

# Australian Bonito (2020)

*Sarda australis*



**John Stewart:** Department of Primary Industries, New South Wales, **Heather Patterson:** Australian Bureau of Agricultural and Resource Economics and Sciences

## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales	Eastern Australia	Sustainable	Depletion estimates, Catch, Catch rates, Size composition, Harvest rates, Mortality

## STOCK STRUCTURE

Australian Bonito *Sarda australis* occurs in the western Pacific Ocean where it is restricted to waters around south-eastern Australia, Norfolk Island and northern New Zealand (Collette and Nauen 1983). South-east Queensland is the northern extent of the species range. Little is known about stock structure within this range; however Australian Bonito are highly mobile and commercial landings exhibit consistent seasonal patterns in availability in terms of both abundance (peaking during summer and autumn) and sizes (Stewart et al., 2013). Due to the latitudinal distribution along eastern-Australia, and influence of the prevailing southerly flowing Eastern Australian Current in this area Australian Bonito are considered to be a single biological stock in this region. Here, assessment of stock status is presented at the biological stock level—Eastern Australia.

## STOCK STATUS

### Eastern Australia

The Eastern Australia biological stock has components in Commonwealth and New South Wales waters off eastern Australia. The catch of Australian Bonito by Commonwealth fishers is extremely low, averaging less than 200 kg per year since 2010. These low levels constitute less than 1% of the total harvest during this time. Consequently the stock is assessed using data from New South Wales.

Results of modified Catch-MSY analyses [Haddon et al. 2018, Martell and Froese 2013] using NSW commercial catch data from 1990 to 2018 produced imprecise estimates of depletion; however even the lowest trajectories during 2018-19 were above the limit reference level of 0.2 of the unfished biomass [Stewart 2020]. The median depletion level in 2018-19 was estimated to be approximately 0.6 which is well above the limit reference level of 0.2. Standardized catch rates for line fishing methods between 1997-98 and 2018-19

fluctuated substantially, likely a reflection of highly variable abundance of Australian Bonito as a result of their life history [Stewart 2020, Stewart et al. 2013]. However, no obvious overall trends in catch rates and recent slight increases suggest that the biomass is not declining. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Estimated mean harvest rates from the Catch-MSY analyses were below that estimated to cause the stock to decline [Stewart 2020]. The landed commercial catch of Australian Bonito fluctuates annually but in recent (the last 5) years has averaged approximately 180 tonnes (t) which is below the mean estimate of commercial MSY of 207 t [Stewart 2020]. Harvest rates may have been excessive during the late 2000s and early 2010s when large (approaching 350 t per year) landings occurred but has since declined. Commercial fishing effort on Australian Bonito has been relatively stable during the previous decade [Stewart 2020]. The size composition in the landed catch indicates a change from generally being bi-modal during 2003-04 to 2006-07 to mainly the smaller mode being present between 2008-09 and 2014-15 with an associated decline in average size [Stewart 2020]. This may reflect high abundance of younger cohorts in more recent years, or alternatively the fishing of the majority of larger fish. Given that these 'bi-modal' years were generally lower catch years and that the years of very high landings were mainly the smaller mode the former hypothesis is most likely. Estimates of mortality derived from length-based catch curves and an estimated maximum age of 4 years indicate that Z is unlikely to exceed 2 x M [Stewart 2020]. The above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the entire Eastern Australian biological stock is classified as a **sustainable stock**.

## BIOLOGY

**Australian Bonito biology** [Stewart et al. 2013, Collette and Nauen 1983]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Australian Bonito	4 years, 1001 mm FL	1 year, 360 mm FL

## DISTRIBUTION



Distribution of reported commercial catch of Australian Bonito

**TABLES**

<b>Fishing methods</b>	<b>Commonwealth</b>	<b>New South Wales</b>
<b>Charter</b>		
Handline		✓
<b>Commercial</b>		
Line		✓
Pelagic Longline	✓	
Various		✓
<b>Recreational</b>		
Handline		✓
Spearfishing		✓

