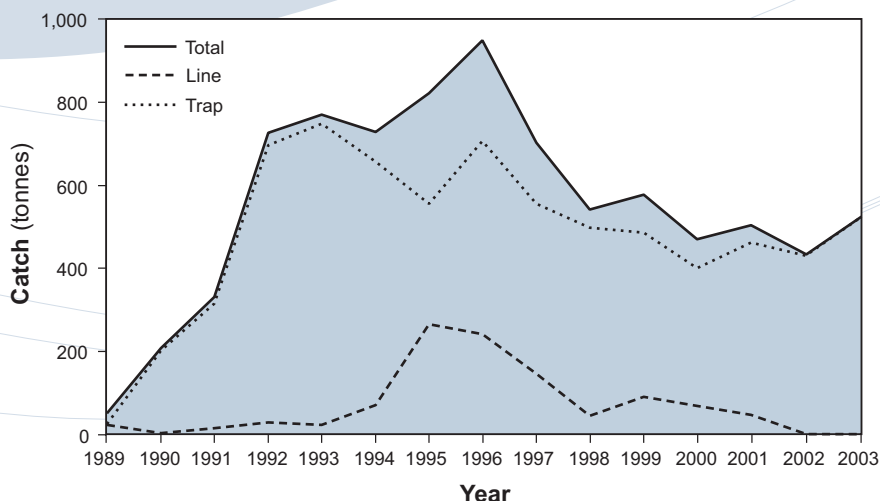


Northern Demersal Scalefish Catch



NORTHERN DEMERSAL SCALEFISH FIGURE 2

Catch levels of demersal finfish in the NDSF by line and trap, 1989–2003.

Pilbara Demersal Finfish Fisheries Status Report

Prepared by P. Stephenson and J. King, with management input by K. Saville

FISHERY DESCRIPTION

The majority of the demersal finfish caught in the Pilbara region are taken by the Pilbara Fish Trawl (Interim) Managed Fishery, with a lesser quantity taken by the Pilbara Trap Managed Fishery. In addition, some demersal scalefish are taken by ‘wetline only’ vessels that do not have access to specific managed fisheries.

The trawl fishery targets 10 main species, namely blue-spot emperor (*Lethrinus hutchinsi*), threadfin bream (Nemipteridae), flagfish (*Lutjanus vitta*), red snapper (*Lutjanus erythropterus*), red emperor (*Lutjanus sebae*), scarlet perch (*Lutjanus malabaricus*), goldband snapper (*Pristipomoides multidens*), spangled emperor (*Lethrinus nebulosus*), frypan snapper (*Argyrops spinifer*) and Rankin cod (*Epinephelus multinotatus*).

The main catch in the trap fishery comprises six of these same species (blue-spot emperor, spangled emperor, red emperor, Rankin cod, red snapper and goldband snapper).

Governing legislation/fishing authority

Pilbara Fish Trawl Fishery (Interim) Management Plan 1997
 Pilbara Trap Management Plan 1992
 Fishing Boat Licence (line fishing)

Consultation process

Department–industry meetings

Boundaries

The boundaries of the Pilbara Fish Trawl (Interim) Managed Fishery are the waters lying north of latitude 21°35' S and

between longitudes 114°9'36" E and 120° E on the landward side of a boundary approximating the 200 m isobath and seaward of a line generally following the 50 m isobath (Pilbara Figure 1). The trawl fishery consists of two zones. Zone 1, in the west of the fishery, is currently not being trawled. In Zone 2, the interim management plan introduced in 1998 set down boundaries for six management sub-areas. The exact latitudes and longitudes delineating the areas are listed in the Pilbara Fish Trawl Fishery (Interim) Management Plan 1997.

The Pilbara Trap Managed Fishery (Pilbara Figure 1) lies north of latitude 21°44' S and between longitudes 114°9'36" E and 120° E on the landward side of a boundary approximating the 200 m isobath and seaward of a line generally following the 30 m isobath. The exact latitudes and longitudes delineating the fishery are listed in the Pilbara Trap Management Plan 1992.

Management arrangements

The trawl and trap fisheries are both managed primarily by the use of input controls in the form of individual transferable effort allocations monitored with a satellite-based vessel monitoring system.

The trawl fishery came into a formal management framework in 1998 with effort levels determined (FRDC project 93/125) to achieve the best yield from the fishery while keeping exploitation rates of the key indicator species, red emperor and Rankin cod, at sustainable levels. This involved a number of areas being closed to trawling, namely Zone 1, Area 3, Area 6, and the area inshore of the 50 m depth isobath. Since then, effort has been reduced and redistributed on the basis of annual assessments of the main target species and age-structured modelling of red emperor, Rankin cod and blue-spot emperor. There are 11 licence units with varying time allocations throughout the various areas, with the allocation being used by the equivalent of four full-time vessels.

The ITE management arrangements introduced into the trap fishery in January 2000 dealt with the issue of latent effort in the fishery and proved effective at holding the fishery within its acceptable 300 t limit. However, the ability of the fishery to target long-lived species like red emperor may require limits on the catch of specific species in the future. There are six licences in the fishery, with the allocation used by two vessels in 2003.

