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REPORT

APRIL 2016

AN INVESTIGATION INTO THE TRADE OF NAUTILUS



AN INVESTIGATION INTO THE TRADE OF *NAUTILUS*



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TRAFFIC
the wildlife trade monitoring network



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EXECUTIVE SUMMARY

From May 2013 to March 2014 TRAFFIC conducted an investigation into the trade and harvest of nautilus species in selected harvest locations in range countries in Southeast Asia where active fisheries exist or have existed and in major consumer markets in the USA and Europe. TRAFFIC investigators conducted surveys and interviewed fishermen, traders, craftsmen, wholesalers, and retailers at various sites in Indonesia and the Philippines, and conducted interviews and online surveys in China, the USA, and Europe to evaluate the extent of trade of nautilus products.

In Indonesia, there has been a prohibition on the harvest and sale of *N. pompilius* since 1999. Despite this, substantial nautilus products are still available both domestically and for export. Nautilus products were found in 5 of the 7 Provinces surveyed during TRAFFIC's investigation, and more than 30 shops, markets, stalls, warehouses, and traders surveyed carried nautilus products. Most shops with nautilus products offered between 1 and 50 shells, while orders for larger numbers could be placed with some traders. Shops selling nautilus shells and handicrafts incorporating nautilus shell are mainly located in areas that cater to local and foreign tourists.

The identified sources of the shells were mainly eastern Indonesia (West Nusa Tenggara & eastwards), with collectors occasionally traveling to fishing villages in Makassar (Sulawesi) and elsewhere. The main trade, distribution, and export centers of nautilus are located in western Indonesia, principally in Java, Bali, Sulawesi and Lombok. Shops selling nautilus shells and handicrafts incorporating nautilus shell are mainly located in areas that cater to local and foreign tourists, who will buy these products there and then try to import them into their home countries, often not forewarned on the illegality of the trade.

TRAFFIC's investigation noted that the trade appears to have shifted from shops openly displaying nautilus shells to internet sales, which are harder to control. While the sale of whole/recognizable nautilus shells may have declined, the sale of shell fragments incorporated into furniture and other handicrafts as inlays continues.

From the results of this survey, it is clear that the harvest and trade in nautilus shells continues in Indonesia despite the current ban. Interviews with vendors and collectors suggest that the number of nautilus collected appears to have significantly declined in the last 10 years; attributed to a mix of possible increasing rarity or depletion of stocks, and increased law enforcement.

In the Philippines, nautilus remain an unregulated fishery with no controls on harvest or trade apart from a prohibition on harvest in a municipal jurisdiction. TRAFFIC's investigation found that more than half of the 162 shops visited offered nautilus products for sale in the form of whole shells, jewellery, art, furniture, handicrafts, and souvenirs targeted towards tourists. More than 18,500 pieces of whole nautilus shell in its raw/natural or processed/pearlized form were encountered during the survey period throughout the country.

Most vendors and exporters in the Philippines that offered nautilus products typically had around 10 pieces of shells for sale, with significantly more available from the larger exporters. Some traders claimed more than 1,000 pieces were available. Almost half of the products offered for sale were observed to be in Luzon with an equal amount available in Western and Central Visayas. A smaller amount was available in Mindanao (Zamboanga).

Palawan waters were identified as the leading area for the harvest of nautilus, with fishermen operating around Panglao Island and Balabac Island. Some exporters claimed that 1,000 to 1,500 pieces were collected from harvest sites in these waters up to six times a year. Cebu is the major export center while Zamboanga is a major transit point. One leading exporter had even claimed that prior to 2005 more than 2,000 pieces of nautilus products were exported to the USA three to four times a year, although in recent years many exporters claimed that the volume has declined.

In China, Hong Kong, and Taiwan there were some nautilus products observed for sale during the study period. Imports in these locations however do not record specific customs codes for nautilus products making it difficult to determine the volumes coming in. While *N. pompilius* is listed as a protected Class I species in China where the harvest is prohibited, enforcement remains a challenge. Small numbers of shells were observed for sale in art ware markets in parts of southern China (Fujian, Guangdong and Hainan), with both shell and meat observed for sale in Guangzhou seafood markets and home décor shops. There is a small trade of live specimens available for sale for aquaria purposes in Hong Kong, though the shells are rarely seen in markets there. In Taiwan, small numbers of nautilus shells are sold as souvenirs in fishing ports and around tourist beaches. The origin of shells offered for sale was generally not known or provided, though some were claimed to be from the Philippines.

In Europe, as in China, Hong Kong and Taiwan, there is an absence of species- or genus-specific customs codes, with nautilus shells having the same codes as coral and shells of molluscs, crustaceans, and echinoderms (customs codes 05080020 and 05080090) and monitoring of nautilus trade is not a priority for authorities. Overall, the trade and

sale of nautilus in Europe appears to occur at a low level, with the majority of nautilus found for sale on websites located in France, Germany and the UK. Nautilus shells are sold individually, or as parts of ornaments, with half-sawn shells and smaller pieces used in jewelry, with the stock usually made up of only a few pieces. The details on the species and country of origin were not usually provided.

In the USA, there are a significant amount of nautilus products available online. TRAFFIC conducted an online survey in November and December of 2013 and during this period detected more than 500 nautilus items from over 40 different vendors. Additionally, many retailers have supplies or access to supplies in excess of the amount available online at any particular time, and some retailers are also wholesalers, so even if only one nautilus item was offered for sale, it was still possible to purchase hundreds from them.

Overall, TRAFFIC's investigation found that significant volumes of nautilus products are entering both international trade and consumed locally in source countries, with a growing source of trade occurring online. There is illegal harvest and trade of *N. pompilius* occurring in Indonesia and substantial harvest and trade in the Philippines. Furthermore, the absence of customs codes to track international trade, and the absence of market measures to ensure that the trade is legal mask the overall volume of harvest and trade that is occurring.

TRAFFIC recommends that several steps be taken to ensure that the trade in nautilus products is both legal and sustainable. First, stock assessments should be conducted and improved reporting of harvested species should be established to determine the status of the stock and the extent of fishing pressure to ensure that the harvest is sustainable. Catch documentation that identifies the origin of nautilus products and the adoption of supply chain controls and traceability systems should be encouraged and/or mandated to verify the legality of products offered for trade. States should then expand customs codes to record and monitor nautilus products that are entering trade as exports and imports, and more systematically exchange information related to the illegal harvest or trade of nautilus when detected. Finally, major market states should work with range states to help build capacity and resources for enforcement and to raise awareness among buyers and suppliers of legal restrictions and sustainability concerns.

BACKGROUND

A history and overview of Nautilus trade

There are two genera in the family Nautilidae, *Nautilus* and *Allonautilus*, which are chambered nautilus. Often referred to as a 'living fossil', the ancestors of the nautilus first appeared in late Cambrian times, around 500 million years ago. This mobile cephalopod, typically associated with coral reefs, has a large, chambered shell and up to 90 small tentacles. It changes the amounts of gas inside its chambered shell to adjust its buoyancy, using jet propulsion to swim. Nautilus live in deep waters at depths of up to 700 m, with an optimal depth range from 150 to 300 m (Dunstan *et al.*, 2011), rising to shallower waters and lower reef slopes at night to feed, when the surface temperature is cool (Jereb, 2005). Chambered nautilus are slow growing molluscs, with a lifespan exceeding 20 years. They have a relatively low fecundity and are late to mature, reproducing when they reach the age of 15.5 years (Dunstan *et al.*, 2011) and only laying between 10 - 20 eggs per year (Dunstan *et al.*, 2011), making them highly vulnerable to even low levels of exploitation. While the nautilus is a deep water animal, it requires warmer tropical waters in which to breed (O'Dor *et al.*, 1993) (Carlson *et al.*, 1993).

The six species that are generally recognized as nautilus that can be distinguished by differences in their shells and soft morphology include *Allonautilus perforatus*, *Nautilus belauensis*, *N. macromphalus*, *N. pompilius*, *N. repertus*, and *N. stenomphalus* (Jereb *et al.*, 2005). *Nautilus pompilius* is distributed throughout the Indo-Pacific region while the other species are more narrowly distributed. Table 1 shows distributions and morphological differences between these species, as reported by Jereb (2005) and Dunstan *et al* (2011).

Table 1: *Nautilus* species descriptions (Jereb, 2005)

Species	Features/Size	Geographic Distribution	Notes
<i>Nautilus pompilius</i>	Shell diameter between 170 - 180 mm around Fiji and the Philippines, larger in the Western Australian population (mean diameter up to 222 mm).	Indo-West Pacific; Andaman Islands, Ambon, the Philippines, New Guinea to Fiji; northeastern and northwestern Australia; American Samoa.	Most widely distributed and best known <i>Nautilus</i> species. Species involved most heavily in the shell trade. Artisanal fisheries use bamboo fish traps at depths from 60 to 240 m.
<i>Nautilus macromphalus</i>	Maximum shell diameter around 160 mm.	Southwestern Pacific Ocean (live animals known only from off of northeastern Australia, New Caledonia and Loyalty Islands. Drift shells have been recorded as far south as Lizard Island, Queensland).	Artisanal fisheries and consumed locally.
<i>Nautilus belauensis</i>	Shell diameter up to 226 mm, animal weight up to 1,308 g (2 nd largest species of <i>Nautilus</i>).	Palau, Western Caroline Islands.	Rare species (few records exist, to date).
<i>Nautilus repertus</i>	Shell diameter up to 228 mm.	Rottneest Island and Pelsart Island, Western Australia.	Rare species (few records exist to date). May be subspecies of <i>N. pompilius</i> .
<i>Nautilus stenomphalus</i>	Shell diameter ~ 170 mm. Similar in size to <i>N. pompilius</i> .	Great Barrier Reef, eastern Australia.	Rare species (few records exist to date).

Species	Features/Size	Geographic Distribution	Notes
<i>Allonautilus perforatus</i>	Shell diameter up to ~180 mm.	Tropical western Pacific: Papua New Guinea, Manus Province, Bismarck Archipelago and Milne Bay. (Drift shells found as far south as the Solomon Islands.)	Rare species. Some reported harvest and trade in West Papua, Indonesia but this may be false and only reported as such to evade detection of illegal harvest of <i>N. pompilius</i> .

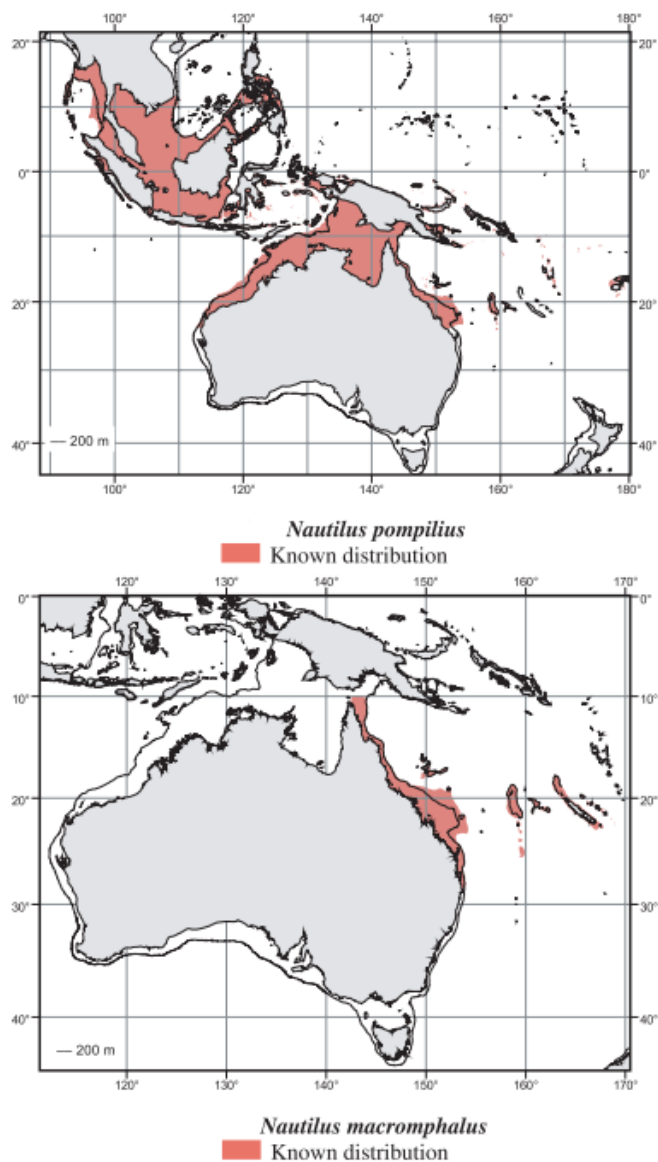


Figure 1: Known distribution of *Nautilus pompilius* and *Nautilus macromphalus*. (Jereb, 2005) (Dunstan et al., 2011)

The population demographics of *Nautilus spp.* are poorly known and sustainable fishing levels have not been addressed in the nautilus fisheries of the Indo-Pacific. What is known is that intensive nautilus fisheries are short-lived, lasting a decade or two before becoming commercially nonviable (Aguiar, 200). Declines have been reported in areas where intensive fisheries exist or have existed, including the Philippines, New Caledonia, and possibly Palau (Dunstan *et al.*, 2010). Data from a detailed interview questionnaire of *N. pompilius* fishers and traders in Palawan in 2010 shows that the Philippines have seen 80% declines in reported catch per unit of effort (CPUE) from 1980 to the present (Dunstan *et al.*, 2010).

All of the currently recognized species of nautilus have been reported in trade, according to published and unpublished market surveys. Products range from live specimens to meat to shells and shell parts. Shells are used to make handicrafts, buttons, and jewelry; the meat is consumed (sometimes only locally); and live animals are collected for use in aquaria and for research (see Figure 2) (Del Norte-Campos, 2005). For at least two species – *N. pompilius* and *N. macromphalus* – the meat is also occasionally consumed after the shell has been harvested, largely at the artisanal and subsistence levels. Nautilus are also sometimes collected live for public display and home aquaria, and for research purposes.

The shells of *N. pompilius*, *N. macromphalus* and *A. perforatus* are all marketed and sold by the international shell trade (e.g., in Indonesia, Fiji, New Caledonia, and the Philippines). *N. pompilius*, the most widely distributed species – found around the Andaman Islands, Ambon, the Philippines, New Guinea, Fiji, and northeastern and northwestern Australia – supports a shell trade as well as subsistence and artisanal fisheries. Captured in bamboo fish traps at depths from 60 to 240 m, the meat is sold in local markets and the shells are often sent to Cebu City for the shell trade. The outer layers of the shells are sometimes removed, leaving the inner surface of nacre, a silvery mother-of-pearl layer (Del Norte-Campos, 2005). Specimens can be found for sale at relatively low prices and in seeming abundance. The iridescent material inside nautilus shells is sometimes machined into various shapes and sold as “Osmeña pearl” (Del Norte-Campos, 2005).

Commodities originate from range countries where active fisheries exist or have existed (such as Indonesia and the Philippines) and where there have been no known fisheries (such as Fiji and Solomon Islands – where drift or “beach washed” shells – a shell found on the beach - may be collected on shore). The nautilus consumer market includes North and South America, Europe, Asia, Africa, the Middle East, and Oceania. Large numbers are reportedly traded within Asia to satisfy the meat market with as many as 25,000 specimens exported from Indonesia to China between 2007 and 2010 (De Angelis, 2011). Large-scale wholesale distributors in Israel and some Member States of the EU are among other non-range countries involved in the international trade of nautilus products (De Angelis, 2011). There has been some trade reported to Israel, South Africa, and South American countries, but the extent of trade and consumption in these regions is less known.

From 2005 to August 2010, the United States imported more than 789,000 nautilus products or commodities (De Angelis, 2011). About 12% of the trade involved whole shells (more than 93,000), live (173), and specimens (38). More than 88% (more than 694,000) of the commodities in trade consisted of parts of nautilus: jewelry, trim, and shell products, such as buttons, along with one shipment of meat (De Angelis, 2011). The Philippines were the largest exporters to the USA, accounting for more than 87% of the trade reported by quantity and 42% reported by weight, with the greatest variety of products (jewelry, live specimens, meat, shell products, trim and whole shells). Indonesia was the second largest exporter with more than 9% reported by quantity, and 46% reported by weight.



Figure 2: Nautilus meat and shell, Cagayancillo, Philippines. © Jürgen Freund and WWF/TRAFFIC

The international demand for nautilus shells, the evidence that small-scale fisheries can rapidly induce declines in catch rates, the ease with which local Indo-Pacific communities have adopted unsustainable fishing practices, and the ecology and life history of the animal suggest increased international attention may be warranted. This demand from the ornamental shell trade worldwide and the restricted habitat of the nautilus may be contributing to their rapid decline (De Angelis, 2011; Dunstan *et al.*, 2011). Additionally, while *N. pompilius* is the most exploited and comprises by far the largest segment of the nautilus shell market, the other species are also at risk of overfishing if fisheries are initiated in locations such as Papua New Guinea or Palau. Table 2 provides an overview of information on the trade in nautilus species that had been collected prior to this TRAFFIC investigation.

Table 2: Overview of identified trade in *Nautilus* species.

Species	Origin of Traded Commodities	Known Consumer Markets	International Trade Notes
<i>Nautilus pompilius</i>	Australia, China, Taiwan, Fiji, India, Indonesia, Malaysia, New Caledonia, Papua New Guinea, Philippines, Solomon Islands, Vanuatu, Viet Nam	Global; USA, EU (Italy, UK, France, Portugal), Middel East (UAE, Saudi Arabia), Australia, Singapore, Malaysia, Indonesia, Philippines, Hong Kong, Russia, Korea, Japan, China, Taiwan and India	Most prevalent species in trade. Numbers of specimens in trade are high at the local levels. Fisheries in the Philippines and Indonesia exist for the shell business primarily. The meat is reportedly sold fresh in local markets. Large-scale exports reported for wholesalers from the Philippines. Additional sales to individual tourists and visitors reported in significant amounts. Illegal harvest and trade in Indonesia and some jurisdictions in the Philippines. Retailers in the USA offer shells whole, sliced, and

Species	Origin of Traded Commodities	Known Consumer Markets	International Trade Notes
			as pearled products. Shells on sale in souvenir stores cost upwards of \$65 depending on shell size. Retailers also sell shells in the E.U. and they are offered for sale in some specialty fairs.
<i>Nautilus belauensis</i>	Palau	USA	Some shells noted for sale in the USA
<i>Nautilus macromphalus</i>	New Caledonia	USA	Shells of the species for sale in the USA with live specimens offered for the aquaria trade.
<i>Nautilus repertus</i>	Australia	Unknown	Specific data for trade in this species is scarce.
<i>Nautilus stenomphalus</i>	Australia	Unknown	Shells very similar to <i>N. pompilius</i> . No trade data available.
<i>Allonautilus perforatus</i>	Papua New Guinea, Solomon Islands	US, EU, Indonesia	Some reported trade in Indonesia. Low commercial availability makes this species highly-prized by shell collectors.

Figure 3 provides an overview of major consumer destinations for nautilus products that were surveyed in this TRAFFIC study. Dashed lines indicate regions where consumer markets are suspected but where further investigations have not been conducted. Major known consumer markets include the USA and the E.U., with additional reported consumption of nautilus products in China, Australia, and the Middle East. Less is known regarding consumption in South Africa and South America (Argentina), although nautilus products have occasionally been observed for sale in some markets there.

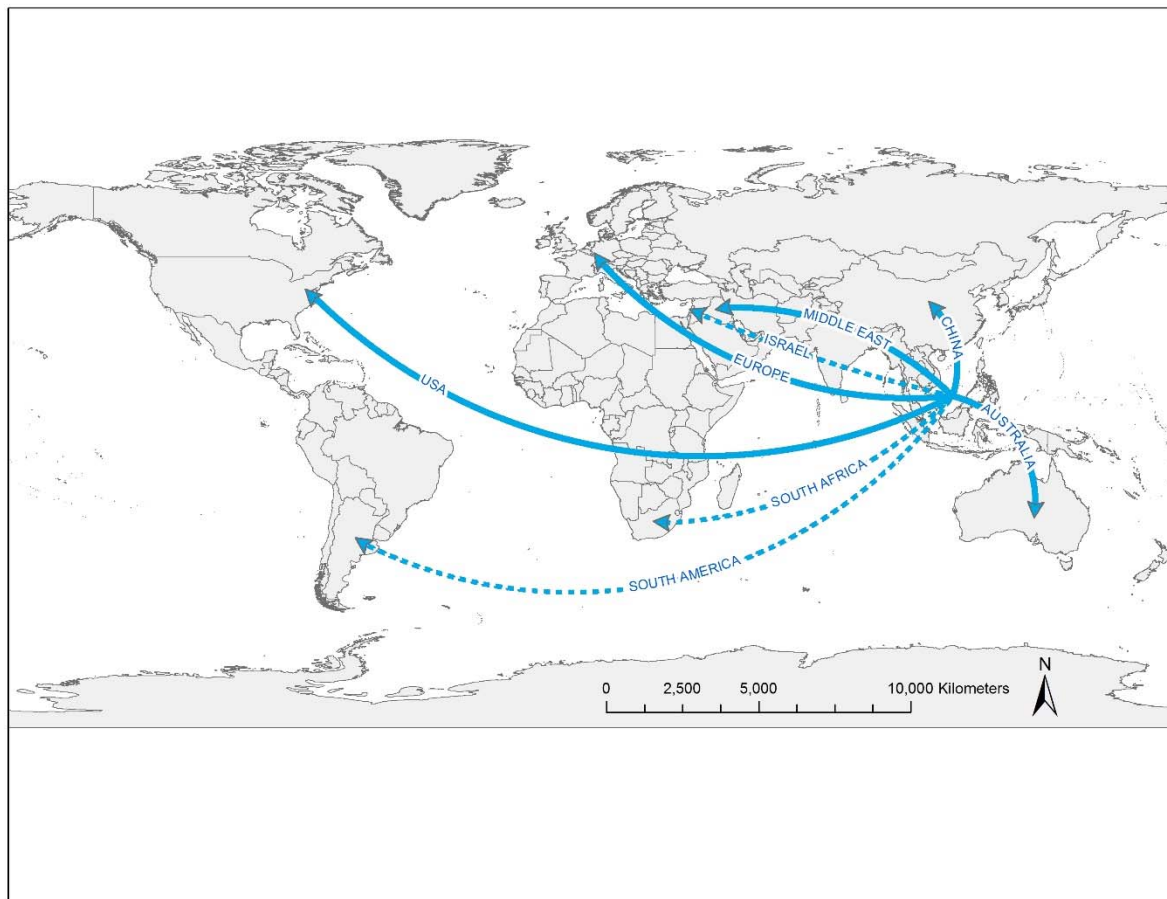


Figure 3: Overview of consumer destinations for nautilus products.

METHODOLOGY

Online research was conducted in the initial stage of this study to identify locations where nautilus are sourced, harvested, processed, and exported from; to identify the main commodities in trade; and to identify specific areas to investigate. The following criteria was used to identify priority “hotspots” for further investigation:

1. Where harvest of nautilus was known to occur and where qualitative information suggests that catch has either increased or decreased in the past decade;
2. Where origin of product is identified from online advertising to represent a significant portion of what is available (>20%);
3. Where trade controls are absent or evidence suggests they are poorly enforced;
4. Where management controls on harvest are absent or evidence suggests they are poorly enforced;
5. Where trade information from official Customs statistics in export and import countries suggests significant volumes of trade; and,
6. Where there is evidence of legal or illegal trade in other marine invertebrate shell products.

The results of this research have identified Indonesia and the Philippines as two of the primary countries involved in the sourcing and trade of nautilus products. Investigators then identified specific areas for further investigation in both harvest locations and trade centers. TRAFFIC investigators then conducted surveys and interviewed fishermen, traders, craftsmen, wholesalers, and retailers at various sites on the archipelagoes to evaluate the extent of trade of nautilus products in the region. A market survey was developed for interviews of fishermen, middlemen, vendors, and exporters (see Appendix 1), however, in many instances individuals were unwilling or hesitant to talk, particularly in Indonesia, because of the illicit nature of some of these activities (trade is prohibited in *Nautilus pompilius* in Indonesia and harvest is prohibited in parts of the Philippines). Despite this, investigators were able to obtain information with a less formal approach that still relied upon the survey questions that were developed. Investigations were carried out between July 2013 and February 2014 in both Indonesia and the Philippines.

In addition to these field investigations, internet research and consultation with experts was carried out in order to obtain insights into the trade in nautilus shells and other products available online. Searches for offers for sale were carried out on national and international auction, shopping and business sites such as eBay and Alibaba, as well as via Google and classified advertisement/community websites. Experts consulted included conchologists and other shell experts/enthusiasts, shell traders, fashion retailers, and European CITES, Customs, Inspection and Conservation authorities. Finally, trade data in major market states – the USA and the E.U. - was analyzed to review the extent of trade between partners.

HARVEST METHODS

The following section details collection methods that were observed at harvest locations in Indonesia and the Philippines. Nautilus are collected largely at the local level for commercial trade, with the shells sold as part of the larger shell trade and the meat often consumed locally as a byproduct of the shell harvest (the meat is often tough and difficult to prepare and the lack of adequate cold-storage facilities in the areas of harvest increases the likelihood of spoilage) although some is reportedly exported. Live specimens are also collected for aquaria, public display and research. While previous research has indicated that some *Nautilus pompilius* shells in trade are reportedly from beach washed or drift specimens (Jereb, 2005), the primary collection methods observed in Indonesia and the Philippines were from local fishing using bamboo fish traps deployed at depths from 60 to 240 m throughout the species' range.

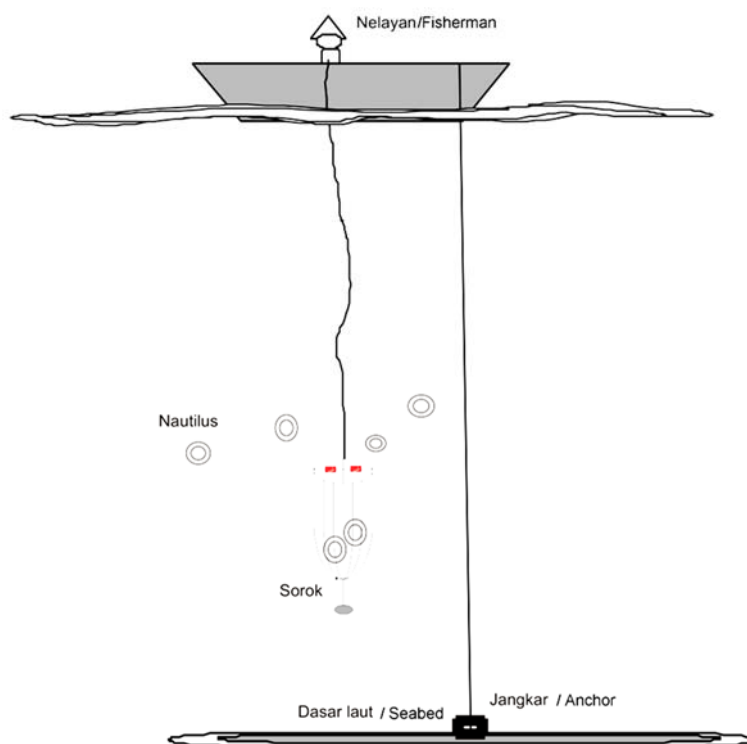


Figure 4: A Nautilus collection method in Lombok, Indonesia (baited trap).

In Indonesia, chambered nautilus are caught with traps called 'sorok' in Gangga (North Lombok), typically set at 150 – 200 m depth, to a fixed location with an anchor (Figure 4). Bait – usually cow, duck and goat meat or offal – is placed inside the trap. The sorok is set at night, and reportedly works best in very calm seas during the rainy season (the peak season for catch is October-November, when the rainy season starts).¹ The weighted trap is baited and is lowered from an anchored boat some 100-200m down into the sea at night, and after 1-3 hours, it is hauled up with nautilus inside. At fishing villages in Lombok, where nautilus fishing occurs, the fishermen typically leave in the late afternoon (~ 4 PM) and return early the next morning (~ 5 AM).

In the Philippines, fishing for nautilus primarily occurs from May until November with peaks in May to June, and again in August and September. Nautilus is fished from 250 - 300 m depths by means of bamboo traps that are

deployed at the bottom of the sea for about 36 hours, and are then retrieved with usually an average of 0 - 3 individuals in the traps. Nautilus are carnivorous and require freshly butchered baits, preferably fresh, whole chicken inside each trap to lure them at night. One fisherman claimed that there has been a slight decrease in nautilus populations. Ten years ago, one collector could catch 1 - 7 individuals per trap, now the maximum catch is 0 - 3 individuals per trap. Most fishermen interviewed stated that nautilus fishing is not their main source of livelihood and they only go offshore to fish if there are orders from exporters. Fishing costs also remain expensive if whole chickens are used as bait.



Figure 5: Nautilus shells and bamboo traps used for fishing. Balabac, Philippines. © Jürgen Freund and WWF/TRAFFIC

Local fishing of *Nautilus pompilius* in the Philippines is typically conducted in a 'banca' - an outrigger boat with a 300 m long rope for the nautilus traps. The traps, made from bamboo (see Figure 5), are virtually identical to those used in Indonesia, with pufferfish meat and chickens used as bait. Traps here are also typically set in the late afternoon and retrieved in the early morning the following day. Fishermen engaged in larger scale operations may load their boats with as many as 150 bamboo traps and stay out at sea for a week. Catches at this level of effort may include between 400 - 800 nautilus during a week time frame. Some fishermen claimed that fishing for *N. pompilius* in the Sulu Seas from ports in Balabac and elsewhere, had resulted in near commercial extinction, with the result that fishermen from the region have moved on to new areas in the South China Sea.

According to local fishermen in Indonesia and the Philippines, *Nautilus pompilius* were also caught by diving (known as 'molo') to collect the meat, while empty shells were collected after being washed up on the beach. *Nautilus macromphalus* is collected at a depth of around 65 m on the outer slope of the barrier reef in New Caledonia and at depths between 300 - 400 m in the Coral Sea using traps. There is also some bycatch in other fishing gillnets targeting other fish species. Nautilus are usually retained when caught as bycatch rather than discarded back into the ocean.

Table 3: Nautilus harvest methods

Harvest Method/Location	Gear Type	Impact
Diving/Indonesia, Philippines, Papua New Guinea, Fiji, New Caledonia	Snorkel gear may be used.	Minimal – live and dead specimens collected.
Fishing trap/Indonesia, Philippines	Traps made of bamboo or other material are set at 150 - 200 m depth in a fixed location with an anchor.	1 - 15 Nautilus may be caught in a night from traps (past reports – around 5 years ago - estimated catch of 10 - 15 individuals a night; current catch rates average 1 – 3 per night in some parts of Indonesia).
Beach collection/Throughout Range		Minimal – specimens are collected after drifting/being washed ashore.
Bycatch/Indonesia, Philippines	Gillnets, other.	Unknown – specimens are usually retained and sold rather than discarded back into the ocean

OVERVIEW OF TRADE IN SOUTHEAST ASIA

TRAFFIC conducted surveys and interviewed fishermen, traders, craftsmen, wholesalers, and retailers at various sites in Indonesia and the Philippines to evaluate the extent of trade of nautilus products in the region. A summary of these findings is presented below.

Indonesia

In Indonesia, nautilus are known as '*lobo*' in South Sulawesi, '*bia gengge*' in Ambon, '*sokle*' in Java, and '*cukli*' in Lombok. The shell is called a '*cangkang*'. *Nautilus pompilius* has been protected under national regulation PP 7/1999, Preservation of Plants and Animals, in Indonesia since 1999 (Indonesian Government Regulation Number 7 Year 1999 on Wildlife Preservation – See Appendix 2).ⁱⁱ The regulation provides full protection for *Nautilus pompilius*, with all exploitation and commercial utilization of the species prohibited. However, this species is still commonly collected, harvested, and traded domestically in the country for meat and marine curios, and the shells are used as ornaments and as inlays for furniture and carvings. The exploitation of *Nautilus pompilius* is widespread throughout Indonesia, including in Java, Bali, Lombok, Sulawesi, and Papua. In Lombok and Bali, *Nautilus* shells are crafted and made into jewelry and traded internationally.

Nautilus shells, as whole shells or in the form of jewelry, are widely available in Indonesia in various shops including art, handicraft and jewelry shops. The shops vary in size, from small stalls on tourist beaches, to large, fancy shops in main cities such as Denpasar in Bali. Some vendors selling nautilus shells seemed to be well aware that nautilus is a protected species, as some of them were suspicious about the questions being asked, and sometimes reluctant to answer questions. However, overall, vendors were relaxed about having protected species on sale in their shops.

In general, shop managers and shop owners said that they know that *Nautilus pompilius* is protected. If anyone is caught buying or selling nautilus products, they will claim no knowledge of the species' protected status, or else will claim that it is another, rarer species, *Allonautilus perforatus*, which is not protected, to avoid the regulations. A number of sellers who were aware of the differences between the two species mentioned that they sold more *N. pompilius* than *A. perforatus*.

The main domestic demand for nautilus shells in Indonesia comes from handicraft and furniture producers in Lombok Island, where nautilus shells are used in making furniture and ornaments. In the sites TRAFFIC visited, local communities informed the investigators that nautilus shells are mostly being purchased by fishermen or tradersⁱⁱⁱ from South Sulawesi, who are the main suppliers to Lombok furniture and handicraft producers. Further information on the Lombok furniture is given in the section under 'Lombok'.

Past USA import data indicated that 74,000 items of nautilus were imported into the US as well as 2,700 kg over the period 2005 – 2010, only from Indonesia (Nijman *et al.*, 2014). Besides being valued for its shell, nautilus is also sold locally as a source of meat (Pers. comm. with Indonesian Fisherman. November 11, 2013). Nautilus meat is also reportedly exported to Singapore (Pers. comm. with Indonesian Fisherman. November 11, 2013).^{iv} Large numbers of nautilus were reportedly traded in Asia as meat, with as many as 25,000 specimens exported to China from Indonesia from 2007 – 2010 (De Angelis, 2011). International customs codes do not have nautilus species listed for seafood products, so if the meat is exported or imported it is likely to be claimed as another seafood product (possibly as octopus or squid, but in many cases where there is no specific category for a product it is often claimed as the lowest value product to avoid tax).

During several visits to government offices in Lombok, chairs, tables and handicrafts with nautilus ornaments were seen to be part of the furniture. Questions were asked concerning the use of nautilus shells for ornaments, and the answers were unclear. It seems that law does not apply when only parts of this (and other) species are used. One official stated that nautilus were becoming rare, and they were being replaced in the handicraft workshops by other sorts of shells, but he was not specific. According to the official, the nautilus for use in handicrafts are now purchased from Makassar in South Sulawesi (Pers. comm. MMAF official. November 20, 2013).

Market survey locations

TRAFFIC investigators surveyed retail outlets, handicraft workshops, collectors and middlemen from the following Provinces in Indonesia:

- Central Java Province Yogyakarta
- East Java Province - Situbondo
- Bali Province - Badung, Gianyar
- West Nusa Tenggara Province - Lombok
- East Nusa Tenggara Province - Kupang and Alor
- South Sulawesi - Makassar
- Papua Barat Province - Sorong

Survey results and discussion

During the study period from August 2013 to November 2013, investigators observed nautilus products for sale in Indonesia in more than 30 separate locations. Tables 4 and 5 below provide summaries of the number of locations surveyed and offering nautilus products for sale. About 10% of the shops surveyed (33) offered nautilus products for sale in Indonesia, with the overwhelming majority located in East Java (27).

Table 4: Summary of locations surveyed in Indonesia

Shops	Number	Percentage (%)
Number selling nautilus	33	10
No nautilus observed	310	90
TOTAL	343	100

Table 5: Number of shops selling nautilus, by Province

Province (location)	Number of shops selling nautilus	No nautilus observed	TOTAL	Average number of products observed for sale	Source or Trade centre
Central Java (Yogyakarta)	1	13	14	2	Trade centre

Province (location)	Number of shops selling nautilus	No nautilus observed	TOTAL	Average number of products observed for sale	Source or Trade centre
East Java (Situbondo, Pasir Putih Beach, Jember, Bali)	27	249	276	2	Possible source, Trade centre
West Nusa Tenggara (Lombok)	3	17	20		Trade centre
East Nusa Tenggara (Kupang and Alor)	0	0	0	0	Source, Trade centre
South Sulawesi (Makassar)	0	14	14	0	Trade centre
Papua (Sorong)	2	18	20	1	Trade centre
TOTAL	33	310	343		

Table 6 provides a summary of the supply chain for nautilus products that enter markets from the source collection areas, through processing (workshops), wholesale and final destination markets for exported goods. Interviews with traders suggest that collection and trade through these locations has significantly declined over the past 10 years.

Table 6: Summary of nautilus trade chain in Indonesia

Source (Location of Collection areas)	Trade hubs (workshops and shops)^v	Local exports (locations)	International Exports (countries)
Lombok	Lombok	Lombok (furniture is mainly for the domestic markets on other islands, e.g., Makassar and main towns in Kalimantan including Banjarmasin and Tarakan).	Ornaments are mainly to the USA, Netherlands and Japan.
Nusa Penida (Bali) South Sulawesi (Roaming Fishermen)	Denpasar, Bali	Denpasar, Bali	Worldwide, especially to Italy, Spain, Russia, and the Netherlands.
Kupang, W. Timor (East Nusa Tenggara)	Madura, Pasuruan, Banyuwangi, and Surabaya (E. Java)	Madura and Surabaya (E. Java)	USA (shells)
Alor (East Nusa Tenggara)	Spermonde Islands, Makassar (S. Sulawesi)	Makassar (S. Sulawesi)	Singapore (meat)
Bali Aru, Maluku, Papua (Eastern Indonesia)	Kupang (NTT East Nusa Tenggara)	Kupang (East Nusa Tenggara)	Noumea, New Caledonia, Pacific Islands
Biak (Papua)	Ambon (Maluku)	Ambon (Maluku)	None known
Ayau Islands, east of Waigeo Island, Teluk Cenderawasih (NW Papua)	Sorong (Papua)	Sorong (Papua)	None known

Lombok serves as a collection area, trade hub and processing center, and as a point of export for crafted products. Collection of nautilus occurs in the waters surrounding Lombok, as well as in East Nusa, Papua and Bali. Shells are then purchased by craftsmen or other shell-trade wholesalers, who will transform the products either in areas close to collection or close to major tourist areas where shops and retailers of other shell products are located.

Shops: Jewelry, Souvenirs, Flea Markets

Central Java - Yogyakarta

One shop in the area advertises nautilus on their website, and the customer must wait for 3-7 days before the order arrives, with a minimum order of 10 shells. The shop owner informed the team that the stock came from Lombok. *Nautilus pompilius* stock is available but *Allonautilus perforatus* is not available, because it is now relatively hard to find.

East Java - Pasir Putih

In the Pasir Putih Beach, one handicraft shop in this popular beach area for domestic tourists said that there are shops that sell nautilus (locally called “*sokle*”) as souvenirs. However, the trader also claimed that authorities often conduct raids on shops to ensure that they do not sell protected species.^{vi}

In one warehouse in Mujati there was a one box with 11 *Nautilus pompilius* in the shop, with the shells being either “perfect’ or broken. According to the seller, their son and his friend were jailed for importing one ton of nautilus shells (export location was not provided).

In Pasir Putih, *Allonautilus perforatus* was visible for sale on a shelf in one store, however the owner was not available for questions. The seller said he had three *A. perforatus* one month ago, but two were bought by a tourist. The seller claimed that the nautilus came from Lombok.

