

Annual status report

East Coast Spanish Mackerel Fishery

April 2007



The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

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Inquiries should be addressed to:

Intellectual Property and Commercialisation Unit
Department of Primary Industries and Fisheries
GPO Box 46
Brisbane Qld 4001

or

copyright@dpi.qld.gov.au
Tel: +61 7 3404 6999

Introduction

The East Coast Spanish Mackerel Fishery (ECSMF) is a line fishery targeting the largest of the mackerel species in Queensland—*Scomberomorus commerson*. Spanish mackerel are highly sought after by both commercial and recreational fishers.

This report covers the financial year of July 2005 – June 2006.

Description of the fishery

Fishery profile 2005–06

Total harvest from all sectors 2005–06: Approximately 729 t

Commercial harvest 2005–06: Approximately 271 t

Recreational harvest 2002: Approximately 425 t

Indigenous harvest: Uncertain, but considered negligible

Charter harvest 2005: Approximately 33 t

Commercial Gross Value of Production (GVP) 2005–06: Approximately \$4 million

Number of licences: 297 (as of November 2006)¹

Commercial fishing boats accessing the fishery in 2005–06: 154

Fishery season: Predominantly late spring/early summer, but Spanish mackerel may be caught all year round

Fishing methods

The ECSMF is a line-only fishery in which both commercial and recreational fishers are permitted to use a maximum of three lines and up to six hooks. Spanish mackerel are generally caught while trolling.



Fishing area

Commercial operators with a Spanish Mackerel (SM) fishery symbol and who possess a line fishing endorsement (L) (i.e. L1, L2, L3, L6, L7 and L8), are permitted to take Spanish mackerel in east coast Queensland waters. The L symbol dictates the area in which they can fish (see Figure 1).

The harvest of Spanish mackerel in the Gulf of Carpentaria (GOC) is managed separately to the east coast and reported in the GOC Line Fishery Annual Status Report.²

¹ As of November 2006, the Department of Environment and Water Resources (DEW) (formerly known as the Department of Environment and Heritage) holds 36 licences under the Great Barrier Reef Marine Park Structural Adjustment Package.

² Annual status reports for all Queensland fisheries are available on the internet at www.dpi.qld.gov.au/fishweb

Main management methods used

Management of the ECSMF is the responsibility of DPI&F. A range of input and output controls are set out in the *Fisheries Regulation 1995* and are used to manage the harvest of Spanish mackerel. These controls include:

- A commercial Total Allowable Catch (TAC), shared through individual transferable quotas.
- A minimum size limit of 75 cm.
- A recreational in-possession limit of three fish.
- Total closures to the take of Spanish mackerel in certain areas.
- Permits to commercially fish for Spanish mackerel in grey nurse shark designated areas in southern Queensland.
- A mandatory requirement for recreational fishers to remove a pectoral fin from a retained fish.
- Restrictions on the maximum size of boat permitted in the commercial fishery.

Further closures to fishing for Spanish mackerel are implemented through marine parks zoning (marine national park and other no take or no entry zoning).

Approximate allocation between sectors

The Spanish mackerel resource has historically been shared almost equally between the commercial and recreational sectors. DPI&F believe that the catch share may have shifted towards the recreational sector as a result of the low commercial catch during 2005–06.

Fishery accreditation under *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

A Wildlife Trade Operation (WTO) approval, acknowledging that the fishery was being managed in an ecologically sustainable manner, and allowing the continued export of Spanish mackerel caught on the east coast of Queensland, was granted in December 2004 under Part 13A of the EPBC Act. The approval expires in November 2007.

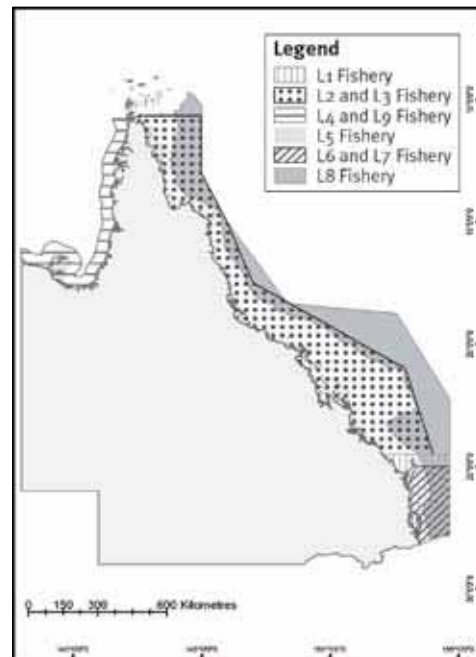


Figure 1: Map of Fishery area.

Catch statistics

Commercial

The commercial catch of Spanish mackerel (Figure 2), as per the Commercial Fisheries Information System (CFISH), has historically exhibited a stable catch per unit effort trend, despite inter-annual variability in total catch. As Spanish mackerel are a schooling species, and known to aggregate for spawning, there is some potential for declines in stock size without apparent changes in catch per unit effort (CPUE). Therefore, temporal changes in CPUE cannot be assumed to reflect changes in the biomass of the Spanish mackerel stock. The non-proportionality in the relationship between CPUE and stock abundance is known as ‘hyperstability’³ and presents a challenge for monitoring and management. For this reason, stock assessments using age-structured models are undertaken for the east coast Spanish mackerel fishery.

Ryan (2004)⁴ considered the catch history to consist of two clear periods (pre- and post-1997) with the increase in catch post-1997 corresponding to speculative fishing following the 1997 investment warning for the Coral Reef Fin Fish Fishery. This increase in catch was followed by a sharp reduction between 2002–03 and 2003–04, and the decline has continued in the 2005–06 period (Figure 2). This is likely to be a result of the introduction of the SM fishery symbol in February 2004, and the associated decrease in the number of boats accessing the fishery.

