes of fish worth around $11.25 million was taken in the wetline fishery during the 1997-98 financial year. This represents about two per cent of the value of the total Western Australian commercial catch or harvest value of $535.4 million (including pearling).

The study has been undertaken for a number of reasons, including the need to:

- determine the activities of the 'residual' Western Australian commercial fishing fleet after a decade of active management and placement of the majority of other licensees into more fishery-by-fishery specific management arrangements, in order to determine future strategic directions for management;
- obtain data on the impact of the wetline fishing sector on finfish species such as dhufish and Spanish mackerel, about which there were sustainability concerns; and
- obtain data on the geographical range of the fleet's activities and its take of finfish, to help a resource sharing debate with the recreational marine angling and charter sectors.

The study is broken down into four sections.

- Section 1 gives the background information to the study.
- Section 2 builds a 'snapshot' profile of the activities of licensed fishing boats which carry out wetlining. It identifies how the catch is taken, the boats/fishing units which carry out the wetline activities, looks at the composition of their catch, where the catch is taken, and finally, considers seasonal variations in the wetline catch.
- Section 3 looks at the line caught species that are most affected by wetline fishing and identifies who targets the fish, where the fish are taken, how they are taken and when they are taken.
- Section 4 examines the major geographical areas where wetlining is carried out, what species are taken from those areas, who fishes in those areas, and when they fish.

1.0 Backgound

1.1 Licensing under the Fish Resources Management Act 1994

1.1.1 Definition of a fishing boat licence

The *Fish Resources Management Act 1994* (FRMA) defines a fishing boat licence as "… *a licence granted under the regulations authorising a person to use a* ***boat*** *for commercial fishing*". A Western Australian fishing boat licence (for a licensed fishing boat or LFB) is informally referred to as a 'wetline licence'. It has also been referred to as an 'open access' licence or an 'open west coast' licence.

When used in conjunction with a Commercial Fishing Licence (CFL), a fishing boat licence entitles the holder to conduct any fishing activity which is not otherwise prohibited, and to sell his/her catch. This fishing activity is informally called 'wetline fishing'.

A Commercial Fishing Licence (or CFL) is defined in the FRMA as "… *a licence granted under the regulations authorising a* ***person*** *to engage in commercial fishing*." Fisheries WA is currently considering options for the removal of the requirement for crew on licensed fishing boats to hold CFLs.

Fishing boat licences commonly have conditions attached which modify the permitted scope of activities possible under that licence. Generally, fishing boat licence conditions 16, 17 and 18 are accepted as 'wetline' conditions, that is, the conditions which make up the unrestricted Western Australian Fishing Boat Licence. These conditions are as follows :

- Condition 16 : No fishing between Pt. Maud and Tantabiddi;
- Condition 17 : Crew shall not live on Abrolhos Islands; and
- Condition 18 : No river or estuarine fishing.

A fishing boat licence with only conditions 16, 17 and 18 is allowed access to those fisheries for which there are no restrictions on the number of licensed boats with access, or on the use of specific types or quantities of fishing gear. These unregulated informal 'fisheries' include: the general hand line and drop line fishery south of North West Cape; the troll line fishery; the squid jig fishery; the fishery for oceanic blue manna crabs by drop nets or hand hauled nets; and the unrestricted beach seine fishery. The licensed fishing boats who work in the aforementioned fisheries are generally regarded the core of the 'wetline only' fleet.

Dinghies attached to a lead or mother boat so as to form a 'fishing unit' may also have conditions 16, 17 and 18 attached to their own fishing boat licences. *For the purposes of this study, the 'fishing unit' as a whole has been considered, rather than the main fishing boat and the licensed dinghies as separate entities.* At 30 June 1998 there were 1,361 fishing units in the Western Australian commercial fishing fleet.

However, there are a range of licensed dinghies (ie. less than 6.5 metres long) which operate along the Western Australian coast *as individual autonomous fishing units.* Their licences are essentially neither transferable, nor tradeable, except to be attached to an 'open west coast licence' with which the dinghy licence would be used in conjunction (ie. as part of a 'fishing unit').

Fishing boat licences may have other conditions attached to them which permit the licensed fishing boat to undertake certain fishing activities, such as estuarine fishing.

A Managed Fishery Licence or an Interim Managed Fishery Permit is required in addition to a fishing boat licence for a boat to fish in a managed or interim managed fishery.

Other conditions which can be attached to fishing boat licences may permit licensed boats to undertake certain specific fishing activities, such as permitting the use of herring traps.

1.2 History of the fishing boat licence

The origins of the fishing boat licence or 'wetline' licence lie in the first Fisheries Act of 1899 (R. Lenanton, 1984) which required commercial fishing boats and their operators to be licensed. From 1899 onwards, the system of regulating particular fisheries was carried out by closing off certain Western Australian waters to fishing for a particular species, or at a particular time, or by a particular method other than those used by commercial fishermen who were endorsed for that fishery.

In the mid 1960s the concept of 'Limited Entry Fishery' was introduced under the *Fisheries Act 1905*. As at 30 June 1998 there were 31 Managed Fisheries (formerly Limited Entry Fisheries) and one Interim Managed Fishery under its successor, the FRMA. The licensed boats which operate in these fisheries tend to treat the Managed Fishery Licence and the fishing boat licence as a package.

There are a variety of combinations of permitted fishing activities attached to the fishing boat licences. These include Managed and Interim Managed Fishery authorisations, supplementary authorisations and licence conditions which permit the licensed boat to undertake certain restricted fishing activities.

1.3 Objective of study

The objective of this study is to examine the historic and current status and dynamics of fishing undertaken using the Western Australian fishing boat licence, and to compare them with catches that are taken by the recreational and other fishing sectors. This will enable the Minister for Fisheries to explore options for management of the wetline fishery and determine an appropriate, cost effective approach that can address resource sustainability and allocation issues.

1.4 Methodology

The following background data collection and analysis took place:

- Analysis of the licensing status of the 'wetline fleet' as at 30 June 1998, ie. identify which boats make up:
  - the managed and interim managed fishing fleet and those licensed boats operating under licence conditions which focus on wetline fishing as a supplementary (rather than primary) activity; and
  - the fleet of licensed boats which operate under a fishing boat licence only and are totally dependent on wetline fishing.

    As the management of the Pilbara demersal line fishery is proceeding under separate consideration, this analysis focused on fishing boats operating south of North West Cape, except for those licensed boats targeting pelagic species north of North West Cape.
- Analysis of the catch and activities of the boats and individuals identified as making up the 'wetline fleet' for the last seven years, ie. 'who', 'what', 'where', 'how' and 'when' they are taking fish.
- Comparison of commercial and recreational catches for the relevant species and areas.
- The catch records for the previous seven financial years were examined through the Catch and Effort Statistics (CAES) system to determine the historic and current status of wetline fishing. This was achieved by the following method :
  1. Examination of all catch data, then discarding catches associated with managed or interim managed fisheries and licence conditions, for example rock lobster catches taken by boats licensed to fish in the West Coast Rock Lobster Fishery and rock lobster catches taken by boats not licensed to fish in that fishery were not taken into account. The catches would be assigned as a managed fishery catch in the first instance and illegal or unauthorised fishing in the rock lobster fishery in the second;
  2. Examination of all by-catch of managed and interim managed fisheries and licence conditions to ascertain whether catch was correctly assigned as 'by-catch' or was actually open access or wetline fishing. For example, Spanish mackerel is highly unlikely to be

caught in trawl nets, and was thus taken, after discussion with appropriate scientists and field staff, as open access fishing. Herring and whitebait taken by salmon fishing units using beach seine nets is taken as open access fishing because separate nets are used (although a small allowance of 250 kgs was allowed as by-catch). However, demersal finfish other than pink snapper taken in Shark Bay has been recorded as a by-catch of the Shark Bay Snapper Managed Fishery because the same gear/lines are used to take these species which are not the target species. This accounted for about 100 tonnes a year over the period of the study;

3 Areas and/or fisheries which came under some form of management prior to and during the study (such as Cockburn Sound) and those that were likely to come under management during or shortly after the period of the study (such as the Pilbara) were not included in the study as 'wetline' catches; and

4 The final outcome of this process was taken as the residual or 'wetline' catch.

1.5 The catch and effort statistics (CAES) system

In the provision of research advice to fisheries managers and industry, the most up-to-date data is extracted from the Fisheries WA Catch and Effort Statistics (CAES) database. Data within the CAES database is being continually maintained and updated, both by addition of new statistical returns and the modification of records to correct errors in data entry or interpretation that are detected during ongoing analysis and data quality control by the research section responsible for studying each fishery.

Occasionally data may be modified in response to advice from fishermen that earlier statistical returns have been misinterpreted, or that the data recorded in those returns was incorrect, or that errors were made in the process of data entry. The data stored within the CAES database is widely regarded as being the most accurate and timely available for fisheries analysis purposes.

The data in the CAES system is regularly reviewed by Fisheries WA research staff. This study is based on CAES data taken from the database on 28 April 1999.

1.6 "No authority to fish"

Some wetlining recorded in the Fisheries WA Research Division's Catch and Effort Statistics (CAES) data is listed under 'No Authority to Fish'. This may be, for example, where a boat has wetlined when its fishing boat licence has expired.

Where the fishing is relevant, it has been taken into account for the purposes of this study. Note that there were no significant catches recorded under 'No Authority to Fish'.

2.0 Profile of the wetline fleet

2.1 How wetline catch is taken

A fishing boat licence or 'wetline licence' in conjunction with a Commercial Fisherman's Licence, entitles the holder to do anything by way of fishing which is not otherwise prohibited, and to sell his/her catch

The usual methods of wetline fishing are hand lining, drop lining, trolling, beach seining and hand hauled netting. Some confusion exists as to what methods constitute wetline activities. For instance, gill netting may be considered wetlining if the net is hand hauled, but not if a power operated net is utilised. The CAES data does not discriminate between hand hauled and power operated gill netting, but Fisheries WA Research Division's log book data does attempt to discriminate between the two types.

Consequently, during this study other methods of wetlining were identified. Beam tide trawling in certain areas, drop netting, hand hauled gill netting, squid jigging, lift netting and diving were all reported as wetline catches and taken into account.

Hand lining and drop lining were the usual catch methods of taking the most sought-after line-caught fish species such as dhufish, and pink snapper. Trolling was used to target Spanish mackerel. Australian herring and whitebait were taken by beach seine nets. Hand hauled gill netting was mostly used for the inshore species such as cobbler and flathead, whilst drop nets and diving were generally used to take invertebrate species.

The increase in the reported 1997-98 dhufish catch by the rock lobster fleet (Section 2.3.1) was primarily due to an increase in drop line catches, which was directly related to an increase in the number of boats drop lining, ranging from 45 (777 block days fishing) in 1996-97 to 70 (1,745 block/days fishing) in 1997-98. The continuous operation of drop lines by the rock lobster fleet has largely superseded the traditional methods of drifting over productive ground using hand lines. Some rock lobster boats are reportedly using up to 150 drop lines at one time, although the CAES data is unable to confirm this.

Table 1 shows the overall different wetline methods used for the purposes of this study, while Table 2 shows the different wetline methods used by the rock lobster fleet.

Table 1 Different methods of wetline fishing by all licensed fishing boats which wetline.

Catch method	Number of boats						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Beach Seine	59	60	51	52	39	36	36
Beam Tide Trawl	1	-	-	-	-	-	-
Drop Line	129	125	110	92	116	126	165
Diving	7	5	1	2	5	3	4
Drop Net	6	4	12	10	15	10	16
Gill Net	70	61	59	51	40	40	41
Hand Line	222	215	184	206	222	243	273
Haul Net	34	29	26	23	14	19	12
Lift Net	2	1	1	2	2	3	5
Squid Jig	42	41	42	41	35	33	34
Troll Line	61	45	67	51	62	56	67
*Trawl	18	22	19	17	19	25	23

★*Note: Although trawling is not a wetline method, a number of species such as Spanish mackerel were reported as having been taken by trawl. As this would be highly unlikely the catch of these species has been taken as wetline fishing by this study even though it was reported as trawling.*

Table 2 Different methods of wetline fishing by rock lobster licensed fishing boats which wetline

Catch method	Number of boats						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Beach Seine	2	2	3	4	-	1	2
Drop Line	37	22	26	24	31	45	70
Drop Net	-	-	-	-	-	-	1
Gill Net	6	4	6	4	5	5	5
Hand Line	57	46	33	55	56	74	93
Haul Net	4	-	1	3	3	4	1
Squid Jig	4	2	-	2	2	3	3
Troll Line	-	1	1	1	1	3	1

2.2 Identification of wetline fleet

The 'wetline fleet' is made up of licensed fishing boats from the managed and interim managed fisheries; boats which operate under supplementary licences or various licence conditions; and boats operating under licence conditions 16, 17 and 18 (see Section 1.1.1) - which are classified as 'wetline only' boats.

Most licensed fishing boats have multiple endorsements. Some authorisations are 'fishing units', made up of a mother boat and one or more dinghies adopting the same licence number. Different dinghies within these fishing units may have different endorsements. As stated previously, this study examines the wetline fishing activities of the 'fishing unit' as a whole, except in cases where a dinghy has obviously been fishing as a separate fishing unit.

This situation means that the make-up of the wetline fleet is extremely complex and difficult to both describe and quantify.

2.2.1 Number of licensed fishing boats wetlining

In total, 720 of the 1,361 licensed fishing boats/fishing units reported wetlining in the last seven financial years, ie. from 1991-92 to 1997-98. *It should be noted that this sub-section deals with the licensed fishing boats/fishing units and the authorisations attached to those boats/units.*

The breakdown of these fishing units that were part of managed and interim managed fisheries as at 30 June 1998 is shown at Appendix 2. *Licensed fishing boats have moved in and out of managed fisheries during the seven years examined by this study. The picture presented here is the licensed fishing boats/fishing units as licensed as at 30 June 1998.*

In addition the following information as at 30 June 1998 is relevant:

- 404 licensed fishing boats which wetlined during the past seven financial years had one or more managed and/or interim managed fishery licence or supplementary licence attached to them;
- 38 licensed fishing boats which wetlined during the past seven financial years had one or more managed and/or interim managed fishery licence or supplementary licence *and* a licence condition other than the standard 'wetline only' licence conditions attached;
- 125 licensed fishing boats which wetlined during the past seven financial years had conditions 16, 17 and 18 or the standard 'wetline only' conditions attached to them;
- 82 licensed fishing boats which wetlined during the past seven financial years operated under licence conditions other than or as well as the standard 'wetline only' conditions, such as estuarine conditions;
- 48 licensed fishing boats which wetlined during the past seven financial years were sold to the Fisheries Adjustment Scheme, prior to 30 June 1998, while a further 12 have been sold since that date;
- 15 licensed fishing boats which wetlined during the past seven financial years had their licences cancelled under a total rock lobster pot redistribution prior to 30 June 1998, while a further one was cancelled after that date;
- Five licences expired and were not renewed; and
- Three were renumbered, but the renumbered licensed fishing boats/fishing units did not wetline.

Any licensed fishing boats which wetlined during this period and were renumbered were counted once.

This situation means that showing the breakdown of the number of boats wetlining is extremely difficult without creating confusion. To help with this situation, a series of tables have been created in this section of the study.

In the study period between 349 and 424 licensed fishing boats/fishing units report wetlining each year. This is set out below in Table 3.

Table 3 Annual number of licensed fishing boats/fishing units which reported wetlining 1991-92 to 1997-98

Total No. of fishing units as at 30.6.98	91-92	92-93	93-94	94-95	95-96	96-97	97-98
1,361	410	386	373	349	368	395	424

The licensed fishing boats which reported wetlining during 1997-98 are set out in Figure 1. Appendix 2 sets out the number of boats which have wetlined in the last seven financial years from 1991-92 to 1997-98 in the managed and interim managed fisheries.

2.2.2 Licensed boats which operate under licence conditions

There are 117 licensed fishing units which wetline under licence conditions that vary from the standard 'wetline only' fishing boat conditions of 16, 17 and 18. The main licence conditions the 117 units operate under are:

- condition 19, which permit estuarine fishing (see Tables 4 and 5);
- condition 42, which permits herring fishing; and
- condition 98, which permits the use of shark gear between 32° 41' and 33° South;

Note that a more detailed look at the estuarine licence conditions is also given in Tables 4 and 5. The declining number of estuarine fishing units wetlining over the last seven years is indicative of the numbers sold to the FAS. The Voluntary Reallocation and Buyout Fisheries Adjustment Scheme which was initiated during 1998 has reduced the total number of estuarine units by a further 28 per cent since 30 June 1998. A new round of this scheme is currently in place and these numbers may reduce further.

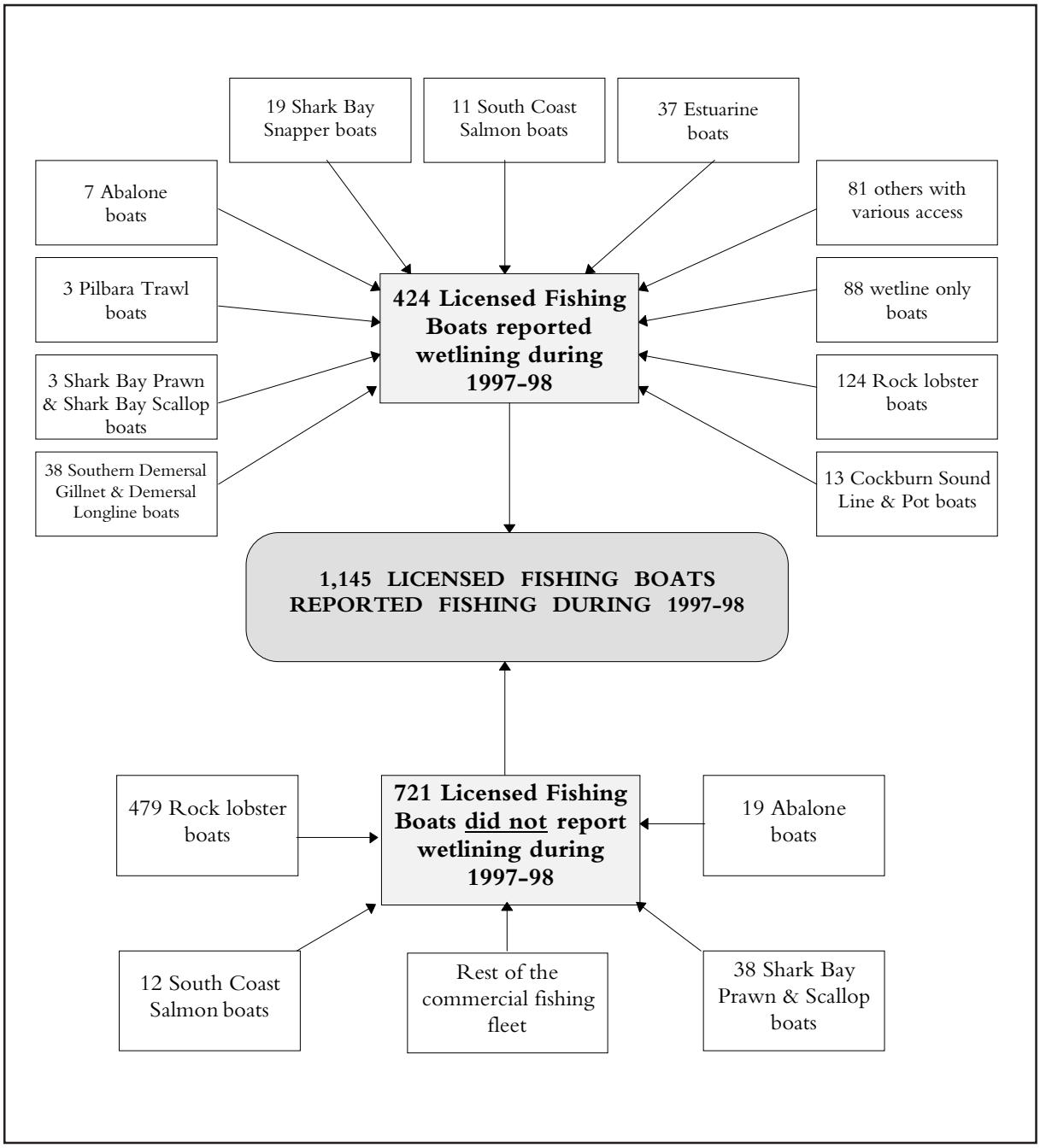


Figure 1 Number of boats wetline fishing during 1997-98.

Table 4 Number of boats in the estuarine fisheries which reported wetlining.

Estuarine Fishery (Condition 19)	Number of licensed fishing boats/units in the fishery as at 30.6.98	Total no. of fishing boats as licensed at 30.6.98 which wetlined in the fishery 1991-92 to 1997-98
South Coast Estuarine Fishery	33 units	30
Hardy Inlet Estuarine Fishery	2 units	2
Leschenault Estuarine Fishery	6 units	6
Mandurah Estuarine Fishery	14 units	5
Swan Canning Estuarine Fishery	6 units	4
Exmouth Gulf Beach Seine Fishery	4 units	4

Table 5 Annual number of estuarine units which reported wetlining 1991-92 to 1997-98.

No. of fishing units in the estuarine fisheries as at 30.6.98	91-92	92-93	93-94	94-95	95-96	96-97	97-98
66 units	71	60	59	48	45	43	37

2.2.3 'Wetline only' licensed fishing boats

Usually about 90 'wetline only' boats fish each year (see Table 6).

Altogether, 214 'wetline only' fishing units have reported fishing during this period. According to licensing records as at 30 June 1998, there were 225 'wetline only' licensed fishing boats, including dinghies listed as part of fishing units. Catch records indicate that only 125 'wetline only' fishing units licensed at 30 June 1998 have been active in the past seven years.

The records of the 'non-fishing' 'wetline only' licensed fishing boats show that their inactivity falls into two categories.

- Some of these 'boats' are dinghies attached to a mother boat, where the mother boat has the fishing activities recorded against it, and the mother boat has not wetlined; and
- Others are licensed fishing boats that previously held either managed fishery authorisations or licence conditions which were either transferred to another boat, sold to the Fisheries Adjustment Schemes, or lost at transfer. These boats have been productive, but have not wetlined since becoming 'wetline only' licensed fishing boats.

In total, 21 'wetline only' licensed fishing boats had the same licensing status for the whole of the seven year period and did not fish. Only two of these boats are dinghies.

Table 6 Annual number of 'wetline only' fishing units which reported wetlining 1991-92 to 1997-98.

No. of 'wetline only' fishing units as at 30.6.98	91-92	92-93	93-94	94-95	95-96	96-97	97-98
156 units	97	83	88	89	90	90	88

2.3 Identification of wetline catch

A full breakdown of wetline catches south of North West Cape and troll line figures, can be found at Appendix 3. The total wetline catch has been around 2,000 tonnes for most of the period of this study, rising to 2,267 tonnes in 1997-98.

The wetline catches by species of the 'wetline only' fleet, the West Coast Rock Lobster fleet, and two sample fisheries, the Southern Demersal Gillnet and Demersal Longline Fishery, and the Shark Bay Snapper Fishery are shown at Appendix 4.

It is interesting to note that the 'wetline only' fleet took 45 per cent of the total reported wetline catch and the West Coast Rock Lobster boats took seven per cent of the total reported wetline catch. However, the rock lobster boats took 24 per cent of the reported 'wetline' caught dhufish and 21 per cent of the total commercial dhufish catch during 1997-98. The rock lobster fleet's reported wetline catch increased by 74 per cent between 1996-97 and 1997-98.

The wetline catches of three line caught species of fish exceed 100 tonnes. These are dhufish, Spanish mackerel and pink snapper. Two net caught species, Australian herring and whitebait usually exceed 100 tonnes.

2.3.1 Most targeted wetline species

Prior to the commencement of this study, anecdotal evidence suggested that dhufish and Spanish mackerel stocks may be at risk of overfishing from commercial wetline fishing and recreational marine angling. Anecdotal evidence also suggested that commercial fishing boats were increasingly targeting other species prized by the recreational fishing sector.

Therefore, statewide wetline catches of dhufish, Spanish mackerel, and other popular recreational finfish species (identified through the *preliminary* results of the Lower West Coast Recreational Fishing Boat Survey from Augusta to Kalbarri) were examined. These were compared to the remainder of the commercial catch of these species.

The commercial catch (wetline and other commercial) from Augusta to Kalbarri was also compared to the *preliminary* results of the recreational boat catch survey, and with respect to Australian herring, a recreational beach survey (the Western Australian Salmon and Australian Herring Creel Survey). Data on the shore-based catch for species which have a large shore-based component, such as skipjack trevally and sea garfish, was not processed in a way that could be used at the time of writing this study.

It should be noted the beach survey only reported catches between Augusta, and the Perth metropolitan area. *The recreational catches for many species used in this study are therefore under-reported.* In addition, no allowance has been made for incidental mortality of demersal species, ie. even if undersize, unwanted or excess fish are returned to the sea, some demersal species will die if they have been taken from deep waters.

The preliminary results of the boat survey, taken between Kalbarri and Augusta indicate large recreational catches along this stretch of coastline. The survey area largely corresponds with the fishing blocks. However, there may be some slight discrepancies at the edges of the study area, with commercial fishing boats travelling further afield, but landing the catches at Kalbarri or Augusta.

The Western Australian Salmon and Australian Herring Creel Survey indicated that the 1994 and 1995 recreational beach catches of Australian herring from the State's South West ie. Perth to

Augusta, were 247 tonnes and 177 tonnes respectively. The Australian salmon fishery is a managed fishery and there were few wetline catches recorded for this species (0.1 tonnes in 1997-98)

Tables 7-14 set out the commercial catch figures, beginning with the two species considered to be of most concern - dhufish and Spanish mackerel. Tables for those species where less than 10 per cent of the catch is taken by the wetline fleet are shown in Appendix 5. Unless otherwise stated, the recreational catch shown is taken from *preliminary* data of the recreational boat catch survey from Augusta to Kalbarri.

Because figures for catches from recreational fishing charter boats could be underestimated, they have not been used. The discussion paper "Future management of the aquatic charter industry in Western Australia" of 1997 indicated there were 135 charter operators in 1997. This number of operators is not reflected in the catch figures, nor the boats which hold charter fishing licence conditions.

Table 7a

DHUFISH	**Live weight (tonnes)**						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	150.3	127.8	114.5	136.1	147.7	160.0	201.8
Other commercial catch	35.2	45.6	44.8	35.8	37.1	36.9	30.0
Total commercial catch	185.5	173.4	159.3	171.9	184.8	196.9	231.8
Wetline catch as % of total commercial catch	81.0%	73.7%	71.9%	79.2%	79.9%	81.2%	87.0%
Wetline catch of Rock Lobster fleet	18.2	11.3	9.1	13.4	19.9	20.2	49.1
*Wetline catch of Rock Lobster fleet as % of total commercial catch	9.8%	6.5%	5.7%	7.8%	10.8%	10.3%	21.2%

* *Note: the percentage wetline catch of the Rock Lobster fleet was shown in this instance as it is a frequent assertion that licensed fishing boats in the Rock Lobster fleet take large amounts of dhufish.*

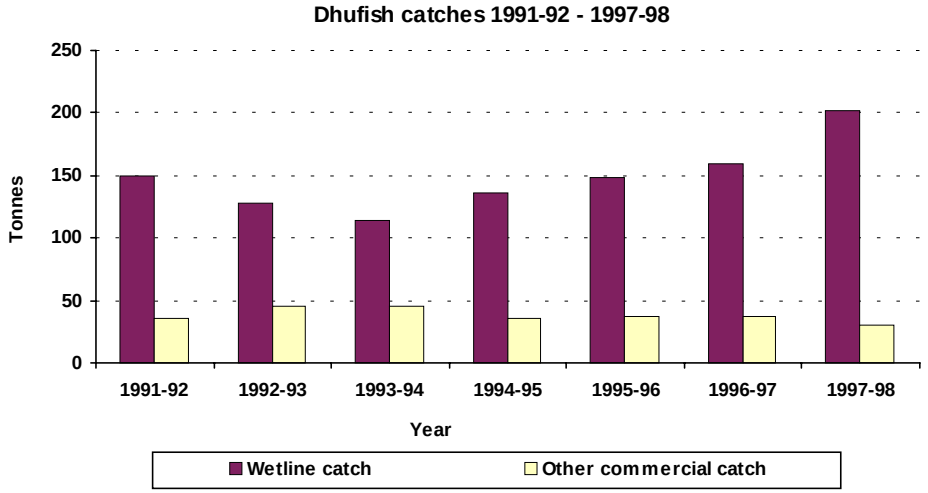


Figure 2a

Table 7b

DHUFISH	**Live weight (tonnes) 1996-97**	**Percentage of total catch, Kalbarri - Augusta**
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	132	40.8%
Wetline catch, Kalbarri to Augusta	156.1	48.3%
Other commercial catch, Kalbarri to Augusta	35.1	10.9%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	323.2	100%

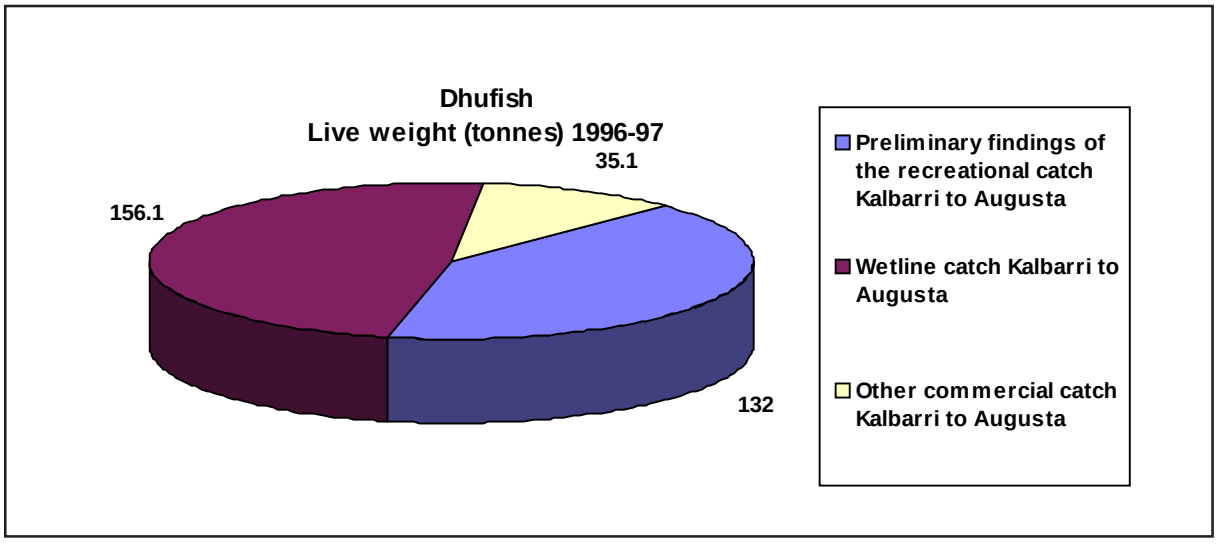


Figure 2b

Table 8a

SPANISH MACKEREL	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	228.6	228.4	425.3	445.7	470.7	476.7	536.5
Other commercial catch	160.8	142.6	35.7	25.3	31.3	10.0	23.3
Total commercial catch	389.4	371.0	461.0	471.0	502.0	486.7	559.8
Wetline catch as a % of total commercial catch	58.7%	61.6%	92.2%	94.6%	93.8%	97.9%	95.8%

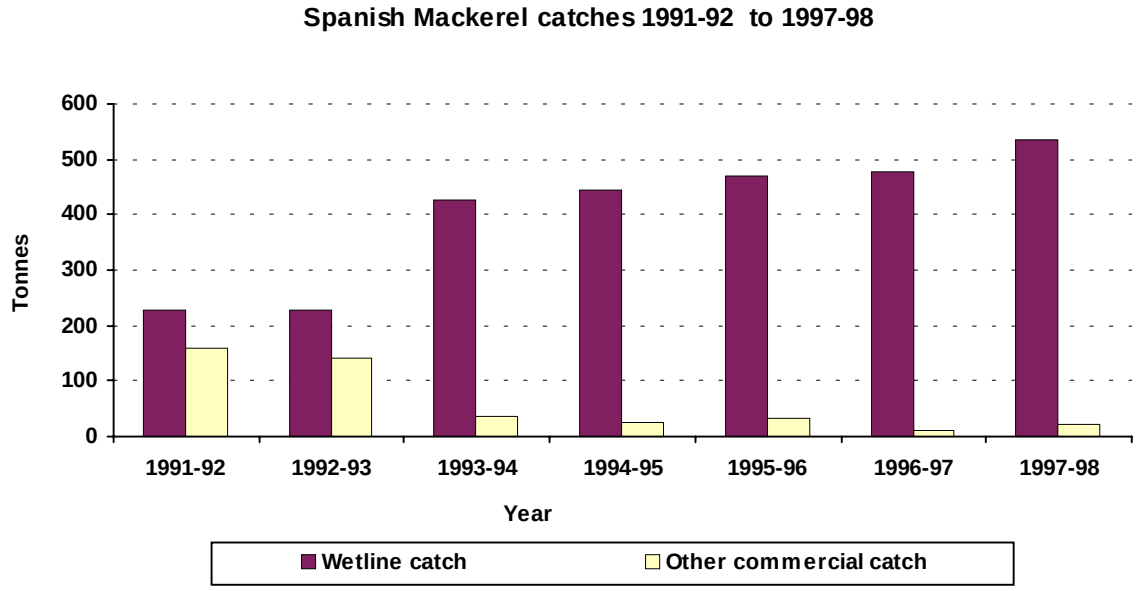


Figure 3a

Table 8b

SPANISH MACKEREL	**Live weight (tonnes) 1996-97**	**Percentage of total catch, Kalbarri - Augusta**
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	12.5	45.5%
Wetline catch, Kalbarri to Augusta	15.0	54.5%
Other commercial catch, Kalbarri to Augusta	-	-
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	27.5	100%

* *Note: The recreational catch is from the Kalbarri area only and as a predominantly northern species, Spanish mackerel is not often fished commercially south of the Shark Bay area.*

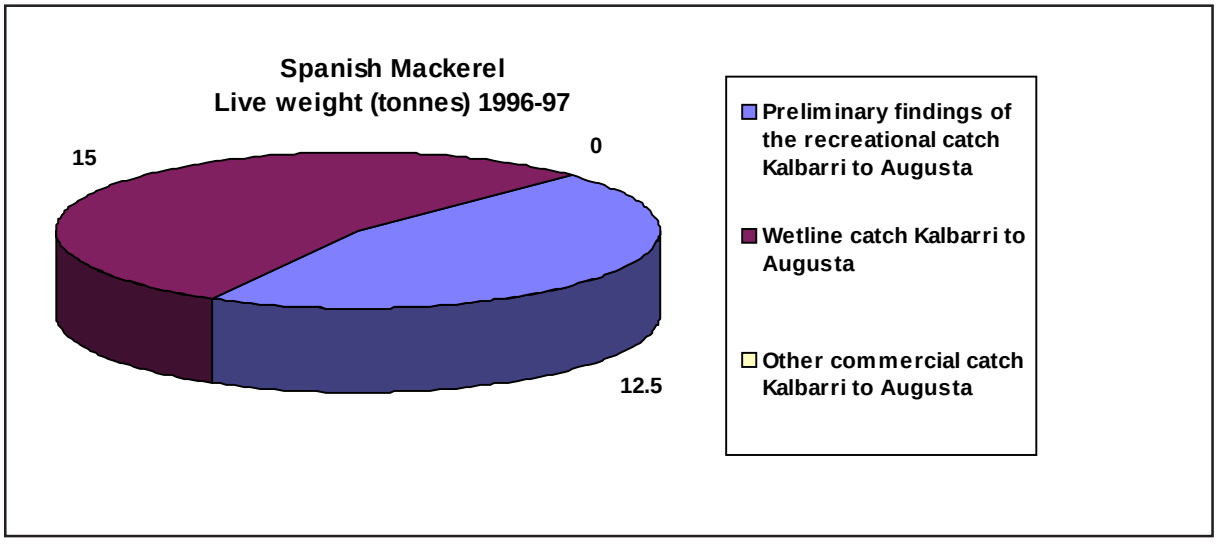


Figure 3b

Table 9a

GARFISH, SEA	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	31.5	20.2	12.4	11.7	13.9	15.9	14.7
Other commercial catch	35.4	20.6	38.7	44.9	38.4	27.9	33.1
Total commercial catch	66.9	40.8	51.1	56.6	52.3	43.8	47.8
Wetline catch as a % of total commercial catch	47.1%	49.5%	24.3%	20.7%	26.6%	36.3%	30.8%

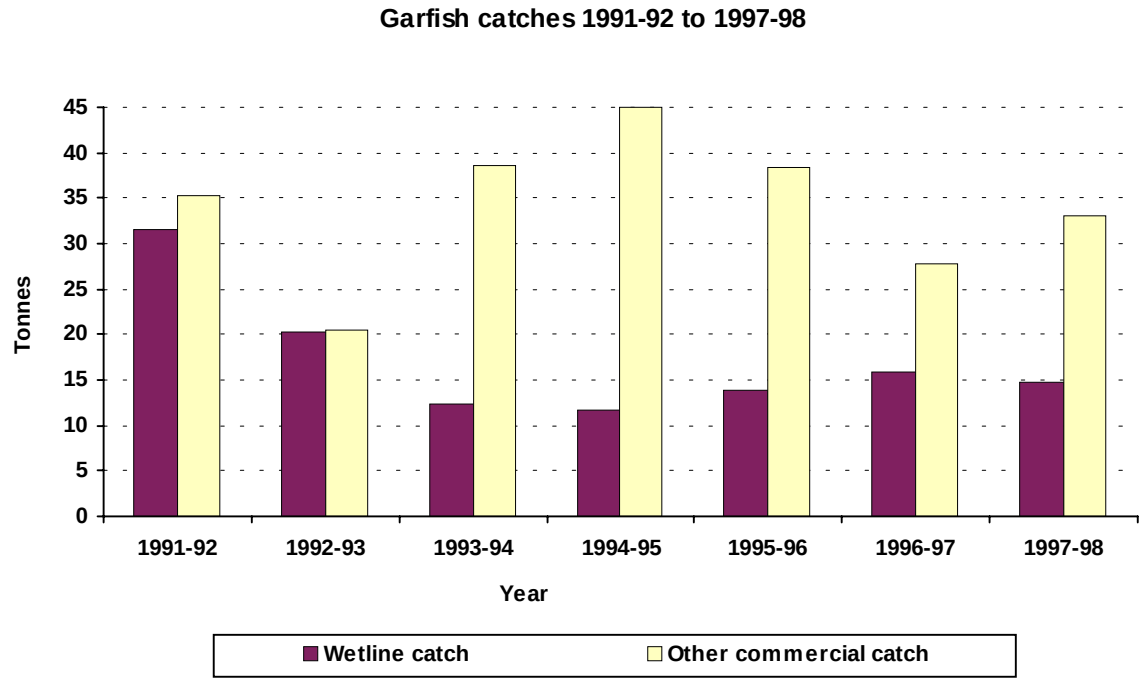


Figure 4a

Table 9b

GARFISH, SEA	Live weight (tonnes) 1996-97	Percentage of total catch, Kalbarri - Augusta
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	7.6	24.7%
Wetline catch, Kalbarri to Augusta	3.6	11.7%
Other commercial catch, Kalbarri to Augusta	19.6	63.6%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	30.8	100%

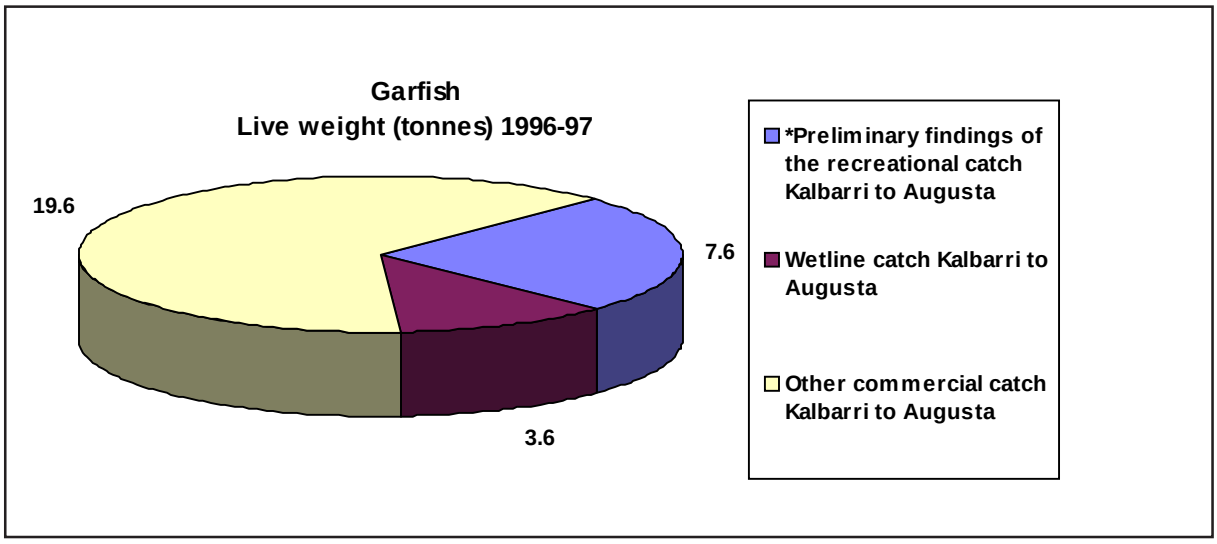


Figure 4b

Table 10a

GROPER, BALDCHIN	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	40.6	32.3	27.3	32.2	34.8	29.9	35.0
Other commercial	9.4	17.5	26.1	16.4	8.1	9.9	7.1
Total commercial catch	50.0	49.8	53.4	48.6	42.9	39.8	42.1
Wetline catch as a % of total commercial catch	81.2%	64.8%	51.1%	66.2%	81.1%	75.1%	83.1%
*Abrolhos Islands wetline catch	-	7.2	13.0	19.9	19.4	17.2	19.3
*Abrolhos Islands wet-line catch as % of total commercial catch	-	14.5%	24.3%	40.9%	45.2%	43.2%	45.8%

* *Note: Anecdotal evidence suggested that large numbers of baldchin groper were being taken by the wetline fleet from the waters surrounding the Abrolhos Islands (see Section 2.3 of this document - 'Where Wetline Catch is Taken').*

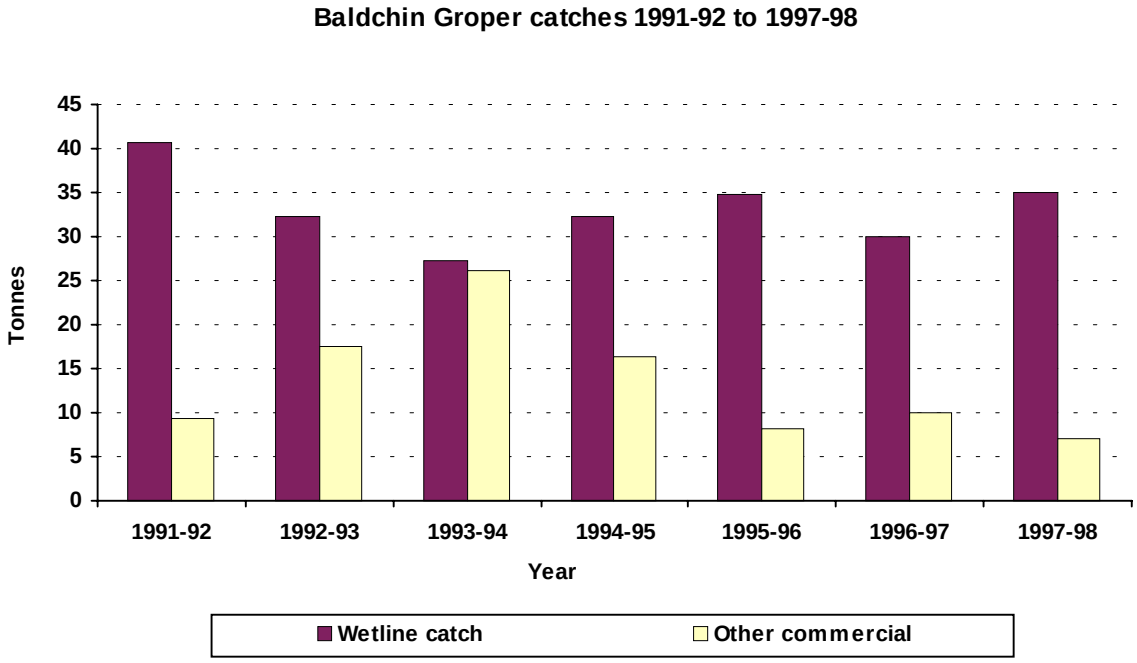


Figure 5a

Table 10b

GROPER, BALDCHIN	Live weight (tonnes) 1996-97	Percentage of total catch, Kalbarri - Augusta
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	23.0	38%
Wetline catch, Kalbarri to Augusta	29.2	48.2%
Other commercial catch, Kalbarri to Augusta	8.4	13.8%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	60.6	100%

