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FINAL DETERMINATION

Rexea solandri - Gemfish

The Fisheries Scientific Committee, established under Part 7A of the *Fisheries Management Act 1994* (the Act), has made a final determination not to list *Rexea solandri* - Gemfish as an ENDANGERED SPECIES in NSW in Part 1 of Schedule 4 of the Act.

The Fisheries Scientific Committee, with reference to the criteria relevant to this species, prescribed by Part 11B of the *Fisheries Management (General) Regulation 2002* (the Regulation) has found that:

Background

1. *Rexea solandri* - Gemfish is a valid, recognised taxon and is a species as defined in the Act.

2. Gemfish inhabit oceanic continental shelf and upper slope waters, and are distributed throughout southern Australian and New Zealand waters. The eastern Australian population is genetically different to the western Australian population, and different to the two populations of gemfish found in New Zealand waters.

3. Eastern gemfish are caught at depths from 100 to 600 metres (approx. 50 to 300 fathoms) from northern New South Wales / southern Queensland to southern Tasmania. The majority of the catch is taken north of 40°S latitude. Off New South Wales, the 100 m-depth contour generally lies between 5 and 10 nautical miles (n.m.) from the coastline; however, in some areas (off Kurnell, Jervis Bay and Montague Island) the 100 m depth contour can be found 2 to 3 n.m. from the coast.

4. Historically, the Commonwealth-managed South East Trawl Fishery took the main catches of eastern gemfish. However, eastern gemfish are also taken by fisheries managed under the NSW *Fisheries Management Act 1994* (the trawl fishery north of Barrenjoey Pt, the dropline fishery which operates along the length of the NSW coast, and the recreational fishery).

5. Before 1993, the very limited recreational fishery and the large commercial fishery were based on targeting of the northerly pre-spawning migration along the NSW coast in winter. The post-1993 commercial fishery is a by-catch fishery of juveniles and sub-adults in the trawl sector and mature fish in the dropline sector of the fishery.

6. In the National Recreational and Indigenous Fishing Survey database there are no records of eastern gemfish caught in NSW.

7. The eastern population of gemfish *Rexea solandri* has the following conservation status:

    i. IUCN 2004: - no listing;

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ii. Pogonoski *et al.* 2002: - Lower Risk (conservation dependent) or Vulnerable;
iii. Australian Society for Fish Biology 2004: - Vulnerable.

Criteria – reduction in abundance, geographic distribution or genetic diversity (Regulation clause 340F)

1. Heavy commercial fishing pressure has led to a large, rapid and significant decline in catch rates and a steady decline in size at maturity of eastern gemfish since the 1970's: this is well documented in the listed references.

2. The peak catch of eastern gemfish in 1980 was 5,000 tonnes (t). Significant fisheries management intervention commenced in 1988 when regulations were changed. A 3,000t total allowable catch (TAC) was introduced. This was reduced to a zero TAC from 1993 to 1996. In 1997, the fishery was given a TAC of 1000t, however, less than 500t of eastern gemfish were caught. Consequently a zero targeted TAC was set in 1998 to 2007 and a reducing by-catch management TAC was introduced. In 2004, with a zero targeted TAC, but a by-catch management TAC (of 97t), 98t of eastern gemfish were landed.

3. Previous stock assessments have shown very low numbers in estimated spawning biomass. The quantitative stock assessment in 2000 by the eastern gemfish advisory group (EGAG) estimated the current spawning biomass of eastern gemfish to be <1% to 4% of the 1979 biomass. The 2005 Australian fishery status report based on qualitative assessments stated that the "stock is still well below AFMA's limit reference biomass (20% of 1979 biomass)".

4. Monitoring of the ‘by-catch’ of gemfish since 2000 identified a stronger cohort, spawned in 2002, which was expected to recruit to the mature population as 4 to 6 year old fish between 2007 and 2008. Although subsequent cohorts have not been identified to be as strong as the 2002 cohort and it is unlikely that gemfish will recover to target management levels in the near future, the species has shown some recovery and recruitment to the spawning biomass.

5. During the 2007 winter season a trawl survey was conducted to provide a current abundance index, the results from which have been utilised in a new quantitative assessment model developed using the ‘Stock Synthesis 2’ (SS2) software (Little *et al.*, in prep). The use of SS2 has also allowed the incorporation in the quantitative assessment of a lot of auxiliary data from the ‘by-catch’ period. The SS2 model was specified so as to mimic as closely as possible the important characteristics of the previous assessment (Punt 2000).

Following the trawl survey and ‘by-catch’ fishing during the 2007 winter season, the SS2 model for gemfish was updated and the following outcomes were apparent (Little *et al.*, in prep):

- The spawning biomass of gemfish was assessed to be increasing under the influence of a stronger 2002 cohort. Fish from this cohort will continue to recruit to the mature population as six-year-olds in 2008.

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- For a range of likely scenarios, current (post 2007 winter season) spawning biomass of females was estimated to be between 11 and 23% of the unexploited level. For the Base-Case model (current spawning biomass estimated to be 14% of the unexploited level) this represents the highest level of spawning biomass since the late 1990's.
- In terms of absolute rather than relative biomass, the spawning biomass of females in 2008 is estimated by the Base-Case model to be 1591t (ranging between 1465 and 2583t for the likely sensitivities examined). Note that the biomass of mature males needs to be added to this figure to estimate the total spawning biomass during 2008 – likely to be of the order of 2000 – 3000t). (The actual value for total spawning biomass was not available from the model outputs examined to date.)
- Whilst the 2002 cohort is estimated to be 'strong' (about 30-35% of 'normal strength' for cohorts spawned during the 1970's) the available data do not suggest that the following cohorts (2003 to 2005) are 'strong' - indicating it is unlikely that the spawning biomass of the eastern stock of gemfish will recover to a level greater than the management target in the foreseeable future.

6. In light of the above, the Fisheries Scientific Committee has found that although eastern gemfish has undergone a very large reduction in abundance, the species is not facing a high risk of extinction in New South Wales in the near future and does not meet the criteria of Endangered.

Criteria – threatening processes (Regulation clause 340G)

1. Currently, eastern gemfish are captured as by-catch in a number of commercial fisheries managed by both the Commonwealth and NSW. The Commonwealth managed south east trawl fishery has a 100t non-targeted by-catch for eastern gemfish. NSW managed fisheries have a 50kg trip limit total catch and 0kg in NSW waters south of Barrenjoey Headland.

2. Recreational fishing vessels are restricted to 10 whole fish in possession on board a vessel per day and similarly a zero take south of Barrenjoey Headland. Records of retained catch of eastern gemfish from the NSW recreational Charter Boat Fishery from 2000/01 to 2004/05 for all recorded charter fishing activities (nearshore, deepsea and gamefishing) show an increasing catch from 186 (~0.6t) fish to 792 (~2.5t) fish per year.

3. In light of the above, and having regard to the level of protection offered to the species by current fisheries management strategies the Fisheries Scientific Committee has found that; although gemfish are still taken by commercial and recreational fisheries, the species is not threatened with extinction if the current management practices remain in force and continue to improve.

Conclusion pursuant to section 220F(3) of the Act

In the opinion of the Fisheries Scientific Committee:

Rexea solandri - Gemfish is not facing a very high or high risk of extinction in New South Wales in the near future.

The species is not eligible to be listed as an ENDANGERED SPECIES.

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