Bali

Nautilus shells as part of silver or gold jewelry are sold in jewelry shops in Denpasar and Gianyar. Several jewelry and craft shops, silver workshops and a shell museum were visited to gather information on the nautilus.

In Kuta, there is a small stall selling silver items, which sells ornamented nautilus shells. A privately owned shop in Kuta also sells shells as marine curios. The shop is popular with tourists, and also has a record of important Indonesian visitors, including those from the government. During the survey, taking photographs was not permitted, and staff were reluctant to provide information about nautilus trade. Staff were aware that nautilus is protected, however, purchase orders of nautilus are taken if there are requests for them. The shop will not provide receipts for the purchases, and the staff said it is the responsibility of the buyer if they are caught and the nautilus are confiscated.

Nautilus products sold here were decorated with silver and being sold at varying prices. A number of items on display had been seized elsewhere by the local enforcement authority Balai Konservasi Sumber Daya Alam (BKSDA – Bali Conservation Department) officers, and were allowed to be kept in a museum, because they had the necessary permits for display. However, illicit sales of products from the museum were noted and the seller had been warned not to speak too much about this trade. The nautilus shells that were sold here were reportedly sourced from Surabaya, in East Java.

A third shop in Kuta specializes in handicrafts from Lombok. Lombok handicrafts are known for their wood carvings decorated with nautilus shells. The shop seller did not seem to know about the exact origins of the nautilus, except that they know the crafts were brought from Lombok.

In Denpasar, one shop has been selling shell handicrafts for over 10 years, and they began to receive orders for nautilus shells in 2002. Nautilus shells as curios and handicrafts were exported worldwide, especially to Italy, Spain, Russia, and the Netherlands. Until 2004, the shop sent two containers per month, with one container holding about 5,000 Nautilus shells. Although the shipment of Nautilus shells continued until 2006, it apparently became more difficult since then because authorities were more closely monitoring the shop. Currently, the shop sells and exports nautilus as handicrafts, and according to the shop owner, they have stopped selling complete shells only. Nautilus ornamented crafts and jewelry are less monitored (i.e., the nautilus inlay is not recognized as such by the authorities, and cannot be distinguished from other shell inlay products).



Figure 6: Ornamented nautilus crafts and jewellery in Denpasar, Bali. © WWF/TRAFFIC

One shop also sells *Allonautilus perforatus* shells, but they are not always available, as the species is harder to find. The seller was able to easily recognize the difference between *Nautilus pompilius* and *Allonautilus perforatus* by looking at the morphology of the shell.



Figure 7: *Allonautilus perforatus* in shop in Bali. © WWF/TRAFFIC

One shop reports that it obtains nautilus from Pasir Putih in east Java, which were collected from various areas including Makassar, Kupang, and Maluku. The traders receive the shipments, but do not look for the nautilus themselves, because the risk is too high. Nautilus is still being shipped, but mixed in with other craft items.

One shop in Sanur has been trading in marine curios for 10 years, with the supply of shells reportedly from Madura Island, located in east Java. During the visit, the shop was selling several large and medium *N. pompilius*, and at least 12 items were showed during the visit. The shop owner did not seem to know that *N. pompilius* is a protected species. Besides shells, the shop also sells jewelry in the shape of nautilus (see Figure 8).



Figure 8: Nautilus shells and jewelry in Sanur. © WWF/TRAFFIC

There are three souvenir shops in Nusa Dua that sell Nautilus shells as souvenirs. There were 12 shells for sale during the survey from the total of three shops. One shop in Tampak Siring in Gianyar specializes in carving horn and bone structures, but also the carving of nautilus shells. Researchers observed one carved shell on a shelf, and two complete shells (see Figure 9).



Figure 9: Nautilus products from Gianyar. © WWF/TRAFFIC

West Nusa Tenggara - Mataram, Lombok

Mataram is the capital city of West Nusa Tenggara. The Ruangrang Jangkuk is a well-known area in Mataram for shops that sell antiques and handicrafts, including nautilus products. This area is the major production area for furniture and handicrafts that use nautilus shells for ornaments. The white shells are cut up into small pieces to decorate handicrafts and furniture.^{vii} The trade in nautilus handicrafts started here in the 1970s.



Figure 10: Small pieces of Nautilus shells are used to decorate wooden furniture. © WWF/TRAFFIC

In these local shops, tourists especially like the “Lombok Primitive” designs. The furniture is made from mahogany, because it is a “hard and durable wood”. Traders stated that in order to decorate one set of furniture consisting of one table and three chairs, the number of nautilus shells required is 40 - 100 (see Figure 8). The shops are able to make three sets in one month.^{viii} Orders are received from the USA, Netherlands and Japan. The workshops also send large quantities of the finished products to art shops in Bali. Similar products are also made in Lendang Rei, Gegutu and Sesela (Lombok News, 2008).

A shop in Ruangrang Jangkuk, Mataram, also receives orders for chair and table sets, mainly from Makassar and Borneo. Large orders come from Borneo (Indonesian Kalimantan) that are usually requested to arrive in Makassar before the Moslem festival (*Eid el Fitri*).

All the goods displayed in one workshop use nautilus materials. Nautilus shells are used for inlay work, because other shells are too thick and not smooth like nautilus shells. Because the nautilus shells are reportedly becoming more

difficult to obtain, the craftsmen have tried using pearl oyster shells, but these are not as desirable as nautilus.^{ix} The shop stated that they now have much less work on handicrafts, because nautilus shell has become rare.



Figure 11: Furniture with nautilus shells. © WWF/TRAFFIC

In general, souvenir traders interviewed informally in Lombok said that they knew about nautilus shells (although they were unsure as to the source), but said that the shells were less frequently available than in years before. The shops in Senggigi beach in Lombok stated that they now rarely sell “banned sea creatures”, because there have been several raids by the authorities on their shops. The shop keepers/owners admitted that the information about upcoming raids always ‘leaks’ beforehand, so they are able to clean up before the raid. The maximum punishment if caught violating the law is 5 years in jail, or Rp.100 million (USD \$10,000) fine, and these penalties have made them afraid to continue selling protected species. There have been awareness talks by the Department of Tourism, Forestry and Police about the regulations on wildlife preservation. Previously, nautilus and other rare shells were all displayed openly. Now, after the raids, none of the shops display these items anymore.

Gili Trawangan is one of the popular small tourist islands on the North West coast of Lombok. Here only one shop was observed selling three Nautilus shells.

South Sulawesi - Makassar

Souvenir sales of nautilus in Makassar were extremely abundant in the past, prior to a ban, where a single shipment could be up to two tonnes (one tonne was estimated to equal between 2,000-3,000 shells). Currently, nautilus shells are sold in less obvious ways, and transactions are said to be carried out at sea. Nautilus traders have reportedly moved into areas where law enforcement is weak and sea patrols are infrequent, particularly in eastern Indonesia, including Maluku, Papua and the Lesser Sunda Islands Provinces. The nautilus middlemen are mainly local, originating from Bali, Lombok as well as Pasuruan and Banyu Wangi (from East Java).

Collection areas

Due to the reluctance of the traders to mention their sources of nautilus, it was difficult to obtain comprehensive information about nautilus collection areas. However, the investigators established that there are collection areas in the deeper waters of eastern Indonesia, notably around the seas of Lombok, Sulawesi, Banda, and Papua (Figure 12).

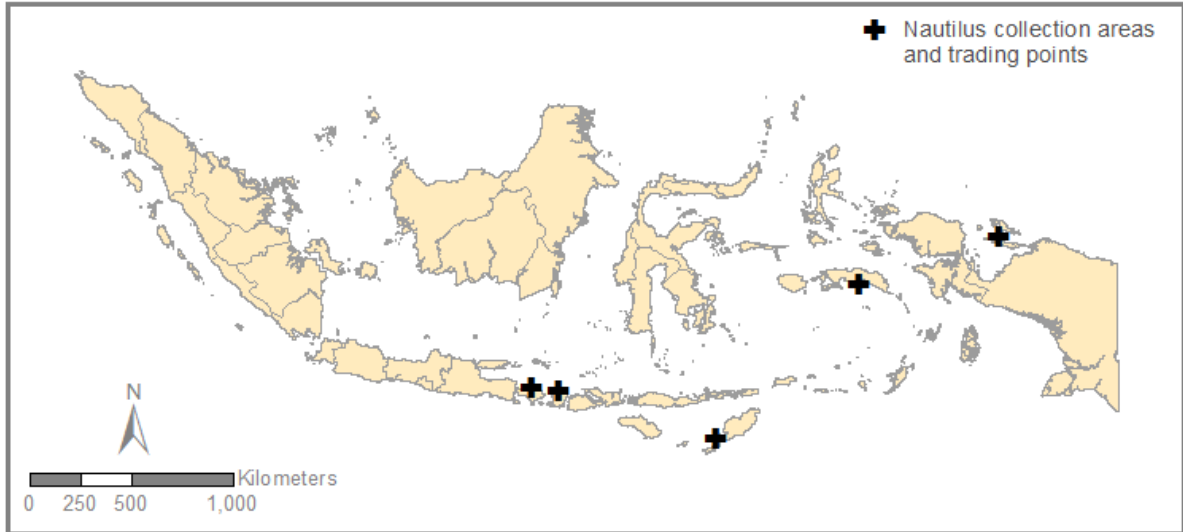


Figure 12: Nautilus collection areas and trading points in Indonesia. © WWF/TRAFFIC

West Nusa Tenggara

Luk – Sambik Bongkol village – Gangaa, North Lombok

Formerly, fishermen could get from 10 to 15 nautilus in one night, but now they reportedly catch only from 1 to 3. The peak season for catching nautilus is October-November, or when the rainy season starts. The fishermen eat the nautilus meat, and make it into 'sate', and sell the shells. Figure 13 below provides a photo of the common preparation for the nautilus meat that is consumed as a soup.



Figure 13: Nautilus served as soup. © Jürgen Freund and WWF/TRAFFIC.

Despite the recent rules prohibiting the capture of nautilus, the fishermen are still reportedly targeting and catching them, depending on whether orders are received. There are several middlemen operating in the trade there.

Tampes, Selengen village, Kayangan subdictris, North Lombok

According to one middleman at Tampes, there are 25 fishermen in Tampes who set traps to catch nautilus.

Ketapang, Desa Selengen, Kecamatan Kayangan, Kabupaten Lombok Utara

There is one middleman for nautilus sales, who lives in Ketapang, near to Tampes. However, no information was gained about nautilus in Ketapang.

South Sulawesi

Nautilus in Ujung Pandang in Makassar (nautilus is referred to as “*lobo*” Makassar) is known to be a protected species, and current exploitation is reduced because, in addition to its increasing scarcity, its trade is also banned by the Provincial government. Nautilus shells have been sold in Makassar for many years, but since 2000, the fishermen claimed to have stopped bringing them into town because law enforcement became more serious about enforcing the prohibition, and this also reduced the trade in nautilus outside the province.

In the Spermonde Islands, in the western part of Makassar, the fishing communities craft nautilus shells to make souvenirs for selling in shops in Makassar city.

Ambon - Maluku

Nautilus used to be fished in the Teluk Ambon Bay back in late 1980s. A British researcher collected nautilus during the Operation Raleigh expedition in 1987 from the fishers, who used hook and line to fish nautilus in Ambon bay. *Nautilus pompilius* is recorded in the species list found in Pombo Island Nature Reserve (Merdeka, 2008). The town of Ambon has long been known as a centre for marine curios, and is a significant trade hub for many kinds of produce from both western and eastern Indonesia. The town has open shell markets where complete shells are available for sale, including nautilus.

Interviews revealed that nautilus were abundant around the Banda Islands 20 years ago, with whole shells and shell fragments washed up along the beaches, and regularly kept as ornaments in homes. Nautilus shells are still available for sale in the tourist shops in the main town, but in lesser quantities. It is not clear if this is because the trade is illegal or whether stocks have declined, but the products were offered in the open for sale and vendors were not trying to hide the nautilus products.

Sorong - Papua

Sorong, at the westernmost point of Indonesian Papua, on the so-called “Bird’s Head” Peninsula, is a well-known trade area for marine species of many kinds. In the shops there, only a very few Nautilus were visible. One shop had two *N. pompilius* on display, and while the seller was not present, another trader indicated that the shells were collected from the Ayau Islands, east of Waigeo Island. He said that nautilus were caught by ‘*molo*’ (diving) to collect the meat, while empty shells were collected after being washed up on the beach. The trader added that, because the divers were only diving ‘naturally’ i.e., without air lines/compressors, and were diving for other marine products, they only occasionally found a live nautilus, and this would be collected for its meat while the shell would be sold. More usually, the shells were already empty and collected off the beach.

No one along the Mayalibit Bay seemed to know the name of a nautilus shell as being a nautilus, (or other local name) only calling it a ‘seashell’.^x People said that formerly there were many more shells of this type (i.e., nautilus) washed up along the Mayalibit Bay, but now they appeared only rarely. A trader said that nautilus were never specifically targeted for collection, but he did not know about the situation now. He was of the opinion that, like the Ayau Islands, Biak also faces the Pacific Ocean, so it was possible that nautilus still occur there.



Figure 14: Traditional marine curio stall in Sorong. © WWF/TRAFFIC

Bali

According to anecdotal evidence from fishermen in north Bali, there may still be some collection of nautilus along the northwest coast, but it is very seasonal, and at the time of year the survey was conducted, there were no nautilus being collected. Some fishermen claimed that until 2005, 10 to 20 nautilus could be caught in one night but yields more recently have been much less.

East Nusa Tenggara

A survey was conducted in Pantar Island in Alor district. Alor is a district located in the Eastern part of the East Nusa Tenggara province. The villagers informed the investigator that people came from Bima, Sumbawa to look for nautilus. Local people called nautilus '*Kalabinga*', and claimed that 10 years ago, they could find up to 30 empty shells on the beach after a storm, while today, they may only find one or two on the beach. Alor communities that were interviewed reported that they do not catch live nautilus, but only collect empty shells on the beach.

Online Suppliers

During the surveys, local suppliers of whole shells of the *Nautilus pompilius* who were located in East Java, Lombok and Makasar were interviewed. These local suppliers were aware of the regulations banning the sale of nautilus, and reported to have been conducting the transactions covertly. Suppliers claimed that requests for 'escorts' from the authority were often needed during land transportation from east Java to the buyers in Bali.^{xi} Concerns of being caught with illegal products openly available in "brick and mortar" shops have resulted in a number of operators making their products available only through the internet. Online sales of nautilus jewelry are available from a number of suppliers in Bali, Surabaya, Jogja, and Central Sulawesi.

Table 7: Number of online nautilus suppliers from Indonesia

Region	Number of etailers
Bali	4
Surabaya	2
Jogja	1
Central Sulawesi	1
TOTAL	8

Processing procedures

The main products and commodities made from nautilus shells are jewelry and wood products, with Lombok as the main producer for wood products. Shells are broken into small pieces that can be used as inlays in furniture and ornaments. Once inlaid, they are more difficult to detect by the authorities, because they look similar to pearl (or other seashell) inlay. Nautilus shells are also either sold as whole shells (occasionally being sawn laterally in half to expose the chambers within).

Some nautilus shells are ornamented with silver, and are sold in shops as expensive stand-alone ornaments. One supplier in Bali stated that the ornamented silver nautilus shells are exported under the category of 'jewelry', and given a name as the shape of the jewelry. The naming of jewelry works well for export purposes to European countries like Spain, Italy, the Netherlands and Russia.

Nautilus markets

The main demand for nautilus comes from domestic furniture and handicraft industries in Lombok. The products containing nautilus shells as ornaments are sold locally, and are also exported overseas without any problems. In contrast, seizures were occasionally conducted in shops selling the whole shells of *Nautilus pompilius*. A billboard with information about "Species of Wild Fauna and Flora that are prohibited in trade/Trafficking" by WWF, BKSDA (Bali Conservation Department) and Angkasa Pura is on display in Lombok Airport (see Figure 15).



Figure 15: Poster on prohibited species for trade. © WWF/TRAFFIC

The billboard also states that lawbreakers, if convicted, could face a fine of IDR 100,000,000 (USD \$10,000) or be jailed for 5 years. Several nautilus handicrafts were also displayed in some airport shops.

Nautilus seizures in Indonesia

Interviews with some enforcement officials indicated that at least thirteen seizures of nautilus products have taken place during the time period of 2005 to 2012, with the majority of seizures occurring in Bali (Pers. comm. with BKSDA official. October 23, 2013). A summary of nautilus seizures that have occurred from 2005 – 2012 is provided in Table 8 below.

Table 8: Summary of nautilus seizures in Indonesia from 2005-2012

Year/Date	Local of seizure (Province/Town)	Amount Seized (# of shells)
29-Aug-05	Bali	1
02-Dec-05	Bali	10
17-Feb-06	Bali	22
Nov-07	Surabaya	Unknown (100s - 1000s)
07-May-08	Bali	20
10-Jul-08	Bali	2
27-Aug-08	Bali	5
12-Aug-09	Bali	20
Sep-09	Bali	200
Sep-09	Surabaya	558
25-Sep-09	Bali	200
Dec-10	Jakarta	20
Jun-12	Surabaya	485

On June 2008, the Natural Resources Conservation Agency in Bali confiscated hundreds of shells of the protected species 'Trumpet Triton' and 'Nautilus Hollow' with prices estimated at hundreds of millions of dollars, which were to be exported to Pacific island countries. Smuggling was stopped when shells were discovered as 15 boxes of garments and handicrafts passed through an X-ray examination at the cargo terminal in Ngurah Rai International Airport, Bali. Shells were planned to be transported to Noumea, New Caledonia via Qantas Airlines. Officials reported that shells were not from Bali, but had been imported from other regions such as Sulawesi and Maluku, and that Bali was just a place of transit and exit of these shells (Antara News, 2013).

On September 2009, customs from the Surabaya Harbour seized a shipment of various sea shells, including 2,959 helmet conch, 558 nautilus and 56 triton (Trumpet Conch) shells, all of which are nationally protected species. The shipment was bound for China (Surya Online, 2009).

On June 2012, another shipment was seized in the Surabaya container harbour, where two containers with various protected species were confiscated, including 20,515 helmet conch (*Cassia cornuta*), 485 *Nautilus pompilius*, 204 triton (*Cheronia tritonis*), 2,849 kg *Cymbiola nobilis* and 768 *Syrinx aruanus*. The owners of the containers did not know the origin of the shells, but officials suspected that the shells were bought from various places such as Aru (southeast Maluku), Tarakan (Kalimantan) and Situbondo and Banyuwangi (East Java) (Pers. Comm. With BKSDA official. October 23, 2013).

Sustainability and conservation issues for nautilus in Indonesia

Information gathered from the surveys during this period suggests that the open collection and sales of nautilus shells has reduced significantly during the last 5-10 years. The furniture producers in Lombok stated that until 1990, they bought nautilus shells from fishermen in Lombok, who collected the shells in the Lombok area. Currently, craftsmen are sourcing shells from further away and have to buy nautilus shells from traders who buy the shells from Makassar (Sulawesi). According to investigators, the minimum amount of nautilus shells that the craftsmen order is 200 Kg.

The main contributing factors of declining sales on nautilus shells are:

1. Increasing scarcity of nautilus supply.
2. Knowledge among collectors, middlemen and end buyers that nautilus are protected (*N. pompilius* only). *A. perforatus* is not yet protected, so at least some sales list the shell as this species rather than those of *N. pompilius*.

3. A reduction in the numbers of young people becoming collectors and traders of nautilus (some for the reasons given above).

However, internet sales of nautilus appear to be easier to trade online due to increased anonymity and the possibility of the seller being able to check out who the buyer/s may be. This method of trade also appears to be easier due to the inability of the authorities to distinguish between items (such as furniture, etc.) incorporating nautilus inlay, compared to those that use other types of seashell.

Indonesia summary

From the results of the survey, it is clear that the harvest and trade in nautilus shells continues in Indonesia despite the ban. While collectors at the source are paid low prices for nautilus shells, significant sums of money and profits are to be gained further along the trade chains, particularly where nautilus shells are worked to include gold and silver, and in furniture and other products into which shell fragments have been incorporated. Thus significant financial incentives exist for sellers of nautilus shells and products higher up the trade chains.

Although some nautilus are being specifically targeted by collectors during the rainy season when these animals become easier to collect, some shells are collected opportunistically, particularly if the shells are washed up on beaches, or when caught in fishermen's nets as bycatch. Where whole live animals are collected, the meat is taken (and sometimes sold locally) for consumption, while the shells are sold to traders. Interviews with vendors and collectors suggest that the number of nautilus collected appears to have significantly declined in the last 10 years; attributed to a mix of possible increasing rarity or depletion of stocks, and increased law enforcement.

The sources of the shells appear to come mainly from eastern Indonesia (from West Nusa Tenggara eastward), where the waters are deep, nautilus populations are still large enough to make collection economically viable, and where law enforcement may be weaker than in western Indonesia.

The main trade /distribution/export centers of nautilus are located in western Indonesia, principally in Java, Bali, Sulawesi and Lombok. Shops selling nautilus shells and handicrafts incorporating nautilus shell are mainly located in areas that cater to local and foreign tourists, who will buy these products there, and then try to import them into their home countries' often not forewarned on the illegality of the trade. The trade seems to have shifted from shops openly displaying nautilus shells to internet sales, which are harder to control. While the sale of whole/recognizable nautilus shells may have declined, the sale of shell fragments incorporated into furniture and other handicrafts as inlays continues.

A significant proportion of the sellers are aware that the trade is illegal. During the last 2-3 years, a number of traders have been caught selling nautilus shells, and have been prosecuted, with heavy fines and/or prison sentences.

Some traders seem to be labeling specimens of *N. pompilius* as *A. perforatus*, because the former species is nationally protected, while the latter is not. As a result, the enforcement agencies are not able to distinguish between these two species, and cannot distinguish mother of pearl products containing nautilus shell fragments (used as inlays) from other legal shell products..

Enforcement of the Indonesian government's policy towards the collection and sale of Nautilids is lax.. On the one hand, *Nautilus pompilius* is a protected species under Indonesian law, and the collection and sale of *Nautilus pompilius* shells and products is therefore illegal. Despite this, at least some government officials knowingly possess and display furniture and other products that incorporate nautilus shells. Further, shells and shell products are on display and for sale to tourists in airports from where they could be exported overseas.

Philippines

Background and overview

The trade in nautilus (primarily *Nautilus pompilius*), locally called "*lagan*," in the Philippines, has been in existence since the early 1970s based on interviews with traders in the shellcraft industry in Cebu Province in Central Visayas and Zamboanga City in Southern Mindanao. Due to the international demand for nautilus products, known collecting grounds for nautilus were reported to have crashed, with some of the harvest sites which have experienced reported declines in populations including: Palawan, Tawi-Tawi, Panay Islands and areas in the Visayas Region (Dunstan *et al.*, 2010).

Nautilus remains essentially an unregulated fishery in the Philippines. There are a few municipalities in Cebu Province, such as the Municipality of Dalaquete, and those within Panay Islands in Western Visayas, which now have local ordinances for the conservation and protection of nautilus, that prohibit harvest, however in most of the Philippines the harvest and trade of nautilus is allowed. One of the first traders in the shellcraft industry in Cebu claimed that beginning in the late 1970s until the early 2000s, they exported to the USA around 2,000 pieces of nautilus products three to four times a year, with sizes ranging from 3 to 7 inches. One of the largest exporters of nautilus, also from Cebu, claimed that they collected nautilus from harvest sites every other month to buy 1,000 to 1,500 pieces of nautilus. This was done it was claimed, to meet orders from importing countries or from other exporters.^{xii} The leading exporter and supplier of nautilus based in Manila informed the survey team that they stopped exporting nautilus in 2005 when the demand and price of nautilus products started to fluctuate.^{xiii}

Traders claimed that there has been no great demand for nautilus products, other than the whole specimen. Nautilus meat is used for local consumption and the shell is sold for a premium to shell merchants.^{xiv} Local fishermen often do not have a way to preserve the meat and whatever is not consumed by the fishermen is occasionally sold to the local village market. Traders have claimed that importing countries favor nautilus as a specimen shell, in its natural or polished/pearlized form. Items such as table lamps are also popular, as long as the whole form of the animal is retained. Fashion jewelry, nautilus in-lays such as glass canister, letter openers, and frames made of nautilus shells are available in souvenir and curio shops in malls and tourist resorts throughout the country, however, importing countries, according to exporters interviewed, still prefer mother-of-pearl in-lays over the nautilus nacre.



Figure 16. Nautilus products in trade in Philippines. © WWF/TRAFFIC

Survey locations

TRAFFIC investigated key collection sites for information on nautilus and the status of the trade with the key players in the market chain, including exporters based in the three major Philippine islands - Luzon, Visayas and Mindanao – and those in the key shell trade areas - Manila, Cebu and Zamboanga.^{xv} Of the 17 administrative Regions in the Philippines, nautilus investigations were conducted in the following areas (Figure 15):

- The *National Capital Region* (NCR) covering Metropolitan Manila
- Region I (*Ilocos Region, Northern Luzon*): La Union, Pangasinan and Ilocos Norte
- Cordillera Autonomous Region (CAR): Baguio, Mountain Province in Northern Luzon
- Region III (*Central Luzon*): Bulacan, Pampanga and Zambales
- Region IV-A (*CALABARZON, Southern Luzon*) consisting the provinces of Cavite, Laguna, Batangas and Quezon, hence the acronym CALABARZON
- Region IV-B (*MIMAROPA, Southern Luzon*) consisting the provinces of Mindoro, Marinduque, Romblon and Palawan, hence the acronym MIMAROPA
- Region V (*Bicol Region, Southern Luzon*) with Ticao Island, Masbate and Caramoan, Camarines Sur as specific areas for nautilus collection
- Region VI (*Western Visayas*) where the world-famous tourist destination, Boracay Island in Aklan province is located
- Region VII (*Central Visayas*) where the twin provinces of Cebu and Bohol are located

- Region IX or the *Zamboanga Peninsula* (Mindanao Area)
- Autonomous Region of Muslim Mindanao (ARMM) covering the provinces of *Sulu and Tawi-Tawi*

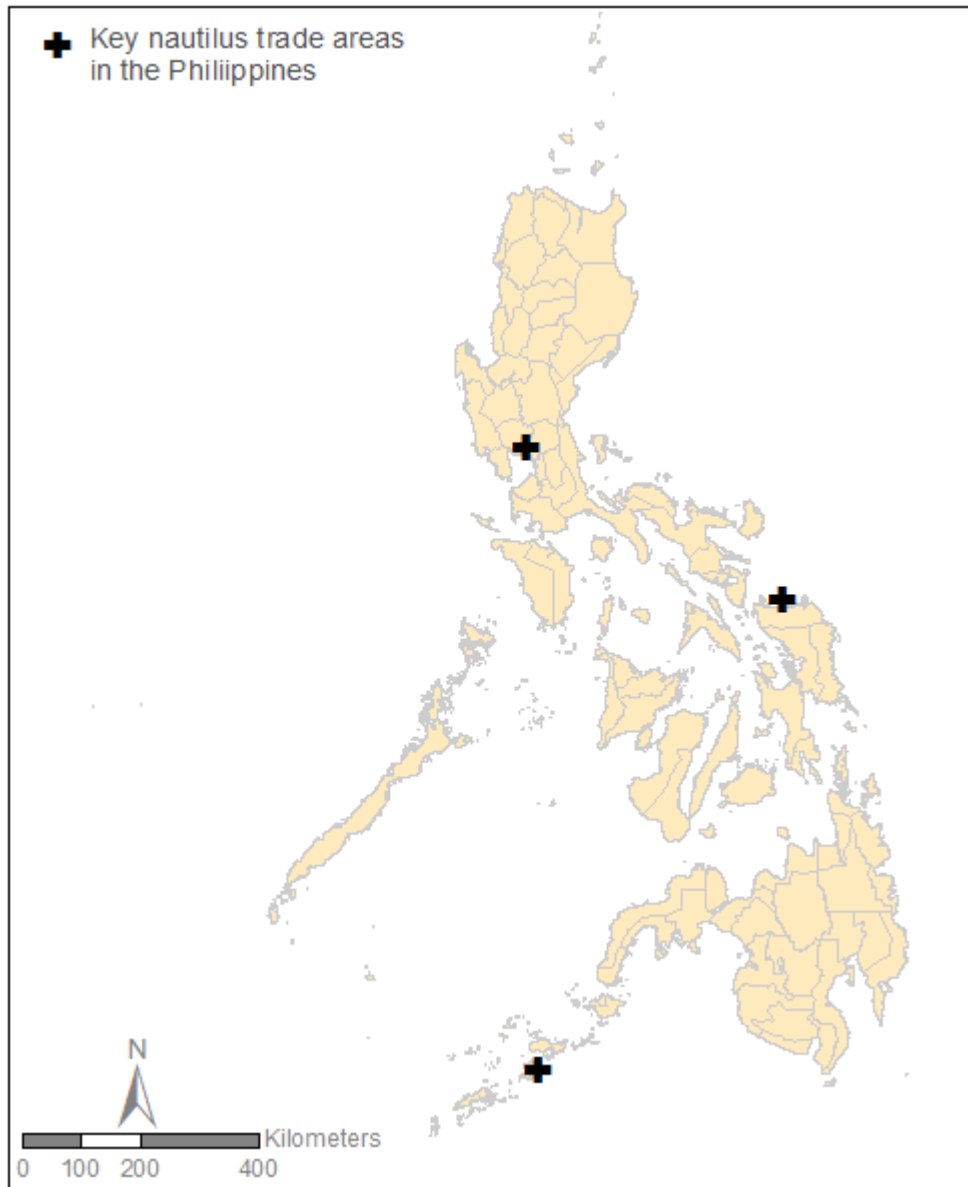


Figure 17: Key nautilus trade areas in the Philippines. © WWF/TRAFFIC

Survey results and discussion

TRAFFIC’s investigations collected information on the trade in nautilus related to the market chain from the fishers to consumers; information on the economics of the trade; information on the existing collection areas and fishing season; and information on the prevailing market prices of nautilus products for local and international markets.

A total of 162 shops that offered shells, jewelry, art, furniture, handicrafts, and/or souvenirs targeted to tourists were visited in these regions, with more than 50% offering nautilus products for sale (91 shops). Tables 9 and 10 summarize the results of the survey by region and shops by region.

Table 9: Nautilus surveys by region

Region	Total Number of Shops Surveyed	Total Number of Shops Selling Nautilus
National Capital Region (NCR): Metropolitan Manila	38	7
Region I (Ilocos Region), Northern Luzon	18	9
Cordillera Autonomous Region (CAR), Northern Luzon	11	0
Region III (Central Luzon)	6	0
Region IV-A (CALABARZON), Southern Luzon	11	7
Region IV-B (MIMAROPA), Southern Luzon	9	0
Region V (Bicol Region), Southern Luzon	0	0
Region VI (Western Visayas)	20	18
Region VII (Central Visayas)	45	45
Region IX (Zamboanga Peninsula), Southern Mindanao	8	5
Autonomous Region of Muslim Mindanao (ARMM)	0	0
Total	166	91

Table 10: Summary result of Nautilus survey in exporters' showrooms, shops, stalls and flea markets, by area within regions

Regions	Total Number of Shops Surveyed	Total Number of Shops Selling Nautilus	% of Shops Selling Nautilus
National Capital Region (NCR): Metro Manila	38	7	18.4
Antipolo City	1	0	
Las Pinas	4	0	
Makati City	8	1	
Mandaluyong City	1	0	
Manila City	5	2	
Marikina City	1	0	
Paranaque City	5	3	
Quezon City	8	0	
Valenzuela City	5	1	

Region I (Ilocos Region), Northern Luzon	18	9	50
La Union	7	3	
Pangasinan	10	6	
Ilocos Nort	1	0	
Cordillera Autonomous Region (CAR): Baguio City, Mt. Province, Northern Luzon	11	0	
Region III (Central Luzon)	6	0	
Bulacan	3	0	
Pampanga	3	0	
Region IV-A (CALABARZON), Southern Luzon	11	7	63.6
Cavite	7	5	
Laguna	3	2	
Rizal	1	0	
Region IV-B (MIMAROPA), Southern Luzon: Palawan	9	0	
Region V (Bicol Region), Southern Luzon	0	0	
Region VI (Western Visayas): Aklan Province, Boracay Island	20	18	90
Region VII (Central Visayas)	45	45	100
Cebu	37	37	
Bohol	8	8	
Region IX (Mindanao Area): Zamboanga Peninsula	8	5	62.5
Autonomous Region of Muslim Mindanao (ARMM)	0	0	
Total No of shops surveyed	166	91	54.8

National Capital Region (NCR) covering the Metro Manila

The Metro Manila cities include: Antipolo, Las Piñas, Makati, Mandaluyong, Manila, Marikina, Parañaque, Quezon City and Valenzuela. The National Capital Region (NCR), covering the cities within Metropolitan Manila, is a major trade route of nautilus and all other Philippine products for the domestic and foreign markets, having four large airports and two international seaports in this geographic area. Three of the airports cater to both domestic and international flights. There are no known harvest locations for nautilus around the Metro Manila area. The nautilus trade survey covered 38 souvenir and curio shops in nine cities within Metro Manila, seven of these shops are engaged in nautilus trade.

Region I: (La Union and Pangasinan) and Cordillera Autonomous Region (CAR) (Mountain Province in Northern Luzon)

Nine of the 18 shops surveyed in Northern Luzon (Figure 18) sold nautilus in its natural and polished forms. Northern Luzon, consisting of the Cordillera Autonomous Region (CAR) and Region I, is a major tourist destination. This part of the country is both a collection site and trade route of nautilus. Tourist spots in the Mountain Province include the world-famous Banaue Rice Terraces, La Trinidad Valley in Benguet and Mines View Park, Burnham Park and Camp John Hay in Baguio City. Although Mt. Province does not have marine areas, being a major tourist destination, souvenir shops are abundant and showcase many types of native products from all over the country, including shell crafts. None of the shops surveyed in CAR sold nautilus.

Another geographic region in Northern Luzon is Region I consisting of Pangasinan, La Union and Ilocos Norte provinces. The province of La Union and Pangasinan (the location of The Hundred Islands National Park), one of the richest fishing grounds in the country, are reported to be collection sites for nautilus in the Lingayen Gulf (Pers. Comm. with Pangasinan fisherman. November 29, 2013). The area is a major tourist destination and has beach resorts with numerous souvenir shops catering to local and foreign tourists.

The Ilocos Norte province is also starting to attract tourists, particularly the Island of Pagudpud. This province is a major tourist destination where beach resorts and souvenir shops abound, catering to local and foreign tourists.

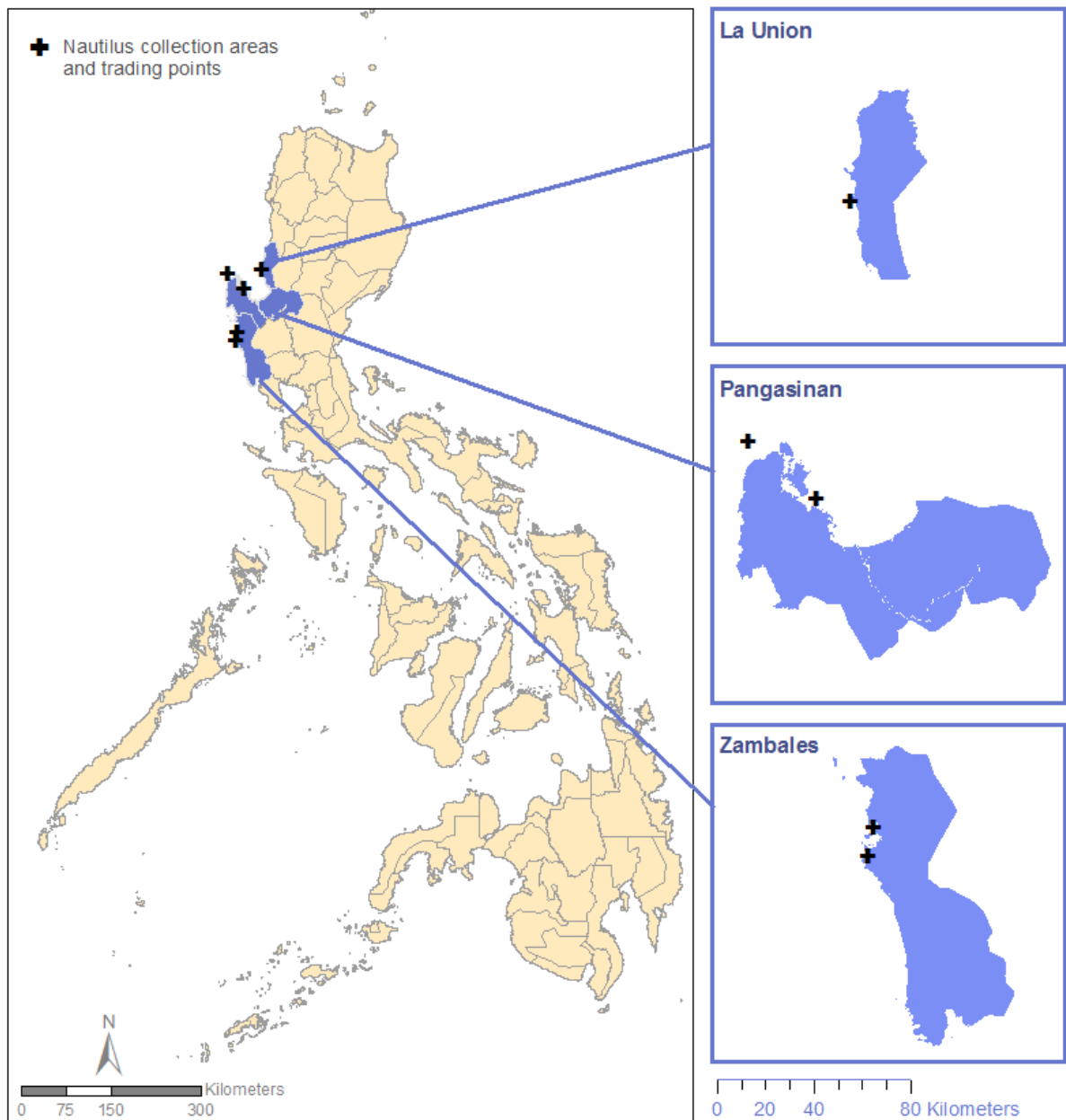


Figure 18: Nautilus collection areas and trading points in Northern Luzon. © WWF/TRAFFIC

Shellcraft products in beach resorts and tourist spots tend to retail for two to three times the price of items if the consumer buys directly from the shell exporters. Even walking vendors who sell their wares along the shores of the resorts mark up the price for their nautilus based on the size. Figure 19 illustrates some of the nautilus offered in souvenir shops at the Hundred Islands, Alaminos, Pangasinan and Bauang, La Union.



Figure 19: Souvenir shops and walking vendor of nautilus in La Union and Pangasinan. © WWF/TRAFFIC

Region III: Bulacan, Pampanga and Zambales in Central Luzon

Central Luzon is both a trade route and collection site. The provinces of Bulacan and Pampanga are manufacturers and exporters of various shell products, however, both manufacturers and traders reported that the last shipments of nautilus were in 2003 and 2007, respectively.^{xvi} None of the companies interviewed claimed to have ordered nautilus from suppliers since then. Zambales, located along the disputed West Philippine Sea, is reportedly a newer collection site for nautilus.