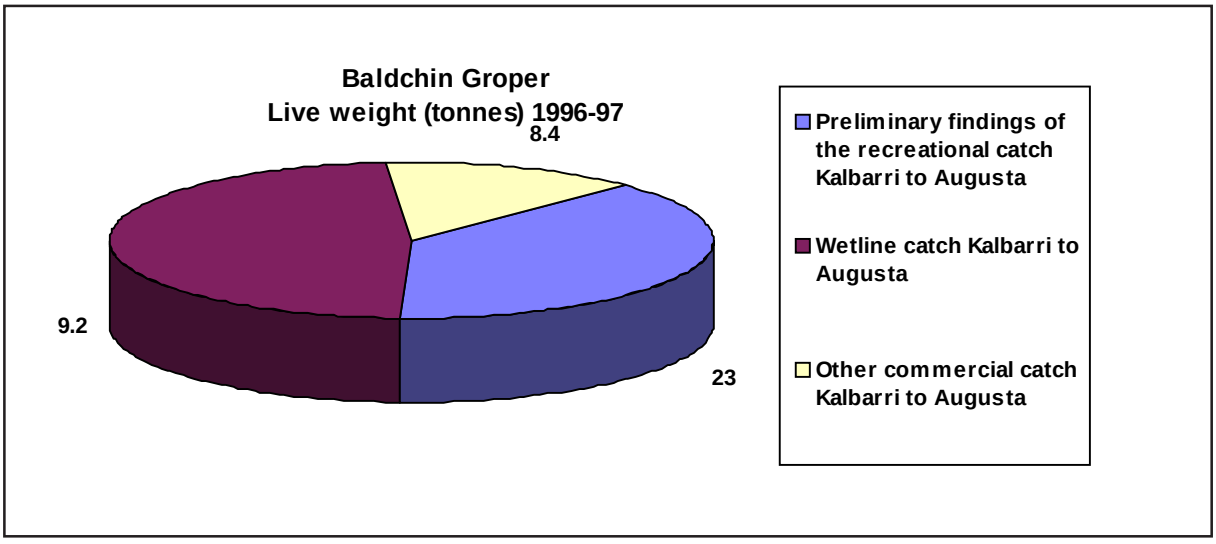


Figure 5b

Table 11a

GROPER, BLUE	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	4.4	9.3	6.4	7.6	6.8	3.5	7.4
Other commercial catch	31.6	35.9	29.9	29.7	26.9	31.8	28.0
Total commercial catch	36.0	45.2	36.3	37.3	33.7	35.3	35.4
Wetline catch as a % of total commercial catch	12.2%	20.6%	17.6%	20.4%	20.2%	9.9%	20.9%

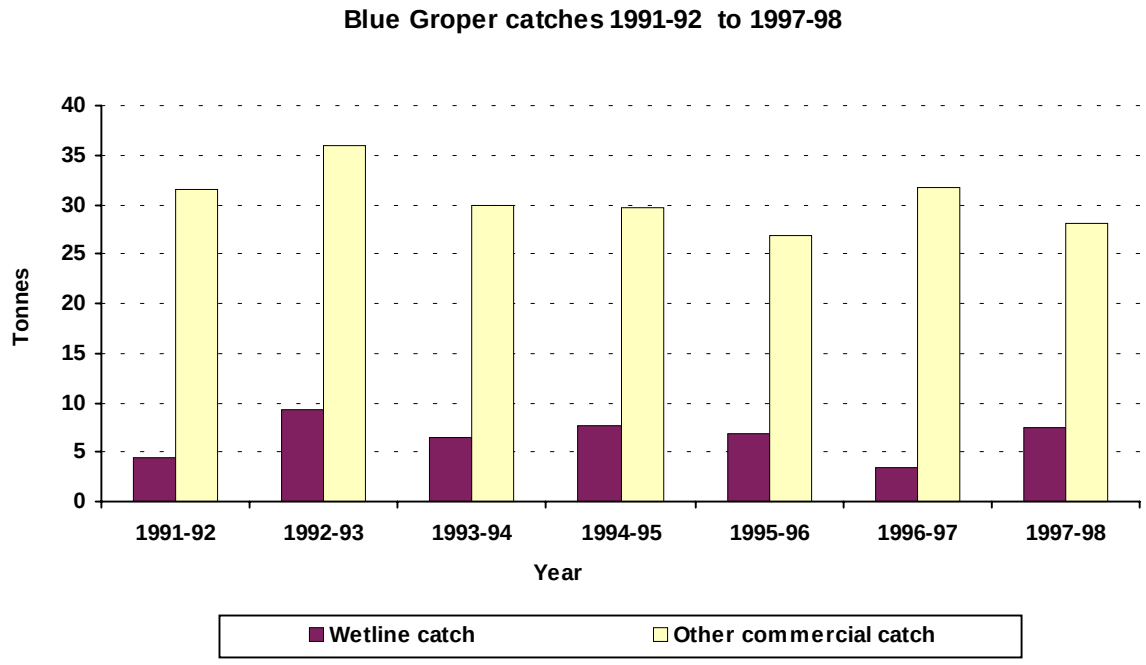


Figure 6a

Table 11b

GROPER, BLUE	**Live weight (tonnes) 1996-97**	**Percentage of total catch, Kalbarri - Augusta**
**Preliminary* findings of the recreational catch survey, Kalbarri to Augusta	2.7	12.9%
Wetline catch, Kalbarri to Augusta	2.5	12.0%
Other commercial catch, Kalbarri to Augusta	15.7	75.1%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	20.9	100%

* *Note: This species also occurs outside the area of the survey, particularly along WA's south coast.*

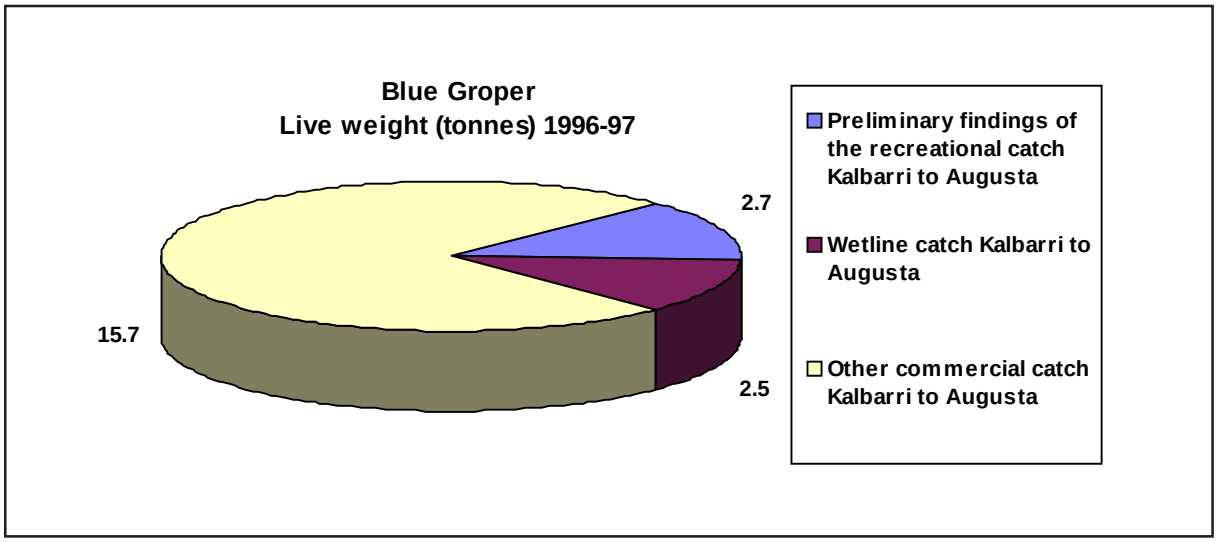


Figure 6b

Table 12

HERRING, AUSTRALIAN	Live weight (Tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	305.6	220.3	156.3	157.5	129.6	124.5	111.8
Other commercial catch	1,016.2	563.2	844.4	630.0	936.2	958.6	652.0
Total commercial catch	1,321.8	783.5	1,000.7	787.5	1,065.8	1,083.1	763.8
Wetline catch as a % of total commercial catch	23.1%	28.1%	15.6%	20%	12.2%	11.5%	14.6%
Recreational catch			*247.0	*177.0		**50.0	
Total catch			1,247.7	964.5			
Wetline catch as a % of total catch			12.5%	16.3%			
Recreational catch as a % of total catch			19.8%	18.4%			

* *From the Western Australian Salmon and Australian Herring Creel Survey (shore and boat).*

** *Estimated recreational catch based on preliminary boat catch from Augusta to Kalbarri collected for the Lower West Coast Recreational Fishing Boat Survey (boat only).*

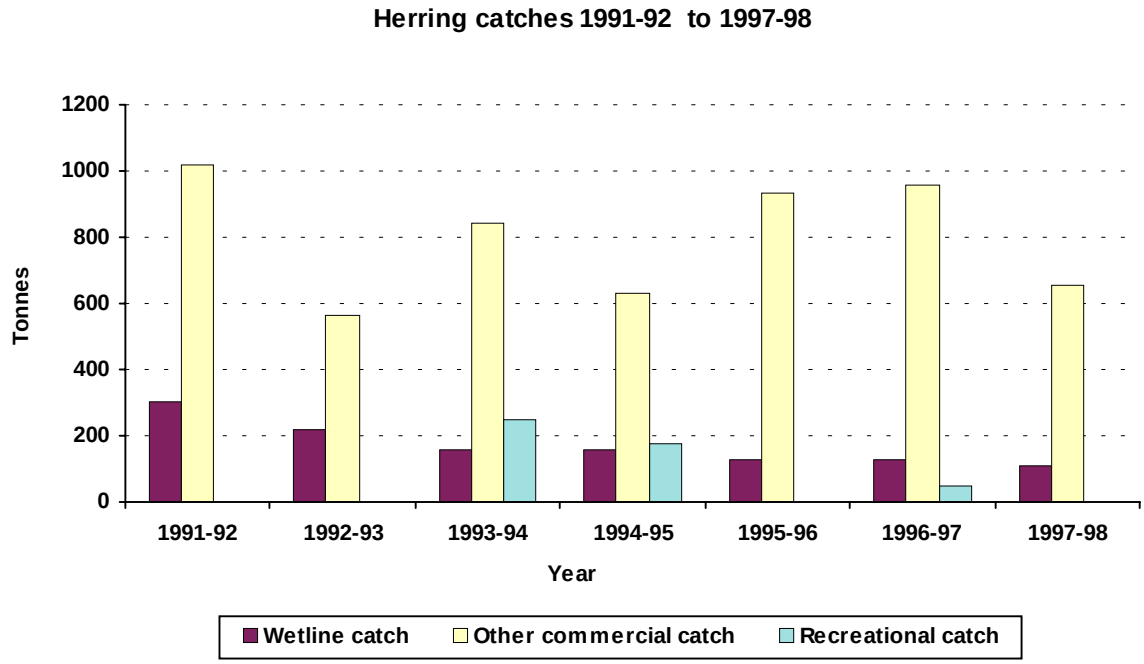


Figure 7

Table 13a

SNAPPER, PINK	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	224.5	175.7	235.7	277.3	336.2	264.9	230.5
Other commercial catch	501.1	634.3	526.9	573.8	509.7	636.8	534.0
Total commercial catch	725.6	810.0	762.6	851.1	845.9	901.7	764.5
Wetline catch as a % of total commercial catch	30.9%	21.7%	30.9%	32.6%	39.7%	29.4%	30.1%

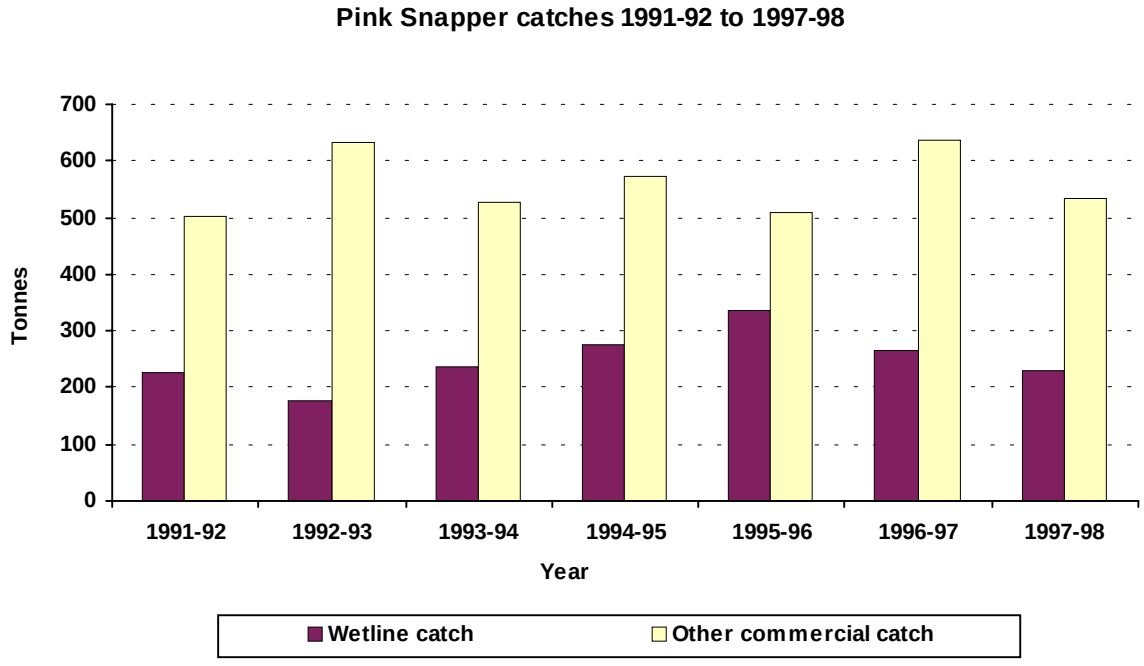


Figure 8a

Table 13b

SNAPPER, PINK	**Live weight (tonnes) 1996-97**	**Percentage of total catch, Kalbarri - Augusta**
**Preliminary* findings of the recreational catch survey, Kalbarri to Augusta	27.0	9.0%
Wetline catch, Kalbarri to Augusta	228.8	76.1%
Other commercial catch, Kalbarri to Augusta	45.0	14.9%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	300.8	100%

* *Note: Since this species is distributed from South Australia to Coral Bay, much of the commercial and recreational catch (particularly in Shark Bay) occurs outside the area of the survey. The total recreational and commercial catch will exceed the estimate available. The 1996-97 year was considered to be a poor one for pink snapper by many recreational anglers (Neil Sumner, pers. comm. 1998).*

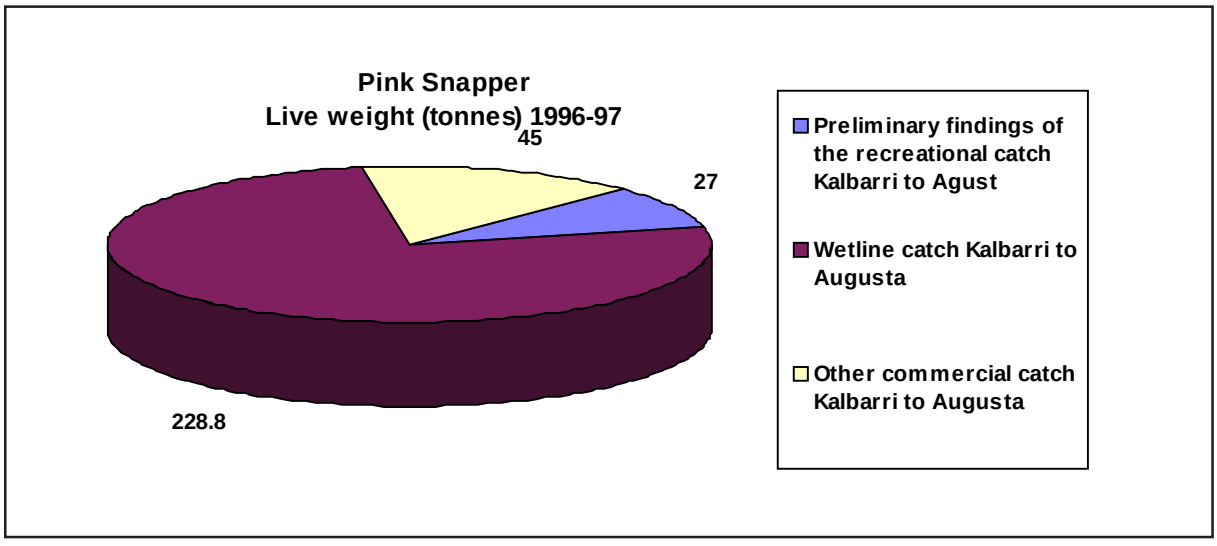


Figure 8b

Table 14a

TREVALLY, SKIPJACK	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	3.7	3.0	4.5	4.7	3.1	4.9	6.1
Other commercial catch	2.0	6.2	4.5	3.1	3.2	2.9	2.8
Total commercial catch	5.7	9.2	9.0	7.8	6.3	7.8	8.9
Wetline catch as a % of total commercial catch	64.9%	32.6%	50.0%	60.3%	49.2%	62.8%	68.5%

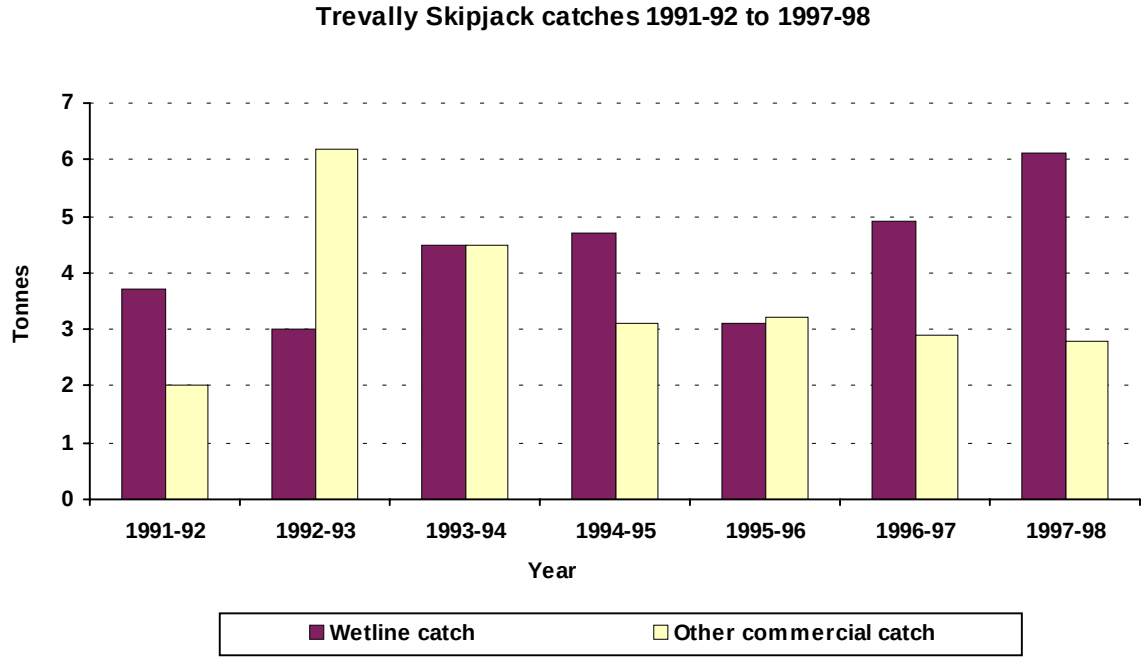


Figure 9a

Table 14b

TREVALLY, SKIPJACK	Live weight (tonnes) 1996-97	Percentage of total catch, Kalbarri - Augusta
**Preliminary* findings of the recreational catch survey, Kalbarri to Augusta	43.0	96.2%
Wetline catch, Kalbarri to Augusta	1.7	3.8%
Other commercial catch, Kalbarri to Augusta	-	-
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	44.7	100%

* *Note: Since this species is distributed from South Australia to NW Cape, much of the recreational catch occurs outside the area of the survey. Therefore, the total recreational catch will exceed the above estimate.*

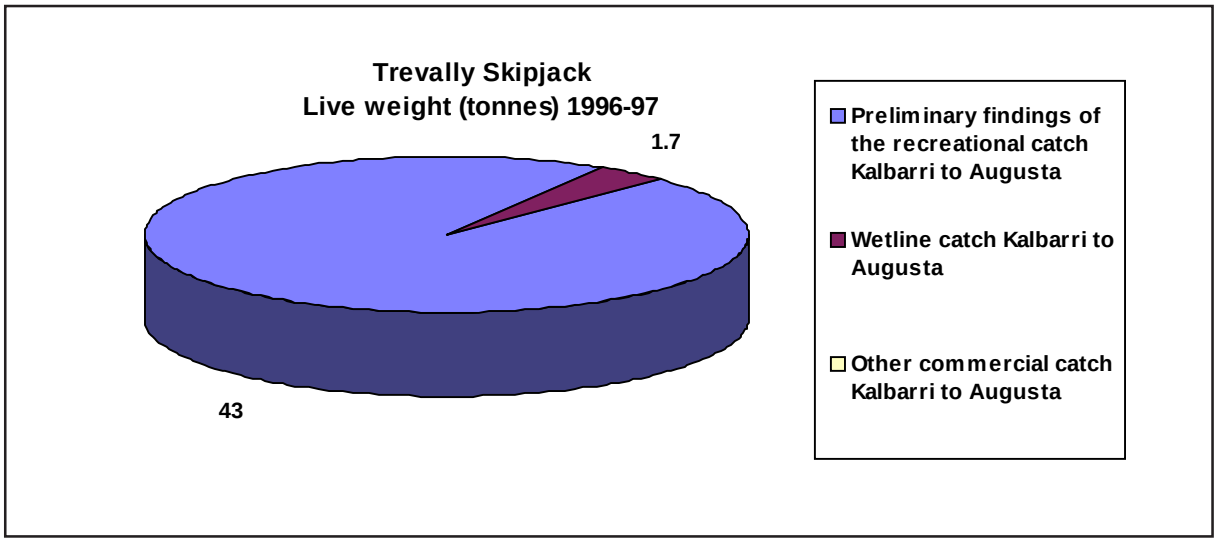


Figure 9b

Other large wetline catches of species from the waters south of North West Cape, which are not generally regarded as recreationally important, are listed in Table 15 below.

Table 15 Wetline catches of fish not considered important to the recreational sector

SPECIES	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Hapuku	12.6	8.4	13.3	9.3	19.3	22.0	21.4
Mullet, Sea	78.6	84.6	79.1	70.3	58.7	68.0	71.7
Samsonfish	58.6	49.3	48.3	52.7	40.0	55.8	101.9
Whitebait	158.9	122.7	137.3	91.0	181.5	256.1	47.8

2.4 Where wetline catch is taken

Appendix 6 shows the block by block breakdown of wetline fishing catches. The main areas south of North West Cape are the South West, from Mandurah to Jurien, Albany and Geraldton and the Abrolhos Islands, (see Map 1).

With the exception of the 'wetline only' licensed boats, the majority of wetline activity takes place near a licensed fishing boat's home port. For example, if it is licensed fishing boat owned by an Albany resident, it tend to fish around Albany, or if it is a licensed fishing boat with a Zone C West Coast Rock Lobster Managed Fishery licence, it will wetline in Zone C. Changes in the geographical fishing patterns of a licensed boat often indicate a change of ownership.

2.4.1 Geographical fishing patterns of 'wetline only' licensed fishing boats

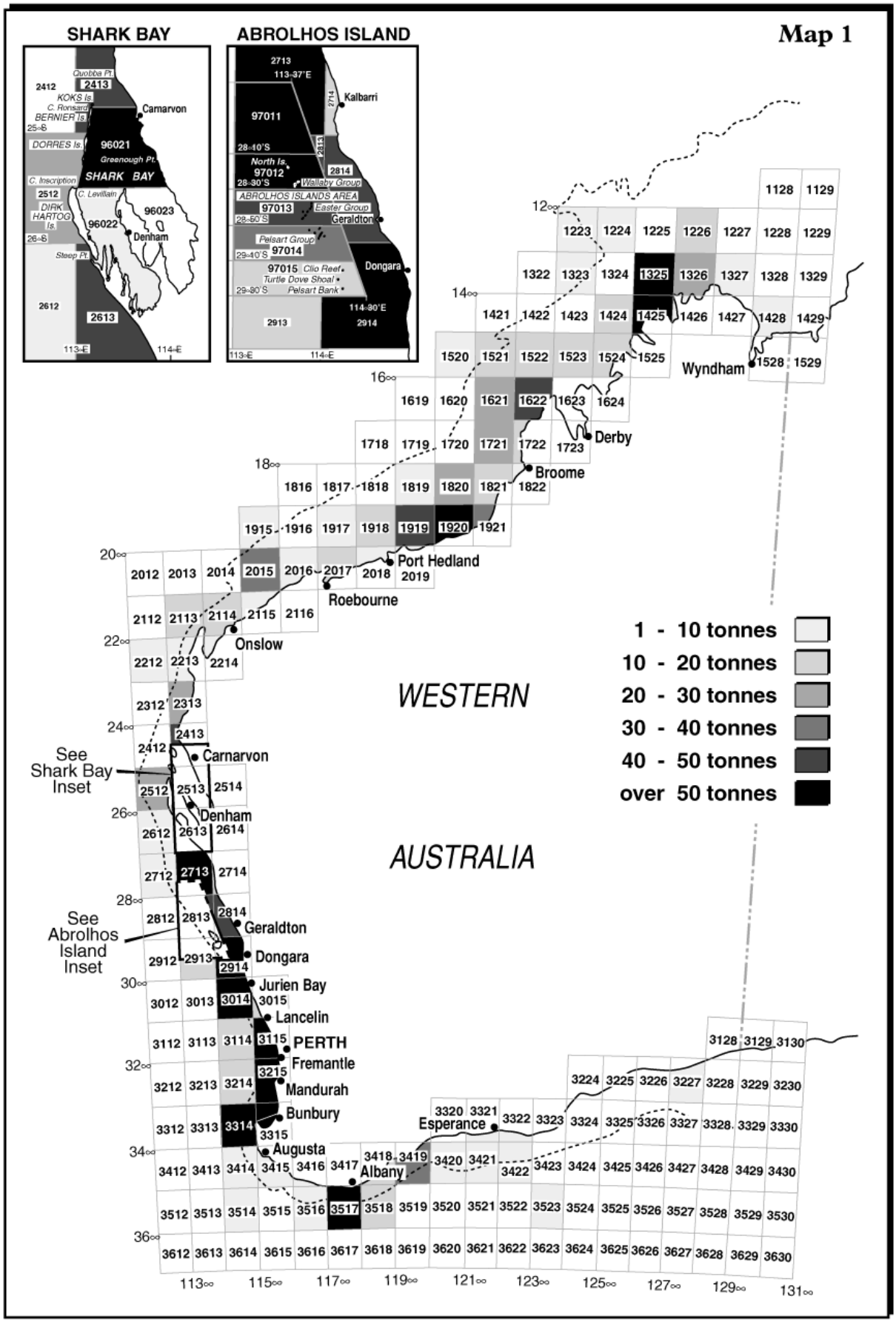
Many of the active 'wetline only' licensed fishing boats are highly mobile. The vast majority of boats change ownership more frequently in comparison to those boats whose licensees also have access to managed and other commercial fisheries.

The pattern of the 'wetline only' fishing activity is often that a licensed fishing boat will fish a certain area or target a certain species for one or two years, prior to moving on to another area or species, either because its ownership has changed, or for marketing reasons. Wetline licensed boats are often 'held' by boat brokers and frequently change hands due to leasing arrangements, which under Fisheries WA's licensing arrangements often registers as a 'transfer'. Thus a licensed fishing boat may have four or five nominal owners in as many years, with fishing activity ranging from none for some owners to high with others.

Geraldton registered boats tend to fish near Geraldton and the Abrolhos Islands, while the south and South West registered boats tend to fish in the blocks near those areas, although they may fish a number of those blocks. The Fremantle registered boats tend to wetline in all geographic areas of the State. The most mobile 'wetline only' registered boats are those registered in Mandurah and from the North West of Western Australia. A number of these vessels target Spanish mackerel.

Where ownership has remained stable, the 'wetline only' licensed fishing boats tend to fish near their home port, or do not fish at all.

Distribution of Wetline Catches 1997-98



2.4.2 Geographical wetline fishing patterns of boats operating under licence conditions

Licensed fishing boats operating under licence conditions that vary from the 'standard' 16, 17 and 18 of the 'wetline only' fleet tend to be less mobile than the latter. The geographical wetline activities of these boats are influenced by changes of ownership, but not to the same extent as 'wetline only' boats. This situation may be the result of the nature of these licence conditions.

Boats with estuarine and herring trap licence conditions exhibit the least geographical movement.

Licensed boats registered in the State's south and South West tended to be less mobile than those registered in the Perth metropolitan area and in the parts of the State north of Perth.

2.4.3 Geographical wetline fishing patterns of boats holding managed fishery and interim managed fishery and supplementary authorisations

Generally, licensed fishing boats holding managed fishery licences tend to wetline near to the geographical area associated with the particular managed fishery licence. Managed fishery authorisations which target cartilaginous fish or scale fish tend to have a larger percentage of their licence holders involved in wetlining.

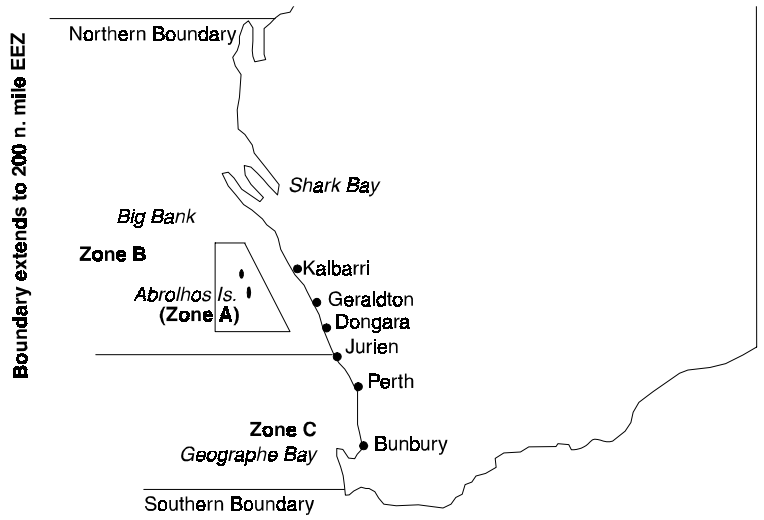
Outlined below are the geographical wetline fishing patterns for the West Coast Rock Lobster Fishery, and two sample managed fisheries - the Southern Demersal Gillnet and Demersal Longline Fishery and the Shark Bay Snapper Fishery.

2.4.3.1 West Coast Rock Lobster Managed Fishery

There appears to be a correlation between wetline fishing activity levels and the particular zone associated with a rock lobster boat (see Appendix 2 and Map 2, Western Rock Lobster Fishing Zones, shown over the page). Zone C licensed boats are the most likely to wetline, while Zone B boats are the second most likely and Zone A the least likely. The reason for this may be levels of cash flow associated with catch peaks, ie. the Zone A rock lobster fleet has two peaks in the catch and therefore has more cash flow, while the Zone C fleet has one peak. Historically, the income from the average Zone C licence supports a large number of licensees and there is an incentive to maximise the income stream. In addition, the Zone C lobster catches fluctuate around the long term mean more than the other two zones, further reinforcing the income motivation to diversify operations as a hedge against uncertainty.

Map 2

Western Rock Lobster Fishing Zones



The CAES data for 1997-98 revealed a doubling in dhufish catch reported by the rock lobster fleet, from 20.2 tonnes in 1996-97 to 49.1 tonnes in 1997-98. Twenty eight rock lobster boats reported catches of dhufish for the first time in 1997-98, with the majority of the increase being recorded from blocks 29140, 29142, 30140 and 31150.

The reasons for the increased finfish activity (mainly in the off season) are threefold;

- under-reporting of wetline catch in the first six years of the study;
- a concern that Government was about to rationalise the future level of wetline access, and thus entitlement of rock lobster fishers to wetline; and
- an anticipation that lower rock lobster prices would continue during the 1998-99 rock lobster season.

During 1998, Fisheries WA received information that strongly suggested that the rock lobster fleet had again increased its wetline fishing activities.

Of the 124 C Zone licensed boats identified as having wetlined during the last seven years, only 13 have taken fish outside that zone. Of the 13, six have fished around Dongara, four have fished the Exmouth Gulf area, and two have gone to the Pilbara.

Eleven Zone B boats have reported wetlining outside their zone, mainly in the Abrolhos and around Shark Bay - while no Zone A licensed boats have reported wetlining outside their zone.

2.4.3.2 Southern Demersal Gillnet and Demersal Longline Fishery

Most licensed boats in this fishery reported wetlining close to their home port, and in the case of some units, there is a relatively large beach seine component. Some licensed fishing boats previously associated with the fishery exhibited a mobile pattern, (fishing from the Kimberley to the Great Australian Bight), but this is no longer the case. The supplementary access holders in this fishery exhibited the most mobility, with one fishing from Albany to the Abrolhos, and another fishing from Shark Bay to Albany.

2.4.3.3 Shark Bay Snapper Fishery

Most of the Shark Bay Snapper licensed boats wetlined between North West Cape and Dongara. None are permitted to fish within the Ningaloo Marine Park to 200 nautical miles offshore. Five of these licensed boats have wetlined in the Abrolhos Islands. Of those wetlining outside this region, most have done so at their home port, (for example, Albany) at the completion of the Shark Bay Snapper Managed Fishery peak season.

2.4.4 Geographical breakdown by species

A block by block breakdown of the most targeted wetline species is provided at Appendix 6. Map 1 shows the current (1997-98) pattern of overall wetline fishing.

Also see Section 3 of this document.

2.5 Seasonal variations in the wetline catch

2.5.1 Seasonal variations in the wetline fleet

Spanish mackerel and whitebait dominate the reported wetline catches. There is a general fishing pattern of slightly (approximately 30 tonnes) more reported wetline fishing in winter than summer months because this is when the most Spanish mackerel are caught. However, in years of high whitebait catches, there is very little seasonal difference in the overall reported wetline catches, for example in 1996-97.

This is shown in Table 16.

Table 16 Seasonal variations of the wetline fleet.

MONTH	Catch live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	169.2	198.5	167.4	225.7	233.8	145.9	272.8
August	162.6	156.5	152.4	244.4	189.2	236.2	328.3
September	139.2	132.2	147.2	171.1	170.9	165.4	215.2
October	144.0	138.9	154.9	182.0	173.0	141.0	185.4
November	135.6	115.2	110.2	121.4	106.3	127.5	148.8
December	131.5	119.9	122.8	138.9	134.5	102.5	109.9
January	160.8	107.9	173.8	131.4	180.9	203.1	145.9
February	155.0	112.9	137.5	133.6	187.4	187.0	122.8
March	194.7	192.6	163.6	149.1	151.7	195.4	197.1
April	286.6	205.0	176.5	204.8	223.0	238.1	220.1
May	153.7	159.9	144.5	138.4	192.7	181.8	153.7
June	205.7	152.2	170.6	157.2	206.2	222.7	167.3
TOTAL	2,038.6	1,792.2	1,821.6	1,997.9	2,149.8	2,146.7	2,267.4

2.5.2 Seasonal variations in the 'wetline only' fleet

There is a marked difference in seasonal variations of reported catches of certain sectors of the 'wetline only' fleet.

The northern 'wetline only' fleet reports more catches in winter months than summer months. The reason for this situation are the very high catches of Spanish mackerel and some other species recorded in the winter months.

The reported catches of dhufish and pink snapper further south averaged around 10 tonnes a month each during 1997-98.

There are high west coast and South West catches of dhufish, pink snapper and usually whitebait during the summer.

Table 17 shows the total seasonal variations in the reported catch of the 'wetline only' fleet.

Table 17 Seasonal variations of the 'Wetline Only' fleet.

MONTH	Catch live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	88.6	66.3	54.1	107.9	67.9	43.2	106.8
August	80.9	60.8	55.3	124.4	56.9	63.7	103.9
September	75.3	64.0	46.9	106.0	72.0	57.9	66.6
October	60.5	63.0	62.8	105.9	94.7	51.0	86.4
November	71.9	47.1	45.7	58.0	56.7	63.7	68.9
December	52.3	50.5	33.8	50.2	43.3	35.7	47.0
January	44.6	36.2	49.8	40.9	60.9	65.0	60.7
February	45.3	42.8	49.9	59.5	68.0	60.6	57.8
March	54.1	50.3	59.1	71.8	60.2	74.7	99.7
April	69.3	46.7	63.9	67.7	88.7	93.5	94.0
May	55.9	55.2	74.8	74.0	94.5	77.1	85.8
June	58.6	66.2	94.5	58.4	82.9	87.0	97.1
TOTAL	757.5	649.2	690.5	924.7	846.6	773.2	975.0

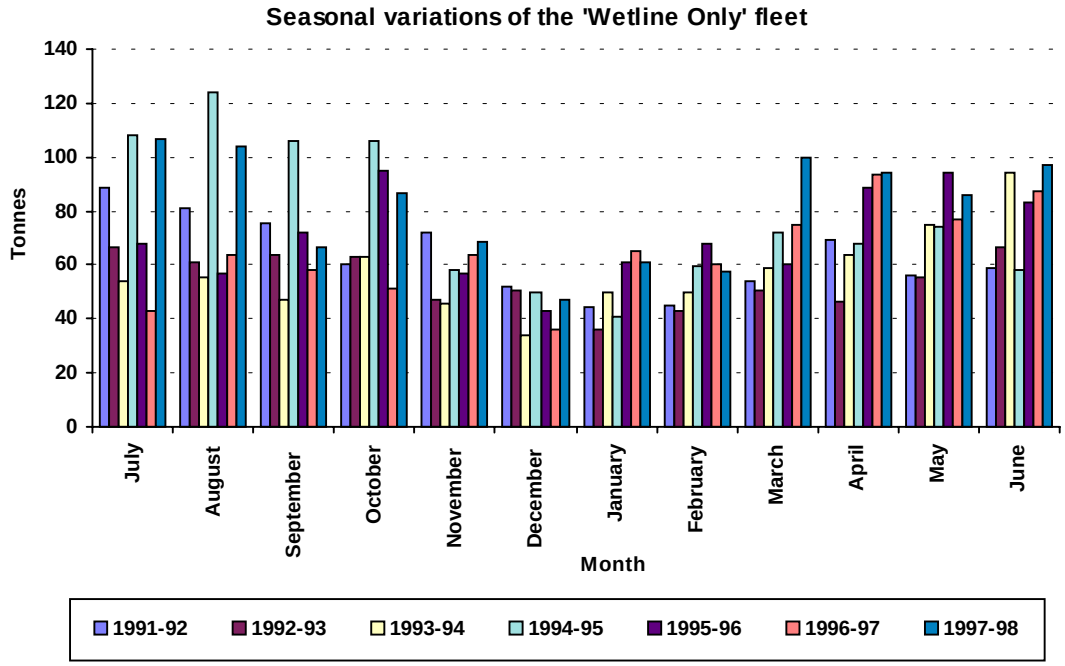


Figure 10

2.5.3 Seasonal variations in the wetline catches of the managed fishery fleet

Outlined below are the seasonal variations for the West Coast Rock Lobster and two sample managed fisheries - the Southern Demersal Gillnet and Demersal Longline Fishery and the Shark Bay Snapper Fishery.

2.5.3.1 Seasonal variations in the wetline catches of the Rock Lobster fleet

Anecdotal evidence suggested that large numbers of the West Coast Rock Lobster fleet wetlined during the off-season. As a result, the month-by-month wetline catches of the rock lobster fleet were examined.

Usually between 70 and 100 rock lobster boats wetline each year, although in 1997-98 124 reported wetlining. Generally, each boat reports taking only small amounts of fish (under one tonne a year). Table 18 lists the reported monthly wetline fishing activity of the West Coast Rock Lobster fleet from 1991-92 to 1997-98.

As expected, the main months for reported wetline fishing activity by West Coast Rock Lobster boats are August, September and October, which coincide with the closed season of the rock lobster fishery. This is particularly so in 1997-98 when the total reported wetline catch increased by 73.9 per cent over the previous year, with the months of July, August and September being considerably higher than previous years.

To ascertain the extent of latent 'wetline' effort in the rock lobster fishery, the correlation between the average price of rock lobster and wetline fishing activity by West Coast Rock Lobster boats over 10 years was examined. The wetline catches of West Coast Rock Lobster boats by species are shown in Appendix 4. The results, shown in Table 19 and Figure 12 below, indicate very little correlation, except in 1997-98 when other factors also need to be taken into account (these have been discussed in Section 2.4.3.1). Note that Figure 12 shows a logarithmic axis in relation to weight, which takes into account the economies of scale between the rock lobster catch and the wetline catch.

Table 18 Seasonal variations of the West Coast Rock Lobster fleet.

MONTH	Catch live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	6.0	2.9	3.4	3.9	5.9	1.9	14.0
August	14.6	4.4	5.4	6.2	10.2	13.3	26.3
September	12.4	3.2	3.0	5.9	10.4	11.0	18.0
October	13.7	4.8	0.9	6.5	11.3	9.3	11.0
November	1.2	2.7	1.1	4.9	3.8	4.0	9.9
December	2.6	4.3	1.6	3.8	4.5	7.4	13.3
January	4.1	2.9	2.7	7.3	6.8	8.4	14.6
February	3.0	1.7	1.5	9.7	5.3	9.2	11.0
March	4.2	3.0	6.0	8.4	7.0	8.4	12.8
April	3.6	3.1	3.1	5.9	6.6	7.7	11.2
May	2.5	4.1	4.1	6.3	5.3	3.8	9.9
June	1.3	2.3	0.9	3.4	3.4	6.2	5.9
Grand Total	69.2	39.5	33.7	72.2	80.5	90.5	158.1

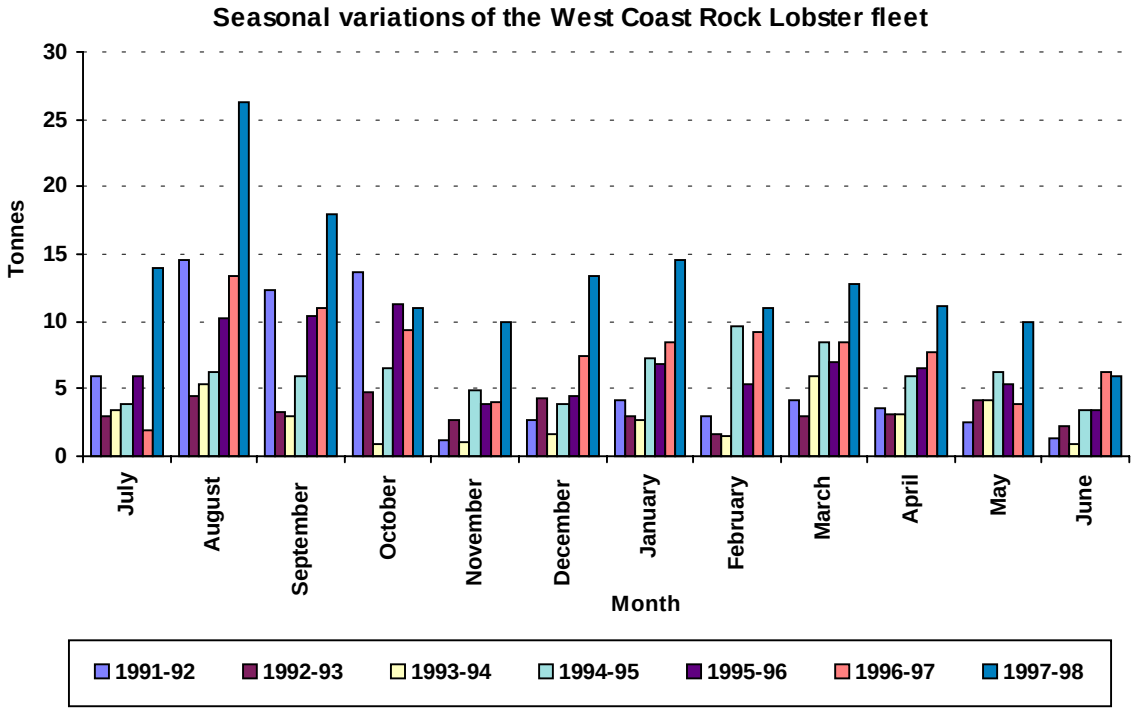


Figure 11

Table 19 Correlation between price of rock lobster and wetline catches in the West Coast Rock Lobster fleet.

