RUBY SNAPPERS (2020)

Etelis spp.

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, Queensland, New South Wales	Eastern Australia	Undefined	Catch
Commonwealth, Western Australia, Northern Territory, Queensland	Northern Australia	Sustainable	Catch, Fishing Mortality, SPR (spawning potential ratio)

STOCK STRUCTURE

Andrews et al. [2016] examined the phylogeny of deepwater snappers of the genus *Etelis* using two mtDNA loci and two nuclear introns. The analyses of Andrews et al. [2016] indicated that species identified as *E. carbunculus* is comprised of two distinct, non-interbreeding lineages separated by a deep divergence, i.e. it was comprised of two cryptic species, *Etelis carbunculus* and a larger *Etelis* sp. (not formally described). Both of these cryptic species exhibit overlapping Indo-Pacific distributions, with *E. carbunculus* being more widespread across the Indo-Pacific, whereas the larger *Etelis* sp. is reported mainly from the Indian Ocean and Western Central Pacific [Andrews et al. 2016]. While these two species are morphologically similar, there are differences in the coloration of the upper-caudal fin tip, the shape of the opercular spine, differences in adult body length, body depth, and head length, and otolith morphometrics that can be used to separate the species [Wakefield et al., 2014; Andrews et al., 2016]. These species are now commonly referred to as pygmy ruby snapper (*E. carbunculus*) and giant ruby snapper (*Etelis* sp.). The main species landed in northern Australian waters is *Etelis* sp. (currently undescribed).

Andrews et al. [2020] investigated the population structure of *E. carbunculus* and *Etelis* sp. (as well as *Etelis coruscans*) across their distributional range in the Indo-Pacific. Andrews et al. [2020] examined a total of 1064 specimens of *E. carbunculus* from 11 regions, and 590 specimens of *E*. sp. from 16 regions. Samples of *E. carbunculus* were analysed using mtDNA and 9–11 microsatellite loci, while E. sp. was analysed with mtDNA only. *Etelis carbunculus* exhibited low but significant levels of isolation for the Hawaiian Archipelago, and divergence between Tonga and Fiji. *Etelis* sp. exhibited little structure except a strong pattern of isolation

for both Seychelles and Tonga at the edge of their distribution (east and west, respectively). This indicates populations are structured on the wider scale of ocean basins and the capacity for widespread dispersal throughout the Indo-Pacific region. As such, Australian populations of Ruby Snappersare likely to form a single biological stock in the Western Pacific area (east coast) and the Indian Ocean area (west coast).

Here, assessment of stock status of Ruby Snappers is presented at the biological stock level—Northern Australia (Western Australia, Northern Territory); and Eastern Australia (Queensland, New South Wales).

STOCK STATUS

Eastern Australia

In Queensland, Ruby Snapper species are reported as a single group, likely comprised primarily of *Etelis carbunculus* and *Etelis* sp. (currently undescribed), but potentially also including similar-looking species (e.g. Flame Snapper, *Etelis coruscans*). Additionally, some catch of Ruby Snappers may be reported in the Unspecified Tropical Snapper catch category. Commercial harvest of Ruby Snapper in Queensland is constrained by a multi-species Total Allowable Commercial Catch, in addition to species-specific harvest control rules as part of the newly implemented Reef Line Fishery Harvest Strategy [QDAF 2020]. For secondary target and by-product species like Ruby Snapper, this includes catch reference points that trigger stock assessments and implementation of a species-specific Total Allowable Commercial Catch. Over the last decade, commercial catch reached a peak of 2.8 t (2018). There are no estimates of recreational harvest of Ruby Snapper in Queensland.

Catch of finfish in the Commonwealth Coral Sea Fishery (CSF) is also managed as a diverse group of species, including the Ruby Snapper species group, caught by line gears and there are no species specific catch limits. Catch of the Ruby Snapper species group in the CSF was 1.9 t in 2018–19, down from 3.6 t in 2017–18, averaging 3.1 t over the years 2010–2019.

There was a small amount of catch of the Ruby Snapper species group taken by Commonwealth-endorsed high seas vessels in 2017–18 (0.15 t) and 2018–19 (2.1 t). There is a small amount of catch (<200 kg per annum) reported in the Commonwealth's Southern and Eastern Scalefish and Shark Fishery, however this is considered to be outside the range for this species and likely misidentified.