In 2003, following a research stock assessment, the value of allocated units was altered to effect a 7% overall effort reduction in the trawl and trap fishery. The trawl unit value was reduced by 10% in Areas 1 and 5 to achieve this.

A comprehensive risk assessment was conducted for the trawl and trap fisheries while developing an application for environmental sustainability certification. This process has determined a number of performance indicators for the fisheries, which state that a review and possible management action will be triggered if:

- spawning biomass across all management areas of the Pilbara falls below 40% (target) and 30% (limit) of the 1972 level for red emperor, the 1990 level for Rankin cod, or the 1993 level for blue-spot emperor (these three species are used as indicators of the other species in the fishery);
- the catch rate of any of the main target species has decreased in three consecutive years; or
- the catch of any of the main target species has increased by more than 20% of the previous four-year average.

Plans for future management of line fishing in the Pilbara are being considered during the current statewide wetline fishing review.

Research summary

Baseline research for managing these important fish stocks was conducted in two FRDC-funded projects from 1993 to 1999, providing a basis for long-term research monitoring of the stocks.

The monitoring of the Pilbara fishery now focuses on the collection of spatial data on effort and catch of 10 major target species in the trawl and trap fisheries. Otoliths (for age-composition analysis) are collected from the trawl catches of the three indicator species red emperor, Rankin cod and blue-spot emperor, and from 2004 will also be collected from goldband snapper. The status of the fishery is determined annually using catch and catch rates of the 10 major species, and every two to three years the data on the indicator species will be incorporated in the age-structured stock assessment model.

In 2004, an observer program will commence in the trawl fishery to improve estimates of the quantity of bycatch, especially protected species. In addition, an FRDC-funded bycatch mitigation project will commence. This will investigate ways of reducing the catch of dolphins and turtles.

RETAINED SPECIES

Commercial production (season 2003):

Trawl 2,860 tonnes
Trap 363 tonnes
Line 81 tonnes

Landings

Catches of the major species for 2003 are shown in Pilbara Table 1. The catches by different fishing methods for the years 1985 to 2003 are shown in Pilbara Table 2 and illustrated in Pilbara Figure 2. Demersal scalefish catch by trawl, trap and line was 2,860 t, 363 t and 81 t respectively.

The trawl catch was outside the acceptable range due to retention of a greater variety of species and increased catch rates of many species. The composition of the trawl fishery demersal scalefish catch changed in 2003 with increased catches of some small species (blue-spot emperor, flagfish and threadfin bream) and a decrease in catches of some larger species (spangled emperor, red snapper and goldband snapper). Thus the major target species landed in 2003 (2002 catch in brackets) were blue-spot emperor 601 t (353 t), threadfin bream 456 t (363 t), flagfish 244 t (211 t), red snapper 220 t (278 t), red emperor 106 t (79 t), scarlet perch 91 t (82 t), goldband snapper 79 t (99 t), spangled emperor 39 t (19 t) and Rankin cod 24 t (17 t). Retained by-product was 154 t, including shark 67 t (68 t), bugs 7 t (5 t) and cuttlefish 78 t (104 t). The catch performance indicator was triggered in 2003 with blue-spot emperor, threadfin bream, red snapper, red emperor, goldband snapper and spangled emperor catches exceeding the four-year average by more than 20%. The catch levels of these species will require review in 2004.

The trap fishery catch increased to 363 t in 2003 (306 t in 2002). Major species taken by the trap fishery in 2003 (2002 figures in brackets) were blue-spot emperor 68 t (57 t), red emperor 43 t (36 t), Rankin cod 39 t (20 t), red snapper 38 t (41 t) and goldband snapper 34 t (38 t). The trap catch was outside the acceptable catch range due to fishers retaining a greater variety of species and the catch rate increasing for several species. There is no by-product in this fishery.

Demersal scalefish catches by line fishing were lower in 2003 at 81 t (90 t in 2002). The catches in 2003 (2002 figures in brackets) were mainly goldband snapper 16 t (27 t), red emperor 6 t (6 t), spangled emperor 5 t (11 t) and Rankin cod 3 t (3 t). In addition, line vessels recorded catches of 133 t (193 t) of sharks and rays (which includes part of the North Coast Shark Fishery catch) and 132 t (119 t) of mackerel in the Pilbara.

The Pilbara shark catch is reported in more detail in the Northern Shark Fisheries Status Report (pp. 146-150), and the mackerel catch in the Mackerel Fishery Status Report (pp. 141-146).

Fishing effort/access level

The fishing effort in the trap, line and trawl sectors of the commercial fishery is shown in Pilbara Table 3. The effort measured in days comes from monthly catch and effort returns. For the trawl fishery, however, the effort from 1991

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to 2003 is also recorded as the net bottom time (hours) taken from skippers' voluntary log book data.

In the trawl fleet there are the equivalent of four full-time vessels. The number of hours allocated to the fleet in each area of the fishery (verified by a satellite monitoring system), the number of hours used (VMS effort), and the percentage of the allocation used over the period 1998–2003 are shown in Pilbara Table 4.