	Live weight (tonnes)						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	69.2	39.5	33.7	72.2	80.5	90.5	158.1
Rock lobster catch	12,084.7	12,252.9	11,015.7	10,771.8	9,798.1	9,895.5	10,464.0
Approx. price of Rock lobster per kg.	*$20.5*	*$18.13*	*$27.25*	*$27.5*	*$23.75*	*$26.75*	*$20.20*

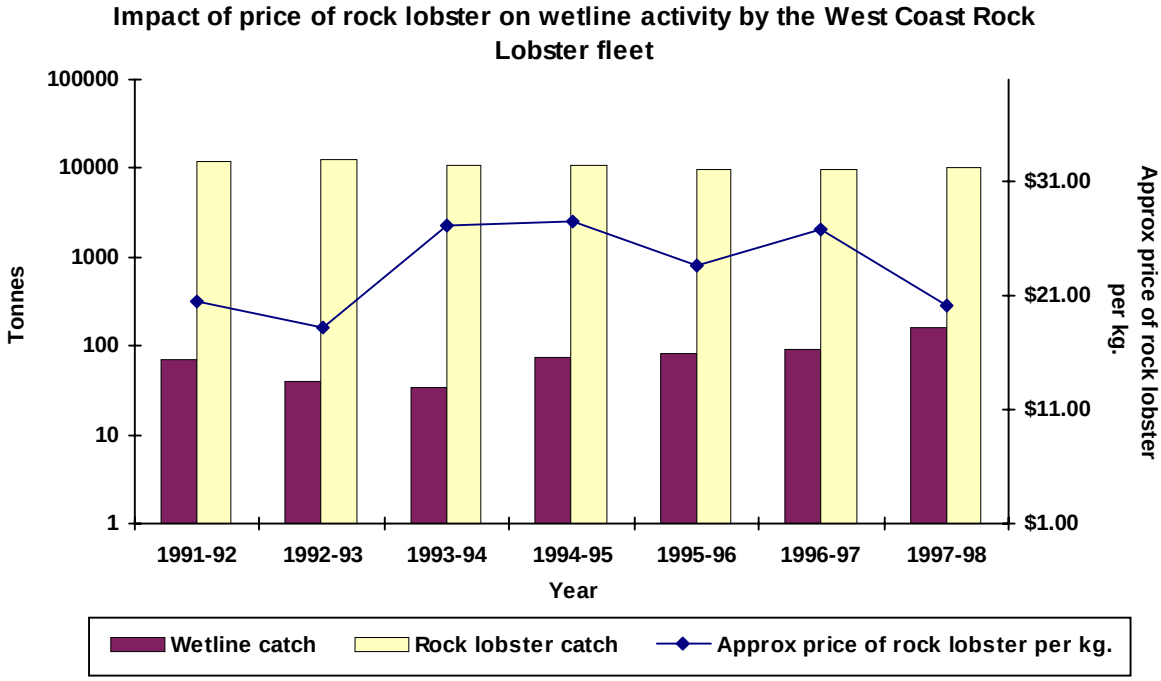


Figure 12

2.5.3.2 Seasonal variations in the wetline catch of the Southern Demersal Gillnet and Demersal Longline Managed Fishery

The average wetline component of the Southern Demersal Gillnet and Demersal Longline fleet catch over the last seven financial years is around 175 tonnes *per annum*. This reported catch is higher than the wetline catch of the rock lobster fleet, except for 1997-98. However, this catch has been decreasing over the last seven years, with 153.3 tonnes being recorded in 1997-98.

During the summer months, some of the Southern Demersal Gillnet and Demersal Longline Fishery units with more diversified operations fish on the beaches, taking Australian herring and whitebait. This net caught catch accounted for 86 tonnes or 48.6 per cent of the total reported wetline catch of the Southern Demersal Gillnet and Demersal Longline Fishery during 1996-97 and 28.9 tonnes or 18.8 per cent during 1997-98, when whitebait catches were unusually low. The net caught component of the wetline catch accounts for the particularly high summer catches during some years.

Also during the summer months, slightly higher drop line and hand line dhufish catches occur. The reason for this phenomenon may be higher consumer demand for dhufish at this time, or perhaps the result of greater catchability of dhufish at this time, or a combination of both. The total reported wetline dhufish catch for this fleet is still relatively low, between 10 and 14 tonnes *per annum*.

Table 20 lists the seasonal variations of the reported Southern Demersal Gillnet and Demersal Longline Fishery wetline catches (ie. catches of cartilaginous and fin fish taken by methods other than demersal gillnet and longline).

Table 20 Seasonal variations in wetline catches for the Southern Demersal Gillnet and Demersal Longline Managed Fishery.

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	9.8	9.8	7.7	6.3	7.8	5.0	17.7
August	13.8	12.7	11.3	6.4	6.3	9.7	17.6
September	8.2	4.4	22.4	4.6	4.8	5.1	12.3
October	7.7	15.1	17.1	5.6	6.1	6.2	14.7
November	12.3	11.1	11.2	8.3	5.8	9.8	9.9
December	25.4	22.0	27.9	23.8	16.3	14.5	11.6
January	33.9	22.5	36.9	19.4	29.8	33.0	13.9
February	31.7	24.3	19.9	11.9	37.8	34.9	11.2
March	13.0	21.0	7.6	26.8	19.4	20.3	15.5
April	32.6	15.0	8.4	8.2	13.7	19.1	13.4
May	15.5	17.3	8.6	4.5	18.4	8.4	6.3
June	6.7	7.2	6.9	4.7	7.2	11.3	9.6
GRAND TOTAL	210.6	182.3	185.9	130.6	173.3	177.4	153.6

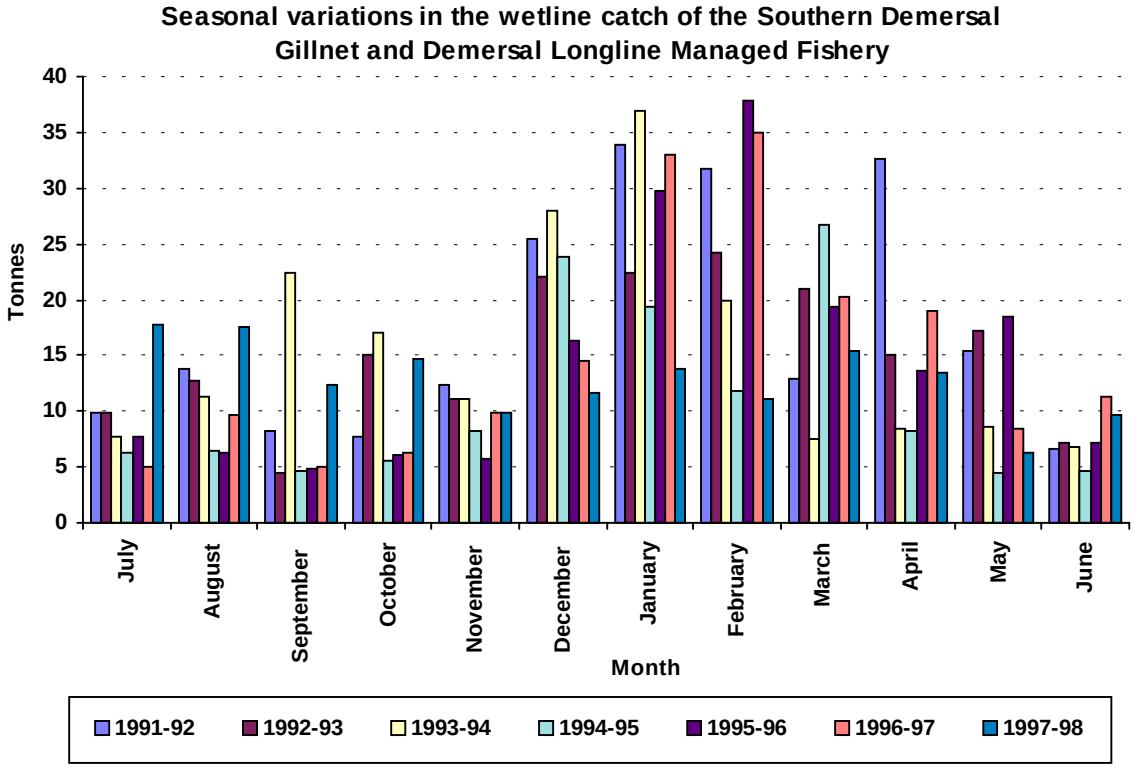


Figure 13

2.5.3.3 Seasonal variations in the wetline catch of the Shark Bay Snapper Fishery

The reported wetline catches of the licensed fishing boats authorised to fish in the Shark Bay Snapper Managed Fishery are relatively low and vary considerably from year-to-year. This may reflect ownership changes and/or leasing arrangements within the fishery.

Because hand lines and drop lines are used in the Shark Bay Snapper Managed Fishery, demersal wetfish catches in the area of the Shark Bay Snapper Managed Fishery are classed as 'by-catch' by Fisheries WA Research Division's Catch and Effort Statistics. Thus, only hand line and drop line catches *outside* that fishery are recorded as wetline catch. The higher reported wetline catches recorded during the Shark Bay Snapper peak season reflect the Spanish and other mackerel taken by troll line off Quobba at the same time.

Table 21 shows the seasonal variation in the reported wetline catches of Shark Bay Snapper Managed Fishery boats.

Table 21 Seasonal variations in the wetline catches of the Shark Bay Snapper Managed Fishery.

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	3.6	3.9	7.7	4.0	10.5	7.3	10.5
August	2.3	3.2	7.7	5.0	9.5	9.2	19.5
September	4.3	5.4	8.3	6.1	2.2	4.9	8.5
October	4.3	0.1	11.0	11.2	9.1	10.0	14.7
November	7.9	1.9	6.6	13.3	5.4	9.6	11.5
December	1.9	4.4	6.3	9.5	2.6	7.4	7.9
January	3.8	3.6	10.0	4.8	7.8	4.8	5.9
February	5.9	3.9	10.0	4.7	11.5	5.2	5.3
March	9.6	4.8	9.8	5.9	5.8	4.5	2.0
April	9.8	5.9	9.9	9.6	10.8	9.2	5.5
May	6.5	1.4	4.4	7.8	13.5	2.5	1.9
June	0.4	5.7	5.8	4.9	14.0	5.7	3.4
GRAND TOTAL	60.4	44.3	97.7	86.7	102.7	80.3	96.9

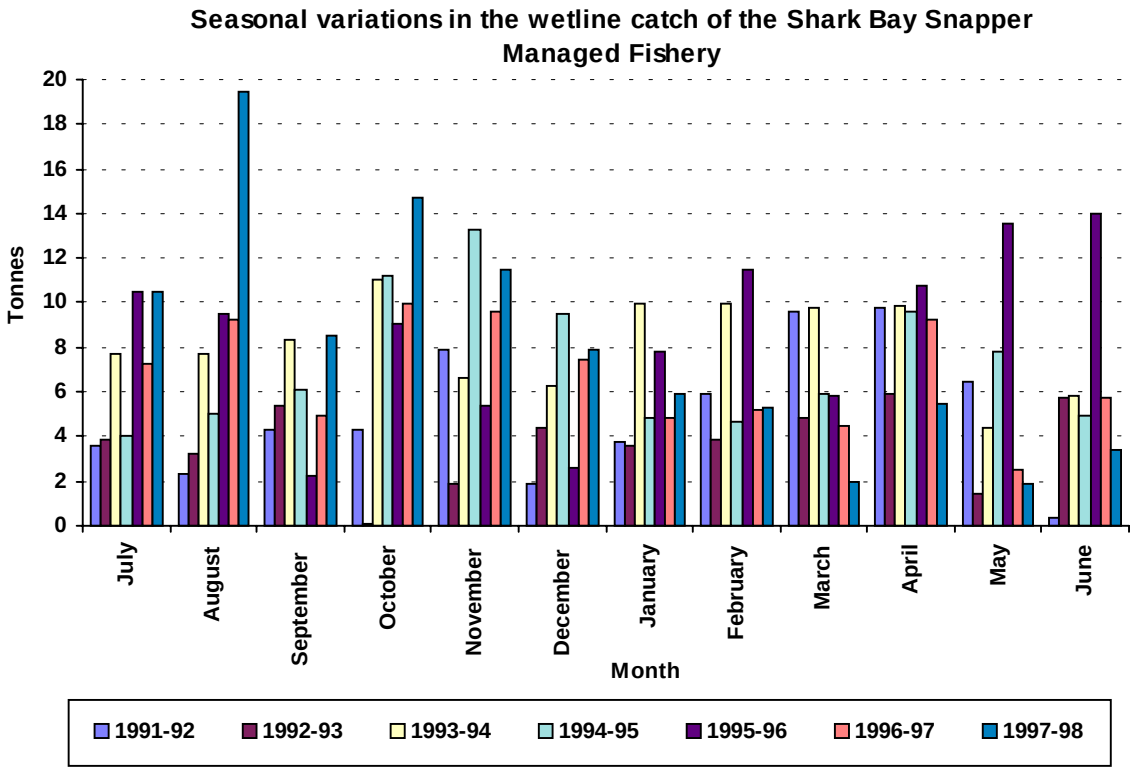


Figure 14

3.0 Effect of wetline fishing by species

Concern about the sustainability of certain species, such as dhufish and Spanish mackerel was one of the reasons for this study. Section 3 looks at these two species, and the other major line caught wetline species - pink snapper (with an annual catch over 100 tonnes).

This section also examines the effect of wetlining on baldchin groper, a key Mid West species and blue groper, a popular species with the recreational sector mainly found in southern Western Australia. It provides an analysis of the licensed fishing boats which target these species and 'how', 'where' and 'when' they are caught.

The net caught catches of Australian herring and whitebait, which both usually have an annual catch of over 100 tonnes, have been examined in detail in other papers. These are 'Aspects of the Biology and Stock Assessment of the whitebait, *Hyperlophus vittatus*, in south western Australia', by DJ Gaughan, WJ Fletcher, RJ Tregonning and J Goh, and 'The Western Australian Salmon and Australian Herring Creel Survey' by S. Ayvasian, R. Lenanton, B. Wise, R. Steckis and G. Nowara. They have therefore not been included in this section.

3.1 Dhufish *(Glaucosoma hebraicum)*

Dhufish is a long-lived resident demersal fish with a slow growth rate. It is estimated that male dhufish mature at three years and females at three to four years, with the size at maturity being 250-300 mm for males and 300-350 mm for females.

Until recently this situation has created a 'buffer' for the stock(s), as the legal minimum length of 500 mm is reached at around six to seven years. Some northern age composition data also indicates that individuals are not fully recruited to the commercial fishery until around 11 years. The maximum age reached by male dhufish is 36 years, while females reach 29 years.

It is vital that full biological and behavioural knowledge of these stocks are obtained, and monitoring of catch and effort continues, in order that rigorous stock assessment can be undertaken and made available as a basis for current and longer term management. Currently, concern is being expressed by Fisheries WA's Research Division at the escalation of wetline fishing pressure on dhufish stocks), particularly by the rock lobster fleet (R. Lenanton, pers.com. 1998).

The annual reported dhufish wetline catches are shown graphically in Figure 15.

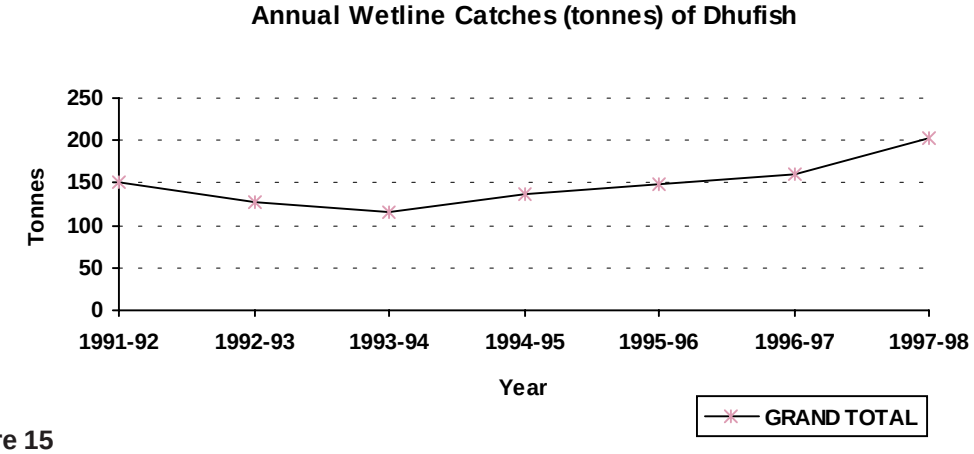


Figure 15

3.1.1 How dhufish are caught

Dhufish are caught by hand line and drop line by the 'wetline fleet'. Over the last seven years, the reported take of dhufish by drop line has doubled, from 43.4 tonnes in 1991-92 to 84.1 tonnes in 1997-98. There has been an increase of only 11 tonnes in the hand line catch from 106.1 to 117.2 tonnes over the corresponding period. Much of this trend is the result of an increase in the use of drop lines by the rock lobster fleet. The reported drop line catch of dhufish by the rock lobster fleet grew from 7.6 tonnes in 1991-92 to 30.2 tonnes in 1997-98.

Dhufish are also caught by the Southern Demersal Gillnet and Demersal Longline Fishery and the West Coast Demersal Gillnet and Demersal Longline Fishery (who use power operated demersal gill nets and longlines), as well as the recreational and charter fishing sectors.

3.1.2 Who targets dhufish?

Prior to 1997-98, the reported dhufish wetline catch was relatively stable, as stocks are subjected to heavy and increasing fishing pressure from both commercial and recreational anglers (see Table 8a and 8b). However, 1997-98 saw an escalation of dhufish catches, particularly by the rock lobster fleet which took 24 per cent of the reported wetline catch and 21 per cent of the total reported commercial catch. This increase continued into the remaining months of 1998.

During 1997-98, the 'wetline only' fleet took 104.8 tonnes or 52 per cent of the reported dhufish wetline catch, and 45.2 per cent of the total commercial dhufish catch.

Dhufish are a prized recreational fish and a sought after table fish for the local fish markets. Together with pink snapper, they are the main target species of the wetline fleet south of North West Cape.

There are 442 licensed fishing boats which have reported wetlining for dhufish in the last seven financial years. Of these, only 38 (including 27 'wetline only') have reported catches over one tonne *per annum* for more than three of the last seven years. The breakdown of boats taking dhufish by wetline (as licensed as at 30 June 1998) is as follows :

- 97 'wetline only' licensed fishing boats took dhufish. The pattern is inconsistent, with some boats reporting large catches for a couple of years, then none, or very few. This situation may reflect leasing arrangements or changes in ownership of boats;
- 113 Zone C, 42 Zone B and 23 Zone A West Coast Rock Lobster licensed fishing boats;
- 28 licensed fishing boats and supplementary licence holders in the Southern Demersal Gillnet and Demersal Longline Fishery (which took 10.4 tonnes or 5.2 per cent of the reported dhufish wetline catch of 1997-98);
- 22 licenses which have subsequently been sold to the Fisheries Adjustment Scheme;
- 14 Shark Bay Snapper Managed Fishery licensed fishing boats;
- 14 Estuarine licensed fishing boats;
- 11 licensed fishing boats which have subsequently had their licences cancelled under a total rock lobster pot redistribution; and
- various other licensed fishing boats, with authorisations and licence conditions ranging from Deep Sea Crab and Southern Rock Lobster to beche-de-mer, and from the Cockburn Sound Managed Fisheries to the South West Trawl Managed Fishery.

3.1.3 Geographical distribution of dhufish catches

Dhufish are predominantly found in waters deeper than 20 metres. Fish caught from this depth are frequently damaged by decompression effects, so the release of undersized fish does not mean they will survive. There are no data on return rates of undersize fish from any sector.

The commercial dhufish catch extends from Kalbarri on the Mid West coast to near Esperance on the south coast (see Map 3 and Appendix 6).

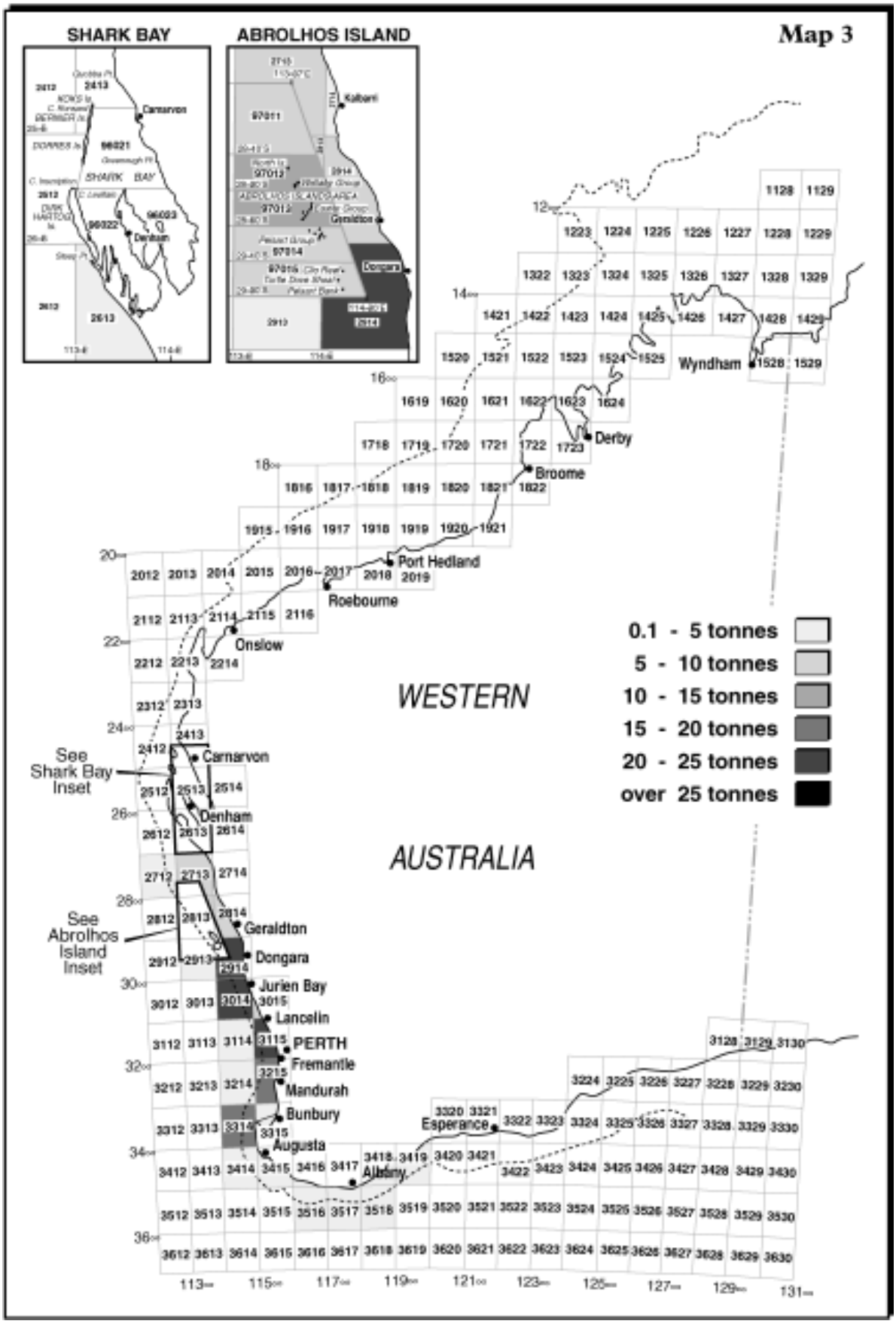
During 1997-98, the majority of the increasing reported wetline catches were in blocks 29140 and 29142 (Dongara area) and 3014 and 31150 (Jurien to Fremantle area), where over 20 tonnes were reported in each block.

The reported wetline catch of dhufish in the Abrolhos Islands over the last six years, are listed below:

- 1992-93, 11.9 tonnes;
- 1993-94, 24.4 tonnes;
- 1994-95, 30.8 tonnes;
- 1995-96, 33.4 tonnes;
- 1996-97, 38.5 tonnes; and
- 1997-98, 46.9 tonnes.

There is very little dhufish caught along the State's south coast.

Distribution of Dhufish Wetline Catches 1997-98



3.1.4 When dhufish are caught

Usually the lowest reported wetline catches of dhufish are in June, July, August and September (the closed season of the West Coast Rock Lobster Fishery), with most being caught in the summer months. This situation may be market-driven. The exception to this pattern was 1997-98, when the rock lobster fleet increased its take of dhufish considerably.

Table 22 and Figure 16 show the seasonal variation in the reported dhufish wetline catch.

Table 22 Seasonal wetline catches (tonnes) of Dhufish

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	12.0	9.8	7.8	6.1	7.0	5.8	15.9
August	14.3	7.9	9.1	10.1	9.1	11.0	22.6
September	11.9	9.1	6.8	8.0	9.6	10.0	18.6
October	10.3	11.0	7.2	12.0	11.9	13.6	18.9
November	13.2	9.3	9.4	13.2	9.6	15.5	17.1
December	18.9	17.1	11.8	17.5	16.3	19.8	19.6
January	18.5	13.9	12.9	14.1	17.5	18.4	17.3
February	13.2	10.9	10.5	14.1	14.4	11.7	12.6
March	11.0	9.5	11.1	11.8	12.6	12.0	17.1
April	12.3	11.4	11.2	9.8	17.3	17.0	17.1
May	9.7	11.0	11.1	11.8	14.3	12.1	14.7
June	5.1	6.8	5.5	7.4	8.1	13.2	10.2
GRAND TOTAL	150.3	127.8	114.5	136.1	147.8	160.0	201.8

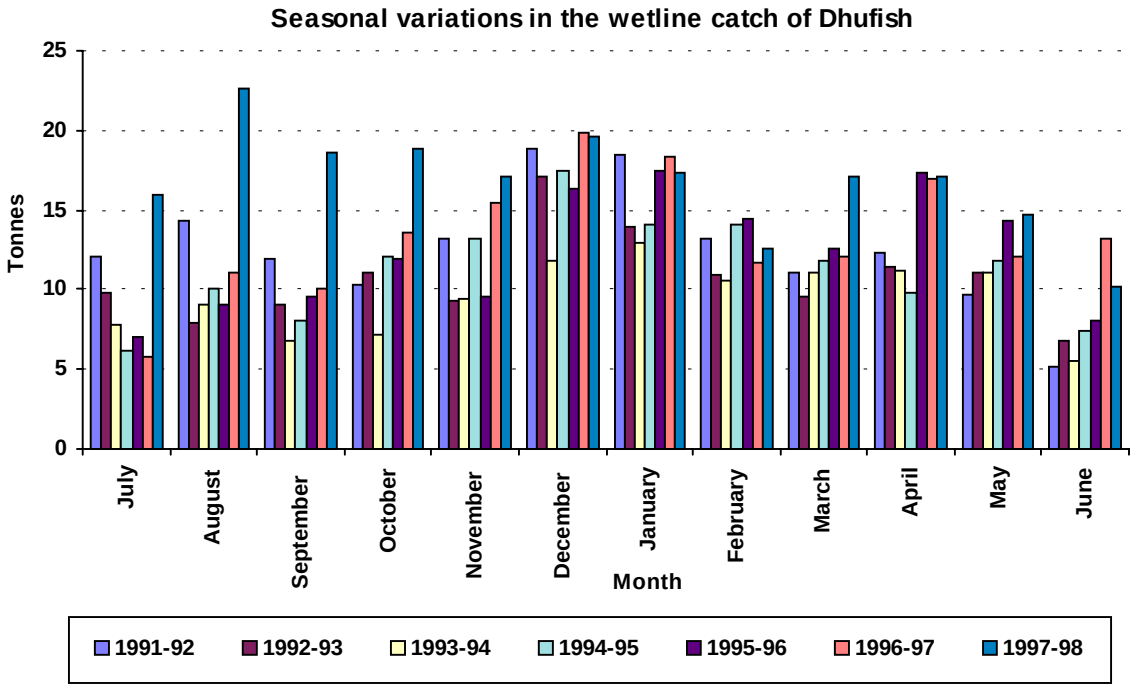


Figure 16

3.2 Spanish mackerel *(Scomberomorus commerson)*

Spanish mackerel are widespread throughout the tropical and subtropical waters of the Indo-Pacific region and distributed in Western Australian waters from Geographe Bay to the Northern Territory Border. Spanish mackerel can be found in shallow coastal waters and range offshore to the edge of the continental shelf, with adults commonly associated with coral reefs, rocky shoals and current lines on offshore reef areas.

Spanish mackerel are relatively large, fast growing, pelagic reef associated predatory fish. They form large aggregations to spawn and may undertake seasonal migrations to reach spawning sites. After spawning has occurred the aggregations disperse. Fishing activities are concentrated during the spawning season.

There are limited data available on which to base an assessment of the status of Spanish mackerel in Western Australian waters. Fishermen from the Kimberley region, from where most of the wetline catch is presently taken, have directly observed a decline in the average size of fish caught over time. These same fishermen have had to greatly increase their total fishing effort, both in number of hours fished and the number of tender vessels used, in order to maintain catch rates. They have reported that their mean annual catch has started to decline at a slow rate, but, at the same time, the effort used (the number of dory hours fished) continues to increase. This situation indicates that actual catch per unit of real effort is showing a significant negative trend.

However, although the effort expended by the long-term, dedicated Spanish mackerel fishers has gone up, the total catch of Spanish mackerel has also increased. This is due to increased opportunistic catches by existing fishers who occasionally target Spanish mackerel and 'new' licensed fishing boats which have moved into the Spanish mackerel fishery over the last two or three years, taking the species when the opportunity presents itself.

To further complicate analysis, the recreational catch is likely to be substantial and will consequently have a significant impact on the sustainability of the resource. Furthermore, the recreational catch in the northern regions is known to be increasing.

However, although the abundance of Spanish mackerel has decreased, there is no sign yet that over-fishing has occurred. On the basis of available knowledge, it appears that there are no immediate concerns about the Spanish mackerel stock (J. Penn pers. comm., 1998).

The total reported wetline catches of Spanish mackerel over the last seven financial years are set out graphically below in Figure 17. The wetline catch, which makes up the large majority of the Spanish mackerel catch has increased by 134.7 per cent over this period of time.

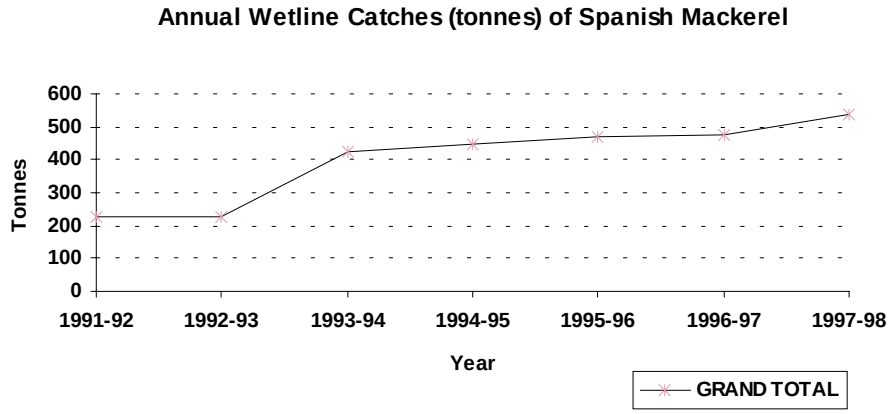


Figure 17

3.2.1 How Spanish mackerel are caught

Spanish mackerel are vulnerable to capture by both commercial and recreational fishing. They are mainly caught by the commercial fleet using troll lines (baits and lures) or drifting baits, while some are caught by hand line and drop line. Dedicated mackerel fishing units use a 'mother' boat and dories (dinghies) when trolling.

There are also a number of opportunistic operators from other managed fisheries such as the Kimberley Prawn Fishery, who do not operate dories.

3.2.2 Who targets the Spanish mackerel?

The overall reported Spanish mackerel wetline catch is increasing steadily and is subject to heavy and increasing fishing pressure from both the commercial sector and recreational anglers (see Tables 9a and 9b).

There are 163 licensed fishing boats which have reported wetlining for Spanish mackerel mainly by trolling in the last seven financial years. There are seven boats which have recently recorded large Spanish mackerel catches of between 20 and 100 tonnes. Of these, four have consistently caught these amounts over at least four of the last seven financial years. Only one of the seven licensed fishing boats does not have access to other fisheries.

There are also a large number of opportunistic operators from other managed fisheries, such as the Kimberley Prawn Fishery catching Spanish mackerel.

The breakdown of boats taking Spanish mackerel by wetline methods (as licensed at 30 June1998) is as follows :

- 58 'wetline only' licensed fishing boats, which took 198.1 tonnes or 37.1% of the total Spanish mackerel catch during 1997-98;
- 18 prawn trawlers, mostly with Kimberley Prawn, Exmouth Gulf Prawn and Onslow Prawn Managed Fishery licences;
- 10 licensed fishing boats with either Shark Bay Snapper Managed Fishery licences or Shark Bay Snapper Supplementary authorisations;
- eight licensed fishing boats with Northern Demersal Scalefish Managed Fishery licences;
- seven licensed fishing boats have subsequently been sold to the Fisheries Adjustment Scheme; and
- various other licensed fishing boats, with authorisations and licence conditions including beche-de-mer, the South Coast Purse Seine Fishery and the North Coast Shark Fishery..

3.2.3 Geographical distribution of Spanish mackerel catches

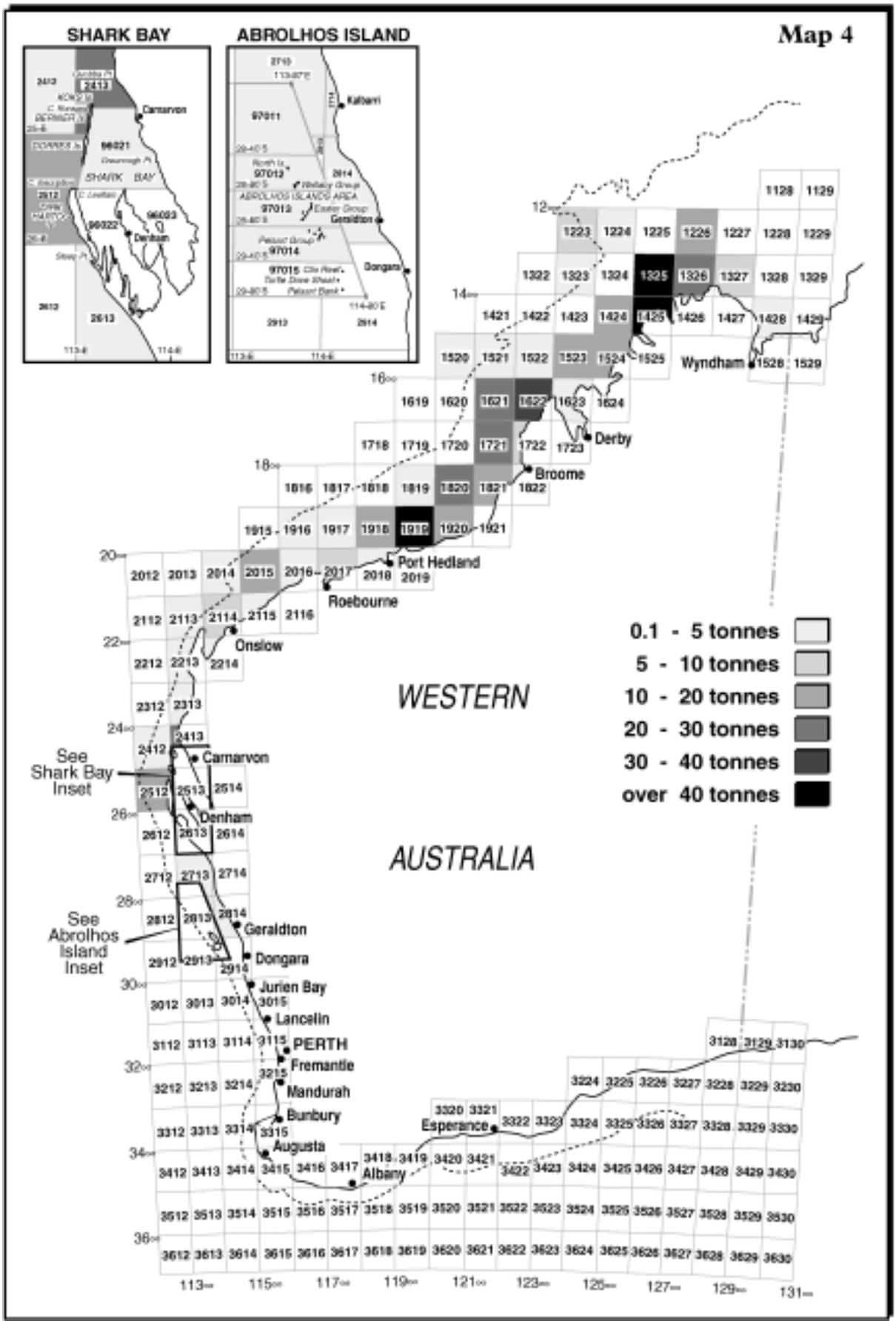
Fishermen have located the places where spawning Spanish mackerel aggregate and concentrate fishing activities on these areas until the fish either move on or are depleted. Therefore, almost all fishing blocks in the area where the aggregations occur are consistently fished. The major trolling areas extend from the Northern Territory border to the Abrolhos Islands (see Map 4 and Appendix 6)

The most heavily fished blocks for Spanish mackerel (over 20 tonnes) based on the 1997-98 catches are:

- Blocks 13250 (46.5 tonnes) and 13260 (25.7 tonnes) near Wyndham;
- Block 14250 (75.1 tonnes) between Wyndham and Derby;
- Blocks 16210 (20.4 tonnes) and 16220 (34.2 tonnes) between Derby and Broome;
- Block 17210 (20.5 tonnes) between Derby and Broome;
- Block 18200 (24.3 tonnes) near Broome;
- Block 19190 (43.0 tonnes) near Port Hedland; and
- Block 24131 near Carnarvon and Quobba (21.6 tonnes).

Although Spanish mackerel catches in the Kimberley continue to climb, anecdotal evidence suggests there also appears to be a lack of larger and presumably older fish in the catch, and localised depletions that are not immediately renewed by new fish are moving into existing fishing sites. Catches of Spanish mackerel in the Pilbara and further south are increasing.

Distribution of Spanish Mackerel Wetline Catches 1997-98



3.2.4 When Spanish mackerel are caught

There is a marked seasonal variation in Spanish mackerel catches, with the summer months providing considerably lower catches than the winter months. This situation may relate to fishing conditions and/or catchability of the fish.

Table 23 and Figure 18 show the seasonal variation in the reported Spanish mackerel catches.

Table 23 Seasonal wetline catches (tonnes) of Spanish Mackerel.

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	34.7	29.7	67.6	103.2	114.3	69.1	120.3
August	39.0	37.6	57.8	113.8	90.5	96.1	150.2
September	38.3	30.6	57.7	57.1	65.1	65.4	70.4
October	47.9	27.4	62.0	52.0	22.0	35.7	45.4
November	28.3	15.5	24.6	2.8	8.0	15.1	20.5
December	7.4	3.4	1.8	1.4	1.1	7.4	2.9
January	1.3	1.7	8.7	2.1	0.7	0.7	3.9
February	0.9	1.9	5.5	1.5	2.4	2.3	2.3
March	4.5	7.0	10.9	4.2	6.3	11.0	8.4
April	6.4	10.0	22.0	19.4	21.7	19.8	21.6
May	3.6	22.8	32.4	29.7	35.2	64.4	27.4
June	16.3	40.7	74.3	58.5	103.3	89.7	63.3
GRAND TOTAL	228.6	228.4	425.3	445.7	470.7	476.7	536.5

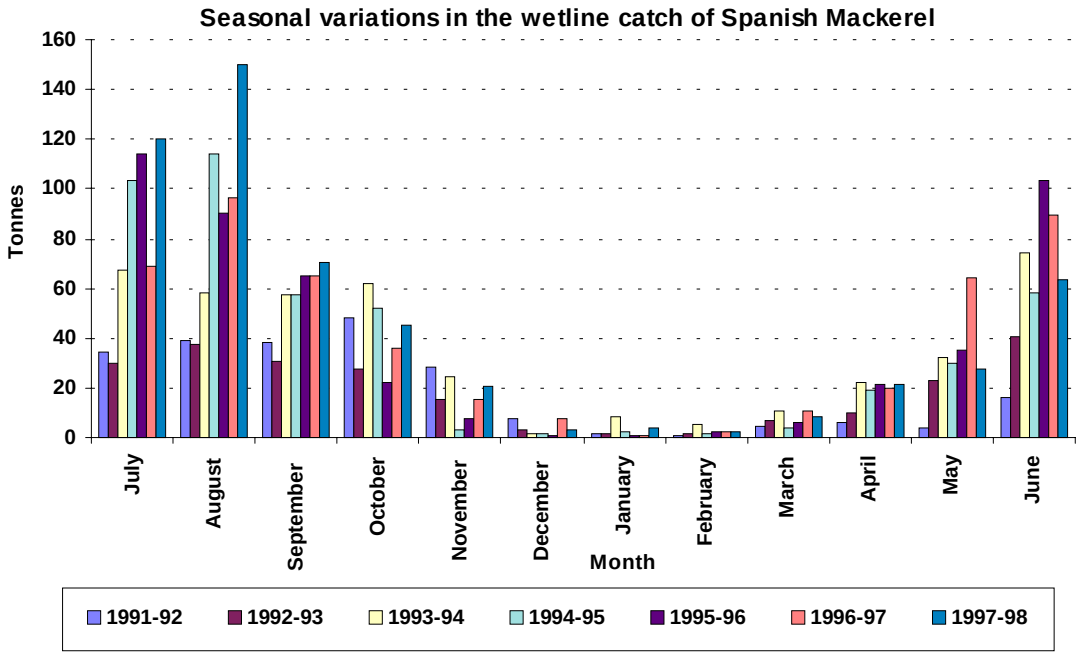


Figure 18

3.3 Pink snapper *(Pagrus auratus)*

Pink snapper are a generally wide-ranging demersal fish. They occur in waters from the Dampier Archipelago in the north of the State to the South Australian border in the south. Major concentrations of adult fish occur off Shark Bay, the Abrolhos Islands and in Cockburn Sound. Juveniles are found in sheltered coastal embayments and estuaries, such as Wilson Inlet and Cockburn Sound. In the Shark Bay region, the inner bay populations are genetically distinct from fish in the offshore areas, making the inner bay stocks especially vulnerable to overfishing.

The Shark Bay Snapper Managed Fishery exists in 'outer' Shark Bay and the offshore region, where there is a total allowable catch of 550 tonnes per annum.

Each year, gatherings of spawning pink snapper, called 'aggregations', form, which are highly vulnerable to capture by the commercial, charter boat and recreational fishing sectors. Measures are in place to protect the aggregations of Shark Bay and Cockburn Sound pink snapper stocks from over exploitation by the three fishing sectors.

The total reported wetline catches of pink snapper over the last seven financial years are set out graphically below in Figure 19.

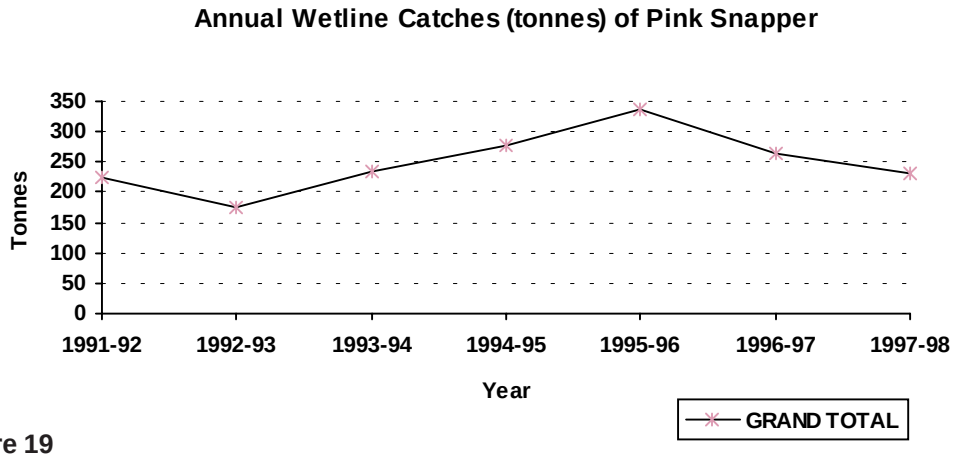


Figure 19

3.3.1 How pink snapper are caught

Pink snapper are taken by hand line and drop line by the wetline fleet. They are also targeted by fishermen in the Southern Demersal Gillnet and Demersal Longline Fishery and the West Coast Demersal Gillnet and Demersal Longline Fishery (who use power operated demersal gill nets and longlines), and the charter boat and recreational fishing sectors.

