

Annual status report 2011

East Coast Spanish Mackerel Fishery



© State of Queensland, Department of Employment, Economic Development and Innovation, 2012.

The Queensland Government supports and encourages the dissemination and exchange of its information. The copyright in this publication is licensed under a Creative Commons Attribution 3.0 Australia (CC BY) licence.



Under this licence you are free, without having to seek permission from DEEDI, to use this publication in accordance with the licence terms.

You must keep intact the copyright notice and attribute the State of Queensland, Department of Employment, Economic Development and Innovation as the source of the publication.

For more information on this licence visit <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Fishery profile 2010–11

Species targeted Spanish mackerel	Total number of commercial licences in 2010–11 252
Total harvest from all sectors 313 tonnes + unquantified recreational catch	Commercial licences accessing the fishery in 2010–11 167
Commercial harvest 278 tonnes	Fishery season Predominantly late spring/early summer
Recreational harvest estimate (2005) Approximately 415 tonnes	Fishery symbols SM and an L1, L2 or L3
Indigenous harvest Considered negligible	Monitoring undertaken Commercial logbooks (CFISH), collection of biological data (fishery-dependent sampling), at-sea observing
Charter harvest 35 tonnes	At-sea observer days in 2010–11 57
Commercial Gross Value of Production (GVP) Approximately \$1.9 million	Accreditation under the EPBC Act Extended until 25 May 2012
Allocation between sectors No formal catch allocation	Logbook validation Yes—completed August 2007
Total exports Negligible—most product sold domestically	Quota managed Yes—SM symbol required. Entitlement under units issued is 544 022 kg, however current legislation requires a reduction in the value of an SM unit if specified catch triggers are reached ¹ .
Key fish resources	Stock status
Spanish mackerel	Sustainably Fished
<p>Comments: At current fishing levels the fishery is considered sustainably fished. The new stock assessment indicates that total mortality estimates are below 2M (2 times natural mortality—that total catch is less than upper thresholds). Current research by the Fishing and Fisheries Research Centre at James Cook University (JCU) on Spanish mackerel spawning aggregations and an updated recreational harvest estimate (available mid 2012) will provide important data for consideration in the next stock status assessment.</p>	

¹ Refer to section 557A of the Fisheries Regulation 2008.

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 commercial and recreational fishers.

This report covers the financial year from July 2010 – June 2011.

Fishery Description

Fishing area and methods

The ECSMF is a line-only fishery in which 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. The line (“L”) symbol attached to a commercial licence with an SM fishery symbol dictates the area in which the licence can operate (Figure 1).

The commercial harvest of Spanish mackerel in the Gulf of Carpentaria (GOC) is managed separately to the east coast and is reported in the GOC Line Fishery Annual Status Report. Spanish mackerel in the GOC are separate stocks from the east coast stock (Buckworth et al, 2007).

Key Species

Growth of juvenile Spanish mackerel is rapid, with fish reaching approximately 65 cm fork length (FL) in the first year. They reach 75 cm FL early in their second year of growth and attain approximately 80 cm FL by two years of age (Welch et al. 2002). Differential growth between sexes occurs with females showing faster growth and higher longevity (McPherson 1992). Sexual maturity for males and females occurs around two years of age from approximately 79 cm FL (McPherson 1993).

Spanish mackerel are known to aggregate in large numbers to spawn. During the 1970’s aggregations of spawning fish on the east coast were reported to occur between Lizard Island and Townsville. In recent years aggregations of spawning fish have been reported to occur over a much smaller area on several reefs east of Ingham. Fish gather on these reefs in large numbers during October and November each year. Spawning activity is believed to be

determined by a combination of environmental factors, but can be observed over much of the two month period. Females in pre-spawning condition are common in troll catches during the morning hours of the day of spawning. Spawning appears to take place during late afternoon and early evening during which time the fish cease feeding. Feeding behaviour resumes immediately after spawning (McPherson 1981).



Figure 1: Line fishery areas in Queensland.

Main management methods used

Management of the ECSMF is the responsibility of Fisheries Queensland, a service of Department of Employment, Economic Development and Innovation (DEEDI). The harvest of Spanish mackerel is managed by a range of input and output controls as set out in the Fisheries Regulation 2008. The total catch entitlement under SM units is 544 022 kg, however the Fisheries Regulation 2008 requires a reduction in the value of each SM unit if specified catch triggers are reached. This ensures that the total allowable commercial catch for the fishery, introduced in 2004, is not exceeded. For a list of the main management arrangements used, refer to the 2008 annual status report for the fishery.