One fisherman interviewed claimed that there are five bancas with two to three fishermen per banca who catch nautilus – though claimed that this is not their main source of livelihood and only a “sideline” activity during the “lean months” (April to June) of the fishing season. Their nautilus fishing started around 2008 and fishing activities came to a halt in 2011 because of the tension between China and the Philippines over the West Philippine Sea. Some traders also claimed that they do not always go fishing for nautilus as they claim to also collect dead nautilus shells floating on the surface.^{xvii} In Zambales, four main collection areas were identified:

- Palauig town - Barangays Lipay and Magalawa Islands
- Masinloc town - Barangays San Salvador and Santa Cruz

Region IV-A: CALABARZON (Cavite, Laguna, Batangas and Quezon) in Southern Luzon

The southern portion of Luzon is divided into three regions: Region IV-A consisting of the provinces of Cavite, Laguna, Batangas and Quezon, and is given the acronym CALABARZON; Region IV-B consisting of the provinces of Mindoro, Marinduque, Romblon and Palawan and Region V or the Bicol Region (Figure 18). All three regions are both trading areas and collection sites for nautilus. There are processing centers, freeports, and business parks in Southern Luzon (CALABARZON), particularly in Cavite, where products are being produced and manufactured for export. In Cavite, five of the seven shell manufacturers carry nautilus products, although one of the shops only caters to local buyers. Batangas, in the center the Verde Island Passage (VIP), is an epicenter of some of the richest marine biodiversity in the Philippines, and one of the sources of collection of nautilus. The Polillo Island group is also known as a haven of marine life, including nautilus shells.

Region IV-B : MIMAROPA (Mindoro, Marinduque, Romblon and Palawan) in Southern Luzon

Both Manila and Cebu shell exporters claimed that Palawan waters are still the leading source of the best nautilus shells in the country, particularly those from Balabac Island.^{xviii} Nautilus from this province is sourced from Taytay and El Nido in the north, and Coron and Cagayacillo in the east.^{xix} Nautilus fishing grounds in MIMAROPA are Caramoan, Camarines Sur and Ticao Pass in Masbate. In these areas, collection of nautilus is secondary to the main source of livelihood - fishing and sea cucumber collecting. The survey team visited nine souvenir shops located in the vicinity of Puerto Princesa domestic airport and found no nautilus shell for sale. This may indicate that nautilus shell collections are intended for the exporters in Manila, Cebu and Zamboanga.

Region V: Bicol Region in Southern Luzon

Nautilus collecting grounds in Region V or the Bicol Region are Caramoan, Camarines Sur and Ticao Pass in Masbate. In these areas nautilus collecting is also not the main source of livelihood but fishing and sea cucumber collecting are.

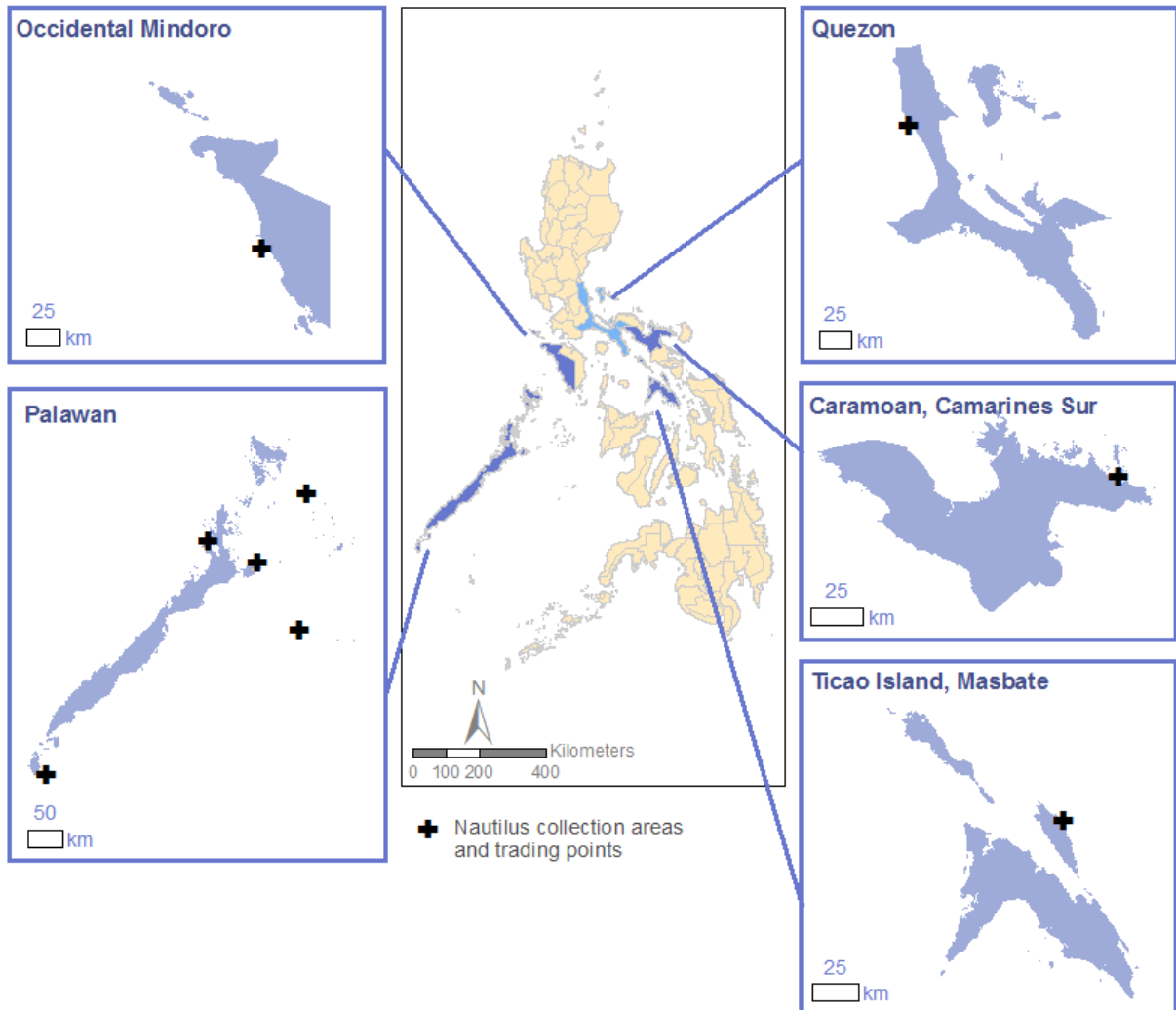


Figure 20: Collection sites in Southern Luzon (Region IV-A and Region IV-B): MIMAROPA and CALABARZON & Region V. © WWF/TRAFFIC

Region VI: Aklan Province in Western Visayas

Western Visayas is a popular tourist destination, where the famous white sand beaches of Boracay Island in the province of Aklan are located. Aklan Province is also a collection site and trade route for marine products as the province is surrounded by the Visayan Sea, one of the richest fishing grounds in the country and a source of shells for food and shellcraft. Eighteen of the 20 souvenir stalls that are lined up along the beaches of Boracay Islands sell nautilus and other shell products to local and foreign tourists.

Region VII: Cebu and Bohol in Central and Western Visayas

Central Visayas, primarily the Province of Cebu (Figure 20), with its international airports and seaports, is the leading manufacturer and producer of products destined for export, with more than 300 exporters located in the province, including the largest in the Mactan Export Processing Zone (MEPZ). Bohol Province and the Bohol Sea, known for its production of shells, reportedly is a collection site for nautilus around Panglao Island. On Boracay Island, in western Visayas, there are souvenir shops selling nautilus at most of the major tourist destinations. All of the 37 exporters' shops in Cebu, all eight in Bohol, and 18 out of 20 shops in Boracay Island, sold nautilus products. All of the 37 exporters' shops in Cebu and all eight in Bohol carry nautilus products - the only surveyed site in the Philippines where 100% of the retailers sell nautilus products.

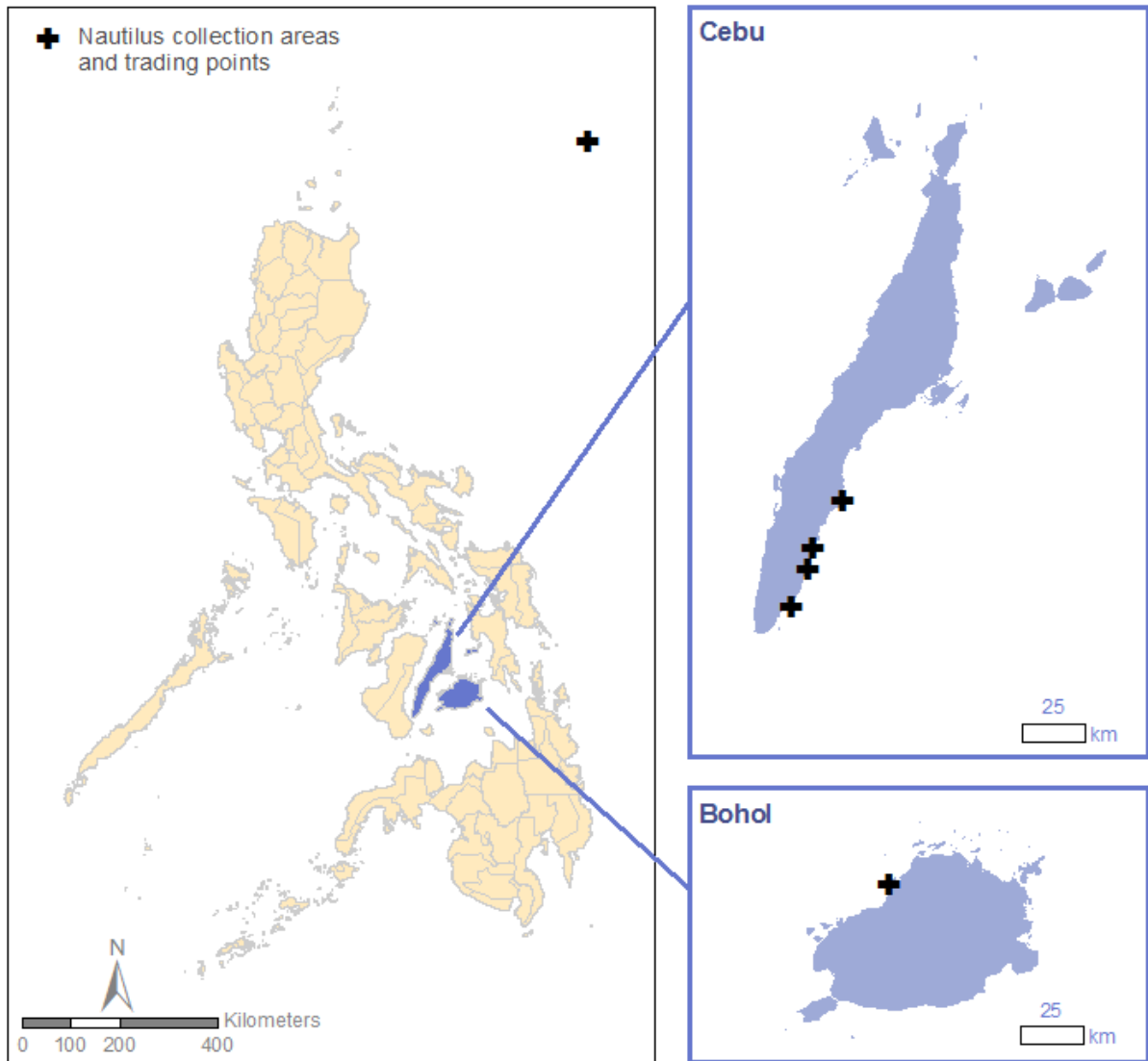


Figure 21: Central and Western Cebu. © WWF/TRAFFIC

Region IX: Davao Oriental and Zamboanga and ARMM (Jolo and Sulu) in Southern Mindanao

This Region (Figure 20) is known as a major transit point for products. TRAFFIC’s investigations of Zamboanga Peninsula revealed 19 seaports, 12 of which are privately-owned and thus free from inspection procedures.^{xx} The Autonomous Region of Muslim Mindanao (ARMM), covering the provinces of Jolo (Sulu) and Tawi-Tawi, remains one of the major sources of raw shells for shellcraft and handicraft manufacturing. The Region is also a gateway for illegal trade activities, being the closest to the border and neighboring countries like Malaysia and Indonesia. There are no registered exporters or souvenir/curio shops in Jolo and Tawi-Tawi since ARMM is a “red zone” for tourists, due to security unrest, however nautilus shells are reportedly present in shipments through Zamboanga ports. Davao

Gulf is the major marine water surrounding the province of Davao in Region XI. Mati in Davao Oriental has been reported as a collecting site for nautilus shells.

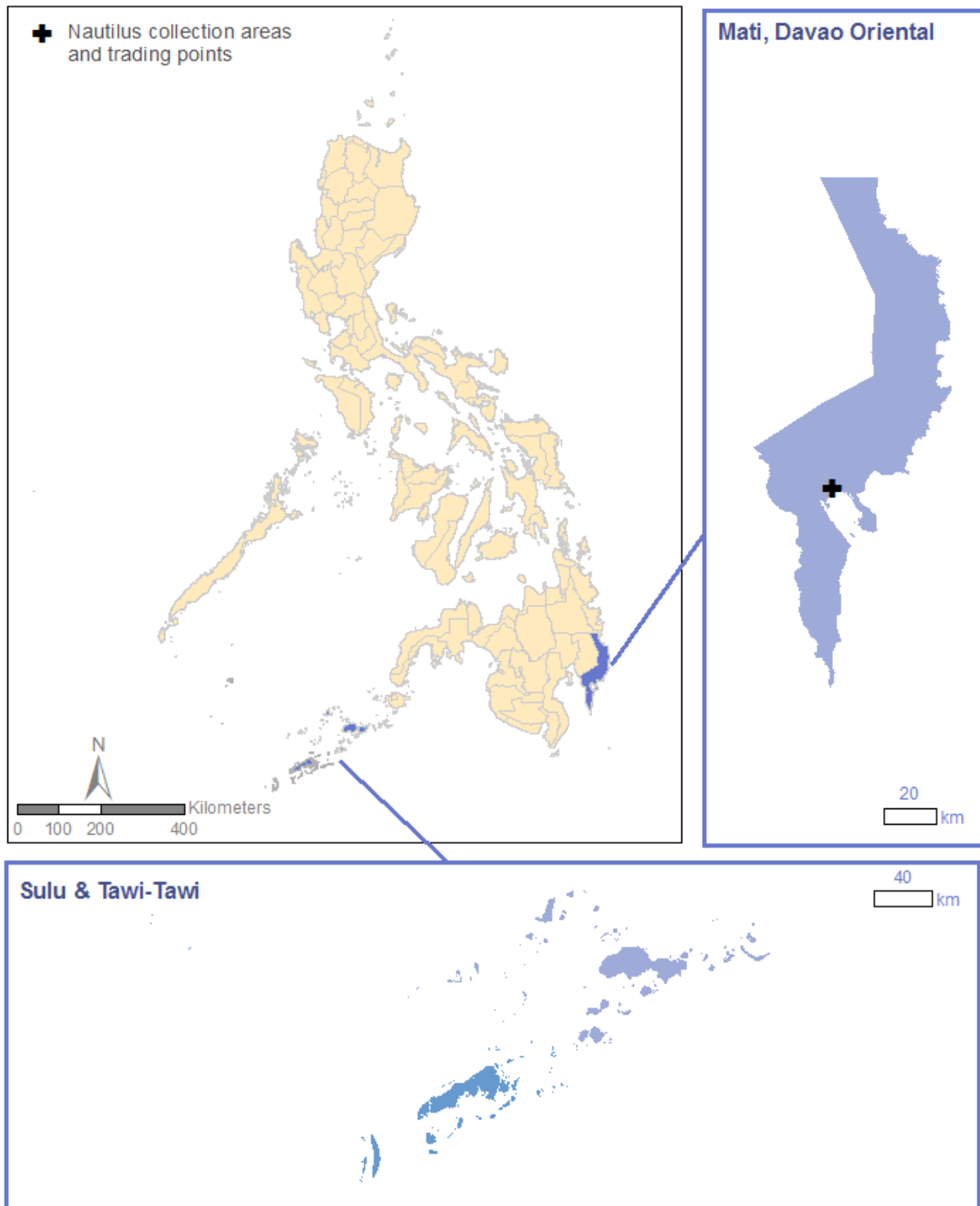


Figure 22: Southern Mindanao and ARMM. © WWF/TRAFFIC

Retail outlets (jewelry, souvenirs, flea markets)

Most of the 166 shops surveyed are exporters of shells and shellcraft products with showrooms that display finished products made of various kinds of raw materials including shells and other local materials. Souvenir and curio shops are located in resorts that are frequented by local and foreign tourists. Nautilus is favoured in its natural or polished form since consumers prefer mother-of-pearl as in-lays of fashion jewelry items. By the end of the survey period, a

total count of 18,544 pieces of whole nautilus shell in raw/natural or processed/pearlized form was made from shops all over the country, broken down as follows:

- Luzon – 8,851 (48% of the total)
- Western and Central Visayas – 8,478 (46% of the total)
- Mindanao (Zamboanga) – 1,215 (7% of the total)

Retail shops in Luzon, Visayas and Mindanao indicated that they usually cannot afford more than 10 pieces of nautilus shells in the natural or polished form, because of the high selling price of the commodity and because there is demand from tourists and local consumers for a variety of products made from other assorted shells and indigenous products. Traders that maintain more than a thousand pieces of nautilus shell are both exporters and suppliers of nautilus to other exporters (with a marked up price).

All Cebu shops that were visited carry at least 10 nautilus pieces, with some containing more than a thousand pieces of nautilus. Products include raw, natural forms, polished/pearlized form, table lamps, fashion jewellery, letter openers, glass canisters, decorative eggs made of nautilus chips or in-lay.



Figure 23: Nautilus products in the Philippines. © WWF/TRAFFIC

Outside Metropolitan Manila and in provinces that are leading tourist destinations, souvenir and curio shops and stalls are located in tourist spots and beach resorts that are frequented by local and foreign tourists. Shellcraft products in beach resorts and tourist spots are double or triple the price of items from exporters who are engaged in the retail of commodities displayed in their showroom.

Based on interviews with the big exporters of nautilus in Metropolitan Manila, Cebu and Zamboanga, the major export markets include the USA, Italy, UK, France, Portugal, Saudi Arabia, Dubai, Australia, Singapore, Malaysia, Hong Kong, Russia, Korea, Japan, China, Taiwan and India. The total volume of export for each of the exporters ranges from 500 to 1,500 pieces per year of nautilus in its raw, natural or polished/pearlized form.^{xxi} The frequency of shipments to regular clients is two or three times a year. The following sections discuss the result of the survey by geographic region.

National Capital Region (NCR) covering Metropolitan Manila

A total of 38 shops were surveyed in the Metro Manila, with seven of them selling nautilus products in retail to local and foreign consumers. Tribesmen Products Enterprises is the largest exporter, local supplier and retailer of nautilus shells in Metro Manila with around 2,000 pieces of whole nautilus shell in natural, pearlized forms and made into lamps (on display in their showroom). Inside large malls, such as the SM Department Store (with branches all over the country), is a section called “Kultura” that sells local products from clothes to handicrafts. A former supplier of

nautilus to Kultura claimed that Kultura no longer carry nautilus products due to the high price and that the consumers would rather purchase less expensive shell products. A total of 3,208 pieces of nautilus shell in raw or processed/pearlized forms or finished products (i.e., lamps) were identified in Metro Manila retail outlets during the survey. The main export markets identified include the USA, the EU (Italy, UK, France, and Portugal), the Middle East (Saudi Arabia, UAE), Malaysia, Hong Kong, Russia, South Korea, Japan, China, Taiwan, and India.

Region I: Northern Luzon: La Union and Pangasinan in Northern Luzon

The number of souvenir shops in the tourist destinations around the beaches of La Union and Hundred Islands National Parks, Pagudpud Beach, and Baguio City, grow rapidly in the area from the onset of summer. Shells and other products of Northern Luzon are sold in shops along the beaches of La Union and Hundred Islands. Six of the ten stores at Hundred Islands and three of the seven stores in La Union offer nautilus in its natural and pearlized forms for sale. In Pagudpud Island, Ilocos Norte, there was no nautilus on sale in the lone souvenir shop. There were 29 pieces of nautilus observed in the six stores in Pangasinan and eight pieces of nautilus in La Union.

CAR (Baguio City, Mt. Province and Region I (La Union, Pangasinan and Ilocos Norte) in Northern Luzon

Along the beaches of La Union and Hundred Islands are shops catering to tourists. Of the eleven souvenir shops that were visited, no shellcraft products using nautilus were encountered, not even whole shells.^{xxii} Sixteen shops in Region I (La Union, Pangasinan and Ilocos Norte) were covered by the survey team.

Region IV-A (CALABARZON: Cavite and Laguna) in Southern Luzon

In summary, 11 shops were surveyed in the CALABARZON provinces of Laguna, Cavite and Rizal. Seven of these were found to be trading nautilus shells in raw, pearlized forms or finished products like lamps and other household fixtures that utilize mother-of-pearl shells. There were about 4,557 whole nautilus shell in the five shops in Cavite, 1,057 in the two shops in Laguna and none in Rizal for a total of 5,614 pieces of whole nautilus shell in the three CALABARZON provinces. The five nautilus exporters in Cavite and Laguna are trading primarily whole nautilus shells to countries such as the USA, Italy, UK, UAE (Dubai), Singapore, Hong Kong, Korea, Japan and China two to three times a year depending on which countries have orders.

Region VI (Western Visayas): Boracay Island, Aklan Province

The Aklan-based survey team was able to cover 20 souvenir shops spread over the island, 18 of which had no more than ten pieces of whole, natural or polished nautilus, with some made into table lamps available. About 98 recognizable whole shells were recorded from the shops and stalls.

Region VII (Central Visayas): Cebu and Bohol

Central Visayas, particularly Cebu, maintains its stature as the leading shellcraft manufacturing and producing capital of the Philippines with more than 300 export companies known for their high export-quality fish and fishery products. Cebu has one of the largest international airports and seaports and export processing zones in Mactan. The Central Visayas survey team covered 37 leading nautilus exporters who, like their Luzon counterparts, are also suppliers of nautilus to fellow exporters in Cebu. The Cebu companies directly export their products and maintain their showroom only to display samples of their products for prospective importers and not for local consumers and tourists. The biggest exporters of nautilus shells in Cebu, with corresponding number of existing stocks of nautilus, are JIJ Multicraft (Code CV38) – with roughly 3,000 pieces, New Chambered Nautilus Marine Exports (Code CV16) – with 2,347 pieces, and Orcullo Enterprises (CV18) – with 1,000 pieces. The remainder of Cebu exporters have less than 10 to 500 pieces of existing stock.

Based on interviews with more than 30 exporters, the total volume of export for each exporter ranged from 500 to 1,500 pieces of nautilus in its raw, natural or polished/pearlized form. The major export markets include the USA, Italy, UK, France, Portugal, Saudi Arabia, UAE, Singapore, Malaysia, Hong Kong, Russia, Korea, Japan, China, Taiwan and India. The frequency of shipments to regular clients is two or three times a year, but the number of countries of destination varies with every shipment.

In Bohol, eight souvenir shops and stalls lined the shores of the resort island of Panglao, all selling whole nautilus shell to local and foreign tourists.

In summary, 37 shops of exporters in Cebu and eight souvenir shops/stalls of local traders in Bohol or a total of 45 shops/stalls were covered by the survey in Central Visayas. The existing stocks of whole nautilus shell during the time of the survey was recorded at 8,342 in Cebu and 38 in Bohol for a total of 8,380 pieces in this region.

Zamboanga Peninsula

There are approximately 55 manufacturers and exporters of fish and fishery products in Zamboanga, however, only eight shell exporters are listed. Five of the eight shell exporters, in the BFAR RO IX carry nautilus products. San Luis Shell Industries, Inc. holds the largest number of nautilus stock at around 1,000 pieces of whole shell with a combined total of 1,215 pieces from the five remaining nautilus shell exporters in Zamboanga.

Collection areas

Table 11 presents an overview of existing collection sites for nautilus in the Philippines that were identified during TRAFFIC's survey from May to December 2013.

Table 11: Collections sites for nautilus and trade routes based on interview with key players in the trade and personal visit to some of these sites.

Source (Location of Collection areas)	Trade hubs (shops)	Local exports (locations)	International Exporters
Zambales Province, Central Luzon: 1. Palauig town (Barangay Lipay, Barangay Magalawa Island) 2. Masinloc town (Barangay San Salvador, Barangay Santa Cruz)	Cebu, Manila and Zamboanga (major shops) Bohol, Panay Island, Davao, Pangasinan, Palawan (souvenir shops for tourists)	Manila, Cebu and Zamboanga Clark Field, Pampanga, Subic Bay; Bataan Export Processing Zone	USA, Italy, UK, France, Portugal, KSA, Dubai, Singapore, Malaysia, Hong Kong, Russia, Korea, Japan, China (and Taiwan), India
Pangasinan Province, Northern Luzon: 1. Bolinao 2. Alaminos	Cebu, Manila and Zamboanga (major trade route)	Cebu, Manila and Zamboanga	
La Union Province, Northern Luzon: 1. Bauang	Hundred Islands National Park, La Union beaches		
Mindoro Occidental Province, Southern Luzon: 1. Sablayan	Manila, Cebu, Zamboanga (major trade routes)	Cebu, Manila and Zamboanga	
Masbate Province, Southern Luzon: 1. Ticao Pass	Puerto Galera, Oriental Mindoro, Verde Island beaches		
Quezon Province, Southern Luzon: 1. Polillo Island	Cebu, Manila and Zamboanga (major trade route)	Cebu, Manila and Zamboanga	
Batangas Province	Batangas beaches and resorts		
Camarines Sur Province, Bicol Region Caramoan	Cebu, Manila and Zamboanga (major trade route) Naga, Caramoan, Legaspi, Albay	Cebu, Manila and Zamboanga	
Palawan Province, Southern Philippines: 1. Taytay 2. El Nido 3. Balabac Island 4. Coron, Calamianes Island	Cebu, Manila and Zamboanga (major trade route) All the islands of Palawan	Cebu, Manila and Zamboanga	

Source (Location of Collection areas)	Trade hubs (shops)	Local exports (locations)	International Exporters
5. Cagayancillo			
Cebu Province, Central Visayas: 1. Oslob 2. Alcoy, Argao 3. Dalaguete Bohol Province, Central Visayas: 1. Inabanga	Cebu, Manila and Zamboanga (major trade route) Panglao Island, Tagbilaran	Cebu, Manila and Zamboanga Cebu International Airport	
Davao Oriental, Southern Mindanao: 1. Mati	Cebu, Manila and Zamboanga (major trade route) Davao City, Apo Island	Cebu, Manila and Zamboanga Davao International Airport	
Jolo (Sulu)	Cebu, Manila and Zamboanga (major trade route) Davao City, Apo Island	Cebu, Manila and Zamboanga Davao International Airport	USA, Italy, UK, France, Portugal, KSA, Dubai, Singapore, Malaysia, Hong Kong, Russia, Korea, Japan, China, Taiwan, India
Tawi-Tawi	Cebu, Manila and Zamboanga (major trade route) Davao City, Apo Island	Private wharves	USA, Italy, UK, France, Portugal, KSA, Dubai, Singapore, Malaysia, Hong Kong, Russia, Korea, Japan, China, Taiwan, India



Figure 24: Nautilus fisherman in Panglao Island, Bohol. © WWF/TRAFFIC

Exporters

Fifty-nine wholesalers/exporters in the Luzon area, 37 major exporters in Cebu and eight in Zamboanga were visited for the survey. From the information gathered on the market chain for nautilus, there are eight key players in the trade and the products change hands five times before they reach consumers (Figure 25 below). The key players are as follows:

1. The *fisherman/collector* who is either self-financing or being financed by the local buyer in the area (referred to as the “stocker”).
2. The *local buyer/stocker* who buys all the catch of the fishermen and waits for their regular buyer from Manila, Cebu or another part of the country. The local buyer dictates the price to the fisherman and the next player in the chain of custody depending on the demand and supply.
3. The buyer - i.e., the *wholesaler/exporter* and “stocker” (who may also sell some nautilus stock to fellow wholesalers/exporters who are unable to go to collection sites or don’t have access to the local buyer). This is essentially a *double layer of wholesaler and exporters*. At times, the wholesaler/exporter/stocker directly purchases from the fisherman and may bypass the local buyer.

4. Another player in the chain of custody of nautilus is the *middleman* who may buy finished products from a wholesaler/exporter/stocker or wholesaler/exporter for local distribution by local retailers.
5. These *local retailers* are the souvenir and curio shops found in malls and tourist spots all over the country.
6. The local retailers then sell them to *local and foreign markets*.
7. Finally are the end *consumers* who purchase the product.

The local buyer may increase the price to the wholesaler/exporter/stocker. The wholesaler/exporter/stocker in turn may mark up the price when selling to other wholesalers/exporters. The price of their products for the local and foreign markets is the same based on prevailing conversion rate of USD to local currency. However, when the middlemen buys the products from the exporters for local distribution by retailers, the mark up price is so high that the retail price of the product may become double or triple the price from the wholesaler/exporter.



Figure 25: Market chain of nautilus trade from source to consumer. © WWF/TRAFFIC

NOTES ON OTHER TRADE IN EAST ASIA

TRAFFIC investigations in other parts East Asia were limited to interviews with local experts in the shell trade. Comprehensive field investigations, such as those conducted in Indonesia and in the Philippines, were not able to be conducted in other areas. Anecdotal evidence, however suggested that there was some trade of nautilus products. The following information provides some brief notes regarding the trade of nautilus products in other areas of the region.

China, Hong Kong, Taiwan

Nautilus pompilius is listed as a Class I species under the Law of the People's Republic of China on the Protection of Wildlife, and harvest is prohibited (Article 16).^{xxiii} Special permission for harvest could be approved for the purposes of scientific research, ranching and breeding, exhibition or other special condition.^{xxiv} Enforcement,

however, remains a challenge and the origin of shells observed for sale was often unknown, not given, or claimed to be from the Philippines.

Interviews with academic experts indicate that nautilus shells may be acquired mostly in the south of China on Hainan Island, and are sometimes referred to as ‘parrot shells’ (Pers. comm. Joyce Wu, TRAFFIC East Asia. December 7, 2013; Pers. comm. with Yujing Zhou, WWF China. December 7, 2013). A small number of nautilus shells are sold in art ware markets occasionally, but numbers appear to be minimal (Pers. comm. Joyce Wu, TRAFFIC East Asia. December 7, 2013; Pers. comm. with Yujing Zhou, WWF China. December 7, 2013). WWF and TRAFFIC in China have been engaged in public awareness campaigns to highlight the vulnerability and protections afforded to marine products, including *Nautilus pompilius*, in Hainan.^{xxv}

TRAFFIC 简介

国际野生生物贸易研究组织 (TRAFFIC) 是野生动植物贸易监测网络, 致力于确保野生动植物贸易不会对自然保护构成威胁。它在全球大部分地区设有代表处, 同《濒危野生动植物种国际贸易公约》(CITES公约) 秘书处紧密合作, 携手开展工作。

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TRAFFIC
 the wildlife trade monitoring network
 is a joint programme of
WWF **IUCN**

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 国际野生生物贸易研究组织
 世界自然基金会

Figure 26: Public awareness flyer on vulnerable marine species in the shell trade in Hainan. © WWF/TRAFFIC

There has been limited detection of nautilus meat for sale in the large coastal cities of China (Fujian and Guangdong Provinces). Nautilus are, however, present in small numbers in both shell and meat form in Guangzhou seafood markets and home décor shops. Shells too, have been seen for sale in some small stores, including at airport gift shops. In 2013, Chinese enforcement officials in Shenzhen reportedly seized two shipments containing a total of five nautilus shells – three shells in a shipment from East Timor and two shells in a shipment from Madagascar (Pers. comm. Joyce Wu, TRAFFIC East Asia. May 3, 2014).



Figure 27: Nautilus shells for sale at gift store in Zhanjiang Airport, Guangdong, China.

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China, Hong Kong, and Taiwan do not record specific Customs codes for nautilus products so government data are not collected on imports or exports of nautilus products. The two main HS codes under which shell trade for nautilus might be reported are^{xxvi}:

- “0508 00” - Coral and similar materials, unworked or simply prepared but not otherwise worked; shells of molluscs, crustaceans or echinoderms and cuttle-bone, unworked or simply prepared but not cut to shape, powder and waste thereof.
- “9601 90” - Bone, tortoiseshell, horn, antlers, coral, mother-of-pearl and other animal carving material, and articles of these materials.

Hong Kong has three 0508 00 codes, splitting unworked/ simply prepared powder and waste (0508 0000), from other powder and waste (0508 0020), and unworked/ simply prepared, not powder or waste (0508 0090). A few additional codes are also used, such as “9606 2910” (Buttons of Shell) in Hong Kong, and “9705 00 00 10-8” (collections and collectors’ pieces of birds, animals, fish and shell) in Taiwan. However, in general, trade in shells is reported under the two main HTS codes described above. TRAFFIC was not able to review specific customs data for China, Hong Kong, or Taiwan during the period of study.

There is a small trade of live specimens for aquaria purposes in Hong Kong, though the shell itself is rarely seen in markets. Tung Choi Street, sometimes referred to as Goldfish Street (金魚街) or Goldfish Market, in the Mong Kok area of Hong Kong, has a number of shops and vendors selling marine and freshwater species for the aquaria trade, and some live nautilus have been recorded for sale in a few shops (Pers. Comm. with Stanley Shea, Bloom Association. December 9, 2013; Pers. Comm. with Allen To, WWF Hong Kong. December 9, 2013). The origin of the source of live specimens was not given.

Nautilus shells are also reportedly sold as souvenirs in the shops of some fishing ports and tourist spots around a few beaches of Taiwan.^{xxvii} There are nautilus on exhibition in at least two of Taiwan’s aquariums, with reports

that one of them has been successfully bred in 2012 (Pers. Comm. with Stanley Shea, Bloom Association. December 9, 2013). There is also a limited amount of nautilus shells and other nautilus products available for sale through online retailers in Taiwan (see Appendix 3 for more information).

OVERVIEW OF TRADE IN EUROPE

Due to a lack of species or genus-specific Customs codes available for most shells in trade, actual nautilus trade levels, quantities and routes involving Europe are not known. Internet research and consultations suggest that overall, trade and sale of nautilus within Europe appears to occur at a low level, with a focus on whole nautilus shells sold individually, or as constituent parts of ornaments, half sawn shells and smaller pieces of whole shells used in jewelry. Prices varied depending on the size (~5-20 cm), quality and rarity (species involved); and stock was usually made up of a few pieces.

The majority of nautilus found for sale on European websites is located in France, Germany and the UK, with only very small quantities found on other national websites. More often than not, details such as the species and the country of origin were not provided in offers for sale, nor easily obtained. With nautilus not being protected in any of the European countries researched (with the exception of some overseas territories), monitoring of their trade is not a priority for authorities.

Analysis of Customs trade data

Customs codes relevant to Nautilus trade

The Harmonized Commodity Description and Coding System, referred to as "Harmonized System" or HS, is the international nomenclature developed by the World Customs Organization for use across the globe for products in trade.^{xxviii} The system is used as a basis for countries' Customs tariffs and for the collection of international trade statistics. Within this system, trade categories in shells are very general with no species, genus or family level information being collected. As noted earlier, trade in nautilus would be reported under the two main HS codes applicable to molluscs and other shell trade under which are:

- "0508 00" - Coral and similar materials, unworked or simply prepared but not otherwise worked; shells of molluscs, crustaceans or echinoderms and cuttle-bone, unworked or simply prepared but not cut to shape, powder and waste thereof.
- "9601 90" - Bone, tortoiseshell, horn, antlers, coral, mother-of-pearl and other animal carving material, and articles of these materials.

A number of countries/territories used slightly more specific codes for shells, as noted in the earlier example for Hong Kong, but these are only useful to further distinguish the types of shell products in trade and not the species involved. However, in general, including in the European Union (EU), trade in shells is reported under the two main HTS codes described above, hereafter referred to as "unworked" and "worked" shell.

EU imports of "Unworked" and "Worked" shell

The following summarizes EUROSTAT^{xxix} data downloaded for these two commodities, for 2008-2012, with a focus on imports into the EU from countries/territories that are range States of nautilus species (highlighted in tables 15 and 16) and the main destinations for shells in the EU.

Between 2008 and 2012, EU Member States reported importing over 65,000 metric tonnes (MT) of unworked shells, and nearly 11,000 MT of worked shells.^{xxx} The main suppliers of unworked shells were Norway (~3,400 MT/yr), mainland China (~3,200 MT/yr), Turkey (~2,900 MT) and the Philippines (~1,100 MT/yr) - together responsible for 80% of all imports during these five years. China and the Philippines are range States for Nautilus - other nautilus range States supplying between 50 and 300 MT of unworked shells per year to the EU include India, Viet Nam, Indonesia, Thailand and Australia. The EU imported ~70 MT per year of unworked shells from the United States. Similar countries were involved in the trade in worked shells. The main suppliers were the Philippines (~1,100 MT/yr), mainland China (~330 MT/yr), India (~320 MT/yr), Indonesia (~110 MT/yr), Fiji and Vietnam (both ~60 MT/yr).

Table 12 – Main suppliers of “unworked” shells (0508 00) to the EU, 2008-2012 (MT)
(Range countries of nautilus highlighted in yellow)

Exporter	2008	2009	2010	2011	2012	Total	Average
Norway	25	93	85	7,689	9,107	16,999	3,400
China	2,603	3,580	3,077	3,220	3,631	16,111	3,222
Turkey	6,631	674	482	6,273	474	14,533	2,907
Philippines	1,023	1,135	1,255	1,191	1,086	5,689	1,138
Faroe Islands	0	0	0	0	2,855	2,855	571
India	551	362	215	118	182	1,428	286
Vietnam	512	190	143	170	241	1,256	251
Indonesia	427	234	189	166	204	1,220	244
Greenland	715	246	0	0	0	961	192
Thailand	148	111	145	119	155	678	136
Sudan	203	70	70	95	70	508	102
USA	180	132	5	5	30	350	70
Korea	175	44	47	36	29	331	66
Australia	101	104	0	36	14	255	51
Other RoW	743	586	472	410	413	2,623	525
TOTAL	14,036	7,560	6,184	19,526	18,490	65,797	13,159

Table 13 – Main suppliers of “worked” shells (9601 90) to the EU, 2008-2012, (MT)
(Range countries of nautilus highlighted in yellow)

Exporter	2008	2009	2010	2011	2012	Total	Average
Philippines	1,565	1,216	960	822	915	5,478	1,096
China	474	364	268	288	278	1,671	334
India	441	270	291	353	275	1,629	326
Indonesia	145	114	178	84	51	572	114
Fiji	110	0	0	87	118	315	63
Vietnam	71	36	63	72	62	303	61
South Africa	47	37	43	35	22	184	37
Thailand	30	26	19	14	10	98	20

Exporter	2008	2009	2010	2011	2012	Total	Average
Australia	2	1	58	16	16	92	18
Nigeria	38	15	10	7	21	91	18
Namibia	17	16	18	19	10	80	16
Kenya	28	12	2	12	6	60	12
USA	9	11	8	14	13	55	11
Madagascar	13	3	7	10	9	42	8
Brazil	13	7	7	6	3	36	7
Other RoW	60	65	38	32	41	236	47
Total	3,061	2,192	1,970	1,870	1,849	10,942	2,188

The main EU countries of destination of shells coming from nautilus range states are shown in Tables 17 and 18. For unworked shells, the UK was by far the main destination, importing ~3,300 MT/yr. Italy, Germany, the Netherlands, Poland, Lithuania and France imported between 100 and 600 MT/yr. Imports of worked shells were distributed more evenly amongst range States, with Spain and Greece also being amongst the top destinations.

