



## Humphead Parrotfish (*Bolbometopon muricatum*)

### Fishery-independent Data

**Table 1.** Data summarized for a total of 3,323 100-metre transects made in 52 countries between 1997 and 2006 (Reef Check pers. comm. on 4<sup>th</sup> Jan 2007). The data show the number of *Bolbometopon muricatum* observed based on the assumption that the transect dimensions are 100 x 10 m numbers are adjusted to 1,000 m<sup>2</sup> (J.H. Choat unpubl. data).

Region	Years						
	2000	2001	2002	2003	2004	2005	2006
Australia	0	0	0.14	0.09	1.28	0.09	0.31
Indonesia	4.18	1.8	2.29	1.1	0.49	0	0.5
Philippines	0	0.07	0.18	0.04	0.05	0.19	0.02

**Table 2.** Data summary of abundance estimates of *Bolbometopon muricatum*, by region, in the Pacific and Indian oceans; data counts used similar and thus comparable methods (J.H. Choat and R.J. Hamilton unpubl. data for use in Red List assessment only). Abundance estimates were made in seven different regions on t 400x20 m visual count transects on reef crest and reef slope environments. Four regional areas were sampled in the Seychelles. Mean estimates are also converted to the number per hectare and the number per square kilometer.

Region		Mean $\pm$ SE 1,000 m <sup>2</sup>	No. per hectare	No. per sq. km
Great Barrier Reef		3.1 $\pm$ 0.7	31	3,100
Solomon Islands:				
Solomons (Roviana)		1.41 $\pm$ 0.2	14.1	1,410
North Choiseul (2005/2006)	N=20	0.118 $\pm$ 0.058	1.18	118
Cocos		0.3 $\pm$ 0.04	3	300
Christmas Island		0.06 $\pm$ 0.05	0.6	60
Papua New Guinea:				
PNG (Kavieng) (Choat 2000)		0.27 $\pm$ 0.16	2.7	270
Kavieng/New Hanover (2006)	N=18	0.035 $\pm$ 0.022	0.35	35
Manus Island (2006)	N=9	0.083 $\pm$ 0.069	0.83	83
Helene Atoll		0.49 $\pm$ 0.31	4.9	490
Seychelles:				
Farquhar		0.47 $\pm$ 0.3	4.7	470
Amirantes Mid		0	0	
Amirantes South		0.2 $\pm$ 0.2	2	200
Granitics Mahe		0.08 $\pm$ 0.04	0.8	80

**Note:** The western and central Pacific data show very low abundances and local extinctions. The Great Barrier Reef data may serve as a benchmark for the comparison made here. The data suggest also that this species is naturally rare in the Indian Ocean and the data from the Pacific argues that high abundances can be reduced once fishers determine how easily this species can be harvested.

**Table 3.** Summary of estimated abundances of *B. muricatum* based on an underwater visual census (UVC) using a belt transect of approximately 400x20 m; data are from the Great Barrier Reef (two habitats; 1995), Papua New Guinea reef crests (Kavieng 2000), and Helene Atoll reef crests (2000) (J.H. Choat, unpubl. data, pers. comm. on 4<sup>th</sup> Jan 2007).

Location	Mean (no. / 8,000 m <sup>2</sup> )	Standard error
Great Barrier Reef (crest)	24.73	5.35
Great Barrier Reef (pass)	11.00	10.22
PNG (crest)	2.20	1.15
Helene Atoll (crest)	3.95	2.16

Fishery-independent data by country

### ***Fiji***

Based on informal traditional knowledge from local fishers, Dulvy and Polunin (2004) reported that *B. muricatum* was the fifth most important commercial species in 1990, but becomes rare in the markets and locally extinct in some of the Lau Islands in Fiji at present.

According to the records from local scientists at 39 locations in 31 Indo-Pacific nations, Dulvy and Polunin (2004) revealed that the previous abundant *B. muricatum* is locally common only inside no-fishing areas and that it is currently rare in the world.