3.3.2 Who targets pink snapper?

The overall reported pink snapper wetline catch has remained relatively stable around a mean. It is also subject to heavy and increasing fishing pressure by recreational anglers (see Tables 14a and 14b).

Pink snapper are a prized recreational fish and a sought after table fish in the local fish markets. Together with dhufish, they are the main target species of the wetline fleet south of North West Cape.

There are 466 licensed fishing boats which have taken pink snapper as part of their wetline activities in the last seven financial years. Most of these boats took small, inconsistent catches. Only 46 have taken more than one tonne in three of the last seven years.

The breakdown of boats taking pink snapper by wetline (as licensed at 30 June 1998) is as follows:

- 103 'wetline only' licensed fishing boats - 30 of these took over one tonne in three of the last seven years. The 'wetline only' fleet took 128.2 tonnes, or 55.6 per cent of the wetline catch of pink snapper during 1997-98;
- 103 Zone C, 38 Zone B and 24 Zone A West Coast Rock Lobster licensed fishing boats;
- 42 Southern Demersal Gillnet and Demersal Longline and supplementary Southern Demersal Gillnet and Demersal Longline licensed fishing boats;
- * 17 Shark Bay Snapper and Supplementary Shark Bay Snapper Managed Fishery licensed fishing boats, of which nine caught over one tonne by wetlining in three of the last seven financial years. The 1997-98 pink snapper wetline catch of boats in this fishery was 33 tonnes, or 15.4 per cent of the total wetline catch;
- 17 South Coast Purse Seine licensed fishing boats;
- 12 Prawn Trawlers, mainly with Kimberley Prawn, Exmouth Gulf Prawn and Onslow Prawn Managed Fishery licences;
- seven South West Salmon licensed fishing boats; and
- various other licensed fishing boats, ranging from those with reef top molluscs and leatherjacket licence conditions to the Esperance Southern Rock Lobster Managed Fishery.

* *This does not include the pink snapper catch of these boats within the waters of the Shark Bay Snapper Managed Fishery.*

3.3.3 Geographical distribution of pink snapper catches

The reported wetline pink snapper catch extends from the Dampier Archipelago to near Esperance (see Map 5 and Appendix 6). The most heavily fished wetline areas for pink snapper based on 1997-98 reported catches are :

- Block 2713 off Kalbarri (36.4 tonnes); and
- The Abrolhos Islands (53.2 tonnes).

Note that these areas do not include Shark Bay, which contains a managed fishery for pink snapper.

There are three or four other blocks where wetline catches of over 20 tonnes had previously been recorded, but wetline catches of this magnitude were not taken in 1997-98. It is not known whether this is due to marketing reasons, or if there are localised depletions of stocks, or a combination of both.

Like dhufish, relatively high pink snapper catches are taken in the Abrolhos Islands. Catches from the Abrolhos Islands are listed below:

- 1992-93, 17.6 tonnes;
- 1993-94, 57.7 tonnes;
- 1994-95, 63.6 tonnes;
- 1995-96, 83.8 tonnes;
- 1996-97, 62.1 tonnes; and
- 1997-98, 53.2 tonnes.

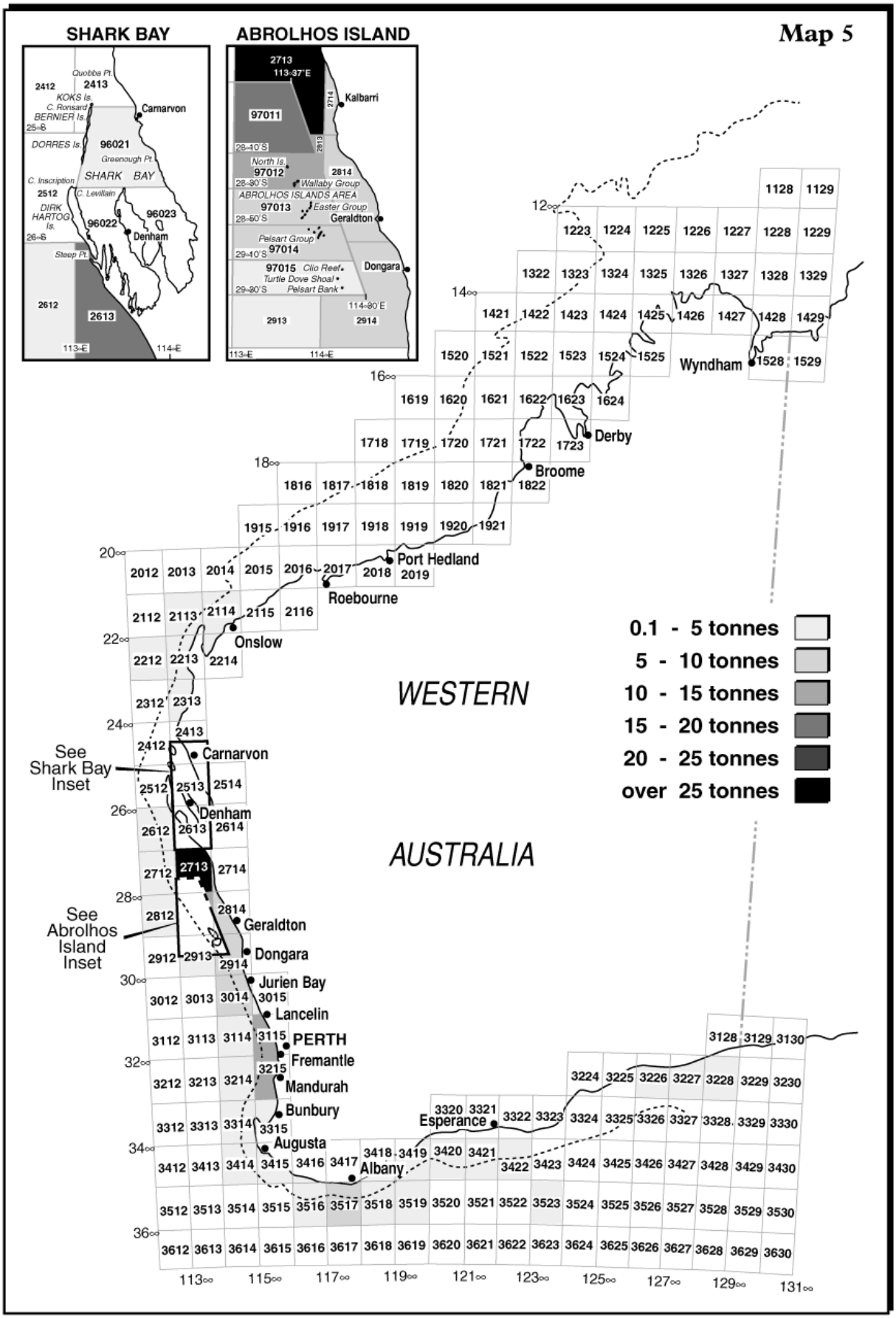
Very little is known about the Abrolhos Islands stocks of pink snapper. There is some conjecture that the islands may act as a nursery area for the oceanic stocks from Shark Bay (M. Moran, pers. comm. 1998).

Further south, near the Perth metropolitan area, catches initially showed a steady increase, but this has been followed by a gradual decline; for example between Mandurah and Fremantle, catches rose from 3.5 tonnes in 1991-92 to 15.7 tonnes in 1994-95, but fell to 8.3 tonnes in 1995-96 and in 1997-98 was 10.3 tonnes. A similar catch pattern occurred between Fremantle and Lancelin.

In the south west of the State, catches are steadily increasing, from a generally low base. Thus the fishing block between Cape Leeuwin and Cape Naturaliste shows catches increasing from 1.4 tonnes in 1991-92 to 5.7 tonnes in 1996-97, falling to 4.7 tonnes in 1997-98.

Catches of pink snapper along the south coast of Western Australia are generally low.

Distribution of Pink Snapper Wetline Catches 1997-98



3.3.4 When pink snapper is caught

The time when pink snapper are most catchable in the Shark Bay Snapper Fishery is in June and July, which generally corresponds with the lowest wetline catches of this species. The highest wetline catches of pink snapper are usually around August and March to April, which correspond with the Shark Bay Snapper fleet moving into and out of the managed fishery area.

Table 24 nearby shows the reported seasonal wetline catches for pink snapper.

Table 24 Seasonal wetline catches (tonnes) for Pink Snapper.

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	24.3	22.4	15.1	20.0	25.1	13.5	13.7
August	25.5	12.1	16.1	24.8	26.4	25.7	29.5
September	16.7	13.8	18.9	21.4	24.7	18.0	17.4
October	17.5	14.3	13.9	25.0	38.5	24.7	21.3
November	18.4	12.5	12.6	19.6	24.9	25.1	22.2
December	16.6	15.0	15.5	18.3	18.2	19.4	14.8
January	16.9	11.5	18.1	15.9	29.8	23.8	14.1
February	17.0	14.9	21.2	30.1	32.7	20.8	14.7
March	21.3	17.2	30.7	35.2	33.2	20.3	26.9
April	23.9	12.7	24.9	26.2	35.4	34.3	24.0
May	16.2	16.0	28.9	23.4	33.4	19.3	16.9
June	10.2	13.3	19.8	17.4	13.9	19.8	14.9
GRAND TOTAL	224.5	175.7	235.7	277.3	336.2	264.9	230.5

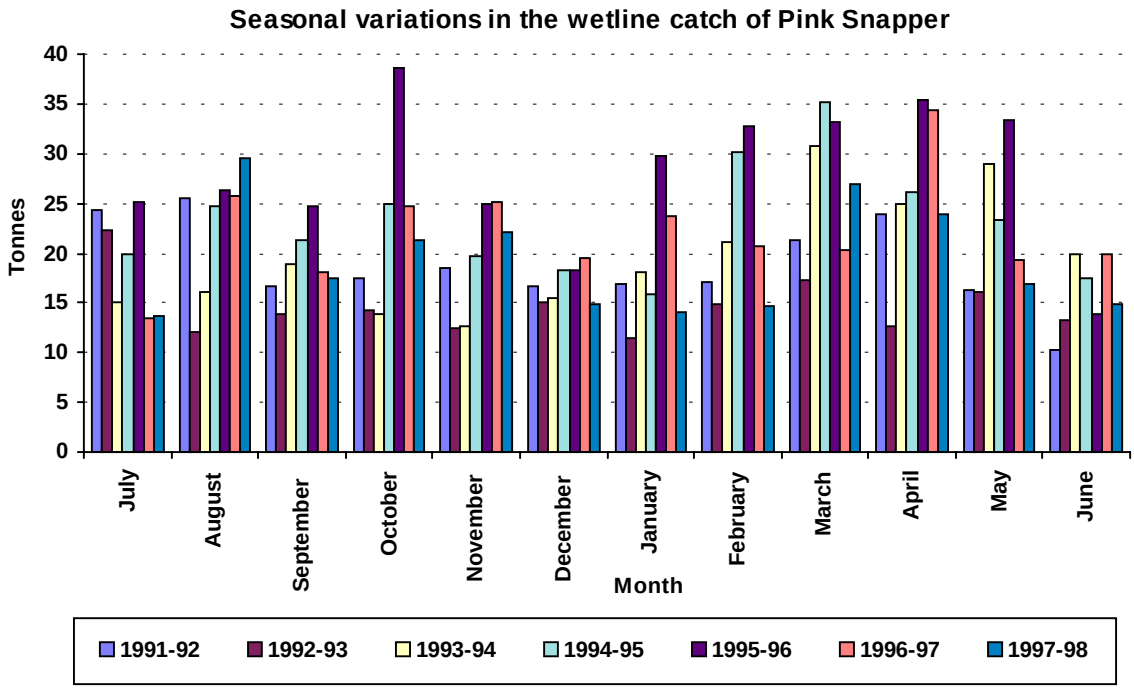


Figure 20

3.4 Baldchin groper *(Choerodon rubescens)*

Baldchin groper is a long-lived resident demersal fish species. They are thought to change sex from female to male at around four years and a length of 40 cm. Baldchin groper are heavily targeted by both commercial and recreational sectors, particularly in the Abrolhos Islands, where there is a high level of public concern about its diminishing numbers.

A research program on baldchin groper in the Easter and Wallabi Groups of the Abrolhos Islands is being conducted by Fisheries WA to determine growth rates, reproductive biology and population density.

The total reported wetline catches of baldchin groper over the last seven financial years are set out graphically below in Figure 21.

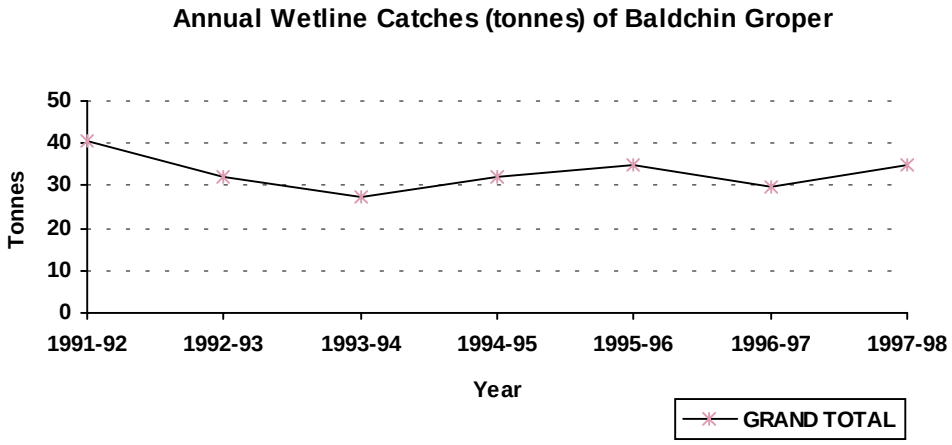


Figure 21

3.4.1 How baldchin groper are caught

Baldchin groper are taken by hand line and drop line by the wetline fleet. They are also taken by the Southern Demersal Gillnet and Demersal Longline and the West Coast Demersal Gillnet and Demersal Longline Fisheries (who use power operated demersal gill nets and longlines), and the recreational and charter fishing sectors.

3.4.2 Who targets baldchin groper?

The overall reported baldchin groper wetline catch is steady around a mean of about 33 tonnes *per annum*.

Wetline catches reported from the Abrolhos Islands make up a significant proportion of the total commercial catch (see Table 10a).

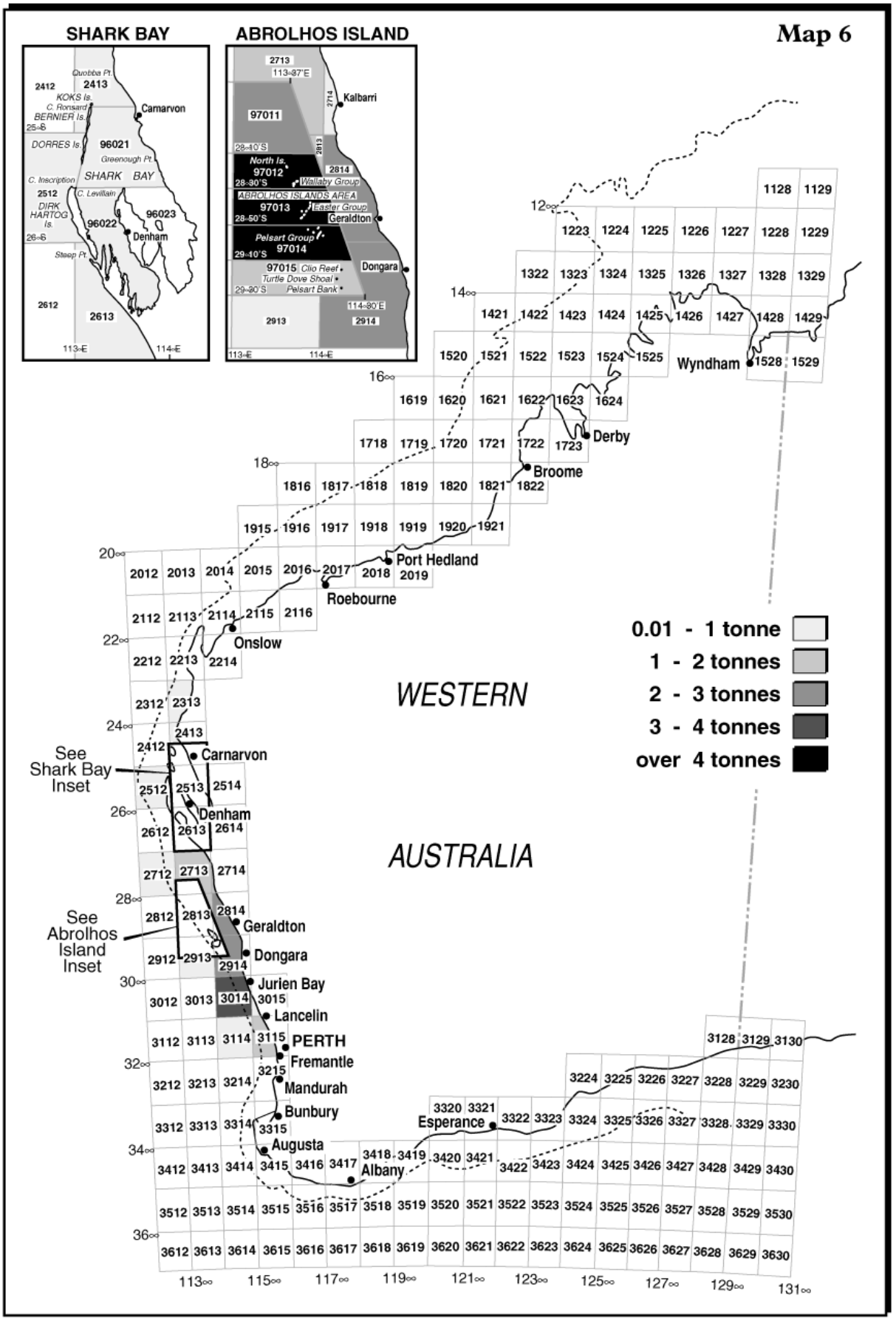
There are 291 licensed fishing boats which have reported taking baldchin groper as part of their wetline activities in the last seven financial years. Only seven, (including six 'wetline only' licensed fishing boats) have taken over one tonne *per annum* in three or more of the last seven financial years. The breakdown of boats taking baldchin groper by wetline activities (as licensed at 30 June 1998) is as follows :

- 86 'wetline only' licensed fishing boats. During 1997-98 these boats accounted for 18.9 tonnes, or 54 per cent of the total wetline catch of baldchin groper;
- 67 Zone C, 29 Zone B and 20 Zone A West Coast Rock Lobster licensed fishing boats. These accounted for 26 per cent (9.1 tonnes) of the 1997-98 wetline catch;
- 18 Shark Bay Snapper and Supplementary Shark Bay Snapper licensed fishing boats;
- various other licensed fishing boats, ranging from those from the Abalone Managed Fishery to ones with beche-de-mer and octopus licence conditions and North Coast Shark authorisations.

3.4.3 Geographical distribution of baldchin groper catches

Around 45.8 per cent of the 1997-98 total commercial catch of baldchin groper is from the reported wetline fishing in the Abrolhos Islands (see Map 6, Table 10a and Appendix 6).

Distribution of Baldchin Groper Wetline Catches 1997-98



3.4.4 When baldchin groper are caught

There is little seasonal variation in the reported baldchin groper wetline catch. However, there are more baldchin groper caught in March, April and May, coinciding with the opening of Zone A of the West Coast Rock Lobster Fishery.

The seasonal variations are shown below in Table 25.

Table 25 Seasonal wetline catches for Baldchin Groper

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	3.8	2.6	3.2	1.8	1.9	1.7	2.9
August	3.7	2.5	2.5	2.8	3.7	2.5	3.8
September	3.7	4.2	2.2	3.5	2.4	1.6	3.8
October	3.6	3.8	2.4	2.6	3.6	2.9	3.2
November	3.8	2.4	2.0	2.7	2.4	3.2	3.2
December	3.3	3.4	1.2	2.5	2.0	2.0	2.7
January	2.9	2.2	1.7	2.4	2.8	2.0	1.9
February	3.3	1.8	2.5	2.6	3.3	2.2	1.3
March	3.3	2.7	2.7	2.9	2.8	3.1	4.1
April	4.0	2.9	2.6	3.3	4.0	4.1	3.7
May	2.7	2.5	2.9	3.2	4.0	2.7	2.5
June	2.4	1.4	1.5	2.0	1.8	1.8	2.0
GRAND TOTAL	40.6	32.3	27.3	32.2	34.8	29.9	35.0

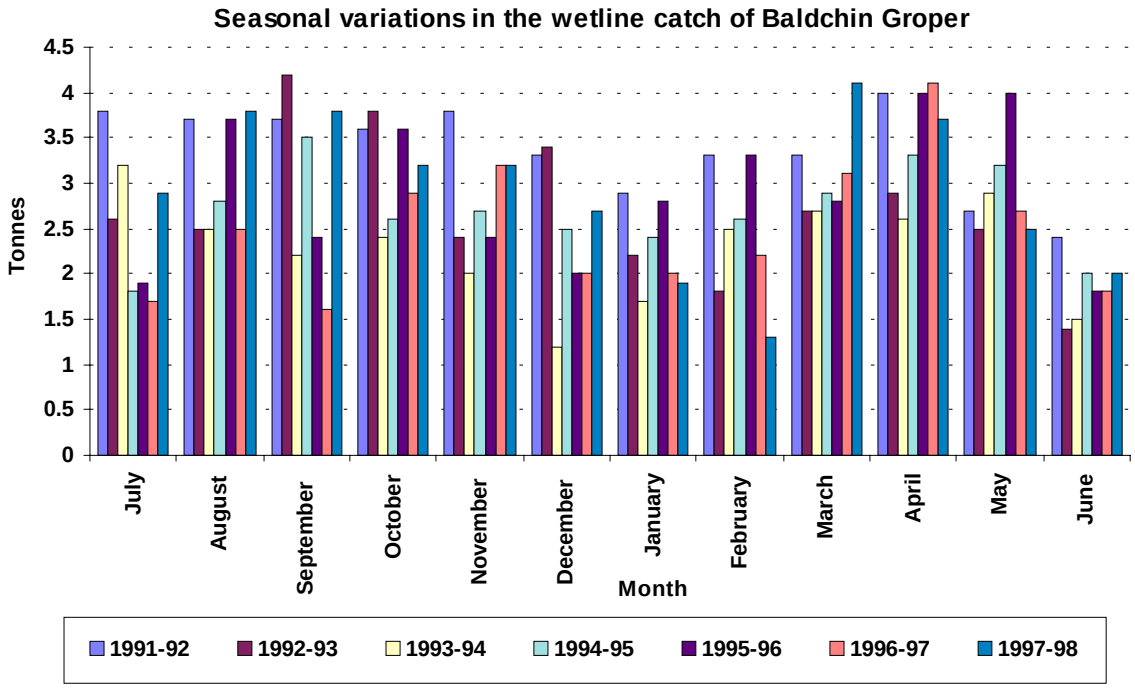


Figure 22

3.5 Blue groper *(Achoerodus gouldii)*

Western blue groper (blue groper) ranges from Port Phillip Bay in Victoria to the Abrolhos Islands in Western Australia. There is little biological information available on this species and no stock assessments on this species in Western Australia have been carried out. It is very closely related to the eastern blue groper, which has been the subject of more scientific research. Western blue groper is known to change sex, with males being the larger and blue in colour and females being smaller and greenish in colour.

The adults' habitat are coastal to offshore rocky reefs, while the juveniles usually inhabit shallow and relatively protected waters, including south coast estuaries.

It can be inferred from the biology of similar species that western blue groper are long lived (greater than 20 years) which makes them vulnerable to overfishing. The sex change that happens to blue groper during their lives makes them even more vulnerable to overfishing.

The total reported wetline catches of blue groper over the last seven financial years are set out graphically below in Figure 23.

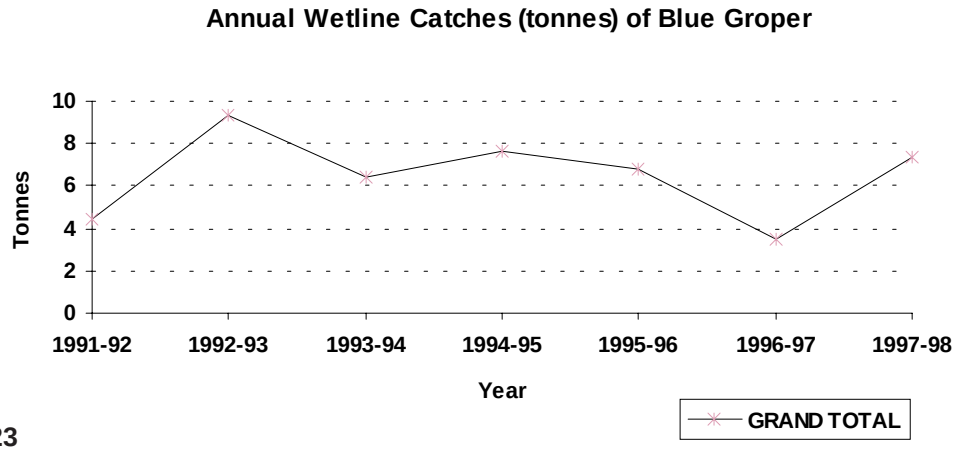


Figure 23

3.5.1 How blue groper are caught

Blue groper are taken by hand line, drop line and hand hauled gillnets by the wetline fleet. They are also taken by the Southern Demersal Gillnet and Demersal Longline and the West Coast Demersal Gillnet and Demersal Longline Fishery (who use power operated demersal gill nets and longlines), as well as the recreational and charter boat fishing sectors.

3.5.2 Who targets blue groper?

Because of its geographic spread, blue groper is mostly caught by licensed fishing boats based on the south or south west coasts of the State. Most catches are very low per licensed fishing boat, with only one boat reporting wetline catches of more than one tonne in three of the last seven years.

Blue groper therefore appears to be an incidental catch, rather than a targeted species of the wetline fleet.

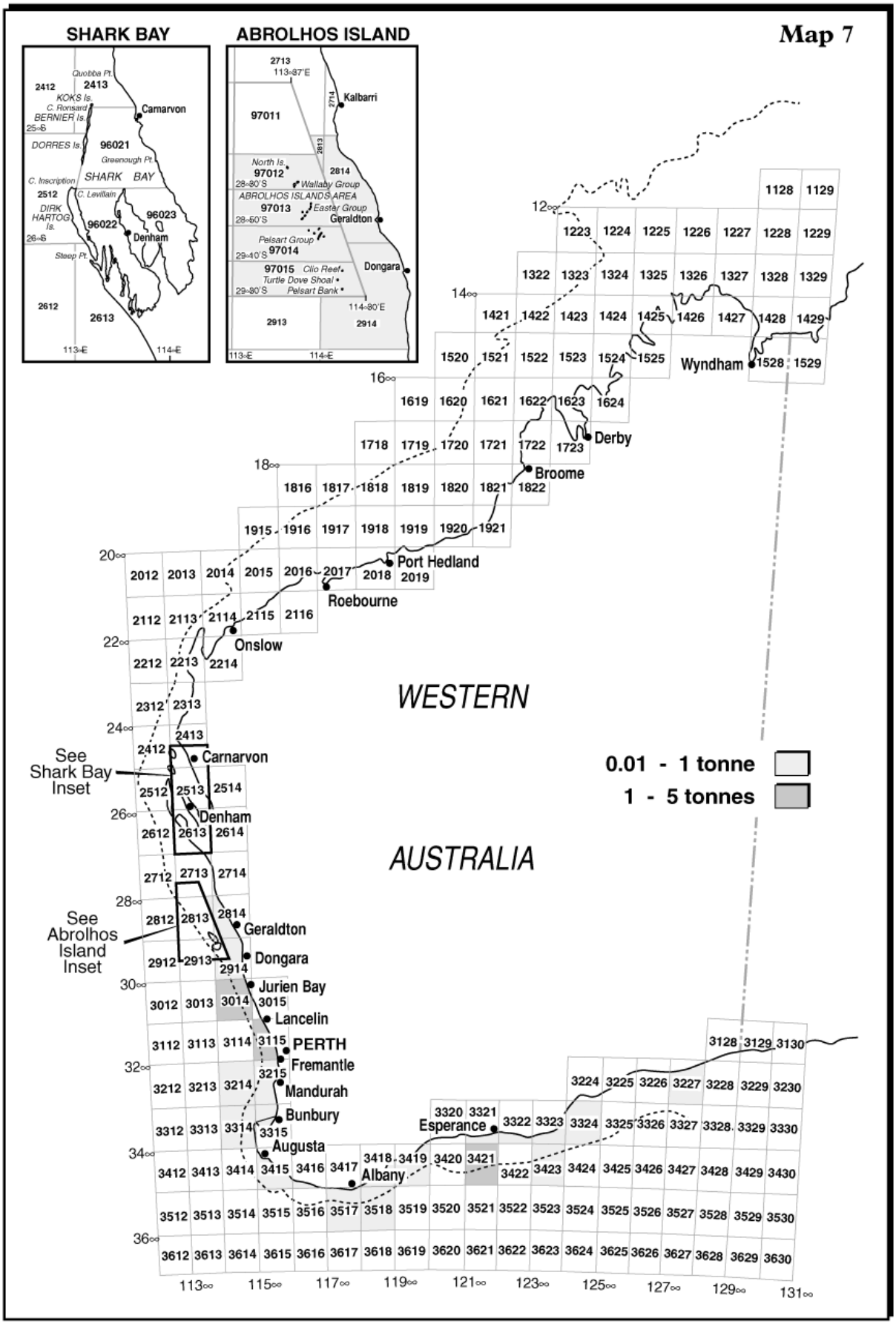
There are 178 licensed fishing boats which have reported taking blue groper as part of their wetline activities over the last seven financial years. The breakdown of boats which reported taking blue groper by wetline activities (as licensed on 30 June 1998) is:

- 48 'wetline only' licensed fishing boats;
- 35 Zone C, four Zone B and three Zone A West Coast Rock Lobster licensed fishing boats;
- 27 Southern Demersal Gillnet and Demersal Longline (Managed Fishery and Supplementary) licensed fishing boats;
- 11 licensed fishing boats have subsequently been sold to the Fisheries Adjustment Scheme;
- seven licensed fishing boats with Estuarine licence conditions;
- six South Coast Salmon licensed fishing boats; and
- various other licensed fishing boats, ranging from those with herring conditions to ones from the South West Salmon, Abalone and Abrolhos Islands and Mid West Trawl Managed Fisheries.

3.5.3 Geographical distribution of blue groper catches

The geographical distribution of blue groper wetline catches are shown on Map 7 and Appendix 6. During 1997-98, small catches of under one tonne were recorded between Geraldton to the Great Australian Bight in virtually every inshore block.

Distribution of Blue Groper Wetline Catches 1997-98



3.5.4 Seasonal variations in blue groper catches

More blue groper appears to be caught by wetline fishing during the summer months than the winter months (as for dhufish), which may be market driven.

Table 26 and Figure 24 show the seasonal variation in the reported blue groper wetline catch.

Table 26 Seasonal wetline catches for Blue Groper

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	0.1	0.4	0.1	0.3	0.1	0.2	1.3
August	0.2	0.1	-	0.4	0.2	0.1	0.5
September	0.4	0.2	0.5	0.4	0.1	-	0.5
October	0.2	0.5	0.5	0.9	0.9	0.2	0.4
November	0.5	0.4	0.4	1.2	0.5	0.5	0.4
December	0.4	0.7	0.6	0.8	1.1	0.9	0.6
January	0.4	1.3	1.1	0.3	0.5	0.3	0.5
February	0.3	1.7	1.0	0.7	0.9	0.3	0.7
March	0.5	1.3	0.5	0.9	0.7	0.3	0.7
April	0.4	1.1	0.5	0.9	0.6	0.3	1.0
May	0.3	0.8	0.4	0.5	0.7	0.2	0.6
June	0.7	0.8	0.8	0.3	0.4	0.2	0.3
GRAND TOTAL	4.4	9.3	6.4	7.6	6.8	3.5	7.4

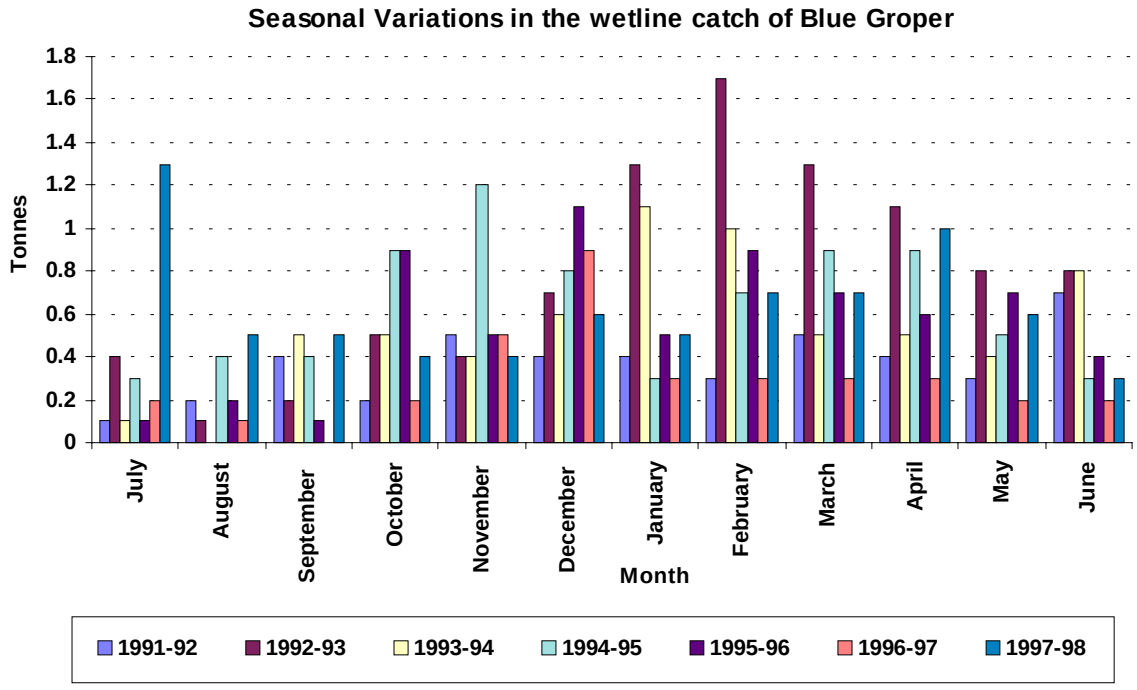


Figure 24

4.0 Major geographical areas for wetline fishing

This section examines the major geographical wetline fishing areas in the State. These are the line caught wetline 'hot spot', of the Abrolhos Islands, and waters in the Perth metropolitan area and the South West, where the line caught species usually make up about two thirds of the wetline catch.

Little line caught wetlining is reported along the south coast of WA, so this area has not been examined in Section 4. Australian herring is the major wetline species reported on the south coast. As discussed in Section 3, this species has already been the subject of the Australian Salmon and Australian Herring Creel Survey and has not been discussed in this paper.

4.1 Wetlining in the Abrolhos Islands

The reported wetline catches from the waters surrounding the Abrolhos Islands (taken as Blocks 97011, 97012, 97013, 97014, 97015) is around two thirds of the catch from the Perth metropolitan area and the line caught catch of the South West area combined (over 200 tonnes in the last three financial years).

Although the Abrolhos Islands fishing block numbers were initiated in 1989, they did not come into general use until 1992-93. From the current CAES data, it is difficult to estimate the wetline catches from the Abrolhos prior to that time.

Commercial fishing has been examined by the Abrolhos Islands Management Advisory Committee in their 'Draft Management of the Houtman Abrolhos System' paper of December 1997 and the final management plan 'Management of the Houtman Abrolhos System' released in December 1998.

Both papers acknowledge there are large and increasing wetline catches of a number of species in the Abrolhos, particularly those which are of prime importance to the recreational fishing sector and to the local fish markets. The 'Management of the Houtman Abrolhos System' recommended that immediate action be taken to reduce wetline fishing in the Abrolhos Islands to limit total catch. As part of reducing effort, the report recommends that negotiations should be undertaken with fishing boat licence holders to prohibit commercial wetline activities within the shallows of the main island groups (Recommendation 71).

Wetline catches in the Abrolhos Islands are shown in Appendix 7. The total catches for the last seven financial years are shown graphically in Figure 25.

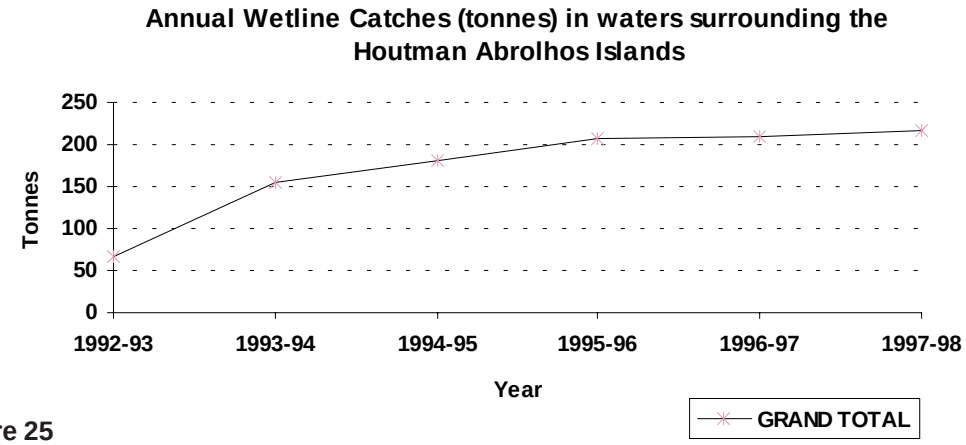


Figure 25

4.1.1 How the wetline catch is taken in the Abrolhos Islands

The most significant reported wetline catch is taken by hand line (177.4 tonnes in 1997-98). This has increased from 60.2 tonnes in 1991-92. The reported use of drop lines has also increased, from 5.1 tonnes taken in 1991-92 to 38.9 tonnes in 1997-98. Few other methods have been used.

4.1.2 Species taken by wetlining in the Abrolhos Islands

The wetline fleet targets a variety of finfish, largely reef species, taken by hand line and drop line. The major species targeted include pink snapper, baldchin groper, dhufish, Spanish mackerel and coral trout.

The major part of the pink snapper stock is located off Shark Bay, but there is some scientific conjecture that the Abrolhos Islands may serve as a nursery area for this stock (M. Moran, pers. comm., 1998). The reported pink snapper catches in the Abrolhos Islands are shown on Map 5. In the last six financial years, the reported wetline catch of pink snapper rose from 17.6 tonnes in 1992-93 to 83.8 tonnes in 1995-96, declining in 1997-98 to 53.4 tonnes.

According to the 'Draft Management of the Houtman Abrolhos System' paper, the Abrolhos Islands system is the main breeding area for one species of coral trout that is found in Western Australian waters. Because the Abrolhos system is relatively isolated from other shelf-edge coral reef systems, it is highly probable that its coral trout population is genetically distinct from all other populations of this species in Western Australia. The reported coral trout wetline catches in the Abrolhos are shown below :

- 1992-93, 1.7 tonnes;
- 1993-94, 4.3 tonnes;
- 1994-95, 4.7 tonnes;
- 1995-96, 4.3 tonnes;
- 1996-97, 8.8 tonnes; and
- 1997-98, 10.2 tonnes.

Baldchin groper and dhufish are thought to have a lower dependence on the Abrolhos reef system than coral trout, but it is likely that the Abrolhos supports an important component of the breeding stock of each of these species.

The wetline catches of baldchin groper and dhufish are discussed in Section 3. If numbers of baldchin groper, coral trout, pink snapper and dhufish are falling, this may affect the balance of the marine ecosystem at the Abrolhos.

4.1.3 Who wetlines in the Abrolhos?

In total, 92 licensed fishing boats have reported wetlining in the waters surrounding the Abrolhos Islands during the last six financial years. During 1997-98, 41 licensed fishing boats reported wetlining in the Abrolhos Islands, up from 21 boats in 1992-93.

Large numbers of wetfish are caught by visiting family and friends of Zone A rock lobster fishing licence holders. This catch cannot be estimated accurately, but may be as large as the total wetline catch (R. Owens, pers. comm. 1998).

The breakdown of licensed fishing boats wetlining in the Abrolhos over the last six financial years (as licensed at 30 June 1998) is:

- 38 'wetline only' licensed fishing boats. Of these only four have fished all six financial years, 10 fished during 1992-93 and 18 fished during 1997-98;
- three Zone C, three Zone B and 20 Zone A West Coast Rock Lobster licensed fishing boats;
- five Shark Bay Snapper Managed Fishery licensed fishing boats; and
- assorted other licensed fishing boats, ranging from ones from the Abrolhos Islands Trawl Fishery, the Demersal Gillnet and Longline fisheries to Abalone Managed Fishery licensed fishing boats.

Only 26 of the licensed fishing boats have fished for three or more of the last six years. Of these 14 are 'wetline only' boats and four are Shark Bay Snapper boats. Most West Coast Rock Lobster licensed fishing boats report taking only small amounts of fish.

Most boats demonstrate a sporadic pattern of wetline fishing in the Abrolhos. Most wetline in the Abrolhos for a couple of years. Some report taking catches of one tonne or more, then do not wetline there again. Perhaps of some concern is that 25 new licensed fishing boats fished in the area in the last two years. Slightly more boats appear to be taking larger catches; for example during 1997-98 nine boats took over 10 tonnes and 17 boats took between one and 10 tonnes, whereas eight took over 10 tonnes and 14 took between one and 10 tonnes during 1994-95.

The other commercial group targeting the cartilaginous fish and finfish in the Abrolhos Islands are the licensed fishing boats which had power operated net hauler licence conditions on 30 June 1998. These boats are now under management and the fishery has become the West Coast Demersal Gillnet and Demersal Longline Interim Managed Fishery.

The charter and recreational fishing sectors also increasingly visit the Abrolhos Islands.

4.1.4 When wetlining takes place in the Abrolhos Islands

The seasonal pattern of reported wetline fishing is not very marked, but more wetlining seems to take place in the spring and autumn than in the winter and summer months. The following table shows the seasonal variation in wetline fishing.

Table 27 Seasonal wetline catches (tonnes) in waters surrounding the Houtman Abrolhos Islands

MONTH	Live weight (tonnes)					
	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	-	6.5	15.7	14.2	11.9	15.1
August	-	12.6	14.5	20.2	22.6	29.1
September	-	13.9	11.3	15.9	17.4	17.4
October	-	8.5	11.9	25.7	20.8	20.1
November	4.9	12.2	13.3	15.5	19.0	18.5
December	10.9	8.4	14.0	14.1	12.2	12.0
January	8.2	13.2	12.2	11.2	12.2	15.8
February	7.6	13.4	15.9	21.6	14.9	13.3
March	9.4	16.3	16.0	12.1	17.6	20.3
April	9.0	14.8	21.4	22.7	26.2	19.3
May	8.7	21.5	17.7	22.9	18.7	18.0
June	7.2	12.6	17.1	10.5	15.3	17.6
GRAND TOTAL	65.8	153.9	181.0	206.6	208.7	216.4

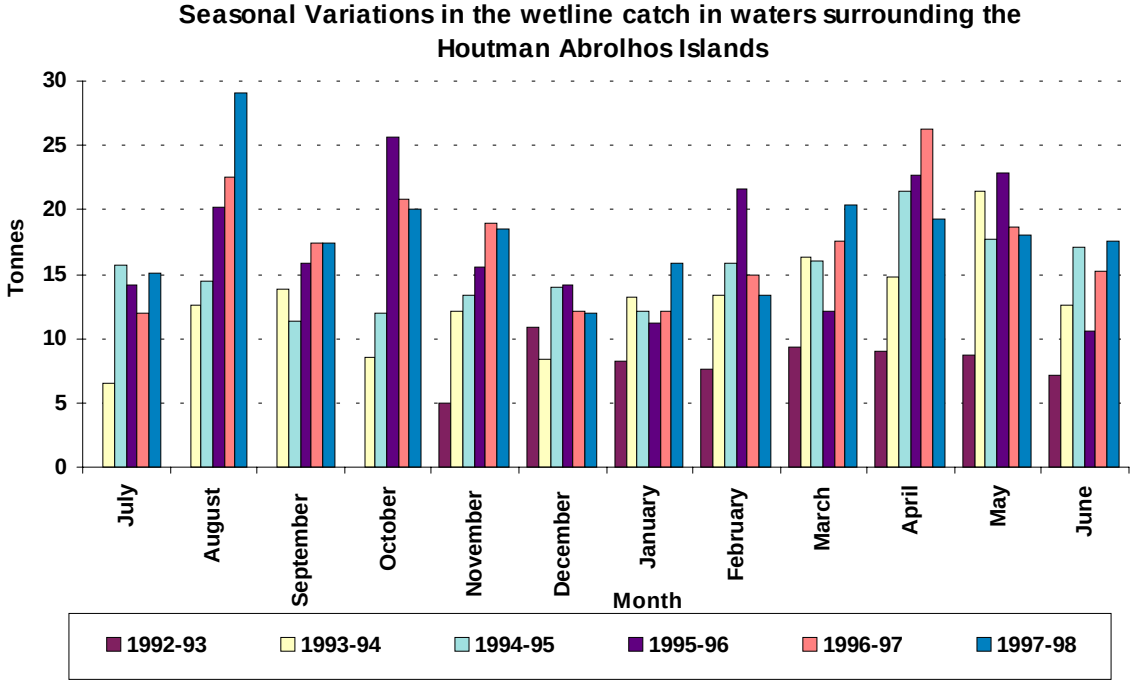


Figure 26

4.2 Wetlining near the Perth metropolitan area (blocks 31150 and 32150)

There is a large and generally declining wetline catch reported in the inshore fishing blocks (31150 and 32150) between Mandurah and Lancelin (See Appendix 7). This catch has declined by nearly one third over the last seven financial years, going from 247 tonnes in 1991-92, to 171 tonnes in 1997-98. However, the 1997-98 catch is atypical of the general trend, and is 40 tonnes higher than the previous year. The reason for this is likely to be the increase in the number of rock lobster boats wetlining during this period. Other licensed fishing boats also reported wetlining or entered the wetline fishery for the first time during this period, perhaps in reaction to industry rumour about a wetline study.

