CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Sixteenth meeting of the Conference of the Parties
Bangkok (Thailand), 3-14 March 2013

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Delist *Dudleya stolonifera* and *Dudleya traskiae* from Appendix II.

B. Proponent

United States of America[*].

C. Supporting statement

1. Taxonomy

1.1 Class: Magnoliopsida

1.2 Order: Saxifragales

1.3 Family: Crassulaceae

1.4 Genus and species, including author and year:
a) *Dudleya stolonifera* Moran 1950
b) *Dudleya traskiae* (Rose) Moran 1942

1.5 Scientific synonyms: b) *Stylophyllum traskiae* Rose; Echeveria traskiae (Rose) A. Berger

1.6 Common names:
English:
a) Laguna Beach live-forever; Laguna Beach dudleya
b) Santa Barbara Island live-forever; Santa Barbara Island dudleya
French:
Spanish:

1.7 Code numbers: None

2. Overview

At the fourth meeting of the Conference of the Parties to CITES (CoP4; Gaborone, 1983), the United States of America proposed *Dudleya stolonifera* and *Dudleya traskiae* to be included in Appendix I (CoP4 Prop. 138 and Prop. 139), which were adopted by the Parties. At the ninth meeting of the Plants Committee (PC9; Darwin, 1999), the two species were reviewed under the Periodic Review of the Appendices, and were subsequently recommended for transfer from Appendix I to Appendix II. *Dudleya stolonifera* and *D. traskiae* were transferred to Appendix II at CoP11 (Gigiri, 2000) and CoP12 (Santiago, 2002), respectively. The species are the only *Dudleya* species listed in the CITES Appendices.

[*] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

The genus *Dudleya* consists of about 45 species native to western United States and northwestern Mexico, with the greatest concentration of species in California, United States (Moran 2008a). *Dudleya stolonifera* and *D. traskiae* are native to California; plants are perennial succulents with leaves in basal rosettes.

*Dudleya stolonifera* and *D. traskiae* are endemics with extremely narrow geographical ranges and small population sizes. The species are protected under the United States Endangered Species Act and by California State law as listed species. National and State listings prohibit wild-collection and possession of specimens from State and Federal lands, except for certain approved circumstances. Additionally, the species are protected under the U.S. Lacey Act, which prohibits trafficking in illegal plants and plant products of listed species.

Although wild-collection of plants and trade were considered significant threats to *D. stolonifera* and *D. traskiae* when they were included in Appendix I in 1983, international trade is no longer a threat to the species. The main threats to *D. stolonifera* are urban development and invasive non-native plants (USFWS 2010). The main threats to *D. traskiae* are the California brown pelican (*Pelecanus occidentalis californicus*), herbivory, and soil erosion (USFWS 2012).

Since *D. stolonifera* and *D. traskiae* were transferred to Appendix II over 10 years ago, there has been no CITES-recorded trade (UNEP-WCMC 2012). There is also no evidence of illegal trade in the species. Because there is no international trade, the species no longer qualify for inclusion in Appendix II according to the criteria of Article II in Resolution Conf. 9.24 (Rev. CoP15).

As the only range country, we believe delisting *D. stolonifera* and *D. traskiae* will not stimulate trade, nor cause enforcement problems for other CITES-listed plant species. Given the national and State laws that protect *D. stolonifera* and *D. traskiae* in the United States, and the remote, relatively inaccessible site locations of the species, wild-collection of specimens for international trade is unlikely.

This proposal is based on a review of the biological and trade status of *D. stolonifera* and *D. traskiae*.

3. Species characteristics

3.1 Distribution

*Dudleya stolonifera* is endemic to the San Joaquin Hills of Orange County, California, United States (USFWS 1998). The species is known from six occurrences in an area approximately 10 square kilometers (sq. km.) (3.9 square miles (sq. mi.)) in size (USFWS 2010). Four occurrences of *D. stolonifera* are on lands managed by city and county governments, and two occurrences are on private lands (USFWS 2010). *Dudleya stolonifera* has never been located outside of the San Joaquin Hills.