Table 14 – Main EU destinations for “unworked” shells (0508 00) from nautilus range states, 2008-2012 (MT)

Importer	2008	2009	2010	2011	2012	Total	Average
United Kingdom	2,729.1	3,605.9	3,185.9	3,487.0	3,721.4	16,729.3	3,345.9
Italy	956.5	496.1	412.9	481.3	703.9	3,050.7	610.1
Germany	561.3	544.1	416.4	289.2	328.8	2,139.8	428.0
Netherlands	399.0	398.8	410.7	306.0	305.9	1,820.4	364.1
Poland	199.4	199.6	200.2	111.9	89.5	800.6	160.1
Lithuania	125.6	193.5	146.0	130.0	120.6	715.7	143.1
France	170.7	146.4	136.3	85.4	96.7	635.5	127.1
Belgium	63.4	23.7	38.9	41.7	56.0	223.7	44.7
Greece	19.7	38.9	14.5	18.3	18.1	109.5	21.9
Denamark	18.1	11.0	11.5	22.9	24.7	88.2	17.6
Portugal	50.6	11.3	7.6	7.8	4.1	81.4	16.3
Czech Republic	17.5	18.9	12.6	7.7	23.6	80.3	16.1
Other EU	65.4	32.5	32.9	30.2	20.4	181.4	36.3
Total	5,376.3	5,720.7	5,026.4	5,019.4	5,513.7	26,656.5	5,331.3

Table 15 - Main EU destinations for “worked” shells (9601 90) from nautilus range states, 2008-2012 (MT)

Importer	2008	2009	2010	2011	2012	Total	Average
Germany	528.0	301.9	296.7	387.3	451.2	1,965.1	393.0
Spain	396.9	288.6	436.5	315.0	324.3	1,761.3	352.3
Italy	494.8	247.9	366.0	300.8	267.0	1,676.5	335.3
Greece	329.5	235.0	139.6	138.3	119.1	961.5	192.3
Poland	251.0	210.0	133.4	181.3	145.1	920.8	184.2
Netherlands	262.2	256.9	143.9	112.8	99.9	875.7	175.1
France	118.6	82.2	77.2	60.6	48.0	386.6	77.3
UK	87.3	102.3	49.1	79.9	48.8	367.4	73.5
Bulgaria	98.7	102.9	42.7	44.6	62.0	350.9	70.2
Romania	75.4	62.2	55.6	31.9	32.8	257.9	51.6
Denmark	57.7	32.6	23.3	28.6	43.7	185.9	37.2
Belgium	59.9	36.7	25.8	15.6	36.6	174.6	34.9
Portugal	12.3	13.4	11.7	12.7	4.7	54.8	11.0
Austria	14.3	12.1	5.9	6.5	15.7	54.5	10.9
Cyprus	17.1	14.0	7.1	7.6	6.7	52.5	10.5
Other EU	32.8	26.6	21.6	10.7	19.8	111.5	22.3
Total	2,836.5	2,025.3	1,836.1	1,734.2	1,725.4	10,157.5	2,031.5

Literature/internet research and consultations

Internet research and consultation with experts was carried out in order to obtain insight into the trade in nautilus shells and other products in Europe (as species or genus-specific trade data is not available for Europe). Searches for offers for sale were carried out on national and international auction, shopping and business sites such as eBay and Alibaba, as well as via Google and classified advertisement/community websites in December 2013 and January 2014. Experts consulted included conchologists and other shell experts/enthusiasts, shell traders, fashion retailers, and European CITES, Customs, Inspection and Conservation authorities.

Searches focused on the following selection of countries and their respective languages: Austria, Belgium, Germany, Greece, Hungary, Italy, the Netherlands, Spain and the UK. Search terms used were “Nautilus”, “Nautilus shell”, “Nautilus pearl” and “Nautilus jewelry” (and their equivalents in the various languages). In several cases websites were re-visited to see if there were any changes over time, however these were minimal.

Examples of offers of sale and information collected from the individual countries and relevant websites are presented in the country summaries below and in Appendix 3. The list of examples provided is not exhaustive – they were selected to provide a representative sample of the types of products for sale. There were also several antique items for sale, however information on these has not been included as their trade is not likely to be relevant to the

current conservation status of populations. Finally, although only one direct link to Europe was found in adverts on international Business to Business platform Alibaba, a number of additional examples of adverts are provided, as they contain potentially interesting information related to the source, stock and availability of this taxa on the international market.

Online research suggested that the majority of European nautilus trade is supplied by companies in France, Germany and the UK, and therefore more detail is provided for these three countries. However, even in these countries, trade and sale of nautilus appeared to occur at a low level, with a focus on whole nautilus shells sold individually, or as constituent parts of ornaments, half sawn shells and smaller pieces of whole shells used in jewelry. These sales varied based on price, quality and rarity (species involved); and stock was usually made up of a few pieces.

More often than not, details such as the species and the country of origin were not provided in offers for sale, nor easily obtained. With nautilus not being protected in any of the European countries researched (with the exception of *Nautilus macromphalus*, which is protected in New Caledonia, a French overseas collectivity), monitoring of their trade is not a priority for authorities, and any information they were able to provide was based on personal interest and/or chance observations.

France

Online offers for sale – summary (specific examples provided in Appendix 4)^{xxxi}

- *eBay.fr*: There were over 100 offers for sale involving nautilus shells and jewelry made from nautilus shell or nautilus pearl (primarily pendants, earrings and rings) during the time period of searches (12/13 – 1/14). However, only 13 of these offers were from sellers based in France. The majority of sellers offering such items on *Ebay.fr* (primarily for jewelry sales) were based in the USA and, to a lesser extent, elsewhere in the EU (e.g., mainly Germany) and in Asia (e.g., the Philippines). Offers listed under “Nautilé” were mainly for nautilus curiosities, fossils and taxidermy.
- *Lecoin.fr*: This e-commerce site retrieved only six advertisements for nautilus involving generally small quantities (one to two) of shells for sale from private sellers. Other online sellers were advertising similarly small quantities.

Other research and consultations

- Selected experts in France (and overseas territories) were contacted for further information on nautilus trade, including countries of origin, quantities imported and legal protection for these species:
 - According to a Paris-based expert, nautilus shells are not of particular interest to collectors, with collections generally containing one or two such items, rarely more. However, “amateurs” interested in pearls, handicrafts and curiosities are believed to be importing quite important quantities of these species for decoration and manufacture of jewelry and other trinkets, mainly made from *Nautilus pompilius*. The Philippines is the main source of importance for shells, while the New Caledonian source (where *Nautilus macromphalus* is found – see below) is extremely limited. Therefore, based on his experience, *Nautilus macromphalus* is very rarely seen for sale (Pers. comm. with E. Monnier. January 1, 2014).
 - A former owner of an oyster pearl farm in French Polynesia informed us that, in his experience, “there is no trade in nautilus shells in French Polynesia”. He had neither seen any evidence of this trade himself nor heard of others who had. No response was received from the AFC expert based in French Polynesia.
- The French Inspection Service (ONCFS), responsible for checks and investigations of internal wildlife trade and markets, have frequently observed nautilus shells and jewelry for sale in shops and markets in New Caledonia (French overseas collectivity), however they noted that they are also commonly found on the beaches.
- ONCFS visited the Maison & Objet Paris Trade Fair^{xxxii} in January 2014 with French Customs, and saw over 30 specimens of whole Nautilus shell for sale at one stand.

In terms of protection for nautilus species under French law and the law of overseas entities (territories/regions/collectivities/departments) with links to France:

- Only *Nautilus macromphalus* appears to be protected in New Caledonia.^{xxxiii} *Nautilus macromphalus* has a limited distribution, being endemic to the waters surrounding this French special collectivity. However, as seen in Appendix 4, shells of the species are available for purchase online.
- *Nautilus pompilius* is apparently not protected in France or its overseas territories.^{xxxiv}

Germany^{xxxv}

Online offers for sale – summary (specific examples provided in Appendix 4)

- **eBay.de:** When searching for “Nautilus Muschel”, there were ~125 offers for sale involving *Nautilus* shells and jewellery, with the majority of the sellers actually based in Germany (unlike for other European countries) during the time period of searches (12/13 – 1/14). Similar adverts as found on eBay were also found on **Amazon.de**, **Hood.de** and seller independent websites.

Other research and consultations

- Four German online sellers were contacted for additional information. They stated that they obtain their shells from German wholesalers (including one called DECORA GmbH), who import them from the Philippines and Thailand. They stated they are mostly sold as whole shells for ornamental purposes, but that there wasn't a great demand for these shells in Germany. In general they kept very little stock, and listed whether they are polished or natural. Most did not know which nautilus species they were offering for sale.
- An enforcement expert working for the German CITES Management Authority was unable to provide additional information on nautilus trade in Germany, due to these being unprotected taxa and there being no specific Customs codes to facilitate tracking of trade.

United Kingdom^{xxxvi}

Online offers for sale – summary (specific examples provided in Appendix 4)

- *eBay.co.uk:* When searching for “Nautilus shell”, there were nearly 1,000 offers for sale involving nautilus shells and jewelry (primarily pendants, earrings and rings) during the time period of searches (12/13 – 1/14). The majority of these sellers were based in the US and, to a lesser extent, elsewhere in the EU (e.g., mainly Germany) and in Asia (e.g., Malaysia and Indonesia). Of the 92 results obtained for products based in the UK, only 17 referred to real nautilus shells or products (the other being photos/stamps of nautilus, or porcelain/silver in nautilus shapes). Only one advert offering nautilus mother of pearl buttons were found, and this seller was based in the US.
- *Etsy.co.uk:* there were several adverts for nautilus products, including buttons, shell pieces (for jewellery making), nightlights and candles made of whole shells, wedding accessories and jewelry, nearly all from companies based in the US (a few also in Indonesia).
- Several UK online sellers have included an environmental statement concerning the shells they are offering for sale, noting that:

“Shells are only collected from naturally sustainable resources and are either a by-product of local food gathering or naturally available through flotsam brought in by the tide. They are gathered and exported with the permission of the local fisheries authorities and (when required) with certification from CITES (Convention on International Trade in Endangered Species). We sell no endangered species and we continue to make every effort to monitor relevant data through trade information and conservation societies in order to ensure this continues to be the case.”

Other research and consultations

- Three UK online sellers contacted for additional information stated that they obtain their shells from three main UK shell importers, who are responsible for the legal requirements of these imports. They noted that smaller size shells (~ 2 to 5 inches) are no longer permitted to enter the UK and any available online are from old stock. They estimate that less than 1,000 nautilus shells come into and are sold in the UK every year (although supplies are plentiful), mainly from Southeast Asia, specifically the Philippines. They were very aware of environmental issues and CITES, and stated that they carefully check their market and will remove any species for sale if they are concerned or new legislation comes into force. One noted that all their stock is made up of *Nautilus pompilius*.
- Officers from the UK Border Force were also contacted – one based at Heathrow airport and the other at Felixstowe port. The former noted that “*Airport Customs do not regularly see nautilus or shell shipments coming from Southeast Asia, although they have been asked to examine shell consignments from the Philippines and Indonesia coming into Thamesport that contained nautilus shells cut in half. These species are not on our controlled list so we are not looking out for them.*” The latter added that: “*Port Customs process*

many shell shipments particularly from the Philippines, however have not seen too many nautilus shells amongst these (these species not being a focus for them). We have also seen a number of nautilus shells amongst personal effects."

Other European countries^{xxxvii}

General Google and national eBay searches for Austria, Belgium, Greece, the Netherlands, Italy, Hungary and Spain provided very little additional information during the time period of searches (12/13 – 1/14). Austrian and Dutch eBays showed ~100 offers for sale of nautilus shells each, however nearly all items were located in Germany. No offers for sale were found on Italian or Hungarian eBay/national equivalents and of the 58 adverts found on Spanish eBay, only five were for items located in Spain.

There were a few private online Dutch sellers offering nautilus shells and jewelry, however in most cases no prices or additional information was provided. A consultant based in the Netherlands working on wildlife enforcement issues noted the following:

"As nautilus species are not CITES listed, they are not of interest to CITES enforcement in the Netherlands. When carrying out internal surveys, however, and visiting companies to check if they offer Queen Conch (Strombus gigas) for sale, I have never seen more than one or two individuals of nautilus for sale. Based on these surveys, numbers of nautilus for sale in the Netherlands appear to be much lower than other shell species, e.g., a company may have three to 30 Queen Conch shells and just two Nautilus pompilius in stock."

Several Greek online sellers were found, with several examples of Nautilus shells being used specifically for wedding favours/decorations.^{xxxviii} A number of high-end Italian fashion houses (including Gucci and Bottega Veneta) were contacted to enquire whether they use Nautilus shell/pearl in any of their products, however they were unable to provide any information. The Belgian-hosted website of the Philippine company Conchology Inc^{xxxix} states that the company:

"Continues to develop its conchological goals by supplying the world with the biggest databases on shells ever made and supplying collectors with the widest possible diversity in quality shells, fully documented. In cooperation with other companies and museums, we aim to provide the best services worldwide and to enrich the malacological world with new informatic tools of significant purposes in the taxonomical/nomenclatorial fields."

In January 2014, Conchology Inc. had roughly 30 shells of *Nautilus pompilius suluensis* for sale, of different sizes (~10-15 cm).^{xl}

International Business to Business (B2B) platforms

In December 2013, 360 different products, including polished shells and jewellery from 57 suppliers, were found when searching one of the main international B2B Platforms (Alibaba) for "Nautilus shell" in an online survey conducted from the UK. Sellers were mainly based in mainland China (17 detected), Philippines (15), United States (6), India (5), Vietnam (4), Thailand (3) and Indonesia (2). Several traders appear to offer relatively large numbers of nautilus shells, stating they are able to supply thousands of shells per month (10,000 in the case of one company in mainland China). One Philippine company^{xli} that ships to Europe was offering live nautilus for sale, for the aquarium trade.

When contacted for more information, a Vietnamese seller stated they get all their shells from islands in Vietnam, they can supply 1,000 pieces a month, with each shell being 5-7 inches in size. Another supplier from the Philippines offered up to 100 shells per week, polished and natural, also of 5-7 inches in size. None specified the species involved.

OVERVIEW OF TRADE TO THE USA

Review of LEMIS data

A review of the USA Fish and Wildlife Service LEMIS trade database has revealed that from 2010 to November 2013, about 6% of *Nautilus* commodities imported into the USA involved whole shells (7,335), with the remaining commodities in trade consisting of parts of Nautilus, including: jewelry – 39% (more than 45,000 items); shell

products – 38% (about 43,500); and pieces of trim (such as buttons and other decorative pieces) – 16% (more than 18,700). Additional transactions recorded by weight, exceeded 500 kilograms (more than 1,100 pounds) of whole shells, shell products and jewelry.

Table 16: Main nautilus commodities traded imported into the United States between January 2010 and December 2013 (LEMIS 2014) (Kg data highlighted)

Wildlife Description	Unit	2010	2011	2012	2013	Overall Total (NO)	Overall Total (KG)
BOD	NO			18	27	45	
GAR	NO		10			10	
JWL	KG	0.005	125	87			212.005
JWL	NO	11,308	12,351	15,968	5,652	45,279	
LIV	NO	26	16	12	47	101	
LPL	NO			2		2	
LPS	NO	40				40	
SHE	KG			5			5
SHE	NO	1,947	1,579	2,024	1,785	7,335	
SPE	NO	6	26	4	21	57	
SPR	KG	27	228	22	8		284.8
SPR	NO	21,327	7,839	8,694	5,639	43,499	
TRI	NO	18,043	613	100		18,756	
UNS	NO	150	452			602	
Annual Total	NO	52,847	22,886	26,822	13,171	115,726	
Annual Total	KG	27	353	114	8	0	502

Wildlife Description: BOD: Bodies; GAR: Garments; JWL: Jewelry; LIV: Live specimens (live animals or plants); LPL: Large leather products; LPS: Small leather products; SHE: Shells (raw or unworked shells); SPE: Specimens (scientific or biological); SPR: Shell products made from mollusk or turtle shell; TRI: Trim (show trim, garment trim, or decorative trim); UNS: Unspecified. Unit: KG: Kilogram; NO: Number (does not necessarily imply a whole animal).

The LEMIS data indicates that 44 countries exported Nautilus products to the United States between 2010 and 2013 (Table 20; LEMIS, 2014). The Philippines supplied the largest amount (accounting for almost 75% of the trade reported by quantity and 99% reported by weight) and greatest variety of products (jewelry, shell products, trim and whole shells). Indonesia was the second largest exporter to the United States (more than 13% reported by quantity), and Thailand was the third largest exporter (accounting for almost 4% of the trade as reported by quantity).

Table 17: Exports and re-exports of all nautilus commodities between January 2010 and December 2013 to the United States (LEMIS, 2014) (Kg data highlighted)

	Unit	2010	2011	2012	2013	Overall Total (NO)	Overall Total (KG)
United Arab Emirates	NO			24	68	92	
Australia	NO				5	5	
Bahrain	NO		2			2	
Brunei Darussalam	NO	2				2	
Canada	NO	101	236	1,540	1,269	3,146	
Congo	NO			40		40	
Switzerland	NO	1		11	2	14	
Cote d'Ivoire	NO		30			30	
China	NO			298	260	558	
Germany	NO	1	80		20	101	
Ecuador	NO			14		14	
Spain	NO			4		4	
France	NO	4	29	6	12	51	
United Kingdom	NO			6	13	19	
Guinea	NO			100		100	
Greece	NO	1				1	
Hong Kong	NO		11	14	1,624	1,649	
Indonesia	NO	531	3,393	9,442	1,739	15,105	
Israel	NO	1				1	
India	NO		3			3	
India	KG			4.3			4.3
Iraq	NO		1			1	
Italy	NO	6	7	74	14	101	
Japan	NO	21	8	10	31	70	
Kuwait	NO		2			2	
Mali	NO		15	60		75	
Malta	NO			25		25	
Maldives	NO		3			3	
Mexico	NO	35	775	2,120	849	3,779	
Mexico	KG	0.005					0.005
Malaysia	NO	1	1			2	
Netherlands	NO	1				1	
Oman	NO				100	100	
Panama	NO			3		3	
French Polynesia	NO				2	2	
Philippines	NO	47,983	18,229	13,006	6,992	86,210	
Philippines	KG	27	352.5	110	8		497.5
Palau	NO	4	5		6	15	
Singapore	NO	1				1	
Thailand	NO	4,153	55	18	103	4,329	
Timor-Leste	NO			1		1	
Turkey	NO		1			1	
Trinidad and Tobago	NO				21	21	
Taiwan	NO			6		6	

Viet Nam	M2			0.38			
Vanuatu	NO				2	2	
South Africa	NO				39	39	
Total AnnualExport	NO	52,847	22,886	26,822	13,171	115,726	
Total AnnualExport	KG	27.005	352.5	114.3	8		501.805

KG: Kilogram; NO: number

Of note is that the USA imported nautilus products from a number of non-range states. Exports from Indonesia, particularly where identified as *N. pompilius*, appear to likely be violations of the USA Lacey Act, which prohibits the trade in wildlife that have been illegally taken, transported or sold.

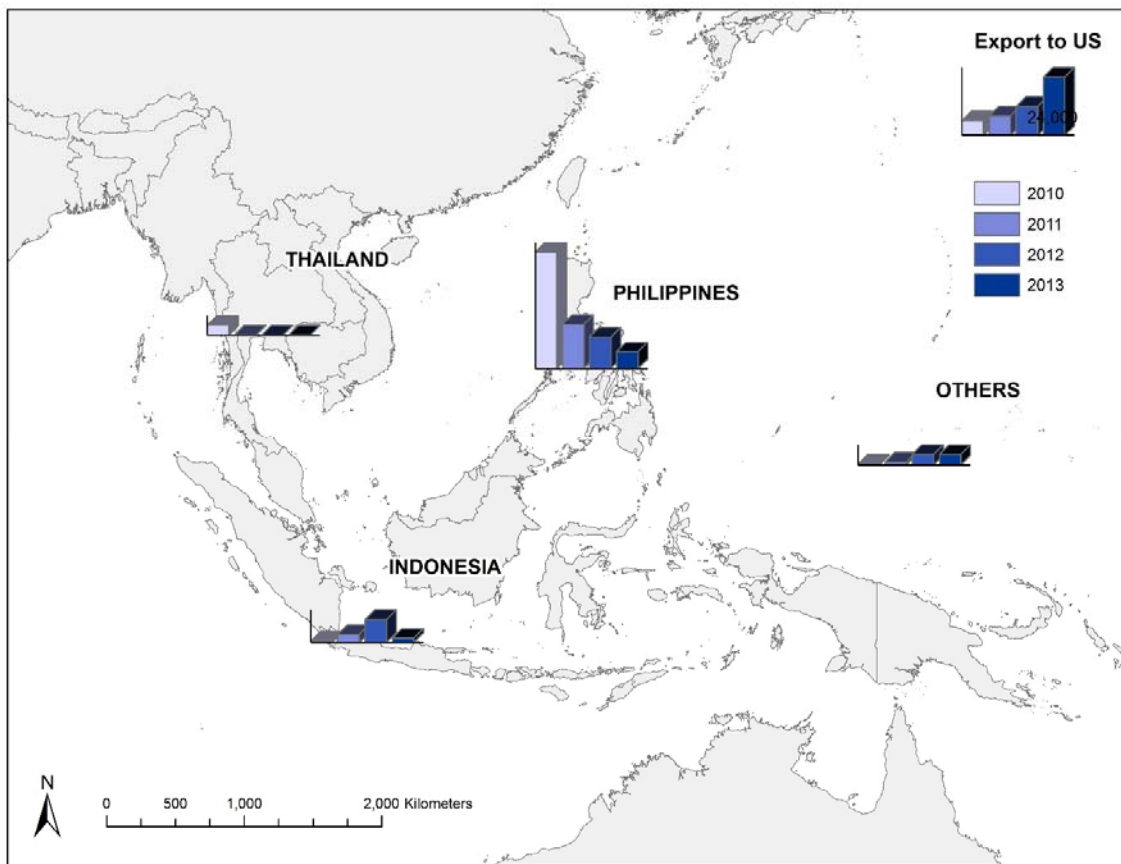


Figure 28: Major export countries to USA for pieces of nautilus from 2010 – 2013 (LEMIS 2014). © WWF/TRAFFIC

The overwhelming majority of nautilus commodities (98%) were from specimens taken from the wild. The remaining products were derived almost entirely from captive-bred (273) and ranched sources (214).

Table 18: Sources of nautilus commodities traded with the United States (Figures represent imports from range and non-range countries. The source of a transaction describes whether the commodity is derived from the wild or another origin) (LEMIS 2014) (Kg data highlighted)

Source	Unit	2010	2011	2012	2013	Overall Total (NO)	Overall Total (KG)
C	NO	267	5		1	273	
F	NO		1	2	5	8	
P	NO			4	4	8	
R	NO	210			4	214	
U	NO	118	899	3	198	1,218	
W	NO	52,252	21,981	26,813	12,959	114,005	
W	KG	27.005	352.5	109.3	8		496.805
U	KG			5			5
Annual Total	NO	52,847	22,886	26,822	13,171	115,726	0
Annual Total	KG	27.005	352.5	114.3	8	0	501.805

For CITES-listed species, the following definitions for Source would apply: C: animals bred in captivity in accordance with CITES Resolution Conf. 10.16 (Rev.) Specimens of animals bred in captivity (www.cites.org/eng/res/10/10-16C15.html); F: animals bred in captivity that do not meet the requirements of Res. Conf. 10.16 (Rev.); P: Personal; R: ranched specimens taken as eggs or juveniles from the wild and reared in a controlled environment; U: source unknown; W: specimens taken from the wild; Unit: KG: kilogram; NO: number.

Online Detection

TRAFFIC conducted an online survey in the USA and Mexico and consulted with experts in December 2013 and January 2014 to review the trade in nautilus shells and other products available for sale through the internet. Searches for offers for sale were carried out on national and international auction, shopping and business sites such as eBay and Alibaba, as well as via Google and classified advertisement/community websites.^{xiii} Experts consulted included conchologists and other shell experts, shell traders, fashion retailers, and other customs and inspection enforcement authorities.

The most relevant retail websites offering nautilus products were: eBay, Amazon, Alibaba and Etsy.^{xiii} More than 40 independent vendors were found offering nautilus shells or other products for sale during the time period of the survey (December 2013 and January 2014). Of these, 25 were based in the USA, five in Australia, four in the UK, and the remaining vendors were located in the Philippines, Indonesia, Thailand, India, Singapore and Thailand.

The majority of retailers offering nautilus products in the USA are located in California and Florida. More than 500 nautilus items were detected as offered for sale online from vendors in the USA during the two-month time period of the survey, however, many retailers claim to have supplies or access to supplies in excess of the amount available online at any particular time. Some retailers are also wholesalers, so even if only one nautilus item is offered for sale, it is still possible to purchase hundreds from them.

The main nautilus products offered on the internet were whole or sliced nautilus shells (primarily identified as *Nautilus pompilius*) – natural and pearly – listed as ornaments, and various pieces of jewelry made from nautilus shells.^{xiv} The origin of most of the nautilus jewelry products are specified as from Indonesia. Country of origin was generally not listed for shells, and more generically listed in some cases as sourced from the Indo-Pacific. The prices for shells offered for sale varied, with the polished “pearlized” shells more expensive. The price for jewelry items was more dependent on the other materials the nautilus shell pieces were combined with.

There appears to be a significant supply of nautilus shells offered through the online market, and retailers usually have nautilus shells available for sale and wholesale, both as jewelry and as ornaments (whole shells).

(See Appendix 5 for further details on online retail of nautilus.)

Conversion Rates

An attempt was made to develop a methodology to quantify the number of individual nautilus imported into the USA based on LEMIS weight data for jewelry, shells, shell products, trim, and meat. However, discrepancies in the size of pieces utilized for jewelry, shell products, and trim as well as the differing sizes of nautilus species have made any attempt at estimating for an individual extremely unreliable.

A preliminary metric for converting weight in meat to number of individuals was developed using information from del Norte-Campos (2005) and De Angelis (2011). Del Norte-Campos indicated that the meat shelled from a nautilus was roughly equivalent to half of the total weight of an individual. To try and devise a rough estimate of the number of individuals in trade, the average weight of a mature male (880 g) and a mature female (720 g) was taken for the largest of the species most regularly observed in the international shell trade, *Nautilus pompilius*, and then divided in half to represent weight of the individual with just the shell (440 g/ 360 g). Trade in jewelry, shells (raw or unworked), and shell products can then be roughly estimated by dividing by 440 g (for a low estimate of individuals) and 360 g (for a high estimate of individuals) respectively to reveal an estimated range for the number of individuals that appear in trade when the weight (kg) is recorded.

Table 19 - Estimates of *Nautilus* individuals in trade in the USA for jewelry (JWL), shells (SHE), and shell products (SPR) where weight (KG) was recorded (LEMIS data 2005-2013)

Wildlife Description	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
JWL (KG)	30	300			41		125	87		583
Low Est. (Individuals)	68	682			93		284	198		1,325
High Est. (Individuals)	83	833			114		347	242		1,619
SHE (KG)	1,033		2,776	35	724			5		4,573
Low Est. (Individuals)	2,348		6,309	80	1,645			11		10,393
High Est. (Individuals)	2,869		7,711	97	2,011			14		12,702
SPR (KG)	332	620	1	133	16	27	228	22	8	1,387
Low Est. (Individuals)	755	1,409	2	302	36	61	518	50	18	3,152
High Est. (Individuals)	922	1,722	3	369	44	75	633	61	22	3,852
Annual Total (KG)	1,395	920	2,777	168	781	27	353	114	8	6,543
Total Low Est. (Individuals)	3,170	2,091	6,311	382	1,775	61	802	259	18	14,870
Total High Est. (Individuals)	3,875	2,556	7,714	467	2,169	75	981	317	22	18,175

For trade data that reports the weight for nautilus products between 2005 and 2013, if one assumes that whole shells represented all of the commodities traded, this suggests an overall estimate representing between 14,870 and 18,175 individual nautilus traded in the USA. The animal weight for *N. pompilius* is up to 1,675 g or larger (Del Norte-Campos, 2005), so if only the largest individuals are collected, this could further reduce the number of individuals reflected in the estimate. Many specimens however, range in size and may be much smaller. Traders in Indonesia had stated that one metric tonne was estimated to equal 2,000 to 3,000 shells (Pers. Comm. with anonymous trader. May 21, 2013), suggesting that shells were between 333 and 500 grams.

Further complicating any attempt at generating an overall estimate of the number of individuals of nautilus traded is the fact that the overall numbers of shipments are not recorded by weight. Additionally, without additional species-specific data, there is not much confidence in attempting to assess trade in particular species using this rough estimate.

Impact of Commodity on Species

The commodities recorded in trade include jewelry, shells, or other shell products, which are made into furniture and home décor such as lamps, and tables, chairs and other pieces that have nautilus shell parts applied to the exterior for decorative reasons. Complete, unworked nautilus shells may be stand-alone ornaments, or the outer white and brown layer is carefully removed to expose the shine of the shell underneath.^{xiv} Small (immature) and larger (mature) full-size shells are sold as ornaments, and sometimes the shells are cut in half to display the spiral and chambers inside.

While a single shell can be cut to make several pieces of jewelry, reports from some traders indicate that in most cases the part used is relatively small and from either side of the center of the shell, with one nautilus shell being used to make two pendants, for example.^{xvi} A shell may be cut and fragmented and the pieces taken from the outer, wider part of the shell may be used for inlay, because they are relatively flat and thin. The fragments from the inner part are usually more curved and are used in smaller 'jewelry' items.

One piece of nautilus product could be derived from two or more nautilus individuals, and conversely one nautilus individual shell could be used to produce several pieces. Most pieces of jewelry, from earrings to necklaces, according to manufacturers in the Philippines, are taken from pieces of a shell, employing less than the total material available in one shell. Smaller nautilus may be cut on each side so as to leave a thin slice that shows the chambers and the spiral to the center. At 3-5 cm diameter, these are often used to make pendants and earrings. Although some parts of the shell are not used because they are too small to incorporate as inlay or jewelry (shavings and very small irregular fragments), craftsmen try to utilize as much of the shell as possible.

Nautilus products such as lamps or cross-sections of shells may utilize anywhere from one-third to the whole shell depending on the commodity. Large nautilus shells are preferred for use as inlay for furniture, with the number used depending on the amount of inlay required. According to reports from a furniture maker in Indonesia using nautilus shells as decorative elements, to decorate one set of furniture consisting of one table and 3 chairs, the number of nautilus shells needed was reported to be between 40 and 100 nautilus. Table 23 attempts to estimate the number of bits of shell that may be used for different commodities based on interviews and observations in Indonesia and the Philippines.

Table 20 – Estimates of individual nautilus used for different commodities

Commodity	Number of Individual Nautilus for Commodity	% of Commodity Traded by Reported Number of Items (Imported to USA 2010-2013, LEMIS)	% of Commodity Traded by Reported Weight of Items (Imported to USA 2010-2013, LEMIS)
Shells (raw or unworked)	1	6	1
Shell products (lamps, furniture, etc.)	Less than 1 – 100 (between 40 -100 for table and chair furniture set)	38	50
Trim ^{xlvii}	Less than 1 - 1	16	(>7)
Jewelry ^{xlviii}	Less than 1 – 1 (earrings, pendants, necklaces, etc.)	39	42

In assessing the relative impact of a commodity on the population, a better understanding of how many whole nautilus shells/individuals are used to create that commodity (pieces of jewelry, furniture, art, etc.) is needed. Results from interviews suggest that the largest number of individual nautilus are needed for larger pieces of furniture, with fewer individual nautilus used in the creation of one piece of jewelry or trim. However, jewelry and trim combined account for almost half of the traded commodities while the cumulative impact from those commodities is still quite significant on the overall harvest and population of nautilus.

It is unclear what the trade in whole shells may represent as an impact of a commodity on the status of nautilus, with the earlier estimate suggesting that only between 11 and 14 individual nautilus (the high estimate for shells imported to the USA) were imported into the USA from 2010 to 2013 for imports reported by weight, representing only 1% of the commodities in trade by weight.^{xlix} Most of the trade in whole shells however, is reported by number, with more than 7,000 shells imported into the USA during this same period. Shells reflected 6% of the commodities that were imported into the USA by number. More than half of the commodities reported by number are of jewelry and trim pieces, with perhaps as many as five or more pieces coming from one nautilus individual. Most of the products exported from Indonesia to the USA, and likely elsewhere, are jewelry (small to large fragments) and shell products (inlay used for small items such as small boxes, picture frames, or larger items such as furniture), because these pieces can more easily evade Customs officials.

If one assumes that five pieces of jewelry or trim were used from one individual nautilus, this would mean more than 12,000 nautilus were collected for these commodities alone (reported by numbers) from 2010 to 2013.^l Table 24 attempts to provide a rough estimate of the number of individual nautilus that may have been imported to the USA from 2010 to 2013.^{li}

Table 21 – Estimate of individual nautilus imported to USA (2010 -2013)

Commodity	Number of pieces reported as imports to US (2010 – 2013, LEMIS)	Estimate of individual nautilus/number of pieces	Estimate of individual nautilus imported
Shell	7,335	1	7,335
Shell products (lamps, furniture, etc.)	43,499	0.1 (Low Estimate)	4,350 (Low Estimate)
		1 (High Estimate) ^{lii}	43,499 (High Estimate)
Trim	18,756	0.1 (Low Estimate)	1,876 (Low Estimate)
		0.2 (High Estimate)	3,751 (High Estimate)
Jewelry	45,279	0.1 (Low Estimate)	4,528 (Low Estimate)
		1 (High Estimate)	45,279 (High Estimate)
TOTAL	114,869^{liii}		18,089 (Low Estimate)
			99,864 (High Estimate)

A preliminary estimate suggests that between roughly 20,000 and 100,000 individual nautilus may have been collected for commodities that were imported to the USA alone from 2010 to 2013, representing an average of between 6,000 to 33,000 nautilus annually.

GAPS IN ANALYSIS/INVESTIGATIONS

Surveys were conducted in the two primary source countries that are most heavily involved in the trade and harvest of nautilus – the Philippines and Indonesia. External factors, including the Bohol Earthquake on October 15, 2013, Typhoon Haiyan on November 8, 2013, and the Zamboanga City crisis/Moro insurgency and armed conflict in September 2013, in the Philippines limited access by TRAFFIC’s survey team to several key areas during the study period. As a result, a comprehensive analysis on the full extent of harvest and trade of nautilus in the Philippines remains incomplete.

Harvest and trade of nautilus are known to also occur in Thailand and other parts of the Coral Triangle and Western Central Pacific, however TRAFFIC was not able to conduct surveys in these regions. Some trade and limited collection also occurs in China, Hong Kong, and Taiwan. Research on harvest and trade in these countries included interviews with marine, seafood, and aquaria experts, however field surveys were not conducted in those locations and further research is also needed to better understand the full extent of harvest and trade in those countries.

Nautilus products are known to be present in some other consumer markets including Canada, South Africa, and a number of countries in the Middle East (UAE, Bahrain, Oman, Kuwait) and Oceania (Australia, New Zealand, Fiji). Information on the overall consumption and demand for nautilus products in these countries however is unknown, and trade data specifying nautilus products is not recorded. It is unknown to what extent countries in South America and Africa are consumers of nautilus products. LEMIS trade data suggests that some amount of nautilus products are being imported from non-source countries. In 2013, the USA imported nautilus products from twelve countries where nautilus do not occur and where drift shells are unlikely to be collected (UAE, Canada, Congo, Germany, France, UK, Italy, Japan, Mexico, Oman, Trinidad and Tobago, and South Africa).

Attempting to quantify the number of nautilus individuals that are traded annually remains a challenge, even where information on the number of retailers, exporters and suppliers is known from the major source countries. Because many retailers may retain stocks of nautilus in an inventory for years, it is difficult to know how many are acquired on an annual basis. Furthermore, as noted earlier, the trade data in most countries^{liv}, where nautilus products are usually reported as “worked” or “unworked products” of “coral and similar materials, shells of molluscs, crustaceans or echinoderms” and other related products, limits the ability of customs officials and others to evaluate how many

nautilus products are even entering trade. Additionally, some attempts to obtain information from suspected vendors of nautilus products, including some of the major clothing companies, did not receive responses, which further complicates an understanding of the full extent of nautilus commodities such as trim pieces (buttons, etc.) that may be used on garments and in assessing how many pieces of trim may be created from one nautilus shell.

The full extent of the illegal trade in nautilus products also remains unknown. There have been cases of smuggling detected in the French dependency of New Caledonia in the Western Pacific to evade customs duties and/or other prohibitions on the trade. In September 2008, officials in Noumea, New Caledonia confiscated hundreds of marine shells, including at least 213 *Nautilus pompilius* shells that were smuggled from Indonesia (Bali) (Wisnu, 2008).^{lv} Airport forestry police on the island reportedly uncovered various attempts by locals and foreign traders in the vicinity of the airport selling nautilus shells (Wisnu, 2008).^{lvi} It is unclear to what extent New Caledonia or other parts of Oceania may continue to serve as transit points for the trafficking and trade of nautilus. New Caledonia however is reportedly a stop-over destination for smugglers who often forward smuggled shells, of various species, for sale in Europe.

CONCLUSION

It appears that significant volumes of nautilus that have been harvested for commercial trade are entering both international trade and consumed locally in source countries. More than 20,000 nautilus products have been exported to the USA annually in the past decade alone. Data from the USA LEMIS database for 2013 shows a slight decline from previous years in both the total recorded number of nautilus pieces imported overall and the total recorded by weight. However, whether this is a trend or an anomaly is unknown. The number of individual nautilus that this represents annually is likely in the thousands, with *N. pompilius* as the most prevalent species observed in trade, but with other species also present.^{lvii} Customs codes currently do not capture data on the trade in nautilus products in a harmonized code system and the USA is the only known country to record information related to nautilus products that have entered international trade.

The illegal harvest and trade in nautilus is evident in Indonesia due to the lack of coordination among law enforcement agencies in enforcing national laws, the lack of necessary taxonomic skills among enforcement officials for identifying nautilus by species, and the lack of political will on the part of local government officials who have jurisdiction over local waters and who issue business permits to stores operating within their city or municipality. Imports of nautilus products to the USA from Indonesia may be Lacey Act violations, especially where *N. pompilius* is identified as the species.

Enforcement on harvest and trade in nautilus in jurisdictions where there are protections is thus weak. There is a need for increased capacity and stronger monitoring and enforcement, particularly in Indonesia and some jurisdictions in the Philippines, where harvest and trade of *Nautilus pompilius* is prohibited. Currently, knowledge of the regulations prohibiting harvest and trade, and law enforcement are particularly weak in the provinces where collection and harvest occur. Because many of these products are entering international trade there is a need to strengthen border inspections, for customs and law enforcement officials to cooperate closely, and to improve coordination between central government agencies and local management and enforcement.

Furthermore, there is a significant lack of management and control on the fishing of nautilus in the Philippines. Absent adequate information on the population status of stocks, and specifics of the life history traits of nautilus, including slow growth and low reproductive rates, makes the species very susceptible to overharvest. Management of fishing for nautilus should take a precautionary approach and strict controls should be established, including prohibitions on harvest and possibly trade where capacity and resources are not able to properly manage harvest.

There are no requirements for transparency in the supply chain in consumer countries or to inform consumers on the origin of products available for sale, making it easier to launder illegally-obtained products into legal supplies and pass them off entirely as a legal product. The lack of enforcement related to harvest and sale in Indonesia, and the absence of adequately monitored traceability systems for legally harvested or collected nautilus species in other countries, means that it may still be possible for suppliers in Asia to transport product. It also means that buyers in the USA and other markets may launder illegally harvested nautilus into legally harvested/collected nautilus stocks for sale in retail outlets and online.

