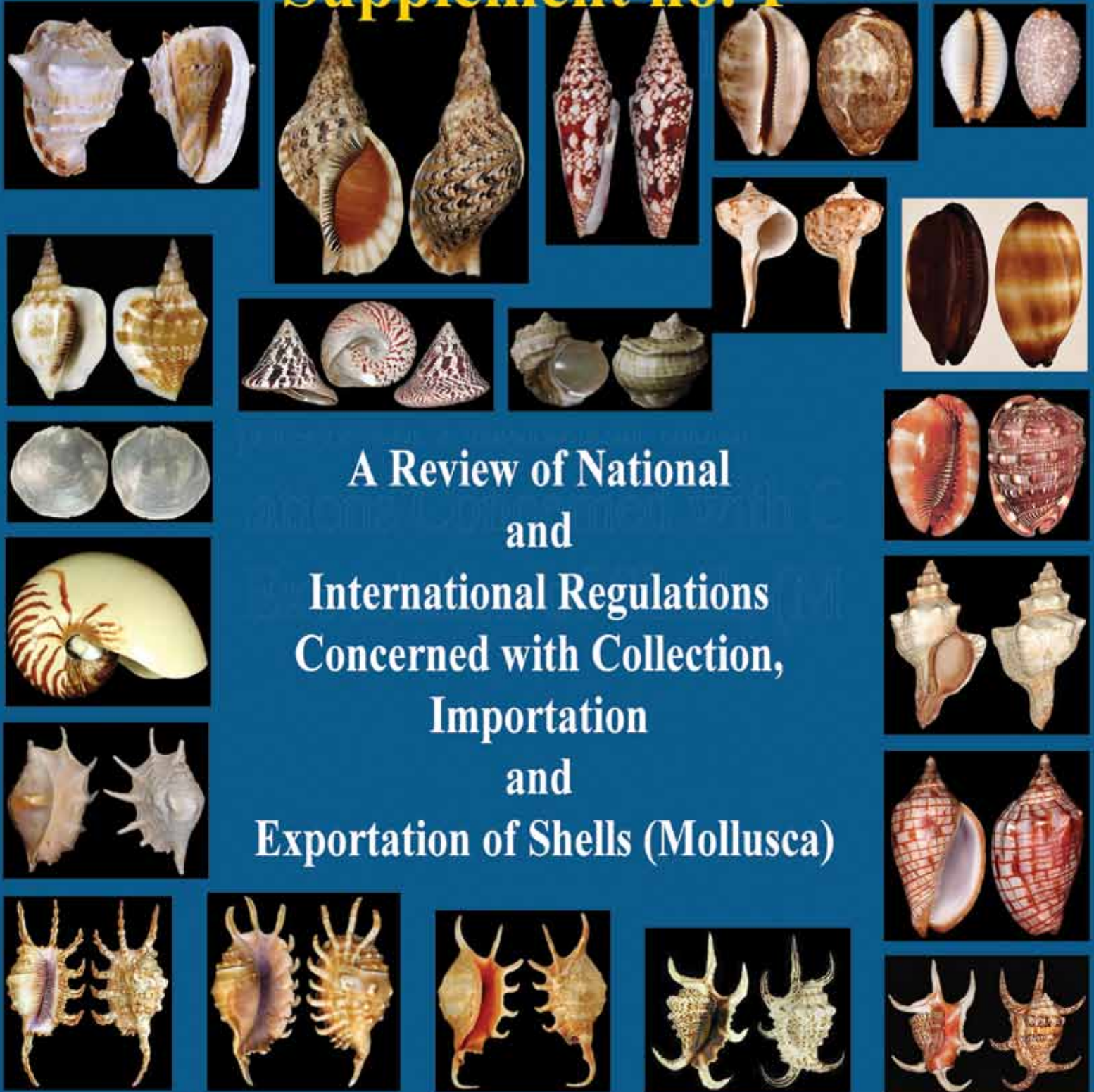


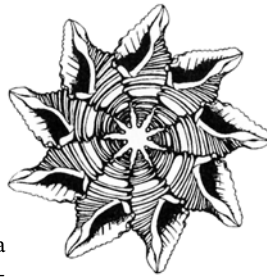
American CONCHOLOGIST

Supplement no. 1



A Review of National
and
International Regulations
Concerned with Collection,
Importation
and
Exportation of Shells (Mollusca)

CONCHOLOGISTS



OF AMERICA, INC.

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors; to the beauty of shells, to their scientific aspects, and to the collecting and preservation of mollusks. This was the start of COA. Our membership includes novices, advanced collectors, scientists, and shell dealers from around the world. In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological, and cultural importance to humans and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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A Review of National and International Regulations Concerned with Collection, Importation and Exportation of Shells (Mollusca)

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Contents

Introduction	4
Organizational Abbreviations	4
U.S. and International Law Governing Protection of Mollusks and Prohibitions and Restrictions on Import to the United States	4
(1) 7 CFR 330.200	4
(2) 18 U.S. Code § 42 (Lacey Act)	5
(3) 50 CFR 17.11 - Endangered and threatened wildlife - Endangered Species Act (ESA)	5
(4) CITES: Enforced under 50 CFR Part 23	5
USFWS Permit and Declaration Requirements and Inspection Authority for Shells Being Imported to the United States --	6
Discussion of Permitting, Declaration and Clearance Regs as They Pertain Specifically to Shells (Mollusca) and to Various Categories of Collectors & Importers	9
Regulations and Information Sources pertaining to Restrictions on Collection and Export of Shells from Other Countries -	10
The IUCN Red List	12
Numbers of IUCN Red Listed Mollusk Species by Country for two Combinations of Assessment Category	13
FAA restrictions of relevance	16
Summary Conclusions	16
Appendix 1: CITES Appendices 1 & 2.....	17
Appendix 2: ESA	20
Appendix 3: IUCN Red List	26

Front cover: Some of the 24 marine molluscan species banned from collection, possession, or trade in India (see: p. 12 and <http://indiansacredconch.blogspot.com>). Names (as listed by Indian authorities) clockwise from top left, inward spiral): *Cassis cornuta*, *Charonia tritonis*, *Conus milneedwardsi*, *Cypraea mappa*, *Cypraea limacina*, *Cypraea talpa*, *Cypraecassis rufa*, *Fasciolaria trapezium*, *Harpulina arausiaca*, *Lambis chiragra*, *Lambis chiragra arthritica*, *Lambis crocata*, *Lambis millepeda*, *Lambis scorpius*, *Lambis truncata*, *Nautilus pompilius*, *Placuna placenta*, *Strombus plicatus siboldi*, *Trochus niloticus*, *Turbo marmoratus*, and *Tudicla spirillus*. Not shown are *Hippopus hippopus*, *Tridacna maxima*, and *T. squamosa*. Images from femorale.com, wikipedia.com, and the editor.

Back cover: Some of the 36 marine molluscan species banned from collection, possession, or trade in the Philippines (see: p. 12 and <http://www.conchology.be/?t=1000>). Names (as listed by Philippine authorities) left to right: top row - *Amusium oblitteratum*, *Barnea manilensis*, *Bolma girgylus*, *Cypraea aurantium*, *Cypraea beckii*. Second row - *Cypraea childreni*, *Cypraea guttata*, *Cypraea katsuae*, *Cypraea leucodon*, *Cypraea mariae*. Third row - *Cypraea martini*, *Cypraea porteri*, *Cypraea saulae*, *Cypraea teramachii*, *Cypraea valentia*. Forth row - *Cypraecassis rufa*, *Hippopus hippopus*, *Malluvium lissum*, *Morum grande*, *Morum kurzi*. Fifth row - *Phalium coronadoi wyvillei*, *Phalium glabratum*, *Phenacovolva dancei*, *Strombus thersites*, *Tibia martini*, *Tridacna crocea*. Sixth row - *Tridacna gigas*, *Tridacna maxima*, *Trochus niloticus*, *Turbo marmoratus*, *Varicospira crispata*. Not shown are *Clypeomorus adunca*, *Eufistulina mumiae*, *Separatista blainvilleana*, and *Tridacna squamosa*. Images from femorale.com and the editor.

Introduction

In response to growing recognition that global biodiversity is increasingly threatened by human depredation and neglectful oversight on numerous fronts, many governments and treaty organizations have formulated rules and regulations to help identify and protect endangered species from further losses. As collectors and students of Mollusca, one of the most diverse groups of organisms on earth, members of the COA must be particularly cognizant of, and attentive to, ongoing conservation efforts and regulations that bear on the collection, possession, transport, export, and import of shells. This paper is focused primarily on the regulations and procedures, and the concomitant dilemmas (Rosenberg, 1996; Jolivet, 2016; Coltro, 2016), faced by the American conchologist who collects shells while traveling abroad and wishes to bring them back to the United States for personal use and study. Our aims are: 1) to identify the species of mollusks that are protected under national and international law, 2) to inform and educate the shell-collecting public on the complex and difficult responsibilities and procedures of regulatory agencies charged with enforcement of the protective measures, and 3) to critique those same protective measures and procedures as they apply to mollusk shells — with a view toward potential simplification and improved regulatory efficiency.

Organizational Abbreviations

ASEAN – Association of Southeast Asian Nations
 CBP – U.S. Customs and Border Protection
 CFR – Code of Federal Regulations
 CITES – Convention on International Trade in Endangered Species of Fauna and Flora
 COA – Conchologists of America
 ESA – Endangered Species Act
 FAA – US Federal Aviation Administration
 FAO – Food and Agriculture Organization of the United Nations
 FAOLEX – Food and Agriculture Organization of the United Nations: Legal Office

GFCM – Global Council of the Mediterranean
 IUCN – International Union for the Conservation of Nature
 NOAA – US National Oceanic & Atmospheric Administration
 SEAFDEC – Southeast Asian Fisheries Development Center
 SARA – Species At Risk Act (Canada)
 SSC – Species Survival Commission (IUCN)
 USDA-APHIS – U.S. Department of Agriculture, Animal and Plant Health Inspection Service
 USFWS (or FWS) – U.S. Fish and Wildlife Service
 WAPPRIITA – Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (Canada)

U.S. and International Law Governing Protection of Mollusks and Prohibitions and Restrictions on Import to the United States

- (1) 7 CFR 330.200 - Movement of Plant Pests Regulated; Permits Required
- (2) 18 U.S. Code § 42 - Importation or shipment of injurious mammals, birds, fish (including mollusks and crustacea), amphibia, and reptiles; permits, specimens for museums; regulations - (Lacey Act)
- (3) 50 CFR 17.11 - Endangered and threatened wildlife - Endangered Species Act (ESA)
- (4) CITES: Convention on International Trade in Endangered Species of Fauna and Flora. Enforced under 50 CFR Part 23

(1) 7 CFR 330.200

The movement of molluscan plant pests is regulated by the U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS). Live snails and slugs that feed upon or infest plants may be imported only under a plant pest permit PPQ 526, and live snails must be declared upon entry at U.S. Customs. Snails of the genus *Achatina* (giant African snails), the carnivorous decollate snail (*Rumina decollata*), and freshwater Ampullariidae of the genus *Pomacea*, are specifically prohibited from import into the United States. We note here that living specimens of the predatory rosy wolf snail (*Euglandina rosea*), although native to the SE U.S., might also be prohibited from import – as they have been introduced and become established in many other countries and are now subject to re-introduction in non-native regions. Live carnivorous snails are also being imported in the aquarium pet trade and could pose a serious threat to native species if released to the wild (Bogan and Hanneman, 2013). Dead snails or slugs, in preservative or dried, may be imported into the U.S., “subject to inspection on arrival to confirm the nature of the material and freedom from risk of plant pest dissemination.” <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/permits/regulated-organism-and-soil-permits/sa_snails_slugs/ct_snails_slugs>

The U.S. Department of Agriculture policy explicitly permits import of seashells: “USDA does not require a permit to bring saltwater sea shells into the country because, if cleaned properly, they do not pose a significant pest or disease threat to agriculture. To avoid complication, you must make sure the shells are as clean as possible and do not contain any dirt, which can carry microorganisms. Also, you should declare the shells at customs. A Department of Homeland Security, Customs and Border

Protection officer will inspect the item[s] and make a final determination as to the admissibility of the shells.” (Published 06/12/2013 12:45 PM | Updated 06/13/2013 03:31 PM) <http://asktheexpert.custhelp.com/app/answers/detail/a_id/5926/kw/can%20bring%20back%20seashells%20from%20another%20country>.