The management plan allows for some over-run in effort between areas. In 2003 the effort over-run was 1% in Area 2 and 4% in Area 4 (compared with 1% and 3% in 2002). There was no trawling in Area 3 or Area 6 in 2003.

Two trap boats were allocated 5,867 trap units in 2003 (days multiplied by number of traps) and the number of units used, calculated from VMS, was 5,733. This number of units equates to 389 days fished with an average of 13.7 traps per day, a decrease from the average of 15.2 traps used per day in 2002. The number of days allocated, the number of days used and the percentage of the allocation used for the period 2000–2003 are shown in Pilbara Table 5.

In 2003, line fishers reported operating for 715 days, compared with 660 days in 2002. This effort does not include trolling, which is reported in the Mackerel Fishery Status Report (pp. 141-146), nor the dropline and longline effort in the Northern Shark Fisheries (pp. 146-150).

Catch rate

Concerns over the decline in catch rates of Rankin cod and spangled emperor in 2002 resulted in a review and consequent effort reduction in 2003. In 2003, catch rates increased for the target species, including Rankin cod, and this indicator was not triggered.

The trawl catch rates (based on nominal VMS effort) for red emperor increased in every area of the fishery, between 30% and 50%. The catch rates in kg/hour for 2003 (2002 in brackets) in Areas 1, 2, 4, and 5 were 3.5 (2.2), 9.6 (6.3), 7.1 (5.2) and 4.3 (3.4). Rankin cod trawl catch rates have also increased in 2003. Based on nominal effort the 2003 catch rates in kg/hour (2002 in brackets) were 0.8 (0.4), 1.6 (1.2), 2.2 (1.4) and 1.5 (1.1). The trawl catch rates of the major species, pooled for all areas, between 1989 and 2003 are shown in Pilbara Figure 3 and Pilbara Figure 4. The total demersal scalefish catch rate from the trawl fishery increased by 27%, from 112 kg/hour in 2002 to 142 kg/hour in 2003, due to increased stock size, retention of a greater variety of species, and increased efficiency.

Catch rates of the major species in the trap fishery (based on reported number of days fished) from 1985 to 2003 are shown in Pilbara Figure 5. The total scalefish catch rate increased from 801 kg/day in 2001 to 933 kg/day in 2003 (a 25% increase) due to increased stock size, retention of more short-lived species, and some efficiency increase.

The line catch rate in 2003 was considerably lower than in 2002.

Recreational component:

< 2%

There is a major recreational fishery in the Pilbara and the charter sector in this area is an increasing user of the resource, however the inshore closures to the commercial sector provide a degree of separation between the two groups. The reported charter catches of the two key commercial species, red emperor and Rankin cod, were 3 t and 1 t respectively in the Pilbara in 2002/03.

In addition, there are data available from a 12-month creel survey of recreational boat-based and shore-based fishing in the Pilbara and West Kimberley region conducted from December 1999 to November 2000 (Williamson et al., in prep.). In the entire survey area (Onslow to Broome), the total recreational fishing effort for the year was estimated to be 190,000 fisher days and the total recreational scalefish catch about 300 t. Recreational fishers in the survey area reported an estimated total catch of 12 t of spangled emperor, 6 t of red emperor, and less than 1 t of scarlet perch. Boat- and shore-based recreational fishers do not catch significant quantities of the other species that are targeted by the commercial Pilbara trawl, trap and line fisheries, which generally operate further offshore.

STOCK ASSESSMENT

Assessment complete:

Yes

Red emperor and Rankin cod are used as indicators of long-lived species and blue-spot emperor is used as an indicator of short-lived species.

In 2002, the stock assessment model used catches from the four sectors of the fishery (trawl, trap, line and recreational) together with catch rate and age-composition data from the trawl fishery. The assessment indicated that the stock of the three species appears adequate. The model using 2002 data indicated an upward trend in spawning biomass of red emperor, depleted Rankin cod stocks in Area 5, and the blue-spot emperor stock in Area 1 depleted but increasing.

The 2003 catch rates increased in all areas for these three indicator species, generally confirming the model predictions.

There have been quite variable efficiency increases between vessels in the Pilbara trawl fishery in 2002 and 2003, with consolidation of the fleet and vessel changes resulting in an estimated efficiency increase of 15% in the two-year period. It also appears that some of the additional increase in catch rate (20% over two years) is due to increased stock size of target species and a reduction in the quantity of discarded fish. It is likely that the 7% effort reduction introduced in 2003 will need to be followed by a further effort reduction in the trawl and trap sector to compensate for efficiency increases.

The line fishers in the Pilbara have unrestricted access and this continues to be of concern. There are ongoing indications that line fishers are operating in deeper water targeting goldband snapper and other deeper-water species which generally have a biology which makes them vulnerable to over-exploitation. The goldband snapper stocks in the Pilbara are managed separately from the adjacent Gascoyne and Kimberley regions as there is little mixing of recruited goldband snapper over this spatial scale. The very high goldband catch by line fishers in

the Pilbara in 2001 highlighted the risk to the stock posed by a small number of dedicated line operators.