The reasons for the general downward trend in reported wetline fishing are unclear. However, the Perth metropolitan area obviously has large and increasing recreational and charter boat fishing pressure - the decline in the wetline catch may reflect the increasing catch share from these two sectors, along with a regional decline in the abundance of the most important target species.

Reported wetline catches of the Perth metropolitan area are shown in Appendix 7. The total catches for the last seven financial years are shown graphically in Figure 27.

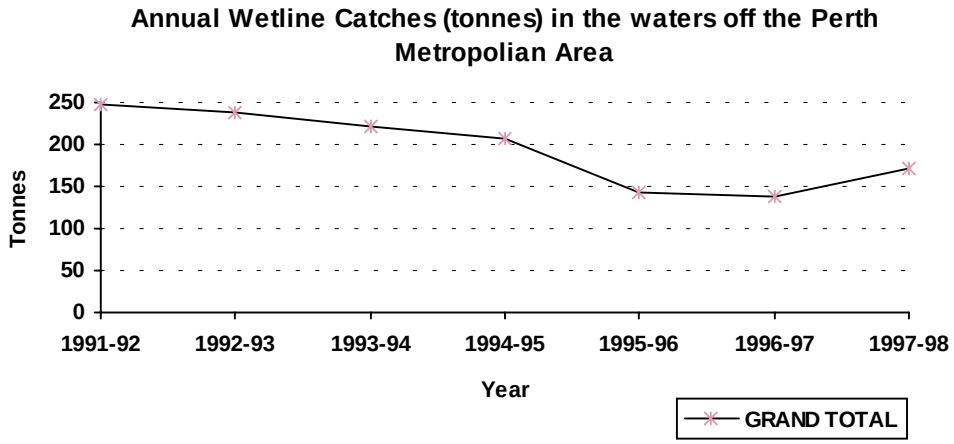


Figure 27

4.2.1 How wetline catch is taken in the Perth metropolitan area

A variety of methods are used to wetline in the Perth metropolitan region. However, hand lining and drop lining are the two most common methods. While the catches for all other methods have dropped or stayed the same, the reported wetline catches for these two methods have doubled, with drop lining catches rising from 29.6 tonnes in 1991-92 to 79.2 tonnes in 1997-98 and hand lining catches rising from 29.4 tonnes in 1991-92 to 48.2 tonnes in 1997-98.

4.2.2 Species taken by wetlining near the Perth metropolitan area

As well as the recreational, charter and wetline sectors, there are a number of other fisheries in and around the Perth metropolitan area which target cartilaginous fish and finfish stocks and crabs. These include the Cockburn Sound Managed Fisheries, the West Coast Purse Seine Managed Fishery, and those boats which now form part of the West Coast Demersal Gillnet and Demersal Longline Interim Managed Fishery.

The wetline fleet takes a wide variety of species from the waters off the Perth metropolitan area, contributing significantly to the overall level of pressure experienced by the finfish resources of this region. The largest reported wetline catches in 1997-98, in excess of five tonnes, were as follows:

- dhufish, 39 tonnes;
- sea mullet, 13.3 tonnes;
- sand crabs, 10.9 tonnes;
- samsonfish, 20 tonnes;
- various species of shark, 29.6 tonnes; and
- pink snapper, 21.2 tonnes

Dhufish and pink snapper are prized recreational species. The dhufish catch remained around 20 tonnes until 1997-98, but the pink snapper catch rose from 9.5 tonnes in 1991-92 to 26.4 tonnes in 1995-96, before falling to 12.7 tonnes in 1996-97 and rising again to 21.2 tonnes in 1997-98.

This situation may be a consequence of environmental conditions during 1994-95, when there were large schools of spawning snapper aggregating in and around Cockburn Sound. However, it may also be a reflection of broader overfishing trends being experienced in the Perth metropolitan area. Seasonal conservation measures were introduced from 1996 onwards to protect the spawning aggregations of snapper in the Perth metropolitan area from excessive recreational fishing pressure.

4.2.3 Who wetlines in the Perth metropolitan area?

In total, 241 licensed fishing boats wetlined in the waters off the Perth metropolitan region over the last seven financial years, with 106 reporting wetlining during 1997-98. Usually between 80 and 100 boats wetline in this area each year.

There are a number of licensed fishing boats from the south and south west of the State which have recorded generally small, sporadic catches in the Perth metropolitan area, as have a smaller number of Geraldton registered boats. The vast majority of the boats wetlining in the area are Fremantle registered Zone C West Coast Rock Lobster boats and 'wetline only' boats.

The breakdown of boats reporting wetlining in the Perth metropolitan area (as licensed at 30 June 1998) is as follows:

- 84 Zone C West Coast Rock Lobster Fishery licensed fishing boats. Rock lobster boats took around 32 per cent of the reported wetline catch in 1997-98;
- 52 'wetline only' licensed fishing boats. 'Wetline only' boats took around 31 per cent of the reported wetline catch in 1997-98;
- 24 various Cockburn Sound Managed Fishery licensed fishing boats;
- 17 licensed fishing boats which have subsequently been sold to the Fisheries Adjustment Scheme;
- 13 estuarine licensed fishing boats, from the Mandurah, Swan-Canning and Leschenault Estuaries;
- various other licensed fishing boats from fisheries such as the West Coast Purse Seine Fishery, the South West Trawl Fishery and the Abalone Fishery.

Only 34 boats have reported taking catches over one tonne *per annum* for three or more of the last seven financial years. Only seven of these boats were 'wetline only' boats, seven were boats with access to the Cockburn Sound Fisheries, and eight were Zone C West Coast Rock Lobster boats.

4.2.4 When wetlining takes place in the waters off the Perth metropolitan area

The seasonal pattern of reported wetline fishing in this area has become more marked over recent years. Generally, more fishing takes place in the summer and autumn months than in the winter. The table below shows not only the seasonal variation in wetline fishing, but the general steady decline in wetline catches.

It is interesting to note that the reported wetline catches in December and January have generally remained fairly stable, perhaps reflecting market demands.

Table 28 Seasonal wetline catches (tonnes) in the waters off the Perth metropolitan area

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	19.6	17.3	18.9	14.7	7.8	2.1	9.6
August	12.7	21.7	16.0	18.3	12.9	7.4	16.9
September	8.3	23.2	13.9	13.0	9.4	7.6	11.2
October	17.0	28.2	9.2	15.7	8.8	13.7	17.3
November	12.8	21.0	16.7	17.3	6.3	9.1	12.8
December	14.6	14.3	24.9	14.1	8.4	14.8	14.2
January	25.0	18.7	26.8	21.2	15.2	19.1	18.2
February	27.9	15.8	20.7	20.9	20.3	16.2	16.2
March	21.4	18.4	17.9	20.2	18.0	13.2	15.7
April	40.6	17.7	22.5	17.5	16.1	14.0	18.4
May	18.2	23.1	20.9	17.2	13.5	11.6	16.0
June	28.6	18.5	14.2	17.9	6.0	9.8	4.2
GRAND TOTAL	246.7	237.8	222.4	208.2	143.1	138.7	170.8

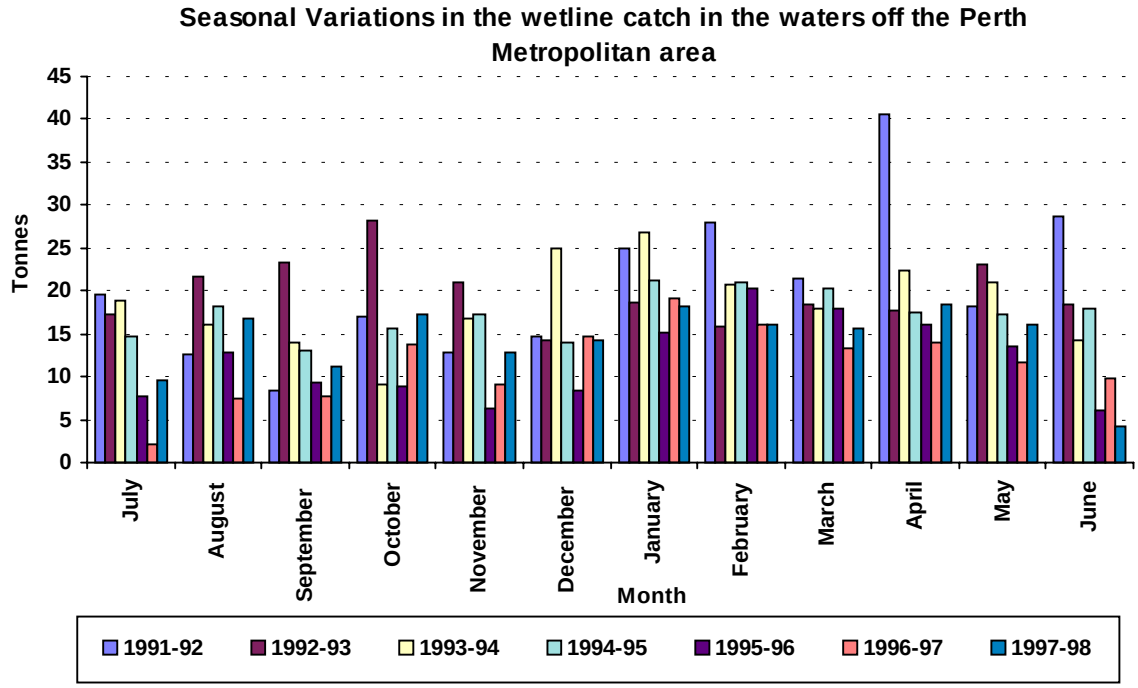


Figure 28

4.3 Wetlining in the South West

The South West of Western Australia (taken as fishing blocks 33140, 33150, 33151 and 96010, see Figures 29 and 30 and Appendix 7) has volatile wetline catches - from 312 tonnes recorded in 1991-92 to 427 tonnes in 1996-97 and down to 242 tonnes in 1997-98. This makes the reported wetline catch in this area considerably larger than that of the Perth metropolitan area. However, a large component of this catch is whitebait and Australian herring (45.2 and 47.8 tonnes respectively in 1997-98) which are taken by beach seining. Australian herring is a major 'bread and butter' recreational species.

Excluding the Australian herring and whitebait catches, the reported wetline catch has increased by around 45 tonnes over the last seven financial years, from 104.3 tonnes in 1991-92 to 149.6 tonnes in 1997-98.

Fewer boats report wetlining in the South West than in the Perth metropolitan area - only 71 boats as compared to 241. In any one year, only about 35 licensed fishing boats report wetlining in the South West.

Like the Perth metropolitan area the South West is a region of large and increasing recreational and charter boat fishing, so an increasing wetline catch may in time place some additional strains on the fish resource of this region and lead to resource sharing conflicts, particularly over shore based Australian herring catches.

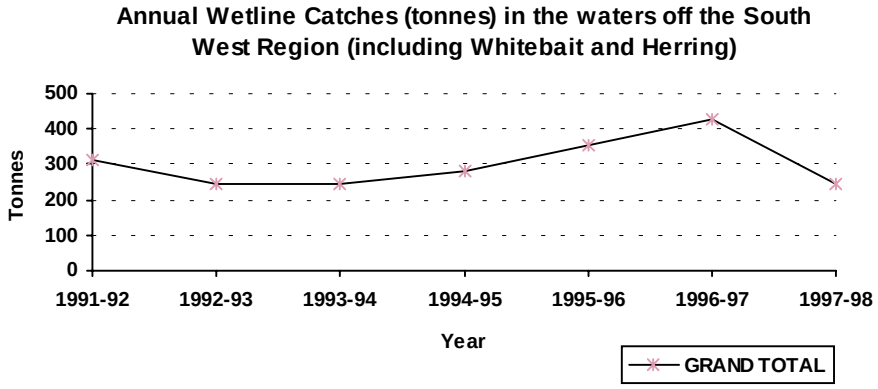


Figure 29

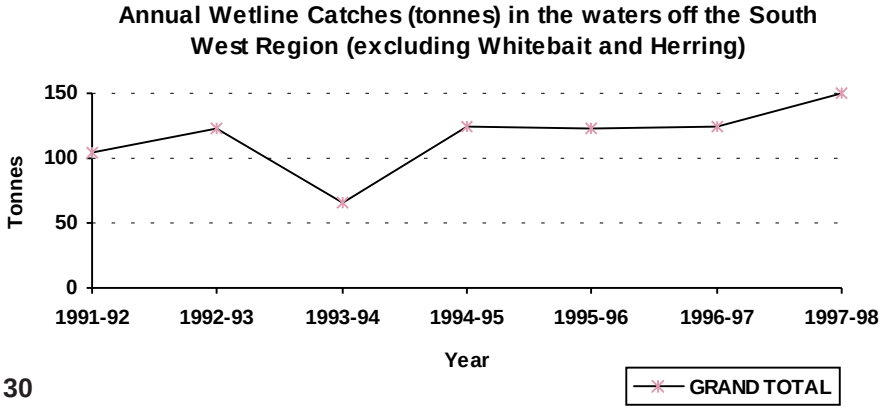


Figure 30

4.3.1 How wetline catch is taken in the South West

A broad range of species occur in the South West region, and this is reflected in the wide range of fishing methods used to wetline in this area. Beach seine nets are used to target whitebait, Australian herring and other species, such as mullet. Sand crabs are taken by drop nets. Hand hauled gillnets and haul nets, along with the usual hand line and drop line methods of wetlining, are also used in the area.

4.3.2 Species taken by wetlining in the South West

The reported wetline catches of dhufish in this region have decreased from 27.9 tonnes in 1991-92 to 25.0 tonnes in 1997-98, with the majority of the catch coming from block 33140 (off Cape Leeuwin and Cape Naturaliste). The catch in this block has remained relatively stable over this period, (between 20 and 25 tonnes), but the catch in the Geographe Bay and Bunbury areas has increased by about four to six tonnes over the past seven years, which may lead to future resource sharing conflicts.

Also of interest is the reported increasing catch of hapuku in the South West, from 0.4 tonnes in 1991-92 to 7.8 tonnes in 1997-98.

The reported catch of sand crabs rose from under one tonne seven years ago to 25.7 tonnes in 1997-98, reflecting the use of new methods and opening of new markets for this species. A review of this fishery has taken place and management is expected to be put in place by the end of 1999.

There were very small, but regular wetline catches reported of various sharks recorded during the seven year period.

The reported pink snapper catch has increased from a low base of 1.8 tonnes in 1991-92 to 7.3 tonnes in 1997-98, with the majority of the catch being taken in the Cape Leeuwin/Cape Naturaliste block 33140.

The reported whitebait catches are highly variable, ranging, for example, from 107.3 tonnes in 1991-92 to 256 tonnes in 1996-97 to 47.8 tonnes in 1997-98. This scenario may reflect changing environmental conditions in the latter years, or may be related to other factors such as fishing effort.

The reported Australian herring catch has steadily declined from 101.2 tonnes in 1991-92 to 45.2 tonnes in 1997-98. A new research project is currently underway to determine the reasons for this decline.

4.3.3 Who wetlines in the South West?

In total, 71 licensed fishing boats have reported wetlining in the waters of the South West region during the last seven financial years. The Southern Demersal Gillnet and Longline Fishery targets the same resource in this area. In addition, there is a large and increasing level of participation by the recreational sector.

The breakdown of licensed fishing boats wetlining in the South West is:

- 16 'wetline only' licensed fishing boats;
- 15 Southern Demersal Gillnet and Demersal Longline licensed fishing boats (including those with supplementary authorisations);
- 12 South West Salmon licensed fishing boats;
- nine Zone C West Coast Rock Lobster licensed fishing boats;
- nine licensed fishing boats which have subsequently been sold to the Fisheries Adjustment Scheme;
- five Leschenault Estuarine licensed fishing boats; and
- various other licensed fishing boats including those with herring licence conditions.

Some of the licensed fishing boats which report wetlining in the waters off the South West are multi-endorsed, reflecting the broad range of methods, fisheries and species taken in this area. Of the 71 boats reported to have wetlined, 26 fished only for one or two years in this area.

There is a core of about 35 boats which regularly wetline, recording larger wetline catches than boats in other areas of the State. The largest catch component of these boats is whitebait. Of those 35 boats, 27 regularly take over two tonnes of fish, with most of them taking between five and 25 tonnes, reflecting the whitebait and Australian herring component of the catch. Most of the core boats are either 'wetline only', or Estuarine, South West Salmon and Southern Demersal Gillnet and Demersal Longline boats, or a combination of these authorisations.

4.3.4 When wetlining takes place in the waters off the South West region

There are marked seasonal variations in the wetline catches of the South West, reflecting the whitebait and Australian herring catches of the beach seiners (see Table 29).

Excluding whitebait and Australian herring, there was an increase of around 45 tonnes in the annual wetline catch in the South West from 1991-92 to 1997-98, as shown in Table 30.

Table 29 Seasonal wetline catches in the waters off the South West region (including whitebait and Australian herring)

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	5.2	3.5	3.2	9.2	12.0	2.9	20.4
August	5.3	8.0	2.6	5.7	6.1	6.4	18.9
September	3.7	5.3	2.2	5.6	6.3	7.0	8.7
October	8.0	11.1	8.7	8.2	11.4	11.4	12.2
November	18.1	17.8	11.9	17.9	7.2	14.9	14.0
December	42.6	24.9	43.5	60.0	67.1	28.1	17.7
January	71.7	29.9	80.1	63.4	88.0	118.3	4.7
February	50.4	39.1	44.0	34.8	77.1	102.9	34.6
March	24.7	40.8	23.0	38.6	36.5	80.2	28.2
April	55.0	32.3	13.4	20.9	22.1	28.1	26.1
May	16.3	21.0	9.2	8.8	12.3	10.6	8.0
June	11.2	12.0	2.5	9.4	7.2	15.9	6.7
GRAND TOTAL	312.2	245.6	244.3	282.4	353.5	426.6	242.7

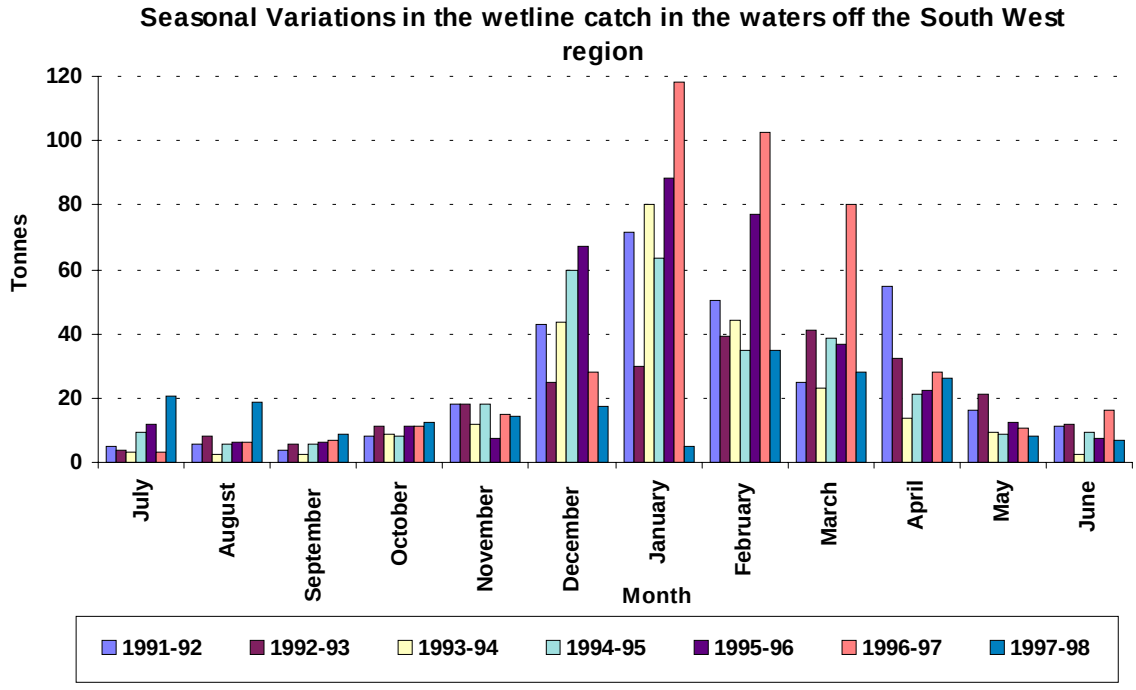


Figure 31

Table 30 Seasonal wetline catches in the waters off the South West region (excluding whitebait and Australian herring)

MONTH	Live weight (tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
July	5.2	3.5	3.1	8.1	12.0	2.9	20.4
August	4.9	8.0	2.6	5.7	6.1	6.4	18.9
September	2.7	4.4	2.2	5.6	6.2	7.0	8.6
October	5.5	6.3	4.9	7.7	11.3	11.4	10.5
November	10.4	7.0	6.1	16.6	7.1	9.5	11.9
December	13.9	13.4	8.5	17.6	12.4	15.7	14.7
January	15.2	11.5	14.2	19.1	22.3	15.8	21.4
February	13.4	10.3	7.4	15.2	13.8	15.6	11.5
March	8.6	21.9	4.9	7.7	12.7	8.6	9.6
April	6.8	10.4	4.0	5.7	7.9	8.2	8.2
May	6.9	15.1	5.9	6.4	6.4	7.6	7.2
June	10.8	11.0	2.5	9.4	5.1	15.9	6.7
GRAND TOTAL	104.3	122.8	66.3	124.8	123.3	124.6	149.6

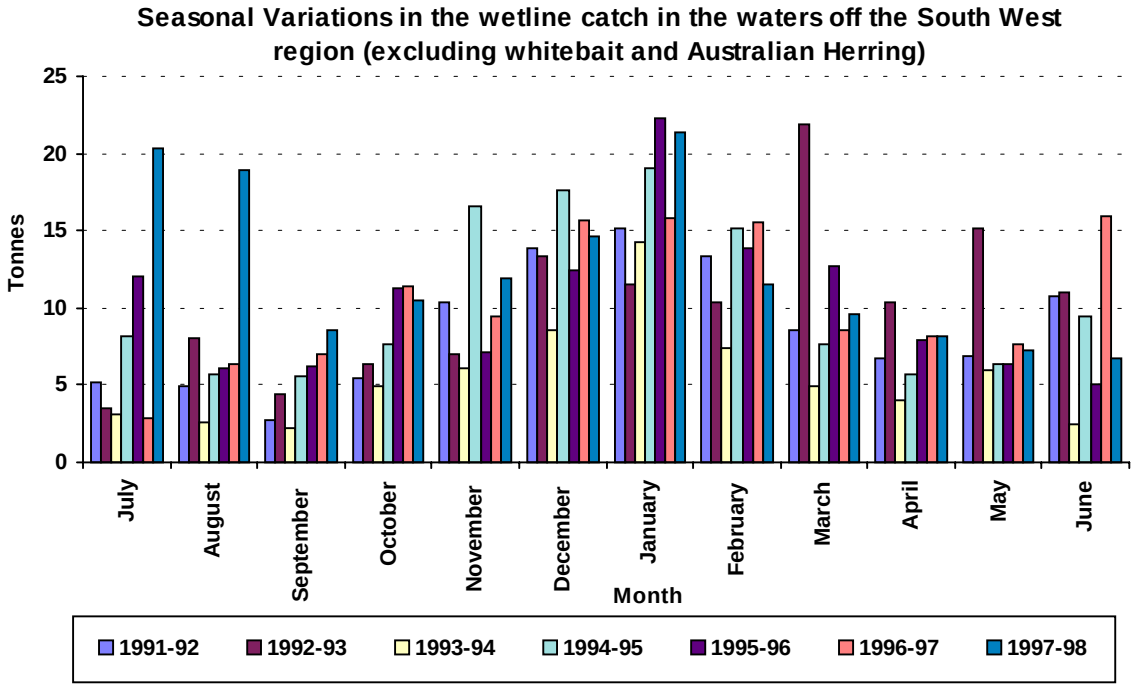


Figure 32

5.0 Conclusion

This study has provided a 'snapshot' profile of the reported wetline activities of the Western Australian fishing fleet as at 30 June 1998. It has attempted to determine the 'who', 'what', 'where', 'how' and 'when' of 'wetline' fishing, in order to determine possible future strategic directions for management. The study confirmed that about half the fishing fleet in the State reported wetlining in the past seven financial years, with most wetlining being reported in the 1997-98 year.

It confirmed that dhufish, pink snapper and Spanish mackerel were the most targeted line caught species by the wetline fleet, with catches of 201, 215 and 534 tonnes respectively reported in the 1997-98 financial year.

Whitebait and Australian herring were the most targeted net caught species with catches of 48 and 110 tonnes respectively reported in the 1997-98 financial years.

The study also determined the geographical range of wetline fishing. While much line caught wetlining takes place in the inshore areas of the Perth metropolitan area and the South West, the Abrolhos Islands line caught wetline catch is the same as both these areas combined. Small amounts of inshore line fishing also takes place along the south coast of the State.

Most commercial net fishing within the wetline catch occurred in the South West and south of the State.

The first six years CAES data used by the study did not confirm a commonly held view that large amounts of finfish were taken by the West Coast rock lobster fleet during years of 'normal' fishing operations. In fact, most of their reported wetline catches were relatively small and only about a third of the rock lobster fleet reported having wetlined at all. Even during 1997-98 when there was a 'blow out' of wetline catch, particularly dhufish, by the rock lobster fleet, they only reported taking seven per cent of the total wetline catch.

Possible reasons for this 'blow out' are:

1 under reporting of wetline catch in the first six years of the study;

2 industry rumours of a wetline review, leading to boats attempting to gain wetline fishing history; and/or

3 lower prices for rock lobster during 1997-98 and lower forecast prices for 1998-99.

The zonal differences in reported wetline catches, and the increasing use of drop lines were of most interest in the rock lobster fishing pattern.

Anecdotal evidence that large amounts of dhufish were taken by the rock lobster fleet were also not verified with respect to the first six years of the study. However, reported dhufish catches by the rock lobster fleet more than doubled from 1996-97 to 1997-98, when they took 24 per cent of the reported wetline catch of dhufish. Dhufish catches were generally lower in the winter months - when the wetline catches of the rock lobster fleet were at their highest.

The question of latent effort in the West Coast Rock Lobster fleet was examined and it was found that generally the average price of rock lobster did not affect the reported amount of wetline fishing being carried out by the rock lobster fleet. The combination of the three factors - including a projected extremely low price for rock lobster - described above may have been the trigger for the recent 'blow out' of the rock lobster catch.

The 'wetline only' fleet took 45 per cent of the total reported wetline catch.

The resource sharing implications of the inshore fishing activities of the wetline fleet will also need to be examined.

Fisheries WA in consultation with key stakeholders must now make policy decisions on whether or not wetline fishing should be permitted to continue in its present unregulated manner.

6.0 Acknowledgments

We would like to especially thank Bruce Stevenson, Neil Sumner and his research team, Mike Moran, Colin Simpfendorfer and their research teams, and Natalie Kennedy for their enormous assistance, patience and dedication in providing me with the information I needed to complete this paper.

We would also like to thank Peter Rogers, Peter Millington, Jane Borg, Lindsay Joll, Richard Sellers, Andrew Cribb, Rebecca Metzner, Laurie Caporn, Eric Barker, Steve Newman, Suzy Ayvazian and Dan Gaughan for their help and many constructive suggestions during the course of this study.

Thank you also to Jenny Hall for the wonderful maps, Sue Meiklejohn for helping complete the word processing and graphs and Steve Ireland and Carolyn Walker for their great editing, formatting and support in getting this paper to fruition.

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8.0 So you want to go wetlining?

A user's guide to wetline fishing

I am acutely aware of the complexity of this study. The wetline fishery is, after all, a multi-species, multi-user, multi-method and geographically widespread fishery. I have therefore included this section as an explanation from an individual fisherman's perspective. It includes the answers to a number of the questions I have been asked while working on this study.

I hope it helps readers to interpret and unravel the various facts and figures associated with wetline fishing.

Fiona Crowe

Since the first Western Australian Fisheries Act of 1899, commercial fishing boats and their operators have had to be licensed.

Since then, commercial fishing in Western Australia has been regulated in three ways

- By area closures to fishing for a particular species, e.g. the Shark Bay Snapper Fishery;
- By seasonal closures, e.g. the West Coast Rock Lobster Fishery; and
- By method of capture, e.g. the South Coast Demersal Gillnet and Demersal Long Line Fishery.

On top of this, every fishing boat is able to fish in the unmanaged 'wetline' fishery. This fishery involves all commercial fishing which is not covered by fisheries legislation.

Let me give you an example of how wetline fishing works.

Mike Smith has invested in a fishing boat licence for a wetline boat. Mike doesn't actually fish the licence himself as he is a mining engineer. He leases it to a fisherman called Dave Brown. Dave has put the licence onto an old rock lobster boat so he can go wetlining.

Dave will be fishing in the State's last unmanaged fishery, the Western Australian wetline fishery. It is a multi-method, multi-user, multi-species, multi-seasonal and geographically-widespread fishery.

During the 1997-98 financial year, 2,270 tonnes of fish were reported as being taken in the wetline fishery. This is an increase of around 10 per cent or 230 tonnes on the wetline catch taken seven years before.

Five species account for about 60 per cent of the wetline catch. These are :

- Spanish mackerel (25 per cent);
- dhufish (10 per cent);
- pink snapper (10 per cent);
- whitebait (usually around 10 per cent); and
- Australian herring (around five per cent).

How do fishers wetline?

To continue with our example, the Western Australian fishing boat licence entitles Dave, who also holds a commercial fisherman's licence, to do anything by way of fishing that is not otherwise prohibited (i.e. he cannot fish in a legislated and designated commercial fishery) and to sell his catch. This type of commercial fishing is called 'wetline fishing'.

The usual methods of wetline fishing are hand lining, drop lining, trolling, beach seining and hand hauled netting. Other methods are squid jigging, drop netting, diving, lift netting and beam tide trawling in certain areas.

Hand lining and drop lining are the usual methods of catching deeper water or demersal fish species, such as dhufish and pink snapper. Trolling is used to target surface or pelagic species such as Spanish mackerel. Australian herring and whitebait are caught by beach seine nets.

The increase in the use of drop lines for wetline fishing , particularly by the rock lobster fleet is of concern. The number of rock lobster boats using droplines has doubled in the past seven years.

Wetlining by rock lobster boats was a key driver in Fisheries WA undertaking a study into the activities associated with the unrestricted Western Australian fishing boat licence and its associated wetline fishery. I am talking about rock lobster boats because the question I have been asked most often during this study is: "what are the rock lobster boats doing"?

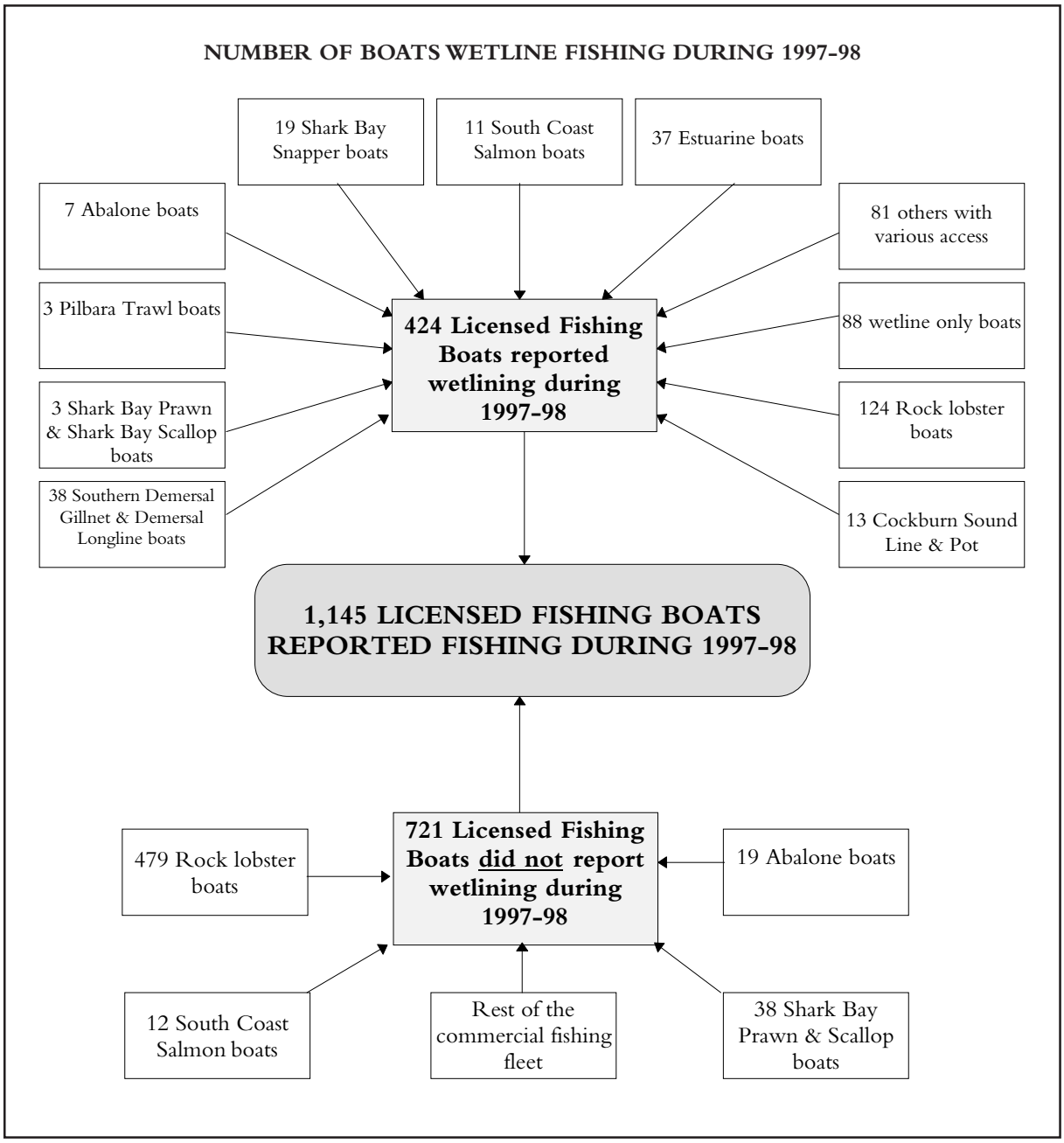
Droplining has largely superseded the traditional methods of drifting over productive ground using handlines. Some rock lobster boats are reportedly using up to 150 drop lines at one time, although the catch and effort data is unable to confirm this. There are currently no restrictions on the number of droplines a commercial fishing boat may use when wetlining.

The concerns about the numbers of rock lobster boats wetlining relate to a general view about boats in an existing managed fishery turning to wetlining as an extra revenue source when catch prices in their particular managed fishery drop, or when they are trying to accumulate fishing history in a fishery which may become managed at a later date.

The increase in rock lobster boats turning to wetlining when rock lobster prices are relatively low serves to illustrate what can happen in any managed fishery when catch prices fall and the consequent potential for increasing numbers of fishers to turn to wetlining.

Who wetlines?

Now, to return to Dave, Dave's boat is one of 720 which have wetlined in the last seven financial years. Usually between 370 and 400 boats wetline in Western Australia each year.



Of the 1,145 commercial fishing boats which fished last year, 424 or 38 per cent reported wetlining, while the remaining 721, or 62 per cent did not.

About 90 wetline only boats, like Dave's, usually fish each year. 125 of these wetline only boats have fished in the past seven financial years.

Dave's boat has competition from other boats wetlining.

One third of the Rock lobster fleet - or 201 boats - wetlined in the last seven financial years. Between 70 and 100 rock lobster boats wetline each year. These are mostly Zone C boats, which fish around the Lancelin, Jurien, Fremantle areas. Usually between 50 and 60 of them wetline each year.

During 1997-98 there was an increase in the number of rock lobster boats which reported wetlining. The reasons for this increase may be threefold :

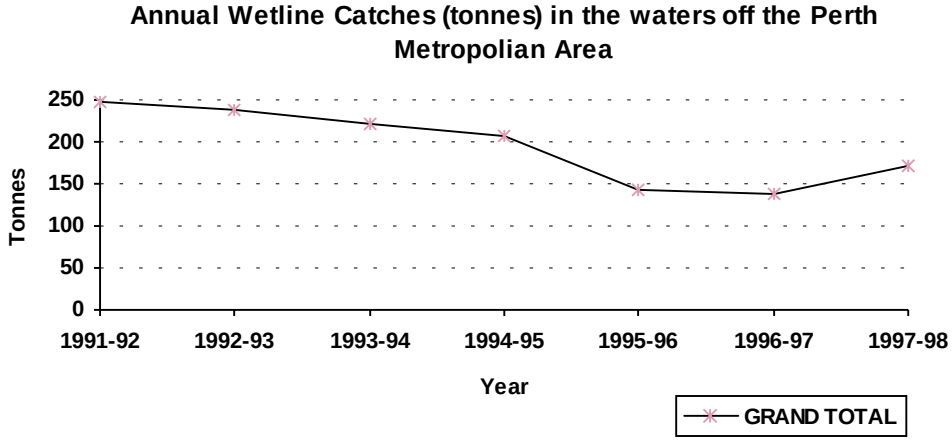
- Rock lobster boat owners or skippers heard industry rumours of a wetline review and started to record their wetline catches to prove fishing history and commitment;
- In response to these rumours they started wetlining; and/or
- Some rock lobster boat owners or skippers wetlined believing that lower rock lobster prices would continue during the 1998-99 rock lobster season.

It is interesting to note that the 'wetline only' boats like Dave's took 45 per cent of the reported wetline catch during 1997-98; the Southern Demersal Gillnet and Demersal Longline boats took seven per cent; and the rock lobster boats took seven per cent. It is what the rock lobster boats took that was of interest, and I'll cover this matter later.

Where is wetlining carried out?

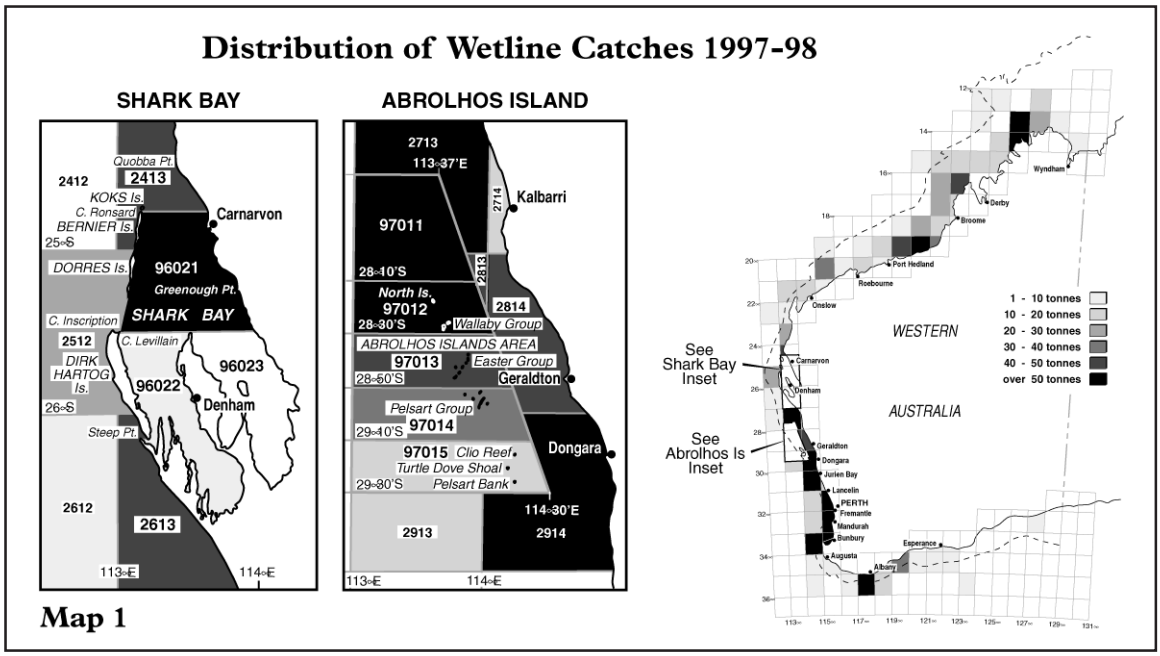
Once again, let us return to our sample fisher, Dave. Dave usually fishes the inshore fishing area between Lancelin and Mandurah - around the Perth metropolitan area - when he leases a boat. He targets dhufish and pink snapper, using hand lines and drop lines.

However, last year he found the competition a little stiff.



Despite a general decline in wetline fishing around the Perth metropolitan area, shown in the graph on the previous page, there was a big increase in the wetline catch of rock lobster boats during 1997-98. The rock lobster fleet took a bigger percentage of the wetline catch in this area than the 'wetline only' boats like Dave's. Rock lobster boats took around 32 per cent of the 170.8 tonnes taken by the wetline fishing. The wetline only boats took 31 per cent.

Wetline catches in the Perth metropolitan area started to increase for the first time in seven years during 1997/98.

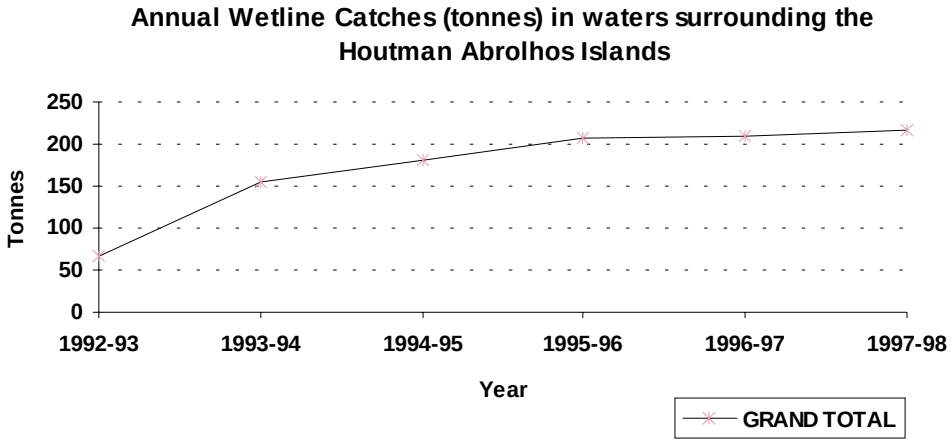


Map 1

The map above shows the distribution of wetline catches during 1997-98. As Dave can fish anywhere in the State outside the regulated commercial fisheries, he is thinking about fishing in the Abrolhos Islands. He has also heard the Spanish mackerel fishing off Quobba near Shark Bay is quite good. He is thinking about going up there to fish. This is a usual pattern of behaviour for 'wetline only' fishermen.

Dave's choices may see him hop out of the frying pan into the fire. The major areas of wetline fishing are all along the West Coast.

Dave's two main target species, dhufish and pink snapper are heavily fished in Western Australia's mid-west, and especially in the Abrolhos Islands.