U.S. Customs and Border Protection (CBP) also explicitly addresses import of seashells on-line: <https://help.cbp.gov/app/answers/detail/a_id/1226/kw/seashells>. “**Seashells** are generally allowed into the U.S. if they are not taken from endangered or threatened species (CITES protected), **and they are completely sanitized from the creatures that inhabited them** [our boldface] and any other agricultural material such as sand, clay, soil, etc. A traveler may bring in a reasonable amount of seashells for personal use as a memento of their trip. Large quantities of seashells being brought into the U.S. for the purposes of using them in crafting, landscaping, or for commercial use are prohibited.”

(2) 18 U.S. Code § 42 (Lacey Act)

The U.S. Fish and Wildlife Service (FWS) is responsible for enforcement of the Lacey Act, the Endangered Species Act, and CITES, all under the authority of 50CFR Chapter I, Subchapter B – “TAKING, POSSESSION, TRANSPORTATION, SALE, PURCHASE, BARTER, EXPORTATION, AND IMPORTATION OF WILDLIFE AND PLANTS.” The Lacey Act of 1900 addresses illegal wildlife trade to protect species at risk and bars importing species found to be injurious to the United States. Among mollusks, the Lacey Act specifically lists only the zebra mussel *Dreissena polymorpha* (Pallas, 1771) as prohibited. We might assume that quagga mussels *Dreissena bugensis* (Andrusov, 1897) often found associated with zebra mussels should similarly be banned, but legislation introduced in 2013 and 2014 (113th Congress, S.2530) for that purpose has apparently languished in committee and not yet been enacted. For practical purposes, however, most U.S. enforcement authorities are already concerned with mussels of the genus *Dreissena* in general (Bowling, 2013).

(3) 50 CFR 17.11 - Endangered and threatened wildlife - Endangered Species Act (ESA)

The FWS maintains an excellent website that allows the user to navigate easily through the species list of the ESA using various sorting criteria to generate lists of specific taxa and listing status: <<http://ecos.fws.gov/ecp0/reports/ad-hoc-species-report-input>>. The United States ESA lists 176 species of protected mollusks (see **Appendix 2**). For each species, detailed information is provided on biology and occurrence, critical habitats, history of endangerment status, and conservation action plans. Forty-three additional species of “clams” – all Unionidae - are identified as Under Review (37), Proposed (2) or Candidate (5) for listing. An additional 102 species of “snails” are identified as Under Review (97), Proposed (2) or Candidate (3) for listing.

(4) CITES: Enforced under 50 CFR Part 23

An overview of the CITES list of molluscan species is most effectively located on-line at <<https://cites.org/sites/default/files/eng/app/2016/E-Appendices-2016-03-10.pdf>>. The complete list, identified by scientific names, is given in the “Index of CITES Species” (2014): <http://hedleyshumpers.com/resources/Index_of_CITES_Species_2014-11-23%2010-43.pdf>.

In that Index, however, the molluscan species are buried in an alphabetical listing of all CITES fauna, and while searchable, this index cannot be sorted by taxonomic group. Neither the word “mollusk” nor “Mollusca” appears in this index; but “Gastropoda” and “Bivalvia” are effective search terms. For some taxa (especially vertebrates), common names are also indexed alphabetically (in amongst the scientific binomials), but common names for mollusks are found only in conjunction with the indexed scientific names. The full list, reformatted in phyloalphabetical sequence, appears in **Appendix 1**. A few nomenclatural inconsistencies between the ESA and CITES lists, especially within the Unionidae, are noted in the respective **Appendices (1 and 2)**.

Three of the Unionidae on the CITES list do not appear on the ESA list: *Epioblasma sampsonii* – delisted, extinct; *Cyprogenia aberti* - under review; and *Lampsilis satura* - not listed, but threatened in TX (Ford et al. 2014, Randklev et al. 2013). It is further noted here, that at least four of the other eight species of *Epioblasma* listed on CITES are most certainly extinct (Williams et al. 1993) and most of the other unionid species are extremely rare in the wild. While the collector should be acutely aware of their presence on the ESA and CITES lists, he or she is most unlikely to encounter them on foreign travel, either in the wild or in the shell trade. The same generalizations apply equally well to the Achatinellidae, which family has been driven to near-extinction in the highlands of Oahu. To some degree, this same conclusion can be applied to nearly all of the North American species of Mollusca listed under ESA. They are rare and endangered species, not to be collected within, or exported from, the United States, under pain of serious criminal penalty. In effect, this means that, for the purposes of CITES, ESA, agricultural pests, and the Lacey Act, the average U.S. citizen shell collector traveling abroad must take special care to avoid collecting and bringing back to the U.S. any live land or freshwater snails, zebra mussels, queen conchs, green Manus tree snails, land snails from Guam and related islands of Micronesia, *Polymita* snails from Cuba, and any species of Tridacnidae (and from Hawaii, any Achatinellidae). It would seem that this should not represent a serious challenge — either for compliance or for enforcement.

USFWS Permit and Declaration Requirements and Inspection Authority for Shells Being Imported to the United States

The U.S. Fish and Wildlife Service is charged with the responsibility for developing regulations and enforcing legislation under the Lacey Act, the ESA, and CITES, and these duties are codified in the U.S. Code of Federal Regulations (CFR), Title 50, which can be accessed in its entirety and studied at one's leisure at http://www.ecfr.gov/cgi-bin/text-idx?SID=015ddc60834832a60aced596af46982c&mc=true&tpl=/ecfrbrowse/Title50/50cfrv1_02.tpl#0

The “Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants” is specifically addressed under 50 CFR Chapter I, Subchapter B, and is more easily manipulated and examined through the Cornell University Law School's website at <https://www.law.cornell.edu/cfr/text/50/chapter-I/subchapter-B>. The requirements of these regulations have been designed generally to prevent illegal possession, import, and export of a host of prohibited or restricted wildlife species — more than 5,000 animal and 30,000 plant species are listed under CITES; they were definitely **not** designed for dealing either with the serious amateur shell collector returning from a one to two-week excursion of snorkeling and intertidal rock-turning in a remote destination known for its molluscan diversity, or for the casual hobbyist returning from beachcombing on a remote tourist beach abroad. In either of these cases, the returning individual may have gathered a diverse assortment of shells from a wild population of mollusks in a natural environment. **If** the shells are clean and free of living materials, and the species are determined not to be on any of the protected lists discussed above [and at least 70,000 species of mollusks (Rosenberg, 2014) are **not** on any of those lists] their entry is permitted under the guidelines of the USDA-APHIS and U.S. Customs as discussed above — but the USFWS rules must now be applied. The rules pertain to USFWS requirements for import and export permits and for completed declarations of wildlife-related goods being imported or exported. In the extremely unlikely event that you have in your possession and wish to import specimens of any species listed on the U.S. ESA or in Appendix I of CITES, refer to the applicable provisions of 50 CFR Chapter I, Subchapter B. We have made no effort here to summarize those requirements, but we have attempted to identify those portions of the U.S. Code that are potentially applicable to the shells of mollusks being brought back into the U.S. by members of COA from another country, and to summarize these in an understandable and useful framework for implementation. If wildlife of any category other than shells is being transported for import, many additional or alternate requirements will apply.

Permit Requirements

1. **Do not attempt** to bring in any species listed on Appendix I of CITES, regardless of origin. Exceptions may be granted for specimens collected before the species was listed, but thorough documentation and permits will be required from the country of export as well as the U.S.
2. A CITES document or permit is not required to bring in empty shells of CITES Appendix II species, e.g. *Strombus gigas* (limit 3) and Tridacnidae (limit 3 pairs of matching valves, or three unmatched single valves - not exceeding 3 kg in total weight) so long as: a) you own the specimens for personal use or intend it as a personal gift, b) the items are in your personal baggage carried by you or checked as baggage on the same conveyance as you, and c) the management authority of the country of origin does not require a CITES document for export purposes [50 CFR 23.15]. A permit will be required if the number or weight restrictions are exceeded or an export CITES document is required.
3. You do not need a permit to import live or dead mollusks (other than those listed by CITES or the ESA), except for living zebra and quagga mussels, genus *Dreissena*, or their viable veligers or eggs (all of which are prohibited) so long as no live mollusks, or any progeny or eggs thereof are released into the wild without prior written permission from the State wildlife conservation agency with jurisdiction over the area of release [50 CFR 16.13].
4. Without obtaining an import/export license, any person may engage in business as an importer of shellfish (including oysters, clams, or other mollusks [50 CFR 10.12]) and non-living fishery products (e.g., frozen mollusks in the shell?) that do not require a permit under CITES, ESA, or the Lacey Act, and are imported or exported for purposes of human or animal consumption, or taken on the high seas for recreational purposes [50 CFR 14.92 (a1)].
5. You do not need a permit or import/export license if you are importing into the U.S. or exporting from the U.S. as a collector or hobbyist for personal use [50 CFR 14.91(c6)]. It is presumed that eight or more similar items will be for **commercial** use. The importer may rebut this presumption based upon the particular facts of each case [50 CFR 14.4].
6. You do need a permit or import/export license if you are importing into the U.S. or exporting from the U.S. as a collector or hobbyist for commercial purposes, including sale, trade, or barter [50 CFR 14.91(c7)].

7. You do not need a permit or import/export license if you are importing into the U.S. or exporting from the U.S. as a public museum or public scientific or educational institution for noncommercial research or educational purposes [50 CFR 14.91(c18)]. These persons must keep records, however, that will fully and correctly describe each importation and subsequent disposition of the specimens [50 CFR 14.92 (b1)], and further must provide duly authorized FWS officers access (upon notice) and the opportunity to examine the inventory of imported wildlife specimens and to copy those records [50 CFR 14.92(b2)].