*Dudleya traskiae* is endemic to Santa Barbara Island, the smallest of the eight Channel Islands off the coast of southern California (Clark and Halvorson 1989). The island is 2.6 sq. km. (1 sq. mi.) in size and is 61 km (38 mi) from the mainland. All of the known sites of *D. traskiae* are located on the rocky cliffs and marine terraces that surround the island (CITES 2000).

3.2 Habitat

*Dudleya stolonifera* is restricted to shaded north-facing weathered sandstone and breccia rock outcrops and steep-walled canyon walls, primarily in coastal sage scrub or chaparral plant communities (USFWS 1998). The species is also found in chaparral, woodlands, and valley and foothill grasslands at elevations up to 300 meters (m.) (1000 feet (ft.)) (CNPS 2012a; Moran 2008b). Suitable habitat is restricted to discontinuous areas within the species' range (CITES 2000).

*Dudleya traskiae* is restricted to thin poorly developed soils on the rocky cliffs and marine terraces 15-110 m (49-360 ft) in height on the eastern, southeastern, and southwestern slopes of Santa Barbara Island (USFWS 2012). The species is also found within several canyons on rocky outcrops where vegetation is sparse and plants are restricted to thin, poorly developed soils (Clark and Halvorson 1989). *Dudleya traskiae* occurs in the maritime cactus scrub and southern coastal bluff scrub plant communities (CNPS 2012b).

3.3 Biological characteristics

*Dudelya stolonifera* is a succulent perennial herbaceous plant with a caudex stem and a basal rosette of flat, oblong, bright green leaves with purple-tinged edges (Moran 2008b). It is the only species in the genus which forms lateral vegetative branches (i.e., stolons). During late spring and early summer (May to July) plants produce flowering stems (peduncle) with flowers that have bright yellow-green petals that are fused near the base. Plants are drought tolerant. Two hybrids of *D. stolonifera* have been found where it co-occurs with *D. edulis* and *D. lanceolata* (Thomson 1993 as cited in USFWS 2010).

*Dudelya traskiae* is a succulent perennial herbaceous plant with a branched caudex stem with one to several hundred rosettes of 25-35 flat, oblong leaves that are green or glaucous with waxy covering (Clark and Halvorson 1989). The peduncle is axillary and the inflorescence is indeterminate in paniculate or cymose clusters (Clark and Halvorson 1989). The leaves on the peduncle decrease in size as they progress up the stem to the flowers (USFWS 1985). Flowers are bright yellow, often with red veins, and typically bloom in spring from April to May (Clark and Halvorson 1989). Fruit is produced in mid-summer (July) with seed and fruit dispersal occurring from July to September (Clark and Halvorson 1989). Plants are drought tolerant.

Little is known of the reproductive strategies of *D. stolonifera* and *D. traskiae*, though it is suspected that they are self-fertilizing as is the case for many *Dudleya* species.

3.4 Morphological characteristics

*Dudleya stolonifera* form stolons that rise from axils of lower rosette leaves. Rosettes comprised of 15-30 25 leaves (Moran 2008b). Individual leaf: 1.5–3 cm (0.6–1.2 in) wide, 3–7 cm (1.2–2.8 in) long, and 3–4 mm (0.11-0.16 in) thick; nonglaucous (Bartel 1993; Moran 2008b). Caudex: 1.5–3 cm (0.6–1.2 in) wide, simple (Bartel 1993). Peduncle: 8-25 cm (3.1–9.8 in) tall, with 3 to 9 short yellow-green flowers (Bartel 1993). Flowers: sepals 2-3 mm (.07–0.11 in), deltate, wider than long; petals 10–11 mm (0.3–0.4 in), 3-3.5 mm (0.1–0.13 in), wide, fused 1–2 mm (0.03–0.07 in), elliptic, with 10 stamens and five pistils (Bartel 1993). Fruits: follicles ascending (Moran 2008b).