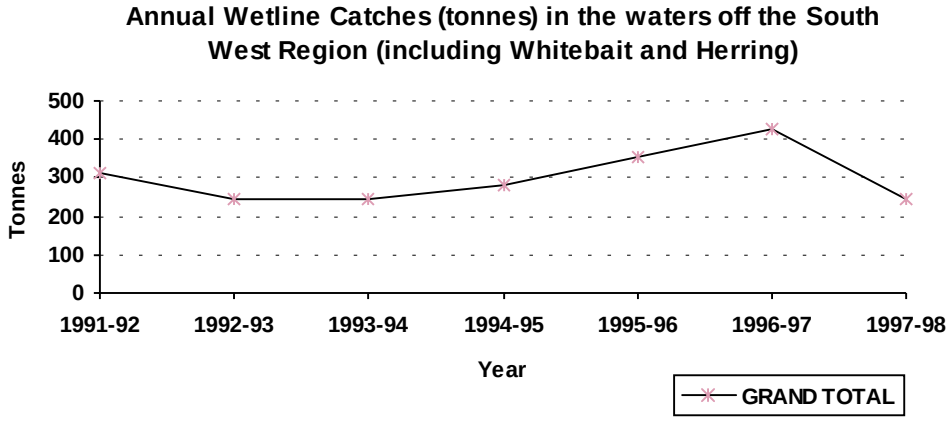
The total reported wetline catch in the Abrolhos Islands, as shown graphically above, has risen by 142 per cent from 65.8 tonnes to 216.4 tonnes over a period of six years. Wetline dhufish catches in the Abrolhos rose by 395 per cent from 11.9 tonnes in 1992-93 to 46.9 tonnes 1997-98. Pink

snapper catches rose by 300 per cent from 17.6 tonnes to 53.2 tonnes during that same period. In 1997-98 46 per cent of the statewide catch of baldchin groper came from wetline catches from the Abrolhos Islands. That is 19.3 tonnes out of a total of 42.1 tonnes. So, as wetliners have been so successful catching baldchin groper in the Abrolhos, Dave may decide to target baldchin groper as well.

Can all this fishing pressure be sustained?

If Dave goes to the Abrolhos he will join 38 'wetline only' boats who have tried wetlining there in the last six financial years. 92 boats have wetlined there altogether, but only 26 of these have fished there for three or more years. 14 of these are 'wetline only' boats. Perhaps these figures are telling us that wetlining in the Abrolhos may not be economically viable.

However, Dave's wife Debbie would rather live in Dunsborough than Geraldton.



The graph shown above shows wetline catches in the waters off the South West. Debbie has done some research into the diverse species and methods of capture used by wetliners in the South West, that is Bunbury to Cape Leeuwin. Around 25 tonnes of dhufish are taken in this area each year, the snapper catch has increased from 1.8 to 7.3 tonnes and a deep water fish called hapuku is also caught there. 7.8 tonnes of hapuku were caught in the South West area last year.

Dave thinks he might drop net for blue swimmer crabs in the South West. Nearly 26 tonnes of crabs were caught by drop nets in this area during 1997-98. However, he has heard that Fisheries WA are bringing this fishery under management shortly.

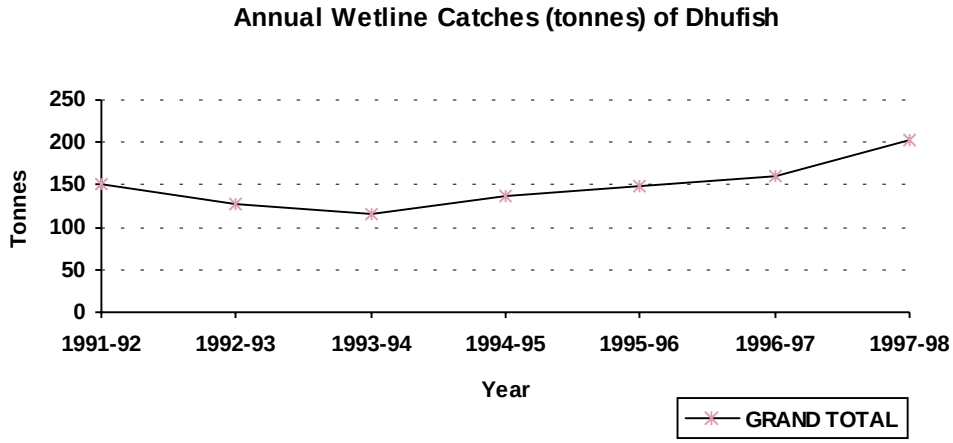
Dave also thought he might do a bit of beach seining for whitebait and Australian herring. The whitebait catches of this fishery fluctuate widely, from 107.3 tonnes in 1991-92 to 256 tonnes in 1996-97 and down to 47.8 tonnes in 1997-98. Environmental factors may be responsible for this fluctuation.

Australian herring catches are consistently decreasing, from 101.2 tonnes in 1991-92 to 45.2 tonnes in 1997-98. The reasons for this decrease are unknown, and a research project is currently underway to try to find out why. However, this year there are reports of large schools of herring, but very little is being caught due to market related factors. Because of this uncertainty, Dave won't be getting a dinghy to go beach seining.

What species are wetlined for?

In the end Dave and his wife decided to stay based in Perth and spend part of the year fishing for Spanish mackerel from Broome.

Dave will continue to target dhufish (see the graph below) and pink snapper while fishing in the Perth area. He has chosen to concentrate on the three species most heavily fished by the wetline fleet.



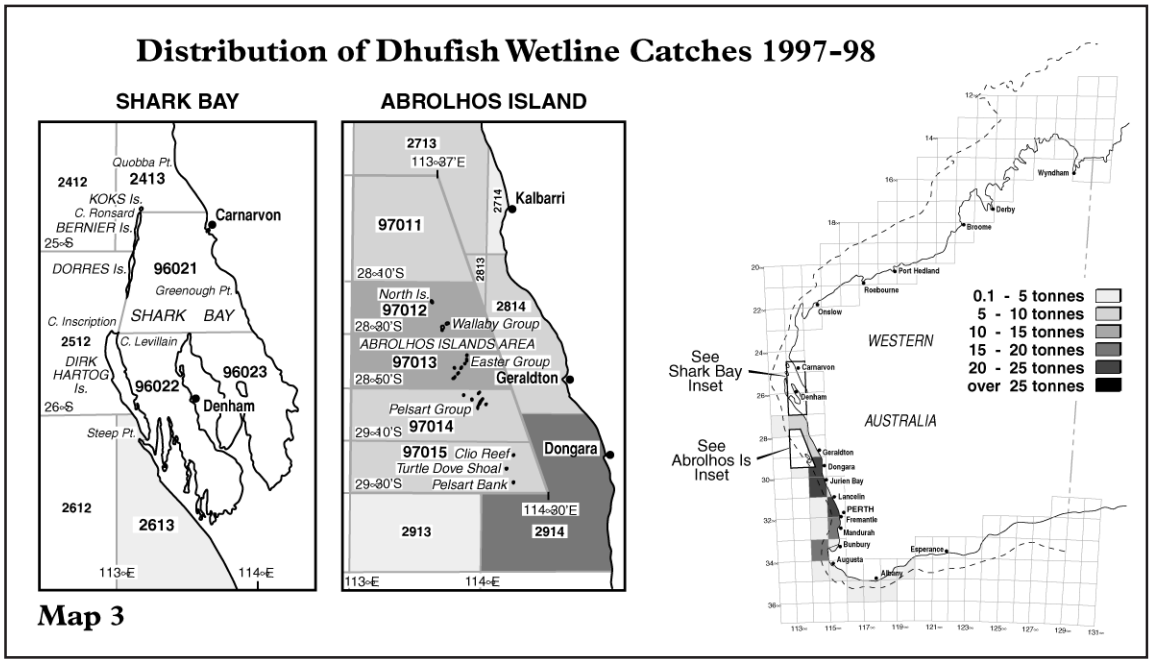
Last year the total dhufish wetline catches were 201.8 tonnes.

During 1997-98, the 'wetline only' fleet took 52 per cent of the dhufish wetline catch and 45.2 per cent of the total commercial dhufish catch. During the same period, the rock lobster fleet took 24 per cent of the wetline dhufish catch and 21 per cent of the total commercial dhufish catch.

Dhufish is a long lived resident demersal fish with a slow growth rate. It is estimated that male dhufish mature at three years and females at three to four years.

Until recently this situation has created a 'buffer' for the stocks, as the legal minimum length of 500 mm is not reached until the fish are around six to seven years old. However, Fisheries WA is concerned at the escalation of wetline fishing pressure on dhufish stocks.

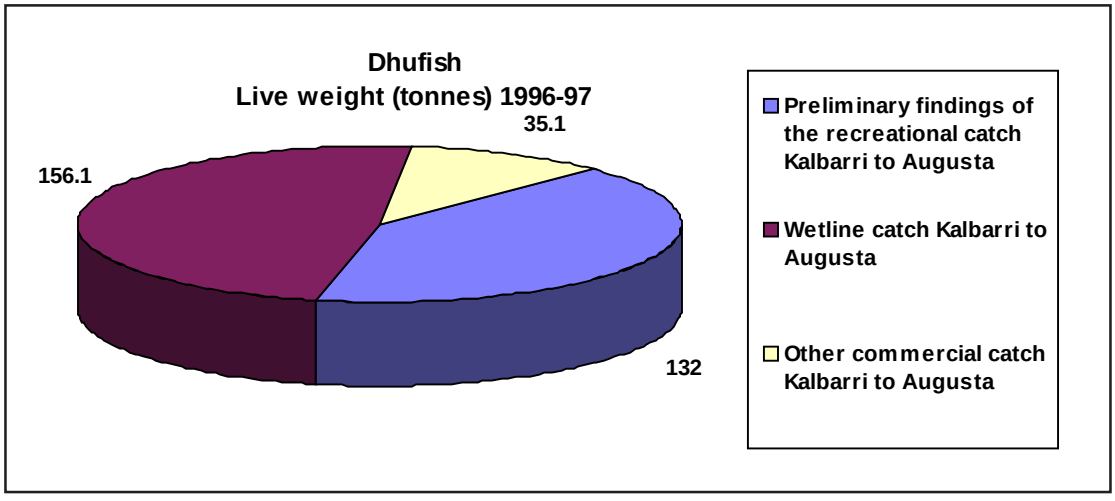
By staying put, Dave will remain in an area of relatively high wetline catches of dhufish, as most of the rock lobster taking dhufish are Zone C boats (see the map below).



Map 3

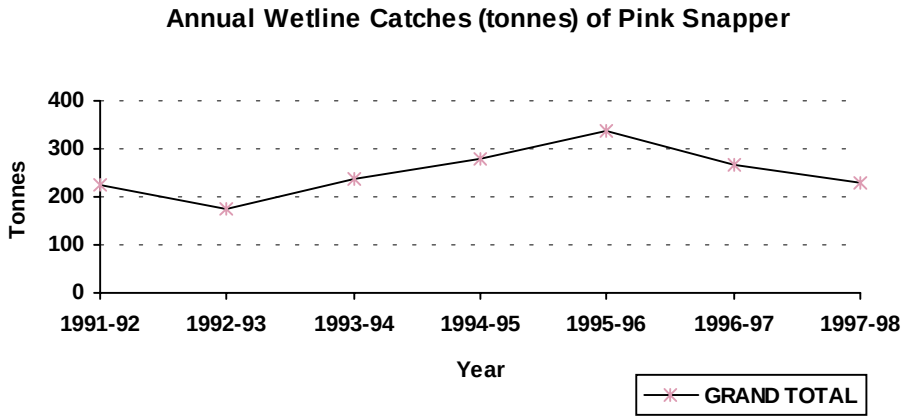
Lets also remember that dhufish are highly sought after by recreational fishers.

The best idea of the scale of these recreational catches comes from the preliminary findings of the Lower West Coast recreational fishing boat survey (from Augusta to Kalbarri), which comprises a large part of Dave's fishing area (see the chart overleaf).

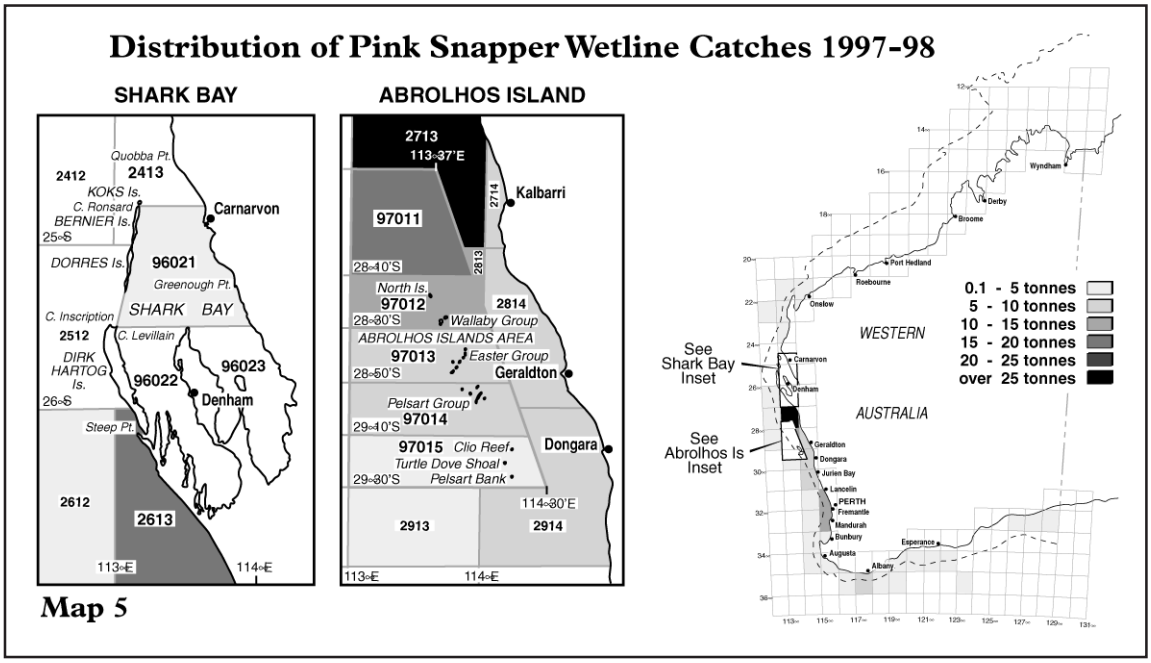


Taking the same area for the commercial catches, so we can compare 'apples with apples', we find that the recreational take of dhufish in 1996-97 was around 132 tonnes. This is around 41 per cent of the total catch of 323 tonnes. The remainder of the catch is made up of wetline fishing (48 per cent) and other commercial (mainly the boats endorsed to use demersal longlines and gillnets, commonly referred to as shark boats) 11 per cent.

Pink snapper, Dave's other target species are a generally wide ranging demersal fish (see the graph below).



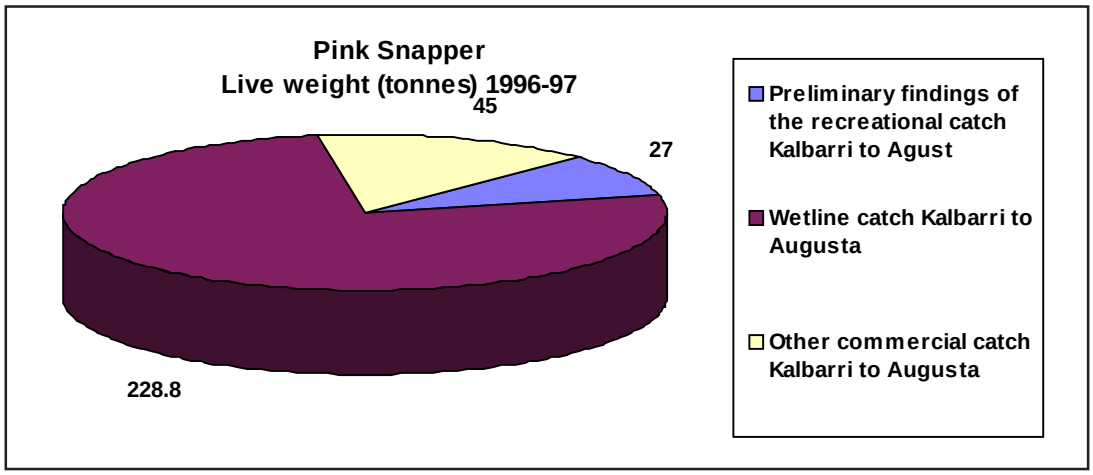
The major pink snapper fishery is a managed fishery off Shark Bay and so the wetline catch only accounted for 30 per cent of the total commercial catch of 764 tonnes during 1997-98. The total pink snapper wetline catch was 230.5 tonnes in 1997-98.



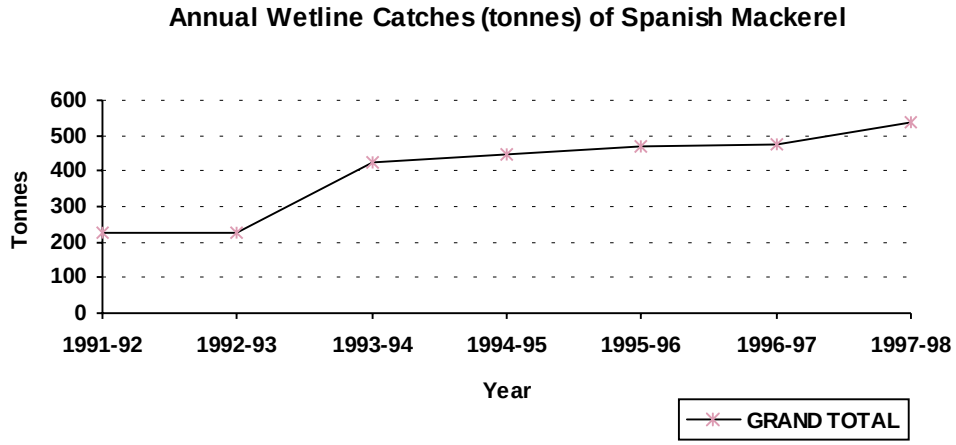
Map 5

Major concentrations of adult pink snapper occur off Shark Bay, the Abrolhos Islands and in Cockburn Sound (see the above map).

Again we need to acknowledge that the wetline sector is not the only one targeting pink snapper. The recreational fishing sector also takes a great deal of pink snapper.



Once again, comparing 'apples with apples' (see the chart above), in Dave's major fishing area, the Kalbarri to Augusta area, recreational fishers took 27 tonnes or 9 per cent of the total catch of 300 tonnes of pink snapper. I understand that 1996-97 was considered a bad year for recreational pink snapper fishermen. 76 per cent of the 300 tonnes of pink snapper was taken by wetline methods.

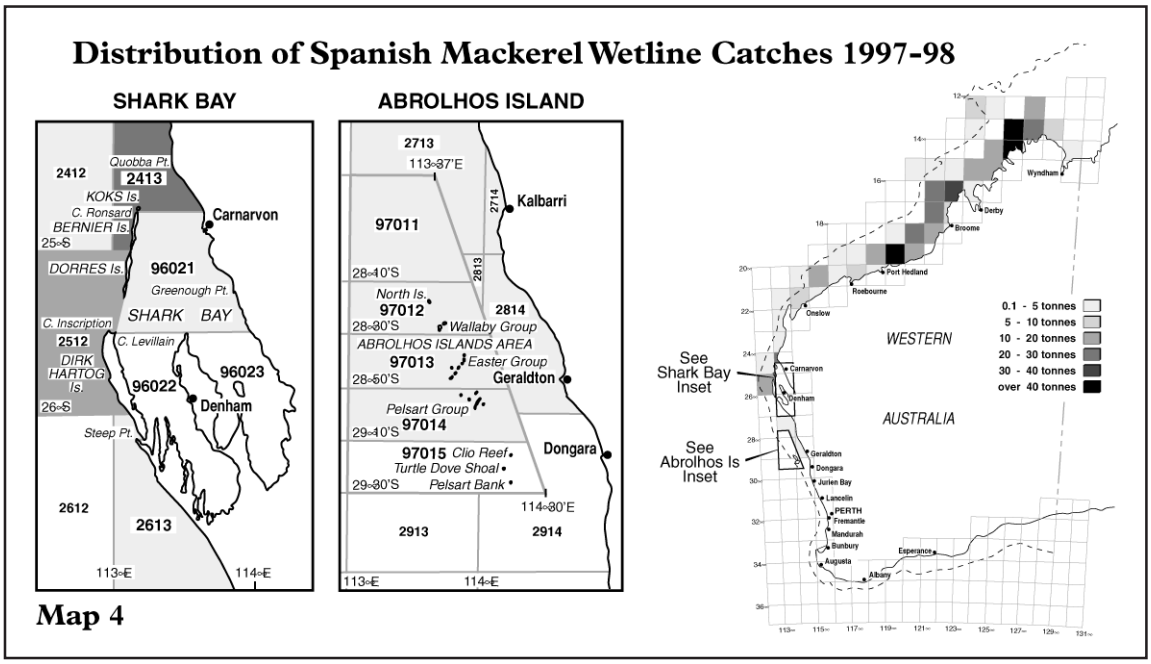


When Dave goes up to the Kimberley to troll for Spanish mackerel, he'll find a fishery in which the wetline catch has increased by 135 per cent in recent years - from 228.6 tonnes in 1991-92 to 536 tonnes in 1997-98 (see the above graph). Most of the current catch of Spanish mackerel is wetline.

Long term fishermen from the Kimberley region have directly observed a decline in the average size of Spanish mackerel caught over time and a decline in the catch per unit of effort. However, although the effort expended by the dedicated mackerel fishermen has gone up, the total catch has also increased.

This is due to increased opportunistic catches by existing fishers who occasionally target Spanish mackerel, and 'new' fishers that have moved into the fishery over the last two or three years, like Dave, who take the species when the opportunity presents itself.

It is difficult to make a meaningful comparison of the recreational Spanish mackerel catch, but a recent survey in the Northern Territory put the recreational catch at around 200 tonnes.

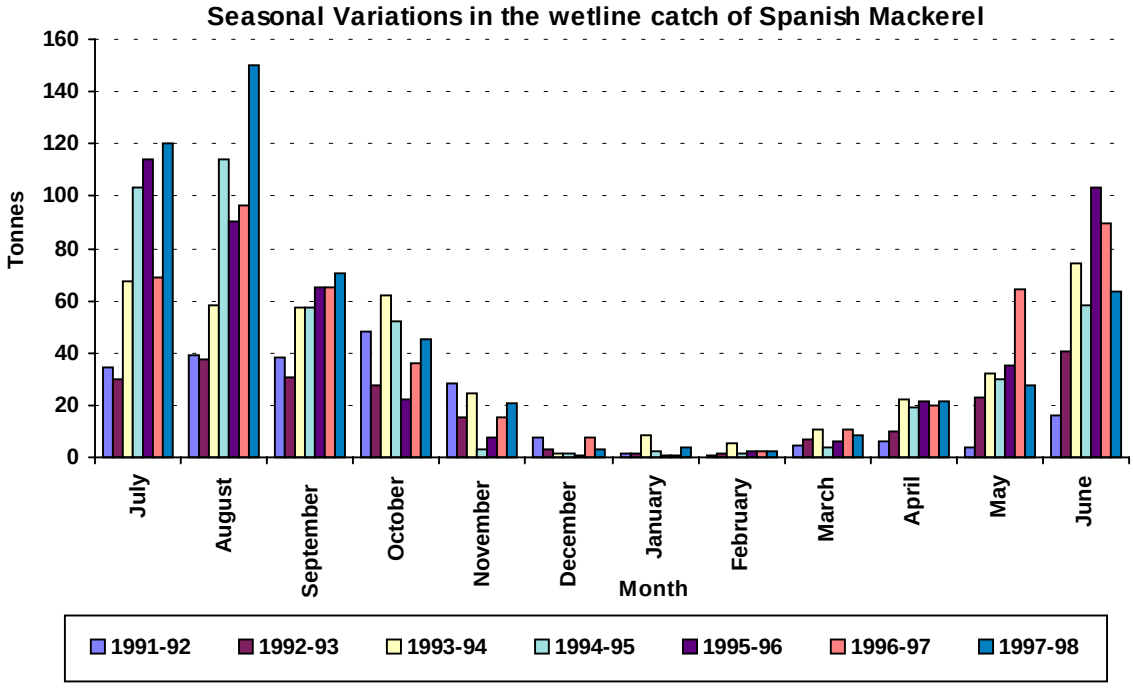


Spanish mackerel are a relatively large, fast growing, pelagic reef associated predatory fish. As shown in the map above, they are distributed from Geographe Bay to the Northern Territory border and beyond.

Fisheries WA has recently begun a study into the stock structure of Spanish mackerel, and has moved to increase the legal minimum length from 75 cm to 90 cm, the estimated size at maturity.

When is wetlining carried out?

Dave and his wife have decided to go up north to fish for Spanish mackerel during the winter. The reason for this is obvious when you see the table below.

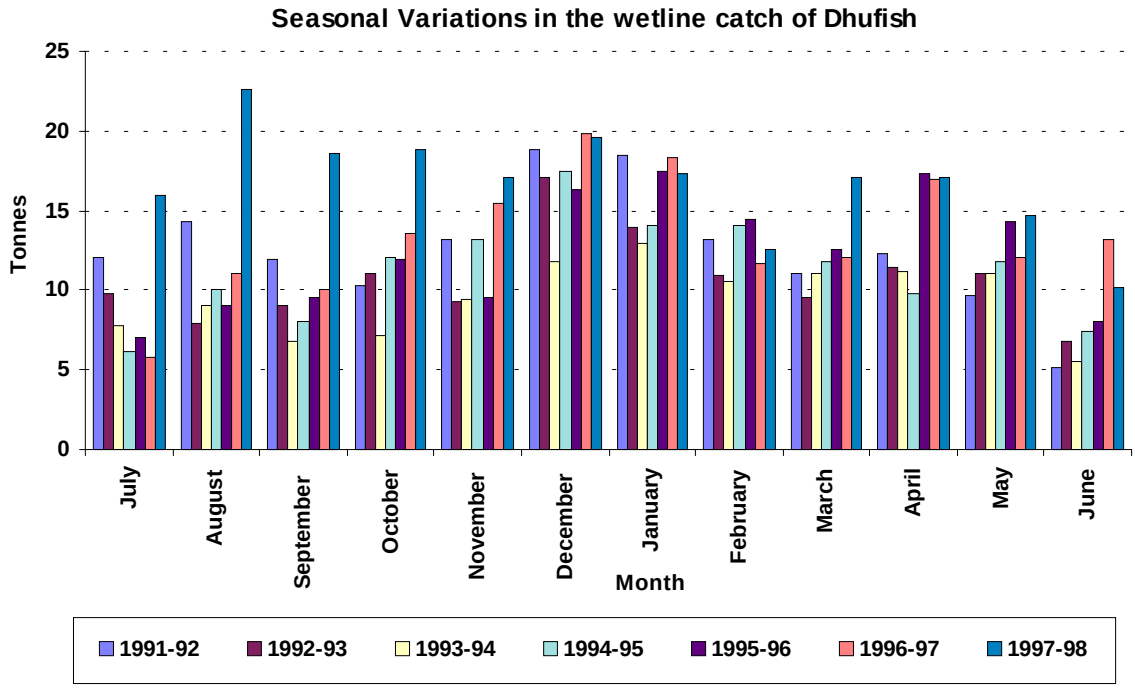


Like pink snapper, Spanish mackerel form large aggregations to spawn and may undertake seasonal migrations to reach spawning sites. After spawning has occurred the aggregations disperse. Fishing activities are concentrated during the spawning season, in Western Australia's winter months.

Spanish mackerel and whitebait dominate the seasonality of wetline catches, contributing around 25 per cent and 10 per cent of the total wetline catch.

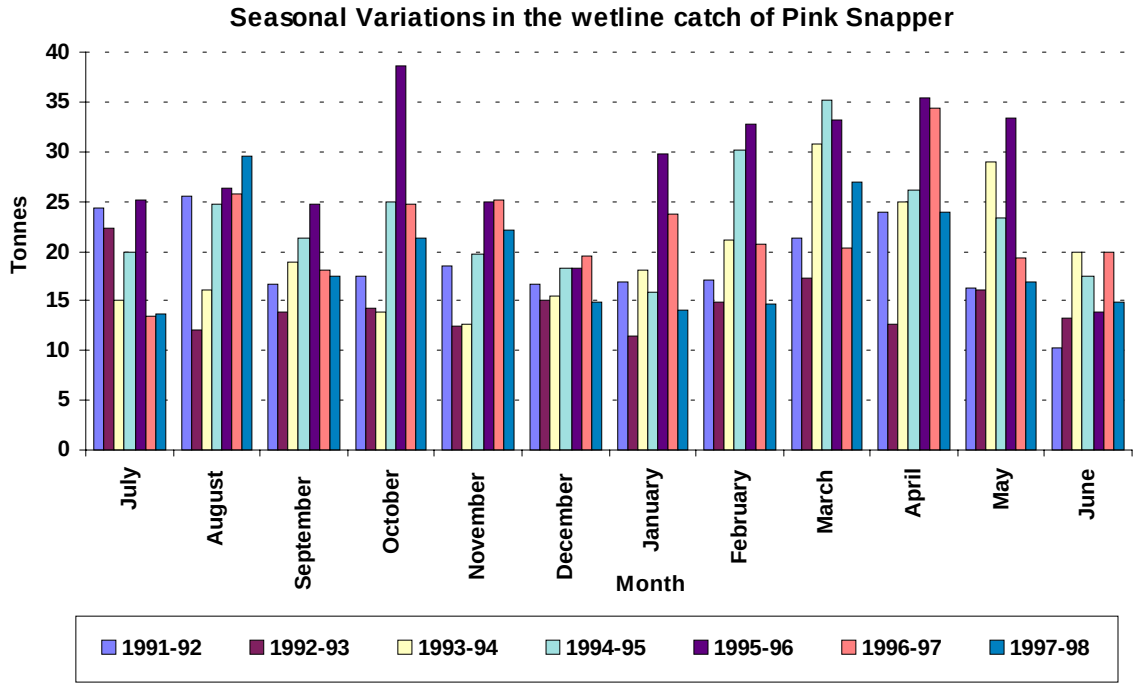
The large whitebait and Australian herring catches usually caught every summer by open access or wetline fishing, mean that there are very little seasonal differences in the wetline catches. The differences between summer and winter wetline catches are in species caught in Western Australian waters and the area in which the fish are caught in.

Dave knows that most demersal or deeper water finfish in Western Australian waters are caught in the spring, summer and autumn months. The dhufish wetline catches, shown graphically below show this quite well.



It is interesting to note that apart from 1997-98, most of the wetline fishing for dhufish takes place during the summer months, not the off-season for rock lobster fishing.

The snapper fishery, on the other hand seems to have two peaks, the spring and autumn which corresponds with the Shark Bay Snapper fleet moving into and out of the managed fishery area. This is shown below. Dave's wife, Debbie, thinks this may also relate to marketing, as pink snapper prices are often lowest during the Shark Bay snapper season.



How much is wetlining worth?

At the end of the day, I think the most telling figure for Dave and his wife and their future business interests will be when they look at the economics of the wetline fishery. During 1997-98 this fishery was worth around $11.25 million. The 'wetline only' fleet take around 45 per cent of the catch, and say 45 per cent of the value. 88 'wetline only boats fished last year, and this makes the average earnings of a wetline only boat only around $55,000 gross - out of which must come your running costs!.

If the $11.25 million is simply averaged out amongst the 424 boats which fished in the wetline fishery, this figure averages out at $28,000 a year.

This $11.25 million represents only 2 per cent of the value of the total Western Australian commercial catch or 'harvest value' of $535.4 million (including pearling).

Will it be worth Dave's while to carry on in this fishery?

Is it worth Western Australia's while to allow this unmanaged fishery with all its latent effort to continue?

I trust that this study will enable the public to explore options for management of the wetline fishery.

Appendix 1 Fisheries WA announcements on 'New study of fishing boat licence'

FISHERIES DEPARTMENT
OF WESTERN AUSTRALIA

Dear Licence holder

BENCHMARK DATE FOR 'WETLINE' FISHING HISTORY

I am writing to advise you that the Minister has requested the Department undertake an assessment of the fishing activity against the Western Australian Fishing Boat Licences, that is, in the 'wetline fishery'.

A benchmark date of Monday, 3 November 1997 has been set by the Minister in relation to the recognition of history within the fishery. Should changes in management result in a change in access arrangements, fishing history after 3 November 1997 may not be taken into account.

The assessment will include an analysis of catch data submitted through the Catch and Effort Statistical System managed by the Fisheries Department, the level of recreational fish take and an identification of particular fish resources at risk and any arising sustainability issues . In consultation with stakeholder groups, the Department will also examine the issues surrounding commercial access within the wetline fishery and make recommendations to the Minister on whether a formal review of management for this fishery is required.

This advice does not alter the benchmark date recently announced with respect to the Pilbara area, nor does it affect fishing under the authority of a managed or interim managed fishery authorisation.

The Contact officer within the Department is Fiona Crowe. She can be contacted through (08) 9482 7333.

P.P. Rogers
EXECUTIVE DIRECTOR

3 November 1997

3rd floor SGIO Atrium, 168-170 St Georges Terrace Perth, Western Australia 6000
Telephone: (09) 482 7333, Fax (general enquiries): (09) 482 7389, Fax (Executive Director's) office : (09) 481 3576

FISHERIES DEPARTMENT OF WA
Bulletin

No. 1/97 Date: 3 November 1997

New study of fishing boat licence

The Fisheries Department has announced a study of fishing activity undertaken with Western Australia's fishing boat licence [FBL].

Fisheries Department Executive Director Peter Rogers said there had been community concern that what was commonly known as the 'wetline' fishery, had unrestricted access to a wide range of species.

Mr Rogers said the sustainability of species, such as dhufish, had been a concern.

The 'benchmark' date of 3 November, 1997 had been set - no 'wetline' fishing history after this date would be considered in the development of any new management arrangements for the fishery.

Fishermen with an FBL have been individually informed by mail today of the benchmark date.

"We will analyse all available information on this fishery, including catch data provided by commercial fishermen," Mr Rogers said.

"The analysis will also involve consulting stakeholder groups over issues affecting the fishery."

Most of the Western Australian commercial fishing fleet, about 1600 vessels, are holders of an FBL. Three-quarters of the commercial fleet predominantly fish in the State's 29 managed fisheries while about 250 fishing boat licence holders rely on the 'wetline' fishery for their livelihood.

The fishery includes the use of hand lines, drop lines and hand-hauled netting.

/2

FISHERIES DEPARTMENT OF WA
3rd Floor, SGIO Atrium, 168-170 St George's Terrace, Perth 6000 Ph (08) 9482 7333 Fax (08) 9482 7389
Web Site: http://www.wa.gov.au/westfish

Mr Rogers said the department would consult stakeholder groups on management options which would best address any sustainability or resource sharing issues.

He said the study and its benchmark date would not alter the arrangements for the review of line fishing off the Pilbara coast, nor did it affect fishing under a Managed or Interim Managed Fishery authorisation.

Mr Rogers said he expected the study to be completed by early next year. The Minister for Fisheries, the Hon Monty House, would then decide whether a formal review of the fishery would be undertaken.

FOR MORE INFORMATION CONTACT:
Commercial Fisheries Program
Fisheries Department of WA
(08) 9482 7333
bulletin1/wetline

FISHERIES DEPARTMENT OF WA
3rd Floor, SGIO Atrium, 168-170 St George's Terrace, Perth 6000 Ph (08) 9482 7333 Fax (08) 9482 7389
Web Site: http://www.wa.gov.au/westfish

Appendix 2 Number of boats which have reported wetlining in the managed and interim managed fisheries 1991-92 to 1997-98

The two columns on the right hand side of Appendix 2 headed “No. of fishing boats as licensed at 30.6.98 which wetlined *in the zone/area* 1991-92 to 1997-98” and “Total no. of fishing boats as licensed at 30.6.98 which actually wetlined *in the fishery* 1991-92 to 1997-98” require clarification.

There are a number of boats which wetline in a fishery that are endorsed to fish in one or more zones of a fishery or have two classes of licences in a fishery. For example, a licensed fishing boat may have both an A class and a B class licence in the Shark Bay Snapper Fishery. This means that the same boat would be shown twice in the second last column of the table, but only once in the last column.

In another example, there are several licensed fishing boats in the Cockburn Sound managed fisheries which are licensed for two or more of the managed fisheries in this area. Therefore, even though it appears there are quite a large number of boats reported to have wetlined in each managed fishery, the total number of boats endorsed to fish in the Cockburn Sound Managed Fisheries that have actually wetlined is quite small.

Where the number of boats which have actually wetlined in a fishery each year does not correspond with the number shown to have wetlined, this may indicate that the managed fishery was recently established and a boat wetlined prior to its establishment. It may also indicate that a managed fishery licence may have been purchased and attached to a boat in a ‘licence splitting’ exercise, whereby although the boat wetlined, it was not licensed to fish in that particular fishery when it did so.

Number of boats in the managed and interim managed fisheries that wetlined (continued)

Fishery	No. of boats/units in the fishery as at 30.6.98	Number of licensed fishing boats wetlining in the fishery by year 91 92	92 93	93 94	94 95	95 96	96 97	97 98	No. of fishing boats as licensed at 30.6.98 which wetlined in the zone/area 1991-92 to 1997-98	Total no. of fishing boats as licensed at 30.6.98 which actually wetlined *in the fishery* 1991-92 to 1997-98
Abalone Managed Fishery	26									
Zone 1 (6)		3	1	2	1	2	3	2	4	)
Zone 2 (8)		2	2	1	1	1	1	3	3	)10
Zone 3 (12)		2	1	1	1	1	1	2	3	)
[1] **Abrolhos Island & Midwest Trawl Managed Fishery**	17	6	4	3	2	3	1	2	6	6
[2] **Broome Prawn Interim Managed Fishery**	5	-	-	-	-	-	-		-	-
[3] **Cockburn Sound Crab Managed Fishery**	15									
A Class Licence (7)		-	-	-	-	2	1	2	4	)
B Class Licence (8)		-	-	-	-	3	2	4	6	)
[3] **Cockburn Sound Fish Net Managed Fishery**	4	-	-	-	-	2	1	3	4	) Total No. of Cockburn
[3] **Cockburn Sound Line & Pot Managed Fishery**	32	-	-	-	-	10	8	13	20	) Sound boats wetlining
[3] **Cockburn Sound Mussel Managed Fishery**	3	-	-	-	-	-	-	1	1	) 35
[3] **West Coast Beach Bait Managed Fishery**	13									)
A Class Licence (10)		-	-	-	-	1	2	4	8	)
B Class Licence (3)		-	-	-	-	2	2	1	3	)
Kimberley Gillnet & Barramundi Managed Fishery	10	5	4	4	3	4	4	4	5	5
Northern Demersal Scalefish Managed Fishery	10									
Zone 1 (4)		-	-	-	-	-	-	2	3	) 9
Zone 2 (6)		-	-	-	-	-	-	1	6	)
Marine Aquarium Fish Managed Fishery	10	-	-	-	-	1	1	1	1	1

Number of boats in the managed and interim managed fisheries that wetlined (continued)

Fishery	No. of boats/units in the fishery as at 30.6.98	Number of licensed fishing boats wetlining in the fishery by year 91 92	92 93	93 94	94 95	95 96	96 97	97 98	No. of fishing boats as licensed at 30.6.98 which wetlined in the zone/area 1991-92 to 1997-98	Total no. of fishing boats as licensed at 30.6.98 which actually wetlined *in the fishery* 1991-92 to 1997-98
Pilbara Trap Managed Fishery	6									
Zone 1 (6)		1	5	7	2	2	2	3	5	) 5
Pilbara Trawl Managed Fishery	16	-	-	-	-	-	-	3	5	5
Shark Bay Beach Seine & Mesh Net Managed Fishery *Note : There are 22 licences in this fishery.Most fishing units are made up of a 'mother' boat and one or more dinghies.*	9 units	-	3	5	3	-	4	6	9 units	9 units
South Coast Purse Seine Managed Fishery	25 units	-	-	-	9	13	18	18	20	20
Southern Demersal Gillnet& Demersal Longline Managed Fishery	55 units									
Zone 1 (14)		11	10	12	11	9	9	10	13	)
Zone 2 (15)		9	11	7	5	12	8	9	14	)
Zone 3 (0)		-	-	1	-	1	1	-	-	)49
Zone 4 (1)		-	-	-	1	1	-	-	1	)
Supplementary										)
Zone 1 (10)		13	12	12	7	10	11	9	9	)
Zone 2 (15)		13	12	12	9	9	11	12	12	)
Other (1)		-	-	-	-	-	-	-	-	
[1] **South West Trawl Managed Fishery**	14									
Zone A (2)		-	1	-	-	-	-	-	1	)
Zone A & B (1)		-	-	-	-	-	-	-	-	)
Zone B (4)		6	3	6	3	3	3	3	3	)8
Zone B & C (4)		-	-	-	-	-	-	-	3	)
Zone D & B (3)									1	)
[2] **Kimberley Prawn Managed Fishery**	135									
Zone 1 (126)		-	-	11	21	22	23	22	38	)42
Zone 2 (9)		-	-	-	1	2	1	2	4	)

continued over

Number of boats in the managed and interim managed fisheries that wetlined (continued)

Fishery	No. of boats/units in the fishery as at 30.6.98	Number of licensed fishing boats wetlining in the fishery by year 91 92	92 93	93 94	94 95	95 96	96 97	97 98	No. of fishing boats as licensed at 30.6.98 which wetlined in the zone/area 1991-92 to 1997-98	Total no. of fishing boats as licensed at 30.6.98 which actually wetlined *in the fishery* 1991-92 to 1997-98
[2] **Onslow Prawn Managed Fishery**	31									
Zone A (4)		-	-	-	-	1	2	3	2	)
Zone B (3)		2	2	1	1	2	2	1	1	)
Zone C (12)		10	12	11	10	12	12	12	11	)22
Zone D (12)		5	5	5	1	3	2	5	8	)
[2] **Exmouth Gulf Prawn Managed Fishery**	16	10	12	‘4	12	15	16	16	15	15
[2] **Nickol Bay Prawn Managed Fishery**	14	4	6	5	1	3	3	6	9	9
[2,4] **Shark Bay Prawn Managed Fishery**	27	4	5	7	7	3	3	1	11	11
[1,4] **Shark Bay Scallop Managed Fishery**	14 scallop only boats	1	1	2	1	-	1	2	3	3
Shark Bay Snapper Managed Fishery	22									
A Class licences (12 licenses and 11 boats)		1	6	4	4	8	9	9	11	)
B Class licences (11 licenses and 10 boats)		6	4	4	5	6	6	9	10	)22
Supplementary (5 licenses and 5 boats)		6	6	6	5	5	5	5	5	)
Note: there are 5 licensed fishing boats with more than one licence or type of licence in this fishery. Hence the number of licences and boats do not correspond.										
South Coast Salmon Managed Fishery *Note: there are 70 licensed fishing boats in this fishery. Most units are made up of a ‘mother’ boat and one or more dinghies.*	23 units	18	16	16	15	12	14	11	21 units	21 units
South West Salmon Managed Fishery *Note: there are 48 licensed fishing boats in this fishery. Most units are made up of a “mother” boat and one or more dinghies.*	13 units	12	13	12	12	12	13	13	13 units	13 units

Number of boats in the managed and interim managed fisheries that wetlined (continued)

Fishery	No. of boats/units in the fishery as at 30.6.98	Number of licensed fishing boats wetlining in the fishery by year 91 92	92 93	93 94	94 95	95 96	96 97	97 98	No. of fishing boats as licensed at 30.6.98 which wetlined in the zone/area 1991-92 to 1997-98	Total no. of fishing boats as licensed at 30.6.98 which actually wetlined *in the fishery* 1991-92 to 1997-98
Specimen Shell Managed Fishery *Note: 10 Specimen Shell Managed Fishery licences do not have boats attached to them.*	24 boats & 34 licences	-	-	-	-	1	2	1	1	1
Warnbro Sound Crab Managed Fishery	1	-	-	-	-	-	-	-	1	)
Esperance Southern Rock lobster Managed Fishery	11									
Zone A (10)		5	6	5	1	6	5	5	7	)
Zone B (1)		1	2	-	-	1	1	1	1	)8
West Coast Purse Seine Managed Fishery (6)	11 units	1	-	1	1	-	5	4	1	)
Supplementary (5)		6	5	4	5	3	3	3	4	)5
West Coast Rock Lobster Managed Fishery	603									
Zone A (149)		5	11	4	9	9	11	15	27	)
Zone B (151)		14	8	9	14	12	23	29	50	)201
Zone C (303)		60	44	40	48	51	64	80	124	)
Windy Harbour Rock Lobster Managed Fishery	2	8	10	6	4	6	4	2	2	2

1 *There are inter-relationships between the Shark Bay Scallop Fishery, the Abrolhos Islands & Midwest Trawl Fishery and the South West Trawl Fishery eg. 2 boats which wetline in the AIMWTF are also in the SB Scallop Fishery & one boat which wetlines in the SWTF is also in the AIMWTF.*

2 *There are significant inter-relationships between the prawn trawl fisheries. Of the 46 prawn trawlers which wetline, 18 have access to three prawn trawl fisheries, 17 have access to two, and eleven have access to one fishery.*

3 *There are a number of boats in the Cockburn Sound Fisheries which are licensed in more than one fishery. Hence, only 30 boats from all these fisheries wetlined. In addition, the fisheries only came under management in 1995. Many wetlined before that date, but the data was not collated under that particular fishery. Their history has been carried with the boat.*