Exploitation status: Fully exploited

Breeding stock levels: Adequate

The spawning biomass of the indicator species was above the target performance level and this is supported by increasing catch rates.

The effort reduction in 2003 should ensure breeding stock levels of the indicator species are maintained at satisfactory levels in the short term. Effort adjustment to compensate for any further increased efficiency will be necessary in the future.

NON-RETAINED SPECIES

Bycatch species impact: Low

The bycatch survey in the trawl fishery (Stephenson and Chidlow 2003) indicated an annual discard of 1,000 t of unmarketable scalefish and 150 tonnes of sharks. The scalefish and small species of sharks returned to the water are expected to have poor survivorship.

The trap and line fisheries have minimal bycatch.

Protected species interaction: Moderate

The trawl bycatch survey (Stephenson and Chidlow 2003) documented the incidental capture of dolphins, turtles, sea snakes, pipefish and seahorses. Turtles and sea snakes are generally returned to the water alive but dolphins, pipefish and seahorses are generally dead when landed. Given the area of distribution and expected population size of these protected species, the impact of the trawl on protected species is probably minimal. There is a small catch of green sawfish, a species which is expected to be protected in the near future.

A new trawl log book, revised to enable the recording of protected species, was introduced at the end of 2003. Mechanisms to reduce the interaction of fishing gear with dolphins are being investigated.

There is no indication of interaction between the line fishery and protected species. The trap fishery has a negligible impact on protected species.

ECOSYSTEM EFFECTS

Food chain effects: Low

The current fish trawl fishery operates with standard stern trawling gear (single net with extension sweeps) within an area previously trawled by a Taiwanese fleet. Historical research by CSIRO has suggested that the extensive Taiwanese pair trawl fishery caused a significant decrease in the biomass of finfish on the North West Shelf, and a change in species composition towards smaller species. The current Australian trawl fishery, which developed when the fish stocks had somewhat recovered, uses a much larger mesh size and much lighter ground rope, and operates at lower exploitation rates. The present levels of trawl and trap effort appear to be resulting in increased catch rates, probably due to increased

stock size. Overall, the effect of the fishery on the food chain of the North West Shelf is considered to be at an acceptable level.

Habitat effects: Moderate

Impacts to the habitat are restricted to those of the trawl fishery, which is restricted to a relatively small proportion of the North West Shelf (Pilbara Figure 1). Area 3 and the waters inside 50 m are permanently closed to trawling, Zone 1 is currently closed to trawling, and Area 6 has had no trawl effort allocation since 2000.

Within the area open to trawling, past research has indicated that approximately 10% of the sessile benthic fauna (e.g. sponges) is detached per year, with higher rates in Area 1 where the effort is concentrated. Recent analysis of archived photographs of benthos by CSIRO indicates the diversity was greatest in Area 1 of the trawl fishery. It is not known whether the detachment rate exceeds the rate of regrowth.

SOCIAL EFFECTS

It is estimated that 22 fishers on 4 vessels were directly employed during 2003 in the Pilbara trawl fishery, and 7 fishers on 2 vessels in the trap fishery. The level of employment in line fishing is not available.

ECONOMIC EFFECTS

Estimated annual value (to fishers) for year 2003:
\$11.2 million

This estimate is based on the landed weight and price of each species as supplied by fish processors.

There has been little overall increase in fish prices in the last two years. The trawl demersal finfish catch is dominated by lower-valued species such as blue-spot emperor and threadfin bream, and its value in 2003 was \$9.1 million. The trap and line catches are dominated by the valuable species such as red emperor and goldband snapper, and the demersal scalefish catch from these sectors was valued at approximately \$1.7 million (trap) and \$400,000 (line). Important components of the line catch are shark and Spanish mackerel, which have not been included in the value of the line fishery, but are recorded in the Northern Shark Fisheries Status Report (pp. 146-150) and the Mackerel Fishery Status Report (pp. 141-146) respectively. The trawl fishery also has a retained by-product valued at \$500,000.

The catches from the Pilbara fisheries dominate the Western Australian metropolitan markets and support the local fish processing sector. There is also an increasingly important export of scalefish to Europe and Asia.

FISHERY GOVERNANCE

Acceptable catch range (2004):
Trawl 2,000–2,800 tonnes
Trap 160–360 tonnes
Line 50–115 tonnes

In the trap and line fisheries, the acceptable catch range was previously based on the catch variation of the target

North Coast Bioregion

species over the period 1993 to 2001. In the trawl fishery, the acceptable catch range was determined from the past catch rates and the allocated effort.

The trawl and trap fishery catches in 2003 were above the acceptable ranges as previously set (trawl 1,900–2,200 t, trap 150–300 t) due to retention of more species, increased stock size, and to a lesser extent efficiency increases.

Between 2001 and 2003 there was an effort reduction of 7% and an estimated increase in the exploitable biomass of 20%. On this basis, the acceptable catch range for the trawl fishery has been revised to 2,000–2,800 t, and for the trawl fishery to 160–360 t.