*Dudleya traskiae* forms a caudex with basal rosette of 25–40 leaves (Moran 2008c). Individual leaf: 4–15 cm (1.5–5.9 in) long, 1–4 cm (0.39–1.5 in) wide, and 4–6 mm (0.15–0.23 in) thick, glaucous; base 1–4 cm (0.39–1.5 in) wide (Bartel 1993). Caudex: 20 mm (7.8 in) long, 1–3 cm (0.39–1.18 in) wide, branched (Bartel 1993) with clumps to 50 cm (19.6 in) diameter (Moran 2008c). Peduncle: 1–4 mm (0.03–0.15 in), terminal branches 4–10 cm (1.5–3.9 in), 7–15 flowers (Bartel 1993). Flowers: sepals 2.5–4 mm (0.09-0.15 in), deltate, acute; petals 8-10.5 mm (0.31-0.41 in), 3-4 mm (0.11-0.15 in), wide, fused 1–2 mm (0.03–0.07 in), narrowly ovate, yellow, with 10 stamens and five pistils (Bartel 1993). Fruits: follicles ascending, 7-8 mm (0.2-0.3 in) long; seeds are many and minute, narrow and pointed (Bartel 1993; Clark and Halvorson 1989).

3.5 Role of the species in its ecosystem

The life-histories' of *D. stolonifera* and *D. traskiae* and the succession of plant communities associated with them are unknown. Both species are found in habitats with minimal soil and other vegetation.

*Dudleya stolonifera* has a positive association with a co-occurring lichen species, *Niebla ceruchoides* (angel-hair sea fog lichen) (Riefner and Bowler 1995). The lichen functions as a seed bed for *D. stolonifera* by providing moisture and a nutrient-rich base for seed germination (Riefner and Bowler 1995).

Reportedly, small bees and flies can access the nectar of flowers of *D. stolonifera* (Levin and Mulroy 1985 as cited in USFWS 2010). Bees in the genera *Bombus* and *Anthophora* have been identified as important pollinators of other *Dudleya species* (Moldenke 1976 as cited in USFWS 2010).

4. Status and trends

4.1 Habitat trends

Prior to 1987, a portion of occupied habitat was reduced in size as the land was commercially developed (USFWS 2010). Currently, the largest habitat for *D. stolonifera* is considered stable (USFWS 2010).

The historical distribution of *D. traskiae* on Santa Barbara Island is unknown, though it is believed that the species probably occupied much more of the island than it does today (USFWS 1985). The vegetation on the island has been influenced from more than 100 years of anthropogenic disturbance including burning, farming, herbivore introductions, and intensive use of the island by the U.S. Navy following World War II (Clark and Halvorson 1989). The most dramatic impacts to the vegetation was by early settlers who introduced farming and non-native animals to the island. By 1850, the island was "densely populated" with domestic goats (*Capra aegagrus hircus*) (Philbrick 1972 as cited in USFWS 1985). Other introduced animals included: domestic cats (*Felis catus* or *Felis silvestris catus*) in the 1880s; sheep (*Ovis aries*) in the early 1900s; New Zealand red rabbits (*Oryctolagus cuniculus)* in 1915; and Belgian hare (*Oryctolagus cuniculus*) in 1942 (McEachern 2004 as cited in USFWS 2012). Each of these species impacted the natural vegetation. Settlers also farmed grain crops (e.g., oats, barley) and potatoes over much of the island during the first half of the 1900s (McEachern 2004 as cited in USFWS 2012). By 1981, the National Park Service eradicated all of the non-native herbivores from the island, and later the non-native iceplant (*Mesembryanthemum crystallinum*) was removed (USFWS 2012).

The habitat for *D. traskiae* continues to be of concern due to soil erosion caused by previous disturbances and damaged caused by nesting and roosting of California brown pelican (*Pelecanus occidentalis californicus*) (USFWS 2012).