Regulators and enforcement officials should thus take efforts to more accurately quantify the amount of nautilus currently held in the inventories of retailers, the amount of nautilus harvested annually, and establish requirements to document harvest, to trace products through the supply chain, and to validate claims on the origin of nautilus products sold, to verify their legality.



Figure 29: Nautilus shells on local dock. Balabac, Philippines. © Jürgen Freund and WWF

RECOMMENDATIONS

There are several actions that source and destination countries of nautilus products can do to ensure that the trade in nautilus products is both legal and sustainable. The following are recommendations on actions to reform harvest and trade controls, to prevent the overexploitation and illegal harvest and trade of nautilus.

General recommendations

- Major importing and exporting states should record nautilus products that are traded in their customs data. Customs codes should be expanded to include the various commodities – shells, jewelry, trim, etc. – of nautilus products that are traded. The EU, China and other major consumer countries currently do not record this trade.
 - Specifically, a method should be developed to identify nautilus shell fragments that have been incorporated into furniture and other handicrafts as inlay.
- Scientific assessments of stocks should be routinely undertaken to determine the status of the stock and the extent of fishing pressure, to ensure that harvest and trade is within sustainable limits. Governments, particularly the Philippines, should establish control measures on the harvest of nautilus where it is legal, including setting sustainable annual quotas based on scientifically sound stock assessments.
- Catch documentation should identify the origin of nautilus products for sale, and this information should accompany the products through the supply chain, whether for domestic sale or international trade, to prevent illegally caught or traded nautilus from entering supply chains and markets.
- Traceability systems that track nautilus products throughout the supply chain from the point of harvest to the final point of sale should eventually be established that document the legal and verifiable harvest of the species traded. Governments and retailers should establish audits to verify the legality of products entering markets for sale.
- Assessments should be made of the socio-economic status and economic incentives that drive the direct and opportunistic take of nautilus in harvesting countries. Socio-economic studies should be conducted in

fishing communities and other local businesses involved in the harvesting, processing or trade of nautilus products to determine the level and nature of dependence on nautilus products.

- Sharing of actionable intelligence information regarding illegal harvest and trade of nautilus products should be promoted between processing and harvesting/other sourcing countries or regions as part of a systematic exchange with additional multi-national and trans-regional co-operation when needed. In the USA, imports of nautilus products from Indonesia should be targeted for further investigation to ensure that the USA Lacey Act is not violated.
- Relevant government authorities in harvesting, processing, and trading countries should focus capacity building at regional and national levels to further educate relevant law enforcement agencies about nautilus conservation including enforcement activities. Fisheries Authorities and relevant partners, including NGOs, should co-operate with law enforcement agencies in the training of field staff on the implementation and enforcement of relevant national laws.
- Governments and NGOs should continue monitoring the status of nautilus product availability and trade patterns in harvesting and processing countries, in order to measure the success of enforcement efforts and to track changing market trends, trade routes and other relevant information. This should include increased systematic monitoring of internet sales of nautilus products. In Indonesia, this will allow enforcement officials to identify the sources/locations of retail sites, to track down traders, and to close down illegal operations.
- Buyers and traders, particularly in major consumer markets in the USA and E.U. should be aware of potential illegal sourcing and of sustainability concerns with the harvest of nautilus species.

Additional recommendations for source countries

Indonesia

- Law enforcement agencies in Indonesia should identify traders and organize operations to seize and prosecute offenders to eradicate the trade in illegal *Nautilus pompilius* products.
- Government officials in Indonesia should distribute information regarding the protected nature of *Nautilus pompilius* at the collection and distribution ends of the trade chains. The production of posters showing nautilus and information regarding their protected status, should be distributed to help deter sales and purchases. Target groups should include government departments and enforcement agencies, and tourists at points of entry and exit into and out of the country.^{lviii}
- Training should be given to assist government officers and enforcement agencies in distinguishing between protected species (including *N. pompilius*) and unprotected species.^{lix}
- Governments and NGOs should produce simple identification posters/guides, and more technical information about nautilus identification for enforcement agencies, as well as develop public awareness campaigns to alert the public collectors, buyers, traders, and enforcement agencies to the protected nature of *N. pompilius*, and the penalties for harvesting and trading them.
- Additionally, the status of *Allonautilus perforatus* in Indonesia, and throughout its range, should be reviewed, and national legislation should be revised to include all nautilus shells and products made thereof.
- Scientific studies and surveys should be conducted in areas identified as centers for the remaining nautilus populations, to more accurately assess the status of these populations. Tagging of live nautilus would provide useful information on the capacity of nautilus to drift on ocean currents and repopulate other areas.

Philippines

- Stock assessments of *Nautilus pompilius* should be conducted by the Philippine Management Authority responsible for aquatic species, the Bureau of Fisheries and Aquatic Resources (BFAR)^{lx}.
- Monitoring of collection areas, particularly to assess the quantities of nautilus, and then to document subsequent changes in population numbers should be conducted.
- Controls and management rules on fishing nautilus in the Philippines should be established. Seasonal closures may be necessary and more precautionary measures should be implemented where the status of the stock is unknown – including prohibitions on harvest, especially where intensive fishing effort has coincided with declines in catch.
- Local governments should establish their own fishery-dependent and independent studies of nautilus populations in their respective areas to be used as a scientific basis for regulations controlling the harvest or trade in nautilus. Where there is significant harvest, such as in Balabac, regulations on the trade and harvest should be developed.

- Governments and NGOs should produce simple identification posters/guides, and more technical information about nautilus identification for enforcement agencies, and develop public awareness campaigns to alert the public collectors, buyers, traders, and enforcement agencies to the protected nature of nautilus in some jurisdictions, and the penalties for harvesting.

China

- The legal protection of nautilus in China should be supported by strengthened enforcement actions by relevant government authorities, such as the Fishery Department of China's Agriculture Administration.^{lxi} Enforcement agencies should increase efforts to detect and prevent further illegal harvesting by Chinese fishermen.
- Awareness campaigns should be developed by the Government and NGOs targeting local public, tourists, vendors and fishers regarding the illegal harvest of nautilus, and to raise awareness of existing legislation and illegal trade issues particularly focused in Hainan, Guangdong and Guangxi Provinces where consumption may be more prevalent.
- General patrolling and enforcement at certain border points (such as Dongxing port of Guangxi, China) should be enhanced between China and Southeast Asian countries, especially Viet Nam and Myanmar, where nautilus and other wildlife products may be smuggled into the country.^{lxii}

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APPENDIX 1: Nautilus survey questionnaire

Date:

Location:

Respondent:

Supply Chain Actor (Fisherman, Middleman, Wholesaler, Vendor, Exporter, Etc.):

1. (If fisherman): What is the area of your fishing grounds?
2. (If fisherman): How many fishermen are actively fishing for nautilus?
3. When do you fish for nautilus? (Seasonal, year-long, etc.)
4. How many shells of nautilus are caught, sold, bought (in specimens)? (Average per month? Average per year?)
5. In the last few years has the number of nautilus (caught, sold, bought) – increased, decreased, stayed the same?
6. When do you sell nautilus? All year?
7. Who are your purchasers for nautilus shells (exporters, wholesalers, souvenir shops, tourists, etc.)?
8. Can you distinguish between different species?
9. What is the most common type of product sold (whole shell, pieces, jewelery, etc.)?
10. Do you sell nautilus products to buyers in other countries?
11. Is the majority of your trade local/domestic or international?

APPENDIX 2: Indonesia Regulation on *Nautilus pompilius* (in English and Indonesian)

PP 7/1999, PRESERVATION OF PLANTS AND ANIMALS (ENGLISH)

PRESIDENT OF THE REPUBLIC OF INDONESIA,

Considering:

a. that plants and animals are part of a natural resource that is invaluable so that sustainability needs to be maintained through the efforts of preservation types;

b. that based on the above and the implementation of Law No. 5 of 1990 on Conservation of Natural Resources and Ecosystems, it is necessary to establish the rules of the Preservation of Fauna and Flora Regulation;

Given:

1. Article 5 Paragraph (2) and Article 33 paragraph (3) of the Constitution of 1945;
2. Law No. 5 of 1967 on Basic Provisions on Forestry (State Gazette of 1967 Number 8, Supplement to State Gazette No. 2823);
3. Law No. 9 of 1985 on Fisheries (Statute Book of 1985 No. 46, Supplement to Statute Book No. 3299);
4. Law No. 5 of 1990 on Conservation of Natural Resources and Ecosystems (State Gazette No. 49 of 1990 Supplement to Statute Book No. 3419);
5. Law No. 12 Year 1992 on Cultivation System (State Gazette of 1992 No. 46, Supplement to Statute Book No. 3478);
6. Law No. 16 of 1992 concerning Animal, Fish and Plant (Statute Book of 1992 No. 56, Supplement to Statute Book No. 3482);
7. Law No. 5 of 1994 on pengesahaan Convention Concerning the United Nations Biodiversity (Statute Book of 1994 No. 41, Supplement to Statute Book No. 3556);
- * 27019 8. Law No. 23 of 1997 on Environmental Management (State Gazette of 1997 No. 68, Supplement to Statute Book No. 3699);
9. Government Regulation No. 13 Year 1994 on Hunting Animals Hunt (Statute Book of 1994 No. 19, Supplement to Statute Book No. 3544);
10. Government Regulation No. 68 Year 1998 on Nature Reserve Area and Conservation Areas (State Gazette Year 1998 Number 132, Supplement to Statute Book No. 3776);

DECIDED:

GOVERNMENT REGULATION ON THE PRESERVATION OF PLANTS AND ANIMALS.

CHAPTER I GENERAL PROVISIONS

Article 1

In this regulation referred to as:

1. Preservation is an attempt to keep the diversity of plants and animals and their ecosystems both inside and outside the habitat is non-existent.
2. Preservation of plant and animal species outside its habitat is an effort to maintain the diversity of plants and animals from extinction.
3. Conservation Society is an organization engaged in the conservation of plants and animals in or outside their habitat (ex situ), either a government or non-government agencies.

4. Identification of plants and animals is an effort to get to know the type, the general state population status and made his place in their habitat.

5. Inventory of plants and animals is an attempt to determine the condition and status of the population in more detail as well as the endemic area were conducted inside and outside the habitat as well as conservation organizations.

6. Species of plants or animals is scientifically known type species or types of children who are scientifically called sub-species both within and outside the habitat.

7. Population is a group of individuals of a particular species in a particular place in nature and in the long run have a tendency to achieve a dynamic balance of population in accordance with the conditions of their environment and their habitat.

* 27020 8. Minister is the minister responsible for forestry.

Article 2

Preservation of plants and animals intended for:

- a. avoid the plant and animal species from danger of extinction;
- b. maintain genetic purity and diversity of plants and animals;
- c. maintain balance and stability of the existing ecosystem; so can be used for human welfare in a sustainable manner.

CHAPTER II PRESERVATION EFFORTS

Article 3

Preservation of plants and animals through the efforts:

- a. determination and classification of protected and unprotected;
- b. management of plant and animal species and their habitats;
- c. maintenance and breeding.

CHAPTER III DETERMINATION OF PLANTS AND ANIMALS

Article 4

(1) Type of plant and animal groups defined on the basis of: a. plants and animals are protected; b. plants and animals that are not protected.

(2) The types of plants and animals are protected as referred to in paragraph (1) letter a is as attached to this Regulation.

(3) The change of plant and animal species are protected to unprotected and otherwise stipulated by the Decree of the Minister of Scientific Authority after being considered (Scientific Authority).

Article 5

(1) A species of plants and animals shall be set in a protected class if it meets the following criteria: a. where the population is small, b. a sharp decline in the number of individuals in the wild; c. limited distribution area (endemic).

(2) The types of plants and animals that meet the criteria referred to in paragraph (1) shall be done preservation efforts.

* 27021 Article 6

A species of plants and animals that are protected can not be converted into protected status when the population has reached a certain level of growth so that the type in question no longer belongs to the category of plants and animals as referred to in Article 5 paragraph (1).

CHAPTER IV MANAGEMENT OF PLANTS AND ANIMALS AND THEIR HABITAT Part One General

Article 7

Management of plants and animals as stipulated in the provisions of this Regulation do not prejudice the provisions on the management of plant and animal species on nature reserves and conservation areas as stipulated in Government Regulation governing the nature reserves and conservation areas.

Article 8

- (1) Preservation of plant and animal species through habitat management activities in the (in situ).
- (2) In support of the activities referred to in paragraph (1) carried out habitat management activities (ex situ) to augment and restore the population.
- (3) Management of plant and animal species in the habitat (in situ) in the form of: a. Identification: b. Inventory c. Monitoring; d. Development of habitat and population e. Rescue type f. Assessment, research and development.
- (4) Management of plant and animal species outside its habitat (ex situ) in the form of: a. Maintenance b. Breeding; c. Assessment, research and development d. Wildlife rehabilitation e. Rescue of plants and animals.

The second part of the Habitat Management (In Situ)

Article 9

(1) identification of the Government in implementing the habitat as referred to in Article 8 paragraph (3) determination letter for the benefit of a group of plants and animals.

* 27022 (2) Further provisions on the identification referred to in paragraph (1) shall be stipulated by the Minister.

Article 10

- (1) The Government shall implement the inventory referred to in Article 8 paragraph (3) letter b, to determine the condition of populations of plants and animals.
- (2) Inventory referred to in subsection (1) includes a survey and observations on the potential of the plant and animal species.
- (3) The government can work with the community in the implementation of surveys and observations referred to in paragraph (2).
- (4) Further provisions on the inventory referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 11

- (1) The Government shall perform monitoring as referred to in Article 8 (3) c, to identify trends in the development of populations of plants and animals from time to time.
- (2) The monitoring referred to in paragraph (1) shall be conducted through surveys and observation of the potential of plants and animals on a regular basis.
- (3) The Government may cooperate with the community in the implementation of surveys and observations referred to in paragraph (2).
- (4) Further provisions on the monitoring referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 12

- (1) The Government implement habitat and population development as referred to in Article 8 (3) d, to maintain existing populations of plants and animals in balance with the carrying capacity of its habitat.
- (2) Development of habitat and populations referred to in paragraph (1) shall be implemented through the following activities: a. Coaching pasture to eat animals, b. Planting and maintenance of shade trees and tree species nest feeding wildlife resources; c. Making drinking water facilities, where animals wallow and bath; d. Thinning or populations of plants and animals, e. The addition of native plants or animals; f. Eradication of plants and animals * 27 023 bullies.
- (3) The government can work with the community to carry out the activities referred to in paragraph (2).
- (4) Further provisions on the development of habitat and populations of plants and animals as referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 13

(1) The Government shall implement the rescue action of plants and animals as referred to in Article 8 paragraph (3) letter e, the plant and animal species in danger of extinction is still in its habitat.

(2) Rescue of plants and animals as referred to in paragraph (1) shall be implemented through breeding, treatment, maintenance and removal of habitat or habitat to another location.

(3) The government can work with the community to do the rescue act referred to in paragraph (2).

(4) Further provisions regarding the rescue of plants and animals as referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 14

(1) The Government shall carry out an assessment, research and development of plants and animals as referred to in Article 8 (3) f, to remain subdued state support and the availability of genetic resources of plants and animals in a sustainable manner.

(2) assessment, research and development of plants and animals as referred to in paragraph (1) shall be implemented through assessment of the biological and ecological research in the form of basic, applied and testing.

(3) The Government may carry out activities in cooperation with the study, research and development as referred to in paragraph (2).

(4) Further provisions on assessment, research and development of plants and animals. Referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Part Three outside Habitat Management (Ex Situ)

Article 15

* 27 024 (1) Maintenance of plant and animal species outside its habitat as referred to in Article 8 (4) carried a letter to the rescue of genetic resources and populations of plants and animals.

(2) Maintenance referred to in paragraph (1) shall include also the collection of plants and animals in the conservation agencies.

(3) Maintenance of habitat types beyond shall meet the following requirements: a. meet the animal and plant health standards, b. provide a wide, safe and comfortable; c. and has hired experts in the medical field and maintenance.

(4) Further provisions on the maintenance of species outside its habitat as referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 16

(1) The breeding of plants and animals outside their habitat as referred to in Article 8 (4) letter b shall be implemented for the development of natural population from extinction.

(2) breeding activities referred to in paragraph (1) shall be conducted while maintaining the purity of species and genetic diversity.

(3) The breeding habitat types beyond shall meet the following requirements: a. maintain the purity of type b. maintaining genetic diversity; c. make a designation and certification; d. make a list of genealogy books (Studbook).

(4) Further provisions concerning the breeding of plants and animals outside their habitat as referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 17

(1) assessment, research and development of plant and animal species outside its habitat as referred to in Article 8 (4) c done in an effort to remain subdued state support and the availability of genetic resources of plants and animals in a sustainable manner.

(2) The assessment, research and development of plants and animals as referred to in paragraph (1) shall be implemented through assessment of the biological and ecological research in the form of basic, applied and testing.

(3) Further provisions on assessment, research * 27025 and development of plants and animals out of their habitat as referred to in paragraph (1) and paragraph (2) shall be stipulated by the Minister.

Article 18

(1) Rehabilitation of wildlife habitat outside as referred to in Article 8, paragraph (4) d implemented to adapt the animal for any reason that is in the human environment, to be returned to their habitat.

(2) Rehabilitation referred to in subsection (1) is done through activities to determine the presence or absence of disease, treat and selecting animals that deserve to be returned to their habitat.

(3) Further provisions regarding rehabilitation of animals referred to in paragraph (1) and paragraph (2) shall be stipulated by the Minister.

Article 19

(1) Rescue of flora and fauna habitat outside the area as referred to in Article 8 (4) e done to prevent local extinction of plants and animals as a result of natural disasters and human activities.

(2) Rescue of plants and animals as referred to in paragraph (1) is done through the following activities:

a. transfer of plants and animals to their habitat better, b. restore habitat, rehabilitation or if not possible, submit or store in the Conservation or if damaged, defective or does not allow live better destroy it.

Article 20

(1) The management outside the habitat of plants and animals that can only be protected by the Government.

(2) The government can work with the community to carry out management activities referred to in paragraph (1).

Article 21

(1) Type of plant and animal management results referred to in Article 15, Article 16, Article 17, Article 18 and Article 19 can be released back into their habitat with the following requirements: a. habitat is part of the release of the original distribution of species is released, b. plants and animals that are released must be physically fit and have a diversity of high genetic * 27026 c. attention to the presence of occupants habitat.

(2) Further provisions on the release of plants and animals back to their habitat as referred to in paragraph (1) shall be stipulated by the Minister.

CHAPTER V CONSERVATION INSTITUTE

Article 22

(1) Agency has the main function of the Conservation and breeding of plants and animals or rescue while maintaining the purity of its kind.

(2) In addition to having the primary function referred to in paragraph (1) Conservation Society also serves as a place of education, demonstration and research and development of science.

(3) to form the Conservation Zoo, Museum of Zoology, Animal Park Special, Special Animal Training Centre, Botanical Garden, Herbarium and Garden Special plants.

(4) Further provisions concerning Conservation Institute referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

Article 23

(1) In order to perform its functions, Conservation Society to obtain plants and or animals either protected or not protected by: a. taking or catching of the natural, b. confiscated; c. exchange d. purchase, for the types that are not protected.

(2) Further provisions on the procedure for obtaining plants and animals for Conservation Institute referred to in paragraph (1) shall be stipulated by the Minister.

Article 24

(1) In order to rescue and breeding of plants and animals, Conservation Institute to conduct exchange of protected plants or animals with similar institutions abroad.

(2) The exchange referred to in subsection (1) must be carried out with species conservation value and the numbers balanced.

(3) Further provisions on the exchange referred to in paragraph (1) and paragraph (2) shall be stipulated by the Minister.

* CHAPTER VI 27027 DELIVERY OR TRANSPORT OF PLANTS AND ANIMALS ARE PROTECTED

Article 25

(1) Delivery or transport of plant and animal species are protected from and to a place in the territory of the Republic of Indonesia or of and out of the territory of the Republic of Indonesia on the basis of consent of the Minister.

(2) Delivery or transport plants and animals referred to in paragraph (1) shall: a. equipped with plant and animal health certificate from the competent authority, b. conducted in accordance with the applicable technical requirements.

(3) Further provisions on the procedure for the delivery or transportation of plants and animals as referred to in paragraph (1) and paragraph (2) shall be stipulated by the Minister.

CHAPTER VII THE HARMFUL ANIMAL HUMAN LIFE

Article 26

(1) Individuals for some reason out of its habitat and endanger human life, must be herded or captured alive to be returned to their habitat or if it is not possible to be released back into their habitat, wildlife is sent to the Conservation Society to raise.

(2) If the manner referred to in paragraph (2) can not be implemented, then the animals that directly threaten human life can be killed.

(3) The arrest or killing of protected animals referred to in paragraph (1) and paragraph (2) shall be conducted by authorized personnel.

(4) Further provisions regarding the treatment of workers and animals that are dangerous to human life as referred to in paragraph (1), paragraph (2) and (3) set by the Minister.

CHAPTER VIII MONITORING AND CONTROL

Article 27

(1) In order to preserve plants and animals, is done through monitoring and control.

(2) The supervision and control as referred to in paragraph (1) shall be conducted by law enforcement authorities under the legislation in force.

* 27028 (3) The supervision and control as referred to in paragraph (2) is done through actions: a. preventive, and b. repressive.

(4) Preventive measures referred to in paragraph (3) letter a shall include: a. counseling; b. law enforcement training for law enforcement officers; c. publishing books manual identification of plants and animals are protected and are not protected.

(5) repressive measures referred to in paragraph (3) letter b shall include enforcement action against an alleged attempt legal action against the preservation of flora and fauna.

CHAPTER IX TRANSITIONAL PROVISIONS

Article 28

With the enactment of this Government, then all the rules implementing the legislation governing the preservation of flora and fauna that existed before the entry into force of this Regulation shall remain valid as long as not contrary to or not revoked or replaced by this Regulation.

CHAPTER XI CONCLUSION

Article 29

This regulation comes into force on the date of promulgation.

For public cognizance, this Government Regulation shall be promulgated in the State Gazette of the Republic of Indonesia.

Stipulated in Jakarta on January 27, 1999 THE PRESIDENT OF THE REPUBLIC OF INDONESIA

Jusuf Habibie signed BACHARUDDIN

Enacted in Jakarta on January 27, 1999 SECRETARY OF STATE MINISTER OF THE REPUBLIC OF INDONESIA,

Signed Akbar

* 27029 THE REPUBLIC OF INDONESIA NUMBER 14 OF 1999

EXPLANATION OF THE REPUBLIC OF INDONESIA NUMBER 7 OF 1999 ON PRESERVATION OF PLANTS AND ANIMALS

GENERAL

Indonesian nation blessed by God Almighty natural resources and ecosystems consisting of animal natural resources, plant natural resources and ecosystems. Biological resources can be one of the authorized capital of Indonesia development of sustainable national development. So that natural resources are a gift of God Almighty and the authorized capital of the Indonesian national development fast not extinct so it can be utilized for the maximum benefit of the people, the natural resources need to be conserved through the protection of life support systems, preserving species diversity plants and animals and their ecosystems and the sustainable use of natural resources and ecosystems. Given these interests will be over, and the implementation of Law No. 5 of 1990 on Conservation of Natural Resources and Ecosystems and the legal basis for the implementation of the preservation of flora and fauna necessary legislation in the form of Government Regulation.

ARTICLE BY ARTICLE

Article 1

Figures 1 explanatory

Figures 2 explanatory

Figures 3 explanatory

Figures 4 Clear

Figures 5 Clear

Figures 6 Clear

Figures 7 The ability of a population to evolve depends on the balance between the ability of reproduction and natural conditions * 27030 influence. In the most favorable environmental conditions, the balance of the population will be reached when the carrying capacity of its habitat are met. Populations of a species can be divided into groups that can be referred to as the sub-population that has its own balance with the habitat and environment. Figures 8 Self-explanatory

Article 2

The types of plants and animals because of certain biological factors, ecological and geographical of the species as well as the factors that caused by human actions have experienced life-threatening condition in which sustainability and could become extinct in the near future if no action is preservation. Preservation of plants and animals to prevent or avoid the extinction of a plant or animal species. In addition, the presence of species of flora and fauna species purity must be maintained as well as genetic diversity is maintained without any change to the natural properties of plants and animals. By preserving the types of plants and animals, the populations of plants and animals can be increased and reached a level that is dynamically stable. Because some species of plants and animals are part of the ecosystem, then the stability of the species population to ensure the balance and stability of the ecosystem.

Article 3

Self-explanatory

Article 4

Paragraph (1) Sufficiently clear Paragraph (2) Sufficiently clear Paragraph (3) If the Minister has the data and scientific information that a particular type of plant or animal has met the criteria to be protected, or the Minister accept proposals from other government agencies or NGOs to protect a plant or animal species with scientific information, the Minister may assign these types to be protected. In the case of proposals to protect a species of plants or animals coming from LIPI, the Minister directly specify the type proposed to be protected.

Article 5

Paragraph (1) Letter A type is said to have a small population * 27031 if characterized by at least one of the following: a. based on observation, allegation and projections contained sharp decline in the number of individuals and the wider community and habitat quality, b. each sub-population numbers are small, c. majority of individuals in one or more phases of its life history have concentrated on only one sub-population only; d. in a short time have experienced sharp fluctuations in the number of individuals; e. because the biological properties and the types of behavior such as migration, the species vulnerable to extinction danger. Letter b The sharp decline in the number of individuals in nature can be known by: a. observations where there is currently a sharp decline occurred at a time or in the distant past, but there is the potential to happen again, or b. expectations or projections that are based on at least one of the following things: 1) decrease in area or quality of habitat; 2) the threat of external factors such as the influence of pathogens, competitors, parasites, predators, crosses, foreign type (new species) and effect of toxins or pollutants, or 3) reduced reproductive potential.

Letter c limited deployment area, characterized by at least one of the following: a. population fragmentation, b. only contained in one or several locations (endemic); c. large fluctuations in the number of sub-populations or the number of distribution areas; d. based on observation, allegation or projections contained in steep declines in at least one of the following: 1) the area of deployment, 2) number of sub-populations, and 3) the number of individuals; 4) the breadth and quality of habitat; 5) reproductive potential. Paragraph (2) Sufficiently clear

Article 6

Self-explanatory

Article 7

At the time of the enactment of this Regulation, the provisions regarding the nature reserves and conservation areas Peraturan stipulated in Government Regulation No. 68 Year 1998 on Nature Reserve Area and Conservation Areas.

* 27 032 Article 8 Paragraph (1) Preservation of plants and animals are carried in the most ideal habitat (in situ conservation) through population management and habitat management to produce a balance between population and habitat. Paragraph (2) In many cases, because the pressure on the population or habitat, in situ conservation activities alone are not enough to do the pickling plant species and animals, so it must be supported by the management of the species outside its habitat (ex situ conservation). The purpose of ex situ conservation is to release back into the plant and animal habitats that can evolve naturally and achieve a degree of balance. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 9

Paragraph (1) To establish a plant or animal species as protected species must be based on adequate information about population, biological conditions and ecological types in question, including habitat and environment. The most accurate information obtained through the inventory. Nevertheless inventory often takes time, costs and huge power, so while waiting for a more detailed inventory, determination of plant and animal species as protected species identification can be based on the results that describe the state of the species population in general and criteria associated with the has been set. Identification is required to determine the general description (qualitative) population status of a species of plant or animal. Of identification has been known that a plant or animal species can be classified as a protected species. Paragraph (2) Sufficiently clear

Article 10

Paragraph (1) Inventory is an activity to determine the condition of populations of plants and animals, including habitat. Detailed information about the critical condition of the population obtained through the inventory of them in the context of policy formulation such as: a. population data including biological status; * 27033 b. map the spread of species and habitat with enough scale detail, c. habitat conditions. Paragraph (2) Ideally, the number of individuals of a population needs to know, but it is difficult but also requires a high cost inventory so that the prediction-estimation can be done about the state of the population of a species with the survey method as well as other techniques that are scientifically justifiable. Inventory results must be documented properly by using data management technology available. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 11

Paragraph (1) In order to preserve the policy formulation, species of plants and animals, should be monitoring of population dynamics. Paragraph (2) regular monitoring should be done, especially on protected species and other types of trading and hunting pressure or experiencing pressure on their habitat. Method of monitoring the populations of plants and animals, such surveys should be standardized and scientifically justifiable, and can be easily carried out by field officers. In determining the standard method, the Minister needs to cooperate and consult with LIPI or other agencies, including NGOs. Monitoring results should be documented properly by using data management technology available. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 12

Paragraph (1) Sufficiently clear Paragraph (2) Letter a b Self-explanatory Self-explanatory Self-explanatory c d Spacing done if the population has exceeded the carrying capacity of the habitat and can be done only if the species in question is not protected. Or if the type of question that * 27034 protected, habitat carrying capacity can not be increased or no other habitat that can be done to contain it if the

relocation. Thinning as much as possible is done by capturing him alive, or through hunting activities as stipulated in the government or in a hurry perburuan. satwa government regulation on the use of plants and wildlife. Letter e. The addition of native plants or animals intended to add or rehabilitate populations and habitats damaged or. The definition of the type of native species that once lived in the area that will be rehabilitated or area to be rehabilitated is a type intended deployment area. Importation of alien species should be avoided. Letter f. Of plants and animals consist of class bully: a. original type b. alien species (exotic). Disruption of native species due to natural competition between species in which one species tend to outperform and destroy other species that commonly occur in habitats that are not on the ecosystem equilibrium level. Control of nuisance native species populations such coaching is done by thinning the type of disturbance and habitat development. The types of foreign (exotic) are the types that historically have never lived in the relevant geographic area naturally. Foreign types are located in a particular area because it was taken by a man, so that such species should be destroyed. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 13

Paragraph (1) The definition of a rescue aid to populations of plants or animals whose habitat has become narrow and isolated or damaged due to natural disaster or due to human activity so that populations or sub-populations of species in question to be in danger of local extinction when kept in habitat. Local extinction is the loss of a sub-population of certain areas due to habitat * 27035 habitat becomes very narrow, fragmented (cut into pieces) or isolated from the original population, or habitat is damaged and requires a long time to be restored. In such circumstances the sub-populations became endangered and should be saved through relocation or translocation of the transfer of territory to another, more appropriate habitat. Paragraph (2) Transfer to another location (translocation) is an activity to move the whole sub-populations of threatened into another habitat that can support the sub-populations. Removal can be done through activities such as convoy, transport or other means that are safe for plants or animals and for humans. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 14

Paragraph (1) assessment, research and development of plants and animals in order preservation is the study, research and development to support the preservation of genetic diversity, species diversity and ecosystem diversity. As for the benefit of the use, study, research and development is regulated by its own government. Paragraph (2) Sufficiently clear Paragraph (3) assessment, research and development can basically be done by good scientists representing institutions and individuals in accordance with their knowledge field. However, in the context of policy formulation preservation of flora and fauna, assessment, research and development should remain the responsibility of the Government. Paragraph (4) Sufficiently clear

Article 15

Paragraph (1) Maintenance of species of flora and fauna aims to rescue and preserve genetic resources outside of their habitat to support the conservation of plants and animals in their habitat. Maintenance of individual plants or animals was because the individual for any reason can not be returned to their habitat so it is better kept as a backup or germplasm resources in order outside the breeding habitat. Maintenance of plants and animals can * 27 036 form: a. maintain plants or animals alive, b. store frozen semen, c. storing seeds or seedlings in the dry and cold storage. Paragraph (2) Institute for conservation is the most ideal place to nurture the kinds of plants and animals in order to preserve genetic resources outside of its habitat. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 16

Paragraph (1) The definition of breeding is to multiply the individual efforts made both inside and outside the habitat through the following ways: a. For plants, multiply the individual performed by growing material for the growing of plants such as seeds, cuttings (pieces), dispersal from one clump, plant tissue culture and spores while maintaining the purity of its kind. Purity species will be maintained if there is no cross breeding between species (species or sub-species). b. For animals, reproduce individual carried naturally by mating or artificial (artificial insemination) if the reproduction is married and the way the other way when the way is not mating reproductive both inside and outside the habitat. Breeding of animals with human intervention should pay attention to ethics. Paragraph (2) In order to preserve the plant and animal species, breeding should be directed to be returned to its natural habitat in an effort to increase the population in the wild. Therefore, in the breeding of animals mating reproductive way to avoid marriage between relatives (in breeding) and cross-breeding between different species or subspecies that is generated between the individuals who are genetically healthy than pure types. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 17

Paragraph (1) assessment, research and development of plants and animals are carried out * 27037 habitat preservation is in order and is in favor of research and development with the goal of conservation in situ preservation of genetic diversity, species diversity and ecosystem diversity. Paragraph (2) Sufficiently clear Paragraph (3) Sufficiently clear

Article 18

Paragraph (1) Not all animals that are outside their natural habitat can be directly returned to its natural habitat. This is because the individual animals that have long been in the human environment that makes their dependence on humans, so if directly released into its natural habitat will experience death, transmit disease to native populations in their natural habitat, or reduce genetic quality (degeneration) native populations in natural habitat . Therefore, to adapt and conditioning as well as select the animals to be released back into its natural habitat rehabilitation needs to be done in order to have state and behavior as native populations residing in nature. Rehabilitation of wildlife species that has been done so long in the environment that humans have a high survival to be released back into nature and do not interfere with native populations who inhabited the habitat through the spread of disease and genetic pollution. Paragraph (2) wildlife rehabilitation

activities include the following: a. studied the health of animals, b. take medication and vitamin and food supplements; c. train and adapt to their natural habitat environments selected animals to be released into their habitat. Paragraph (3) Sufficiently clear

Article 19

Paragraph (1) Plants and animals illegally outside their habitat under the control of a person must be saved to be returned to their habitat. Paragraph (2) Sufficiently clear

Article 20

Paragraph (1) Sufficiently clear Paragraph (2) Sufficiently clear

* 27 038 Article 21 Paragraph (1) What is meant by releasing back to their habitat is activity returns to its natural habitat animal breeding results, rescue, rehabilitation or confiscated in order to breed naturally with respect to the original range of the species in question, which has a population inhabiting habitat goals, objectives and habitat carrying capacity of its environment. In releasing the animals back into their natural habitat carrying capacity of the habitat should be noted that the ability to guarantee Lestari habitat types to be released. Included in the carrying capacity of the habitat component is sufficient feed naturally and space protection. Habitat selected for re-release should be a type of habitat that was historically known distribution of native species that will be released. Original distribution is an area where a species known to exist. In releasing the animals back into their natural habitat should also be noted that existing populations both occupants of the same type or of other types that can be considered the possibilities of competition, predation, symbiosis and parasitism. Physically healthy means visually look healthy, strong and active, and known to be free of disease. Whereas high genetic diversity means it is not the result of breeding in which mating occurs between relatives (inbreeding) and wherever possible is closest to parent offspring derived from catches in nature. Animals caught from the wild can be ensured to have high genetic diversity. Paragraph (2) Sufficiently clear

Article 22

Paragraph (1) Sufficiently clear Paragraph (2) Sufficiently clear Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 23

Paragraph (1) Sufficiently clear Paragraph (2) Sufficiently clear

Article 24

Paragraph (1) Sufficiently clear Paragraph (2) * 27039 Sufficiently clear Paragraph (3) Sufficiently clear

Article 25

Paragraph (1) transport permit shall, among others: a. Letter number and date of the letter b. The type and number of plants and or animals; c. The origins of animals; d. Point e. Validity period of the license; f. Departure port or terminal; g. Port or terminal objectives; h. Other provisions. Paragraph (2) Sufficiently clear Clause a Letter b technical provisions making animal cages and ways of transport following provisions with international standards. Paragraph (3) Sufficiently clear

Article 26

Paragraph (1) What is meant by harm human life is human life that can threaten normal life in the settlements or neighborhoods that the presence of animals in the place was very dangerous and can be life-threatening residents in the settlement. Animals dangerous to human life that can occur due to human settlements adjacent habitat or wildlife habitat has become narrow and isolated by human activities resulting in a daily exploration out of the habitat or because it is old or less competitive and driven out of the group so it is out of their habitat towards human settlements. Diseased animals and because the disease is dangerous to human life, then these animals can be destroyed. Paragraph (2) What is meant by threatening directly if the animal is expected to directly injure or kill humans and spread diseases that endanger human life and there is no more effective way to avoid it. Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear

Article 27

Paragraph (1) * 27040 Sufficiently clear Paragraph (2) The definition of law enforcement officers are authorized Indonesian Police, Rangers, Customs Officers, Quarantine Officer and Civil Servant (investigators). Paragraph (3) Sufficiently clear Paragraph (4) Sufficiently clear Paragraph (5) Sufficiently clear

Article 28

Self-explanatory

Article 29

Self-explanatory

THE REPUBLIC OF INDONESIA NUMBER 3803

NOTE

ATTACHMENT OF THE REPUBLIC OF INDONESIA NUMBER 7 OF 1999 DATE January 27, 1999

Types of Protected Plants and Animals

----- No. Name Scientific Name Indonesia -----

MAMMALS (BREASTFEEDING)

1 depressicornis Anoa Lowland Anoa, Anoa Buffalo Short quarlesi Anoa mountains 2 3 4 Binturong binturong Arctictis Arctonyx collaris Babyrousa babyrousa babirusa Pulusan 5 6 7 Balaenoptera musculus blue whale Balaenoptera physalus finned whales 8 9 Capricornis Bull boss sondaicus sumatrensis Goat 10 Cervus kuhli Sumatra; Axis 11 kuhli Bawean deer Cervus spp. Deer, deer, Sambar (all species of the genus Cervus) 12 Cetacea whales (all species of cetacean family) 13 14 Cynocephalus Dhole Cuon alpinus variegatus lemur, Tando, Walangkekes 15 Cynogale Benetti water Weasel 16 Cynopithecus niger Sulawesi black monkey 17 Dendrolagus spp. Tree kangaroo (all kinds of genus Dendrolagus) 18 Dicerorhinus sumatrensis Sumatran rhino * 27041 19 Dolphinidae dolphins sea water (all types of family Dolphinidae) 20, 21 dugongs Dugong dugon Elephants Elephas indicus 22 Felis badia red cat Felis bengalensis 23 Cats, Meow congkok 24 Felis marmorata Kuwuk 25 planiceps cat Felis Felis impact temmincki 26 golden cat Felis viverrinus 27 Cats 28 Helarctos malayanus mangrove honey bear 29 Hylobatidae gibbons, macaques no tails (all kinds of family Hylobatidae) 30 31 Iomys porcupine Hystrix brachyura horsfieldi red squirrel tail fly 32 Lariscus hosei 33 striped ground squirrel Lariscus insignis ground squirrels, ground squirrels 35 34 Lutra Lutra Lutra Lutra Lutra sumatrana brunnescens Macaca Monkeys Sumatra Sulawesi 36 37 38 Sulawesi monkey Macaca maura Macaca pagensis Bokoi, Mentawai monkey Macaca tonkeana 39 40 Macrogalidea musschenbroeki crested Monkey Sulawesi Weasel 41 Pangolin Manis javanica, Peusing 42 humpback whales Megaptera novaeangliae Kidang 43 Muntiacus muntjac, muncak 44 Mydaus javanensis Skunks 45 Nasalis larvatus Kahau, 46 Proboscis Neofelis nebulosa limb 47 Nesolagus netscheri Tiger Sumatran Rabbit 48 Nycticebus coucang shyly 49 Orcaella brevirostris water dolphins bargaining, porpoises 50 Panthera pardus Tiger beetle, leopard Panthera tigris sondaica 51 52 Javan Tiger Sumatran Tiger Panthera tigris sumatrae 53 Petaurista elegans Cukbo, Squirrel flew 54 Phalanger spp. Possum (all kinds of genus Phalanger) 55 Pongo pygmaeus Orang Utan, monkey Mawas 56 Presbytis frontata white forehead 57 Presbytis rubicunda red monkey, Presbytis aygula Triton 58 Surili 59 Presbytis potenziani Joja, Mentawai langurs Presbytis thomasi Rungka 60 61 Prionodon linsang Weasel congkok 62 Prochidna bruijini Irian Hedgehog, Hedgehog Ratufa bicolor ants jelarang 63 64 65 Javan Rhinoceros sondaicus Simias concolor Simpei Mentawai 66 Tapir Tapirus indicus, Cipan, tapir 67 Tarsius spp. Animal ghosts, singapuar (all kinds of genus Tarsius) 68 Thylogale spp. Kangaroo land (all types of genus Thylogale) 69 Tragulus spp. Hare, coney, Napu (all species of the genus Tragulus) 70 Ziphiidae dolphins sea water (all types of family Ziphiidae)