Declaration and Clearance Requirements

1. A FWS officer must clear all wildlife, including mollusks, imported into the U.S. prior to release through Customs [50 CFR 14.52(a)]. This includes, but is not limited to, snails, mussels, clams, oysters, scallops, abalone, squid, and octopuses; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product [CFR 50 10.12]. Though not explicitly mentioned, shells (live or dead) are clearly included.
2. Importation of all wildlife, including mollusks (i.e., shells), and the required FWS clearance must be through one of 17 designated major ports of entry into the U.S [50 CFR 14.11] enumerated in [50 CFR 14.12]. Exceptions to this list of designated entry ports may be made for a) shipments traveling under valid permits applied for and issued to the importer (50 CFR 14.20), b) for wildlife items not otherwise requiring a permit if those items were obtained in either Canada or Mexico and are being imported through an approved border port (50 CFR 14.16), and c) for wildlife items not otherwise requiring a permit when the final destination of those items is in Alaska, Puerto Rico, or the Virgin Islands (50 CFR 14.19).”
3. Collectors bringing in perishable shipments (e.g., frozen mollusks in their shells) “must notify the FWS at least 48 hours prior to estimated time of arrival” to ensure that an officer will be available for clearance. When a FWS officer is not available within a reasonable time, however, US Customs Officers may clear live or perishable wildlife subject to post-clearance inspection and investigation by the FWS. [50 CFR 14.54 (a)]
4. **BUT:** Any person may import into or export from the United States at **any** Customs port (an exception to the designated port requirement) wildlife products or manufactured articles (mollusk shells not excepted) that are not intended for commercial use and are used as clothing or contained in accompanying personal baggage. [50 CFR 14.15(a)] Furthermore, wildlife lawfully imported in personal baggage at any port of entry under § 14.15, may, if a Service officer is not available within a reasonable time, be cleared by Customs officers, subject to post-clearance inspection and investigation by the Service. [50 CFR 14.54]
5. With certain exceptions (see 6-8), a completed Declaration for Importation or Exportation of Fish or Wildlife (Form 3-177), signed by the importer, must be filed with the FWS upon the importation of any wildlife (i.e., shells) at the place where Service clearance is requested. Importers must furnish all applicable information requested on the Form 3-177 and the importer must certify that the information furnished is true and complete to the best of his/her knowledge and belief. [50 CFR 14.61] FORM 3-177 and instructions for completing it can be accessed at <<https://www.fws.gov/le/declaration-form-3-177.html>>.
6. Except for wildlife (i.e., shells) requiring a permit pursuant to ESA or CITES, an importer does not have to file a Declaration for Importation or Exportation of Fish or Wildlife (Form 3-177) for importation of shellfish and fishery products for purposes of human or animal consumption, or taken in waters under the jurisdiction of the United States or on the high seas for recreational purposes. [CFR 50 14.62(a)]
7. Except for wildlife (i.e., shells) requiring a permit pursuant to the Lacey Act, ESA, or CITES, a Declaration for Importation or Exportation of Fish or Wildlife (Form 3-177) does not have to be filed for importation of Wildlife products or manufactured articles that are not intended for commercial use and are used as clothing or contained in accompanying personal baggage. [50 CFR 14.62 (b2)]
8. Excepting wildlife (i.e., shells) requiring a permit pursuant to the Lacey Act, ESA, or CITES, scientific specimens imported for accredited scientific institutions for taxonomic, systematic research, or faunal survey purposes may be described in general terms by the importer. The declaration (Form 3-177) must identify specimens to the most accurate taxonomic classification reasonably practicable using the best available taxonomic information, and the importer must file an amended Form 3-177 within 180 days after filing the general declaration. The Director of FWS may grant extensions to the 180-day period. [50 CFR 14.62 (c)] The declaration Form 3-177 is not required at the time of importation for

dead, preserved, or dried scientific specimens or parts thereof, imported by accredited scientists or accredited scientific institutions for taxonomic or systematic research purposes. A form 3-177 must be filed within 180 days, identifying the specimens to the most accurate taxonomic classification reasonably practicable using best available information and must declare the country of origin. [50 CFR 14.62 (d)] This latter exemption from declaration also applies to exports by scientific institutions, with the same requirement for subsequent filing. [50 CFR 14.64 (b3)]

9. Excepting wildlife (i.e., shells) requiring a permit pursuant to the Lacey Act, ESA, or CITES, a Declaration Form 3-177 does not have to be filed for **export** of wildlife that is not intended for commercial use where the value of such wildlife is under \$250 [50 CFR 14.64 (b1)].
10. Any container or package (we take this not to include accompanied personal luggage) containing any wildlife (including shellfish products) must be marked conspicuously on the outside with both the name and address of the shipper and consignee. An accurate and legible list of its contents by species scientific name and the number of each species must accompany the entire shipment. [50 CFR 14.81]
11. To obtain clearance, the importer will make available to a Service officer (or to an acting Customs officer): (1) All shipping documents (including bills of lading, waybills and packing lists or invoices); (2) All permits, licenses or other documents required by the laws or regulations of the United States; (3) All permits or other documents required by the laws or regulations of any foreign country; (4) The wildlife (i.e., shells) being imported or exported; and (5) Any documents and permits required by the country of export or re-export for the wildlife. [50 CFR §14.52 (c)]
12. Any Service officer may detain or refuse clearance of imported or exported wildlife (i.e., shells) and any Customs officer acting under §14.54 may refuse clearance of imported wildlife when there are responsible grounds to believe that: (1) A Federal law or regulation has been violated; (2) The correct identity and country of origin of the wildlife has not been established (in such cases, the burden is upon the owner, importer, exporter, consignor, or consignee to establish such identity by scientific name to the species level or to the subspecies level, if any subspecies is protected by the laws of this country or the country of origin); (3) Any permit, license, or other documentation required for clearance of such wildlife is not available, is not currently valid, has been suspended or revoked, or is not authentic; (4) The importer has filed an incorrect or incomplete declaration for importation as provided in §14.61 or §14.63; or (5) The importer has not paid any fee or portion of balance due for inspection fees required by §14.93 or §14.94, or penalties assessed against the importer under 50 CFR part 11 [50 CFR §14.53(b)].
13. The non-commercial citizen collector is clearly exempt from permitting fees, but the regulations seem somewhat uncertain regarding the requirement for inspection fees, as described in 50 CFR 14.94. According to 50 CFR 14.94 (k) (2): “You do not have to pay base inspection fees, premium inspection fees, or overtime fees if you are importing or exporting wildlife that is exempt from import/export license requirements as defined in § 14.92(a) or you importing or exporting wildlife as a government agency as defined in § 14.92(b)(1)(ii).” Subject to a number of certifications and conditions listed in 50 CFR 14.94 (k)(4), licensed shell dealers may also be exempted from base inspection fees for “low-risk importations.” According to a recent notice (DOI-FWS, 2016), however, this exemption of certain businesses from the designated port base inspection fees is only “an interim measure while we [FWS] reassess the current user fee system.”

Regulatory Implications of Points 11.3, 11.5, and 12.2 (above)

Here is our first real notice that the FWS will be looking for permits and documents required under the laws and regulations of the country of export (or re-export) of our shells. And furthermore, that it is our responsibility to ascertain whether any species or subspecies of mollusks are so regulated by the countries we may have visited, and to establish species- or subspecies-level identifications for all specimens being imported in such a case, all presumably to enable the FWS inspector to properly clear the specimens being imported. We may also infer that a specimen shell with a label stating its origin as “Punta Engano, Mactan Island, Cebu, Philippines” purchased from a shell dealer in a shop in London, England, might be confiscated by USFWS at a U.S. port of entry because export documents from the Philippines (and/or re-export documents from the UK) were unavailable. For those shells that were collected personally from the wild by the traveler within the country or countries visited, it is the duty and responsibility of the traveler to determine whether any of the countries visited regulate the collection, possession, and export of any of the species collected, obtain any permits that may be required, and then somehow to convince the FWS inspector that the specimens identified on the Declaration Form 1-377 are in compliance with the applicable domestic and international regulations.

Discussion of Permitting, Declaration and Clearance Regs as They Pertain Specifically to Shells (Mollusca) and to Various Categories of Collectors & Importers

Of the estimated minimum 70,000 species of mollusks living globally today (Rosenberg, 2014), only 206 (CITES: 96; ESA: 176 [67 in common with CITES]; Lacey Act: 1) are currently protected or prohibited from import, export, and/or transport under U.S. and international (CITES) law, and many of those protected species are so rare as to be virtually inaccessible to members of the public and will never be encountered in the wild. Similarly, the molluscan conservation measures so far introduced by sovereign nations other than the U.S. are focused on a very few species of special interest because of limited geographic distributions or special habitat concerns. Despite this very limited number of “species of concern” however, the USFWS procedure (Form 3-177) requires the shell collector to identify to species or subspecies level any or all of the other 69, 771+ species that (theoretically) might be collected and presented for importation to the U.S. Even though the amateur collector or hobbyist is granted the same exemption as the accredited scientist from having to obtain a license to import non-prohibited species of mollusks, the accredited scientist is granted the leniency of identifying their specimens “to the most accurate taxonomic classification reasonably practicable using the best available taxonomic information,” while the amateur collector or hobbyist is apparently required to identify those same specimens to genus and species (or even subspecies, if mandated under regulations of the exporting country). In the case of mollusks, this appears to place an unnecessary and extreme burden on both the collector and the USFWS agent responsible for inspecting and clearing the specimens presented for import.

Mollusks are one of the most diverse groups of animals on earth, second only to arthropods. The empty shells of mollusks are largely mineral, i.e., non-living, in composition, and many are nearly indistinguishable from sub-fossil or fossil forms (which are totally exempted from any consideration under 50 CFR Subchapter B). The larger species of mollusks are widely exploited and used for food throughout the world, and shellfish (alive or dead) intended for human consumption are specifically exempt from both permitting and declaration requirements in the FWS regulations. “Clean shells” are of little concern under the policies of USDA and US Customs, so long as they are intended for personal use, and not imported for the commercial trade. “Shell (mollusc, raw or unworked)” requires exactly one category of description (SHE, * a CITES-recognized description code) on USFWS Declaration Form 3-177, among the 94 other categories dedicated to various specific articles mainly of vertebrate origin (and to a lesser degree of plant origin), but generally of much greater concern within the CITES framework. These other categories of “species” range from baleen, bark, and bone, to wax, wing, and wood products; including: horn (3 categories), genitalia, piano, plywood, shoe, soup, and “unspecified.” This list highlights the difficulty of the task faced by the FWS inspectors. With only one or two exceptions (e.g., “leaves”), however, these categories are applicable to rather specific items of concern, and are not broad all-inclusive categories like “raw or unworked mollusc shells” which contain a vastly disproportionate number of species of no regulatory concern.

Within this one descriptor code of “raw or unworked mollusc shells”, the importer is tasked with accurate identification and certification of taxonomic accuracy for a group of animals realistically comprising perhaps 15,000 different species that might reasonably be encountered during one’s travels; and the FWS agent is tasked with the responsibility of recognizing and identifying from that list any of those few scientific names associated with protected species. We submit that this task could be drastically simplified for both parties, and made much more effective from a regulatory standpoint, through the creation of a “Form 3-177M” that listed all molluscan species of regulatory concern (perhaps including descriptions and illustrations to facilitate identification and clearance), and provided a means for the collector to certify whether any specimens of those were included among the otherwise not-yet-completely identified species being brought back into the U.S. We do not know what use the USFWS makes of the information (50 CFR § 14.3 - Information collection requirements) gathered on molluscan species (shells) imported into the United States and declared on Form 3-177, and suspect that the information is much more useful in connection with other categories of import. Nonetheless, the USFWS (2016) is proposing to renew these same information requirements for all categories of importations. **For this specific category of import (shells — mollusc, raw or unworked)** we doubt that the detailed taxonomic data are of great analytical value, and suggest that **for this category** the more general level of taxonomic identification currently required from accredited researchers at accredited scientific institutions and museums should suffice — excepting of course those species specifically protected under CITES, U.S. Law, or the laws and export regulations of any other sovereign nation. In the next section, we examine the problem of determining which species are protected by entities outside the U.S.

Regulations and Information Sources pertaining to Restrictions on Collection and Export of Shells from Other Countries

As we have seen, the regulations of the exporting nation, (and those of the country of origin, which in a re-export situation may be different from the exporting nation) are important to shell-collecting U.S. citizens returning to the U.S. with their specimens because under part (c) of 50 CFR §14.52 the USFWS must be satisfied that wildlife being imported into the U.S. was **collected and exported in accord with applicable foreign law**, and it is the responsibility of the collector/importer to provide the necessary information and documentation. We have found that ease of retrieval of this information varies widely from country to country. While most countries appear to have no applicable regulations beyond those required under their CITES membership, some countries have identified species of concern, and regulate their collection and export. If the USFWS has access to specific foreign regulatory policies (concerning collection and export of shells) that might be invoked during inspection upon return to the U.S., it would greatly facilitate the inspection and clearance process if that information was made public for the traveling collector. Following is a list of sources that may be useful to the collector about to embark on foreign travel with the intent of bringing back shells to the United States and wishing to learn about applicable regulatory policies. It is recommended that when explicit information cannot be located in print or on-line, that the prospective traveler-collector contact (by telephone or email) the respective environmental regulatory authorities of the country to be visited.

