

*Tridacna crocea* Lamarck, 1819

**FAMILY:** Tridacnidae

**COMMON NAMES:** Boring Clam, Crocus Clam (English)

**GLOBAL CONSERVATION STATUS:** Listed as Least Concern in the *2004 IUCN Red List of Threatened Species* (IUCN, 2004).

**SIGNIFICANT TRADE REVIEW FOR:** Australia, Fiji, India, Japan, Malaysia, New Caledonia (France), Palau, Papua New Guinea, Vanuatu, Viet Nam

**Range States selected for review**

Range State	Exports* (1994-2003)	Urgent, possible or least concern	Comments
Australia	Minimal	Least concern	Minimal trade
Fiji	10,352 live wild	Possible concern	Population (re) introduced, status unknown; domestic use levels unknown; no population monitoring or basis for ensuring non-detrimental nature of exports was available.
India	None	Least concern	No trade
Japan	None	Least concern	No trade
Malaysia	Minimal	Least concern	Minimal trade
New Caledonia	1,252 shells	Least concern	Low level of export, although status of stock unknown.
Palau	Minimal	Least concern	Minimal trade
Papua New Guinea	Minimal	Least concern	Minimal trade
Vanuatu	53,577 live wild	Possible concern	Reported rare; exports greatly declined since 2001, but continued until at least 2003 despite reported export ban. Situation should be re-reviewed if trade resumes.
Viet Nam	268,474 live wild	Urgent concern	High levels of trade; no information on population monitoring or basis for ensuring non-detrimental nature of exports was available.

\* Excluding re-exports.

**SUMMARY**

*Tridacna crocea*, Boring Clam or Crocus Clam, occurs from southern Japan, south to Australia and east to Palau. It is the smallest of the giant clams and is considered still reasonably abundant, although is believed extinct in Guam and the Northern Marianas. It is currently classified by IUCN as Lower Risk/Least Concern.

The Animals Committee selected ten countries and territories for the Review of Significant Trade. No export was recorded from two of these (India and Japan) for the period under review, and therefore + classified as of Least Concern and these countries were excluded from more detailed analysis. Of the remaining eight countries and territories recorded trade in the species was at a low level from five (Australia, Malaysia, New Caledonia, Palau and Papua New Guinea). Trade from these countries was also classified as of Least Concern. Substantial exports from three countries were reported: Fiji, Vanuatu and Viet Nam. These were subject to more detailed review.

Results of the study seem to indicate that, in the majority of range States concerned, data and information that are necessary to ensure that exports comply with Article IV and make non-detriment findings may not be available.

Recent reported exports from Fiji are relatively low, although additional exports of giant clams have been recorded at the genus or family level. No information was available on the basis for non-detriment findings, so that the species is considered of Possible Concern in Fiji.

Although large numbers of wild-collected *T. crocea* have been exported from Vanuatu during the period 1994-2003, reported numbers in trade have dropped dramatically, from an average of 13,000 a year during the period 1998-2001 to ca 500 in 2002, just under 1,000 in 2003 and none in 2004. However most specimens exported have been described as wild collected, despite an export ban apparently having been put in place in 2001. Because of this and the fact that no information was available on the basis for non-detriment findings, the species is considered of Possible Concern in Vanuatu. However, given that the species is reportedly rare in Vanuatu, the situation would merit urgent attention if trade levels increase.

In Viet Nam, given the continued and high levels of trade in the species, lack of population status information available and the absence of advice on the nature of the management arrangements, trade is considered of Urgent Concern.

Ongoing trade in giant clam species recorded to the family level hinders accurate analysis of the impact of trade on specific species.

### SPECIES CHARACTERISTICS

*T. crocea* is the smallest of the Tridacnidae, reaching a maximum shell size of 15cm. It lives embedded in corals and occurs from southern Japan, south to Australia and east to Palau. It was reported by Wells (1997) as still reasonably abundant, although possibly extinct in Guam and the Northern Marianas (Munro, 1989; Wells, 1997). Globally IUCN classifies the conservation status of *T. crocea* as Lower Risk/Least Concern (IUCN, 2004).

Each of the ten countries identified for examination in relation to *T. crocea* are range States for the species. In addition to these, UNEP-WCMC (2004) report the occurrence or possible occurrence of *T. crocea* in Indonesia, the Philippines, Singapore, Solomon Islands, Taiwan, Thailand and Tuvalu.