<b>Management Methods</b>	<b>Commonwealth</b>	<b>New South Wales</b>
<b>Commercial</b>		
Gear restrictions		✓
Licence		✓
Marine park closures		✓
Spatial closures		✓

Trip limits	✓	
Vessel restrictions		✓
<b>Recreational</b>		
Bag limits		✓
Gear restrictions		✓
Licence		✓
Marine park closures		✓
Possession limit		✓
Spatial closures		✓

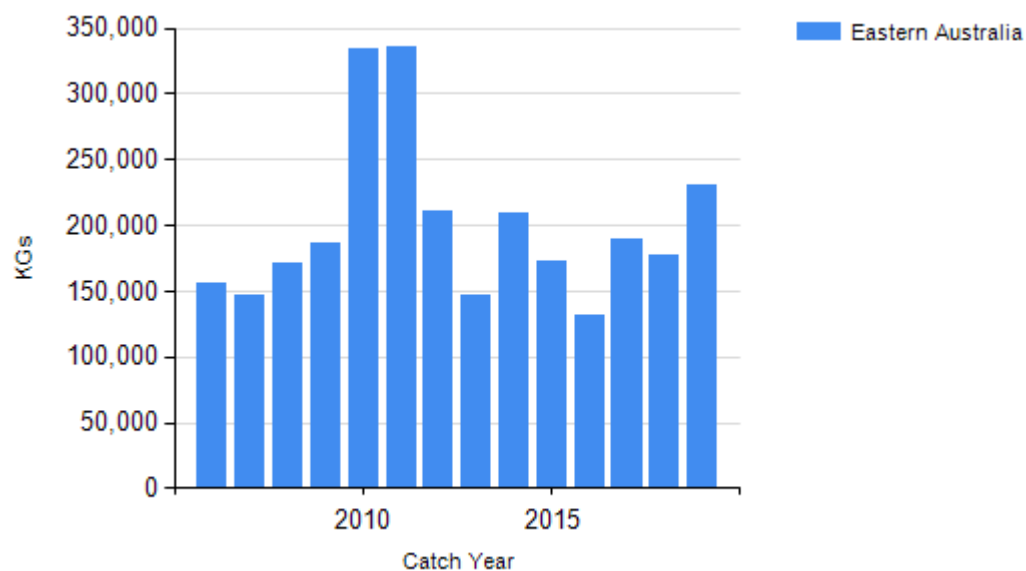
Catch	New South Wales	
	Commonwealth	New South Wales
Commercial	0.465 t	230.317 t
Indigenous		Unknown
Recreational		32.4 t (2017-18)

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

**New South Wales – Indigenous (management methods)**

<https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

### CATCH CHART



Commercial catch of Australian Bonito - note confidential catch not shown

<b>References</b>	
Collette and Nauen 1983	Collette, BB and Nauen, CE 1983, Scombrids of the World. An Annotated and Illustrated Catalogue of Tunas, Mackerels, Bonitos and Related Species Known to Date. Rome, FAO: 137 pp.
Stewart et al. 2013	Stewart, J, Robbins, WD, Rowling, K, Hegarty, A, and Gould, A 2013, A multifaceted approach to modelling growth of the Australian bonito <i>Sarda australis</i> (Family Scombridae). <i>Journal of Fish Biology</i> , 64: 671-678.
Stewart 2020	Stewart, J 2020. Status of Australian Fish Stocks 2020 – NSW Stock status summary – Australian Bonito ( <i>Sarda australis</i> ).
Martell and Froese 2013	Martell S, Froese R 2013, A simple method for estimating MSY from catch and resilience. <i>Fish Fish</i> 14:504–514
Haddon et al. 2018	Haddon M, Punt A and Burch P 2018, simpleSA: A package containing functions to facilitate relatively simple stock assessments. R package version 0.1.18.
Murphy et al. 2020	Murphy, JJ, Ochwada-Doyle, FA, West, LD, Stark, KE and Hughes, JM 2020, The NSW Recreational Fisheries Monitoring Program - survey of recreational fishing, 2017/18. NSW DPI - Fisheries Final Report Series No. 158.