* 27 042 Aves (BIRD) 71 Accipitridae kestrel, hawk (all kinds of family Accipitridae) 72 Aethopyga exima Jantingan 73 Aethopyga duyvenbodei mountain honey Sangihe 74 Alcedinidae Bird Bird shrimp, king prawns (all kinds of family Alcedinidae) 75 Alcippe pyrroptera Brencet wergan 76 Anhinga melanogaster Pecuk snake 77 Aramidopsis plateni Mandar Sulawesi 79 78 Argusianus Argus Argus egret Bubulcus ibis, the White Stork 80 Bucerotidae Hornbill, Hornbill, Great Hornbill, Hornbill (all kinds of family Bucerotidae) 81 large white cockatoo Cacatua galerita 82 yellow crested cockatoo Cacatua goffini 83 gofin Seram cockatoo Cacatua moluccensis 84-crested Cockatoo Cacatua sulphurea yellow wild ducks 85 Cairina scutulata 86 Caloanas nicobarica Junai, Burungmas, Minata 87 Casuarius Benetti small cassowary, 88 cassowary Casuarius casuarius 89 Casuarius unappendiculatus the Cassowary wattle, 90 cassowary yellow neck Stork Ciconia episcopus black, Sandanglawe 91 Colluricincla megarhyncha sanghirensis sohabe Birds Birds brown 92 Crocias albonotatus 93 Ducula whartoni Pergam sun king 94 95 Egretta sacra reef egret Egretta spp. Herons, White Storks (all kinds of genus Egretta) 96 Elanus caeruleus Alap-alap white, Alap-alap mice 97 Elanus hypoleucus Alap-alap white, Alap-alap mice 98 Eos histrio Nuri Sangir 99 Esacus magnirostris Wili-wili, Uar, Duck 100 Eutrichomyias rowleyi sea Seriwang Sangihe 101 Falconidae kestrel, hawk (all kinds of family Falconidae) 102 Fregeta andrewsi scissors Birds, Birds rufifrons Garrulax Bintayung 103 horse 104 Goura spp. Crown pigeon, Birds titi, Mambruk (all species of the genus Goura) 105 Gracula religiosa mertensi Flores 106 Gracula Beo Beo Nias robusta religiosa religiosa venerata Beo 107 Gracula Sumbawa 108 Grus spp. Levels (all kinds of genus Grus) 109 Himantopus himantopus Trulek sticks, Lilimo cinereus Bluwok 110 Ibis, Ibis leucocephala Bluwok Walangkadak 111 112 Lorius roratus colored parrots Leptoptilos javanicus 113 Marabu, tom-tom heron Leucopsar Rothschildi Bali Starling 114 115 116 Limnodromus semipalmatus Blekek asia Lophozosterops javanica Birds eye glass neck gray 117 white-tailed Lophura bulweri Beleang 118 Loriculus catamene Serindit Sangihe Loriculus exilis 119 120 Lorius domicellus Serindit Sulawesi red Nori black head * 27043 121 122 Macrocephalon maleo Bird maleo Megalaima armillaris Cangcarang 123 Megalaima Haruku corvina, tap-tap 124 Megalaima javensis Tulung stacks, Java Bultok 125 Megapodiidae maleo, charred Birds (all types of family Megapodiidae) 126 127 Megapodius reinterwardtii footed Birds Birds Meliphagidae sips, honey suckers (all jenisdari family Meliphagidae) 128 Muscivora rueckii 129 Blue Bird fan milky stork Myzoceryx cinerea, Bluwok 130 Nectariniidae Birds honey, Jantingan, Klaces (all kinds of family Nectariniidae) 131 Numenius spp. Gagajahan (all species of the genus Numenius) 132 red herons Nycticorax caledonicus 133 owl Otus beccarii migicus Biak 134 Pandionidae kestrel, hawk (all kinds of family Pandionidae) 135 Paradiseidae Bird of paradise (all kinds of family Paradiseidae) 136 Pavo muticus Birds peacock sea gangsa Pelecanidae 137 (all types of family Pelecanidae) 138 Pittidae paok Birds, Birds worms (all kinds of family Pittidae) 139 Plegadis falcinellus Ibis black-roko roko Polyplectron malacense 140 141 Probosciger aterrimus Peacock Cockatoos dwarf king, black cockatoos 142 Psaltria exilis glatik small, mountain glatik 143 Pseudibis davisoni black Ibis white back 144 Psittichas fulgidus Kasturi king, big Betet 145 Ptilonorhynchidae Namdur Birds, Birds Birds gods 146 Rhipidura euryura white belly fan, fan mount 147 fan 148 Rhipidura javanica Birds Birds Rhipidura phoenicura red tail fan 149 Satchyris grammiceps Burung tepus dada putih 150 Satchyris melanothorax Burung tepus pipi perak 151 Sterna zimmermanni Dara laut berjambul 152 Sternidae Burung dara laut (semua jenis dari famili Sternidae) 153 Sturnus melanopterus Jalak putih, Kaleng putih 154 Sula abbotti Gangsa batu aboti 155 Sula dactylatra Gangsa batu muka biru 156 Sula leucogaster Gangsa batu 157 Sula sula Gangsa batu kaki merah 158 Tanygnathus sumatranus Nuri Sulawesi 159 Threskiornis aethiopicus Ibis putih, Platuk besi 160

Trichoglossus ornatus Kasturi Sulawesi 161 Tringa guttifer Trinil tutul 162 Trogonidae Kasumba, Suruku, Burung luntur 163 Vanellus macropterus Trulek ekor putih

Reptilia (reptiles)

164 Batagur baska Tuntong 165 loggerhead turtle Caretta caretta 166 Carettochelys insculpta turtles Chelodina 167 novaeguineae Kura Irian Irian long neck * 27 044 168 169 green turtle Chelonia mydas Chitra indica Labi-labi large umbrella Soa kingii Chlamydosaurus 170 171 172 Chondropython viridis green Python Crocodylus novaeguineae 173 Guinea freshwater crocodile Crocodylus porosus estuarine crocodile Crocodylus siamensis 174 175 Siamese Crocodiles Dermochelys coriacea Leatherbacks 176 Elseya novaeguineae Kura Irian short neck Eretmochelys imbricata Hawksbill 177 178 179 Gonycephalus dilophus Chameleon comb Hydrasaurus amboinensis Soa-soa, ambon Lizard, Lizard 180 trees Lepidochelys olivacea turtles Natator Ridel 181 182 Orlitia flat depressa Turtle Tortoise ivory borneensis 183 184 bodo Python Python Python molurus Python timorensis 185 East Lizard Tiliqua gigas Panana Tomistoma schlegelii False 186, 187 Sapit Crocodile Monitor lizard Varanus borneensis Kalimantan 188 189 brown Lizard Varanus gouldi Varanus indicus Maluku lizard Varanus komodoensis 190 Komodo dragon, Varanus nebulosus Ora 191 gray 192 Lizard Varanus prasinus green Lizard Varanus timorensis 193 East 194 Lizard Lizard Varanus togianus Togian

Insecta (INSECTS)

Myrina Cethosia 195 196 Ornithoptera chimaera Kupu Kupu angel wings fairy Ornithoptera 197 goliath goliath bird wing butterfly 198 butterfly wing Ornithoptera Paradisea 199 bird paradise bird priamus Ornithoptera priamus Kupu Kupu 200 Ornithoptera rotschldi rotsil 201 bird birds Ornithoptera tithonus Kupu Kupu Titon 202 Trogonotera brookiana trogon 203 Troides amphrysus monarch butterfly monarch butterfly andromanche Troides 204 205 206 Troides criton king Troides haliphron Kupu Kupu Kupu helena king king Troides 207 208 209 Troides hypolitus Troides meoris monarch butterfly monarch butterfly monarch butterfly miranda Troides 210 211 Troides plato Kupu Kupu rhadamantus Troides king 212 king 213 Troides riedeli Kupu Kupu vandepolli Troides king 214 king

PISCES (FISH)

215 Homaloptera gymnogaster rail Maninjau 216 sea king fish Latimeria chalumnae 217 Notopterus spp. Belida Java, Java Lopis (all species of the genus Notopterus) 218 Pritis spp. Pari Sentani, Sentani Sharks (all species of the genus Pritis) 219 Puntius microps Wader goa * 27045 220 Scleropages formosus peyang malaya, Tangkelasa, 221 Scleropages jardini Arowana Irian, Irian peyang, Kaloso

Anthozoa

222 Antiphatas spp. Root bahar, black corals (all species of the genus Antiphatas)

Bivalves

223 Birgus latro coconut crabs Cassis cornuta 224 225 Head of goat horns Charonia tritonis Triton 226 Hippopus hippopus Kima hooves, nails bear Kima Kima 227 Hippopus porcellanus China pompillius Nautilus 228 Nautilus 229 Tachipleus gigas quests hollow hoof Kima Kunia 230 Tridacna crocea, Tridacna 231 Holes Kima derasa south 232 Tridacna gigas giant clams Tridacna maxima 233 234 Tridacna squamosa Kima Kima small scales, Kima Trochus niloticus Troka flutes 235, 236 Turbo marmoratus fringe round match stone, green snail

PLANTS

I. Palmae

237 Flowers decussilvae carcass tall Amorphophallus Amorphophallus titanum Flower 238 239 carcasses of giant Borrassodendron borneensis Bindang, warehouses etc. 240 Palm Caryota no king / Indonesia 241 242 Ceratolobus glaucescens Palem Cystostachys lakka Pinang Jawa Kalimantan red 243 red Pinang Bangka Cystostachys ronda 244 245 Eugeissona utilis Bertan Johanneste ijsmaria altifrons 246 umbrella leaf fan palm Livistona spp Sumatra (all species of the genus Livistona) Palm Sumatran elephants Nenga 247 248 249 Phoenix paludosa Korma swamp Pigafatta filaris Manga 250 pinanga javana Pinang Jawa

II. RAFFLESIACEA

251 Rafflesia spp. Rafflesia, Flower Padma (all species of the genus Rafflesia)

III. Orchidaceae

252 Orchid Ascocentrum miniatum kebutan pandurata Black orchid Coelogyne 253 254 255 Corybas fornicatus koribas Cymbidium Orchids Orchid hartinahianum Hartinah 256 257 karawai Dendrobium Orchids Dendrobium catinocloesum d'albertsii albert 258 Dendrobium Orchids Orchid lasianthera stuberi * 27 046 259 260 Dendrobium macrophyllum emerald orchid Dendrobium Orchids ostrinoglossum karawai 261 Dendrobium orchid phalaenopsis orchids papuanum Grammatophyllum Larat 262 263 Grammatophyllum Irian giant cane speciosum orchid Orchids 264 Macodes petola ki 265 characters chamberlainianum Orchids Paphiopedilum Paphiopedilum sandals mustache glaucophyllum 266 267 Paphiopedilum orchids furry shoes sandals praestans Orchids Orchid denevei Paraphalaenopsis 268 tape month of 269 Paraphalaenopsis laycockii Orchid months Central Kalimantan 270 Paraphalaenopsis serpentilingua Orchids in West Kalimantan 271 amboinensis Phalaenopsis Orchid Phalaenopsis gigantea in Ambon 272 273 giant moon orchid Phalaenopsis Orchid in

Sumatra 274 sumatrana violacose Phalaenopsis Orchids Orchid Matutina flickering orange Renanthera 275 276 277 Spathoglottis zurea
Vanda Orchids spoon celebica 278 Vanda Vanda tiny Minahasa Vanda hookeriana pencil mini 279 280 Vanda Vanda pumila Vanda Vanda
sumatrana Sumatra

IV. NEPHENTACEAE

281 Nepenthes spp. Pitcher plants (all species of the genus Nepenthes)

V. Dipterocarp

282 283 Tengkawang stenopten Shorea Shorea Shorea stenoptera Tengkawang gysberstiana Tengkawang 284 285 286 Tengkawang pinanga
Shorea Shorea compressa Shorea Seminis Tengkawang Tengkawang 287 288 289 Shorea Shorea martiniana Tengkawang mexistopteryx
Tengkawang beccariana Tengkawang 291 290 Shorea Shorea Shorea micrantha Tengkawang palembanica Tengkawang 292 293 294 Shorea
Shorea lepidota Tengkawang singkawang Tengkawang

PRESIDENT OF THE REPUBLIC OF INDONESIA

Jusuf Habibie signed BACHARUDDIN

Based on the original CABINET SECRETARIAT RI Head of Legislation I

Signed Lambock V. Nahattands

PP 7/1999, PENGAWETAN JENIS TUMBUHAN DAN SATWA (INDONESIAN)

PRESIDEN REPUBLIK INDONESIA,

Menimbang :

a. bahwa tumbuhan dan satwa adalah bagian dari sumber daya alam yang tidak ternilai harganya sehingga kelestariannya perlu dijaga melalui upaya pengawetan jenis;

b. bahwa berdasarkan hal tersebut diatas dan sebagai pelaksanaan Undang-undang Nomor 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya, dipandang perlu untuk menetapkan peraturan tentang Pengawetan Jenis Tumbuhan dan Satwa dengan Peraturan Pemerintah;

Mengingat :

1. Pasal 5 Ayat (2) dan Pasal 33 ayat (3) Undang-Undang Dasar 1945;

2. Undang-undang Nomor 5 Tahun 1967 tentang Ketentuan-ketentuan Pokok Kehutanan (Lembaran Negara Tahun 1967 Nomor 8, Tambahan Lembaran Negara Nomor 2823);

3. Undang-undang Nomor 9 Tahun 1985 tentang Perikanan (Lembaran Negara Tahun 1985 Nomor 46, Tambahan Lembaran Negara Nomor 3299);

4. Undang-undang Nomor 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya (Lembaran Negara Tahun 1990 Nomor 49 Tambahan Lembaran Negara Nomor 3419);

5. Undang-undang Nomor 12 Tahun 1992 tentang Sistem Budidaya Tanaman (Lembaran Negara Tahun 1992 Nomor 46, Tambahan Lembaran Negara Nomor 3478);

6. Undang-undang Nomor 16 Tahun 1992 tentang Karantina Hewan, Ikan dan Tumbuhan (Lembaran Negara Tahun 1992 Nomor 56, Tambahan Lembaran Negara Nomor 3482);

7. Undang-undang Nomor 5 Tahun 1994 tentang Pengesahaan Konvensi Perserikatan Bangsa-Bangsa Mengenai Keaneka-ragaman Hayati (Lembaran Negara Tahun 1994 Nomor 41, Tambahan Lembaran Negara Nomor 3556);

*27019 8. Undang-undang Nomor 23 Tahun 1997 tentang Pengelolaan Lingkungan Hidup (Lembaran Negara Tahun 1997 Nomor 68, Tambahan Lembaran Negara Nomor 3699);

9. Peraturan Pemerintah Nomor 13 Tahun 1994 tentang Perburuan Satwa Buru (Lembaran Negara Tahun 1994 Nomor 19, Tambahan Lembaran Negara Nomor 3544);

10. Peraturan Pemerintah Nomor 68 Tahun 1998 tentang Kawasan Suaka Alam dan Kawasan Pelestarian Alam (Lembaran Negara Tahun 1998 Nomor 132, Tambahan Lembaran Negara Nomor 3776);

MEMUTUSKAN :

Menetapkan : PERATURAN PEMERINTAH TENTANG PENGAWETAN JENIS TUMBUHAN DAN SATWA.

BAB I KETENTUAN UMUM

Pasal 1

Dalam Peraturan Pemerintah ini yang dimaksud dengan :

1. Pengawetan adalah upaya untuk menjaga agar keanekaragaman jenis tumbuhan dan satwa beserta ekosistemnya baik di dalam maupun di luar habitatnya tidak punah.
2. Pengawetan jenis tumbuhan dan satwa di luar habitatnya adalah upaya menjaga keanekaragaman jenis tumbuhan dan satwa agar tidak punah.
3. Lembaga Konservasi adalah lembaga yang bergerak di bidang konservasi tumbuhan dan atau satwa di luar habitatnya (ex situ), baik berupa lembaga pemerintah maupun lembaga non pemerintah.
4. Identifikasi jenis tumbuhan dan satwa adalah upaya untuk mengenal jenis, keadaan umum status populasi dan tempat hidupnya yang dilakukan di dalam habitatnya.
5. Inventarisasi jenis tumbuhan dan satwa adalah upaya untuk mengetahui kondisi dan status populasi secara lebih rinci serta daerah penyebarannya yang dilakukan di dalam dan di luar habitatnya maupun di lembaga konservasi.
6. Jenis tumbuhan atau satwa adalah jenis yang secara ilmiah disebut species atau anak-anak jenis yang secara ilmiah disebut sub-species baik di dalam maupun di luar habitatnya.
7. Populasi adalah kelompok individu dari jenis tertentu di tempat tertentu yang secara alami dan dalam jangka panjang mempunyai kecenderungan untuk mencapai keseimbangan populasi secara dinamis sesuai dengan kondisi habitat beserta lingkungannya.

*27020 8. Menteri adalah menteri yang bertanggung jawab dibidang kehutanan.

Pasal 2

Pengawetan jenis tumbuhan dan satwa bertujuan untuk :

- a. menghindarkan jenis tumbuhan dan satwa dari bahaya kepunahan;
- b. menjaga kemurnian genetik dan keanekaragaman jenis tumbuhan dan satwa;
- c. memelihara keseimbangan dan kemantapan ekosistem yang ada; agar dapat dimanfaatkan bagi kesejahteraan manusia secara berkelanjutan.

BAB II UPAYA PENGAWETAN

Pasal 3

Pengawetan jenis tumbuhan dan satwa dilakukan melalui upaya:

- a. penetapan dan penggolongan yang dilindungi dan tidak dilindungi;
- b. pengelolaan jenis tumbuhan dan satwa serta habitatnya;
- c. pemeliharaan dan pengembangbiakan.

BAB III PENETAPAN JENIS TUMBUHAN DAN SATWA

Pasal 4

(1) Jenis tumbuhan dan satwa ditetapkan atas dasar golongan : a. tumbuhan dan satwa yang dilindungi; b. tumbuhan dan satwa yang tidak dilindungi.

(2) Jenis-jenis tumbuhan dan satwa yang dilindungi sebagaimana dimaksud dalam ayat (1) huruf a adalah sebagaimana terlampir dalam Peraturan Pemerintah ini.

(3) Perubahan dari jenis tumbuhan dan satwa yang dilindungi menjadi tidak dilindungi dan sebaliknya ditetapkan dengan Keputusan Menteri setelah mendapat pertimbangan Otoritas Keilmuan (Scientific Authority).

Pasal 5

(1) Suatu jenis tumbuhan dan satwa wajib ditetapkan dalam golongan yang dilindungi apabila telah memenuhi kriteria : a. mempunyai populasi yang kecil; b. adanya penurunan yang tajam pada jumlah individu di alam; c. daerah penyebaran yang terbatas (endemik).

(2) Terhadap jenis tumbuhan dan satwa yang memenuhi kriteria sebagaimana dimaksud dalam ayat (1) wajib dilakukan upaya pengawetan.

*27021 Pasal 6

Suatu jenis tumbuhan dan satwa yang dilindungi dapat diubah statusnya menjadi tidak dilindungi apabila populasinya telah mencapai tingkat pertumbuhan tertentu sehingga jenis yang bersangkutan tidak lagi termasuk kategori jenis tumbuhan dan satwa sebagaimana dimaksud dalam Pasal 5 ayat (1).

BAB IV PENGELOLAAN JENIS TUMBUHAN DAN SATWA SERTA HABITATNYA Bagian Pertama Umum

Pasal 7

Pengelolaan jenis tumbuhan dan satwa sebagaimana diatur dalam ketentuan Peraturan Pemerintah ini tidak mengurangi arti ketentuan tentang pengelolaan jenis tumbuhan dan satwa pada kawasan suaka alam dan kawasan pelestarian alam sebagaimana diatur dalam Peraturan Pemerintah yang mengatur mengenai kawasan suaka alam dan kawasan pelestarian alam.

Pasal 8

(1) Pengawetan jenis tumbuhan dan satwa dilakukan melalui kegiatan pengelolaan di dalam habitatnya (in situ).

(2) Dalam mendukung kegiatan sebagaimana dimaksud dalam ayat (1) dilakukan kegiatan pengelolaan di luar habitatnya (ex situ) untuk menambah dan memulihkan populasi.

(3) Pengelolaan jenis tumbuhan dan satwa di dalam habitatnya (in situ) dilakukan dalam bentuk kegiatan : a. Identifikasi; b. Inventarisasi; c. Pemantauan; d. Pembinaan habitat dan populasinya; e. Penyelamatan jenis; f. Pengkajian, penelitian dan pengembangan.

(4) Pengelolaan jenis tumbuhan dan satwa di luar habitatnya (ex situ) dilakukan dalam bentuk kegiatan : a. Pemeliharaan; b. Pengembangbiakan; c. Pengkajian, penelitian dan pengembangan; d. Rehabilitasi satwa; e. Penyelamatan jenis tumbuhan dan satwa.

Bagian Kedua Pengelolaan dalam Habitat (In Situ)

Pasal 9

(1) Pemerintah melaksanakan identifikasi di dalam habitat sebagaimana dimaksud dalam Pasal 8 ayat (3) huruf a untuk kepentingan penetapan golongan jenis tumbuhan dan satwa.

*27022 (2) Ketentuan lebih lanjut mengenai identifikasi sebagaimana dimaksud dalam ayat (1) diatur oleh Menteri.

Pasal 10

(1) Pemerintah melaksanakan inventarisasi sebagaimana dimaksud dalam Pasal 8 ayat (3) huruf b, untuk mengetahui kondisi populasi jenis tumbuhan dan satwa.

(2) Inventarisasi sebagaimana dimaksud dalam ayat (1) meliputi survei dan pengamatan terhadap potensi jenis tumbuhan dan satwa.

(3) Pemerintah dapat bekerjasama dengan masyarakat dalam pelaksanaan survei dan pengamatan sebagaimana dimaksud dalam ayat (2).

(4) Ketentuan lebih lanjut mengenai inventarisasi sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 11

- (1) Pemerintah melaksanakan pemantauan sebagaimana dimaksud dalam Pasal 8 ayat (3) huruf c, untuk mengetahui kecenderungan perkembangan populasi jenis tumbuhan dan satwa dari waktu ke waktu.
- (2) Pemantauan sebagaimana dimaksud dalam ayat (1) dilaksanakan melalui survei dan pengamatan terhadap potensi jenis tumbuhan dan satwa secara berkala.
- (3) Pemerintah dapat bekerjasama dengan masyarakat dalam pelaksanaan survei dan pengamatan sebagaimana dimaksud dalam ayat (2).
- (4) Ketentuan lebih lanjut mengenai pemantauan sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 12

- (1) Pemerintah melaksanakan pembinaan habitat dan populasi sebagaimana dimaksud dalam Pasal 8 ayat (3) huruf d, untuk menjaga keberadaan populasi jenis tumbuhan dan satwa dalam keadaan seimbang dengan daya dukung habitatnya.
- (2) Pembinaan habitat dan populasi sebagaimana dimaksud dalam ayat (1) dilaksanakan melalui kegiatan : a. Pembinaan padang rumput untuk makan satwa; b. Penanaman dan pemeliharaan pohon pelindung dan sarang satwa pohon sumber makan satwa; c. Pembuatan fasilitas air minum, tempat berkubang dan mandi satwa; d. Penjarangan jenis tumbuhan dan atau populasi satwa; e. Penambahan tumbuhan atau satwa asli; f. Pemberantasan jenis tumbuhan dan satwa *27023 pengganggu.
- (3) Pemerintah dapat bekerjasama dengan masyarakat untuk melaksanakan kegiatan sebagaimana dimaksud dalam ayat (2).
- (4) Ketentuan lebih lanjut mengenai pembinaan habitat dan populasi tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 13

- (1) Pemerintah melaksanakan tindakan penyelamatan jenis tumbuhan dan satwa sebagaimana dimaksud dalam Pasal 8 ayat (3) huruf e, terhadap jenis tumbuhan dan satwa yang terancam bahaya kepunahan yang masih berada di habitatnya.
- (2) Penyelamatan jenis tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1) dilaksanakan melalui pengembangbiakan, pengobatan, pemeliharaan dan atau pemindahan dari habitatnya ke habitat di lokasi lain.
- (3) Pemerintah dapat bekerjasama dengan masyarakat untuk melakukan tindakan penyelamatan sebagaimana dimaksud dalam ayat (2).
- (4) Ketentuan lebih lanjut mengenai penyelamatan jenis tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 14

- (1) Pemerintah melaksanakan pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa sebagaimana dimaksud dalam Pasal 8 ayat (3) huruf f, untuk menunjang tetap terjaganya keadaan genetik dan ketersediaan sumber daya jenis tumbuhan dan satwa secara lestari.
- (2) Pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1) dilaksanakan melalui pengkajian terhadap aspek-aspek biologis dan ekologis baik dalam bentuk penelitian dasar, terapan dan ujicoba.
- (3) Pemerintah dapat bekerjasama dengan masyarakat melaksanakan kegiatan pengkajian, penelitian dan pengembangan sebagaimana dimaksud dalam ayat (2).
- (4) Ketentuan lebih lanjut mengenai pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa .sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Bagian Ketiga Pengelolaan di luar Habitat (Ex Situ)

Pasal 15

- *27024 (1) Pemeliharaan jenis tumbuhan dan satwa diluar habitatnya sebagaimana dimaksud dalam Pasal 8 ayat (4) huruf a dilaksanakan untuk menyelamatkan sumber daya genetik dan populasi jenis tumbuhan dan satwa.
- (2) Pemeliharaan sebagaimana dimaksud dalam ayat (1) meliputi juga koleksi jenis tumbuhan dan satwa di lembaga konservasi.

(3) Pemeliharaan jenis diluar habitat wajib memenuhi syarat : a. memenuhi standar kesehatan tumbuhan dan satwa; b. menyediakan tempat yang cukup luas, aman dan nyaman; c. mempunyai dan mempekerjakan tenaga ahli dalam bidang medis dan pemeliharaan.

(4) Ketentuan lebih lanjut mengenai pemeliharaan jenis di luar habitatnya sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 16

(1) Pengembangbiakan jenis tumbuhan dan satwa diluar habitatnya sebagaimana dimaksud dalam Pasal 8 ayat (4) huruf b dilaksanakan untuk pengembangan populasi di alam agar tidak punah.

(2) Kegiatan pengembangbiakan sebagaimana dimaksud dalam ayat (1) dilaksanakan dengan tetap menjaga kemurnian jenis dan keanekaragaman genetik.

(3) Pengembangbiakan jenis diluar habitatnya wajib memenuhi syarat: a. menjaga kemurnian jenis; b. menjaga keanekaragaman genetik; c. melakukan penandaan dan sertifikasi; d. membuat buku daftar silsilah (Studbook).

(4) Ketentuan lebih lanjut mengenai pengembangbiakan jenis tumbuhan dan satwa diluar habitatnya sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 17

(1) Pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa diluar habitatnya sebagaimana dimaksud dalam Pasal 8 ayat (4) huruf c dilakukan sebagai upaya untuk menunjang tetap terjaganya keadaan genetik dan ketersediaan sumber daya jenis tumbuhan dan satwa secara lestari.

(2) Kegiatan pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1) dilaksanakan melalui pengkajian terhadap aspek-aspek biologis dan ekologis baik dalam bentuk penelitian dasar, terapan dan ujicoba.

(3) Ketentuan lebih lanjut mengenai pengkajian, penelitian *27025 dan pengembangan jenis tumbuhan dan satwa di luar habitatnya sebagaimana dimaksud dalam ayat (1) dan ayat (2) diatur oleh Menteri.

Pasal 18

(1) Rehabilitasi satwa diluar habitatnya sebagaimana dimaksud dalam Pasal 8 ayat (4) huruf d dilaksanakan untuk mengadaptasikan satwa yang karena suatu sebab berada di lingkungan manusia, untuk dikembalikan ke habitatnya.

(2) Rehabilitasi sebagaimana dimaksud dalam ayat (1) dilakukan melalui kegiatan-kegiatan untuk mengetahui ada atau tidaknya penyakit, mengobati dan memilih satwa yang layak untuk dikembalikan ke habitatnya.

(3) Ketentuan lebih lanjut mengenai rehabilitasi satwa sebagaimana dimaksud dalam ayat (1) dan ayat (2) diatur oleh Menteri.

Pasal 19

(1) Penyelamatan jenis tumbuhan dan satwa diluar kawasan habitatnya sebagaimana dimaksud dalam Pasal 8 ayat (4) huruf e dilaksanakan untuk mencegah kepunahan lokal jenis tumbuhan dan satwa akibat adanya bencana alam dan kegiatan manusia.

(2) Penyelamatan jenis tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1) dilakukan melalui kegiatan-kegiatan :

a. memindahkan jenis tumbuhan dan satwa ke habitatnya yang lebih baik; b. mengembalikan ke habitatnya, rehabilitasi atau apabila tidak mungkin, menyerahkan atau menitipkan di Lembaga Konservasi atau apabila rusak, cacat atau tidak memungkinkan hidup lebih baik memusnahkannya.

Pasal 20

(1) Pengelolaan di luar habitat jenis tumbuhan dan satwa yang dilindungi hanya dapat dilakukan oleh Pemerintah.

(2) Pemerintah dapat bekerjasama dengan masyarakat untuk melaksanakan kegiatan pengelolaan sebagaimana dimaksud dalam ayat (1).

Pasal 21

(1) Jenis tumbuhan dan satwa hasil pengelolaan sebagaimana dimaksud dalam Pasal 15, Pasal 16, Pasal 17, Pasal 18 dan Pasal 19 dapat dilepaskan kembali ke habitatnya dengan syarat : a. habitat pelepasan merupakan bagian dari sebaran asli jenis yang dilepaskan; b.

tumbuhan dan satwa yang dilepaskan harus secara fisik sehat dan memiliki keragaman genetik yang *27026 tinggi; c. memperhatikan keberadaan penghuni habitat.

(2) Ketentuan lebih lanjut mengenai pelepasan kembali jenis tumbuhan dan satwa ke habitatnya sebagaimana dimaksud dalam ayat (1) diatur oleh Menteri.

BAB V LEMBAGA KONSERVASI

Pasal 22

(1) Lembaga Konservasi mempunyai fungsi utama yaitu pengembangbiakan dan atau penyelamatan tumbuhan dan satwa dengan tetap mempertahankan kemurnian jenisnya.

(2) Disamping mempunyai fungsi utama sebagaimana dimaksud dalam ayat (1) Lembaga Konservasi juga berfungsi sebagai tempat pendidikan, peragaan dan penelitian serta pengembangan ilmu pengetahuan.

(3) Lembaga Konservasi dapat berbentuk Kebun Binatang, Musium Zoologi, Taman Satwa Khusus, Pusat Latihan Satwa Khusus, Kebun Botani, Herbarium dan Taman Tumbuhan Khusus.

(4) Ketentuan lebih lanjut mengenai Lembaga Konservasi sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

Pasal 23

(1) Dalam rangka menjalankan fungsinya, Lembaga Konservasi dapat memperoleh tumbuhan dan atau satwa baik yang dilindungi maupun tidak dilindungi melalui: a. pengambilan atau penangkapan dari alam; b. hasil sitaan; c. tukar menukar; d. pembelian, untuk jenis-jenis yang tidak dilindungi.

(2) Ketentuan lebih lanjut mengenai tata cara memperoleh tumbuhan dan satwa untuk Lembaga Konservasi sebagaimana dimaksud dalam ayat (1) diatur oleh Menteri.

Pasal 24

(1) Dalam rangka pengembangbiakan dan penyelamatan jenis tumbuhan dan satwa, Lembaga Konservasi dapat melakukan tukar menukar tumbuhan atau satwa yang dilindungi dengan lembaga sejenis di luar negeri.

(2) Tukar menukar sebagaimana dimaksud dalam ayat (1) harus dilakukan dengan jenis-jenis yang nilai konservasinya dan jumlahnya seimbang.

(3) Ketentuan lebih lanjut mengenai tukar menukar sebagaimana dimaksud dalam ayat (1) dan ayat (2) diatur oleh Menteri.

*27027 BAB VI PENGIRIMAN ATAU PENGANGKUTAN TUMBUHAN DAN SATWA YANG DILINDUNGI

Pasal 25

(1) Pengiriman atau pengangkutan tumbuhan dan satwa dari jenis yang dilindungi dari dan ke suatu tempat di wilayah Republik Indonesia atau dari dan keluar wilayah Republik Indonesia dilakukan atas dasar ijin Menteri.

(2) Pengiriman atau pengangkutan tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1) harus : a. dilengkapi dengan sertifikat kesehatan tumbuhan dan satwa dari instansi yang berwenang; b. dilakukan sesuai dengan persyaratan teknis yang berlaku.

(3) Ketentuan lebih lanjut mengenai tata cara pengiriman atau pengangkutan jenis tumbuhan dan satwa sebagaimana dimaksud dalam ayat (1) dan ayat (2) diatur oleh Menteri.

BAB VII SATWA YANG MEMBAHAYAKAN KEHIDUPAN MANUSIA

Pasal 26

(1) Satwa yang karena suatu sebab keluar dari habitatnya dan membahayakan kehidupan manusia, harus digiring atau ditangkap dalam keadaan hidup untuk dikembalikan ke habitatnya atau apabila tidak memungkinkan untuk dilepaskan kembali ke habitatnya, satwa dimaksud dikirim ke Lembaga Konservasi untuk dipelihara.

(2) Apabila cara sebagaimana dimaksud dalam ayat (2) tidak dapat dilaksanakan, maka satwa yang mengancam jiwa manusia secara langsung dapat dibunuh.

(3) Penangkapan atau pembunuhan satwa yang dilindungi sebagaimana dimaksud dalam ayat (1) dan ayat (2) dilakukan oleh petugas yang berwenang.

(4) Ketentuan lebih lanjut mengenai petugas dan perlakuan terhadap satwa yang membahayakan kehidupan manusia sebagaimana dimaksud dalam ayat (1), ayat (2) dan ayat (3) diatur oleh Menteri.

BAB VIII PENGAWASAN DAN PENGENDALIAN

Pasal 27

(1) Dalam rangka pengawetan tumbuhan dan satwa, dilakukan melalui pengawasan dan pengendalian.

(2) Pengawasan dan pengendalian sebagaimana dimaksud dalam ayat (1) dilaksanakan oleh aparat penegak hukum yang berwenang sesuai peraturan perundang-undangan yang berlaku.

*27028 (3) Pengawasan dan pengendalian sebagaimana dimaksud dalam ayat (2) dilakukan melalui tindakan: a. preventif; dan b. represif.

(4) Tindakan preventif sebagaimana dimaksud dalam ayat (3) huruf a meliputi : a. penyuluhan; b. pelatihan penegakan hukum bagi aparat-aparat penegak hukum; c. penerbitan buku-buku manual identifikasi jenis tumbuhan dan satwa yang dilindungi dan yang tidak dilindungi.

(5) Tindakan represif sebagaimana dimaksud dalam ayat (3) huruf b meliputi tindakan penegakan hukum terhadap dugaan adanya tindakan hukum terhadap usaha pengawetan jenis tumbuhan dan satwa.

BAB IX KETENTUAN PERALIHAN

Pasal 28

Dengan ditetapkannya Peraturan Pemerintah ini, maka segala peraturan pelaksanaan peraturan perundang-undangan yang mengatur tentang pengawetan jenis tumbuhan dan satwa yang telah ada sebelum berlakunya Peraturan Pemerintah ini dinyatakan tetap berlaku sepanjang tidak bertentangan atau belum dicabut atau diganti berdasarkan Peraturan Pemerintah ini.

BAB XI KETENTUAN PENUTUP

Pasal 29

Peraturan Pemerintah ini mulai berlaku pada tanggal diundangkan.

Agar setiap orang mengetahuinya, memerintahkan pengundangan Peraturan Pemerintah ini dengan penempatannya dalam Lembaran Negara Republik Indonesia.

Ditetapkan di Jakarta pada tanggal 27 Januari 1999 PRESIDEN REPUBLIK INDONESIA

ttd BACHARUDDIN JUSUF HABIBIE

Diundangkan di Jakarta pada tanggal 27 Januari 1999 MENTERI NEGARA SEKRETARIS NEGARA REPUBLIK INDONESIA,

ttd AKBAR TANDJUNG

*27029 LEMBARAN NEGARA REPUBLIK INDONESIA TAHUN 1999 NOMOR 14

PENJELASAN ATAS PERATURAN PEMERINTAH REPUBLIK INDONESIA NOMOR 7 TAHUN 1999 TENTANG PENGAWETAN JENIS TUMBUHAN DAN SATWA

UMUM

Bangsa Indonesia dikaruniai oleh Tuhan Yang Maha Esa sumber daya alam hayati dan ekosistemnya yang terdiri dari sumber daya alam hewani, sumber daya alam nabati dan ekosistemnya. Sumber daya alam hayati tersebut dapat dijadikan salah satu modal dasar pembangunan pembangunan nasional Indonesia yang berkelanjutan. Agar sumber daya alam hayati yang merupakan karunia Tuhan Yang Maha Esa dan modal dasar pembangunan nasional Indonesia tersebut tidak cepat punah sehingga dapat dimanfaatkan untuk sebesar-besarnya kemakmuran rakyat, maka sumber daya alam hayati tersebut perlu dikonservasikan melalui kegiatan perlindungan sistem penyangga kehidupan, pengawetan keanekaragaman jenis tumbuhan dan satwa beserta ekosistemnya dan pemanfaatan secara lestari sumber daya alam hayati dan ekosistemnya. Mengingat akan kepentingan-kepentingan tersebut di atas, dan sebagai pelaksanaan dari Undang-undang Nomor 5 Tahun

1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya dan sebagai landasan hukum bagi pelaksanaan kegiatan pengawetan jenis tumbuhan dan satwa diperlukan peraturan perundang-undangan berbentuk Peraturan Pemerintah.