4 *27 Shark Bay Prawn Fishery boats also fish in the Shark Bay Scallop Fishery. However, only the 14 dedicated scallop trawlers are included here.*

Appendix 3 Reported wetline catches by species

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Anchovy	340	.	.	6	.	.	.
Barracuda (Northern pike)	949	22	17	174	351	448	71
Barramundi (Giant perch)	13993	10060	5274	2108	1764	3773	1914
Boarfish	186	74	57	329	751	146	123
Bonito	156	92	407	313	67	106	1512
Bream, Buffalo	.	1200	804	5200	.	.	75
Bream, Robinson	.	102	.	.	120	372	257
Bream, black	1543	111	100	935	.	1328	4747
Bream, mixed	.	.	.	.	5	43	126
Bream, monocle	.	.	.	.	.	.	52
Bream, sea	.	27	.	.	.	.	3
Bream, silver (Tarwhine)	1369	1456	625	1586	105	126	156
Bream, western yellow fin	3447	2815	1476	859	1156	813	2034
Catfish, sea	328	297	395	439	216	233	157
Chinaman cod	.	36	.	.	710	4895	4882
Chinaman fish	.	126	10	4	.	205	41
Cobbler	4191	1493	6604	10853	3036	1517	694
Cockles	3682	.	.	.	.	.	.
Cod	31004	28637	29151	23648	17088	15677	22259
Cod, Rankin	182	3526	2662	2204	3584	2719	6111
Cod, grey banded	286	114	80	706	1158	675	1053
Cod, spotted	.	118	67	255	340	242	188
Crab, sand	26707	18512	27852	32741	32328	43983	36722
Cuttlefish	203	220	210	432	315	109	418
Dart	.	.	91	.	12	51	6
Dhufish, Westralian	150349	127772	114549	136106	147756	159982	201760
Emperor, blue lined	.	.	.	.	.	260	168
Emperor, red	5619	4292	6721	3820	5396	7721	11415
Flagfish, Spanish	71	636	938	1237	727	457	567
Flathead, other	383	184	126	143	401	199	436
Flounder	147	44	17	15	6	144	15
Footballer	.	.	21	724	16	66	82
Garfish, sea	31508	20248	12447	11688	13860	15912	14696
Groper	.	.	.	.	.	17	.
Groper, baldchin	40634	32319	27327	32189	34807	29893	35050
Groper, blue	4426	9291	6421	7634	6824	3528	7406
Gurnard	.	20	55	47	97	.	4
Hapuku	12624	8355	13294	9347	19305	22007	21366
Herring, Australian	305573	220278	156333	157509	129582	124516	111767
Herring, Perth	600	4260	229	1000	590	.	415
Herring, hairback	.	.	.	.	.	20	.
Jobfish	1540	1415	2775	1516	63	52	883
Jobfish, rosy	.	.	.	.	840	1578	2973
John Dory	66	3	6	3	.	7	.
Kingfish, black (Cobia)	757	567	1280	1112	748	1167	2277
Kingfish, yellowtail	466	100	1030	349	684	458	818
Knifejaw	.	.	317	526	623	671	789
Leatherjacket	3782	1753	5384	3130	1609	1296	2842
Ling, pink or rock ling	.	.	11	39	56	23	6
Mackerel, Spanish	228587	228434	425299	445752	470746	476741	536540
Mackerel, blue	11	.	78	.	124	669	19
Mackerel, other	91668	67172	63421	95946	76551	79356	125486
Mackerel, scaly	2000	878	30	.	132	120	.
Mangrove Jack	.	1411	1994	.	.	9	.
Morwong	137	391	270	122	270	95	426
Mullet, bluetail	100	.	15	.	.	.	.
Mullet, diamond scale	129	67	.	.	.	.	.
Mullet, other	7247	4218	3344	3149	3500	1856	1355
Mullet, red	79	68	55	15	34	60	35
Mullet, sea	78633	84634	79076	70311	58712	68027	71773
Mullet, yellow-eye	30700	52481	23577	11988	8293	5034	9453
Mulloway	7319	9373	10775	9863	6974	6343	10916
Mussel	213	.	.	.	435	400	.
Octopus	30	.	.	382	58	22	220
Oyster, winged pearl	.	1	.	.	.	.	.
Parrot fish	152	487	499	308	189	141	314
Perch, Moses	.	35	13	2	2	28	38
Perch, other	714	411	266	14	33	40	181
Perch, pearl	323	316	1412	846	1543	1915	2328
Perch, red	.	45	31	77	.	.	40
Perch, scarlet sea	19	.	.	335	.	5	135
Perch, yellowtail	1461	.	572	22	.	.	63
Pike, sea	803	79	427	161	592	854	526

(CONTINUED)

Appendix 3 (continued)

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Prawn, western school	.	.	220	.	.	.	.
Queenfish	909	781	1333	229	483	.	353
Redfish	16458	15333	12078	13733	13452	20352	40381
Redfish, bight	5112	5328	4243	2573	6605	4763	7637
Roach	.	24	.	.	.	.	.
Salmon, Australian	229	11	206	867	283	21	134
Samsonfish	58578	49499	48256	52693	39998	55814	101891
Scad, yellowtail	1496	121	.	.	451	6	.
Scallop, saucer	.	.	.	.	.	.	1324
Sea urchin	.	.	.	68	1	48	42
Shark, blacktip	248	1674	5196	12750	5194	2488	7853
Shark, bronze whaler	19187	25613	18781	39715	56948	19922	27613
Shark, eastern school	1274	1505	3972	832	14650	.	100
Shark, grey nurse	3527	782	480	1997	7677	4994	1903
Shark, gummy	19830	6519	3915	11913	19716	16226	3961
Shark, hammerhead	294	1086	475	3875	6977	5131	7565
Shark, other	82793	129163	43510	64118	51108	37450	61451
Shark, pencil	138	671	43	531	723	51	143
Shark, spurdog	5181	6290	288	868	1156	566	500
Shark, thickskin	5663	3600	2565	7488	11035	12767	21782
Shark, tiger	.	10839	.	64	1518	1681	1474
Shark, whiskery	9220	6756	7903	14050	17137	8714	5750
Shark, wobbegong	8051	10853	11192	14413	9126	9212	8148
Skates and Rays	719	1224	829	1838	26266	26056	24603
Snapper, Ruby	.	326	.	.	.	940	251
Snapper, frypan	.	.	.	.	.	.	14
Snapper, goldband	.	.	.	.	.	45	3337
Snapper, long nose	.	.	.	.	.	.	51
Snapper, northwest (large)	19556	60300	45099	29939	35901	42756	52053
Snapper, northwest (small)	.	4073	7104	975	2045	809	779
Snapper, pink	224500	175664	235749	277288	336169	264858	230461
Snapper, queen	7914	13725	14094	17152	16144	10889	17246
Snapper, red	.	273	.	.	.	14	707
Snapper, spangled emperor	74601	18331	27779	43233	32656	39459	46771
Snoek (Barracouta)	.	23	.	.	.	.	.
Sole	.	.	.	.	.	1	.
Sprat, blue	33237	15257	11287	19135	18159	9594	14174
Squid	12490	8765	11507	16471	10892	7723	8029
Sweep	5330	7649	6272	4871	4842	2683	3446
Sweetlip	20788	24639	14638	11459	9297	20676	15091
Sweetlip, emperor	19457	3551	7063	11301	25342	21192	56166
Tailor	10216	4363	4828	1465	5353	5596	8022
Threadfin	19064	13158	16330	26092	15639	20933	12231
Threadfin bream, Butterfish	.	.	.	1	5	.	2
Threadfin, giant	5460	2494	2591	973	20164	53608	53561
Trevalla, deepsea	2944	19666	11389	35420	4388	2692	3978
Trevally, gold spotted	.	.	232	.	.	.	.
Trevally, golden	725	680	386	641	693	413	1044
Trevally, other	22409	13293	10322	15416	17480	17620	37479
Trevally, skipjack	3726	3017	4533	4713	3158	4915	6078
Trout, coral	9291	5397	6886	6197	7282	11805	12595
Tuna, bigeye	33	.	.	143	22	2	.
Tuna, mackerel	.	.	.	.	25	7	137
Tuna, northern bluefin	290	.	1016	656	143	177	91
Tuna, other	3285	7391	2471	21366	4942	8383	5961
Tuna, skipjack or striped	4	77	345	1272	590	556	867
Tuna, southern bluefin	79	9	.	36	.	.	.
Tuna, yellowfin	146	1298	3407	1766	18535	1463	1698
Turban shell (Welks)	251	.	.	.	.	.	.
Turrum	.	.	37	67	.	.	.
Tuskfish, bluebone	922	1050	952	1073	565	1542	1506
Whitebait	158949	122676	137321	90961	181504	256086	47771
Whiting, King George	8171	6443	1997	1900	2128	2418	921
Whiting, golden lined	59	500	642	.	.	.	2556
Whiting, other	376	855	258	220	210	309	431
Whiting, school	253	710	.	.	330	.	.
Whiting, trumpeter	.	340	.	100	79	.	.
Whiting, western sand	16417	11865	17401	7320	17736	11785	15879
other fish	21320	15649	15852	13474	41645	9368	22228
TOTAL	2038607	1792251	1821590	1997931	2149848	2146729	2267400

Appendix 4 Reported wetline catches of 'wetline only', West Coast Rock Lobster, Southern Demersal Gillnet and Demersal Long Line and Shark Bay Snapper licensed fishing boats

Wetline catches of boats which do not have any LEF or any CONCESSION CODE except 16, 17 & 18 23
08:40 Wednesday, April 28, 1999

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Barracuda (Northern pike)	36	12	.	71	43	50	.
Barramundi (Giant perch)	2582	513	2013	1273	875	1762	332
Boarfish	.	60	.	246	733	112	.
Bonito	37	62	114	113	61	80	123
Bream, Robinson	.	102	.	.	120	372	255
Bream, mixed	.	.	.	.	5	43	126
Bream, monocle	.	.	.	.	.	.	52
Bream, sea	.	27	.	.	.	.	3
Bream, silver (Tarwhine)	68	8	27	51	.	9	98
Bream, western yellow fin	3253	835	935	395	360	779	1337
Catfish, sea	70	3	118	388	131	198	88
Chinaman cod	.	36	.	.	408	3508	3223
Chinaman fish	.	20	10	.	.	.	.
Cobbler	211	53	9	654	333	369	.
Cod	14977	12794	14053	15075	10532	9028	10596
Cod, Rankin	85	3392	2154	1778	2065	1961	4114
Cod, grey banded	26	.	40	320	557	465	158
Cod, spotted	.	106	.	226	94	242	170
Crab, sand	597	544	2114	2049	10353	6633	2618
Cuttlefish	13	.	13	26	146	3	59
Dart	.	.	91	.	12	28	6
Dhufish, Westralian	90919	74346	73905	82251	86602	88580	104793
Emperor, blue lined	.	.	.	.	.	13	.
Emperor, red	4837	2673	1993	2207	3946	5303	6993
Flagfish, Spanish	31	253	429	685	228	70	126
Flathead, other	52	113	7	41	73	78	25
Flounder	4	4	.	1	.	12	2
Footballer	.	.	21	610	10	9	33
Garfish, sea	1276	506	20	520	734	528	898
Groper, baldchin	26886	22883	19181	21233	22619	18545	18913
Groper, blue	1728	4765	4004	4475	4292	1340	1455
Gurnard	.	.	.	1	53	.	.
Hapuku	1796	2489	2082	6676	4435	15144	11125
Herring, Australian	11741	8058	4629	3100	2035	547	2577
Jobfish	675	1091	393	731	34	34	221
Jobfish, rosy	.	.	.	.	805	932	2149
John Dory	.	.	4	3	.	.	.
Kingfish, black (Cobia)	405	163	320	624	503	816	1629
Kingfish, yellowtail	57	.	767	14	314	166	572
Knifejaw	.	.	16	103	228	29	36
Leatherjacket	266	144	662	530	486	437	1072
Mackerel, Spanish	136511	134178	191774	208336	105025	62922	198228
Mackerel, other	38659	21901	19984	63359	13683	14016	31498
Morwong	24	45	53	53	198	95	6
Mullet, diamond scale	86	.	.	.	.	.	.
Mullet, other	2504	483	1215	1231	302	674	585
Mullet, red	79	57	51	14	28	21	23
Mullet, sea	28170	16254	12121	16806	14313	29330	23851
Mullet, yellow-eye	1099	522	14	498	.	.	782
Mulloway	4840	5412	5320	6593	3972	5051	8825
Octopus	23	.	.	.	.	.	220
Parrot fish	47	42	6	303	18	26	38
Perch, Moses	.	.	.	1	.	8	2
Perch, other	6	.	.	.	18	40	175
Perch, pearl	297	176	227	387	593	851	508
Perch, red	.	.	31	.	.	.	10
Perch, scarlet sea	.	.	.	60	.	5	120
Perch, yellowtail	1410	.	.	.	.	.	63
Pike, sea	314	.	24	22	.	12	70
Queenfish	617	342	1165	110	175	.	8
Redfish	2826	6428	5370	9046	3934	6901	17336
Redfish, bight	20	58	251	303	1350	625	1179
Roach	.	24	.	.	.	.	.
Salmon, Australian	4	3	137	340	55	7	3
Samsonfish	29151	18710	28301	34188	23990	31886	47948
Scad, yellowtail	172	121	.	.	.	.	.
Shark, blacktip	.	1094	999	2167	2706	2091	6853
Shark, bronze whaler	2239	11083	12639	28889	52514	8863	7354
Shark, eastern school	874	43	2546	832	14576	.	.
Shark, grey nurse	173	329	.	1712	7491	4697	1693
Shark, gummy	3886	1716	2592	10812	19382	15367	38
Shark, hammerhead	.	498	56	2513	6842	4681	6142

(CONTINUED)

Appendix 4 (continued)

Wetline catches of boats which do not have any LEF or any CONCESSION CODE except 16, 17 & 18 24
08:40 Wednesday, April 28, 1999

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Shark, other	9965	22871	25211	55626	22776	21899	33602
Shark, pencil	59	56	5	423	668	10	37
Shark, spurdog	.	.	.	830	.	.	.
Shark, thickskin	1146	2984	1110	5795	10560	11865	17523
Shark, tiger	.	10839	.	64	1518	1509	1258
Shark, whiskery	3985	5544	5640	11125	15625	5838	3123
Shark, wobbegong	2825	5726	9319	11431	7259	6907	4978
Skates and Rays	229	100	123	1486	25632	24813	23396
Snapper, Ruby	.	326	.	.	.	.	.
Snapper, goldband	.	.	.	.	.	45	3087
Snapper, long nose	.	.	.	.	.	.	47
Snapper, northwest (large)	13130	43264	18121	13291	27639	35674	46703
Snapper, northwest (small)	.	3052	3438	975	1717	675	779
Snapper, pink	157897	121295	132098	148186	190218	157814	128159
Snapper, queen	1252	5480	8405	11440	8447	4434	6123
Snapper, red	.	273	.	.	.	.	705
Snapper, spangled emperor	48625	14183	20775	27007	19857	22731	25465
Snoek (Barracouta)	.	21	.	.	.	.	.
Sprat, blue	1576	1102	110	1135	1446	.	978
Squid	1024	1170	2762	6954	3140	1183	1244
Sweep	959	3205	2345	789	473	267	1187
Sweetlip	17666	20382	3982	3748	7851	11905	11848
Sweetlip, emperor	19339	2915	2915	9388	19164	15431	53881
Tailor	8666	1858	418	1041	853	3517	1594
Threadfin	6718	166	10095	22866	9553	7583	6752
Threadfin bream, Butterfish	.	.	.	1	5	.	.
Threadfin, giant	.	.	.	.	14784	36243	26792
Trevalla, deepsea	.	.	151	26417	1070	566	626
Trevally, gold spotted	.	.	232	.	.	.	.
Trevally, golden	61	620	193	422	666	370	723
Trevally, other	8409	5872	4020	6921	5521	8591	11491
Trevally, skipjack	891	1697	881	1405	1566	749	2005
Trout, coral	7072	4460	5848	4716	4864	7720	8702
Tuna, bigeye	.	.	.	.	15	.	.
Tuna, mackerel	.	.	.	.	25	.	72
Tuna, northern bluefin	173	.	8	.	27	.	.
Tuna, other	1060	584	284	901	1409	983	3244
Tuna, skipjack or striped	.	38	306	20	157	194	77
Tuna, yellowfin	117	958	1598	767	1055	1034	977
Turrum	.	.	.	67	.	.	.
Tuskfish, bluebone	50	672	542	710	350	1282	1207
Whitebait	8093	1599	5487	6496	8833	27670	3345
Whiting, King George	154	361	103	405	2	53	60
Whiting, golden lined	19	.	.	.	.	.	.
Whiting, other	217	.	6	.	.	60	107
Whiting, school	58	188	.	.	.	.	.
Whiting, trumpeter	.	340	.	100	79	.	.
Whiting, western sand	11050	4647	2361	2725	3968	3163	1861
other fish	8320	4787	6606	3983	2393	3989	11679
TOTAL	757467	649203	690497	924703	846571	773163	974969

Appendix 4 (continued)

Wetline catches of Rock Lobster boats 08:40 Wednesday, April 28, 1999 1

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Bream, Buffalo	.	.	.	.	.	.	75
Bream, silver (Tarwhine)	.	10	.	.	.	.	2
Chinaman cod	.	.	.	.	6	137	703
Cobbler	.	.	.	14	.	.	11
Cod	1544	1016	735	2196	1791	2029	3347
Cod, Rankin	.	.	.	.	1286	.	.
Cod, grey banded	.	.	.	7	86	23	571
Cod, spotted	.	.	.	.	242	.	.
Crab, sand	.	5	.	.	.	.	95
Cuttlefish	65	40	10	5	16	71	80
Dhufish, Westralian	18222	11265	9117	13426	19895	20205	49137
Emperor, red	.	.	.	5	.	20	36
Flathead, other	.	.	.	5	.	.	35
Footballer	.	.	.	87	.	42	35
Garfish, sea	20	.	.	.	.	.	.
Groper, baldchin	2227	2793	1433	5498	4577	4694	9097
Groper, blue	457	264	51	248	912	827	1659
Gurnard	.	.	.	12	15	.	.
Hapuku	400	.	.	1319	2764	.	2719
Herring, Australian	631	371	321	533	525	373	615
Kingfish, black (Cobia)	.	.	.	7	6	.	12
Kingfish, yellowtail	11	.	4	.	.	5	.
Knifejaw	.	.	.	7	178	.	.
Leatherjacket	198	154	.	77	124	106	258
Mackerel, Spanish	20	.	83	87	761	7815	49
Mackerel, other	101	163	297	29	2958	448	1090
Mackerel, scaly	2000	.	.	.	.	.	.
Mullet, sea	1170	863	3239	7250	4390	7252	5435
Mullet, yellow-eye	.	10	.	.	.	.	.
Mulloway	203	55	.	34	63	6	.
Parrot fish	29	.	10	.	171	110	255
Pike, sea	2	.	110	62	45	.	23
Redfish	274	364	88	164	364	720	2330
Redfish, bight	25	231	125	446	.	.	213
Salmon, Australian	.	.	.	.	228	10	50
Samsonfish	4289	4407	1963	4492	4594	7137	14468
Scad, yellowtail	1150	.	.	.	.	.	.
Shark, blacktip	.	.	30	78	27	.	.
Shark, bronze whaler	4771	2463	1639	4430	1827	7165	9565
Shark, eastern school	.	.	.	.	.	.	65
Shark, grey nurse	97	132	.	.	95	72	192
Shark, gummy	57	27	.	5	.	100	56
Shark, hammerhead	143	32	.	.	85	167	281
Shark, other	2641	1947	866	2532	2672	4044	12343
Shark, pencil	.	477	.	.	.	8	.
Shark, spurdog	.	.	.	.	40	.	.
Shark, thickskin	2278	142	13	156	29	194	356
Shark, tiger	.	.	.	.	.	172	217
Shark, whiskery	1695	113	156	1094	528	292	225
Shark, wobbegong	2131	1215	843	235	647	543	1333
Skates and Rays	.	254	86	.	.	212	527
Snapper, northwest (large)	619	431	143	167	71	1153	1794
Snapper, pink	11696	7982	9656	23905	24078	19454	30103
Snapper, queen	119	350	212	194	412	178	352
Snapper, spangled emperor	1985	156	352	763	1056	688	1281
Snoek (Barracouta)	.	1	.	.	.	.	.
Sprat, blue	2500	.	.	.	.	.	.
Squid	907	583	588	828	397	548	848
Sweep	103	2	24	.	38	11	39
Sweetlip	236	.	21	59	33	127	292
Sweetlip, emperor	.	.	.	.	100	.	160
Tailor	72	40	103	84	.	7	100
Trevalla, deepsea	.	.	.	75	405	.	264
Trevally, other	3097	323	285	261	557	709	483
Trevally, skipjack	.	16	242	40	9	18	206
Trout, coral	68	45	27	24	404	592	597
Tuna, bigeye	.	.	.	143	.	.	.
Tuna, other	.	16	.	12	11	146	41
Tuna, skipjack or striped	.	.	.	.	.	125	.
Tuna, yellowfin	.	.	.	98	.	171	70
Whiting, King George	.	.	2	2	5	.	51
Whiting, other	.	.	.	.	.	.	4
Whiting, school	180	.	.	.	.	.	.

(CONTINUED)

Appendix 4 (continued)

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Whiting, western sand	471	576	796	554	750	650	1331
other fish	321	216	43	493	259	985	2513
TOTAL	69224	39549	33712	72242	80532	90560	158087

Appendix 4 (continued)

Wetline catches of Southern Gillnet & Longline boats 08:40 Wednesday, April 28, 1999 8

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Barracuda (Northern pike)	.	.	.	.	.	5	.
Boarfish	24	.	19	30	3	13	123
Bonito	67	.	217	114	.	.	150
Bream, Buffalo	.	.	804	.	.	.	.
Bream, Robinson	.	.	.	.	.	.	2
Bream, black	633	56	.	35	.	.	.
Bream, silver (Tarwhine)	131	31	27	50	.	.	6
Catfish, sea	.	.	.	.	9	.	.
Chinaman cod	.	.	.	.	.	28	11
Chinaman fish	.	.	.	.	.	.	15
Cobbler	120	.	6	.	4	.	.
Cod	3771	8807	5793	1902	1769	1427	1769
Cod, Rankin	.	.	407	.	31	.	14
Cod, grey banded	64	112	35	302	494	178	220
Crab, sand	378	599	726	4895	3737	5858	3517
Cuttlefish	86	161	127	66	84	20	14
Dhufish, Westralian	13806	13406	12343	11043	13350	12959	10645
Emperor, red	83	.	1429	21	87	86	27
Flagfish, Spanish	.	.	138	12	6	22	143
Flathead, other	144	16	43	34	168	18	20
Flounder	10	3	11	10	.	95	8
Footballer	.	.	.	6	.	15	14
Garfish, sea	8676	6632	7679	1698	5027	4075	2855
Groper, baldchin	905	869	337	167	703	161	.
Groper, blue	480	1643	1120	721	329	673	1578
Gurnard	.	20	55	31	29	.	4
Hapuku	1530	4669	5460	415	10133	2481	3510
Herring, Australian	55829	25566	25379	29675	19617	26324	18445
Herring, Perth	.	2530	.	.	.	.	115
Jobfish	.	.	135	.	.	.	108
Jobfish, rosy	.	.	.	.	.	.	2
John Dory	.	.	3	.	.	7	.
Kingfish, black (Cobia)	37	.	344	36	39	133	173
Kingfish, yellowtail	81	61	260	316	216	268	210
Knifejaw	.	.	86	42	94	38	82
Leatherjacket	537	1031	508	122	535	142	342
Ling, pink or rock ling	.	.	11	.	46	.	.
Mackerel, Spanish	4009	2196	17674	6685	8477	13115	12779
Mackerel, blue	7	.	.	.	11	19	6
Mackerel, other	680	1051	2580	111	213	2806	7533
Morwong	.	33	.	.	49	.	.
Mullet, other	101	.	.	.	.	.	.
Mullet, sea	3454	7843	8353	9320	14029	6523	1963
Mullet, yellow-eye	743	563	987	62	.	741	239
Mulloway	25	9	535	.	24	10	15
Mussel	213	.	.	.	.	.	.
Octopus	5	.	.	.	.	.	.
Perch, Moses	.	.	.	.	.	.	6
Perch, other	302	.	.	.	.	.	.
Perch, pearl	.	.	471	.	.	.	1
Perch, scarlet sea	.	.	.	.	.	.	15
Pike, sea	287	29	57	25	46	629	79
Redfish	5384	4291	1930	867	2243	4432	7707
Redfish, bight	1122	1390	635	169	514	311	1409
Salmon, Australian	195	3	.	.	.	.	.
Samsonfish	9445	9585	6435	2781	2759	4024	12222
Scad, yellowtail	2	.	.	.	.	.	.
Shark, blacktip	.	.	.	16	25	.	350
Shark, bronze whaler	4212	1960	3229	4310	2635	4694	6253
Shark, eastern school	.	1462	1426	.	75	.	.
Shark, grey nurse	124	65	143	80	91	.	17
Shark, gummy	243	1517	1259	755	310	465	1158
Shark, hammerhead	40	119	366	391	.	238	758
Shark, other	1038	12701	501	54	6041	631	1270
Shark, pencil	13	83	14	79	16	33	107
Shark, spurdog	.	6245	244	38	1116	557	500
Shark, thickskin	1700	92	64	256	428	356	.
Shark, whiskery	1520	629	1658	956	434	536	1013
Shark, wobbegong	746	613	458	1526	668	606	1168
Skates and Rays	336	.	106	20	391	427	292
Snapper, long nose	.	.	.	.	.	.	4
Snapper, northwest (large)	.	290	2254	84	1573	88	147
Snapper, northwest (small)	.	.	782	.	12	.	.

(CONTINUED)

Appendix 4 (continued)

Wetline catches of Southern Gillnet & Longline boats 08:40 Wednesday, April 28, 1999 9

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Snapper, pink	9764	4536	8125	4522	9370	8499	13851
Snapper, queen	3202	4095	2837	2224	2345	3058	5466
Snapper, red	.	.	.	.	.	.	2
Snapper, spangled emperor	2664	133	307	932	1809	249	436
Sole	.	.	.	.	.	1	.
Sprat, blue	10064	2483	852	4914	2287	1050	673
Squid	1890	705	1359	1079	483	559	457
Sweep	2186	1949	1563	1044	466	165	697
Sweetlip	559	90	213	35	171	90	2
Sweetlip, emperor	88	.	1184	.	12	4	180
Tailor	113	283	171	5	15	.	160
Trevalla, deepsea	.	19666	5565	7	1297	362	1796
Trevally, golden	151	.	.	.	.	.	1
Trevally, other	4201	2433	2702	2046	4587	1793	13065
Trevally, skipjack	570	223	306	153	160	2045	1830
Trout, coral	455	260	84	8	31	32	85
Tuna, mackerel	.	.	.	.	.	.	47
Tuna, northern bluefin	.	.	5	193	116	177	91
Tuna, other	17	.	122	.	.	.	221
Tuna, skipjack or striped	.	.	.	21	28	.	4
Tuna, southern bluefin	79	9	.	.	.	.	.
Tuna, yellowfin	.	232	1010	3	38	114	5
Turrum	.	.	13	.	.	.	.
Tuskfish, bluebone	111	.	.	39	.	.	9
Whitebait	45204	20084	40166	28037	49182	60084	10538
Whiting, King George	1000	658	413	850	760	669	433
Whiting, other	96	.	.	.	.	.	.
Whiting, western sand	1543	882	453	388	54	402	63
other fish	3333	4586	2823	3775	1447	1757	2323
TOTAL	210625	182287	185935	130605	173345	177377	153566

Appendix 4 (continued)

Wetline catches of Shark Bay Snapper boats 08:40 Wednesday, April 28, 1999

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Barracuda (Northern pike)	153	10	.	.	4	17	.
Bonito	.	.	.	.	.	3	.
Bream, Robinson	.	.	.	.	.	.	2
Bream, silver (Tarwhine)	.	1	5	.	.	8	3
Bream, western yellow fin	.	.	.	.	.	22	390
Catfish, sea	.	.	31	51	76	35	69
Chinaman cod	.	.	.	.	5	16	84
Chinaman fish	.	.	.	.	.	.	15
Cod	1380	1023	1456	782	831	716	801
Cod, Rankin	.	.	66	169	116	30	796
Cod, spotted	.	.	.	2	4	.	18
Dhufish, Westralian	7633	5168	5373	6730	6790	10621	11062
Emperor, red	19	267	405	1074	488	253	1603
Flagfish, Spanish	.	13	40	43	1	16	111
Flathead, other	.	.	.	3	.	.	6
Garfish, sea	.	.	.	.	.	64	.
Groper, baldchin	1452	1134	2309	950	1778	1527	2005
Groper, blue	.	60	25	.	.	.	49
Gurnard	.	19	21	.	.	.	.
Hapuku	.	92	.	.	287	390	405
Jobfish	.	11	273	735	29	18	540
Jobfish, rosy	.	.	.	.	35	207	162
Kingfish, black (Cobia)	160	6	85	60	89	49	190
Kingfish, yellowtail	.	17	.	.	.	.	.
Leatherjacket	106	.	52	59	45	119	45
Mackerel, Spanish	8874	11866	20937	10160	27207	25803	20064
Mackerel, other	4227	1520	1994	6435	6302	1107	3343
Morwong	.	5	.	.	.	.	.
Mullet, red	.	10	2	1	.	2	7
Mullet, sea	.	.	170	.	.	463	295
Mulloway	87	350	1441	628	996	137	1410
Oyster, winged pearl	.	1	.	.	.	.	.
Perch, Moses	.	.	.	1	.	.	10
Perch, pearl	.	58	86	253	578	328	583
Perch, red	.	.	.	.	.	.	6
Perch, scarlet sea	.	.	.	.	.	.	15
Queenfish	33	.	.	.	.	.	.
Redfish	1244	61	43	12	.	.	13
Salmon, Australian	.	.	39	.	.	.	.
Samsonfish	2969	3352	3126	2230	1418	1541	3972
Shark, blacktip	.	.	16	.	6	.	.
Shark, bronze whaler	350	25	512	22	.	.	.
Shark, grey nurse	2358	.	337	.	.	.	.
Shark, hammerhead	.	.	21	.	.	.	.
Shark, other	2285	1063	712	786	906	734	855
Shark, pencil	.	.	19	.	.	.	.
Shark, spurdog	.	.	45	.	.	.	.
Shark, thickskin	374	18	1334	72	.	.	.
Shark, whiskery	296	40	56	5	21	.	38
Shark, wobbegong	647	43	68	.	.	.	.
Snapper, frypan	.	.	.	.	.	.	14
Snapper, goldband	.	.	.	.	.	.	250
Snapper, long nose	.	.	.	.	.	.	4
Snapper, northwest (large)	.	2698	6216	10850	4166	1558	452
Snapper, northwest (small)	.	.	269	.	.	.	.
Snapper, pink	10928	10011	34753	32039	44634	23263	33048
Snapper, queen	201	.	81	.	22	.	.
Snapper, red	.	.	.	.	.	.	2
Snapper, spangled emperor	9259	1152	2860	6347	2343	7527	8349
Squid	.	.	.	9	.	54	50
Sweep	.	.	5	.	.	.	.
Sweetlip	230	2347	9606	3137	205	2119	1528
Sweetlip, emperor	.	.	61	1504	1215	100	485
Tailor	.	32	148	20	127	115	204
Threadfin bream, Butterfish	.	.	.	.	.	.	2
Trevalla, deepsea	.	.	.	.	.	.	506
Trevally, golden	321	.	180	.	.	.	1
Trevally, other	73	488	1100	969	816	450	1221
Trevally, skipjack	68	253	207	52	26	.	.
Trout, coral	196	200	363	109	317	257	776
Tuna, mackerel	.	.	.	.	.	7	18
Tuna, northern bluefin	.	.	.	97	.	.	.
Tuna, other	.	83	126	78	135	8	293

(CONTINUED)

Appendix 4 (continued)

Wetline catches of Shark Bay Snapper boats 08:40 Wednesday, April 28, 1999 6

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Tuna, skipjack or striped	.	39	10	21	243	108	190
Tuna, yellowfin	17	100	189	6	242	27	121
Tuskfish, bluebone	.	.	.	.	4	.	29
Whiting, western sand	.	.	.	.	.	.	8
other fish	4429	656	474	216	227	468	336
TOTAL	60368	44291	97746	86715	102733	80288	96853

Appendix 5 Targeted wetline and recreational species

NOTE: Recreational catch shown is preliminary boat catch from Augusta to Kalbarri for the lower West Coast Recreational Fishing Boat Survey.

Appendix Table 1a

BREAM, SILVER (TARWHINE)	**LIVE WEIGHT (Tonnes)**						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	1.4	1.4	0.6	1.5	0.1	0.1	0.2
Other commercial catch	6.5	5.7	5.4	14.6	2.4	2.8	4.6
Total commercial catch	7.9	7.1	6.0	16.1	2.4	2.9	4.8
Wetline catch as a % of total commercial catch	17.7%	19.7%	10%	9.3%	4.1%	3.4%	4.2%

Appendix Table 1b

BREAM, SILVER (TARWHINE)	**Live weight (Tonnes) 1996-97**	**Percentage of total catch, Kalbarri - Augusta**
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	1.4	87.5%
Wetline catch, Kalbarri to Augusta	0.1	6.2%
Other commercial catch, Kalbarri to Augusta	0.1	6.3
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	1.6	100%

Note: This species is distributed from Albany to Coral Bay. Much of the catch occurs outside the area surveyed. The shore-based catch of the recreational sector also needs to be considered.

Appendix Table 2

COD, SPOTTED	**LIVE WEIGHT (Tonnes)**						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	-	0.1	0.06	0.2	0.3	0.2	0.2
Other commercial catch	10.6	42.1	41.3	48.4	68.7	52.0	39.4
Total commercial catch	20.9	42.2	41.3	48.6	69.0	52.2	39.6
Wetline catch as a % of total commercial catch	-	0.2%	-	0.4%	0.4%	0.4%	0.5%

Appendix 5 (continued)

Appendix Table 3a

FLATHEADS	LIVE WEIGHT (Tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Wetline catch	0.3	0.2	0.1	0.1	0.4	0.2	0.4
Other commercial catch	35.3	36.9	12.6	10.7	8.0	10.3	7.3
Total commercial catch	35.6	37.1	12.7	10.8	8.4	10.5	7.7
Wetline catch as a % of total commercial catch	0.8%	0.5%	0.8%	0.9%	4.8%	1.9%	5.2%

Appendix Table 3b

FLATHEADS	Live weight (Tonnes) 1996-97	Percentage of total catch, Kalbarri - Augusta
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	5.4	87.1%
Wetline catch, Kalbarri to Augusta	0.1	1.6%
Other commercial catch, Kalbarri to Augusta	0.7	11.3%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	6.2	100%

Appendix Table 4a

TAILOR	LIVE WEIGHT (Tonnes)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Wetline catch	10.2	4.4	4.8	1.4	5.3	5.6	8.0
Other commercial catch	37.6	44.6	44.5	52.4	50.7	45.7	45.9
Total commercial catch	47.8	49.0	49.3	53.8	56.0	51.3	53.9
Wetline catch as a % of total commercial catch	21.3%	9.0%	9.7%	2.6%	9.4%	10.9%	14.8%

Appendix Table 4b

TAILOR	Live weight (Tonnes) 1996-97	Percentage of total catch, Kalbarri - Augusta
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	10.0	85.5%
Wetline catch, Kalbarri to Augusta	1.5	12.8%
Other commercial catch, Kalbarri to Augusta	0.2	1.7%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	11.7	100%

Appendix Table 5a

KING GEORGE WHITING	**LIVE WEIGHT (Tonnes)**						
	1991-92	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Wetline catch	8.2	6.4	2.0	1.9	2.1	2.4	0.9
Other commercial catch	30.1	27.4	23.9	18.3	20.9	32.4	75.2
Total commercial catch	38.3	33.8	25.9	20.2	23.0	34.8	76.1
Wetline catch as a % of total commercial catch	21.4%	18.9%	7.7%	9.4%	9.1%	6.8%	1.1%

Appendix Table 6b

KING GEORGE WHITING	Live weight (Tonnes) 1996-97	Percentage of total catch, Kalbarri - Augusta
Preliminary findings of the recreational catch survey, Kalbarri to Augusta	21.0	94.3%
Wetline catch, Kalbarri to Augusta	0.8	3.5%
Other commercial catch, Kalbarri to Augusta	0.5	2.2%
Total catch including *preliminary* recreational catch, Kalbarri to Augusta	22.3	100%

Appendix 6 Reported wetline catches by fishing block

Wetline catches 08:40 Wednesday, April 28, 1999 9:

BLOCK	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
11280	2039	749	615	.	.	.	.
12230	.	.	261	.	.	1571	5594
12240	23	3214	.	.	.	.	2873
12250	.	.	4236	2276	3000	.	.
12260	.	.	4229	3972	2237	10577	13836
12270	.	2361	.	12929	.	1277	.
12280	.	.	2253	.	.	.	.
13230	.	.	1230	1092	313	.	2499
13240	23	2760	1713	1652	4285	1274	.
13250	14573	11630	17870	25976	11255	40346	52263
13260	22945	8393	8185	22662	14465	44089	29798
13270	4908	.	544	4933	2598	20	6728
13280	.	.	.	.	.	125	.
14210	.	2250	1999	3290	.	.	.
14220	.	31937	23779	5928	.	476	.
14230	238	18620	24955	19308	16476	1058	.
14240	18397	5857	20359	41554	19078	13465	18336
14250	28594	22305	40497	52312	65660	74971	79793
14260	.	31	20	.	.	1800	4478
14270	.	.	.	.	.	30	20
14280	6088	.	171	2279	445	1785	1206
14290	.	.	.	1935	9948	315	.
15200	.	.	.	.	40	.	1298
15210	2149	.	2495	16996	1995	223	17773
15220	5477	35304	14964	23350	27156	22699	19524
15230	11162	2424	9530	3630	3107	986	16875
15240	11008	14922	10804	30021	12073	23925	17965
16190	.	.	2255	.	.	.	.
16200	.	.	573	.	.	529	.
16210	21442	6397	10809	5674	9249	6482	21186
16220	34431	19584	21993	32635	36733	22137	45289
16230	21190	255	2586	.	3426	1321	672
16240	.	.	45	.	.	746	.
17200	363	619	751	2402	875	.	.
17210	4164	15485	46634	35400	27904	13972	25959
17220	9100	7038	11916	22587	19375	11863	10859
18170	.	.	.	.	.	143	.
18180	.	.	.	2575	.	11	100
18190	1229	.	331	1121	.	2436	1893
18200	.	3701	12279	1752	7991	14476	24962
18210	7868	10705	23156	13940	31010	16888	19374
18220	8358	5835	7242	2742	3376	850	3523
19150	.	.	.	.	.	461	4900
19160	.	3750	1834	2660	1593	979	585
19170	246	376	4474	7464	2423	885	1524
19180	11871	503	4593	12570	18840	22484	16852
19190	18768	774	60305	47363	55410	32056	46884
19200	10685	2942	33821	47248	145459	132790	129163
19210	1761	3250	1427	62985	12452	25430	30745
20130	.	146	2688	825	1876	.	.
20140	4505	4900	972	.	2785	8257	499
20150	10933	21319	23307	22183	18584	10831	30144
20160	6817	9248	3462	697	1322	4678	5279
20170	16565	7816	20440	7449	8435	13593	16290
20180	34906	29252	4175	3683	2089	2035	7269
20190	8062	7871	22773	1575	2188	10634	1754
21120	.	.	911	.	.	.	.
21130	1668	33386	19838	8184	10335	8781	18048
21140	4822	3135	876	11021	2833	24483	12754
21150	1248	1760	559	4652	4824	5823	1177
22120	259	.	639	.	.	.	2424
22130	2964	3839	4306	723	2399	2282	9839
22140	6690	6474	9243	6674	4392	2899	5500
23120	1187	99	90	.	.	401	39
23130	14203	13327	22409	8097	13118	18399	27791
24120	.	6805	2454	508	2040	2296	832
24130	49330	36415	.	.	.	119	4639
24131	6146	2065	27789	27414	51862	46072	43111
25120	6816	28592	39303	20730	15199	20000	22894
25130	215	.	.	.	.	.	.
26120	368	1686	8515	329	6363	2977	1419
26130	4882	12785	15017	27812	18585	25100	30632
26131	13641	12275	20971	14478	8610	13165	13152

(CONTINUED)

Appendix 6 (continued)

BLOCK	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
27120	6698	10667	10908	12245	14810	11526	5140
27130	116955	81846	92972	89660	128241	93769	83516
27132	3806	10607	15011	19903	17159	18338	46867
27140	31670	22011	17437	17675	16094	11951	19126
28120	792	1016	.	3726	3060	.	603
28130	215935	76766	27465	34486	60002	57437	35200
28132	3269	2072	310	2647	5294	4802	5236
28140	55411	26986	16626	10387	28385	26973	24825
28142	2765	11225	12286	8718	9830	11850	20415
29120	785	.	.	.	.	.	.
29130	24207	16081	8459	1487	20321	6706	11244
29132	.	.	.	254	.	1576	939
29140	76724	43370	30079	56973	42652	26738	32263
29142	10341	6431	567	4614	8454	18949	27043
30130	151	.	.	648	.	.	.
30140	34871	33968	39244	39879	44113	35581	64555
30150	8341	8249	10309	14854	13278	22354	16940
31130	.	154	610	1902	46	.	.
31140	4786	4789	4069	5248	5604	2610	13141
31150	59718	60141	53035	85104	64576	61984	92733
31280	.	.	.	.	2850	.	.
31290	.	.	3476	.	.	.	.
31300	.	.	.	.	.	207	.
32120	68	.	.	.	.	.	.
32140	6481	2553	2554	2688	8223	6629	13585
32150	187022	177645	169414	123113	78504	76676	78035
32250	.	.	.	2251	.	.	325
32260	10420	922	.	13	5557	.	773
32270	10418	925	4860	12	13818	.	1325
32280	.	927	.	11	1918	248	408
33120	.	352	.	.	.	.	.
33130	.	546	.	.	.	.	.
33140	48248	40521	34222	49180	76878	55024	56446
33150	39414	21991	23529	35348	36237	37666	19750
33151	61676	52104	81333	38843	124536	172754	46094
33200	10885	3070	549	1312	487	3837	.
33210	2250	1458	1964	24263	8311	12478	4125
33220	8187	5642	2880	5060	2302	15673	1050
33230	12224	428	2580	7997	2078	134	228
33240	5896	1995	1147	2760	3272	105	130
33250	399	.	.	.	.	100	.
33260	.	.	.	.	28	15	13
33270	.	.	.	.	63	135	.
33280	.	.	.	.	103	48	31
34140	1924	12265	303	2249	4252	8432	7117
34150	26292	6404	10689	11823	5415	5756	8269
34160	4744	1978	4926	4820	2059	3095	3890
34170	489	2183	30	963	299	310	217
34180	8280	9629	9795	7558	10582	6167	17349
34190	17132	9484	9507	16468	24570	14129	38739
34200	604	4311	1208	8194	4262	3222	2490
34210	11825	39316	19857	14805	1298	5757	8905
34220	3765	13199	15591	6836	3024	2288	5424
34230	.	4181	4325	7279	6066	528	920
34240	.	6939	.	.	.	.	.
35120	.	430	.	.	.	.	.
35140	.	.	.	.	.	.	1027
35150	1862	2	.	15	16	.	25
35160	23489	17196	10052	8999	3149	11444	7196
35170	167940	153684	88937	90650	84938	97253	100321
35180	8867	10254	9005	7742	27166	9502	15483
35181	1575	1926	531	.	.	.	.
35190	2052	11305	583	1207	1210	40	809
35200	.	157	.	.	.	40	.
35210	.	157	.	.	.	.	.
35220	.	.	.	.	.	.	385
35230	.	.	.	.	460	.	1020
96000	.	.	.	43	.	.	1233
96010	162815	131024	105195	159062	115869	161121	120483
96021	16631	19654	11417	8914	49320	37928	53509
96022	27371	18255	6172	9461	2018	2880	1290

(CONTINUED)

Appendix 6 (continued)

Wetline catches 08:40 Wednesday, April 28, 1999 97

BLOCK	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
96023	6671	34652	.	259	179	611	.
96030	8140	3196	3152	2047	1896	1908	2015
97011	.	13683	48421	48988	57712	67334	59168
97012	.	18033	30280	47719	52703	49790	59153
97013	.	25091	47200	45527	32301	46869	48993
97014	.	7869	26467	31517	46169	35748	33057
97015	.	1168	1581	7280	17745	8929	15995
GRAND TOTAL	2038607	1792251	1821590	1997931	2149848	2146729	2267400