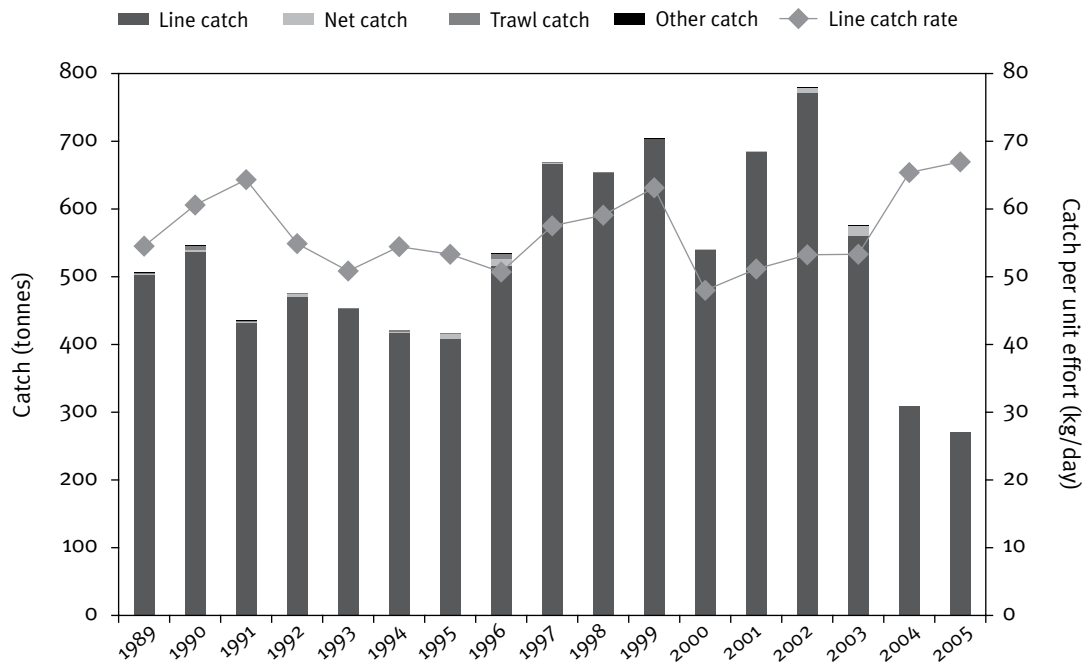


Figure 2: Total commercial catch and effort of Spanish mackerel 1989–90 to 2005–06 financial year.

³ Welch, D, Hoyle, S, Gribble, N and McPherson, G 2002, *Preliminary assessment of the east coast Spanish mackerel fishery in Queensland*, Department of Primary Industries and Fisheries, Brisbane.

⁴ Ryan, S 2004, *Ecological assessment of the Queensland east coast Spanish mackerel fishery*, Department of Primary Industries and Fisheries, Brisbane, Australia.

Figure 3 shows the decline in both boat numbers (187 in 2004–05, down from 432 in 2003–04) and days fished.

The catch decline was most evident during the first quota year, from 561 t in 2003–04 to 309 t in 2004–05. In 2005–06 the catch decreased further to 271 t (Figure 2). Effort also declined by more than half, from 10 531 days in 2003–04 to 4733 days in 2004–05, and continued to drop in 2005–06 to 4047 days (Figure 3). The number of boats accessing the fishery also continued to decline to an historic low of 154 in 2005–06 (Figure 3). Concurrent with decreases in effort, the catch per unit effort continues to rise (67 kg/day compared with 65.3 and 53.3 kg/day in 2004–05 and 2003–04 respectively). It is likely that this increase in catch per unit effort is a result of the more active and efficient operators remaining in the fishery following the introduction of new management arrangements in early 2004 and the removal of less efficient Spanish mackerel fishers (Figure 4).

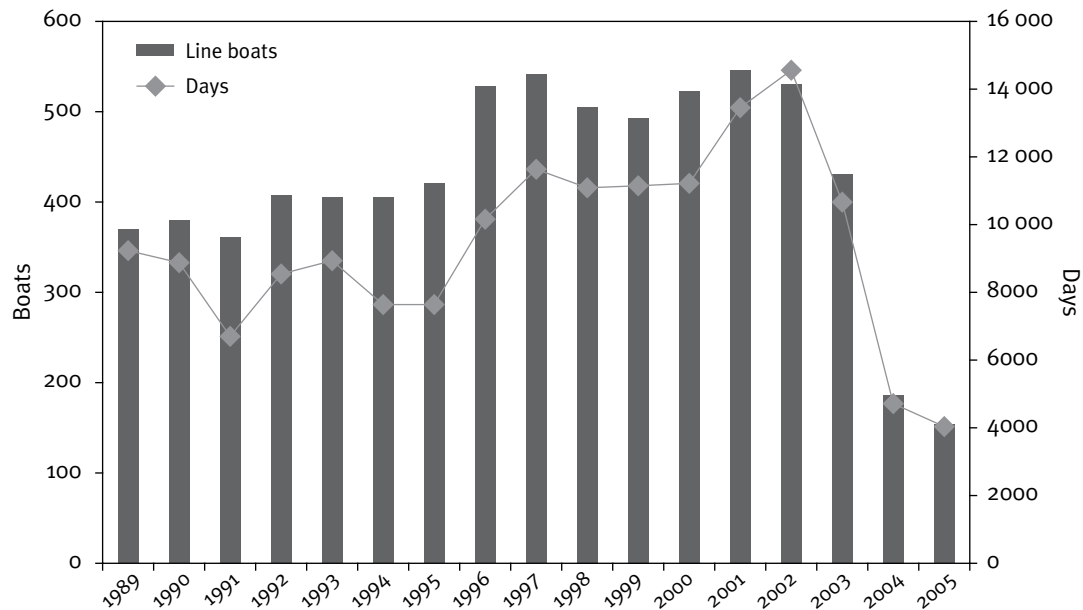


Figure 3: Effort in the east coast Spanish mackerel line fishery 1990–91 to 2004–05 financial year.

Spanish mackerel are most heavily targeted during October to November in an area of reefs off Ingham (Rib reef) where they aggregate to spawn. In the 2005–06 quota year, the distribution of commercial fishing effort displayed a similar pattern to previous years⁵ with effort concentrated mainly north of Mackay.