PASAL DEMI PASAL

Pasal 1

Angka 1 Cukup jelas

Angka 2 Cukup jelas

Angka 3 Cukup jelas

Angka 4 Cukup jelas

Angka 5 Cukup jelas

Angka 6 Cukup jelas

Angka 7 Kemampuan suatu populasi untuk berkembang bergantung pada keseimbangan antara kemampuan reproduksi dan kondisi-kondisi alam yang *27030 mempengaruhinya. Pada kondisi lingkungan yang paling mendukung, keseimbangan populasi akan tercapai pada saat daya dukung habitatnya terpenuhi. Populasi suatu jenis dapat terbagi-bagi ke dalam kelompok-kelompok yang dapat disebut sebagai sub populasi yang mempunyai keseimbangan tersendiri dengan habitat dan lingkungannya. Angka 8 Cukup jelas

Pasal 2

Jenis-jenis tumbuhan dan satwa tertentu karena faktor-faktor biologis, ekologis dan geografis dari jenis tersebut maupun faktor-faktor yang disebabkan oleh tindakan manusia telah mengalami keadaan dimana keberlangsungan kehidupannya terancam dan dapat punah dalam waktu dekat apabila tidak ada tindakan pengawetan. Pengawetan jenis tumbuhan dan satwa untuk mencegah atau menghindari terjadinya kepunahan dari suatu jenis tumbuhan atau satwa. Kecuali itu, keberadaan jenis-jenis tumbuhan dan satwa harus tetap terjaga kemurnian jenisnya serta tetap terjaga keanekaragaman genetik tanpa merubah sifat-sifat alami jenis tumbuhan dan satwa. Dengan mengawetkan jenis-jenis tumbuhan dan satwa, maka populasi jenis tumbuhan dan satwa dapat meningkat dan mencapai tingkat yang secara dinamik mantap. Karena suatu jenis tumbuhan maupun satwa merupakan bagian dari ekosistem, maka kemantapan populasi jenis tersebut dapat menjamin keseimbangan dan kemantapan ekosistem.

Pasal 3

Cukup jelas

Pasal 4

Ayat (1) Cukup jelas Ayat (2) Cukup jelas Ayat (3) Dalam hal Menteri memiliki data dan informasi ilmiah yang cukup bahwa suatu jenis tumbuhan atau satwa telah memenuhi kriteria untuk dilindungi, atau Menteri menerima usulan dari instansi pemerintah lain atau Lembaga Swadaya Masyarakat untuk melindungi suatu jenis tumbuhan atau satwa dengan informasi ilmiah yang cukup, maka Menteri dapat menetapkan jenis tersebut untuk dilindungi. Dalam hal usulan melindungi suatu jenis tumbuhan atau satwa datang dari LIPI, maka Menteri langsung menetapkan jenis yang diusulkan menjadi dilindungi.

Pasal 5

Ayat (1) Huruf a Suatu jenis dikatakan mempunyai populasi yang *27031 kecil apabila dicirikan oleh paling tidak salah satu dari hal-hal berikut: a. berdasarkan observasi, dugaan maupun proyeksi terdapat penurunan secara tajam pada jumlah individu dan luas serta kualitas habitat; b. setiap sub populasi jumlahnya kecil; c. mayoritas individu dalam satu atau lebih fase sejarah hidupnya pernah terkonsentrasi hanya pada satu sub-populasi saja; d. dalam waktu yang pendek pernah mengalami fluktuasi yang tajam pada jumlah individu; e. karena sifat biologis dan tingkah laku jenis tersebut seperti migrasi, jenis tersebut rentan terhadap bahaya kepunahan. Huruf b Adanya penurunan yang tajam pada jumlah individu di alam dapat diketahui berdasarkan: a. observasi dimana saat ini sedang terjadi penurunan tajam atau terjadi di waktu yang telah lampau namun ada potensi untuk terjadi kembali; atau b. dugaan atau proyeksi yang didasarkan pada paling tidak salah satu dari hal-hal berikut: 1) penurunan areal atau kualitas habitat; 2) ancaman dari faktor luar seperti adanya pengaruh patogen, kompetitor, parasit, predator, persilangan, jenis asing (jenis introduksi) dan pengaruh racun atau polutan; atau 3) menurunnya potensi reproduksi.

Huruf c Daerah penyebaran yang terbatas, dicirikan dengan paling sedikit salah satu dari hal berikut: a. terjadi fragmentasi populasi; b. hanya terdapat di satu atau beberapa lokasi (endemik); c. terjadi fluktuasi yang besar pada jumlah sub populasi atau jumlah areal penyebarannya; d. berdasarkan observasi, dugaan maupun proyeksi terdapat penurunan yang tajam pada paling tidak salah satu dari hal berikut: 1) areal penyebaran; 2) jumlah sub populasi; 3) jumlah individu; 4) luas dan kualitas habitat; 5) potensi reproduksi. Ayat (2) Cukup jelas

Pasal 6

Cukup jelas

Pasal 7

Pada saat ditetapkannya Peraturan Pemerintah ini, ketentuan mengenai kawasan suaka alam dan kawasan pelestarian alam diatur dalam Peraturan Pemerintah Nomor 68 Tahun 1998 tentang Kawasan Suaka Alam dan Kawasan Pelestarian Alam.

*27032 Pasal 8 Ayat (1) Pengawetan jenis tumbuhan dan satwa yang paling ideal dilakukan di dalam habitatnya (konservasi in situ) melalui kegiatan pengelolaan populasi dan pengelolaan habitat sehingga dihasilkan keseimbangan antara populasi dan habitatnya. Ayat (2) Dalam banyak hal, karena adanya tekanan terhadap populasi atau habitat, kegiatan konservasi in situ saja tidak cukup untuk melakukan pengawetan jenis-jenis tumbuhan dan satwa, sehingga harus didukung dengan pengelolaan jenis di luar habitatnya (konservasi ex situ). Tujuan dari konservasi ex situ adalah melepaskan kembali tumbuhan dan satwa ke dalam habitatnya sehingga dapat berkembang secara alami dan mencapai tingkat keseimbangan. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 9

Ayat (1) Untuk menetapkan suatu jenis tumbuhan atau satwa sebagai jenis yang dilindungi harus didasarkan pada informasi yang memadai tentang populasi, kondisi-kondisi biologis dan ekologis jenis yang bersangkutan termasuk habitat dan lingkungannya. Informasi yang paling akurat didapatkan melalui kegiatan inventarisasi. Namun demikian inventarisasi sering membutuhkan waktu, biaya dan tenaga yang sangat besar, sehingga sambil menunggu inventarisasi yang lebih rinci, penetapan jenis tumbuhan atau satwa sebagai jenis yang dilindungi dapat didasarkan dari hasil identifikasi yang menggambarkan keadaan populasi jenis tersebut secara garis besar dan dihubungkan dengan kriteria yang telah ditetapkan. Identifikasi diperlukan untuk mengetahui gambaran secara umum (kualitatif) status populasi suatu jenis tumbuhan atau satwa. Dari identifikasi sudah dapat diketahui bahwa suatu jenis tumbuhan atau satwa dapat digolongkan menjadi jenis yang dilindungi. Ayat (2) Cukup jelas

Pasal 10

Ayat (1) Inventarisasi merupakan kegiatan untuk mengetahui kondisi populasi jenis tumbuhan dan satwa termasuk habitatnya. Secara rinci Informasi tentang kondisi populasi yang penting diperoleh melalui kegiatan inventarisasi diantaranya dalam rangka perumusan kebijaksanaan antara lain berupa: a. data populasi termasuk status biologisnya; *27033 b. peta penyebaran jenis beserta habitatnya dengan skala yang cukup rinci; c. keadaan habitat. Ayat (2) Idealnya jumlah individu dari suatu populasi perlu diketahui, namun hal tersebut kecuali sulit juga memerlukan biaya yang tinggi sehingga dengan inventarisasi dapat dilakukan pendugaan-pendugaan tentang keadaan populasi suatu jenis dengan metoda survei serta teknik-teknik lain yang secara ilmiah dapat dipertanggungjawabkan. Hasil inventarisasi harus didokumentasikan secara baik dengan menggunakan teknologi pengelolaan data yang tersedia. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 11

Ayat (1) Dalam rangka perumusan kebijaksanaan pengawetan, jenis tumbuhan dan satwa, harus dilakukan pemantauan terhadap dinamika populasi. Ayat (2) Pemantauan secara berkala harus dilakukan, terutama terhadap jenis-jenis yang dilindungi dan jenis-jenis yang diperdagangkan dan mengalami tekanan perburuan atau yang mengalami tekanan terhadap habitatnya. Metoda pemantauan terhadap populasi tumbuhan dan satwa, seperti survei harus standar dan secara ilmiah dapat dipertanggungjawabkan, serta dapat dengan mudah dilaksanakan oleh petugas lapangan. Dalam menentukan metoda yang standar, Menteri perlu bekerjasama dan berkonsultasi dengan LIPI atau lembaga-lembaga lain, termasuk Lembaga Swadaya Masyarakat. Hasil pemantauan harus didokumentasikan secara baik dengan menggunakan teknologi pengelolaan data yang tersedia. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 12

Ayat (1) Cukup jelas Ayat (2) Huruf a Cukup jelas Huruf b Cukup jelas Huruf c Cukup jelas Huruf d Penjarangan dilakukan apabila populasi telah melampaui daya dukung habitat dan dapat dilakukan hanya jika jenis yang bersangkutan tidak dilindungi. Atau apabila jenis yang *27034 bersangkutan dilindungi, daya dukung habitatnya tidak dapat ditingkatkan atau tidak ada habitat lain yang dapat menampungnya apabila dilakukan relokasi. Penjarangan sedapat mungkin dilakukan dengan cara menangkap hidup-hidup, atau melalui kegiatan perburuan sebagaimana diatur dalam Peraturan Pemerintah mengenai perburuan satwa buru atau dalam Peraturan Pemerintah mengenai pemanfaatan jenis tumbuhan dan satwa liar. Huruf e. Penambahan tumbuhan atau satwa asli dimaksudkan untuk menambah atau merehabilitasi populasi dan atau habitat yang rusak. Yang dimaksud dengan jenis asli yaitu jenis yang pernah hidup di daerah yang akan direhabilitasi atau daerah yang akan direhabilitasi merupakan daerah penyebaran jenis dimaksud. Pemasukan jenis-jenis asing harus dihindarkan. Huruf f. Jenis tumbuhan dan satwa pengganggu terdiri dari golongan: a. jenis asli; b. jenis asing (exotic). Gangguan dari jenis-jenis asli terjadi karena adanya persaingan alami antar jenis dimana salah satu jenis mengungguli dan cenderung memusnahkan jenis yang lain yang umumnya terjadi pada habitat ekosistem yang tidak berada pada tingkat keseimbangan. Pengendalian gangguan dari jenis asli dilakukan dengan pembinaan populasi seperti penjarangan terhadap jenis pengganggu dan pembinaan habitat. Jenis-jenis asing (exotic) adalah jenis-jenis yang dalam sejarahnya tidak pernah hidup di kawasan geografi yang bersangkutan secara alami. Jenis-jenis asing tersebut berada di suatu daerah tertentu karena dibawa oleh manusia, sehingga jenis-jenis yang demikian harus dimusnahkan. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 13

Ayat (1) Yang dimaksud dengan penyelamatan merupakan pertolongan terhadap populasi jenis tumbuhan atau satwa yang habitatnya telah menjadi sempit dan terisolasi atau rusak karena adanya bencana alam atau karena kegiatan manusia sehingga populasi atau sub populasi jenis yang bersangkutan menjadi terancam bahaya kepunahan lokal apabila tetap berada di habitatnya. Kepunahan lokal adalah hilangnya suatu sub populasi dari wilayah habitat tertentu karena *27035 habitatnya menjadi sangat sempit, terfragmentasi (terpotong-potong) atau terisolasi dari populasi aslinya, atau habitatnya rusak dan memerlukan waktu lama untuk dipulihkan. Dalam keadaan demikian sub-populasi tersebut menjadi terancam punah sehingga harus diselamatkan melalui kegiatan relokasi atau translokasi yaitu pemindahan ke wilayah habitat lain yang lebih memadai. Ayat (2) Pemindahan ke lokasi lain (translokasi) merupakan kegiatan memindahkan seluruh sub-populasi yang terancam ke dalam habitatnya yang lain yang dapat mendukung sub-populasi tersebut. Pemindahan dapat dilakukan melalui kegiatan-kegiatan seperti penggiringan, pengangkutan atau cara-cara lain yang aman bagi tumbuhan atau satwa dan bagi manusia. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 14

Ayat (1) Pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa dalam rangka pengawetan adalah pengkajian, penelitian dan pengembangan yang harus menunjang terjaganya keanekaragaman genetik, keanekaragaman jenis dan keanekaragaman ekosistem. Sedangkan untuk kepentingan pemanfaatan, pengkajian, penelitian dan pengembangan diatur dengan Peraturan Pemerintah tersendiri. Ayat (2) Cukup jelas Ayat (3) Pengkajian, penelitian dan pengembangan pada dasarnya dapat dilakukan oleh ilmuwan baik yang mewakili instansi maupun perorangan sesuai dengan bidang ilmu yang dimilikinya. Namun demikian dalam rangka perumusan kebijaksanaan pengawetan jenis tumbuhan dan satwa, pengkajian, penelitian dan pengembangan harus tetap menjadi tanggung jawab Pemerintah. Ayat (4) Cukup jelas

Pasal 15

Ayat (1) Pemeliharaan jenis-jenis tumbuhan dan satwa bertujuan untuk menyelamatkan dan memelihara sumber daya genetik di luar habitatnya dalam rangka mendukung konservasi jenis tumbuhan dan satwa di dalam habitatnya. Pemeliharaan individu-individu tumbuhan atau satwa dilakukan karena individu tersebut karena suatu sebab tidak dapat dikembalikan ke habitatnya sehingga lebih baik dipelihara sebagai cadangan atau sumber plasma nutfah dalam rangka pengembangbiakan di luar habitatnya. Pemeliharaan jenis tumbuhan dan satwa dapat *27036 berbentuk: a. memelihara tumbuhan atau satwa dalam keadaan hidup; b. menyimpan semen beku; c. menyimpan biji atau benih di dalam penyimpanan kering dan dingin. Ayat (2) Lembaga konservasi merupakan tempat yang paling ideal untuk memelihara jenis-jenis tumbuhan dan satwa dalam rangka pengawetan sumber daya genetik di luar habitatnya. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 16

Ayat (1) Yang dimaksud dengan pengembangbiakan adalah usaha memperbanyak individu secara buatan baik di dalam maupun di luar habitatnya melalui cara-cara sebagai berikut: a. Untuk tumbuhan, memperbanyak individu dilakukan dengan cara menumbuhkan material untuk tumbuh dari tumbuhan seperti biji, stek (potongan), pemencaran dari satu rumpun, kultur jaringan tumbuhan dan spora dengan tetap mempertahankan kemurnian jenisnya. Kemurnian jenis akan terjaga apabila tidak terjadi pembiakan silang antar jenis (species maupun sub species). b. Untuk satwa, memperbanyak individu dilakukan dengan cara mengawinkan secara alami maupun buatan (inseminasi buatan) apabila cara reproduksinya adalah kawin dan dengan cara lain apabila cara reproduksinya adalah tidak kawin baik di dalam maupun di luar habitatnya. Pengembangbiakan satwa dengan campur tangan manusia harus memperhatikan etika yang berlaku. Ayat (2) Dalam rangka pengawetan jenis tumbuhan dan satwa ini, pengembangbiakan harus ditujukan untuk dikembalikan lagi ke habitat alamnya sebagai upaya meningkatkan populasi di alam. Oleh karena itu dalam pengembangbiakan satwa yang cara reproduksinya kawin harus dihindari perkawinan antar kerabat (in breeding) dan perkawinan silang antar jenis atau antar anak jenis agar dihasilkan individu-individu yang secara genetik sehat dari jenis yang murni. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 17

Ayat (1) Pengkajian, penelitian dan pengembangan jenis tumbuhan dan satwa yang dilakukan di luar *27037 habitatnya adalah dalam rangka pengawetan dan merupakan penelitian dan pengembangan yang mendukung konservasi in situ dengan tujuan terjaganya keanekaragaman genetik, keanekaragaman jenis dan keanekaragaman ekosistem. Ayat (2) Cukup jelas Ayat (3) Cukup jelas

Pasal 18

Ayat (1) Tidak semua satwa yang berada di luar habitat aslinya dapat langsung dikembalikan ke habitat alamnya. Hal ini karena individu satwa tersebut telah lama berada di lingkungan manusia yang membuat adanya ketergantungan terhadap manusia sehingga apabila langsung dilepaskan ke habitat alamnya akan mengalami kematian, menularkan penyakit kepada populasi asli di habitat alam, atau menurunkan mutu genetik (degenerasi) populasi asli di habitat alam. Oleh sebab itu, untuk mengadaptasikan dan mengkondisikan serta memilih satwa yang akan dilepaskan kembali ke habitat alamnya perlu dilakukan rehabilitasi agar mempunyai keadaan dan tingkah laku seperti populasi asli yang berada di alam. Rehabilitasi satwa dilakukan agar satwa yang telah lama berada di lingkungan manusia mempunyai ketahanan hidup yang tinggi untuk dilepaskan kembali ke alam serta tidak mengganggu populasi asli yang telah mendiami habitat tersebut melalui penyebaran penyakit dan polusi genetik. Ayat (2) Rehabilitasi satwa meliputi kegiatan-kegiatan sebagai berikut: a. mengamati kesehatan satwa; b. melakukan pengobatan dan pemberian vitamin dan makanan tambahan; c. melatih dan mengadaptasikan dengan lingkungan habitat alamnya satwa-satwa yang terpilih untuk dilepaskan ke habitatnya. Ayat (3) Cukup jelas

Pasal 19

Ayat (1) Tumbuhan dan satwa yang secara tidak sah berada di luar habitatnya dibawah penguasaan seseorang harus diselamatkan untuk dikembalikan ke habitatnya. Ayat (2) Cukup jelas

Pasal 20

Ayat (1) Cukup jelas Ayat (2) Cukup jelas

*27038 Pasal 21 Ayat (1) Yang dimaksud dengan melepaskan kembali ke habitatnya adalah kegiatan mengembalikan ke habitat alamnya satwa hasil pengembangbiakan, penyelamatan, rehabilitasi atau hasil sitaan agar dapat berkembang biak secara alami dengan memperhatikan daerah sebaran asli jenis yang bersangkutan, populasi yang telah mendiami habitat tujuan, daya dukung habitat tujuan dan lingkungannya. Dalam melepaskan kembali satwa ke habitat alamnya harus diperhatikan daya dukung habitat yaitu kemampuan habitat untuk menjamin lestari jenis yang akan dilepaskan. Termasuk dalam komponen daya dukung habitat adalah kecukupan pakan secara alami dan ruang perlindungan. Habitat yang dipilih untuk pelepasan kembali harus merupakan tipe habitat yang menurut sejarahnya diketahui merupakan sebaran asli jenis yang akan dilepaskan. Sebaran asli adalah suatu wilayah dimana suatu jenis diketahui pernah ada. Dalam melepaskan kembali satwa ke habitat alamnya harus juga diperhatikan populasi penghuni yang telah ada baik dari jenis yang sama maupun dari jenis lain sehingga dapat dinilai kemungkinan-kemungkinan adanya persaingan, predasi, simbiose dan parasitisme. Secara fisik sehat berarti secara visual terlihat sehat, kuat dan aktif serta diketahui bebas dari penyakit. Sedangkan keragaman genetik yang tinggi berarti bukan merupakan hasil pengembangbiakan dimana terjadi kawin antar kerabat (inbreeding) dan sedapat mungkin merupakan keturunan terdekak dengan induk yang berasal dari tangkapan di alam. Satwa hasil tangkapan dari alam dapat dipastikan mempunyai keragaman genetik yang tinggi. Ayat (2) Cukup jelas

Pasal 22

Ayat (1) Cukup jelas Ayat (2) Cukup jelas Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 23

Ayat (1) Cukup jelas Ayat (2) Cukup jelas

Pasal 24

Ayat (1) Cukup jelas Ayat (2) *27039 Cukup jelas Ayat (3) Cukup jelas

Pasal 25

Ayat (1) Surat izin pengangkutan memuat antara lain : a. Nomor surat dan tanggal surat; b. Jenis dan jumlah tumbuhan dan atau satwa; c. Asal-usul satwa; d. Tempat tujuan; e. Masa berlaku surat izin; f. Pelabuhan atau terminal pemberangkatan; g. Pelabuhan atau terminal tujuan; h. Ketentuan lain. Ayat (2) Huruf a Cukup jelas Huruf b Ketentuan teknis pembuatan kandang satwa serta cara-cara pengangkutan mengikuti ketentuan-ketentuan dengan standar internasional. Ayat (3) Cukup jelas

Pasal 26

Ayat (1) Yang dimaksud dengan membahayakan kehidupan manusia adalah dapat mengancam kehidupan manusia yang hidup secara normal di tempat pemukiman atau lingkungan pemukiman sehingga keberadaan satwa di tempat itu sangat membahayakan dan dapat mengancam jiwa manusia warga masyarakat dalam pemukiman tersebut. Satwa yang membahayakan kehidupan manusia tersebut dapat terjadi karena habitatnya berdampingan dengan pemukiman manusia atau habitat satwa tersebut telah menjadi sempit dan terisolasi oleh kegiatan manusia sehingga dalam penjelajahan sehari-hari keluar dari habitatnya atau karena sudah tua atau kalah bersaing dan terusir dari kelompoknya sehingga keluar dari habitatnya menuju pemukiman manusia. Satwa yang berpenyakit dan karena penyakit tersebut membahayakan kehidupan manusia, maka satwa tersebut dapat dimusnahkan. Ayat (2) Yang dimaksud dengan mengancam secara langsung apabila satwa tersebut secara langsung diduga akan mencederai atau membunuh manusia atau menularkan penyakit yang membahayakan kehidupan manusia dan tidak ada cara lain yang lebih efektif untuk menghindarinya. Ayat (3) Cukup jelas Ayat (4) Cukup jelas

Pasal 27

Ayat (1) *27040 Cukup jelas Ayat (2) Yang dimaksud dengan aparat penegak hukum yang berwenang adalah Polisi Republik Indonesia, Jagawana, Petugas Bea Cukai, Petugas Karantina dan Penyidik Pegawai Negeri Sipil (PPNS). Ayat (3) Cukup jelas Ayat (4) Cukup jelas Ayat (5) Cukup jelas

Pasal 28

Cukup jelas

Pasal 29

Cukup jelas

TAMBAHAN LEMBARAN NEGARA REPUBLIK INDONESIA NOMOR 3803

CATATAN

LAMPIRAN PERATURAN PEMERINTAH REPUBLIK INDONESIA NOMOR 7 TAHUN 1999 TANGGAL 27 Januari 1999

Jenis-jenis Tumbuhan dan Satwa yang Dilindungi

----- No. Nama Ilmiah Nama Indonesia -----

MAMALIA (MENYUSUI)

1 Anoa depressicornis Anoa dataran rendah, Kerbau Pendek 2 Anoa quarlesi Anoa pegunungan 3 Arctictis binturong Binturung 4 Arctonyx collaris Pulusan 5 Babyrousa babyrussa Babirusa 6 Balaenoptera musculus Paus biru 7 Balaenoptera physalus Paus bersirip 8 Bos sondaicus Banteng 9 Capricornis sumatrensis Kambing Sumatra 10 Cervus kuhli; Axis kuhli Rusa Bawean 11 Cervus spp. Menjangan, Rusa, Sambar (semua jenis dari genus Cervus) 12 Cetacea Paus (semua jenis dari famili Cetacea) 13 Cuon alpinus Ajag 14 Cynocephalus variegatus Kubung, Tando, Walangkekes 15 Cynogale bennetti Musang air 16 Cynopithecus niger Monyet hitam Sulawesi 17 Dendrolagus spp. Kanguru pohon (semua jenis dari genus Dendrolagus) 18 Dicerorhinus sumatrensis Badak Sumatera *27041 19 Dolphinidae Lumba-lumba air laut (semua jenis dari famili Dolphinidae) 20 Dugong dugon Duyung 21 Elephas indicus Gajah 22 Felis badia Kucing merah 23 Felis bengalensis Kucing hutan, Meong congkok 24 Felis marmorata Kuwuk 25 Felis planiceps Kucing dampak 26 Felis temmincki Kucing emas 27 Felis viverrinus Kucing bakau 28 Helarctos malayanus Beruang madu 29 Hylobatidae Owa, kera tak berbuntut (semua jenis dari famili Hylobatidae) 30 Hystrix brachyura Landak 31 Iomys horsfieldi Bajing terbang ekor merah 32 Lariscus hosei Bajing tanah bergaris 33 Lariscus insignis Bajing tanah, Tupai tanah 34 Lutra lutra Lutra 35 Lutra sumatrana Lutra Sumatera 36 Macaca brunnescens Monyet Sulawesi 37 Macaca maura Monyet Sulawesi 38 Macaca pagensis Bokoi, Beruk mentawai 39 Macaca tonkeana Monyet jambul 40 Macrogalidea musschenbroeki Musang Sulawesi 41 Manis javanica Trenggiling, Peusing 42 Megaptera novaeangliae Paus bongkok 43 Muntiacus muntjak Kidang, Muncak 44 Mydaus javanensis Sigung 45 Nasalis larvatus Kahau, Bekantan 46 Neofelis nebulosa Harimau dahan 47 Nesolagus netscheri Kelinci Sumatera 48 Nycticebus coucang Malu-malu 49 Orcaella brevirostris Lumba-lumba air tawar, Pesut 50 Panthera pardus Macan kumbang, Macan tutul 51 Panthera tigris sondaica Harimau Jawa 52 Panthera tigris sumatrae Harimau Sumatra 53 Petaurista elegans Cukbo, Bajing terbang 54 Phalanger spp. Kuskus (semua jenis dari genus Phalanger) 55 Pongo pygmaeus Orang Utan, Mawas 56 Presbytis frontata Lutung dahi putih 57 Presbytis rubicunda Lutung merah, Kelasi 58 Presbytis aygula Surili 59 Presbytis potenzianni Joja, Lutung Mentawai 60 Presbytis thomasi Rungka 61 Prionodon linsang Musang congkok 62 Prochidna bruijni Landak Irian, Landak semut 63 Ratufa bicolor Jelarang 64 Rhinoceros sondaicus Badak Jawa 65 Simias concolor Simpei Mentawai 66 Tapirus indicus Tapir, Cipan, Tenuk 67 Tarsius spp. Binatang hantu, Singapuar (semua jenis dari genus Tarsius) 68 Thylogale spp. Kanguru tanah (semua jenis dari genus Thyloga

APPENDIX 3: Nautilus products available online through Yahoo in Taiwan

Product	Notes/Description	Vendor Website
Nautilus shell (species and origin not given)	Quantity available unknown, but potentially sizable	https://tw.page.bid.yahoo.com/tw/auction/e40787367;_ylt=Av7SbRcq2afRKGWJPLvICtyFbN8;_ylv=3
Nautilus clock	Size of Nautilus: 48x38cm	https://tw.page.bid.yahoo.com/tw/auction/1236107870?
Nautilus lamp	Origin from Bali	https://tw.page.bid.yahoo.com/tw/auction/e40787367;_ylt=Aj0qBYbAfWLVVSpYGIXBNv9yFbN8;_ylv=3
Nautilus shell	Size of Nautilus: 20cm	https://tw.mall.yahoo.com/item/p025145806704;_ylt=A8tUwYKKq2ITaSYAIB9r1gt.;_ylu=X3oDMTVib2tmZmphBHQ0A3Byb2RMc3QEdDUDcHJvZARONXBvcwMxBHQ2A2ltZwR0YXJndXJsA2h0dHBzOi8vdHcubWFsbC55YWhvby5jb20vaXRlbS9wMDIIMTQ1ODA2NzA0P19jbz1wRlNfVklQVFc1OSZfY28yPXBGU19WSVBUVzU5BGlkA3AwMjUxNDU4MDY3MDQeY2F0aWQDNzM4NTAwMDAwMDAwBHByaWNlAzEsNjkwIOWFgw--?_co=pFS_VIPTW59&_co2=pFS_VIPTW59
Nautilus shell	7-8 cm	https://tw.mall.yahoo.com/item/p025133303122;_ylt=Ai1cNodJIW5WsSyYfCb8Za1iTB4J;_ylv=3?act=srpa

APPENDIX 4: Websites of European (inc. overseas territories) traders offering *Nautilus* shells for sale

Table I. European trader websites offering nautilus products for sale.

Vendor Location	Product type and website (screen shot number links to Table IV below)	Species	Origin	Notes and information on offers for sale (size, availability; if specified)
France (incl. overseas territories/departments)				
	Whole shells; shells cut in half or three: http://www.alexnat.com/coquillages/liste_generale/liste_generale.php (n1)	<i>Nautilus pompilus</i>	Philippines or “zone Indo-Pacific”	<ul style="list-style-type: none"> • Sizes 8 - 18cm • Sold as whole shells, shells cut in half or into three
	Other items: http://www.alexnat.com/recherche.php?keyword=nautilus&submit=Rechercher&action=search (n2)	Not specified		<ul style="list-style-type: none"> • Also items made from <i>Nautilus</i> pearl • Various sizes and prices
	Whole shells: http://www.lagrenadine.com/prestashop/search.php?search_query=nautilus (n3)	<i>Nautilus macromphallus noumea</i>	Not stated	<ul style="list-style-type: none"> • Branches in Italy also
	Whole shells: http://alabaster-shell.com/1/index.php (n4)	<i>Nautilus perforatus</i>	IndonesiaPhilippines	<ul style="list-style-type: none"> • Size: 174.3 mm, • Described as “Grade F++ RARE” • 1 item in stock
	Also selling on eBay: http://www.ebay.in/itm/SEA-SHELL-COQUILLAGE-NAUTILUS-NACRE-/170308871645#shId (n5)	<i>Nautilus</i> spp.	Indonesia	<ul style="list-style-type: none"> • Size 170-180mm, • Described as F+++ • 6 available, 27 sold
	 http://www.ebay.in/itm/SEA-SHELL-COQUILLAGE-NAUTILUS-			<ul style="list-style-type: none"> • Size: 155-170 mm, • Described as “Grade F++ RARE” • 2 available, 2 sold

<p>SCROBICULATUS- /170789648089#ht_1818wt_1093 (n6)</p>	<p><i>Nautilus perforatus</i></p>	<p>New Caledonia</p>	<ul style="list-style-type: none"> • Size: 130 mm, • Described as Rare F+++
<p>http://www.ebay.fr/itm/SEA-SHELL-COQUILLAGE-NAUTILUS-MACRONPHALUS- /360833463745?pt=FR_JG_Collections_Coquillages_Coquillages&hash=item540359b5c1 (n7)</p>	<p><i>Nautilus macromphallus</i></p>	<p>Philippines</p>	<ul style="list-style-type: none"> • Size: 100 to >150 mm,
<p>Whole shells: http://alacapitainerie.pagesperso-orange.fr/frame.html?page=coquillages.html&option=2 (n8)</p>	<p><i>Nautilus pompilus</i></p>	<p>Philippines</p>	<ul style="list-style-type: none"> • Size: 100 to >150 mm,
<p>Whole shells: http://www.caledonianseashells.com/search.php?orderby=position&orderway=desc&search_query=nautilus (n9)</p>	<p><i>Nautilus macromphalus</i></p>	<p>New Caledonia</p>	<ul style="list-style-type: none"> • Shop based in New Caledonia 3 advertisements • 2 advertisements
<p>Whole Shells: http://www.pat-coquillages.fr/offre/ (n10)</p>	<p><i>Nautilus perforatus</i></p>	<p>Indonesia</p>	
<p>Whole Shells: http://www.pat-coquillages.fr/offre/ (n10)</p>	<p><i>Nautilus macromphalus</i></p>	<p>New Caledonia</p>	

	<i>Nautilus pompilius</i>	Palau Islands	
	<i>Nautilus repertus</i>	Australia	
<i>Nautilus</i> shells mounted on wooden stands: http://www.art-deco-marin.com/advanced_search_result.php?search_in_description=0&keywords=nautilus&x=0&y=0 (n11)	Not specified	Not specified	<ul style="list-style-type: none"> • Multiple items available
Whole Shells: http://www.nuggetsfactory.com (n12) Also selling on Ebay: http://www.ebay.fr/itm/1-Nautilus-Nautilus-des-Philippines-003-/190834291627?pt=FR_JG_Collections_Coquillages_Coquillages&hash=item2c6e9c33ab (n13)	Not specified	Philippines	<ul style="list-style-type: none"> • Sizes: small (69-90 mm), large (170-190 mm), • 4 available • Varying sizes • 4 available
Half shell: http://www.chasse-maree.com/objets-de-marine/decoration-marine/decoration-maritime/3,4541-coquillage-nautilus.html (n14)	<i>Nautilus pompilius</i>	Not specified	<ul style="list-style-type: none"> • Size: around 150 mm
http://www.anatoll.fr/achat/index.php?id=10&start=100 (n15) and http://www.anatoll.fr/achat/index.php?id=10&start=105 (n16)	Not specified	Not specified	<ul style="list-style-type: none"> • Various shells for sale, ranging from 100 to 180 mm.

Germany

http://www.nadeco.de/naturdekorationen/chdekoration/muschelnundschnecken/ (n17)	<i>Nautilus pompilius</i>	Pacific	<ul style="list-style-type: none"> • Various shells for sale and sizes ranging from 10-20 cm,
http://elegant-green.com/Interieur/Wohnaccessoires/Art---Decor-75/Nautilus-Schale--Perlmutter.html (n18)	Not specified	Not specified	<ul style="list-style-type: none"> • Decorative shell on stand,
http://www.fossilien.de/seiten/nautilus/nautilus_rezent.htm (n19)	<i>Nautilus pompilius</i>	Philippines	<ul style="list-style-type: none"> • Various shells for sale, sizes ranging from 11-13cm,
http://www.sternsand.de/de/dept_18.html (n20)	Not specified	Not specified	<ul style="list-style-type: none"> • Various shells sold as whole shells, or split in half or thirds, various sizes available.
http://www.muschel-sammler-shop.de/shop/page/3?sessid=GwGMc2AM10EJcbWS2lzVepOi2E0YOHY6sf0vvaz8pInQYu0l05RDWSLSlxlv5fyF&shop_param=shop_overview_pager%3D1%26cid%3D38%26 (n21)	Not specified	Not specified	<ul style="list-style-type: none"> • Half shell, size 150 mm.
http://www.dreamsailor.de/shop/article_40006/Muschel-geschliffen%2C-Nautilus-pompilius.html?sessid=WB5bGY9ctYdgIqsD84v3kbRWWHfR8VvKpsAT8OIHYTd2zwOfp6OpSL8C3NqiEH7K&shop_param=cid%3D9%26aid%3D40006%26 (n22)	<i>Nautilus pompilius</i>	Not specified	<ul style="list-style-type: none"> • Size 18 cm, Price:

United Kingdom

http://www.beachcomberseashells.co.uk/nautilus.htm (n23)	<i>Nautilus pompilius</i>	Not specified	<ul style="list-style-type: none"> • Various sizes (“mini” to “large”) from 6 to 15 cm.
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http://shellworldgifts.com/index.php?route=product/search&filter_name=nautilus (n24)	<i>Nautilus pompilius</i>	Not specified	• Sizes: 10-15 cm.
http://www.buythesea-bymail.co.uk/nautilus-shell-polished-pearl-337-p.asp (n25)	Not specified	Not specified	• Size 17-20 cm.
http://www.dorsetgifts.com/shellslarge.html (n26)	Not specified	Not specified	• Various sizes from 50-200 mm.
http://www.nautilusimports.co.uk/shells.htm (n27)	Not specified	Not specified	• Various sizes, whole shells and split in half or thirds.
http://eatonseashells.cowleg.com/advanced_search_result.php?keywords=nautilus (n28)	<i>Nautilus pompilius</i>	Not specified	• Sold as whole shells, and split in half or sold as centre section only.

Other countries

http://demuseumwinkel.com/Schelpen (n29)	Not specified	Not specified	<ul style="list-style-type: none"> • Based in the Netherlands. • Various sizes of shell from 10 to 17 cm, whole shells and mounted on stands.
http://www.conchology.be/?t=27&family=N_AUTILIDAE&species=&locality=&display=ge nus (n30)	<i>Nautilus pompilius suluensis</i>	Palawan Island, Philippines	<ul style="list-style-type: none"> • Various sizes from 106-151 mm. • Belgian owners, company based in Philippines
http://www.noveltex.gr/component/virtuemart/?page=shop.browse&category_id=11 (n31)	Not specified	Not specified	<ul style="list-style-type: none"> • Greek website. • Various sizes, whole shells and split from 5.8-19.8 cm. • Multiple items available.

http://www.bomponiera.com/prod-227-ylika-gia-mpomponieres-vaftisis-%E2%80%93mpomponieres-gamou-kochyli-naytilos-html (n32)	Not specified	Not specified	<ul style="list-style-type: none"> • Greek website. • Whole shells, size 12 cm. • Wedding presents, favours.
http://www.oceanwave.gr/images/stories/pdf/katalogos_2013.pdf (n33)	Not specified	Not specified	<ul style="list-style-type: none"> • Greek website. • Whole shells.

Table II. Listings of *Nautilus* products on national European eBay or other auction/e-commerce sites
(if not listed above, by country where product is located).

Vendor Location	Product type and website (screen shot number, links to Table IV)	Species	Origin	Notes and information on offers for sale (size, availability; if specified)
Czech Republic	Nautilus shell pearl pendant: http://www.ebay.fr/itm/Nautilus-shell-pearl-925-silver-pendant-27-65cts-CJAPEND0524-/380248471248?pt=Fashion_Jewelry&hash=item58889336d0 (n34)	Not specified	Not specified	<ul style="list-style-type: none"> • Ships internationally.
France	Half Shell: http://www.ebay.fr/itm/Coquillage-decoupe-demi-nautilus-pompilius-/151206212770?pt=FR_JG_Collections_Coquillages_Coquillages&var=&hash=item233497b4a2 (n35)	<i>Nautilus pompilius</i>	Indian Ocean	<ul style="list-style-type: none"> • Size: 160-190 mm. • 4 available.
Germany	Pendants, earrings made from <i>Nautilus</i> shell, e.g. filled with resin: http://www.ebay.de/itm/NAUTILUS-PERLMUTT-SILBER-ANHANGER-schmuck-design-kette-ammonit-muschel-perlboot-/400547490592?pt=DE_Armb%C3%A4nder_Sets&hash=item5d427dab20 (n36)	Not specified	Not specified	<ul style="list-style-type: none"> • Multiple items available. • Ships internationally.

Vendor Location	Product type and website (screen shot number, links to Table IV)	Species	Origin	Notes and information on offers for sale (size, availability; if specified)
Germany	Nautilus pearl: http://www.ebay.de/itm/EvS-schone-grose-Nautilus-Perlen-Zuchtperle-Natilusperle-oval-43-x-27-mm-/390559127578?pt=DE_Uhren_Schmuck_Echtschmuck&hash=item5aef23581a (n37)	Not specified	Not specified	<ul style="list-style-type: none"> • Availability not specified. • Ships internationally.
Germany	Whole shells, earrings, pendants and rings made from <i>Nautilus</i> shell: http://www.meinpaket.de/de/searchResult.html;jsessionid=C F8B01A726ABF387AE6006377EC5A2BA.as00?ajaxsearchlink=%2Fde%2Fsuggest%2Fjson%3Bjsessionid%3DCF8B01A726ABF387AE6006377EC5A2BA.as00%3Fscope%3D%252f%252fcatalog01%252fde_DE&search=Nautilus+Muschel&ajaxresponseType=JSON&submit.x=39&submit.y=10 (n38)	<i>Nautilus pompilius</i>	Not specified	<ul style="list-style-type: none"> • Whole shells range in size from 12-15 cm approx. • In stock.
Germany	Whole shells, pendants and earrings made from <i>Nautilus</i> shell: http://www.meta-shops.com/36729/suchergebnisse/nautilus-muschel/ (n39)	<i>Nautilus pompilius</i>	Not specified	<ul style="list-style-type: none"> • Whole shells range in size from 10-17 cm.
Malaysia	Pendant: http://www.ebay.co.uk/itm/BEAUTIFUL-GENUINE-NAUTILUS-SHELL-925-STERLING-SILVER-PENDANT-/310636422487?ssPageName=ADME:X:RTQ:GB:1123 (n40)	Not specified	Not specified	
USA	<i>Nautilus</i> shell ring: http://www.ebay.co.uk/itm/PEARL-BLUE-NAUTILUS-SHELL-925-STERLING-SILVER-US-9-ring-/380810957586?pt=Handcrafted_Artisan_Jewelry&hash=item58aa1a1312 (n41)	Not specified	Not specified	<ul style="list-style-type: none"> • Ships internationally.