General information on the biology of *T. crocea* and other giant clam species is provided in the accompanying introduction.

### INTERNATIONAL TRADE

Over the period 1994-2003, exports of *T. crocea* were recorded for 24 countries and territories. These included eight of the ten countries and territories selected for inclusion in the review of trade in this species; exports were not recorded for India and Japan. Of the remaining eight, trade from four countries was minimal and therefore of Least Concern. Analysis focused on trade from Fiji, New Caledonia, Vanuatu and Viet Nam. Of the 16 countries not selected for review recording exports, only the Solomon Islands appeared to be trading in significant quantities.

Exports of *T. crocea* by Fiji, Indonesia, New Caledonia, Vanuatu and Viet Nam and the Solomon Islands are shown in Table 1.

**Table 1: Exports excluding re-exports of *T. crocea* from significant trading range States 1994-2003.**

Term	Unit	Source	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
<b>Fiji</b>													
Live		C			8	186	1462	2636	583		15		4890
Live	kg	C					4						4
Shells		C							300				300
Live		F									410	16	426
Shells		F									100		100
Live		W	50	31	4	1351	5115	2507	866	99	329		10352
Live	kg	W					39						39
Shells		W					42						42
<b>Indonesia</b>													
Live		C								50			50
Live		F							130	535			665

Term	Unit	Source	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Carvings		W							6			2	8
Live		W	82	0		8			2	50			142
Shells		W										10	10
New Caledonia													
Shells		W				1	120	66	300	345	257	163	1252
Solomon Islands													
Live		C		242	801	4425	3378	1910	2251	3626	4067	2267	22967
Shells		C							53	200			253
Live		F								700	1746	3276	5722
Live		W	2184	3352	6685	9524	7847	4025	1273	5400	3864	9	44163
Shells		W			87			4					91
Viet Nam													
Live		C								3800	2500	7594	13894
Live	kg	C								1500			1500
Live		F										2157	2157
Carvings		W											0
Live		W				500	46390	36500	40000	61674	48342	35068	268474
Shells	kg	W							4				4
Vanuatu													
Live		C									251		251
Live		W				250	15310	11150	17386	8290	232	959	53577
Live	kg	W					179		266		100		545
Shells		W				150	202		462				814

(Source: CITES trade statistics derived from the *CITES Trade Database*, UNEP World Conservation Monitoring Centre, Cambridge, UK)

## COUNTRY ACCOUNTS

### Fiji (CITES Party since 1997)

#### Status:

Not recorded as naturally occurring (Wells, 1997), but reported to have been introduced (Parry-Jones, 2003).

#### Management and trade:

Although Fiji provided export data for giant clams in their CITES annual reports beginning in 1998, these have not been incorporated into the CITES trade database by UNEP-WCMC as there are questions concerning the data. Queries have been sent to Fiji's CITES Management Authority, and the data will be incorporated into the database once the questions have been resolved. Information below on CITES-reported trade is therefore based solely on data from CITES Parties reporting imports from Fiji (Caldwell *in litt.* 2006). The ability of CITES data to support assessment of the potential impacts of recent trade levels on wild populations is hindered further by the failure to report some imports to the species level. Significant quantities of giant clams have been reported simply as "Tridacnidae spp." precluding accurate analysis of the impact of trade on specific species.

There were significant quantities of reported imports of *T. crocea* from Fiji between 1997 and 2000, notably some 15,000 live specimens, of which two-thirds were reported as of wild origin. Since 2000 reported imports from captive bred sources have virtually ceased and those from wild sources have declined markedly. In 1999, 6,620 live specimens of giant clam, and in 2002, 1,413 shells, were imported from Fiji as Tridacnidae spp.; it is not known how many of these were *T. crocea*.

There was no information available on the domestic market for, or level of collection of, *T. crocea* specifically, but this species is known to be used along with other giant clam species. Clams are collected for subsistence purposes and considered as 'high status food' for use on special occasions or as a reserve food when times are difficult. In the 1980s, giant clam meat was sold in municipal markets

and directly to restaurants, supermarkets and other outlets, and was considered to be expensive relative to other seafood products (Wells, 1997). In 2003, clam meat from wild stocks was being sold in markets (Raymakers *et al.*, 2003) and in 2004 clam meat was still served in at least one restaurant (Parry-Jones, *in litt.*, 2006).