In November 2005, the Reef Scientific Advisory Group (Reef SAG) and the DPI&F Reef Management Advisory Committee (Reef MAC) agreed that current impacts on Spanish mackerel spawning aggregations are probably low in context of the significant under-catch of quota and the reduced fishing pressure on the stock in general. As such, it is considered that the east coast Spanish mackerel spawning aggregations have been afforded adequate protection at the lower levels of fishing effort, both in the 2004–05 and 2005–06 quota years.

⁵ For historic information on effort distribution see Ryan, S 2004, *Ecological assessment of the Queensland east coast Spanish mackerel fishery*, Department of Primary Industries and Fisheries, Brisbane, Australia.

Figure 4 shows the characteristics of the Spanish mackerel fleet over time. In general, the ECSMF exhibits a similar pattern to other fisheries in Queensland, in that a significant proportion of the operators in the fishery only harvest a small amount of product.

Figure 4 also reflects the reduction in fishing days across the fishery in 2004, compared with earlier years. The buyback of SM fishery symbols by the Department of the Environment and Water Resources (DEW), through the Great Barrier Reef Marine Park (GBRMP) Structural Adjustment Package since 2004–05 has contributed to the reduction in fishing effort. In 2004–05, a 50% reduction was apparent in the number of operators who harvest smaller quantities of Spanish mackerel (i.e. less than 50 kg/day). In 2005–06 this trend continued with a further 31% reduction of operators harvesting less than 20 kg a day, and 22% reduction of those harvesting less than 50 kg/day. This is predominantly a result of the allocation of SM fishery symbols and associated line units and the subsequent removal of operators who could not demonstrate a significant history in the fishery. This is reflected by the increase in the number of days with catch over 200 kg by efficient operators in 2005–06 (35% increase in 250–300 kg/day, 16% increase in 400–500 kg/day and 19% increase in 750–1000 kg/day categories).

Commercial operators have indicated that there has been a shift in targeting behaviour, with operators who historically targeted Spanish mackerel tending to target live coral trout in the coral reef fin fish fishery due to the higher value of that species.

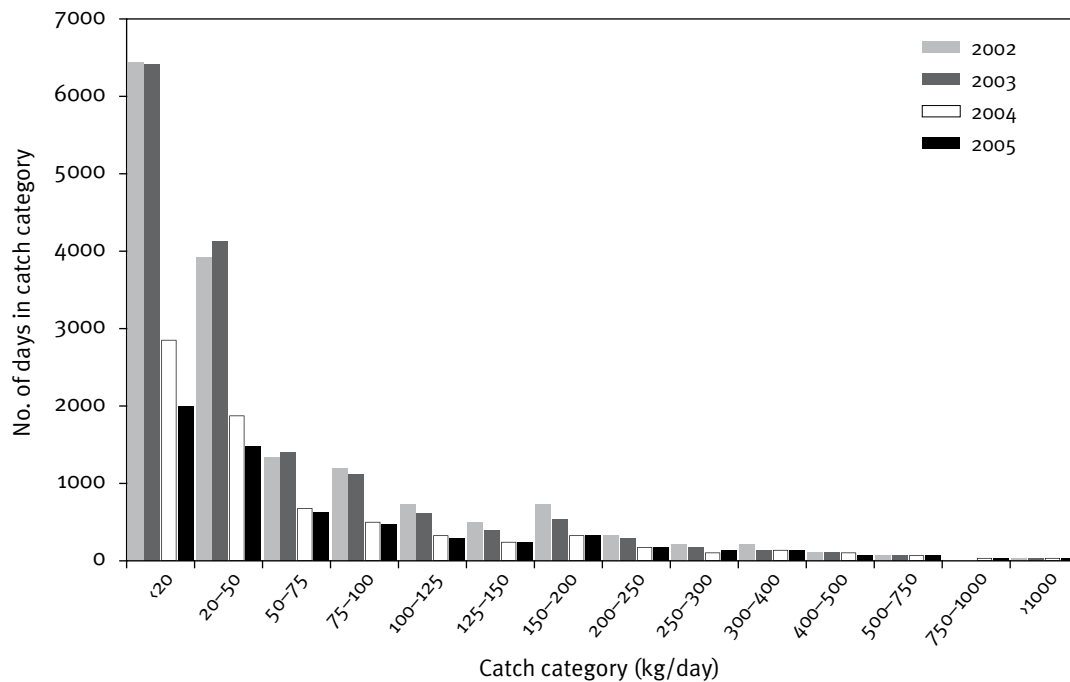


Figure 4: Spanish mackerel fleet characteristics.

Under-catch of quota

Management arrangements for the Spanish mackerel fishery are based on a TAC of 619 520 tonnes shared among commercial fishers through Individual Transferable Quotas (ITQs). Commercial fishers that demonstrated a reliance on the Spanish mackerel fishery prior to February 2004 could remain in the fishery after the allocation of an SM fishery symbol and SM units. With the introduction of the catch quota system, a quota reporting system was established that requires commercial fishers to report trip catches to DPI&F prior to landing.

There are several factors that have collectively contributed to the reduction in the total catch and effort of Spanish mackerel in the commercial fishery in 2004 and 2005 and the under-catch of quota in the first year. These include:

- fisher difficulty with the introduction of the commercial TAC and the associated administrative requirements
- transfer of effort to the coral reef fin fish and net/crab fisheries
- further closure to areas within the Great Barrier Reef (GBR), through the rezoning of the Marine Park in 2004
- inclement weather
- rising fuel prices
- difficulty in employing and maintaining reliable crew
- increased competition from imports.

The total number of Spanish mackerel units available for use in the commercial fishery has been reduced through the buyback of units by DEW under the GBRMP Structural Adjustment Package. The DEW structural adjustment package was offered to those fishers who demonstrated they were severely affected by fishing closures introduced in the Representative Area Program (RAP) rezoning by the Great Barrier Reef Marine Park Authority (GBRMPA). DEW now holds approximately 10% of the total number of SM units (619 520 SM units), making the commercial TAC available to industry approximately 560 tonnes (559 808 SM units).