Consideration should be given to setting an effort level in the trawl and trap fishery which could be left unadjusted for several years. There would need to be appropriate adjustment to the allocated effort in the trawl and trap sectors. The increased line catch of deep-water species like goldband snapper and the increasing charter catch are also cause for concern, as these sectors do not have effort or catch limits at present.

New management initiatives (2003/04)

On 1 July 2003, the management period for the trawl fishery changed from calendar year to financial year. This will facilitate effort management by fishers in the peak pre-Christmas marketing period when cyclones are more likely to occur.

The Australian Government Department of Environment and Heritage is currently considering an application to certify the Pilbara trap and trawl fisheries as environmentally sustainable under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*.

Planning for future management of line fishing in the Pilbara is continuing.

EXTERNAL FACTORS

The area available for fishers has decreased over recent years as a result of exclusion zones for gas pipeline and facilities. Seismic surveys also restrict the operation of fishers. However, neither of these operations is expected to significantly affect fish catches.

PILBARA TABLE I

Commercial catches (to the nearest tonne) and the percentages (to the nearest 1%) of each major species taken by trawl, trap and line in the Pilbara in 2003.

	FISH TRAWL CATCH		TRAP CATCH		LINE CATCH		TOTAL CATCH
	tonnes	%	tonnes	%	tonnes	%	tonnes
Blue spot emperor <i>Lethrinus hutchinsi</i>	601	90%	68	10%	-	-	669
Threadfin bream <i>Nemipteridae</i>	456	100%	-	-	-	-	456
Red snapper <i>Lutjanus erythropterus</i>	220	84%	38	15%	3	1%	261
Flagfish <i>Lutjanus vitta</i>	244	97%	7	3%	-	-	251
Goldband snapper <i>Pristipomoides multidens</i>	79	61%	34	27%	16	12%	129
Red emperor <i>Lutjanus sebae</i>	106	68%	43	27%	6	5%	155
Scarlet perch <i>Lutjanus malabaricus</i>	91	87%	10	10%	4	3%	105
Spangled emperor <i>Lethrinus nebulosus</i>	39	38%	59	57%	5	5%	103
Frypan snapper <i>Argyrops spinifer</i>	47	98%	1	2%	-	-	48
Rankin cod <i>Epinephelus multinotatus</i>	24	36%	39	60%	3	4%	66
Other demersal scalefish	953	90%	64	6%	44	4%	1,061
All demersal scalefish	2,860	87%	363	11%	81	2%	3,304
Shark and ray	67	33%	0	-	133*	67%	200
Other by-product	87	100%	0	-	0	-	87

* Includes part of the North Coast Shark Fishery catch.

PILBARA TABLE 2

Summary of reported commercial catches (t) of demersal scalefish by line, trap and trawl in the Pilbara fishery, as well as by-product from the fish trawl fishery.

YEAR	DEMERSAL SCALEFISH				BY-PRODUCT*
	Line	Trap	Trawl	Total	Trawl
1985	180	168	-	348	-
1986	65	113	-	178	-
1987	67	192	3	262	-
1988	136	243	3	382	-
1989	104	457	124	685	-
1990	157	407	421	985	4
1991	107	119	754	980	14
1992	63	148	1,413	1,624	21
1993	67	178	1,724	1,969	42
1994	79	207	2,506	2,792	102
1995	95	222	2,821	3,138	77
1996	136	302	3,201	3,639	102
1997	109	234	2,630	2,973	133
1998	78	250	2,512	2,840	119
1999	50	371	2,136	2,419	69
2000	59	257	1,995	2,314	80
2001	99	266	2,221	2,592	150
2002	90	306	2,310	2,706	180
2003	81	363	2,860	3,304	154

* By-product consists of shark, cuttlefish, rays, bugs, and tropical lobster.

PILBARA TABLE 3

Summary of effort in the Pilbara fishery. The trap, line and trawl effort (days) is from monthly catch and effort returns. The trawl effort (hours) is nominal effort from operators' log book data.

YEAR	LINE (days)	TRAP (days)	TRAWL (days)	TRAWL (hours)
1985	809	709	-	-
1986	655	548	19	-
1987	614	507	17	-
1988	985	804	32	-
1989	863	1,198	310	-
1990	1,332	1,321	698	-
1991	740	472	1,132	8,660
1992	514	681	983	10,030
1993	876	696	832	10,725
1994	732	545	1,484	22,087
1995	852	608	1,571	21,529
1996	814	513	1,550	25,246
1997	809	483	1,389	19,810
1998	692	503	1,291	20,555
1999	453	842	1,139	15,963
2000	500	518	957	14,084
2001	401	446	1,162	15,330
2002	660	418	1,035	17,329
2003	715	412	-	14,663