### ***Kirbati***

G.R. Allen (pers. comm. on 28<sup>th</sup> Dec 2006) reported that two groups of *B. muricatum* were observed at Phoenix Islands, one school of 100, another school of 20, with an average sighting frequency of two fish per dive (dividing the number of fish by the number of dives).

### ***Micronesia***

G.R. Allen (pers. comm. on 28<sup>th</sup> Dec 2006) observed *B. muricatum* in 9 out of 41 dives (to 50 m depth) from Pohnpei and nearby areas on 12 September 2005.

### ***Palau***

According to the interviews (8 out of a total of 30) with local fishers in July 2003 (Y. Sadovy pers. comm.; source: unpublished interviews done by the Society for the Conservation of Reef Fish Aggregations) the following observations were made:

- Fish with eggs before new moon.
- Caught 60 at one go in shallow water at night with a spear in the 1970s; could remove the whole school at a time using SCUBA.
- Maximum catch was 250 fish in 1 fishing trip in 1975; 30 to 50 fish per trip after 1975; very few now.
- *B. muricatum* sleeps in predictable places and can be found easily; *B. muricatum* are now caught at greater depth using SCUBA.
- The number of *B. muricatum* had declined dramatically and noticeably by the early 1990s.
- Could catch 100 to 150 fish (about 60 lbs each) in a month between 1960 and 1970; could catch 30 to 60 fish (30 lbs each) in a month after 1990; a lot of females with eggs were caught about 8 to 9 days after full moon.
- Easier to catch at new moon in shallow (2 to 3 m) waters at low tides in very predictable places; caught 1,000 lbs in the early 1980s.

### Solomon Islands

CPUE surveys of night time spearfishing trips in heavily fished Roviana Lagoon and at lightly fished island Tetapare in 2000 and 2001 indicated that *B. muricatum* was a target species (for details see Table 4 below).

**Table 4.** Results of the catch per unit estimate (CPUE) surveys carried in Roviana Lagoon and at Tetapare .

	Roviana Lagoon	Tetapare
No. of <i>B. muricatum</i> caught	239	65
Percentage of total catch	36.6%	86%
Mean size	63.2 cm TL	89.5 cm FL
Percentage of juveniles	56%	5%
Percentage of fish $\geq$ 100 cm FL	3%	35%
Average No. fish shot / trip	2.9	16.3

Source: Hamilton (2003)

Hamilton (2003) revealed that *B. muricatum* has been heavily over-fished and its stock is overexploited.

Interviews with 21 spearfishermen from Roviana Lagoon in 2000 and 2001 indicated that major declines in *B. muricatum* catch in the past ten years (especially for fish  $\geq$  100 cm FL – large terminal phase male), with 15 of all 21 spearfishermen claimed that the most *B. muricatum* they had ever caught in one night in the past two years was between 5 to 16 (compared with 70 fish in a night in the mid 1970s to early 1980s), and the average number of fish caught in one trip was around two to eight (Hamilton 2003).

According to a 236-hour fishing effort in 30 night time spearfishing trips in the Kalikoqu passage and outer-reef-drop in Roviana Lagoon from September 2000 to July 2001, Aswani and Hamilton (2004) recorded that *B. muricatum* comprised 59.6% (634.6 kg) of the total catch, with an average catch rate at 2.89 kg per hour. The fish caught sized 28.5 to 102.0 cm TL, with a mean length of 62.7 cm TL (Aswani and Hamilton 2004).

The belief that *B. muricatum* predominantly aggregates at night around the new moon period and that catch rates are far greater during the new moon was not supported by CPUE and UVC surveys done in 2000 and 2001 (Aswani and Hamilton 2004).

In Tetapare, Aswani and Hamilton (2004) reported that the Bahana Fisheries Centre in Kia bought over 31,000 kg wet-weight of *B. muricatum*, with recorded catches of over 500 kg being regularly landed by a single diving party in a night.

Dulvy and Polunin (2004) concluded that *B. muricatum* would be extinct locally in some fishery-exploited areas.

**Note:** The references mentioned above are cited in full under the Fact Sheet for the species on the IUCN Red List of Threatened Species.