The rezoning of the GBRMP was implemented at the same time as the catch quota system from 1 July 2004. The result of the rezoning was the additional closure of approximately 30% of reef and shoal habitat in the GBRMP to fishing, an increase from reef closures of 21% prior to the RAP.

The under-catch of quota species in the first quota year may also be partially explained by high variability in recruitment. Tobin and Mapleston (2003)⁶ reported high recruitment variability in the Spanish mackerel fishery, evidenced by more than 75% of both the recreational and commercial catches collected between July 2001 and January 2003 consisting of mackerel in the one to four year classes. Results from the research indicate that the commercial sector target fish of a specific size range, with 28.3% of the total sample being one year old. Conversely, the recreational sector tend to catch more larger and smaller sized fish compared with the commercial sector, with 46.6% of the sample being one year old fish.

Weather is also thought to have influenced the under-catch of quota in the first year. A large proportion of the commercial catch of Spanish mackerel is obtained between October and November in northern Queensland. It was reported that during the 2005–06 quota year bad weather around Lucinda in north Queensland reduced the available fishing time, particularly in the peak fishing month of October. Commercial operators with smaller boats (25–30 ft), conducting day or overnight trips and catching an average of 600–700 kg of Spanish mackerel per trip, were particularly negatively influenced by the inclement weather.

⁶ Tobin, A and Mapleston, A 2003, *Exploitation dynamics and biological characteristics of the Queensland East Coast Spanish mackerel (Scomberomorus commerson) fishery*, FRDC Report No 2001/109, CRC Reef Research Centre, Townsville.

Recreational

Estimates of the recreational catch of Spanish mackerel are available through DPI&F's Recreational Fisheries Information System (RFISH) program and the National Recreational and Indigenous Fishing Survey (NRIFS).⁷

The first RFISH diary survey was conducted in Queensland in 1997, and the NRIFS in 2000. Both surveys estimated catches of all mackerel species combined resulting in difficulty in accurately determining the Spanish mackerel catch. The RFISH survey was expanded in 1999, 2002 and 2005 to capture information on a range of different mackerel species, including Spanish mackerel. To produce a more accurate estimate of the individual species catches within the 'mackerel' catch estimates, 'unspecified mackerel' catches were allocated to individual species. This assumes anglers who did not allocate their mackerel catches to a particular species have the same catch characteristics as anglers who did allocate their catches to a particular species.

The 2002 RFISH diary survey indicated that approximately 58 000 Spanish mackerel were harvested by recreational fishers in Queensland (Table 1). This represents a reduction from the catch of 78 000 estimated in 1999. The reported catch and release rate also appears to have reduced slightly from approximately 30% to 28% between 1999 and 2002. It is possible that the decline in catch may reflect decreasing participation rates in the fishery. The 2005 recreational diary survey data is currently being analysed by the Australian Bureau of Statistics (ABS), with results available in mid-2007.

An average weight of 12.2 kg was used to estimate the total catch weight, based on Tobin and Mapleston's⁸ regional estimates. Sampling undertaken through the DPI&F Long Term Monitoring Program (LTMP) may result in development of a length-weight relationship which will allow for more accurate conversion of RFISH figures in the future, through the use of better estimates of the average weight of fish caught recreationally.

Table 1: Recreational catch estimates for Spanish mackerel from the RFISH program.

	1997	1999	2002
Number caught	63 000	111 000	81 000
Number released	8000 (12.7%)	33 000 (29.7%)	23 000 (28.4%)
Total estimated harvest	55 000	78 000	58 000
Estimated weight of total harvest[#]	671 t	952 t	708 t

[#] Weight factors used to convert numbers of fish caught to total weight of harvest were sourced from regional data collected by Tobin and Mapleston.

The NRIFS estimated that 339 445 mackerel were caught in Queensland in 2000. This was estimated to be approximately 1 160 902 kg (around 1100 t). The national survey only estimated the catch of a group of species including Spanish mackerel, school mackerel, spotted mackerel, shark mackerel, grey mackerel and wahoo.

⁷ Henry, GW and Lyle, JM 2003, *The National Recreational and Indigenous Fishing Survey*, FRDC Project No. 99/158, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, Australia.

⁸ Tobin, A and Mapleston, A 2003, *Exploitation dynamics and biological characteristics of the Queensland East Coast Spanish mackerel (Scomberomorus commerson) fishery*, FRDC Report No 2001/109, CRC Reef Research Centre, Townsville.

Charter

Annual charter catches of Spanish mackerel on the east coast have continued to increase from 22 t in 2002 to 33 t in 2005 (Figure 5). The CPUE has also risen for the first time since 2002, to 18.7 kg/day in 2005. This CPUE is equal to the highest level reported in 1999. Some of the increase in reported catches could be due to fishers being more diligent in the completion of their logbooks, i.e. recording each species of mackerel rather than 'mackerel—unspecified'. The increase in total catch, however, is interesting given the decrease in recreational bag limits from 10 fish to three (six on extended overnight charter trips) which came into effect in December 2003. Assuming high compliance with the regulations it would appear that the decrease in bag limit has had little impact on total charter catches.