- **CITES website** <<https://cites.org/eng/cms/index.php/component/cp>>

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) website provides an inclusive list of all signatory countries with addresses and email links to the relevant responsible wildlife management authorities in each country. These authorities will usually be responsible for enforcement of national law as well as international law pertaining to CITES, and, barring language problems, etc., may be a useful source of information about a country's regulations regarding collection and export of shells. We examined about one-third of these country sites for on-line information regarding local (national) wildlife laws and regulations. Only a small fraction of the CITES signatory states provide website links on their page (some in the native language only), and nearly all of those, in turn, are focused exclusively on administration of CITES regulations. A few countries (e.g., Argentina) present a nice website that describes conservation areas and policies but makes no reference to Mollusca or shells. Two exceptions are noted here: the Antigua and Barbuda website contains a list of protected species and states (as of 2014) that mollusks were yet "to be determined." In stark contrast, Australia's website includes detailed provisions about all aspects of wildlife management, including lists of protected mollusks and non-protected mollusks, specimen shells, beach shells, and export limits. The websites of Cabo Verde, Canada, and the United States, for example, are among those websites (accessed through links from the CITES page, above) that focus principally on CITES enforcement and generally fail to mention shells or mollusks (or any other additional protected/endangered species) in any other context. It would be most helpful if the sites accessible through this comprehensive country listing could be linked prominently to information sources on pertinent domestic conservation measures and species protection above and beyond CITES concerns.

- **Global Council of the Mediterranean: GFCM Database on National Fisheries Legislation.** <<http://nationallegislation.gfcmscretariat.org/index.php>>

This website lists 24 contracting parties to the Council and 4 non-contracting parties, and shows national regulations relevant to fisheries for each party. Protected and regulated molluscan species are mentioned in several entries.

- **Bern Convention on the Conservation of European Wildlife and Natural Habitats.** <<http://www.coe.int/en/web/bern-convention>>

This treaty, with 51 signatory member parties, addresses the natural heritage of Europe, as well as some African countries, and is particularly concerned with protection of natural habitats and endangered species, including migratory species. The Convention identifies Protected flora and fauna in three Appendices. Thirty-one species of gastropods and four bivalves are included under Appendix II – STRICTLY PROTECTED FAUNA SPECIES; and one gastropod and 3 bivalves are listed under Appendix III – PROTECTED FAUNA SPECIES. On-line access to these appendices is at: <<http://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/104>> Under Article 6 of this convention, each contracting party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. Deliberate capture and killing of these species is prohibited, as is possession of

and internal trade, alive or dead, including any readily recognisable part or derivative thereof, where this would contribute to the effectiveness of the provisions of this convention. The British Shell-Collecting Club has published a list of species protected under the Bern Convention and other Laws pertinent to Great Britain (Walker and Whicher, 2009) — available on-line at: <<http://www.britishshellclub.org/pages/articles/cites/artcites.htm>>

- **Food and Agriculture Organization of the United Nations: Legal Office – FAOLEX.** <<http://faolex.fao.org>>

FAOLEX is a comprehensive and up-to-date legislative and policy database, one of the world's largest electronic collection of national laws, regulations and policies on food, agriculture and renewable natural resources. Locating laws and regulations pertaining specifically to mollusks, or shells, requires some searching, but a modicum of effort produced relevant regulatory information from Mauritius, Seychelles, Solomon Islands, and Vanuatu. The keywords: protected species, endangered species, snail, bivalve, clam, mollusc, and sea shell (as one word, hyphenated, and two words) are all useful search terms.

- **Association of Southeast Asian Nations, SE Asian Fisheries Development Center — SEAFDEC.** <<http://www.seafdec.org/category/protected-species/>>

Established in 2015, the ten member states of the ASEAN Economic Community are promoting economic, social and cultural cooperation within the region. At present, only 4 of the member states include mollusks on their lists of protected aquatic species: Cambodia (6), Indonesia (12), Philippines (46), and Thailand (Tridacnidae + 1).

- **U.S. National Oceanic & Atmospheric Administration: Management Report for 82 Corals Status Review under the Endangered Species Act: Existing Regulatory Mechanisms (per Endangered Species Act § 4(a)(1)(D), 16 U.S.C. § 1533(a)(1)(D)) and Conservation Efforts (per Endangered Species Act § 4(b)(1)(A), 16 U.S.C. § 1533(b)(1)(A)) - November 2012.** <http://www.nmfs.noaa.gov/stories/2012/11/docs/final_corals_mgmt_report.pdf>

This report focuses on coral and coral reefs, but provides a country-by-country listing of regulations and restrictions pertaining in part to collection of shells in and on coral reefs.

- **Canada:** The website <<http://www.ec.gc.ca/cites/>> accessed through CITES (above) explains the interplay between CITES regulations and their domestic law (WAPPRIITA) that makes it illegal to “Import or possess any wild species of animal or plant, including their parts and derivatives that were obtained or exported illegally from another country.” As this regulation is not restricted to CITES listed species, Canada may impound any shipments of shells being imported, exported, or re-exported when their original provenance is poorly documented. In addition, Canada has detailed regulatory measures for endangered species under the Species at risk Act (SARA) and lists the endangered mollusk species of Canada on their “Species at Risk Public Registry” <http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1> at one of four levels of concern: Extirpated species (2); endangered species (15); threatened species (2); and special concern species (7). Under SARA, no person shall kill, harm, harass, capture, or take individuals of any species listed as extirpated, endangered, or threatened: or shall possess, collect, buy, sell or trade any of these species <<http://laws-lois.justice.gc.ca/eng/acts/S-15.3/page-4.html#h-14>>.

- **Israel:** According to Vaisman and Mienis (2015, 2016), the entire phylum Mollusca, both living and empty shells, is protected under the law of Israel, and collecting, rearing, and trading are regulated under permits issued by the Israel Nature and National Parks Protection Authority. Although the examples discussed in these references deal exclusively with terrestrial and freshwater species, (mainly agricultural pests and snails for human consumption or the aquarium trade) the law extends as well to marine species, which along with coral and anemones, and Echinodermata, are protected everywhere in the country http://www.ramsar.org/sites/default/files/documents/library/nr_israel_cop7.pdf. According to Mienis [<http://www.manandmollusc.net/israel-legalities.html>] permits may be granted for certain scientific collecting.

- **Indonesia:** In addition to the seven native ~~Tridacnid~~ tridacnid species protected under CITES, Indonesia prohibits catching, possession, transport, and trade of Triton's trumpet *Charonia tritonis*, horned helmet *Cassis cornuta*, commercial top shell *Trochus niloticus*, marbled turban *Turbo marmoratus*, and chambered nautilus *Nautilus pompilius*. Despite these restrictions, however, these protected species are reportedly traded openly in local public markets (Nijman et al., 2015).

- **Philippines:** A permit from the Bureau of Fisheries and Aquatic Resources is required for all shells exported from the Philippines. Possession and export of *Charonia* and *Cassis* species are prohibited, along with Tridacnidae and numerous species of Cypraeidae and other families. Pertinent regulations and detailed lists are available at two sites: <<http://www.bfar.da.gov.ph/bfar/download/fao/FAO208.pdf>> and <<http://www.conchology.be/?t=1000>>.
- **India:** Including CITES species, twenty-four marine molluscan species are protected, and their collection, possession, and trade is prohibited. The species are illustrated in a slick brochure from the Zoological Survey of India, and include *Conus milneedwardsi*, *Cypraeacassis rufa*, 5 species of *Lambis*, 3 species of *Cypraea*, *Harpulina arausiaca*, and *Tudicla spirillus*. For a brief period in 2001 the list included 52 species, but more than half (including *Turbinella pyrum*) of those were removed after only 6 months. <http://indiansacredconch.blogspot.com> (posted 29 May, 2011).
- **General Tourist Travel Sites on-line** can be helpful, but access to official conservation policy is often not transparent or is completely lacking. Nearly all countries, of course, prohibit live shell-collecting in their National Parks, and in some regions like Bonaire and the Galapagos, that is essentially everywhere. On-line tourist websites, however, are generally oriented toward promoting visitation, and may not wish to trouble their prospects with burdensome regulations. For example, **Bermuda** customs regulations pertaining to mollusks are available online: <http://www.gotobermuda.com/uploadedFiles/CommonContent/CommonAssets/CUSTOMS_REGULATIONS_2010.pdf>, but those regulations are not prominently linked on the parent site. Except where supported by a license issued by the Department of Environmental Protection, the Bermudan government prohibits the importation and exportation of any (living or dead; whole or in part, including meat) of the following mollusks: “queen conch (*Strombus gigas*); harbour or milk conch (*Strombus costatus*); Bermuda cone (*Conus bermudensis*); netted olive (*Oliva reticularis*); Bermuda scallop (*Pecten ziczac*); calico scallop (*Argopecten gibbus*); Atlantic pearl oyster (*Pinctada imbricata*); helmets and bonnets of all species (Cassididae); calico clam (*Macrocallista maculata*); and West Indian top-shell (*Cittarium pica*, formerly known as *Livona pica*).”

The IUCN Red List: <<http://www.iucnredlist.org/>>

Although carrying no legal authority, The International Union for the Conservation of Nature (IUCN) is the world’s main authority on the conservation status of species. The IUCN Species Survival Commission (SSC) is a network of largely volunteer scientific experts who are assessing and monitoring biological diversity, especially at the species level. The SSC disseminates information about the status and trends of global diversity and on appropriate conservation actions for slowing the current rates of decline in biodiversity and the current crisis in species extinction. The IUCN/SSC **Mollusc Specialists Group** publishes an on-line newsletter *Tentacle* that presents progress on issues of concern to the conservation of mollusks worldwide, occasionally including references to relevant conservation measures and laws of other countries. Past issues of *Tentacle* are accessible at: <http://www.hawaii.edu/cowielab/issues.htm>.

The IUCN Red List of Threatened Species (also known as the IUCN Red List or Red Data List), founded in 1964, is the world’s most comprehensive inventory of the global conservation status of biological species and is a series of regional Red Lists produced by countries or organizations, which assess the risk of extinction to species within a political management unit. The IUCN Red List is set upon precise criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. The aim is to convey the urgency of conservation issues to the public and policy makers, as well as help the international community to try to reduce species extinction. According to the IUCN (1996), the formally stated goals of the Red List are 1) to provide scientifically based information on the status of species and subspecies at a global level, 2) to draw attention to the magnitude and importance of threatened biodiversity, 3) to influence national and international policy and decision-making, and 4) to provide information to guide actions to conserve biological diversity. A search of the IUCN list for “MOLLUSCA” lists 7251 entries. These are distributed among the nine assessment categories as follows:

Red List Categories

EX — Extinct	(310)	LR/cd — Lower Risk; Conservation Dependent	(6)
EW — Extinct in the Wild	(14)	NT or LR.nt — Near Threatened	(529)
CR — Critically Endangered	(581)	DD — Data Deficient	(1988)
EN — Endangered	(507)	LC or LR/lc — Least Concern	(2437)
VU — Vulnerable	(879)		

Of those 581 species assessed as CRITICALLY ENDANGERED, only 5 are associated with FAO Marine Areas; the remainder are terrestrial or freshwater species. Of those 507 species that are identified as ENDANGERED, 14 are associated with FAO Marine Areas; and the remainder are terrestrial or freshwater species. [The Food and Agriculture Organization of the United Nations (FAO) is an agency of the United Nations that leads international efforts to defeat hunger.] Of the 879 species that are identified as vulnerable, only 28 are associated with FAO Marine Areas; the remainders are terrestrial or freshwater species. The marine species in these three categories of endangerment are listed in our **Appendix 3**.