There is no regulation of domestic harvest of giant clams, although exploitation guidelines were drawn up by the Fisheries Division in 1984 (Wells, 1997). Available information indicates that domestic use and sale is also unregulated. Export of wild giant clam meat was banned in 1988 under the Fisheries Act (Cap. 1.58) of 1942, amended in 1992. The Act includes a clause allowing the Permanent Secretary responsible for fisheries to make exceptions for meat from verified mariculture sources. It is therefore possible that the classification of 'wild' in trade data may refer to clams from hatcheries that are placed on the reefs to grow out (Parry-Jones, *in litt.*, 2006). It is not clear whether the export ban also applies to the export of live specimens. No information was available with regard to population monitoring.

Mariculture: Trade data for this species suggest that it is being bred in captivity; hatcheries were in operation in the 1990s (Wells, 1997; Raymakers *et al.*, 2003) but there are, however, no reports of *T. crocea* being involved at that time. Records of trade in wild rather than captive-bred specimens may be a result of misreporting by importing Parties.

Without information on the status of introduced stocks and harvest levels for domestic consumption, it is not possible to assess whether or not current export levels are detrimental to the species' survival in Fiji. Because of this, although the reported trade has declined, trade from Fiji of *T. crocea* has been classified as of Possible Concern.

## **New Caledonia (France)**

### **Status:**

Although there are no early records, this species has recently been recorded from New Caledonia but there is no information on its status (Richer de Forges, 2002).

### **Management and trade:**

Recorded exports of *T. crocea* between 1994 and 2003 comprised only wild-sourced shells. Exports have been recorded each year since 1997, with the highest quantity (345) in 2001. New Caledonian authorities have advised that these shells are effectively a by-product of domestic harvest of clams for meat consumption (Constantin *in litt.* 2004).

Giant clams are traditionally fished for meat in New Caledonia. Domestic markets for clam meat are poorly documented and difficult to separate from subsistence use. Quantities sold locally (i.e. excluding subsistence consumption) are estimated at two to three tonnes per year. Many restaurants have giant clam meat on their menu. There seems to be no local demand for live specimens of giant clams or export of these for the aquarium markets (Baillon *et al.*, 2002).

Information on legislation relevant to giant clams is incomplete. Non-commercial fisheries are not regulated in the *Province des Iles*, although the customary Kanak tenure system may have some relevance. It is understood that giant clams may only be collected by free divers without any underwater air supply device, e.g. scuba and hookah, and only for personal consumption (e.g. sport, leisure). Harvest and trade of giant clams are also regulated through the national licensing and reporting system (Raymakers *et al.*, 2003). In the Northern Province, giant clams are on the list of protected fauna under *Délibération N°23 & N°85-2001/BPN*, but under Article 2 of this regulation, fishing for giant clam species is allowed with an easily acquired "hunting" permit. In 2002 draft legislation was under consideration in the South Province to restrict harvest to licensed professional fishermen and thereby prohibit harvest by non-professionals. It is understood that similar provisions are being drafted for the Northern Province. "Commercial" export of shells is not permitted, but personal exports of up to 6 valves per family is permitted. In 2003 the maximum size of exportable shells was set at 25 cm to provide some protection for breeding adults (Constantin *in litt.*, 2004).

Very little scientific research has been carried-out on wild populations, with baseline information on which to base management plans and information on population monitoring lacking. The preliminary

results of a study conducted in the Northern Province to evaluate clam resources do not yet provide insight on the abundance of the resource but indicate that less than 5% of fishers target clams. The current knowledge of their abundance and recruitment does not provide sufficient basis to set-up adequate management measures or ensure that exports are non-detrimental, as required under CITES (Richer de Forges, 2002).

Mariculture: Experiments on artificial breeding of giant clams were conducted by IFREMER (Institut français de recherche pour l'exploitation de la mer) in New Caledonia from 1993 to 1999, but did not include this species.

Because reported international trade involves relatively low numbers of specimens that are generally considered a by-product of domestic use, export from New Caledonia, is of Least Concern.

## **Vanuatu**

### **Status:**

Patchy or rare, probably naturally so (Wells, 1997).