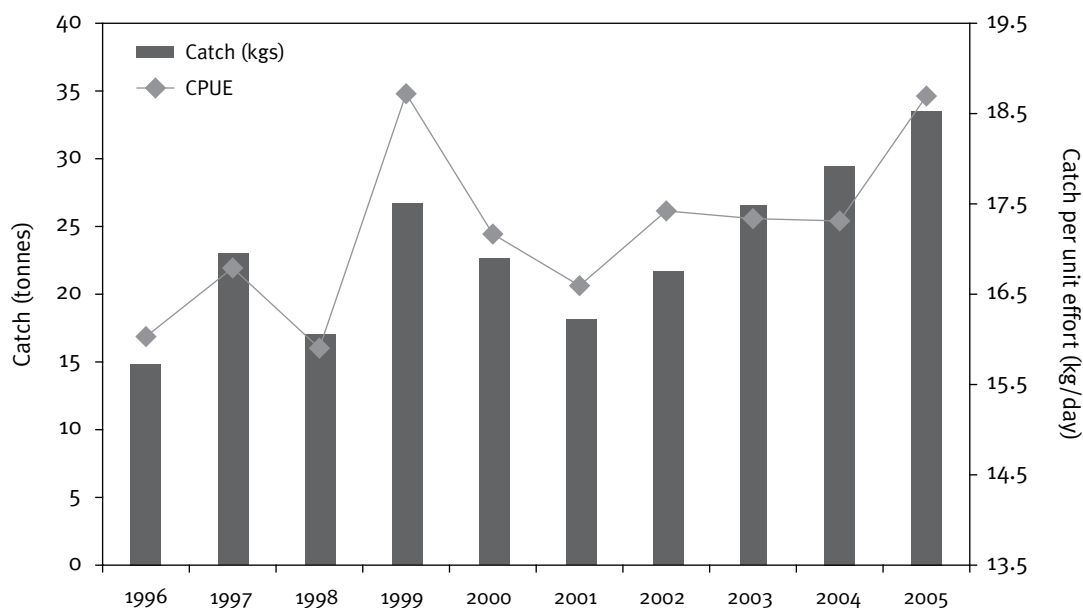


Figure 5: East coast charter retained catch and effort for Spanish mackerel by calendar year for 1996–2005.

Indigenous

The NRIFS estimated that 2382 mackerel (equivalent to approximately 29 tonnes) was harvested by Indigenous fishers in northern Australia in 2000. This estimate includes all species of mackerel, not just Spanish mackerel. Further work is required to include all Queensland indigenous fishers and provide improved estimates of catches of individual species.

Spatial issues/trends

The northern region of the east coast fishery has historically dominated the commercial catch, and has consistently exhibited higher (although variable) catch rates. Conversely, more than half of the recreational catch is estimated to be taken by south east Queensland anglers. It should be noted, however, that the recreational catch estimates are based on where anglers live, as opposed to where the fish were caught. The estimates therefore reflect the fact that a large proportion of the population resides in South East Queensland. DPI&F is converting RFISH estimates from where anglers live to where fish are caught, in order to more accurately depict regional catch statistics.

Socio-economic characteristics and trends

The price for Spanish mackerel has remained relatively stable at approximately \$7/kg for whole fish over the 2005–06 period. As mentioned previously, competition from overseas imported product establishes the base price offered to commercial fishers. Given current imports of Spanish mackerel the price is unlikely to increase in the future. Also access to labour has been difficult given that dory fishers are making a limited income from harvesting Spanish mackerel and there are higher paying alternative employment opportunities elsewhere. Consequently, Spanish mackerel quotas have not been caught in recent years.

Fishery performance

Appraisal of fishery in regard to sustainability

The ECSMF remains in a state of adjustment following the introduction of the SM ITQs in early 2004 and the rezoning of the GBRMP in July 2004. This period of adjustment has contributed to the quota not being met in the last two quota years.

The current stock assessment for this fishery indicates that, at 2001 levels of fishing effort, the fishery is sustainable. Current catch and effort levels are significantly below this level. The age-structured stock assessment model will be re-run in 2007 with additional age data and the up-to-date commercial and recreational catch data. The revised stock assessment will assist in the review of the commercial TAC and other management measures.

Progress in implementing Department of the Environment and Water Resources (DEW) recommendations

DEW made a range of recommendations to DPI&F during its assessment of the fishery, in order to address any perceived risks or uncertainties. Further details of the progress DPI&F has made in implementing each of these recommendations are provided in the following table. DPI&F held a workshop in early April 2006 to develop performance measures for the fishery. The Performance Measurement System (PMS) is to be finalised in early 2007 and will be applied to the fishery post-submission to DEW and reported on annually.

Recommendation	Progress
DPI&F to inform DEW of any intended amendments to the management arrangements that may affect sustainability of the target species or negatively impact on bycatch, protected species or the ecosystem	<i>Ongoing</i> DPI&F has informed DEW of relevant amendments to new arrangements. Reporting arrangements have been reviewed and minor changes have been made to enhance industry flexibility.
From 2005, DPI&F to report publicly on the status of the fishery on an annual basis, including explicit reporting against each performance measure once developed.	<i>Ongoing</i> This annual status report represents the second to be completed for the fishery. DEW has confirmed DPI&F's response adequately fulfils this recommendation.
As part of the biennial review of the ECSMF, DPI&F develop fishery specific objectives linked to performance indicators and performance measures for target, bycatch, protected species and impacts on the ecosystem.	<i>In progress</i> PMS to be finalised in 2007 and will be applied to the fishery from 2007 onwards.