The prospective shell-collecting foreign traveler might consider checking the Red List prior to departure to become familiar with the status of molluscan conservation concerns in the areas to be visited. IUCN species assessment is an ongoing project, and the details are certain to change, so the list should be checked regularly for updated information. While the IUCN Red List is not itself a regulatory document, the regulatory agencies of many countries make use of these assessments in promulgating their own national rules. As the IUCN Red List is readily available to most users, it may offer valuable insights to travelers that encounter difficulty locating the sometimes highly cryptic regulations of their targeted destination country.

To test this “valuable insight” hypothesis above, we generated a complete listing of the 1967 molluscan species (in categories CR, EN & VU— **Appendix 3**) by individual country. For each of the 246 countries, the table shows how many of these species are represented in all 3 assessment categories taken together, and also the number included only in the more imperiled CR & EN categories. Some countries list the same species, leading to greater totals for the country-listed species than for total species. The countries are listed in order of greatest to smallest number of species for the (CR + EN) category. Of the 245 countries, 128 have no Critically Endangered or Endangered species featured on the IUCN Red List. Intuitively, one might expect all of those countries with IUCN Red-Listed species to have domestic regulations concerning collection and export, and conversely, that those countries with very few or no listed species might have no formal regulations in place. While that expectation is generally supported, we have seen that many countries may regulate the collection, possession, and export of species for reasons other than endangerment and the threat of extinction, and we have already identified some notable exceptions to the latter expectation: especially Bermuda, Israel, and the Philippines, which specifically protect and regulate possession and export of many species not on their country’s IUCN Red Lists.

Numbers of IUCN Red Listed Mollusk Species by Country for two Combinations of Assessment Category (ranked by CR+EN)

Country	abbr	all 3	CR+EN	Country	abbr	all 3	CR+EN
United States	US	302	189	Germany	DE	31	19
Spain	ES	143	61	Japan	JP	33	19
Fiji	FJ	68	40	New Caledonia	NC	28	18
Greece	GR	66	40	Madagascar	MG	24	17
Portugal	PT	78	40	Montenegro	ME	21	17
Australia	AU	174	38	South Africa	ZA	22	17
Macedonia	MK	61	37	New Zealand	NZ	35	16
Palau	PW	40	36	Brazil	BR	22	14
Austria	AT	43	33	Mauritius	MU	28	14
Ecuador	EC	49	33	Kenya	KE	17	13
Congo (Democratic. Rep.)	CD	45	31	Cameroon	CM	13	10
France	FR	93	31	China	CN	15	10
Morocco	MA	37	31	Bosnia/Herzegovina	BA	17	9
French Polynesia	PF	34	30	Israel	IL	11	8
Malaysia	MY	35	29	Syrian Arab Rep.	SY	9	8
Albania	AL	49	28	Tanzania	TZ	15	8
Turkey	TR	45	28	Zambia	ZM	13	8
Italy	IT	73	24	Bulgaria	BG	25	7
Seychelles	SC	36	24	Cabo Verde	CV	13	7
Viet Nam	VN	30	22	Senegal	SN	12	7
Croatia	HR	45	19	Uganda	UG	9	7

Country	abbr	all 3	CR+EN	Country	abbr	all 3	CR+EN
Algeria	DZ	11	6	Belarus	BY	3	1
Lebanon	LB	9	6	Burundi	BI	4	1
Slovenia	SI	32	6	Cayman Islands	KY	1	1
American Samoa	AS	6	5	Costa Rica	CR	1	1
Guam	GU	6	5	Estonia	EE	3	1
Romania	RO	11	5	Guinea	GN	3	1
Canada	CA	5	4	Iraq	IQ	1	1
Ethiopia	ET	4	4	Ireland	IE	4	1
Jordan	JO	6	4	Kazakhstan	KZ	2	1
Luxembourg	LU	5	4	Laos	LA	16	1
Malawi	MW	7	4	Liberia	LR	3	1
Mexico	MX	7	4	Liechtenstein	LI	2	1
Norfolk Island	NF	12	4	Lithuania	LT	2	1
Reunion	RE	16	4	Nigeria	NG	3	1
Russian Fed.	RU	8	4	Norway	NO	3	1
Switzerland	CH	10	4	Philippines	PH	3	1
Tunisia	TN	7	4	Saint Helena	SH	1	1
Belgium	BE	6	3	Samoa	WS	1	1
Chad	TD	4	3	Sierra Leone	SL	5	1
Czech Rep.	CZ	6	3	Somalia	SO	2	1
Denmark	DK	5	3	Turkmenistan	TM	1	1
Hungary	HU	8	3	Ukraine	UA	6	1
India	IN	7	3	Uzbekistan	UZ	1	1
Indonesia	D	6	3	Wallis Futuna	WF	1	1
Micronesia, Federated States	FM	5	3	Yemen	YE	2	1
Mozambique	MZ	3	3	Afghanistan	AF	0	0
Poland	PL	7	3	Andorra	AD	3	0
Thailand	TH	15	3	Anguilla	AI	0	0
Vanuatu	VU	4	3	Antarctica	AQ	0	0
Angola	AO	7	2	Antigua/Barbuda	AG	0	0
Armenia	AM	2	2	Argentina	AR	0	0
Azerbaijan	AZ	2	2	Aruba	AW	1	0
Colombia	CO	4	2	Bahamas	BS	1	0
Congo	CG	7	2	Bahrain	BH	0	0
Cote d'Ivoire	CI	5	2	Bangladesh	BD	0	0
Finland	FI	3	2	Barbados	BB	0	0
Georgia	GE	4	2	Belize	BZ	0	0
Guatemala	GT	2	2	Benin	BJ	2	0
Iran	IR	2	2	Bermuda	BM	0	0
Latvia	LV	4	2	Bhutan	BT	0	0
Malta	MT	3	2	Bolivia	BO	2	0
Myanmar	MM	3	2	Botswana	BW	0	0
Netherlands	NL	5	2	Bouvet Island	BV	0	0
Nicaragua	NI	2	2	British Indian Ocean Terr.	IO	0	0
N. Mariana Islands	MP	4	2	Brunei Darussalam	BN	0	0
Palestinian Terr., Occupied	PS	2	2	Burkina Faso	BF	1	0
Serbia	RS	5	2	Cambodia	KH	1	0
Slovakia	SK	6	2	Central African Republic	CF	0	0
Sweden	SE	4	2	Chile	CL	1	0
Tonga	TO	4	2	Christmas Island	CX	0	0
United Kingdom	GB	7	2	Cocos (Keeling) Islands	CC	0	0

Country	abbr	all 3	CR+EN	Country	abbr	all 3	CR+EN
Comoros	KM	0	0	Montserrat	MS	0	0
Cook Islands	CK	2	0	Namibia	NA	2	0
Cuba	CU	0	0	Nauru	NR	0	0
Cyprus	CY	2	0	Nepal	NP	1	0
Djibouti	DJ	1	0	Netherlands Antilles	AN	0	0
Dominica	DM	0	0	Niger	NE	1	0
Dominican Republic	DO	0	0	Niue	NU	0	0
Egypt	EG	0	0	Oman	OM	2	0
El Salvador	SV	0	0	Pakistan	PK	0	0
Equatorial Guinea	GQ	2	0	Panama	PA	0	0
Eritrea	ER	1	0	Papua New Guinea	PG	2	0
Falkland Islands (Malvinas)	FK	0	0	Paraguay	PY	0	0
Faroe Islands	FO	0	0	Peru	PE	4	0
French Guiana	GF	0	0	Pitcairn	PN	5	0
French Southern Territories	FST	0	0	Puerto Rico	PR	0	0
Gabon	GA	2	0	Qatar	QA	0	0
Gambia	GM	2	0	Rwanda	RW	0	0
Ghana	GH	2	0	Saint Barthélemy	BL	0	0
Gibraltar	GI	3	0	Saint Kitts and Nevis	KN	0	0
Greenland	GL	0	0	Saint Lucia	LC	0	0
Grenada	GD	0	0	Saint Martin	MF	0	0
Guadeloupe	GP	1	0	Saint Pierre and Miquelon	PM	0	0
Guernsey	GG	0	0	Saint Vincent /Grenadines	VC	0	0
Guinea-Bissau	GW	2	0	San Marino	SM	1	0
Guyana	GY	0	0	Sao Tome & Principe	ST	3	0
Haiti	HT	0	0	Saudi Arabia	SA	1	0
Heard Is. & McDonald Isls.	HM	0	0	Singapore	SG	0	0
Vatican City State	VA	0	0	Solomon Islands	SB	2	0
Honduras	HN	0	0	S. Georgia & S Sandwich Is.	GS	0	0
Hong Kong	HK	1	0	Sri Lanka	LK	0	0
Iceland	IS	0	0	Sudan	SD	0	0
Isle of Man	IM	0	0	Suriname	SR	0	0
Jamaica	JM	0	0	Svalbard and Jan Mayen	SJ	0	0
Jersey	JE	1	0	Swaziland	SZ	0	0
Kiribati	KI	1	0	Taiwan, China	TW	1	0
Korea (Dem. People's Rep.)	KP	0	0	Tajikistan	TJ	0	0
Korea, Republic	KR	0	0	Timor-Leste	TL	0	0
Kuwait	KW	0	0	Togo	TG	2	0
Kyrgyzstan	KG	0	0	Tokelau	TK	0	0
Lesotho	LS	0	0	Trinidad & Tobago	TT	0	0
Libya	LY	0	0	Turks &Caicos Islands	TC	0	0
Macao	MO	0	0	Tuvalu	TV	1	0
Maldives	MV	0	0	United Arab Emirates	AE	0	0
Mali	ML	0	0	U.S. Minor Outlying Islands	UM	0	0
Marshall Islands	MH	2	0	Uruguay	UY	0	0
Martinique	MQ	2	0	Venezuela	VE	1	0
Mauritania	MR	2	0	Virgin Islands, British	VG	0	0
Mayotte	YT	0	0	Virgin Islands, U.S.	VI	0	0
Moldova	MD	2	0	Western Sahara	EH	2	0
Monaco	MC	1	0	Zimbabwe	ZW	0	0
Mongolia	MN	0	0				
				SUM (total spp.)		2433	1279
						(1965)	(1087)

FAA restrictions of relevance

The US Federal Aviation Administration (FAA) allows air transport of “alcohol” (ethanol or isopropanol) in concentrations of 70% or less. Although carry-on is limited to 3.4 oz (~ 100 mL), checked baggage may contain up to 5 liters at this concentration. If a traveling collector has placed mollusk remains in 70% alcohol for preservation, there should be no additional problem with this particular restriction since tissue water will have diluted the preservative. Many molecular genetics laboratories require ethanol in concentrations greater than 70% for preservation of DNA, however, and this may pose a serious problem. Specimens preserved in 95% grain alcohol for DNA analysis could be drained just prior to air transport and re-constituted immediately upon arrival at destination. Another alternative for DNA preservation, dry ice, is limited to five pounds, and the container must allow for the off-gassing of carbon dioxide. Information on these and related matters can be found at <https://apps.tsa.dhs.gov/mytsa/index.aspx>.