Catch Statistics

Commercial

The commercial nominal² catch rate (kg/day) of Spanish mackerel (Figure 2) has exhibited a stable trend since quota was introduced in 2004, with a slight decline in 2010–11 from 72 kg/day to 57 kg/day. In 2010–11 the catch also decreased from 390 t in 2009–10, to 278 t. The number of vessels accessing the fishery decreased from 181 to 167.

Recreational

Recreational line fishers are restricted to a maximum of three fishing lines and six hooks (total) in all Queensland waters. Fisheries Queensland estimates state-wide recreational catch using a telephone-diary methodology. The most recent state-wide data estimates were those collected during the 2005 effort year³. Fisheries Queensland commenced a new state-wide recreational fishing survey in 2010, with updated recreational catch estimates available mid 2012.

Fisheries Queensland conducted a survey of marine boat-based recreational fishing in south-eastern Queensland in 2007–08. A total of 7657 boat crews were interviewed of which 4559 (60%) were fishing. Spanish mackerel represented a very minor proportion of the catch with only 17 fish reported of which 82% were retained. Refer to the report [‘Survey of marine boat-based recreational fishing in south-eastern Queensland 2007–2008’](#) available on the DEEDI website www.deedi.qld.gov.au for more information.

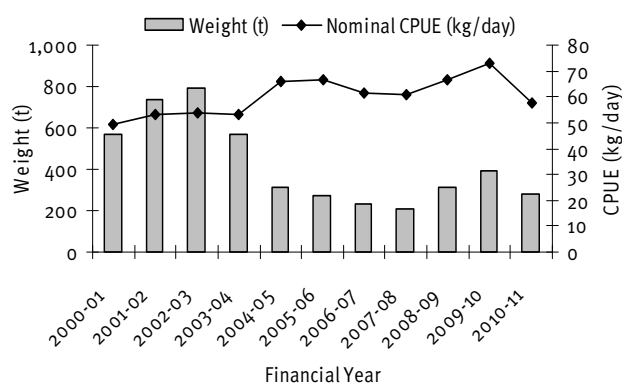


Figure 2: Commercial catch and nominal catch rate 2000–01 to 2010–11 (Source: Fisheries Queensland CFISH database, 2 December 2011).

Charter

Annual reported charter catches of Spanish mackerel in 2010–11 decreased, but were still above the historical averages (Figure 3). Fisheries Queensland’s biological monitoring program indicated that 2009–10 was a strong year for recruitment of two-year old fish to the fishery (see Monitoring Programs section), which contributed to the increased catches observed in that period.

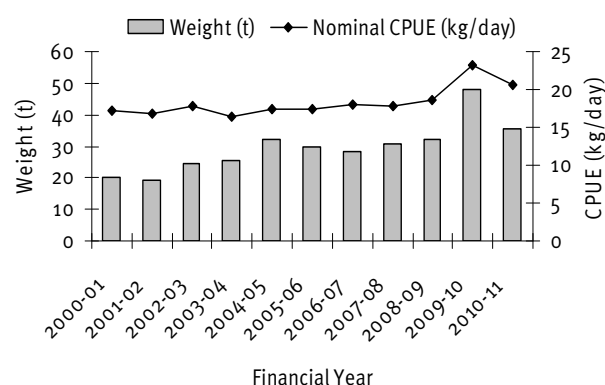


Figure 3: East coast charter catch and nominal catch rate for Spanish mackerel 2000–01 to 2010–11 (Source: Fisheries Queensland CFISH database, 2 December 2011).

Indigenous

The NRIFS estimated that 2382 mackerel were harvested by indigenous fishers in northern Australia in 2000. This estimate includes all species of mackerel, not just Spanish mackerel. Further information is required to include catches from all Queensland indigenous fishers and provide improved estimates of catches of individual species.

² Nominal catch rate refers to the logbook reported catch divided by the total number of days fished. More sophisticated standardisation procedures to calculate catch rate is undertaken in the Performance Measurement System section of this report.

³ Refer to the 2007 ECSMF Annual Status Report for previous figures and catch statistics related to recreational harvest.