Recommendation	Progress
<p>DPI&F to monitor the status of the fishery in relation to the performance measures once developed. Within three months of becoming aware of a performance measure not being met, DPI&F to finalise a clear timetable for the implementation of appropriate management responses.</p>	<p><i>Ongoing</i> Performance measures will be assessed annually once developed.</p>
<p>DPI&F to monitor the size composition of the retained commercial catch of Spanish mackerel and conduct a review of the fishery appropriate to the magnitude of the change if the proportion of catch of pre-mature fish increases above 5% of the commercial TAC. If necessary DPI&F to introduce additional management measures to ensure sustainability.</p>	<p><i>Ongoing</i> The DPI&F LTMP continues to collect information from commercial and recreationally caught Spanish mackerel, to monitor the size composition of the commercial catch, and allow DPI&F to ensure the proportion of pre-mature fish does not increase above 5% of the total allowable catch. DEW has confirmed DPI&F's response adequately fulfils this recommendation.</p>
<p>That DPI&F, at its biennial review of the ECSMF, consider means of reducing the capture of undersized and large Spanish mackerel including more effective size selective gear.</p>	<p><i>Completed</i> A review was conducted as a part of the ECSMF Ecological Risk Assessment (ERA) completed in 2004. Based on the results of the risk assessment and research previously undertaken, Reef MAC and Reef SAG resolved that there is limited catch of undersize fish. The SAG noted that there was a small proportion (LTMP data indicates 3%) of Spanish mackerel taken which are immature (<90 cm) but still above the minimum legal size limit (>75 cm), and that in general the commercial fishery is highly selective for mature fish. DEW has confirmed DPI&F's response adequately fulfils this recommendation.</p>
<p>DPI&F to develop a compliance strategy for the ECSMF. The strategy will explicitly address the following issues and provide for the periodic review of the effectiveness of the strategy:</p> <ul style="list-style-type: none"> • Effectiveness of shore based compliance activity • Non-compliance with size and bag limits • The possible existence of a black market • Compliance with reporting of protected species interaction • Compliance benefits in the adoption of new technology • Fishers and processor knowledge of new compliance requirements 	<p><i>In progress</i> Queensland Boating and Fisheries Patrol (QBFP) are coordinating compliance risk assessments and strategy developments across all Queensland fisheries. The Spanish mackerel fishery is scheduled for completion in mid-2007.</p>
<p>As part of the next biennial review of the ECSMF, DPI&F to develop a robust and regular fishery assessment process, that provides a basis for management decisions which are precautionary and recognise the uncertainty and level of risk. The assessment process will examine the ecological sustainability of the target species using robust stock assessments.</p>	<p><i>Ongoing</i> The preliminary stock assessment for this fishery was conducted in 2002. The next assessment is planned for 2007 using updated data obtained from LTMP, CFISH and RFISH. Similar predictor models will be used for the 2007 assessment to enable comparisons between the periods.</p>

Recommendation	Progress
As part of the biennial review of the ECSMF, DPI&F to consider the protection of Spanish mackerel spawning aggregations. If necessary, DPI&F to implement measures to protect them within 18 months of such finding.	<i>Ongoing</i> The Reef SAG agreed in 2005 that current impacts on spawning aggregations are probably low in context of under-catch of quota and reduced fishing pressure. DPI&F with Reef MAC will review in context of all spatial and temporal closures in place that impact upon ECSMF. DEW has confirmed DPI&F's response adequately fulfils this recommendation.
DPI&F to develop a system to ensure that catch data collected in compulsory logbooks and voluntary diaries is validated on an ongoing basis and to investigate methods for documenting and validating effort in the fishery.	<i>Ongoing</i> DPI&F's logbook validation strategy encompasses a range of activities that may be undertaken across different fisheries. For the purpose of the ECSMF, DPI&F intends to use quota monitoring and observer coverage to validate logbook data. Independent fisheries observers have recently been introduced into the fishery on a voluntary basis.
Within one year, to support the implementation of the Species of Conservation Interest Logbooks, DPI&F to ensure that an education program for fishers, both recreational and commercial, is developed and implemented, to promote the importance of protected species protection and accurate incident reporting.	<i>Completed</i> A protected species education program was released in September 2005. Material was delivered to both recreational and commercial fishers about ways to minimise interactions with protected species, how to handle them should an interaction occur and the importance of accurate reporting of interactions.
DPI&F, as part of the development of performance indicators and performance measures for the fishery, to include a mechanism to identify and respond to changes in the composition and quantity of bycatch in the ECSMF.	<i>Completed</i> DPI&F completed a report on the bycatch and byproduct risk assessment for the ECSMF in early 2006. It was determined that the ECSMF poses low risk to most bycatch and/or byproduct species. It also highlighted the highly targeted nature of the fishery and that the proportion of undersize fish caught by fishers is extremely low. DEW has confirmed DPI&F's response adequately fulfils this recommendation.
Within 18 months, DPI&F to provide reliable estimates of recreational take, and factor these into stock assessments and management controls to ensure overall catch levels are sustainable.	<i>In progress</i> DPI&F employed a consultant from ABS in 2005 to review the differences between the RFISH surveys, and the NRIFS and investigate possible new methods to improve future RFISH surveys. A preliminary investigation was also undertaken into the power of the data collected through the RFISH program, in context of whether it could be converted to the location of catch rather than the location of residence. A workshop was held in April 2006 to further investigate improvements to estimates of recreational participation and catch.
As part of its biennial review, DPI&F to examine measures designed to control Spanish mackerel harvest by recreational fishers to ensure that they are appropriate and adequately constrain recreational effort to within sustainable levels. Should the review indicate that existing measures are not appropriate DPI&F will develop new measures within 12 months.	<i>Not completed</i> DPI&F looking to investigate the effectiveness of current recreational possession limits through use of RFISH surveys. Results from 2005 RFISH survey should be available from ABS for analysis mid-2007.

Management performance

DPI&F, with advice from Reef MAC, has made a commitment to developing management objectives, performance indicators and performance measures for line fisheries for which it is responsible. Draft performance measures were developed in late 2006 and will be finalised during 2007. Preliminary measures relating to Spanish mackerel bycatch and byproduct have been developed as part of the bycatch risk assessment process.

Fishery assessment process

DEW has recommended that DPI&F develop a robust and regular fishery assessment process that provides a basis for management decisions which are precautionary and recognise the uncertainty and level of risk. The assessment process is to examine the ecological sustainability of the target species using robust stock assessments.

An age-structured stock assessment model has been developed to assess the status of the fishery. The last published stock assessment to be completed for Spanish mackerel was in 2002⁹, with a Management Strategy Evaluation¹⁰ updated in 2003. Those assessments concluded that the probability that the Spanish mackerel stock was overfished at the time was low. The assessments recommended that a TAC set at average catch levels between 1992–93 and 2000–01 should be sustainable, subject to ongoing monitoring and amendment.

The current quota available to the commercial fishery (559 040 t after DEW quota holdings are removed) is equivalent to slightly less than 90% of the commercial TAC (619 520 t). The actual catch of the commercial fishery in 2005–06 (271 t) is approximately 40% of the commercial TAC. Even accounting for the uncertainties in the stock assessment model outputs, the actual fishing mortality currently being imposed on the stock is below that which is considered likely to result in overfishing.

The stock assessment model is to be rerun again in 2007 with additional data, including two full years of age-structure data from the enhanced LTMP surveys. The results of the assessment will be available for the next biennial review in March 2008.