Summary Conclusions

In their present form, the regulations of the USFWS impose a major impediment for the importation of mollusk shells, either by hobbyist collectors returning from overseas collection trips or by commercial shell dealers specializing in specimen shells for the amateur shell collecting community. This combined sector of the amateur shell collecting public interacts effectively with professional scientists employed by universities and museums and makes a major contribution to research and discovery of speciation and diversity in the field of malacology. Compared with other categories of endangered species and products, mollusk shells as a group are somewhat unique in that the number of protected forms is infinitesimally small compared to the numbers of species that are potentially collected. The present requirement for declaration of a vast number of non-protected species identified to species level places an unnecessarily large and difficult burden upon both the shell collector returning from a brief excursion abroad and the FWS agents responsible for inspection and clearance of the mollusk shells presented for importation. It is hoped that this review of present regulations will assist collectors and prospective importers of mollusk shells in compliance, and simultaneously may lead to progressive simplification and improved efficiency of the difficult process of surveillance and protection of endangered molluscan species.

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Appendix 1: CITES Appendices 1 & 2

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Species are listed under CITES Appendix I (endangered species believed threatened with extinction, commercial trade and import-export generally prohibited), CITES Appendix II (not presently endangered but needs monitoring to ensure continued viability, limited import-export with permit requirement), or CITES III (not endangered but deemed worthy of listing by a member nation to prevent unsustainable or illegal exploitation, export with permit requirement – no Mollusca presently listed under CITES III). CITES recently announced the addition of two more mollusk groups to its listings. Effective 2 January 2017, land/tree snails of the genus *Polymita* (painted snail: 6 species & many subspecies & varieties) native to the eastern mountainous regions of Cuba, are included in Annex I and generally prohibited from international trade; and all living species of chambered nautilus (Nautilidae: *Nautilus* spp., six species listed) are added to Appendix II, with commensurate restrictions on import and export and requirements for declaration. Here is a list of the 96 molluscan species-level taxa now protected under CITES I & II, listed in phylo-alphabetical order. Indented taxa are for ease of reference only; unindented taxa actually appear on the official list, i.e., Achatinellidae, Tridacnidae, and *Hippopus* spp., and are listed **in addition to** each of their constituent species. Sizes listed with images are approximate. Legend: **freshwater**, **marine**, **terrestrial**.

CEPHALOPODA:

NAUTILIDAE (all species, CITES II)

Allonautilus perforatus Conrad, 1949
Allonautilus scrobiculatus (Lightfoot, 1786)
Nautilus belauensis Saunders, 1981
Nautilus macromphalus Sowerby, 1849
Nautilus pompilius Linnaeus, 1758
Nautilus repertus Iredale, 1944



GASTROPODA:

STROMBIDAE (1 listed species, CITES II)

Strombus gigas Linnaeus, 1758 Tropical
 NW Atlantic

Nautilus pompilius Linnaeus, 1758
 (175mm) anon.

Strombus gigas Linnaeus, 1758 [now *Lobatus gigas* (Linnaeus, 1758)] (200mm+) courtesy Bill Frank, <http://jaxshells.org>.

ACHATINELLIDAE (all species [39 nominal species + 2 synonyms, endemic to Oahu, Hawaii, all but perhaps 9 are extinct] CITES I)

Achatinella abbreviata Reeve, 1850
Achatinella apexfulva (Dixon, 1789)
Achatinella bellula E.A. Smith, 1873
Achatinella buddii Newcomb, 1853
Achatinella bulimoides Swainson, 1828
Achatinella byronii (Wood, 1828)
Achatinella caesia Gulick, 1858
Achatinella casta Newcomb, 1853
Achatinella cestus Newcomb, 1853
Achatinella concavospira L. Pfeiffer, 1859
Achatinella curta Newcomb, 1853
Achatinella decipiens Newcomb, 1854
Achatinella decora (Férussac, 1821)
Achatinella dimorpha Gulick, 1858
Achatinella elegans Newcomb, 1853
Achatinella fulgens Newcomb, 1853
Achatinella fuscobasis (E.A. Smith, 1873)
Achatinella juddii Baldwin, 1895
Achatinella juncea Gulick, 1856
Achatinella lehuiensis E.A. Smith, 1873
Achatinella leucorrhaphae Gulick, 1873
Achatinella lila Pilsbry, 1914
Achatinella livida Swainson, 1828
Achatinella lorata (Férussac, 1824)



Achatinella abbreviata Reeve, 1850 (17mm) courtesy Femorale, <http://femorale.com>.



Achatinella apexfulva (Dixon, 1789) (15mm) courtesy Femorale, <http://femorale.com>.



Achatinella bellula E.A. Smith, 1873 (16mm) courtesy Femorale, <http://femorale.com>.

Achatinella mustelina Mighels, 1845
Achatinella papyracea Gulick, 1856
Achatinella phaeozona Gulick, 1856
Achatinella pulcherrima Swainson, 1828
Achatinella pupukanioe Pilsbry & Cooke, 1914
Achatinella rosea Swainson, 1828
 [= *A. bulimoides* Swainson, 1828]
Achatinella sowerbyana L. Pfeiffer, 1855
Achatinella spaldingi Pilsbry & Cooke, 1914
Achatinella stewartii Green, 1827

Achatinella swiftii Newcomb, 1853
Achatinella taeniolata L. Pfeiffer, 1846
Achatinella thaamumi Pilsbry & Cooke, 1914
Achatinella turgida Newcomb, 1853
Achatinella valida L. Pfeiffer, 1855
Achatinella viridans Mighels, 1845
Achatinella vittata Reeve, 1850
 [= *A. apexfulva* (Dixon, 1789)]
Achatinella vulpina (Férussac, 1824)

HELMINTHOGLYPTIDAE (all 6 *Polymita* species + subspecies & forms, CITES I)*Polymita brocheri* Gutiérrez in Pfeiffer, 1864*Polymita muscarum* Lea, 1834*Polymita picta* Born, 1780*Polymita sulphurosa* Morelet, 1849*Polymita venusta* Gmelin, 1792*Polymita versicolor* Born, 1780

CAMAENIDAE (one listed species, CITES I)

Papustyla pulcherrima Rensch, 1931 Papua New Guinea**PELECYPODA:**

MYTILIDAE (one listed species, CITES I)

Lithophaga lithophaga (Linnaeus, 1758) E Atlantic, Mediterranean

TRIDACNIDAE (all 11 species, CITES II, Indo-W. Pacific)

Hippopus hippopus (Linnaeus, 1758)*Hippopus porcellanus* Rosewater, 1982*Tridacna crocea* Lamarck, 1819*Tridacna derasa* (Röding, 1798)*Tridacna gigas* (Linnaeus, 1758)*Tridacna maxima* (Röding, 1798)*Tridacna ningaloo* Penny & Willan, 2014*Tridacna noae* (Röding, 1798)*Tridacna rosewateri* Sirenko & Scarlato, 1991*Tridacna squamosa* Lamarck, 1819*Tridacna tevoroa* Lucas, Ledua & Braley, 1990

UNIONIDAE (31 species: *29 native to E USA, CITES I, + 2 from Mexico, Central America as noted, CITES II)

Conradilla caelata (Conrad, 1834) [= *Lemiox rimosus* (Rafinesque, 1831)]*Cyprogenia aberti* (Conrad, 1850)*Dromus dromas* (I. Lea, 1834)*Epioblasma curtisii* (Utterback, 1915)*Epioblasma florentina* (I. Lea, 1857)*Epioblasma sampsonii* (I. Lea, 1861)*Epioblasma sulcata* (I. Lea, 1829)*Epioblasma sulcata perobliqua* (Conrad, 1836)*Epioblasma torulosa gubernaculum* (Reeve, 1865)*Epioblasma torulosa rangiana* (I. Lea, 1839)*Epioblasma torulosa torulosa* (Rafinesque, 1820)*Epioblasma turgidula* (I. Lea, 1858)*Epioblasma walkeri* (Wilson & Clark, 1914)*Fusconaia cuneolus* (I. Lea, 1840)*Fusconaia edgariana* (I. Lea, 1841) [= *Fusconaia cor* (Conrad, 1834)]*Lampsilis higginsii* (I. Lea, 1857)*Lampsilis orbiculata* (I. Lea, 1836)*Lampsilis orbiculata orbiculata* (Hildreth, 1828)*Lampsilis satur* (I. Lea, 1852)*Lampsilis virescens* (I. Lea, 1858)*Plethobasus cicatricosus* (Say, 1829)*Plethobasus cooperianus* (I. Lea, 1834)*Pleurobema clava* (Lamarck, 1819)*Pleurobema plenum* (I. Lea, 1840)*Potamilus capax* (Green, 1832)*Quadrula intermedia* (Conrad, 1836)*Quadrula sparsa* (I. Lea, 1841)*Toxolasma cylindrella* (I. Lea, 1868)*Polymita picta* Born, 1780 (28mm) anon.*Lithophaga lithophaga* (Linnaeus, 1758) (75mm) courtesy World Register of Marine Species (WoRMS), <http://www.marinespecies.org>.*Epioblasma torulosa torulosa* (Rafinesque, 1820) (65mm) courtesy of The MUSSEL Project, <http://mussel-project.uwsp.edu/>.†*Unio nickliniana* I. Lea, 1837 Guatemala and Mexico
[= *Megaloniais nickliniana* (I. Lea, 1837)]†*Unio tampicoensis tampicoensis* I. Lea, 1838 Honduras and Mexico
[= *Cyrtonaias t. tampicoensis* (I. Lea, 1841)]
Villosa trabalis (Conrad, 1834)

Legend: freshwater, marine, terrestrial.

* all but 2 of these (†) appear on the Endangered Species Act (ESA) list as well; see text and Appendix 2 (page 20).



Polymita brocheri Gutiérrez in Pfeiffer, 1864 (24mm) anon.



Papustyla pulcherrima (Rensch, 1931) (36mm) anon.



Hippopus hippopus (Linnaeus, 1758) (100mm) adapted from Wikipedia.com.



Tridacna squamosa Lamarck, 1819 (125mm) anon.



Dromus dromas (I. Lea, 1834) (45mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Megalonaias nickliniana (I. Lea, 1837) (105mm) adapted from TheMUSSELProject, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.

Appendix 2: ESA

When Congress passed the Endangered Species Act (ESA) in 1973, it recognized that our rich natural heritage is of “esthetic, ecological, educational, recreational, and scientific value to our Nation and its people.” It further expressed concern that many of our nation’s native plants and animals were in danger of becoming extinct.

The purpose of the ESA <<https://www.fws.gov/endangered/laws-policies/>> is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife Service (FWS) and the Commerce Department’s National Marine Fisheries Service (NMFS). The FWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife. Within the U.S., the ESA lists 176 mollusk species as endangered or threatened (Legend: [freshwater](#), [marine](#), [terrestrial](#); sizes approximate):

BIVALVES (88 spp.)