Spatial issues / trends

Commercial fishing effort was spread along the east coast in 2010–11, with high catch rate grids reported from south east and far north Queensland. The largest area of effort is still focused around several grids from Bowen to Ingham where Spanish mackerel aggregate in large numbers to spawn. These spawning grids have historically reported the highest catches during October and November, and are monitored through the Performance Measurement system (PMS) for the fishery.

Socio-economic characteristics and trends

The price paid to the fisher for Spanish mackerel has remained relatively stable and typically between \$7–10/kg for whole fish over the 2010–11 period. Competition from imported product establishes the base price offered to commercial fishers. Given current imports of Spanish mackerel the price is unlikely to increase in the near future. Also access to labour has been difficult in recent years, given that dory fishers are making a limited income from harvesting Spanish mackerel and there are higher paying employment opportunities in other non-fishing sectors. These factors have influenced the under catch of Spanish mackerel quotas in recent years.

Biological and ecological information

Monitoring Programs

Fisheries Queensland collects fishery-dependent biological data including length, sex and age of Spanish mackerel harvested from the east coast of Queensland by commercial and recreational fishers. An overview of the biological monitoring program for Spanish mackerel is available on the Department's website www.dpi.qld.gov.au. The monitoring program involves collecting representative data from the commercial and recreational (including charter) sectors within four regions along the Queensland east coast between Cairns and the New South Wales border. The program is stratified so that more commercial samples are targeted from areas where commercial landings are higher. The stock

assessment for this species uses these monitoring data (Campbell et al. in press).

The age frequency of Spanish mackerel in 2010–11 was characterised by another strong recruitment of fish in the two-year age group for the recreational and commercial sectors (Figure 5). McPherson (1992) and Mackie (2003) established that Spanish mackerel are fully recruited into the fishery at approximately two years old.

At-sea observing

The east coast line fisheries, including the ECSMF, were a target of the observer program during 2011. Fifty seven days were recorded on boats fishing with an SM fishery symbol. Results will be available in mid 2012 and will be reported through the 2012 annual status report for the fishery.

Bycatch

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

Interactions with protected species

No interactions have been reported in the 2010–11 quota year.

Ecosystem impacts

Juvenile Spanish mackerel are known to inhabit inshore waters along the entire Queensland coast. Population expansion and urban development that can influence water quality and habitat availability in inshore and estuarine areas may influence the health of Spanish mackerel populations.

Sustainability Assessment Performance against fishery objectives

The PMS functions as a reporting framework that is a transparent, defensible set of criteria for evaluating the performance of the fishery against management objectives. Within three months of becoming aware that a performance measure has been triggered,

Fisheries Queensland is required to finalise a clear timetable for implementation of appropriate management responses.

In late 2009 the PMS for the ECSMF was reviewed resulting in more robust performance measures, which also saw the removal of former economic and ecosystem measures that added little value to the document. Fisheries Queensland, through the Industry Development and Economic teams, will endeavour to develop appropriate economic indicators in the future. The ECSMF outcomes for 2010–11 are outlined in Table 2.

The only performance measure that triggered relates to standardised catch rate in specific spawning grids in October and November each year. Investigation into the causes behind the trigger is currently underway, but is likely due to the high catches that

occurred in the previous year, resulting in an overall reduction in catch rate in 2010–11. Additionally, there are also anecdotal reports that the spawning for the stock may have occurred earlier (September–October) in 2010, which has potentially caused the observed drop in catch rate (Figure 7).

Current sustainability status and concerns

The fishery quota continues to be under-caught. The latest stock assessments for the fishery (Campbell et al. in press) concluded that at current levels of fishing effort the fishery is sustainable. Although commercial harvest has increased in recent years, the performance measures resulting to catch and catch rate for the fishery do not indicate that there is any immediate risk to the stock, and that there have been two good years of recruitment to the fishery.