WEST COAST
BIOREGION

GASCOYNE COAST
BIOREGION

NORTH COAST
BIOREGION

SOUTH COAST
BIOREGION

NORTHERN INLAND
BIOREGION

SOUTHERN INLAND
BIOREGION

North Coast Bioregion

PILBARA TABLE 4

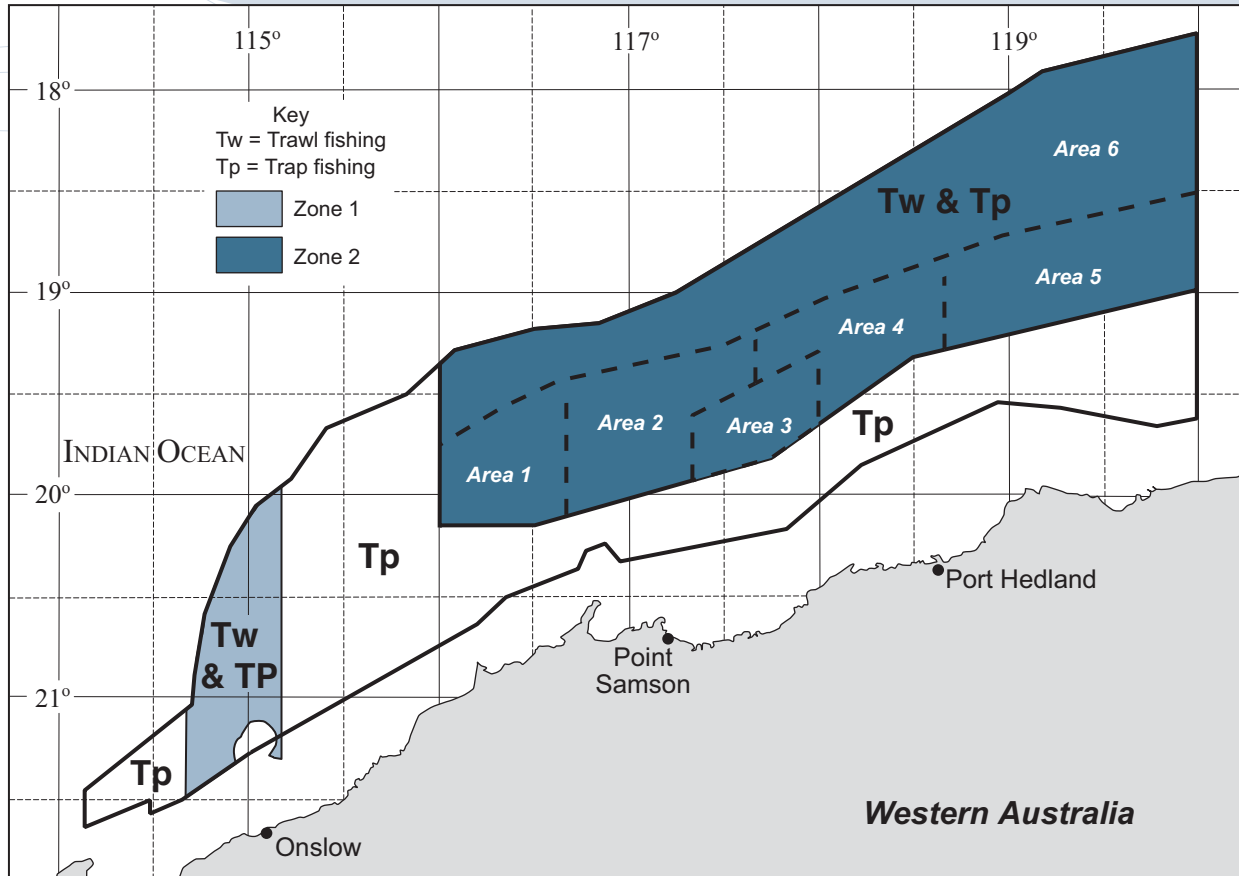
The number of hours allocated, the number of hours used and the percentage of the allocation used in each area of the Pilbara trawl fishery.

		AREA 1	AREA 2	AREA 3	AREA 4	AREA 5	TOTAL
1998	time allocation	17,136	3,360	0	3,360	5,712	29,568
TRAWL	time used	15,076	3,842	0	3,736	4,955	27,609
	% of time used	88%	114%	-	111%	87%	93%
1999	time allocation	11,481	3,360	0	3,057	5,198	23,096
TRAWL	time used	10,237	3,767	0	3,213	4,973	22,190
	% of time used	89%	112%	-	105%	96%	96%
2000	time allocation	11,481	3,360	0	3,057	5,198	23,096
TRAWL	time used	9,438	3,928	0	3,358	4,476	21,199
	% of time used	82%	117%	-	110%	86%	92%
2001	time allocation	10,624	3,797	0	3,528	5,141	23,090
TRAWL	time used	10,428	4,091	0	3,644	4,819	23,000
	% of time used	98%	108%	-	103%	94%	100%
2002	time allocation	10,624	3,797	0	3,528	5,141	23,090
TRAWL	time used	9,040	3,848	0	3,624	4,213	20,544
	% of time used	85%	101%	-	103%	82%	90%
2003	time allocation	8,911	3,542	0	3,293	4,325	20,070
TRAWL	time used	9,562	4,303	0	3,299	2,995	20,159
	% of time used	107%	121%	-	100%	69%	100%