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Bream, silver (Tarwhine)								
	25120	.	.	.	.	.	.	2
	26120	.	.	.	.	.	.	2
	26130	.	.	.	.	11	2	.
	27130	57	6	.	10	12	6	9
	27132	.	.	1	.	.	3	1
	27140	20	3	.	.	.	.	4
	28140	1	.	.	.	.	.	2
	29140	.	10	.	.	.	.	.
	31150	37	.	.	.	.	.	75
	32150	668	.	300	30	.	36	.
	34150	260	175	100	190	20	22	20
	34160	25	.	158	59	25	45	.
	34170	.	.	.	50	.	.	.
	34180	2	.	35	21	.	.	8
	34190	25	229	.	23	28	.	9
	35160	91	118	.	1188	.	.	6
	35170	55	884	.	15	9	.	6
	96010	128	31	.	.	.	.	.
	97011	.	.	16	.	.	3	5
	97012	.	.	14	.	.	5	4
	97013	.	.	1	.	.	4	.
	97014	.	.	.	.	.	.	1
	97015	.	.	.	.	.	.	2
	TOTAL	1369	1456	625	1586	105	126	156
Cod, spotted								
	19200	.	.	.	27	.	.	.
	20130	.	18	.	.	.	.	.
	20180	.	12	6	.	.	.	.
	20190	.	.	61	.	.	.	.
	21130	.	88	.	.	210	.	.
	22130	.	.	.	.	16	.	18
	23130	.	.	.	.	97	100	88
	24130	.	.	.	.	.	.	71
	24131	.	.	.	.	13	142	11
	25120	.	.	.	226	.	.	.
	96022	.	.	.	2	4	.	.
	TOTAL	.	118	67	255	340	242	188
Dhufish, Westralian								
	24120	.	.	.	3	.	7	.
	24130	55	.	.	.	.	.	.
	24131	.	.	.	3	.	7	8
	25120	69	26	.	61	11	22	25
	26120	.	.	.	4	361	1	43
	26130	137	732	496	1108	903	1359	1631
	26131	130	940	509	272	210	400	14
	27120	429	1202	511	86	266	368	146
	27130	6361	5342	4299	3257	9107	6096	4683
	27132	155	1186	992	831	1087	933	3269
	27140	1362	1597	913	1848	986	758	1155
	28120	57	11	.	18	66	.	3
	28130	28423	10458	3584	3524	6047	7493	4802
	28132	457	298	62	199	110	195	448
	28140	6963	2776	1790	1758	3088	3481	4911
	28142	469	2509	1865	1111	1383	1685	2309
	29120	56	.	.	.	.	.	.
	29130	6244	3729	1709	666	2613	2173	2626
	29132	.	.	.	19	.	436	226
	29140	23739	18465	10822	19376	12850	10460	12085
	29142	3857	3645	252	1989	2194	8501	12294
	30130	69	.	.	1	.	.	.
	30140	16200	12654	13143	13361	16734	9848	21246
	30150	2464	1289	2359	411	2579	6461	5978
	31130	.	.	13	.	.	.	.
	31140	434	1204	1155	1394	245	895	4686
	31150	12041	12035	9098	13300	12889	12536	22854
	32120	68	.	.	.	.	.	.
	32140	1335	1241	963	216	3234	2205	4307
	32150	6293	9422	10217	8914	8614	8557	16108
	33120	.	179	.	.	.	.	.
	33140	26888	18457	18005	23008	22062	25195	18141
	33150	.	.	.	23	.	75	2276
	33151	290	2079	2315	4200	3327	4868	1908

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Dhufish, Westralian								
	33200	.	.	.	.	9	.	.
	34140	429	513	135	278	321	291	454
	34150	1133	925	2171	1342	405	993	780
	34160	268	36	75	23	20	190	230
	34170	.	36	.	5	14	.	.
	34180	136	37	.	46	61	.	171
	34190	566	.	110	254	140	117	322
	35120	.	146	.	.	.	.	.
	35150	65	.	.	.	.	.	.
	35160	1041	1267	1375	102	.	662	249
	35170	463	503	644	299	462	412	1295
	35180	348	196	125	251	480	737	513
	35190	154	.	39	21	.	.	19
	96010	675	644	263	1724	1452	3073	2658
	96022	.	.	.	7	1	4	23
	96030	30	66	69	.	.	.	.
	97011	.	2301	4829	5415	5699	8502	7342
	97012	.	3840	3873	8426	7071	8630	12995
	97013	.	3884	8900	8138	5303	9757	12431
	97014	.	1417	6075	7064	11171	8188	9083
	97015	.	486	794	1753	4182	3411	5015
	TOTAL	150349	127772	114549	136106	147756	159982	201760
Flathead, other								
	19200	.	.	.	9	.	.	.
	20180	30	18	.	.	.	.	.
	26120	.	.	.	.	.	.	4
	27120	.	.	.	.	.	.	4
	27130	6	.	.	.	.	14	.
	27132	.	.	1	.	.	16	1
	27140	1	.	.	.	.	16	.
	28130	3	2	.	.	.	.	1
	28142	.	.	.	1	.	16	.
	29140	1	1	.	.	.	.	.
	29142	.	.	.	.	.	.	2
	30140	6	90	1	1	.	.	.
	31130	.	.	.	1	.	.	.
	31140	.	.	.	2	71	.	1
	31150	.	6	3	5	53	50	199
	32150	8	3	20	.	12	.	97
	32250	.	.	.	.	.	.	15
	33140	7	.	.	11	3	.	17
	33210	42	.	.	.	.	.	.
	34140	.	.	.	.	6	.	.
	34150	3	10	9	.	.	13	.
	34160	10	.	.	.	.	.	.
	34170	16	.	.	.	.	.	1
	34180	39	22	71	41	13	37	9
	34190	4	.	.	25	29	.	38
	34200	.	.	.	.	63	.	.
	34210	.	3	.	.	.	.	.
	34220	.	.	3	.	.	.	9
	34230	.	.	2	.	5	.	.
	35160	.	.	2	.	.	.	.
	35170	145	10	11	14	53	9	9
	35180	19	1	.	5	30	.	.
	35181	8	.	.	.	.	.	.
	96010	20	3	1	7	2	.	2
	96021	.	11	.	.	61	7	6
	96022	17	.	.	.	.	.	.
	96030	.	.	.	2	.	10	12
	97011	.	2	.	15	.	1	.
	97013	.	1	2	4	1	9	8
	97014	.	.	.	.	.	1	1
	TOTAL	383	184	126	143	401	199	436
Garfish, sea								
	12230	.	.	.	.	.	.	67
	12260	.	.	.	.	.	.	167
	13250	.	.	.	.	.	.	66
	13260	.	.	.	.	.	.	167
	13270	.	.	.	.	.	.	67

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Garfish, sea								
	14250	.	.	.	.	.	.	67
	20150	577	.	40	.	.	720	4276
	20160	.	.	.	218	.	.	.
	20170	25	.	.	.	.	.	400
	21130	.	.	.	.	65	.	.
	21150	.	.	14	.	650	2164	55
	24131	57	.	964	1155	1207	1167	1382
	28142	.	.	.	.	.	6	.
	29140	20	.	.	.	.	.	.
	30140	.	.	.	.	.	.	7
	31150	50	5	674	1067	2940	1165	678
	31280	.	.	.	.	991	.	.
	32150	354	159	.	160	723	385	75
	33150	45	.	.	480	.	522	225
	33151	.	.	60	1428	161	192	142
	33200	8335	1818	356	118	.	.	.
	33210	1250	765	922	70	.	.	.
	33220	4668	1494	867	609	.	5341	295
	33230	6276	248	.	.	.	.	.
	33240	848	.	.	43	.	.	.
	34140	.	.	.	.	13	.	.
	34160	.	.	40	.	.	.	.
	34170	.	.	4	792	.	.	3
	34180	2756	3040	1527	1057	1119	302	1176
	34190	1467	3546	1862	1140	1418	.	.
	34200	240	.	786	.	.	.	.
	34210	240	165	220	.	.	.	.
	34220	.	162	.	.	.	.	.
	35160	134	1317	.	992	.	.	392
	35170	1412	5468	2456	1118	3145	2150	566
	35180	.	.	443	104	453	.	.
	35200	.	152	.	.	.	.	.
	35210	.	152	.	.	.	.	.
	96010	2124	1408	1192	1045	193	1322	3867
	96021	266	119	20	92	782	476	553
	96022	364	.	.	.	.	.	.
	96030	.	230	.	.	.	.	.
	97012	.	.	.	.	.	.	3
	TOTAL	31508	20248	12447	11688	13860	15912	14696
Groper, baldchin								
	21150	.	.	.	.	6	.	.
	22130	.	47	223	.	.	.	1
	22140	.	.	.	12	.	.	.
	23130	118	134	367	377	362	81	58
	24120	.	.	45	5	.	.	.
	24130	.	7	.	.	.	.	292
	24131	104	.	1	117	58	24	61
	25120	131	711	805	417	13	98	457
	26120	.	.	.	8	258	7	.
	26130	71	202	80	161	86	345	104
	26131	475	619	477	347	129	95	52
	27120	101	191	151	35	159	195	168
	27130	1994	1729	1498	1102	1420	841	961
	27132	229	932	424	233	306	518	883
	27140	516	625	395	361	727	307	600
	28120	38	29	.	7	30	.	.
	28130	21304	9019	2831	1493	2870	2226	1058
	28132	519	398	44	5	96	28	235
	28140	3167	2189	667	735	949	940	1652
	28142	140	642	665	690	483	555	732
	29120	36	.	.	.	.	.	.
	29130	4038	1978	1215	157	709	565	215
	29132	.	.	.	.	.	57	62
	29140	5470	3409	2000	2162	2158	1458	897
	29142	635	156	59	154	523	1123	1514
	30140	861	1395	1083	725	1838	1626	3377
	30150	105	18	100	100	425	832	747
	31140	51	326	37	83	29	10	248
	31150	245	243	553	1870	1373	679	1312
	32140	10	48	19	.	.	.	.

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Groper, baldchin								
	32150	71	.	261	559	293	44	.
	33140	39	.	31	18	36	.	.
	96010	.	.	.	.	8	.	.
	96021	.	27	30	150	14	16	16
	96022	50	4	252	172	14	28	40
	96023	119	.	.	32	.	.	.
	97011	.	788	2169	2329	1878	3395	2851
	97012	.	2615	3388	6820	7490	4908	6484
	97013	.	2294	4763	5348	2949	3898	4427
	97014	.	1487	2587	5074	6208	4436	4489
	97015	.	59	108	333	913	559	1057
	TOTAL	40634	32319	27327	32189	34807	29893	35050
Groper, blue								
	28130	347	348	69	.	321	.	58
	28140	207	340	13	.	320	.	39
	28142	.	.	21	.	.	.	42
	29130	57	87	39	.	34	3	4
	29140	128	154	185	67	222	516	76
	29142	.	.	.	.	.	.	37
	30140	557	1504	214	425	1270	643	1853
	30150	149	30	.	16	110	4	.
	31140	40	.	.	.	92	3	3
	31150	29	1063	880	1100	658	728	1495
	31280	.	.	.	.	21	.	.
	31290	.	.	9	.	.	.	.
	32140	376	69	29	.	.	.	55
	32150	53	852	1078	1269	544	94	79
	32250	.	.	.	49	.	.	.
	32260	147	.	.	.	145	.	.
	32270	147	.	99	.	22	.	28
	32280	.	.	.	.	21	.	.
	33120	.	4	.	.	.	.	.
	33140	230	345	999	835	236	360	144
	33150	.	.	.	.	.	.	12
	33151	.	74	149	78	41	79	11
	33200	267	626	149	83	22	.	.
	33210	.	18	.	11	.	156	14
	33220	114	504	.	.	452	331	53
	33230	48	.	199	360	186	.	111
	33240	50	53	40	49	.	32	16
	33250	66	.	.	.	.	.	.
	34140	.	.	.	46	.	36	7
	34150	550	154	123	268	40	63	58
	34160	498	158	203	409	140	34	87
	34170	25	189	.	.	.	12	.
	34180	62	51	170	50	474	24	92
	34190	.	154	38	202	304	38	34
	34200	.	.	.	568	119	.	.
	34210	.	57	144	599	30	32	1415
	34220	.	290	606	6	155	14	.
	34230	.	157	136	206	11	75	251
	35120	.	14	.	.	.	.	.
	35150	95	.	.	.	.	.	.
	35160	69	87	56	27	11	10	.
	35170	45	1305	215	849	134	228	116
	35180	28	246	73	20	664	.	58
	35190	.	.	.	26	.	.	8
	35230	.	.	.	.	10	.	.
	96010	24	16	96	16	15	2	.
	96030	21	55	50	.	.	.	.
	97011	.	.	50	.	.	.	.
	97012	.	.	46	.	.	.	559
	97013	.	.	46	.	.	.	291
	97014	.	288	172	.	.	.	206
	97015	.	.	25	.	.	12	94
	TOTAL	4426	9291	6421	7634	6824	3528	7406
Herring, Australian								
	28140	.	6	.	.	.	.	.
	28142	.	.	.	.	.	3	.
	29140	48	58	75	43	75	10	.

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Herring, Australian								
	29142	.	.	.	.	.	.	10
	30140	1820	1542	625	.	100	160	100
	30150	70	154	150	449	325	227	105
	31140	.	.	.	.	.	.	58
	31150	740	316	1733	913	2138	.	441
	32150	23286	4814	3684	4658	5264	3438	1426
	32250	.	.	.	.	.	.	41
	33140	7667	5144	2416	2414	7640	.	1742
	33150	9128	8812	7723	6646	7898	7387	10467
	33151	6358	6458	11886	3458	11074	10656	3872
	33200	1563	229	.	15	.	.	.
	33210	201	197	176	.	44	.	.
	33220	2050	1695	1164	38	.	1093	.
	33230	3031	.	.	520	.	.	.
	33240	2284	5	4	80	.	.	.
	34140	.	9917	.	.	937	.	.
	34150	16094	1020	231	100	100	202	187
	34160	30	17	1337	265	185	1064	10
	34170	2	.	26	.	.	.	21
	34180	3821	2861	820	1550	91	2220	5131
	34190	519	1545	976	1822	380	74	317
	34200	.	.	194	.	.	.	.
	34210	.	567	20	.	.	.	.
	34220	.	592	.	.	.	.	62
	34230	.	11	.	.	.	.	.
	35160	720	340	.	4332	.	.	112
	35170	147984	130813	74839	67901	70770	70120	58457
	35180	148	1426	35	1933	576	.	60
	96010	78004	41722	48219	60372	21985	27862	29148
	96030	6	18	.	.	.	.	.
	TOTAL	305573	220278	156333	157509	129582	124516	111767
Mackerel, Spanish								
	12230	.	.	.	.	.	1269	5502
	12240	.	.	.	.	.	.	2499
	12250	.	.	3833	1833	3000	.	.
	12260	.	.	3827	3329	2237	10572	11499
	12270	.	2361	.	12333	.	1272	.
	12280	.	.	2253	.	.	.	.
	13230	.	.	.	.	313	.	2499
	13240	.	2294	329	636	4248	1269	.
	13250	13936	10992	15254	14658	10713	39983	46532
	13260	21648	7986	7677	13353	10123	43691	25675
	13270	.	.	544	4233	2598	.	6579
	13280	.	.	.	.	.	125	.
	14210	.	.	.	663	.	.	.
	14220	.	28201	22380	.	.	.	.
	14230	238	18620	24616	18867	15905	.	.
	14240	17655	5150	15140	34609	18103	11762	16523
	14250	20375	16353	38657	46916	62680	73381	75067
	14260	.	.	.	.	.	1800	3870
	14270	.	.	.	.	.	30	.
	14280	.	.	.	1833	445	1785	1206
	14290	.	.	.	1935	9948	100	.
	15200	.	.	.	.	.	.	1298
	15210	2149	.	2254	16104	.	150	1725
	15220	4344	25893	14379	21116	9105	4149	3165
	15230	9769	2325	8964	2411	2723	986	16632
	15240	9275	7959	7428	4019	11670	21361	10187
	16190	.	.	2255	.	.	.	.
	16200	.	.	573	.	.	150	.
	16210	13398	.	10589	5674	6753	4164	20382
	16220	21639	14175	21465	28963	32372	20350	34227
	16230	21190	.	2586	.	1915	253	429
	17200	363	510	706	1558	.	.	.
	17210	1236	14787	31594	21949	27146	13224	20535
	17220	8548	5661	9303	17043	15580	10875	9974
	18180	.	.	.	2365	.	.	.
	18190	1021	.	331	1105	.	2294	1893
	18200	.	3147	11967	1748	4693	13739	24303
	18210	5818	8982	21624	12150	24365	15971	18594

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Mackerel, Spanish								
	18220	2850	4871	6595	31	589	719	3481
	19150	.	.	.	.	.	346	.
	19160	.	3750	1834	2660	68	825	554
	19170	.	.	1973	3644	1212	570	1428
	19180	4850	209	3137	11545	14278	21390	14283
	19190	7331	22	42904	43905	46609	28984	43020
	19200	104	.	9366	27193	46251	23805	19377
	19210	.	.	1266	4200	.	.	.
	20140	4104	4200	972	.	2641	7532	410
	20150	8219	10310	16057	19704	14088	7108	10552
	20160	2148	4251	3036	30	586	3106	4324
	20170	6977	3710	16359	3496	5279	7982	9659
	20180	2438	470	93	3414	400	291	3063
	20190	8	.	.	1575	.	.	.
	21130	259	295	2666	20	570	38	680
	21140	198	2444	101	329	689	1973	6377
	21150	.	.	90	1140	772	1965	885
	22130	445	1125	106	.	189	.	653
	22140	461	483	718	231	235	313	379
	23120	.	.	90	.	.	346	.
	23130	603	2324	.	70	2384	3509	4370
	24120	.	.	.	500	2000	1350	414
	24130	.	6	.	.	.	119	3004
	24131	1392	594	22202	20849	43463	34319	21617
	25120	2930	3605	2018	987	1099	12302	13040
	26120	368	1441	1210	.	68	1786	.
	26130	26	218	598	311	499	569	223
	26131	.	5	463	180	92	2218	.
	27120	.	3	.	1015	763	1029	10
	27130	3973	3291	2215	1148	1078	471	305
	27132	.	.	223	828	173	341	963
	27140	.	85	2223	18	141	478	215
	28120	.	.	.	.	84	.	4
	28130	2001	466	219	30	298	358	97
	28132	.	.	.	20	748	361	1214
	28140	3206	68	1926	.	240	143	18
	28142	149	621	451	158	85	2173	2342
	29130	5	14	10	.	.	19	25
	29140	86	.	5	.	6	20	.
	30140	20	.	.	70	29	.	.
	96021	841	1334	43	.	.	3071	4150
	96022	.	.	5	36	.	238	.
	96023	.	70	.	.	.	236	.
	97011	.	33	132	39	534	872	1393
	97012	.	766	186	2499	2068	3087	2169
	97013	.	1766	1557	2147	2838	3034	890
	97014	.	190	1729	331	974	2645	146
	97015	.	.	.	.	.	.	19
	TOTAL	228587	228434	425299	445752	470746	476741	536540
Mackerel, blue								
	34150	7	.	.	.	.	.	.
	34180	.	.	78	.	.	.	.
	34190	.	.	.	.	.	650	.
	35160	4	.	.	.	.	.	.
	35180	.	.	.	.	113	.	.
	96010	.	.	.	.	11	19	19
	TOTAL	11	.	78	.	124	669	19
Pike, sea								
	15230	.	.	.	7	.	.	.
	17210	.	.	.	13	.	.	.
	19190	.	.	.	.	8	.	.
	19200	.	.	.	4	28	.	.
	20170	.	.	14	.	.	.	.
	27140	.	.	.	.	.	11	63
	28130	.	8	.	.	.	.	.
	28142	.	.	.	.	.	1	.
	29140	51	.	.	2	.	.	.
	30140	2	.	.	.	25	.	.
	30150	.	.	.	2	.	.	15
	31150	1	.	110	64	26	.	11

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Pike, sea								
	32150	55	34	13	24	123	.	145
	32250	.	.	.	.	.	.	108
	33140	180	.	.	3	.	.	7
	33200	.	.	.	.	.	161	.
	33210	.	.	.	.	.	375	.
	33230	15	.	6	.	.	.	.
	33240	350	.	.	.	.	.	.
	34150	.	.	18	.	313	.	.
	34170	.	.	.	.	.	.	3
	34180	17	8	209	30	20	204	77
	34190	62	.	.	9	.	30	.
	34220	.	.	.	.	.	.	29
	35170	6	14	.	.	39	50	3
	35180	.	3	.	.	.	10	.
	96010	57	12	57	.	6	1	65
	96030	6	.	.	3	4	11	.
	TOTAL	803	79	427	161	592	854	526
Snapper, pink								
	20150	.	.	.	.	30	.	.
	21120	.	.	61	.	.	.	.
	21130	200	4255	919	1472	1487	363	558
	21140	.	.	.	98	26	273	317
	22120	1	.	78	.	.	.	1123
	22130	.	.	928	.	14	105	2015
	22140	8	.	.	21	.	33	154
	23120	118	.	.	.	.	.	.
	23130	3234	921	9110	648	1194	864	947
	26120	.	.	.	156	4422	960	114
	26130	2019	7891	11830	19430	14343	17487	16828
	26131	6213	3192	6695	6482	2240	2889	2282
	27120	3233	4701	6348	4215	10124	6532	2958
	27130	57971	44600	58370	62345	89043	54707	36388
	27132	337	2659	9762	13786	9702	7904	14788
	27140	15778	11041	8897	9962	9840	5590	5894
	28120	347	557	.	1552	1930	.	480
	28130	59851	24109	9549	18333	30718	25185	9159
	28132	889	487	14	966	3350	3374	1132
	28140	17606	7715	6661	4871	8497	11989	5734
	28142	477	2377	4218	3078	4036	4051	3372
	29120	346	.	.	.	.	.	.
	29130	6937	4328	2557	297	7785	2129	1914
	29132	.	.	.	156	.	835	299
	29140	20080	9585	7058	18715	12004	6907	3637
	29142	3716	1632	68	1733	4097	5175	5970
	30130	19	.	.	14	.	.	.
	30140	4465	4765	9332	9660	10487	6423	7882
	30150	444	384	48	219	585	1052	275
	31130	.	.	33	41	.	.	.
	31140	776	1330	1300	863	781	176	847
	31150	5939	7228	8514	10690	7702	4257	10886
	31280	.	.	.	.	41	.	.
	31290	.	.	3	.	.	.	.
	32140	518	141	190	241	949	938	3099
	32150	3516	6970	10897	15699	8303	8456	10305
	32260	.	.	.	.	.	.	663
	32270	.	.	.	.	43	.	427
	32280	.	.	.	.	61	.	177
	33120	.	16	.	.	.	.	.
	33140	1463	1825	1055	3306	2996	5741	4743
	33150	.	.	.	28	.	25	575
	33151	.	51	119	452	943	1524	500
	33210	.	.	46	20	57	815	16
	33230	.	.	.	.	56	.	.
	33240	.	.	14	.	23	.	.
	33280	.	.	.	.	20	.	25
	34140	31	70	81	23	133	542	678
	34150	1388	862	1499	1785	1503	1892	1866
	34160	316	125	41	6	138	449	591
	34170	.	4	.	23	30	.	.
	34180	.	57	.	48	88	90	1709

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Snapper, pink								
	34190	536	365	51	51	126	1600	1826
	34200	.	.	.	.	35	19	157
	34210	.	15	13	.	.	47	221
	34220	.	.	.	23	21	46	269
	34230	.	.	.	.	.	31	.
	35120	.	20	.	.	.	.	.
	35150	8	.	.	11	.	.	.
	35160	3562	2365	1102	408	81	2658	2073
	35170	926	976	403	1186	796	3825	6038
	35180	318	172	48	233	725	1232	1763
	35181	246	63	.	.	.	.	.
	35190	74	11	.	.	24	.	120
	35220	.	.	.	.	.	.	50
	35230	.	.	.	.	.	.	150
	96010	354	170	158	360	442	1284	1512
	96021	.	.	.	.	307	2134	1193
	96022	243	.	.	.	.	.	.
	96030	.	33	.	.	.	160	527
	97011	.	3490	24412	17478	28365	21522	16410
	97012	.	4778	10896	17986	19493	15344	13609
	97013	.	7007	14104	15187	11347	12564	9597
	97014	.	1980	7836	9792	16294	9362	9099
	97015	.	346	435	3144	8298	3304	4523
	TOTAL	224500	175664	235749	277288	336169	264858	230461
Squid								
	12230	.	.	.	.	.	5	25
	12260	.	.	.	200	.	5	25
	12270	.	.	.	150	.	5	.
	13230	.	.	100	.	.	.	.
	13240	.	.	.	.	.	5	.
	13250	.	.	40	.	.	.	25
	13260	30	.	385	800	200	35	25
	13270	45	.	.	.	.	.	25
	14210	.	.	165	125	.	.	.
	14220	.	.	345	325	.	.	.
	14230	.	.	180	.	.	.	.
	14240	.	.	150	255	.	475	15
	14250	83	.	160	2288	670	305	430
	15220	.	.	.	.	500	.	.
	15240	.	.	.	.	.	790	35
	20160	.	42	.	60	.	.	.
	21140	114	.	.	.	.	.	11
	21150	.	330	.	180	.	.	.
	22140	3441	2386	2808	3239	1357	752	1698
	23130	.	.	.	.	.	15	10
	24130	.	.	.	.	.	.	5
	24131	43	.	72	157	134	90	115
	27140	.	.	.	.	.	12	.
	28130	.	.	3	.	.	.	.
	28142	.	.	.	12	.	.	.
	29130	10	.	4	.	4	.	.
	29140	.	.	.	.	.	.	5
	30140	.	.	.	.	20	.	29
	30150	.	.	.	.	.	.	43
	31140	.	.	.	.	40	350	143
	31150	1593	1498	1556	3513	2317	1342	1801
	32150	2121	1813	1917	2171	1298	983	1945
	32270	.	.	.	.	.	.	75
	33140	77	7	.	.	.	.	.
	33150	52	30	.	.	.	28	306
	33151	.	131	145	60	45	52	5
	33200	223	.	.	.	.	.	.
	33210	143	.	52	.	34	30	41
	33220	.	42	.	.	23	.	81
	33230	27	.	.	.	.	.	.
	33240	342	.	60	.	.	.	.
	34150	.	.	6	.	.	.	.
	34160	.	42	238	245	208	.	.
	34170	85	.	.	.	.	.	9
	34180	87	247	101	124	235	134	65

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Squid								
	34190	101	51	154	219	75	160	127
	34200	14	.	78	.	.	.	.
	34210	14	.	26	.	.	.	2
	34220	.	40	40	.	.	.	21
	34230	.	50	40	.	.	.	15
	35160	14	.	.	.	.	.	.
	35170	109	81	190	241	886	678	73
	35180	142	51	37	45	36	10	83
	35190	.	.	.	.	5	.	.
	35200	.	5	.	.	.	.	.
	35210	.	5	.	.	.	.	.
	96010	862	514	1004	221	1003	300	135
	96022	9	4	4	.	.	.	.
	96030	2709	1382	1427	1787	1772	1150	581
	97012	.	14	.	45	6	.	.
	97013	.	.	.	7	6	.	.
	97014	.	.	20	2	18	12	.
	TOTAL	12490	8765	11507	16471	10892	7723	8029
Tailor								
	22130	.	.	21	.	.	.	.
	23130	.	.	128	.	.	.	.
	24120	.	38	110	.	.	25	.
	24130	.	22	.	.	.	.	.
	24131	180	.	.	.	.	25	480
	25120	29	559	1916	328	.	25	3
	26120	.	.	793	.	7	.	.
	26130	80	.	37	87	28	25	.
	26131	.	5	.	4	2	4	.
	27120	.	4	15	4	19	15	11
	27130	21	546	368	156	196	363	195
	27132	.	.	19	22	24	24	57
	27140	17	19	7	4	47	73	47
	28120	.	.	.	1	7	.	1
	28130	4125	4	57	4	32	169	19
	28132	.	.	.	5	.	16	34
	28140	11	121	7	1	22	45	85
	28142	1	.	15	.	3	7	57
	29130	1	.	.	.	.	1	.
	29140	83	40	100	15	.	1	1
	30140	170	150	.	.	.	.	2
	30150	.	.	.	4	.	.	49
	31150	.	.	12	74	2	.	22
	32150	242	788	1004	380	132	345	447
	33140	.	.	.	.	.	.	10
	33150	340	163	.	.	.	.	90
	33151	390	20	45	.	17	80	77
	34150	.	.	.	.	.	.	40
	35170	.	.	.	7	.	.	.
	96000	.	.	.	43	.	.	.
	96010	263	1055	.	13	600	240	378
	96021	285	761	.	225	4009	3962	5556
	96022	3978	.	.	4	52	.	2
	97011	.	12	115	71	105	67	114
	97012	.	.	12	5	41	60	134
	97013	.	53	43	8	1	7	81
	97014	.	3	4	.	7	17	6
	97015	.	.	.	.	.	.	24
	TOTAL	10216	4363	4828	1465	5353	5596	8022
Trevally, skipjack								
	21150	.	.	.	.	80	.	.
	26120	.	.	.	.	17	.	19
	26130	.	.	.	.	.	63	102
	26131	.	.	.	.	19	24	.
	27120	.	.	.	8	12	60	46
	27130	78	785	1	48	267	84	154
	27132	.	13	50	321	110	54	125
	27140	18	.	.	.	.	.	75
	28120	.	.	.	8	.	.	.
	28130	684	187	51	114	439	21	35
	28132	.	8	4	12	94	74	.

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Trevally, skipjack								
	28140	72	60	9	9	.	.	10
	28142	.	183	58	4	35	81	35
	29130	.	40	61	.	257	.	15
	29140	90	75	265	490	378	46	24
	30140	.	.	34	301	8	20	15
	30150	.	.	.	.	8	3	27
	31140	15	.	.	.	13	.	.
	31150	39	31	8	183	128	23	96
	32150	81	73	18	105	377	19	148
	33140	.	89	.	.	.	.	88
	33150	250	.	.	.	.	.	.
	33151	800	.	.	.	.	.	.
	33200	81	.	.	.	.	.	.
	33220	.	.	.	.	.	60	.
	33230	1020	.	.	.	.	.	.
	34150	6	6	130	16	10	65	25
	34160	8	.	5	14	44	.	303
	34170	.	.	.	.	5	.	.
	34180	.	584	2640	22	63	1927	505
	34190	20	46	.	361	60	35	109
	34210	315	.	54	.	.	.	.
	34220	56	8	25	.	19	.	.
	35120	.	26	.	.	.	.	.
	35160	14	138	54	.	.	.	378
	35170	66	59	267	88	11	1131	129
	35180	.	11	203	100	3	.	16
	96010	.	.	.	1630	120	500	2886
	96021	.	.	.	.	.	.	66
	96030	12	2	.	.	.	.	.
	97011	.	405	241	324	278	229	426
	97012	.	154	151	264	168	208	170
	97013	.	30	161	233	79	94	52
	97014	.	5	44	58	35	95	1
	97015	.	.	.	.	21	.	.
	TOTAL	3726	3017	4533	4713	3158	4915	6078
Whiting, King George								
	30140	.	.	.	.	1	1	.
	31140	80	.	.	.	.	.	40
	31150	27	148	30	9	5	.	19
	32140	42	2	.	.	.	.	.
	32150	378	164	325	61	866	212	99
	32250	.	.	.	.	.	.	54
	33140	.	16	6	30	5	2	23
	33150	.	.	.	.	.	.	1
	33151	40	359	150	45	1	25	1
	33210	3	.	.	.	.	.	.
	33220	.	.	.	.	.	7	.
	33240	4	.	.	.	.	.	.
	34150	.	.	.	.	.	.	6
	34160	.	.	236	259	.	.	3
	34170	14	.	.	.	.	.	.
	34180	230	38	168	116	12	111	13
	34190	540	94	24	386	18	28	20
	34220	.	.	.	.	.	.	45
	35160	48	21	6	46	.	.	2
	35170	197	104	86	343	413	1346	11
	35180	5	25	5	36	11	24	.
	35190	.	.	.	.	6	.	.
	96010	5838	5411	569	474	713	520	318
	96030	725	61	392	94	77	141	265
	TOTAL	8171	6443	1997	1900	2128	2418	921
Whiting, golden lined								
	14260	.	.	5	.	.	.	.
	20150	.	500	557	.	.	.	.
	20160	19	.	.	.	.	.	.
	20180	20	.	.	.	.	.	.
	20190	20	.	.	.	.	.	.
	21140	.	.	80	.	.	.	.
	96021	.	.	.	.	.	.	2556
	TOTAL	59	500	642	.	.	.	2556

(CONTINUED)

Appendix 6 (continued)

SPECIES	BLOCK	LIVE WEIGHT (kg)						
		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Whiting, school								
	31150	238	256	.	.	.	.	.
	32150	15	404	.	.	100	.	.
	33151	.	.	.	.	75	.	.
	34150	.	50	.	.	.	.	.
	96010	.	.	.	.	155	.	.
	TOTAL	253	710	.	.	330	.	.

Appendix 7 Wetline catches of the Abrolhos Islands, Perth metropolitan region and South West region

Wetline catches of Abrolhos Islands 08:40 Wednesday, April 28, 1999

SPECIES	LIVE WEIGHT (kg)					
	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Bonito	33	56	34	14	37	32
Bream, silver (Tarwhine)	.	31	.	.	12	12
Chinaman cod	.	.	.	344	3480	3594
Cobbler	.	9	.	.	.	.
Cod	2220	4927	4402	3544	1470	1765
Cod, Rankin	.	2	40	33	20	127
Cuttlefish	.	.	3	.	.	.
Dhufish, Westralian	11927	24471	30796	33427	38488	46866
Emperor, red	2	62	166	220	109	183
Flagfish, Spanish	2	6	.	7	3	6
Flathead, other	3	2	19	1	11	9
Flounder	.	.	.	.	12	.
Garfish, sea	.	.	.	.	.	3
Groper, baldchin	7243	13015	19904	19437	17196	19308
Groper, blue	288	339	.	.	12	1150
Jobfish	.	.	.	.	13	192
Kingfish, black (Cobia)	8	67	122	28	58	170
Kingfish, yellowtail	.	.	14	43	35	212
Leatherjacket	10	7	43	89	79	153
Mackerel, Spanish	2755	3604	5016	6413	9638	4617
Mackerel, other	95	1983	1560	741	1539	1558
Morwong	2	1	1	.	.	.
Mullet, red	5	17	5	23	22	17
Mulloway	297	2895	759	1480	232	2168
Parrot fish	1	6	256	12	9	11
Redfish	8	.	.	4	12	18
Salmon, Australian	.	137	273	55	7	2
Samsonfish	2872	7408	4138	4351	7171	10084
Shark, blacktip	22	10	398	13	94	12
Shark, bronze whaler	48	37	2294	312	164	160
Shark, grey nurse	.	.	1105	.	.	.
Shark, gummy	.	25	.	.	.	.
Shark, other	2790	3285	3319	3391	4711	4318
Shark, pencil	.	.	318	.	.	.
Shark, thickskin	24	78	3203	37	45	178
Shark, whiskery	128	96	590	146	213	71
Shark, wobbegong	.	.	.	24	6	30
Snapper, goldband	.	.	.	.	.	233
Snapper, northwest (large)	5524	9173	5823	11135	15686	13380
Snapper, pink	17601	57683	63587	83796	62096	53238
Snapper, spangled emperor	865	8936	16675	11556	15454	15187
Sprat, blue	124	.	.	.	.	.
Squid	14	20	54	30	12	.
Sweep	1	.	.	1	.	.
Sweetlip	7147	4883	5855	2292	8482	3039
Sweetlip, emperor	.	2270	2078	14631	8022	17811
Tailor	68	174	84	154	151	359
Trevalla, deepsea	.	.	.	.	.	73
Trevally, other	781	1724	1257	1885	2042	2965
Trevally, skipjack	594	597	879	581	626	649
Trout, coral	1662	4351	4719	4341	8799	10170
Tuna, other	8	222	586	497	812	194
Tuna, skipjack or striped	.	28	37	23	33	111
Tuna, yellowfin	525	936	361	50	316	577
other fish	147	377	258	1468	1242	1355
TOTAL	65844	153949	181030	206629	208669	216366

Appendix 7 (continued)

Wetline catches of Perth Metropolitan blocks 08:40 Wednesday, April 28, 1999 5

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Anchovy	340	.	.	.	.	.	.
Boarfish	.	14	22	.	16	.	.
Bonito	.	.	.	.	7	.	2
Bream, Buffalo	.	.	.	.	.	.	75
Bream, silver (Tarwhine)	705	.	300	30	.	36	75
Cobbler	3647	1454	6335	10756	3029	784	433
Cod	1245	1622	2019	4355	2749	2721	3480
Cod, grey banded	.	.	40	327	139	113	629
Crab, sand	25818	17030	21419	18500	17654	25465	10909
Cuttlefish	78	29	78	241	83	86	197
Dhufish, Westralian	18335	21458	19315	22213	21502	21093	38962
Flathead, other	8	9	23	5	65	50	296
Flounder	120	34	.	.	6	6	6
Footballer	.	.	.	.	2	42	.
Garfish, sea	404	164	674	1227	3663	1550	753
Groper, baldchin	316	243	814	2428	1665	723	1312
Groper, blue	82	1915	1958	2369	1202	821	1574
Gurnard	.	.	.	12	15	.	.
Hapuku	10	.	89	531	91	271	258
Herring, Australian	24026	5130	5417	5571	7402	3438	1867
Herring, Perth	600	1380	229	.	590	.	300
Kingfish, yellowtail	41	.	89	.	.	79	.
Knifejaw	.	.	.	138	20	108	.
Leatherjacket	382	293	274	1964	44	205	350
Ling, pink or rock ling	.	.	.	.	4	.	.
Mackerel, other	84	113	.	.	12	.	100
Mackerel, scaly	2000	878	.	.	.	.	.
Morwong	34	51	30	.	.	.	175
Mullet, sea	30143	27902	41691	25154	12028	16487	13281
Mullet, yellow-eye	26784	26192	18507	5348	6756	3295	6232
Mulloway	50	508	619	34	436	375	445
Octopus	.	.	.	382	58	22	.
Parrot fish	23	20	10	.	166	110	255
Pike, sea	56	34	123	88	149	.	156
Prawn, western school	.	.	220	.	.	.	.
Redfish	944	1473	1308	2329	549	1839	1541
Redfish, bight	25	244	127	455	969	625	798
Roach	.	24	.	.	.	.	.
Salmon, Australian	.	.	3	.	.	10	.
Samsonfish	8238	9877	6762	11136	7969	7123	20008
Scad, yellowtail	1322	41	.	.	130	6	.
Shark, blacktip	.	.	348	967	138	353	671
Shark, bronze whaler	5642	8333	9102	18101	7897	11397	8675
Shark, eastern school	684	.	24	.	75	.	65
Shark, grey nurse	.	.	.	76	51	72	308
Shark, gummy	95	372	78	5	522	1164	2647
Shark, hammerhead	9	32	350	238	154	196	64
Shark, other	2131	3923	1038	4738	5004	3638	11074
Shark, pencil	10	.	.	.	6	8	.
Shark, spurdog	.	.	.	.	40	.	.
Shark, thickskin	152	189	526	685	784	460	1481
Shark, tiger	.	.	.	64	.	116	95
Shark, whiskery	2464	4211	4116	5778	2865	2805	1757
Shark, wobbegong	2744	7252	8864	10483	5280	6398	2775
Skates and Rays	286	555	197	97	666	735	130
Snapper, pink	9455	14197	19411	26389	16005	12713	21190
Snapper, queen	559	2694	4756	5851	2968	1805	1761
Sprat, blue	11460	3623	2084	1113	.	.	.
Squid	3714	3311	3473	5684	3615	2325	3746
Sweep	408	266	368	97	126	70	486
Tailor	242	788	1016	454	134	345	469
Trevalla, deepsea	.	22	65	75	104	.	.
Trevally, other	3757	2621	680	937	407	768	1767
Trevally, skipjack	120	104	26	288	506	42	244
Tuna, other	123	.	.	12	.	.	.
Tuna, skipjack or striped	.	.	.	.	.	55	.
Tuna, yellowfin	.	.	.	98	350	182	108
Whitebait	51670	61953	29626	5398	.	.	.
Whiting, King George	405	312	355	70	871	212	118
Whiting, other	8	.	.	.	.	.	.
Whiting, school	253	660	.	.	100	.	.
Whiting, trumpeter	.	.	.	100	79	.	.
Whiting, western sand	2996	2238	5911	2683	4748	3179	2941

(CONTINUED)

Appendix 7 (continued)

Wetline catches of Perth Metropolitan blocks 08:40 Wednesday, April 28, 1999

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
other fish	1493	2001	1542	2145	415	2142	3728
TOTAL	246739	237786	222449	208217	143080	138660	170768

Appendix 7 (continued)

SPECIES	LIVE WEIGHT (kg)						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Boarfish	24	.	.	8	.	51	.
Bream, Buffalo	.	1200	.	5200	.	.	.
Bream, black	1508	5	100	.	.	.	.
Bream, silver (Tarwhine)	128	31	.	.	.	.	.
Cobbler	117	.	.	.	4	.	.
Cod	1536	1384	1109	1768	1973	3018	2279
Cod, grey banded	64	112	35	302	286	178	230
Crab, sand	720	1387	6341	14164	13734	18506	25748
Cuttlefish	96	160	127	76	84	20	44
Dhufish, Westralian	27853	21179	20583	28955	26841	33211	24982
Flathead, other	27	3	1	18	5	.	19
Footballer	.	.	.	87	.	.	35
Garfish, sea	2169	1408	1252	2953	354	2036	4234
Groper, baldchin	39	.	31	18	44	.	.
Groper, blue	253	434	1245	929	292	441	167
Gurnard	.	1	34	31	16	.	4
Hapuku	400	.	.	1319	9995	11525	7783
Herring, Australian	101157	62136	70244	72890	48597	45905	45229
Herring, Perth	.	2880	.	.	.	.	115
John Dory	.	.	3	.	.	7	.
Kingfish, yellowtail	24	.	90	113	.	249	195
Knifejaw	.	.	.	2	184	.	12
Leatherjacket	52	93	5	50	84	86	293
Mackerel, blue	.	.	.	.	11	19	19
Mackerel, other	11	.	.	.	.	4	18
Mullet, sea	17856	30966	7265	21296	20937	15284	12508
Mullet, yellow-eye	3311	24423	3124	3272	1524	1578	3146
Mulloway	25	9	.	40	20	15	.
Mussel	.	.	.	.	435	400	.
Octopus	3	.	.	.	.	.	.
Perch, yellowtail	51	.	.	.	.	.	.
Pike, sea	237	12	57	3	6	1	72
Redfish	467	314	206	446	1104	1995	3308
Redfish, bight	64	8	55	60	315	102	193
Salmon, Australian	.	3	.	480	.	.	.
Samsonfish	4041	5104	4075	3199	2823	3960	12395
Shark, blacktip	.	95	.	.	.	.	70
Shark, bronze whaler	510	345	674	647	657	612	706
Shark, eastern school	6	43	.	.	.	.	.
Shark, grey nurse	.	224	143	.	95	.	159
Shark, gummy	148	37	719	.	.	14	.
Shark, hammerhead	134	38	.	60	8	24	110
Shark, other	157	41	340	808	753	348	923
Shark, spurdog	.	56	.	.	.	.	.
Shark, thickskin	54	29	54	334	127	215	207
Shark, whiskery	756	171	237	716	150	282	525
Shark, wobbegong	1159	1541	367	1014	250	631	718
Skates and Rays	118	137	.	4	.	.	450
Snapper, pink	1816	2046	1331	4145	4381	8573	7329
Snapper, queen	1641	1663	1484	2247	2156	2371	2811
Sole	.	.	.	.	.	1	.
Sprat, blue	20788	11510	9203	18022	18126	9594	13740
Squid	991	682	1149	281	1048	380	446
Sweep	436	588	904	1001	1755	666	1230
Tailor	993	1238	45	13	617	320	555
Trevalla, deepsea	.	.	.	.	1740	681	494
Trevally, other	2105	1941	1362	4075	7638	4067	15766
Trevally, skipjack	1050	89	.	1630	120	500	2974
Tuna, bigeye	.	.	.	143	.	.	.
Tuna, other	.	.	.	5	.	.	.
Tuna, southern bluefin	.	.	.	9	.	.	.
Whitebait	107279	60723	107695	85563	181494	256086	47761
Whiting, King George	5878	5786	725	549	719	547	343
Whiting, other	50	.	.	.	.	.	107
Whiting, school	.	.	.	.	230	.	.
Whiting, western sand	2486	2029	709	1307	893	1172	1807
other fish	1366	1337	1160	2182	895	891	514
TOTAL	312153	245640	244280	282433	353520	426565	242773