In NSW, two species from the genus *Etelis* are reported in commercial catches; the Flame Snapper (*Etelis coruscans*) and Ruby Snapper (*E. carbunculus*). This assessment presents only data for the latter. Reported catch of Ruby Snappers in NSW is very low, with the total commercial catch since 2016 below 1 t per year and recreational and indigenous harvest unknown.

No formal stock assessments have been undertaken to quantify biomass levels of Ruby Snapper on the east coast of Australia, and there are no estimates of indigenous or recreational harvest for this species or species complex. The reported catch is low relative to the distribution of the species on the east coast. There is insufficient information available to confidently classify the status of this stock.

On the basis of the evidence provided above, the Eastern Australian biological stock is classified as an **undefined stock**.

Northern Australia

The assessment of the stock status of Ruby Snapper in Northern Australia is based on an assessment of the relative contributions of catch from each jurisdiction and a formal assessment of the level of fishing mortality of *Etelis* sp. in Western Australia. The Ruby Snapper complex comprises two species, *E. carbunculus* (pygmy ruby snapper) and *Etelis* sp. (giant ruby snapper)

[Wakefield et al. 2014]. These two cryptic species are sympatric and typically co-occur in catches throughout their distribution. The main species landed in northern Australian waters is *Etelis* sp. (currently undescribed).

The total commercial catch of Ruby Snappers in Western Australian demersal fisheries has been variable over the last 10 years (2010–2019), ranging from 4–77 tonnes (t), with a mean annual catch of 27 t [Newman et al. 2020]. The Commonwealth catch in the Western Deepwater Trawl Fishery, operating off the West Australian Coast has been variable over the last decade (2010-2019), ranging from 0 to 28 t (28 t 2017-18; 21 t in 2018-19). Commercial harvest of Ruby Snapper in the eastern Gulf of Carpentaria is managed as part of the 'other species' quota category in the GOCDFFTF (inactive since 2016), which comprises other reef finfish species. Ruby Snapper is also commercially harvested by the GOCLF where there are no caps on total catch at the species or complex level. Catch has not been recorded in either Queensland fishery since 2008, when a total of 8.3 t was recorded.

The stock assessment for Giant Ruby Snapper (*Etelis* sp.) in the North Western Australia region of Northern Australia is based on an assessment of fishing mortality derived from catch curve analysis of representative samples of the age structure [Wakefield et al 2020]. Point estimates of fishing mortality (F = 0.038 [1997] and 0.052 year[-1] [2011]) and associated confidence limits were well below the value for natural mortality (M) of 0.11 year[-1], indicating that, on average over the life span of the fish in the samples, exploitation has been relatively low. Estimates of mortality and selectivity from 1997 and 2011, and analyses of the female relative spawning potential ratio suggest the *Etelis* sp. stock in North Western Australia region has remained at around 60% of the unfished level over the years represented by the age composition sample [Wakefield et al 2020]. Given that this species is longer lived than *E. carbunculus* [see Williams et al 2017] and is more dominant in catches, the status of this species is considered to represent the status of Ruby Snappers in the Northern Australia stock. Catches across the distributional range of *Etelis* sp. are low. The above evidence indicates that the biomass of Ruby Snappers is unlikely to be depleted, recruitment is unlikely to be impaired, and the current level of fishing mortality is unlikely to cause the stock of Ruby Snappers to become recruitment impaired.

On the basis of the evidence provided above, the Ruby Snappers species group in North Western Australia region of Northern Australia is classified as a **sustainable stock**.

BIOLOGY

Ruby Snappers biology [Wakefield et al. 2020]

Species	Longevity / Maximum Size	Maturity (50 per cent)
RUBY SNAPPERS	Etelis sp. Eastern Indian ocean: 42 years,1127 mm FL	Etelis sp. Eastern Indian ocean: Length at 50% maturity (female: 527 mm FL, male: 456 mm FL), Age at 50% maturity (females; 5.4 years, males 4.4 years)

DISTRIBUTION

Distribution of reported commercial catch of Ruby Snappers

TABLES

Fishing methods					
	Commonwealth	New South Wales	Northern Territory	Queensland	Western Australia
Charter					
Hook and Line		✓		✓	✓
Various					✓
Commercial					
Bottom Trawls					✓
Demersal Longline	✓				
Demersal Pair Trawl	✓				
Fish Trap			✓		✓
Hand Line, Hand Reel or Powered Reels					✓
Handline (mechanised)	✓				
Hook and Line				✓	
Line				✓	✓
Trawl				✓	
Unspecified					✓
Various		✓			
Recreational					