DPI&F considers the stock assessment to be robust, particularly given that additional age structure data collected through the LTMP is to be added to the model.

Protection of spawning aggregations

The Reef SAG agreed in November 2005 that the current impacts on Spanish mackerel spawning aggregations are probably low in context of the significant under-catch of quota and the reduced fishing pressure on the stock in general. DPI&F, with advice from Reef MAC, intends to assess the effectiveness of the spawning season closure measures in place for coral reef fin fish in context of all spatial and temporal closures in place that impact upon the ECSMF. The objectives of the spawning season closures, including biological, economic and social objectives will be clearly established as part of the process of examining the effectiveness of the closure measures. Reef MAC intends to reconsider the potential protection of spawning aggregations for the ECSMF at that time for consistency and efficiency.

⁹ Welch, D, Hoyle, S, Gribble, N and McPherson, G 2002, *Preliminary assessment of the east coast Spanish mackerel fishery in Queensland*, Department of Primary Industries and Fisheries, Brisbane, Australia.

¹⁰ Hoyle, S 2002, *2003 Update: Management Strategy Evaluation for the Queensland East Coast Spanish Mackerel Fishery*, Information Series QI 03021, Department of Primary Industries and Fisheries, Brisbane, Australia.

Recreational harvest

The Reef MAC and SAG members have noted that there may be no measurable impact from the reduction of the in-possession limit to three fish, as many recreational fishers were not achieving the bag limit of 10 fish prior to the changes to management arrangements. Reef MAC and SAG will review the estimates of recreational harvest when figures are available from the 2005 RFISH diary round in 2007, and determine whether the measures in place are constraining the recreational catch at a sustainable level.

Resource concerns

Based on the current level of harvest in the fishery, DPI&F considers that the ECSMF is managed in a sustainable and precautionary manner. Some concern has been expressed that spawning aggregations may have contracted over time and that further protection should be afforded to these aggregations. The Reef MAC and SAG have identified the need to locate historically important spawning areas to help determine whether any contraction may have occurred and preliminary research proposals are being developed.

Ecosystem

Non-retained species/bycatch

The level of bycatch and byproduct in the fishery is considered to be low and mainly comprised of undersized mackerel. A large proportion of the other species caught whilst targeting Spanish mackerel are retained as byproduct for sale and consumption.

A bycatch and byproduct risk assessment workshop with key stakeholders was held in November 2005 to formally assess the level of risk to bycatch and byproduct species associated with the fishery. The risk assessment results indicated that the ECSMF poses only a low risk to the majority of the bycatch or byproduct species identified. Sharks caught incidentally, but not retained, were the only species identified as moderate risk, in recognition that they are highly vulnerable to overexploitation as a result of their life history traits¹¹. The risk assessment helped confirm a number of assumptions about the targeted nature of the fishery and also highlighted changing market demands as a result of a quota system being introduced.

Interactions with protected species

Spanish mackerel commercial fishers are required to record interactions with protected species in their Species of Conservation Interest (SOCI) logbook. No interactions have been reported in the 2005–06 quota year. Results of the risk assessment indicated that the risk to protected species associated with the fishery is low as a result of the targeted nature of the fishery and the constant attendance of troll lines while fishing.

Fishery impacts on the ecosystem

It is unlikely that there is any significant physical impact on the ecosystem from the fishery due to the relatively benign line fishing method used (i.e. surface trolling).

¹¹ Department of Primary Industries and Fisheries, 2006, *East Coast Spanish Mackerel Fishery—Bycatch and byproduct risk assessment*, Department of Primary Industries and Fisheries, Brisbane, Australia.

Other ecosystem impacts

Juvenile Spanish mackerel are known to inhabit inshore areas in both the north and south of the state. Population expansion and urban development that can have an influence on water quality and habitat availability in inshore and estuarine areas may therefore also influence the health of Spanish mackerel populations.

Research and monitoring

Recent research and implications

On the Queensland east coast, there is no specific research projects underway related to Spanish mackerel. DPI&F researchers continue to communicate with other fisheries agencies within Queensland and other states to keep up to date with current research.

Monitoring programs and results

Long Term Monitoring Program

An overview of the DPI&F Fisheries LMTP is available at:

www.dpi.qld.gov.au/fisheriesmonitoringprogram

Specifically, the objectives of the program are to develop a time-series of data from the east coast of Queensland comprising:

- age and size structured catch data from the commercial fishers and recreational anglers
- sex ratios and temporal patterns in spawning.

The current monitoring arrangements involve fishery-dependent sampling on major fishing grounds along the Queensland east coast. Representative age, length and sex structure information is collected from both the recreational and commercial sectors at four regions along the Queensland east coast. Detailed information is available in the Fisheries Long Term Monitoring Program Sampling Protocol—Narrow Barred Spanish Mackerel: (2004 onwards) Section I.¹²

The program reports regularly on monitoring survey data through Summary Reports and produces data for use in stock assessment analysis. The LTMP Summary of Spanish mackerel (*Scomberomorus commerson*) survey results: 2004–2005, was released in 2006.¹³ These results for the Queensland east coast indicate:

- the majority of Spanish mackerel collected in 2004–05 were between 800 and 1100 mm fork length
- similar numbers of male (55%) and female (45%) Spanish mackerel were sampled during the 2004–05 season
- the majority of female fish with ovaries in spawning condition were collected between September and December 2004
- the 3% of premature fish caught by the commercial fishing sector is under the 5% reference point recommended by the DEW.

¹² Department of Primary Industries and Fisheries 2006, *Fisheries Long Term Monitoring Program Sampling Protocol—Spanish Mackerel* (2004 onwards) Section 1, Department of Primary Industries and Fisheries, Queensland, Q106022, Brisbane, Australia.

¹³ Rose, D, Bailey, S, Staunton-Smith, J and Mackenzie, B 2006, *Fisheries Long Term Monitoring Program—Summary of Spanish mackerel (Scomberomorus commerson) survey results: 2004–05*, Department of Primary Industries and Fisheries, Brisbane, Australia.