PILBARA TABLE 5

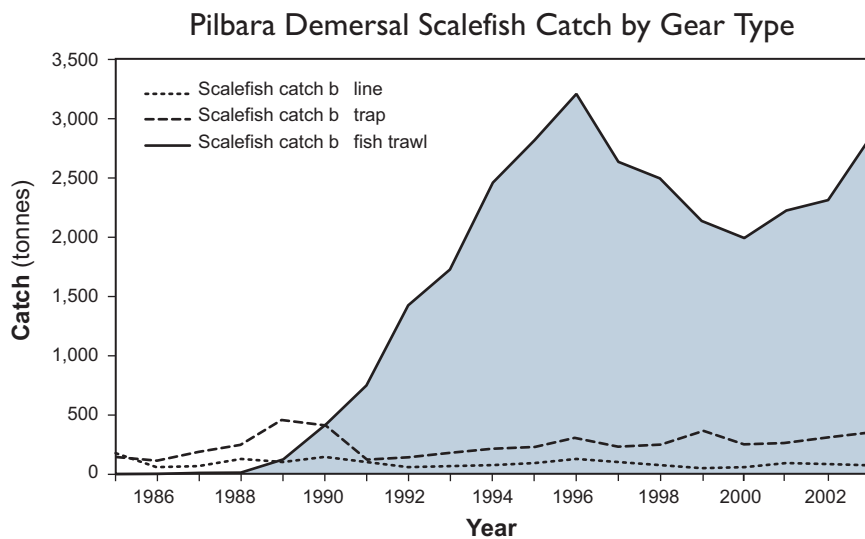
The number of days allocated, the number of days used and the percentage of the allocation used in the Pilbara trap fishery.

2000	time allocation	524
TRAP	time used	507
	% of time used	97%
2001	time allocation	420
TRAP	time used	414
	% of time used	99%
2002	time allocation	385
TRAP	time used	382
	% of time used	99%
2003	time allocation	399
TRAP	time used	389
	% of time used	98%



PILBARA FIGURE 1

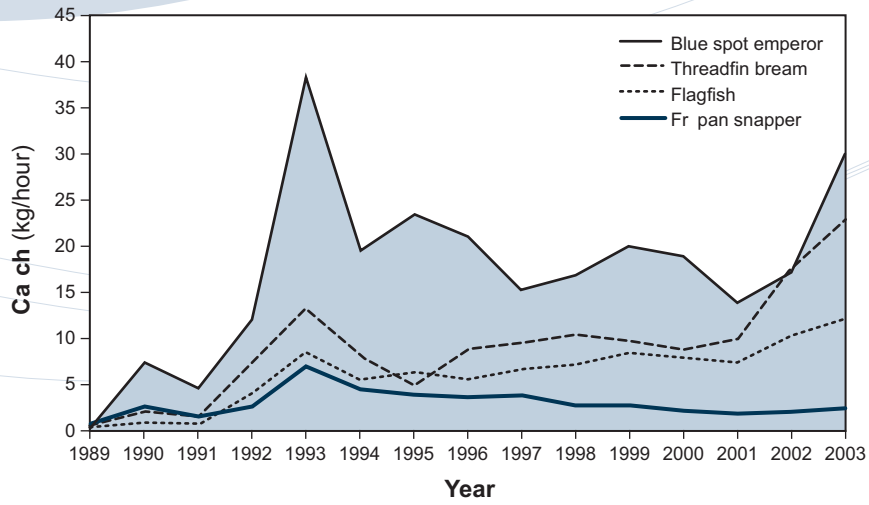
Demersal scalefish fisheries of the Pilbara region of Western Australia. Areas 1 to 6 refer to the management regions in Zone 2 of the trawl fishery. Zone 1 has been closed to trawling since 1998.



PILBARA FIGURE 2

Demersal scalefish catches by trawl, trap, and line from 1985 to 2003.

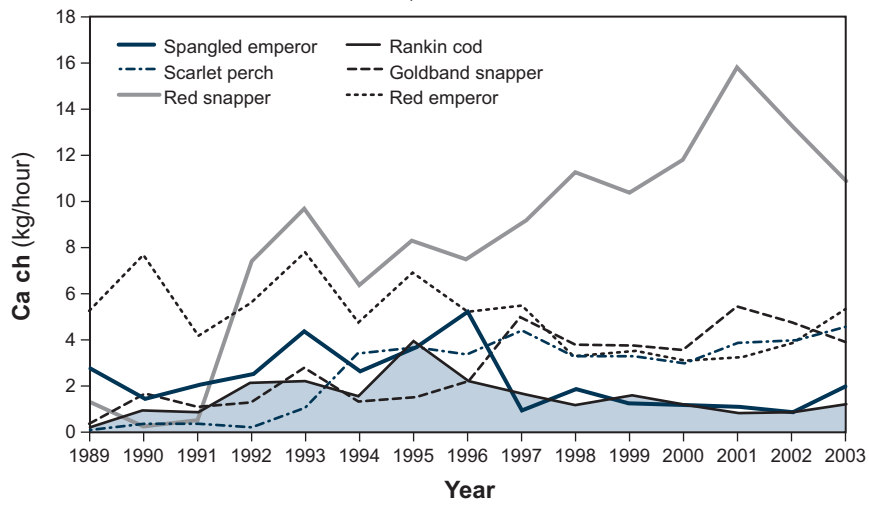
Pilbara Short-lived Scalefish Catch
By Fish Trawl



PILBARA FIGURE 3

Catch rates (kg/hour) of short-lived scalefish caught by trawl from 1989 to 2003.