Hook and Line		✓		✓	✓

Management Methods				
	Commonwealth	New South Wales	Queensland	Western Australia
Charter				
Bag limits				✓
Gear restrictions		✓	✓	
License		✓		
Limited entry				✓
Marine park closures		✓		
Passenger restrictions				✓
Possession limit			✓	
Size limit			✓	✓
Spatial closures		✓	✓	✓
Spatial zoning				✓
Temporal closures			✓	
Commercial				
Effort limits				✓
Gear restrictions	✓	✓	✓	✓
License	✓			
Limited entry		✓	✓	✓
Marine park closures		✓		
Size limit			✓	
Spatial closures			✓	✓
Spatial zoning				✓
Temporal closures		✓	✓	
Total allowable catch			✓	✓
Total allowable effort				✓
Vessel restrictions		✓	✓	✓
Recreational				
Bag limits				✓
Gear restrictions		✓	✓	

Licence (Recreational Fishing from Boat License)				✓
License		✓		
Marine park closures		✓		
Possession limit			✓	✓
Size limit			✓	✓
Spatial closures		✓	✓	✓
Temporal closures			✓	

Catch					
	Commonwealth	**New South Wales**	**Northern Territory**	**Queensland**	**Western Australia**
Charter		Unknown		Unknown	2 t
Commercial	25.3748 t	0.007 t	1.245 t	3.101 t	5.1736 t
Indigenous		Unknown		Unknown	Unknown
Recreational		Unknown		Unknown	Insufficient data

Western Australia – Recreational (Catch) Boat-based recreational catch is from 1 September 2017–31 August 2018. These data are derived from those reported in Ryan et al. 2019.

Western Australia – Recreational (management methods) A Recreational Fishing from Boat Licence is required for the use of a powered boat to fish or to transport catch or fishing gear to or from a land-based fishing location.

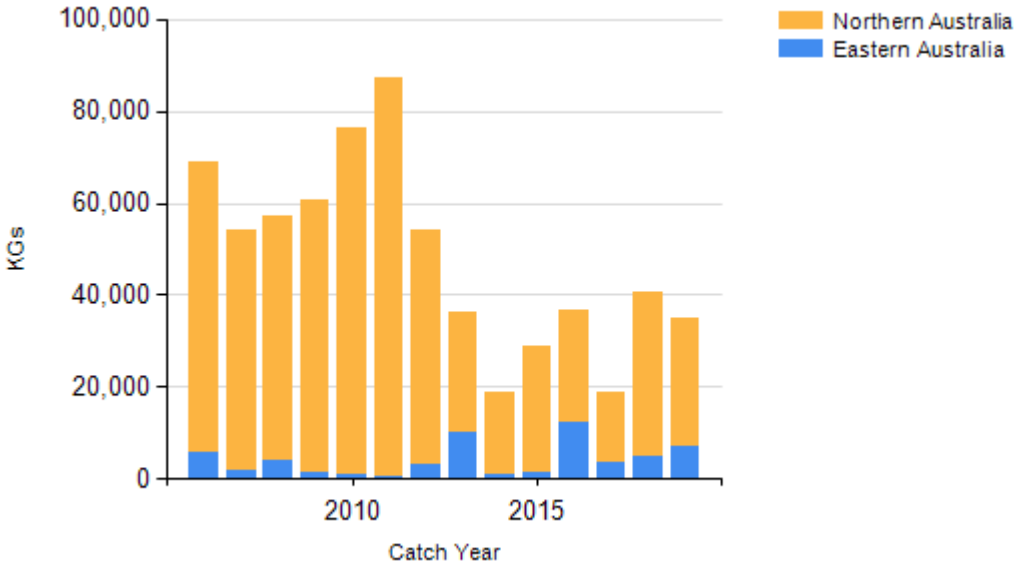
Western Australia – Indigenous (management methods) Subject to application of Section 211 of the *Native Title Act 1993* (Cth), and the exemption from a requirement to hold a recreational fishing licence, the non-commercial take by Indigenous fishers is covered by the same arrangements as that for recreational fishing.

New South Wales – Recreational (Catch) Murphy et al. [2020].

New South Wales – Indigenous (management methods) (https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing

Queensland – Indigenous (management methods) for more information see https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing

CATCH CHART



Commercial catch of Ruby Snappers - note confidential catch not shown

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QDAF 2020	Queensland Department of Agriculture and Fisheries (2020) Reef line fishery harvest strategy: 2020–2025. Brisbane, Queensland.
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