Future monitoring will focus on maintaining commercial fishers' participation and increasing the number of samples collected from recreational fishers across all regions.

Fishery Observer Program

A voluntary fishery observer program was introduced in the commercial sector of the Spanish mackerel fishery in 2006. In this fishery, observers collect information on catch composition, length frequencies, bycatch and any interactions with SOCI. In addition, methods are being investigated to validate the distribution of effort within the fishery in order to develop further understanding of the dynamics of this fishery.

A number of observer trips have been undertaken in the Spanish mackerel fishery with approximately five different species of fish recorded. Spanish mackerel is the most common, comprising 76% of the catch by number. Approximately 16% of the catch, including spotted mackerel (*Scomberomorus munroi*) and northern blue-fin tuna (*Thunnus tonggol*), was retained as byproduct. The few non-marketable species observed were used as bait (4%) or non-permitted species (4%), thus discarded. To date, fishery observers have not recorded any interactions with SOCI.

The preliminary data is limited in observations and by area (southern Queensland). As the program expands into additional regions along the east coast in 2007, the catch composition and effort data collected will provide a more comprehensive picture of bycatch and byproduct for this fishery.

Collaborative research

The East Coast Spanish Mackerel Fishery is considered to harvest a separate genetic stock to the Torres Strait and Gulf of Carpentaria Spanish mackerel stocks. DPI&F researchers worked closely with the Cooperative Research Centre (CRC) Torres Strait and James Cook University researchers in a stock assessment of the Torres Strait Spanish Mackerel Fishery.¹⁴ DPI&F scientists are also collaborating with Northern Territory Fisheries in designing a Spanish mackerel monitoring program in the Queensland Gulf of Carpentaria. The information collected by this program will be used in ongoing stock assessments for the Gulf of Carpentaria Spanish Mackerel Fishery.

Fishery management

Compliance report

During the 2005–2006 quota year, a total of 376 units (commercial vessels (63 units); recreational (300 units, including vessels, shore based fishers, camp sites and fishing clubs; marketer premises (six units); and charter/tour operators (seven units)), were inspected in the ECSMF. Of these units, three were found to be non-compliant with fisheries legislation, resulting in two Fisheries Infringement Notices (FINs) being issued for recreational fishers possessing undersized Spanish mackerel and one FIN being issued for a recreational fisher exceeding the in-possession limit for Spanish mackerel.

A compliance risk assessment will be completed for this fishery in 2007 in order to determine compliance priorities and allow the most effective use of QBFP resources.

¹⁴ Begg et al 2006, *Stock assessment of Torres Strait Spanish mackerel fishery*, CRC Reef Research Centre Technical report No. 66, CRC Reef Research Centre, Townsville.

Changes to management arrangements in the reporting year

Minor changes have occurred with respect to quota monitoring reporting requirements for Spanish mackerel. The changes to reporting are:

- Fishers now only report number of whole, gilled and gutted and/or trunked SM and number of cartons of fillets. Fishers no longer report the total number of fish taken (with all forms combined).
- SM fishers are now allowed to continue to take up to five more SM, once a prior notice has been given, provided that they amend the prior notice to include these fish before they enter the area within 0.5 nautical miles of the landing place.
- Fishers can retain fish (restrictions apply) within the entire area of the fishery—previously the ability to retain fish was limited to a certain area and time period.
- Automated Interactive Voice Response (AIVR) call flows can now be tailored to suit individual fishing operations, i.e. questions in the reef quota/Spanish mackerel call flow can be switched on or off depending on how the fisher operates.

The 1% maximum allowable margin for error in reporting fish numbers prior to landing, has been relaxed. Instead, the allowable difference will depend on what is reasonable in individual circumstances.

From 1 July 2006 existing licence holders have been able to trade fishery symbols, subject to certain conditions, such as boat length limitations. This new provision will enable fishers to more easily diversify by acquiring the relevant fishery symbol from another licence holder, rather than having to sell their current licence and purchase another licence endorsed for the required fisheries. Under the department's catch history policy, any recorded catches attributable to the fishery symbol will also move with the symbol. Whilst this should not have any major implications in terms of management (due to the fishery being limited entry and quota managed), it may enable fishers to more efficiently exercise their fishing rights.

Consultation/communication/education

Promotion of regulations applying to both commercial and recreational fishers, including those relating to Spanish mackerel, is an ongoing role of DPI&F. Approximately 200 000 recreational fishing brochures containing size and possession limit information were distributed in 2005–06. Details of fisheries regulations are also on the DPI&F website. In addition, approximately 750 stakeholders were sent copies of the fisheries newsletter *Fish* four times during 2005. The newsletter highlights recent achievements, the latest research and proposed changes to management arrangements. The newsletter went 'electronic' in 2006 and is now distributed via the DPI&F website and email. It includes links to websites of other fisheries around the globe that contain all the latest fisheries news and is gaining more subscribers daily.

Consultation also occurs through the Reef MAC and Reef SAG.¹⁵ Reef MAC provides an opportunity for stakeholders to provide advice to DPI&F on management measures in place for Spanish mackerel stocks.

¹⁵ The SAG includes representatives from DPI&F, the commercial fishing industry, Sunfish, research (i.e. James Cook University), GBRMPA and the charter fishing sector.

Complementary management

Discussion was held with the New South Wales Department of Primary Industries (DPI) in August 2005 on complementary management arrangements for Spanish mackerel. There is currently no size limit for Spanish mackerel in New South Wales. New South Wales DPI released a discussion paper in July 2005 reviewing recreational freshwater and salt water rules. The introduction of a 75 cm minimum legal length is proposed for Spanish mackerel to provide a minimum legal size equivalent to Queensland's. The recreational catch of Spanish mackerel in New South Wales consists primarily of fish larger than 75 cm so discards of undersized fish from the recreational sector are expected to be minimal. There is currently no in-possession limit for Spanish mackerel in New South Wales.

Information compiled by

Bonnie Holmes

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Image

Spanish mackerel (*Scomberomorus commerson*)