### **Management and Trade:**

Between 1998 and 2001 substantial amounts of *T. crocea* have been recorded as exported, peaking at 17,386 live wild-sourced specimens in 2000. Exports halved in 2001 and have since declined to ca 500 in 2002 (of which half were reported as captive-bred), just under 1,000 in 2003 (all wild-collected) and none in 2004.

Giant clams are prized subsistence foods for the local Ni-Vanuatu population (Zann and Ayling, 1988).

An export ban on giant clams was declared in 2001, but harvesting for domestic use is legal. A protected area has been put in place for giant clams around the island of Efate and its offshore islands, which has been closed to giant clam fishing since 2000.

There was no information on population monitoring.

Mariculture: there is no commercial aquaculture in Vanuatu, but giant clam breeding started in the late 1990s (Adams *et al.*, 2001) with the aim of enhancing depleted stocks of *T. crocea* and other species (Zann and Ayling, 1988).

Because exports continued after the export ban, albeit at a low level, and given the lack of information on stocks and management, trade in *T. crocea* from Vanuatu is categorized as Possible Concern. However, given that the species is reportedly rare in Vanuatu, the situation would merit urgent attention if trade levels increase.

## **Viet Nam**

### **Status:**

Probably occurs (Wells, 1997).

### **Management and trade:**

Between 1998 and 2003 gross live exports of wild-sourced *T. crocea* from Viet Nam peaked at 61,674 specimens in 2001 and have otherwise ranged between 35,000 and 46,000. Much lower though still substantial levels of live *T. crocea* reported as captive-bred, have been exported since 2001 (2,500 to 7500 specimens annually). In 2003 the first record of live (F) exports occurred.

No information was available on legislation, management activities or population monitoring.

Mariculture: no information was available.

Given the large quantities of this species reported as exports from the wild during the review period and the lack of information on stocks and management activities, export of *T. crocea* from Viet Nam is categorised as of Urgent Concern.

#### **PROBLEMS IDENTIFIED THAT ARE NOT RELATED TO THE IMPLEMENTATION OF ARTICLE IV, PARAS 2(a), 3, or 6(a)**

As noted above, the ongoing reporting of trade in giant clam species to the genus (e.g. *Tridacna*) or family level (Tridacnidae spp.) (see Annex) prevents a full assessment of trade levels, and therefore of the potential impact of international trade on wild populations. However, it is important to note that the quality of reporting by some countries has improved significantly, e.g. Indonesia, Viet Nam and Philippines. Reporting of trade from Cook Islands, Fiji, French Polynesia, Tonga, Vanuatu, Samoa and Solomon Islands continues to contain significant information only at the genus or higher level, often in conjunction with reporting by importing Parties. Reporting of trade at the species level would facilitate more accurate analysis of the impact of trade on specific species. Additional reporting problems that hinder accurate aggregation of data across years and species include: variations in the unit of measurement cited; difficulty in estimating the number of specimens involved when reports are made in "kg", which is common in the case of meat and shells; inconsistencies between records provided by importing and exporting countries.

Concerns regarding illegal trade in Tridacnidae have been noted, from Indonesia, and merit further review.

Trade from the Solomon Islands (not a Party and not selected for review) continues to be of concern. The entire family Tridacnidae was included in Phase 3 of the Review of Significant Trade review. Recommendations concerning export from the Solomon Islands were made in 1996, at which time the Secretariat's policy was to recommend against accepting export permits issued by the Solomon Islands. In July 1996 the Minister for Agriculture and Fisheries in the Solomon Islands explained by letter that the country prohibited the export of wild clams, and that those exported were cultured clams produced by a number of village-based farms from clams supplied by an ICLARM (now WorldFish Center) hatchery, which the Minister considered met the CITES definition of bred in captivity. In view of this, the Secretariat considered its recommendation to be no longer applicable. However, more recent sources, including the Food and Agriculture Organization of the United Nations (FAO) (Anon. 2002) and the South Pacific Commission, through its aquaculture portal (<http://www.spc.org.nc/aquaculture>, viewed March 3<sup>rd</sup> 2006) note that aquaculture activity had ceased by 2000 at the latest owing to civil unrest. Since then, Parties have recorded imports from the Solomon Islands of specimens of wild origin of all of the species of giant clam under review here. The nature of the specimens currently in trade from the Solomon Islands should be verified.

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