Alasmidonta atropurpurea

Alasmidonta heterodon

Alasmidonta raveneliana

Amblyma neislerii

Arkansia wheeleri

Cumberlandia monodonta

Cyprogenia stegaria

Dromus dromas

Elliptio chipolaensis

Elliptio spinosa

Elliptio steinstansana

Elliptioideus sloatianus

Epioblasma brevidens

Epioblasma capsaeformis

Epioblasma florentina curtisii

Epioblasma florentina florentina

Epioblasma florentina walkeri (= *E. walkeri*)

Epioblasma metastriata

Epioblasma obliquata obliquata

Epioblasma obliquata perobliqua

Epioblasma othcaloogensis

Epioblasma penita

Epioblasma torulosa gubernaculum

Epioblasma torulosa rangiana

Epioblasma torulosa torulosa

Epioblasma triquetra

Epioblasma turgidula

Fusconaia burkei

Fusconaia cor

Fusconaia cuneolus

Fusconaia escambia

Fusconaia rotulata

Hamiota australis

Hemistena lata

Lampsilis abrupta

Lampsilis attilis

Lampsilis higginsii

Lampsilis perovalis

Lampsilis powellii

Lampsilis rafinesqueana

Lampsilis streckeri

Lampsilis subangulata

Lampsilis virescens

Lasmigona decorata

Lemiox rimosus

Leptodea leptodon



Alasmidonta raveneliana (I. Lea, 1834) (55mm)
adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Amblyma neislerii (I. Lea, 1858) (85mm)
The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Cyprogenia stegaria (Rafinesque, 1820) (45mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Elliptio chipolaensis (Walker, 1905) (80mm)
adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Hamiota australis (Simpson, 1900) (50mm)
adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Arkansia wheeleri Ortmann & Walker, 1912 (75mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Cumberlandia monodonta (Say, 1829) (145mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Epioblasma florentina florentina (I. Lea, 1857) (45mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Epioblasma metastriata (Conrad, 1838) (45mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Fusconaia cuneolus (I. Lea, 1840) (50mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Hemistena lata (Rafinesque, 1820) (55mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Lampsilis higginsii (I. Lea, 1857) (70mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.

Margaritifera hembeli
Margaritifera marrianae
Medionidus acutissimus
Medionidus parvulus
Medionidus penicillatus
Medionidus simpsonianus
Obovaria retusa
Pegias fabula
Plethobasus cicatricosus
Plethobasus cooperianus
Plethobasus cyphus
Pleurobema clava
Pleurobema collina
Pleurobema curtum
Pleurobema decisum
Pleurobema furvum
Pleurobema georgianum
Pleurobema gibberum
Pleurobema hanleyianum
Pleurobema marshalli
Pleurobema perovatium
Pleurobema plenum
Pleurobema pyriforme
Pleurobema strodeanum
Pleurobema taitianum
Pleurobema dolabelloides
Potamilus capax
Potamilus inflatus
Ptychobranthus greenii
Ptychobranthus jonesi
Ptychobranthus subtentum
Quadrula cylindrica cylindrica
Quadrula cylindrica strigillata
Quadrula fragosa
Quadrula intermedia
Quadrula sparsa
Quadrula stapes
Toxolasma cylindrellus
Villosa choctawensis
Villosa fabalis
Villosa perpurpurea
Villosa trabalis



Margaritifera marrianae R.I. Johnson, 1983, (90mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Medionidus acutissimus (I. Lea, 1831) (60mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



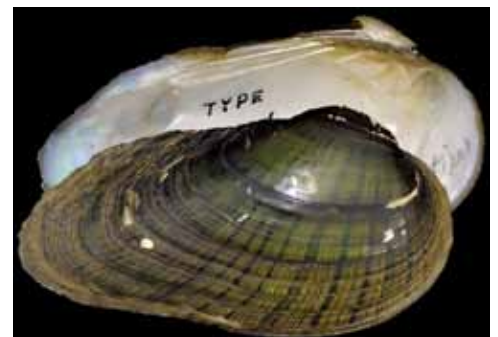
Pleurobema clava (Lamarck, 1819) (50mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Pleurobema pyriforme (I. Lea, 1857) (43mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Villosa fabalis (I. Lea, 1831) (30mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Villosa trabalis (Conrad, 1834) (65mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.

GASTROPODS (88 spp.)

Achatinella spp. [39 spp., Oahu, HI]
Anguispira picta
Antrobia culveri
Assiminea pecos
Athearnia anthonyi
Campeloma decampi
Discus macclintocki
Elimia crenatella
Erinna newcombi [HI]
Haliotis cracherodii
Haliotis sorenseni
Helminthoglypta walkeriana
Juturnia kosteri
Lanx sp.

Antrobia culveri Hubricht, 1971 (2mm) image by David Ashley of Missouri Western State University as published by USFWS, <https://www.fws.gov/Midwest/endangered/Snails/tcca/index>.





Obovaria retusa (Lamarck, 1819) (45mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Pegias fabula (I. Lea, 1838) (30mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Plethobasus cicatricosus (Say, 1829) (75mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Potamilus inflatus (I. Lea, 1831) (110mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Ptychobranthus greenii (Conrad, 1834) (100mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.



Assiminea pecos Taylor, 1987 (1.5mm) Wikipedia.com.



Discus macclintocki (F.C. Baker, 1928) (7mm) Wikipedia.com.



Quadrula fragosa (Conrad, 1836) (75mm) adapted from The MUSSEL Project, U. of Wisconsin-Stevens Point, <http://mussel-project.uwsp.edu/>.

Leptoxis ampla
Leptoxis foremani
Leptoxis plicata
Leptoxis taeniata
Lepyrium showalteri
Lioplax cyclostomaformis
Newcombia cumingi [HI]
Orthalicus reses (not incl. *nesodryas*)
Oxyloma haydeni kanabensis
Partula gibba
Partula langfordi
Partula radiolata
Partulina semicarinata [HI]
Partulina variabilis [HI]
Patera clarki nantahala
Physa natricina
Pleurocera foremani
Polygyriscus virginianus
Pseudotryonia adamantina
Pyrgulopsis [= Marstonia] pachyta
Pyrgulopsis bernardina
Pyrgulopsis bruneauensis
Pyrgulopsis chupaderae
Pyrgulopsis neomexicana
Pyrgulopsis ogmorhaphae
Pyrgulopsis roswellensis
Pyrgulopsis texana
Pyrgulopsis trivialis
Samoana fragilis
Succinea chittenangoensis
Tayloriconcha serpentiocla
Triodopsis platysayoides
Tryonia alamosae
Tryonia cheatumi
Tryonia circumstriata [= T. stocktonensis]
Tulotoma magnifica

Legend: freshwater, marine, terrestrial.



Pyrgulopsis [now *Marstonia*]
pachyta Pilsbry, 1890 (4mm)
 Freshwater Gastropods of
 North America, <http://fwgna.org>.



Leptoxis ampla (Anthony, 1855)
 (20mm) Wikipedia.com.



Leptoxis taeniata (Conrad, 1834) (9mm) courtesy of
 Femorale, <http://femorale.com>.



Partula gibba Férussac, 1821 (18mm) cour-
 tesy of Femorale, <http://femorale.com>.



Partulina variabilis (Newcomb, 1854) (16mm)
 courtesy of Femorale, <http://femorale.com>.



Polygyriscus virginianus (P.R. Burch, 1947) (4mm)
 USF&WS, <https://usfwsnortheast.wordpress.com>.



Pyrgulopsis roswellensis D. Taylor,
 1987 (3mm) Wild Earth Guard-
 ians, <http://www.wildearthguardians.org>.



Newcombia cumingi (Newcomb, 1853) (16mm) courtesy of Femorale, <http://femorale.com>.



Orthalicus reses reses (Say, 1830) (45mm) courtesy of Femorale, <http://femorale.com>.



Oxyloma haydeni kanabensis Pilsbry, 1948 (15mm) Wikipedia.com.



Patera clarki nantahala (Clench & Banks, 1932) (19mm) Wikipedia.com.



Physa natricina Taylor, 1988 (6mm) Idaho Governor's Office of Species Conservation, <https://species.idaho.gov/list/snails.html>.



Samoana fragilis (Férussac, 1821) (10mm) University of Guam, <http://cnas-re.uog.edu/save-our-snails>.



Succinea chittenangoensis (Pilsbry, 1908) (15mm) Wikipedia.com.



Tulotoma magnifica (Conrad, 1834) (20mm) courtesy <http://www.jaxshells.org>.

Appendix 3: IUCN Red List

An analysis of the International Union for the Conservation of Nature Red List (IUCN Red List lists the taxonomy of all molluscan species in three assessment categories (Critically Endangered, Endangered, and Vulnerable) broken out to order or family level as shown in the following list. The largest group of gastropods, Stylommatophora, comprises land snails, distributed among 58 different families; while the next largest group Littorinimorpha are freshwater snails - with over 80% in the family Hydrobiidae. At this level of analysis, it is clear that very few marine Mollusca are currently considered imperiled. So far, geographically-restricted cones (vulnerable mainly to habitat degradation from development and to a much lesser degree over-collection), bathyal-demersal cephalopods (particularly vulnerable to deep-water trawling), and abalones (susceptible to disease and over-fishing), account for all the marine species. All of the listed bivalves are freshwater and nearly all of those are in the Unionoida. Nearly equal numbers of fresh-water and terrestrial gastropods are listed — most of them with very narrow distributional ranges, and many of them island species. Habitat modification from deforestation, agriculture and development, introduction of exotic (frequently predator) species, and pollution are the principal causes for listing.

MOLLUSCA	(1967)	
BIVALVIA	(175)	
ARCOIDA		(1)
CARDIIDA		(4)
UNIONOIDA		(157)
ETHERIIDAE		(2)
HYRIIDAE		(7)
IRIDINIDAE		(6)
MARGARITIFERIDAE		(9)
MYCETOPODIDAE		(1)
UNIONIDAE		(132)
VENEROIDA		(13)
CYRENIDAE		(1)
DREISSENIDAE		(3)
SPHAERIIDAE		(9)
CEPHALOPODA	(5)	
CIRROCTOPODIDAE		(1)
OPISTHOTEUTHIDAE		(4)
GASTROPODA	(1787)	
ALLOGASTROPODA		(8)
ARCHITAENIOGLOSSA		(135)
CYCLONERITIMORPHA		(18)
EUPULMONATA		(2)
HYGROPHILA		(60)
LITTORINIMORPHA		(652)
NEOGASTROPODA		(41)
SACOGLOSSA		(1)
SORBEOCONCHA		(108)
STYLOMMATOPHORA		(759)
SYSTEMLOMMATOPHORA		(1)
VETIGASTROPODA		(2)

These same 1967 species (including the 47 species associated with marine areas and listed previously, of which 45 are associated also with land regions) are distributed geographically as shown below. Some species appear in more than one region. Through sorts such as these, the IUCN Red List can readily be manipulated to identify individual species of concern by individual nations.

Land Regions (1965)

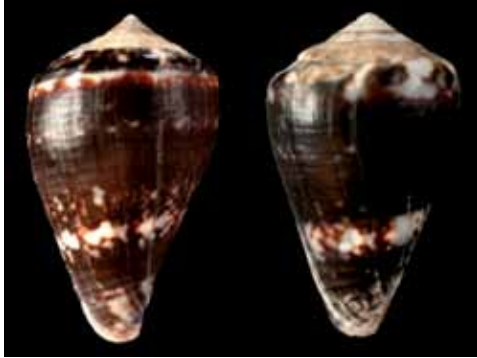
Caribbean Islands (6)
 East Asia (49)
 Europe (648)
 Mesoamerica (10)
 North Asia (11)
 North Africa (42)

Marine Areas (47)

Caribbean Islands (6)
 East Asia (49)
 Europe (648)
 Mesoamerica (10)
 North Asia (11)
 North Africa (42)

FIVE SPECIES of CRITICALLY ENDANGERED MOLLUSCA in FAO MARINE AREAS

- Conus lugubris* Cabo Verde
- Conus mordeirae* Cabo Verde
- Conus salreiensis* Cabo Verde
- Haliotis cracherodii* California and Mexico
- Opisthoteuthis chathamensis* Chatham Rise, 900-1400m off New Zealand N Island (Octopoda)



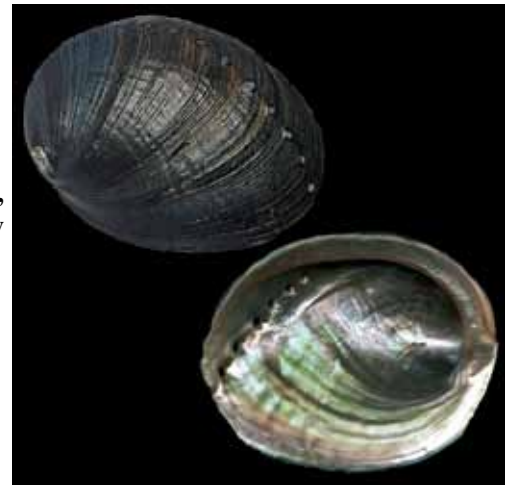
Conus lugubris Reeve, 1849 (25mm) Cabo Verde, courtesy femorale.com.