Vendor Location	Product type and website (screen shot number, links to Table IV)	Species	Origin	Notes and information on offers for sale (size, availability; if specified)
USA	<p><i>Nautilus</i> shell Mabe pearl necklace:</p> <p>http://www.ebay.fr/itm/NAUTILUS-SHELL-MABE-PEARL-SWISS-BLUE-TOPAZ-925-SILVER-NECKLACE-18-/310835052136?pt=Fashion_Jewelry&hash=item485f367e68(n42)</p>	Not specified	Not specified	<ul style="list-style-type: none"> Ships internationally.
USA	<p>Various jewellery items (earrings, pendants, rings):</p> <p>http://www.ebay.com/sch/m.html?_odkw=&item=171198893276&osacat=0&ssPageName=ADME%3AX%3AeRTM%3AUS%3A1123&ssn=fifirose&trksid=p2046732.m570.l1313.TR12.TRC2.A0.Xnautilus&nkw=nautilus&sacat=0&from=R40(n43)</p>	Not specified	Not specified	<ul style="list-style-type: none"> Ships internationally.
USA	<p><i>Nautilus</i> shell buttons:</p> <p>http://www.ebay.co.uk/itm/4-Nautilus-Shell-Buttons-with-Button-Shank-3-4-20mm-Natural-Shell-Button/251438360393?trksid=p2047675.c100011.m1850&trkparms=aid%3D222006%26algo%3DSIC.FITP%26ao%3D1%26asc%3D20183%26meid%3D4483873121355090346%26pid%3D100011%26prg%3D9057%26rk%3D0%26rkt%3D10%26sd%3D251410713281(n44)</p>	Not specified	Not specified	<ul style="list-style-type: none"> Priority shipping to UK. 4 available.
UK	<p><i>Nautilus</i> shell curtain tie backs:</p> <p>http://www.ebay.co.uk/itm/Pair-of-real-nautilus-shell-tie-backs-ivory-silver-or-burnt-orange-tassel-/170981871418?pt=UK_Home_Garden_Curtains_Blinds_CurtainFixtures_Accessories_EH&var=&hash=item27cf504f3a(n45)</p>	Not specified	Not specified	<ul style="list-style-type: none"> Shell size approx. 12cm. 9 pairs available.
UK	<p>http://www.ebay.co.uk/itm/Sea-Shells-Nautilus-Pompilius-Argonautidae-ID-1903-</p>	<i>Nautilus pompilius</i>	Indo-Pacific	<ul style="list-style-type: none"> Size 183 mm. Described as F++

Vendor Location	Product type and website (screen shot number, links to Table IV)	Species	Origin	Notes and information on offers for sale (size, availability; if specified)
	/171170619653?pt=UK Collectables RocksFossils Minerals EH&hash=item27da906105 (n46)			

Table III. Examples of listings of *Nautilus* products on Alibaba (not Europe-specific).

Vendor Location	Link to page	Species	Origin	Offer for sale (species, price, number)
China	http://www.alibaba.com/product-detail/Sea-Shell-Multi-Gemstone-925-Sterling_139366025.html (n47, n48)	Not specified	Hainan China	<ul style="list-style-type: none"> • Natural polished <i>Nautilus</i> shell. • Size: 160-190 mm. • Can supply 10000 per month, maximum 20 per order. • Ships internationally.
India	http://www.alibaba.com/product-detail/Sea-Shell-Multi-Gemstone-925-Sterling_139366025.html (n49)	Not specified	Rajasthan India	<ul style="list-style-type: none"> • Pendant made from <i>Nautilus</i> shell. • Availability: able to supply 1000 pieces per week. Minimum of 20 per order. • Had over 20 similar products made of Nautilus shell – pendants and earring.
Philippines	http://www.alibaba.com/product-detail/chamber-nautilus-shell_140085348.html (n50)	Not specified	Philippines	<ul style="list-style-type: none"> • Whole natural and polished shells. • 5-7 inches in size. • Can supply up to 100 shells per week.
Philippines	http://www.alibaba.com/product-detail/Nautilus_100163308.html (n51, n52)	<i>Nautilus pompilius</i>	Philippines	<ul style="list-style-type: none"> • Live <i>Nautilus pompilius</i> for aquarium trade. • Offer three different sizes (3, 5 and 7 inches) in boxes of up to 12 individual <i>Nautilus</i>.

Viet Nam	http://www.alibaba.com/product-detail/Chambered-Nautilus_125643863.html (n53)	Not specified	Binh Duong Vietnam	<ul style="list-style-type: none"> • Shipped internationally, including to Europe (Germany, France, UK). • Whole shells come from islands in Vietnam. • 5-7 inches in size. • Can supply 1000 pieces per month.
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Table IV: Screenshots for Tables I-III

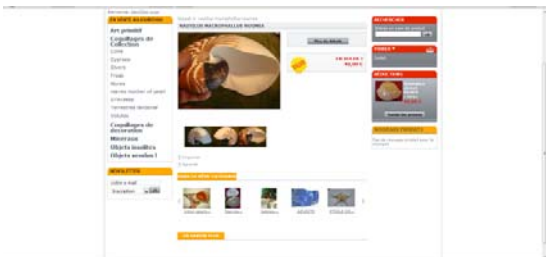
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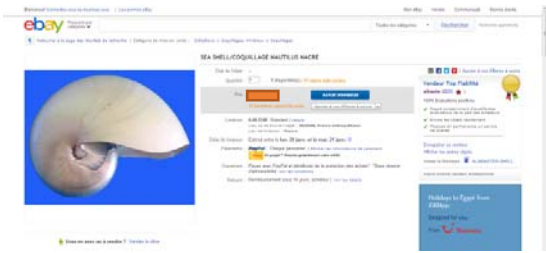
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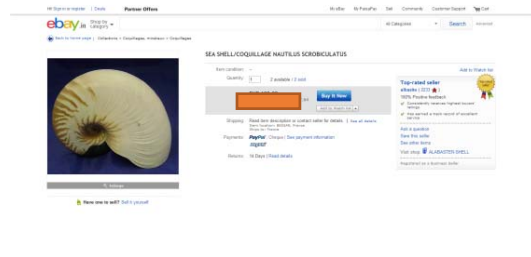
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5



6



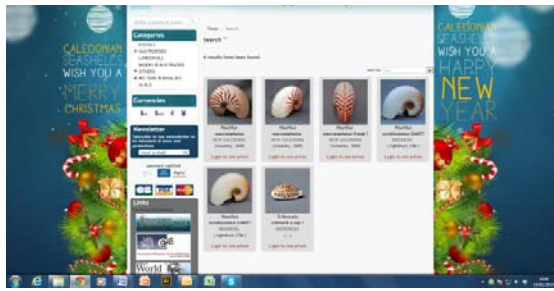
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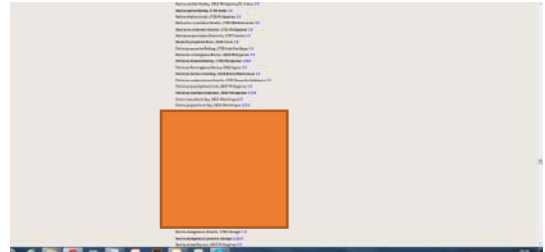
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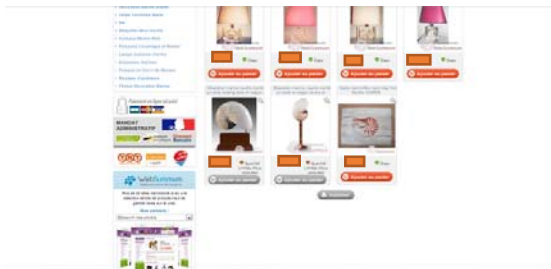
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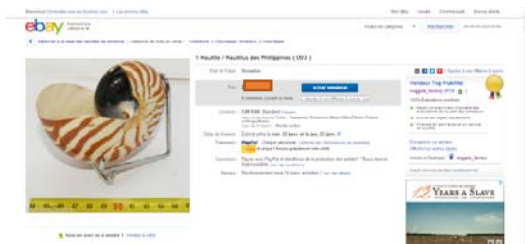
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12



13



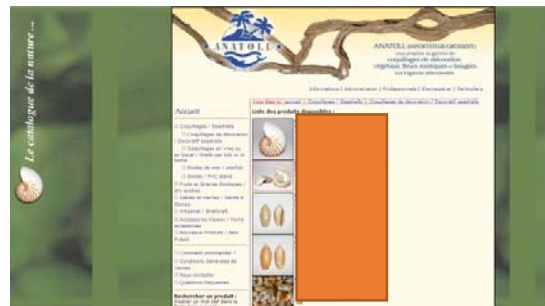
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15



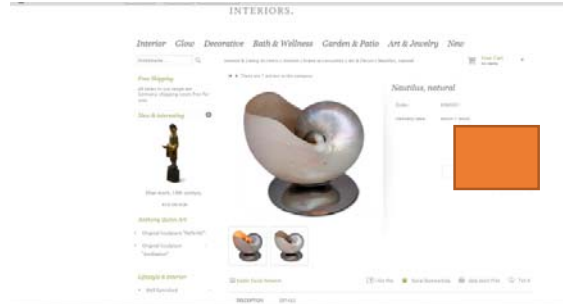
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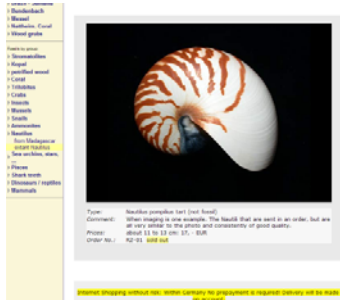
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18



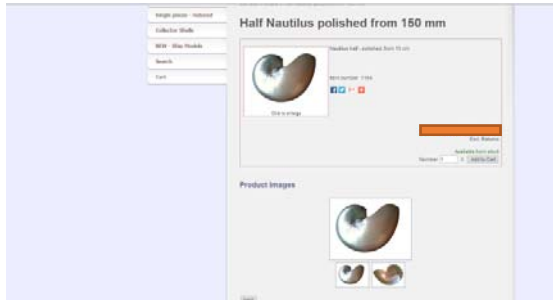
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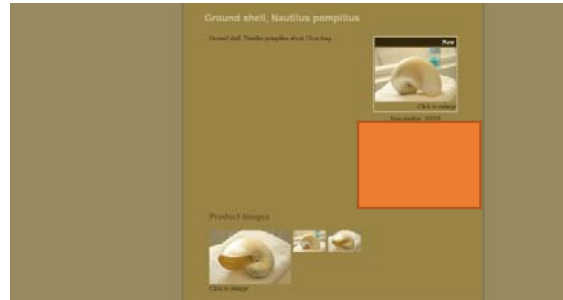
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21



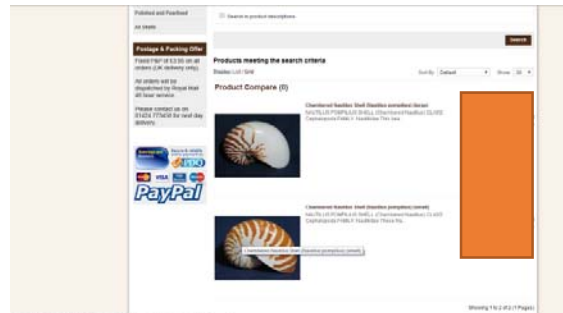
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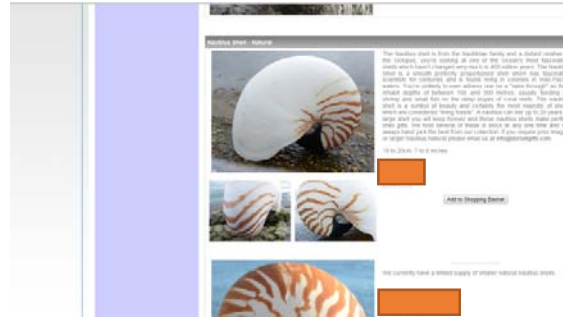
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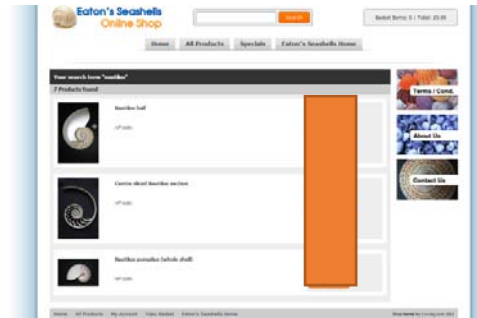
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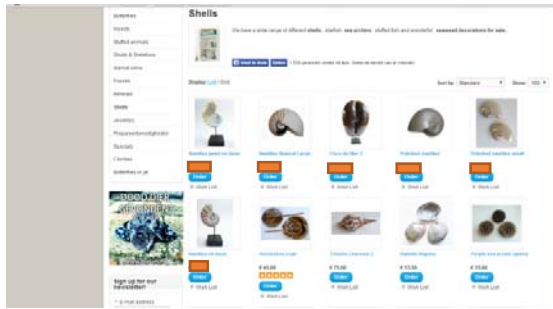
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28



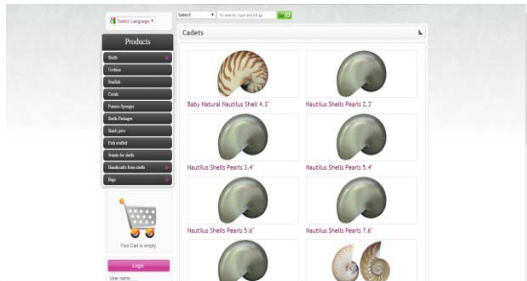
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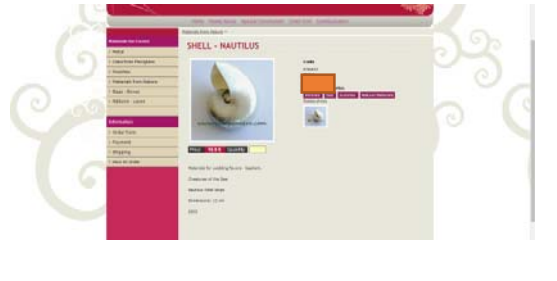
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31



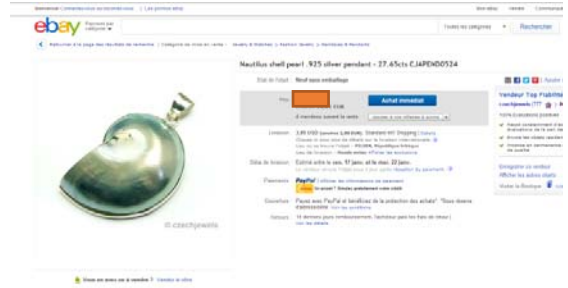
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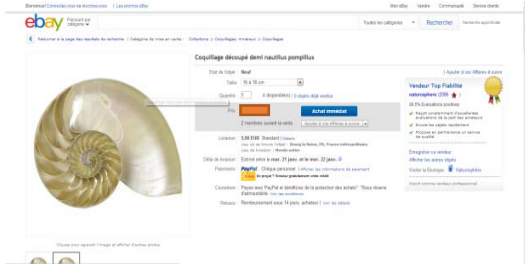
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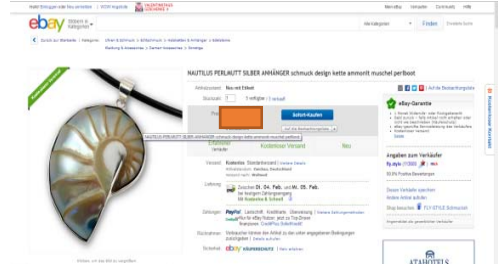
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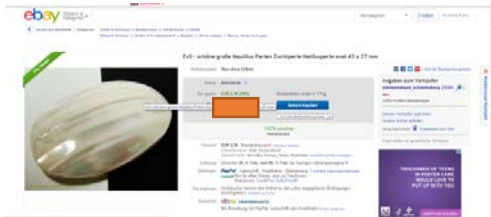
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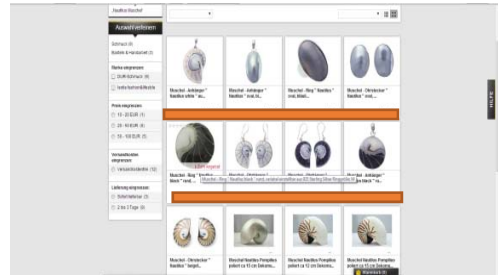
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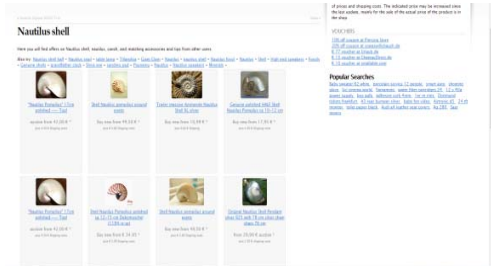
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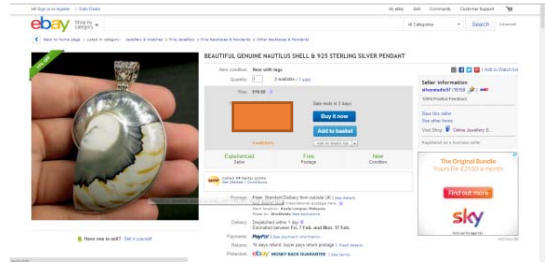
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39



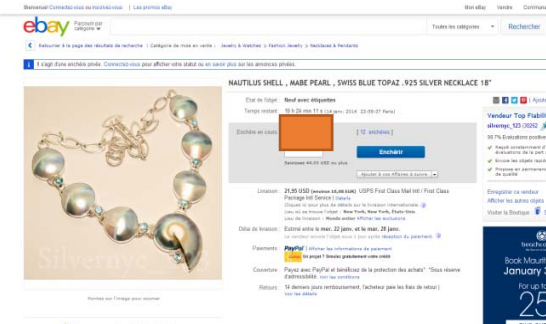
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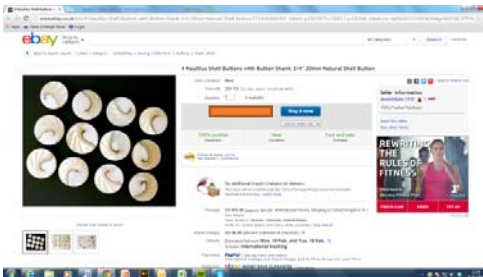
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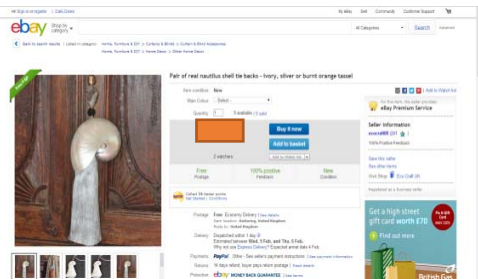
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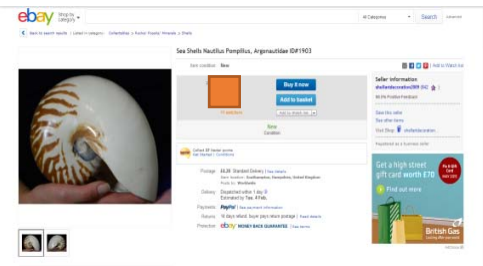
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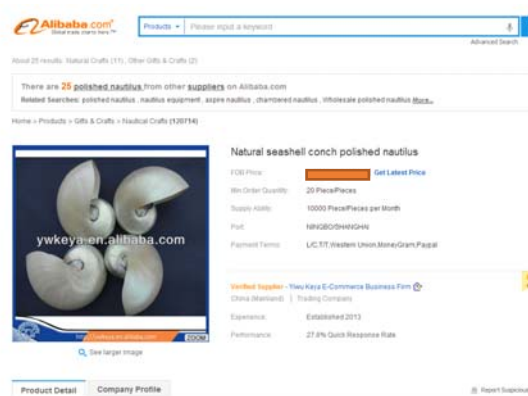
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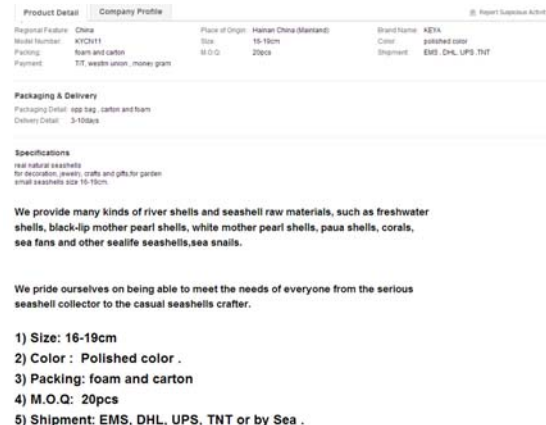
46



47



48



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Products - Please input a keyword Search

Home > Products > Topologies, Jewelry, Earrings > Jewelry > Fine Jewelry > Silver Jewelry (218776)

Sea Shell Multi Gemstone 925 Sterling Silver Pendant, Nautilus Shell Sterling Silver Pendant, Designer Fashion Jewelry Pendant

FOB Price: [Redacted]
 Min Order Quantity: 20 Piece/Pieces
 Supply Ability: 1000 Piece/Pieces per Week
 Port: India
 Payment Terms: T/T, Western Union, PayPal

Verified Supplier: **WEDUCLON** India

Product Detail Company Profile Report Supplier Activity

Quick Details

Jewelry Type	Pendants or Charms	Place of Origin	Rajasthan India	Brand Name	Wedding Jewel
Pendants or Charms Type	Bulk Gemstone Pendants	Jewelry Main Material	Silver	Natural Type	925 Sterling Silver
Main Stone	Nautilus Sea Shell, Quartz & B...	Occasion	Anniversary, Party, Gift, Wedding...	Gender	Children, Women
Multi Gemstone Pendant	Natural Sea Shell Nautilus Shell...				

50

Products - Please input a keyword Search

Home > Products > Gifts & Crafts > Other Gifts & Crafts (889662)

There are **43** chamber nautilus from other suppliers on Alibaba.com
 Related Searches: chamber nautilus, nautilus equipment, agate nautilus, nautilus, wholesale chamber nautilus

chamber nautilus shell

FOB Price: [Redacted] [Get Latest Price](#)
 Min Order Quantity: 100 Piece/Pieces
 Supply Ability: 100 Piece/Pieces per Week
 Payment Terms: T/T, Western Union, MoneyGram

Verified Supplier: **sea Nautilus inc** Philippines
 Experience: Established 1999

Product Detail Company Profile Report Supplier Activity

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Products - Please input a keyword Search

Home > Products > Food & Beverage > Other Food & Beverage (119489)

Nautilus

FOB Price: [Get Latest Price](#)
 Payment Terms: Western Union

Verified Supplier: **pacific aquarum** Philippines

Product Detail Company Profile Report Supplier Activity

Quick Details

Processing	Fresh	Size	Fresh
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Product Detail Company Profile Report Supplier Activity

Specifications

Use nautilus pompilus

PACIFIC AQUARUM
 Supplier

Nautilus Pompilus
 To Our Fellow Aquarists/Enthusiasts:

Greetings!

Our Company is currently based in Cebu - Mactan Island, Philippines and we developed a new facility which has been managed and planned out with local Certified Marine Biologist and with our team personnel with various marine related expertise and experiences. We have received a new contract of having a wholesale marine life in nautilus.

We are pleased to offer you to our marine aquarium business the practical and legal supply of live Nautilus Pompilus. We have accumulated the Nautilus Pompilus by our own well spread equipment which make sure the underlying effort of having to give the maximum quality level of attention during the entire collection process.

Some things before for your order, we offer you the Nautilus size to get the supply, you really need and to your specific work. You can order the minimum of 1 box if you want to have a close control to our marine life stock.

Found that below the blue color of a box to be used for 5 major distributions.

Unprocessed the packing with 3 different sizes of Nautilus Pompilus:

- 12 Nautilus pompilus with a size up to 3 inches per box.
- 8 Nautilus pompilus with a size up to 5 inches per box.
- 4 Nautilus pompilus with a size up to 7 inches per box.

[Redacted]

[Redacted] place an order, request estimates and price quotes to different destinations. Please feel free to contact us if you can't email us at [Redacted].

Beacards, thank,
PACIFIC AQUARUM (PSE)

53

Products - Please input a keyword Search

Home > Products > Gifts & Crafts > Other Gifts & Crafts (889662)

There are **5** Chambered Nautilus, Seashells from other suppliers on Alibaba.com
 Related Searches: Chambered Nautilus Seashells, chambered nautilus, Wholesale Chambered Nautilus Seashells

Chambered Nautilus

FOB Price: [Redacted] [Get Latest Price](#)
 Min Order Quantity: 500 Kilogram/Kilograms
 Supply Ability: 1000 Kilogram/Kilograms per Month
 Payment Terms: D/A, D/P, T/T, Western Union, MoneyGram

Verified Supplier: **shuangyaseashells Co., Ltd** Vietnam
 Experience: Established 2013

Product Detail Company Profile Report Supplier Activity

APPENDIX 5: North America online detection survey results offering *Nautilus* Shells for Sale

Search Engine	Words Searched	Date	Website	Nautilus Detection (Yes/No) - 1 minute of searching	# of Nautilus Items (Count)	Weblink of Page with items	Description and/or rigin of Products	Country	Name of the Website	Major retailers
Google	Nautilus shell sale	01/16/2014	http://www.ebay.com/	Yes	129 shells (jewelry counted separately)	http://www.ebay.com/sch/Nautilus-/157015/i.html	Diverse origins. Some specify they are from Singapore, Thailand, Vietnam, Indonesia, but many don't.	USA (CA)	E-bay	Diverse. Some of the important ones: mygann, sealandimport and hogg14 (see other sheet).
Google	Nautilus jewelry	01/29/2014	http://www.ebay.com/	Yes	More than 200 nautilus shell jewelry articles	http://www.ebay.com/sch/i.html?_nkw=nautilus+shell+jewelry&rt=nc	Diverse origins. Many from Indonesia.	USA (CA)	E-bay	XG (XTREMGEMS2010), qualitygemsandjewellery, fatninja3 and amytradinghouse1 .
Google	Nautilus shell sale	01/17/2014	http://www.atlanticcoralenterprise.com/	Yes	76 Many (6 images which have different prices for different shell sizes; unlimited quantity advertised)	http://www.atlanticcoralenterprise.com/productcart/pc/viewCategories.asp?idCategory=359	Chambered Nautilus shell, pearled N.s. (aslo sold sliced and cut in 3) imported from several parts of the world (tehy all specify where they are imported from)	USA (FL)	Atlantic Coral Enterprise Inc.	Atlantic Coral Enterprise Inc.
Google	Nautilus shell sale	01/17/2014	http://www.conchking.com/	Yes	76 Many (6 images which have different prices for different shell sizes; unlimited quantity advertised)	http://www.conchking.com/Nautilus-Shells-Sections.htm	5 Categories: Whole Tiger Nautilus pompilius whole Pearl N.s., Cut Nautilus shells (pearl and tiger), Paper N.s. and Nautilus seashells Wish Lamps.	USA (FL)	Legendary Shells Simply shells (beach treasures)	Legendary Shells
Google	Nautilus shell sale	01/20/2014	http://www.simplyshells.com.au/	Yes	8	http://www.simplyshells.com.au/nautilus-shells/cat_12.html	Nautilus pompilius, Nautilus pearled, and both half-cut or tri-cut.	Australia, Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, Mexico, Spain, UK	Simply shells (beach treasures)	Simply shells (beach treasures)
Google	Nautilus shell sale	01/20/2014	http://www.amazon.com/	Yes	124	http://www.amazon.com/Hinterland-Trading-Chambered-Nautilus-Shell/dp/B0050R2JW0	Tiger Nautilus shell, white pearlized chambered Nautilus shell,	USA	Amazon Wonders of the Sea Inc.	Hinterland Trading and MyGANN
Google	Nautilus shell sale	01/20/2014	http://www.sealifegifts.net/	Yes	28	http://www.sealifegifts.net/shells_large.html	Nautilus pompilius: natural, pearlized, and sliced.	USA	Wonders of the Sea Inc.	Wonders of the Sea Inc.
Google	Nautilus shell sale	01/21/2014	http://www.shells.co.nz/	Yes	Many: 9 different products offered (3 images with 3 sizes to choose from).	http://www.shells.co.nz/catalogue	Nautilus pompilius. "Our Tropical Shells are sourced mainly from the Indo Pacific area with a few coming from other areas to ensure that we have as wide a range as possible".	New Zealand	Tropical Seashells	Tropical Seashells
Google	Nautilus shell sale	01/21/2014	http://www.dorsetgifts.com	Yes	Many: Natural and pearlized Nautilus in different sizes.	http://www.dorsetgifts.com/shellslarge.html	Nautilus pompilius: Natural shell and pearlized (many different sizes). They "buy large seashells from the two most reputable shell suppliers in the UK and are probably now their biggest clients. All our giant seashells for sale come with ecological certification and are sustainable".	UK	Dorset Gifts	Dorset Gifts

ENDNOTES

- ⁱ Fishermen claimed that if the trap is moved, the Nautilus does not enter.
- ⁱⁱ An earlier regulation in 1987 was also referenced in interviews (Decree from the Minister of Forestry on 12 January 1987 (Surat Keputusan Menteri Kehutanan No 12/Kpts/II/1987), however attempts to review this information have not been successful. The maximum punishment if caught violating the law is 5 years in jail, or a Rp.100 million (USD \$10,000) fine.
- ⁱⁱⁱ Many of the in-shore coastal Indonesian fisheries are multispecies and multigear fisheries opportunistically targeting whatever currently has economic value, and traders likewise will engage in trade of any fish or wildlife product that offers a chance to make money.
- ^{iv} It is reported to taste like goat meat.
- ^v Online sales of Nautilus jewellery are also available from suppliers in Bali, Surabaya, Jogja, and Central Sulawesi.
- ^{vi} One shop owner was raided and had to pay IDR 200 million (USD \$20, 000) in fines and was jailed for six months for selling protected shells.
- ^{vii} To decorate one set of furniture consisting of one table and three chairs, the number of nautilus shells needed was reported to between 40 and 100 nautilus.
- ^{viii} There are at least 50 workshops in this area, which employ about 115 people. The workers/craftsmen are part of a local handicrafts cooperative.
- ^{ix} The pearl shells are too thick and rough, and not easy to work with for making inlays.
- ^x In Kampung Baru, there was also a nautilus shell on the front desk, but the owner said it was not for sale, and they did not say where it was from. In Warkabu, there was another nautilus shell, which had been washed up in front of the security post there.
- ^{xi} One of the traders claimed that if the authority was informed of a shipment, they would provide an escort so that the shipment/transportation would be freed from any “hustle”, holdups or other difficulties from other authorities. Arrangements are made through a payout, so essentially political corruption is employed to pay for protection of the shipment.
- ^{xii} When selling to other exporters, the trader claimed that they will mark up the price.
- ^{xiii} The trader claimed that if there had been a lack of supply, it was mainly due to the seasonality of the species, which has its peak and lean seasons.
- ^{xiv} The meat which is very tough, like rubber, is boiled for hours until softened and is often served as soup.
- ^{xv} Because nautilus is not a protected species in the Philippines, informants were not reluctant to share details of the trade, as was the case in Indonesia.
- ^{xvi} The shipments were reportedly of 100 pieces of nautilus lamps.
- ^{xvii} Philippines Bureau of Fisheries and Aquatic Resources (BFAR) has reportedly been tasked to look into the cause of nautilus death.
- ^{xviii} Balabac is closer to Malaysia than the Philippines being just two hours by ferry from Balabac to Sandakan, Malaysia.
- ^{xix} Some fishermen and traders claimed that nautilus collected from Coron also include the dead shells found at the surface.
- ^{xx} This makes the Peninsula an ideal place for illegal trade activities like coral smuggling. There are registered exporters of raw shells, shellcraft items and other fish and fishery products in Zamboanga.
- ^{xxi} A total of 104 exporters of shell products, including nautilus, were identified in Luzon (59), Cebu (37), and Zamboanga (8) during TRAFFIC’s survey.
- ^{xxii} Where mother of pearl inlay pieces or jewellery not recognizable as being derived from nautilus specifically, were observed these were not assumed to be from nautilus products. However, it is possible that some of these pieces were in fact nautilus products.
- ^{xxiii} China Wildlife Protection Law. Enacted in 1989.
- ^{xxiv} The harvest permission would be evaluated and granted by national level authorities for Class I species, and by province, autonomy and city level authorities for Class II species.
- ^{xxv} The English translation of the brochure’s information on nautilus states: Nautilus: is a living fossil, could reach 20 cm in diameter, the unique airspace shell structure inspired the creation of submarine. Nautilus only distributes at southwest tropical Pacific, with 1 family, 1 genus and 3 species. They move slowly, mature late (5-10 yrs) and only produce once with dozen of eggs every year. It’s susceptible to destruction, and recover slowly. Its beautiful shells are popular in the market and heavily harvested in the Philippines. China has listed Nautilus as Class I species. All the trade and utilization of Nautilus have to obtain the prior approval from the national agriculture authority.
- ^{xxvi} Trade in nautilus for human consumption would be reported under HS codes applicable to molluscs and other shellfish under Chapter 3.
- ^{xxvii} Market surveys were not able to be conducted, however, so the full extent of trade remains unknown.
- ^{xxviii} The Harmonized System (HS) comprises about 5,000 commodity groups, each identified by a six-digit code. Countries may assign up to four additional digits for their exports and imports to further specify a commodity.
- ^{xxix} EUROSTAT is the European Commission database with information on commodities trade. <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>
- ^{xxx} These are for all shell types under the HS code – including nautilus and many other species.
- ^{xxxi} Searches were conducted in December 2013 and January 2014. The Association Française de Conchyliologie (AFC - the French Association of Conchology) website provides a useful source of links to websites of shell dealers based in France and elsewhere (http://www.xenophora.org/en/liens/liens_index.php) that were searched for relevant offers for sale.
- ^{xxxii} Maison & Objet Paris. <http://www.maison-objet.com/en/paris>
- ^{xxxiii} Inventaire National du Patrimoine Naturel. “*Nautilus macromphalus* Sowerby, 1848.” http://inpn.mnhn.fr/espece/cd_nom/590814/tab/statut
- ^{xxxiv} Inventaire National du Patrimoine Naturel. “*Nautilus pompilius* Linnaeus, 1758.” http://inpn.mnhn.fr/espece/cd_nom/590777/tab/statut
- ^{xxxv} Searches were conducted in December 2013 and January 2014.
- ^{xxxvi} Searches were conducted in December 2013 and January 2014.
- ^{xxxvii} Searches were conducted in December 2013 and January 2014.
- ^{xxxviii} Wedding and Christening Materials. <https://www.bombonieres.com.gr/ylika/bomboniera-koxyli>
- ^{xxxix} Conchology Inc. <http://www.conchology.be/?t=1> This is a large company with over 30 skilled employees, led by two Belgian conchologists Guido Poppe and Philippe Poppe, which has been in business since 2003.
- ^{xl} Adverts provide considerable detail on the origin of the shells – all were collected off the island of Palawan, at water depths of 200-450 m.
- ^{xli} Alibaba.com. http://www.alibaba.com/product-detail/Nautilus_100163308.html
- ^{xlii} The online sale detection was made first using the “Google” and then the “Yahoo” search engines. The main word combinations used, and which gave as a result relevant websites selling Nautilus products, were “Nautilus shell sale” and “Nautilus jewelry”.
- ^{xliii} And while some offered a combination of both, shells for ornament and jewelry, others focused exclusively on one product type. For example, Alibaba offered primarily jewelry and only few shells, while Amazon offered almost exclusively shells, and e-bay offering a mix of both in relatively equal amounts.
- ^{xliiii} The retailers with the largest amounts of nautilus products offered on retail websites were MyGANN, Hinterland Trading Co. and Wagners Southern Store. Nautilus products primarily sold in the form of jewelry are offered through JG Trading Inc. and XG (XTREMEGEMS2010). Many of these retailers are hosted on larger online web portals such as eBay and Etsy, however a few retailers hosted their own websites, including Atlantic Coral Enterprise Inc. (Worldwide Wildlife Products), Wonders of the Sea Inc., Shell Horizons Inc., and shells-of-aquariums.com.
- ^{xlv} Silver filigree might then be added to further ornament the shell, and increase its market value significantly.
- ^{xlvi} In many cases the shell is filled with resin.
- ^{xlvii} Buttons tend to be made from trochus and not nautilus, because the shape and size of the nautilus shell limits the number of workable pieces big enough to make items larger than the size of buttons.
- ^{xlviii} While several small items can be made from fragments of the outer whorl of the shell, only one earring or pendant can be made from the spiral center (assuming it is sectioned from each side to leave the middle slice).
- ^{xlix} Imports of whole shells “by number” during this same period (2010-2013) were 7,335 whole shells. Indicating that the vast majority of whole shells that are imported are reported “by number” and not “by weight”.
- ^l From 2010 to 2013, LEMIS recorded 45,279 pieces of nautilus for jewelry and 18,756 pieces for trim.
- ^{li} It remains difficult to assess the accuracy of these estimates as different parts of one shell may be used to make more than one type of item (ie. the outer – thin, flat – part of the shell is used more for inlay, while the inner – thick, curved – part is more likely to be used for jewelry).
- ^{lii} This is likely a very conservative estimate as one piece of furniture may use up to 100 shells.
- ^{liii} An additional 857 pieces of nautilus were also imported during this time period from unknown commodities, and commodities reported as bodies, garments, and live specimens (for aquaria). The overall total number of pieces imported to the USA from 2010 to 2013 was thus 115,726. LEMIS. 2014.
- ^{liiii} The USA was the only identified country that has established records for nautilus products that are imported or exported from the USA
- ^{liv} The shells were packed inside 15 large boxes wrapped inside bed covers and Balinese cloths. The shipping company, Pacific Express, did not have any of the required official documents for exporting the shells.
- ^{lv} Two attempts at smuggling marine shells through the Ngurah Rai International Airport had been foiled since February 2008.
- ^{lvii} Given the differing sizes and overlap in occurrence with the largest and most common species in trade – *Nautilus pompilius* – it is probable that the more rare species are also being harvested, collected, and enter trade, but the identification of those species is often unknown by local traders. Some specimens of *A. perforatus* were observed in some retail sites in Indonesia.
- ^{lviii} The use of electronic and printed media (especially TV and newspapers) for these campaigns remains an opportunity to be more fully exploited in Indonesia.
- ^{lix} Local NGOs with experience in this field can be recruited to assist the government to plan and implement such training.
- ^{lx} The BFAR wildlife regulations group is currently undertaking secondary data collection and collaborating with relevant Philippine academic institutions to review the available scientific data on nautilus that could be used as a basis for regulating the utilization of nautilus.
- ^{lxi} The confiscation of illegal products could also include the deliberate destruction of seized illegal black coral products that remain for sale in wholesale and retail markets.
- ^{lxii} On October 17th, 2013, Fangchenggang Border Police of Guangxi Province signed a border cooperation agreement with the Mong Cai International Port of Viet Nam to establish a hotline and communication system, strengthening bilateral law enforcement cooperation, and cracking down on trafficking of wildlife commodities.

TRAFFIC, the wildlife trade monitoring network, is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

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