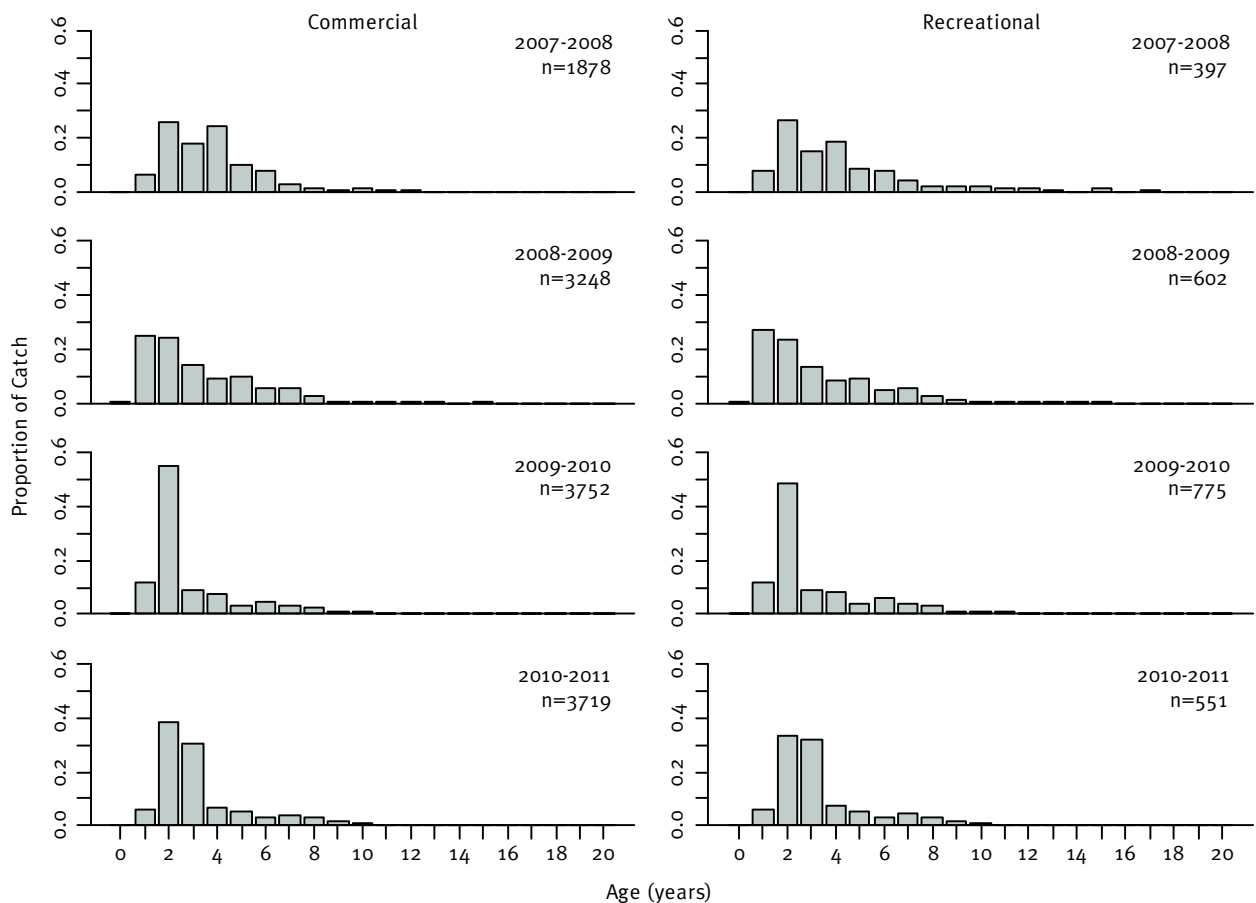


Figure 5: Age distribution of Spanish mackerel sampled from recreational and commercial catches. Data is from the last four year of sampling (2007–08 to 2010–11).

Table 2: Performance measures and outcomes for the Spanish mackerel fishery in 2010–11.