Conus mordeirae Rolán & Trovão, 1990 (24mm) Cabo Verde, courtesy femorale.com.



Conus salreiensis Rolán, 1980 (20mm) Cabo Verde, courtesy femorale.com.



Haliotis cracherodii (Leach, 1817) (125mm) California & Mexico, anon.

FOURTEEN SPECIES of IUCN ENDANGERED MOLLUSCA in FAO MARINE AREAS

- Cirroctopus hochbergi* New Zealand seamounts at 700-1350 m depth (Octopoda)
- Conus ateralbus* Cabo Verde
- Conus belairensis* Dakar, Senegal
- Conus bruguieresi* [bruguieri] Dakar, Senegal
- Conus cloveri* Dakar, Senegal
- Conus crotchii* Cabo Verde
- Conus cuneolus* Cabo Verde
- Conus echinophilus* Dakar, Senegal
- Conus fernandesi* Cabo Verde
- Conus hybridus* Dakar, Senegal
- Conus mercator* Dakar, Senegal
- Conus unifasciatus* Dakar, Senegal
- Haliotis kamtschatkana* SE Alaska to Baja California
- Opisthoteuthis mero* New Zealand at 360-1000m depth (Octopoda)



Conus ateralbus Kiener, 1845 (33mm) Cabo Verde, courtesy femorale.com.



Conus belairensis Pin & Tack, 1989 (30mm) Dakar, Senegal, courtesy femorale.com.



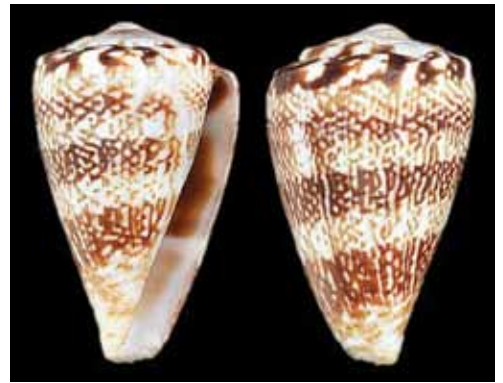
Conus bruguieresi Kiener, 1845 (32mm) Senegal, courtesy femorale.com.



Conus cloveri Walls, 1978 (24mm) Senegal, courtesy femorale.com.



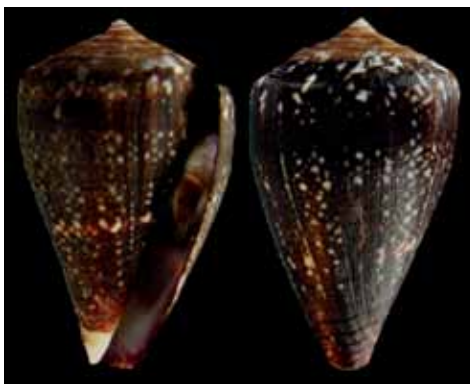
Conus crotchii Reeve, 1849 (18mm) Cabo Verde, courtesy femorale.com.



Conus cuneolus Reeve, 1844 (25mm) Cabo Verde, courtesy of femorale.com.



Conus echinophilus Petuch, 1975 (15mm) Senegal, courtesy femorale.com.



Conus fernandesi Tenorio, Afonso, & Rolán, 2008 (25mm) Cabo Verde, courtesy femorale.com.



Conus hybridus Kiener, 1845 (35mm) Senegal, courtesy femorale.com.



Conus mercator Linnaeus, 1758 (30mm) Senegal, courtesy femorale.com.



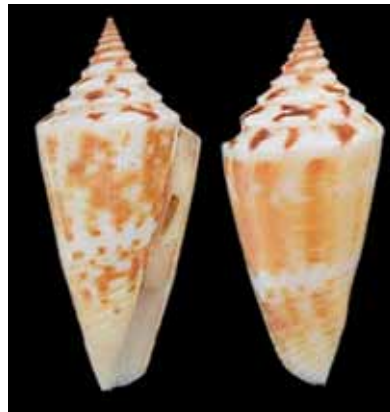
Conus unifasciatus Kiener, 1845 (27mm) Senegal, courtesy femorale.com.



Haliotis kamtschatkana Jonas, 1845 (115mm) SE Alaska to Baja California, courtesy femorale.com.

**TWENTY-EIGHT SPECIES of IUCN VULNERABLE MOLLUSCA
in FAO MARINE AREAS**

- Conus allaryi* Angola
- Conus anabathrum* W Coast Florida
- Conus ardisiaceus* Oman
- Conus cacao* Dakar, Senegal
- Conus cepasi* Angola
- Conus compressus* Western Australia
- Conus cuvieri* Djibouti; Eritrea; Somalia; Yemen
- Conus decoratus* Cabo Verde
- Conus duffyi* Los Roques Archipelago, Venezuela
- Conus felitae* Cabo Verde
- Conus fontonae* Cabo Verde
- Conus guinaicus* Dakar, Senegal
- Conus henckesi* Bahia, Brasil
- Conus hennequini* Martinique-St. Lucia
- Conus hieroglyphus* Auba, Neth. Antilles
- Conus immelmani* South Africa
- Conus jeanmartini* Réunion
- Conus julii* Réunion & Mauritius
- Conus melvilli* Oman
- Conus rawaiensis* Raya Island, Thailand
- Conus regonae* Cabo Verde
- Conus richardbinghami* Bimini Islands, Bahamas
- Conus tacomae* Dakar, Senegal
- Conus teodorae* Cabo Verde
- Conus thevenardensis* Australia
- Conus xicoi* Angola
- Opisthoteuthis calypso* E Atlantic 365-2200m (Octopoda)
- Opisthoteuthis massyae* equator. W Africa 600-1500m (Octopoda)



Conus anabathrum Crosse, 1895 (40mm) W. Coast Florida, courtesy femorale.com.



Conus allaryi Bozzetti, 2008 (28mm) Angola, by Almed2, Wikipedia.com.



Conus ardisiaceus Kiener, 1845 (40mm) Oman, courtesy femorale.com.



Conus cacao Ferrario, 1983 (22mm) Senegal, by Almed2, Wikipedia.com.



Conus cepasi Trovão, 1975 (23mm) Angola, by Almed2, Wikipedia.com.



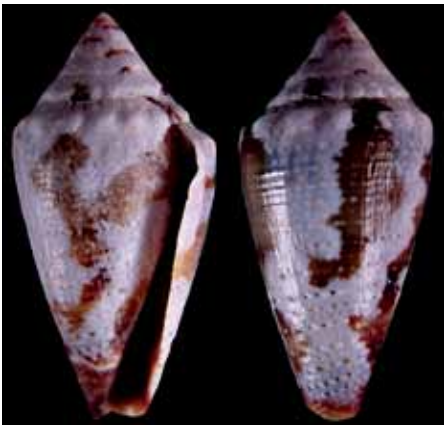
Conus compressus G.B. Sowerby II, 1866 (38mm) Australia, Wikipedia.com.



Conus cuvieri Crosse, 1858 (38mm) Djibouti, by Almed2, Wikipedia.com.



Conus decoratus Röckel, Rolán, & Monteiro, 1980 (27mm) Cabo Verde, by Almed2, Wikipedia.com.



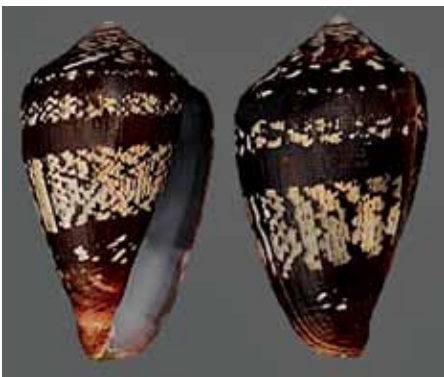
Conus duffyi Petuch, 1992 (25mm) Venezuela, by Almed2, Wikipedia.com.



Conus felitae Rolán, 1990 (12mm) Cabo Verde, courtesy femorale.com.



Conus fontonae Rolán & Trovão, 1990 (15mm) Cabo Verde, courtesy femorale.com.



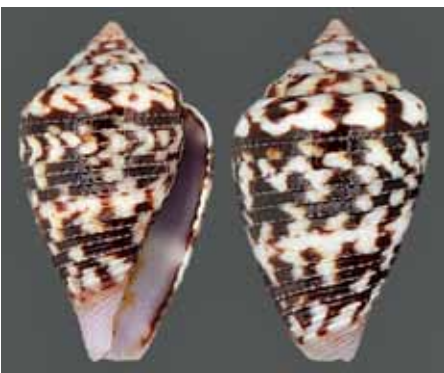
Conus guinaicus Hwass, 1792 (36mm) Canary Is., courtesy femorale.com.



Conus henckesi J. Coltro, 2004 (20mm) Brazil courtesy femorale.com.



Conus hennequini Petuch, 1992 (24mm) Martinique-St. Lucia, courtesy femorale.com.



Conus hieroglyphus Duclos, 1833 (16mm) Aruba, courtesy femorale.com.



Conus immelmani Korn, 1998 (85mm) South Africa.



Conus jeanmartini Raybaudi, 1992 (42mm) Reunion, courtesy of Shells Passion, www.shellspassion.com.



Conus julii Lienard, 1870 (37mm) Mauritius, anon.



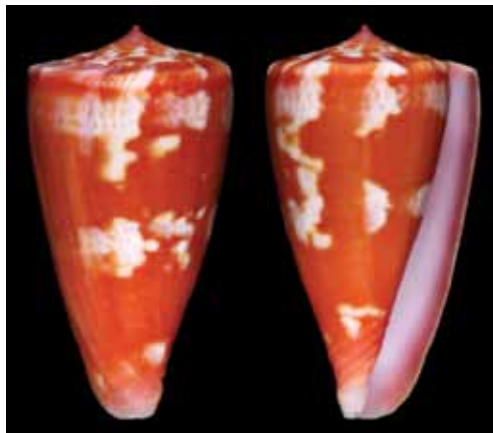
Conus melvilli G.B. Sowerby III, 1879 (27mm) Oman, by Almed2, Wikipedia.com.



Conus rawaiensis da Motta, 1978 (30mm) Thailand, courtesy femorale.com.



Conus regonae Rolán & Trovão in Rolán, 1990 (17mm) Cabo Verde, by Almed2, Wikipedia.com.



Conus richardbinghami Petuch, 1994 (25mm) Bahamas, by Chromatophor Wikipedia.com.



Conus tacomae Boyer & Pelorce, 2009 (25mm) Senegal, courtesy femorale.com.



Conus teodorae Rolán, 1990 (24mm) Cabo Verde, Almed2, Wikipedia.com.



Conus thevenardensis da Motta, 1987 (41mm) Australia, by Almed2, Wikipedia.com.



Conus xicoi Röckel, 1987 (25mm) Angola, by Almed2, Wikipedia.com.