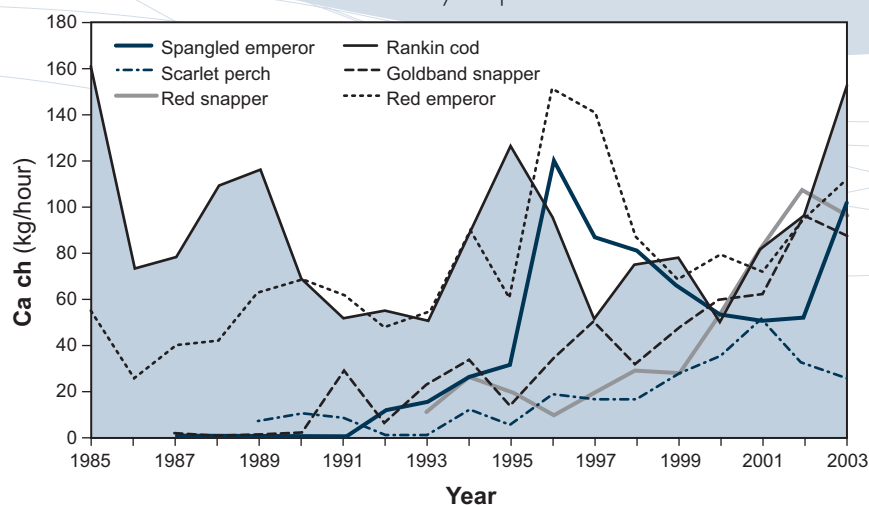
Pilbara Long-lived Scalefish Catch
By Fish Trawl



PILBARA FIGURE 4

Catch rates (kg/hour) of long-lived scalefish caught by trawl from 1989 to 2003.

Pilbara Long-lived Scalefish Catch By Trap



PILBARA FIGURE 5

Catch rates (kg/day) of long-lived scalefish caught by trap from 1985 to 2003.

Mackerel Fishery Status Report

Prepared by M. Mackie, with management input by J. Kennedy

FISHERY DESCRIPTION

The mackerel fishery includes the taking of all species of the genera *Scomberomorus*, *Grammatorcynus* and *Acanthocybium*, but the most commonly targeted species is Spanish mackerel (*Scomberomorus commerson*). Mackerel are usually taken by trolling close to the surface in coastal areas around reefs, shoals and headlands, but some operators also jig for grey mackerel (*Scomberomorus semifasciatus*). The commercial fishery mainly operates between Geraldton and the WA/NT border, with the largest catches being recorded off the Kimberley and Pilbara coasts. Fishing methods vary somewhat to suit the conditions in different regions.

Kimberley: Some operators in the Kimberley use dories, small boats of approximately 4–6.4 m in length which work in conjunction with the main fishing boat (usually 15–20 m in length). Each dory usually trolls two to three lines. Fishing gear used in this area is relatively heavy (8–10 mm rope with a 200+ kg mono line and wire trace), crew numbers vary between three and five, and fishing trips generally last between one and three weeks. Mackerel captured in this area are usually filleted, boxed and frozen for distribution throughout Australia.

Pilbara: Vessels used in this area are between 9 and 15 m in length, with one to two crew using 180 kg mono line and wire trace. In recent years the main catches from this area have come from the vicinity of Port Hedland. Fishing trips usually last less than a week, and the product is trunked, brined, and sold locally or sent fresh to Perth markets.

Gascoyne/west coast: Boats used in these areas are usually 7–15 m in length and are crewed by one to two persons for trips of one to five days' duration. Fishing gear used is rod and reel with 20–30 kg line and wire trace. Fish caught by Carnarvon- and Quobba-based fishers are usually kept whole in brine for export, while fish landed at other ports are usually trunked and sold locally or sent fresh to Perth markets.

Governing legislation/fishing authority

Fish Resources Management Regulations 1995
Fishing Boat Licence

Consultation process

Department–industry meetings

Boundaries

While the mackerel fishery at this stage has no formal boundaries, catches are reported in four areas: Kimberley (121° E to WA/NT border), Pilbara (114° E to 121° E), Gascoyne (27° S to 114° E) and west coast (Cape Leeuwin to 27° S).

Management arrangements

The mackerel fishery is currently open to all WA fishing boat licence holders and subject only to minimum legal sizes of 90 cm total length (TL) for Spanish mackerel, 75 cm TL for grey mackerel and 50 cm TL for 'other' mackerel.

However, formal management of the fishery will commence in the latter half of 2004 under an interim management plan (IMP), which has been developed in consultation with a Mackerel Independent Advisory Panel and stakeholders.

The new management arrangements will initially limit access to each of the three areas of the fishery (Kimberley, Pilbara and Gascoyne/west coast) to those who meet specific access