Performance Measure	Performance
<i>Target species</i>	
Annual standardised catch rate for Spanish mackerel falls below 90% of the average standardised catch rates of all preceding quota years.	<i>Not triggered</i> In 2010–11, the standardised Spanish mackerel catch rate was within the historical average catch rate since quota was introduced in 2004–05 (see Figure 6).
Annual standardised catch rate at identified spawning reefs falls below 90% of the average standardised catch rates of all preceding quota years. ⁴	<i>Triggered</i> In 2010–11, the standardised Spanish mackerel catch rate was lower than the historical average catch rate since quota was introduced in 2004–05 (see Figure 7).
There is a 20% decrease in charter catch rates between consecutive years, or a decrease of 10% in each year over three years.	<i>Not triggered</i> Charter catch rates decreased by 11% in 2010–11.
Total mortality (<i>Z</i>) exceeds 2 times estimate of natural mortality (<i>M</i>).	<i>Not triggered</i> The <i>Z</i> estimate calculated from fishery dependent sampling from all sectors indicates total mortality in 2010–11 was $< 2M$.
Estimates of exploitable biomass fall below 40% of the estimated virgin biomass.	<i>Not triggered</i> The 2008 stock assessment found that the exploitable biomass range was between 30–60% of virgin biomass.
<i>Bycatch and protected species</i>	
Observer information shows the amount of bycatch exceeds 10% of the total catch taken by commercial fishers with an SM fishery symbol when targeting Spanish mackerel (by numbers of fish).	<i>Not measured</i> Results for the 2011 observed days in the fishery will be available in 2012.
The percentage of animals released (alive) from each category falls below 90%.	<i>Not triggered</i> There have been no reported interactions with protected species in this fishery.
<i>Social</i>	
That the rate of compliance falls below 92.5% in the commercial fishery and/or 92.5% in the recreational fishery.	<i>Not triggered</i> The compliance rate for both the commercial and recreational sectors in this fishery for the 2010–11 period was 98% on units inspected.

⁴ Identified spawning reef grids and months analysed are outlined in the East Coast Spanish Mackerel Performance Measurement System document, available at www.dpi.qld.gov.au/28_11060.htm

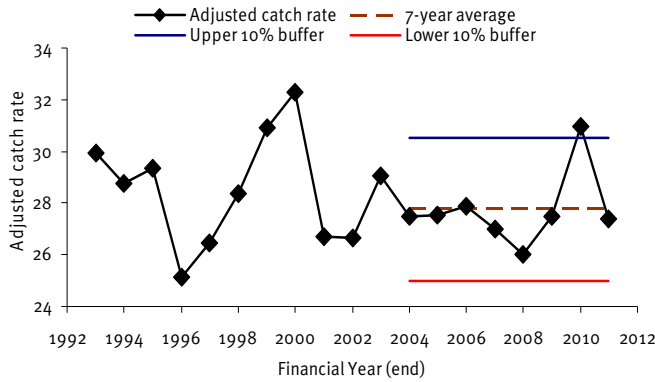


Figure 6: Standardised Spanish mackerel catch rate for the whole fishery 1991–92 to 2010–11. Adjusted catch rates (kg/day) below the red line would trigger the performance measure.

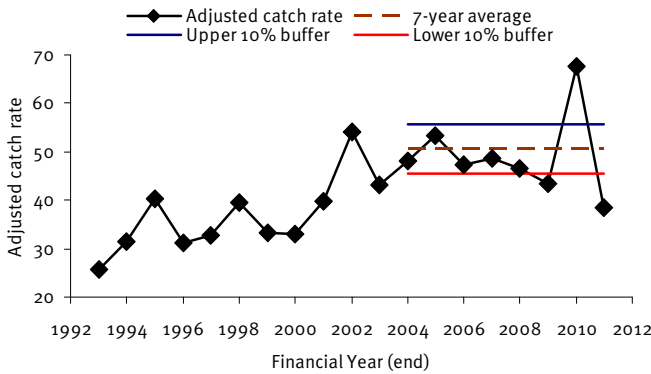


Figure 7: Standardised Spanish mackerel catch rate for specified spawning grids J19, J20, K20 & M22, during Oct–Nov from 1991–92 to 2010–11. Adjusted catch rates below the lower 10% buffer triggers the performance measure.

Resource concerns

Based on recent analyses and stock status assessments, Fisheries Queensland considers that the ECSMF is managed in a sustainable and precautionary manner. Preliminary outcomes from the 2011 stock assessment (Campbell et al. in press) indicate areas of uncertainty in the model, and as such, Fisheries Queensland is continuing to closely monitor the commercial catch through the quota reporting system. The statewide recreational fishing survey currently underway will also reduce uncertainty by providing an updated recreational catch estimate for this species.

As Spanish mackerel is a schooling species and is known to aggregate for spawning, there is potential for catch rates to be hyperstable (i.e. declines in stock size without apparent changes in reported catch rate). The stock assessment for east coast

Spanish mackerel uses an age-structured model, and incorporates a hyperstability-sensitive variant of the catch rate standardisation to account for this potential. The report will be publicly available in mid 2012.

Research

Recent research and implications

There have been no new research findings during the period.

Collaborative research

The ECSM stock is considered to be a separate genetic stock from Torres Strait and GOC Spanish mackerel stocks. Fisheries Queensland scientists are collaborating with Northern Territory Fisheries in refining the Spanish mackerel monitoring program in Queensland waters of the GOC only. There is currently no collaborative research occurring on the east coast stock.

Fishery management

Compliance report

During 2010–11, 1125 units, including 104 commercial fishing vessels, were inspected in the ECSMF. A total of 42 offences were detected during the course of these inspections.

Offences are reported as either a Fisheries Infringement Notice (FIN); Caution (FIN Caution or official caution issues by Legal); or Prosecution (to proceed by complaint summons).

Offences	Caution	FIN	Prosecution
Contravened a condition of an authority–quota	7	1	–
Contravened a regulated waters declaration–recreational fisher	1	2	–
Take or possession of regulated fish–recreational fisher	3	2	–
Take more product than a quota allows	2	1	–

Offences	Caution	FIN	Prosecution
Contravened a condition of an authority–boat mark	–	1	–
Fail to obtain or keep required information in the approved form	–	1	–
Contravened a condition of an authority	–	–	14
Failed to comply with an information requirement	–	–	7

Table 3: Offences recorded in the ECSMF in 2010–11.

Changes to management arrangements in the reporting year

There were no changes to management arrangements during 2010–11.

Communication and education

Promotion of regulations applying to both commercial and recreational fishers, including those relating to Spanish mackerel, is an ongoing role for Fisheries Queensland. Identification guides containing photos of Spanish mackerel and other fish were sent out to over 1800 households participating in the statewide recreational fishing survey and our Fishcare volunteers have engaged with recreational fishers throughout Queensland to educate fishers and communicate fishing regulations including those for Spanish mackerel. The DEEDI newsletter *direct* and the Monitoring our Fisheries Update have also promoted the rules and regulations for Spanish mackerel to over 2000 subscribers during the year.

Complementary management

There is no update for complementary management in the 2010–11 period.

References

Buckworth, R.C., Newman, S.J., Ovenden, J.R., Lester, R.J.G. and McPherson, G.R. 2007. The stock structure of northern and western Australian Spanish mackerel, FRDC Project 1998/159. Department of Primary Industry, Fisheries & Mines, Northern Territory Government, Australia.

Campbell, A.B., O'Neill, M.F., Staunton-Smith, J., Atfield, J. and Kirkwood, J. In press. Stock assessment of the Australian East Coast Spanish mackerel (*Scomberomorus commerson*) fishery. Department of Employment, Economic Development and Innovation, Brisbane, Australia.

Fisheries Queensland. 2009. Annual Status Report for the East Coast Spanish Mackerel Fishery. Department of Employment, Economic Development and Innovation, Brisbane, Queensland.

Mackie, M. C., D. J., Gaughan, and R. C. Buckworth. 2003. Stock assessment of narrow-barred Spanish mackerel (*Scomberomorus commerson*) in Western Australia. Final report to the Fisheries Research and Development Corporation (FRDC) on project no. 1999/151, 242 p. Department of Fisheries, Perth, Western Australia, 6020.

McPherson, G.R. 1981. Preliminary report: Investigations of Spanish mackerel, *Scomberomorus commerson*, in Queensland waters. In Grant, C.J., and Walters, D.G. (eds) 'Northern Pelagic Fish Seminar', Australian Government Printing Series, Canberra.

McPherson, G.R. 1992. Age and Growth of the narrow-barred Spanish mackerel (*Scomberomorus commerson*) in north-eastern Queensland waters. *Australian Journal of Marine and Freshwater Research* 43: 1269-82.

McPherson, G.R. 1993. Reproductive biology of the narrow banded Spanish mackerel (*Scomberomorus commerson* Lacepede, 1800) in Queensland waters. *Asian Fisheries Science* 6 (2): 169-182.

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.

Information compiled by

Bonnie Holmes

Acknowledgements

Dr David Mayer, Anna Garland, Dr Sue Helmke, Dr Clive Turnbull, Stephanie Slade, Dr Brigid Kerrigan, Dr Julia Davies, Dr Tracey Scott-Holland.

Image

Spanish mackerel (*Scomberomorus commerson*)