4.2 Population size

The population of *D. stolonifera* consists of six populations of approximately 30,000 individuals (USFWS 2010).

The population of *D. traskiae* consists of 11 colonies of approximately 1,000 individuals (USFWS 2010).

Both species are considered endangered by the the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Walter and Gillett 1998).

4.3 Population structure

There is no information about the population structure of *D. stolonifera* and *D. traskiae*.

4.4 Population trends

Prior to 1987, a portion of one population of *D. stolonifera* was reduced in size because the land was commercially developed (USFWS 2010). In 1998, the known population of D. stolonifera consisted of six occurrences comprised of approximately 8,000 to 10,000 individuals (USFWS 1998). Since then, one of the six populations was determined to have 20,000 individuals; increasing the total abundance to 30,000 individuals (USFWS 2010). The largest populations of *D. stolonifera* occur on city and county government lands that are unlikely to be developed (USFWS 2010).

A number of factors in the land-use history of Santa Barbara Island may have contributed to the near demise of *D. traskiae*, including farming and the introduction of non-native herbivores, particularly rabbits. The occurrence of *D. traskiae* on the island prior to and during the time of high rabbit densities is not known, but it is believed that the species was more abundant and probably occupied much more of the island prior to the time the herbivores were introduced (USFWS 2012), though it was never abundant on the island (Clark and Halvorson 1989).

In 1975, it was reported that *D. traskiae* had not been collected since 1968 and that the species was possibly extinct (USFW 2012). Later that year, several plants were discovered on the island, and subsequent searches located a few hundred plants on the face of a cliff (USFW 2012). By 1978, the

species was known from only two unspecified sites on the island, and by 1985, there were approximately 10 known sites with an estimated population of fewer than 700 individuals (USFWS 2012). Since then, an additional site has been located on the island, for a total of 11 colonies (USFWS 2012).

The availability of suitable habitat for *D. traskiae* is not limiting population growth (Clark and Halvorson 1989). Clark (1989) suggested that rainfall is correlated with seedling establishment and growth, as yearly rainfall is highly variable on Santa Barbara Island.

4.5 Geographic trends

Although the historical geographic range of D. stolonifera is unknown, it is believed that the species' range might have been larger than its current range.

Duleya traskiae does not occur outside of Santa Barbara Island.

5. Threats

Although wild-collection of specimens and trade were considered significant threats to *D. stolonifera* and *D. traskiae* when the species were included in Appendix I, international trade is no longer a threat to the species.

The main threats to *D. stolonifera* are urban development and associated edge effects, and encroachment and competition by non-native plants (USFWS 2010).

The main threats to *D. traskiae* are nesting and roosting of the California brown pelican (*Pelecanus occidentalis californicus*), herbivory from native deer mice (*Peromyscus maniculatus exilis*) and owlet moth larvae (family Noctuidae), soil erosion caused by previous disturbances, and stochastic events (USFWS 2012).

6. Utilization and trade

6.1 National utilization

At the time of listing *D. stolonifera* and *D. traskiae* in Appendix I, plants of these species were known to be wild-collected for private collections, and wild-collected specimens were available in local nurseries (CITES 1983). However, the easily accessible population of *D. stolonifera*, where collections had once occurred, no longer exist as the land has been commercially developed (USFWS 1998). Today, the species is not known to be commercially available, either as wild-collected or artificially propagated specimens (USFWS 2010).

Artificially propagated specimens of *D. traskiae* have been known to be available at a few local commercial nurseries and retail garden centers associated with botanic gardens in California. According to the California Native Plant Exchange, an on-line resource for native plants in cultivation and their availability (http://www.cnplx.info/), specimens of *D. traskiae* have been available at the garden centers at the Santa Barbara Botanic Garden and Rancho Santa Ana Botanic Garden.

6.2 Legal trade

As reported in the CITES Trade Database, all trade of *D. stolonifera* and *D. traskiae* has been reported at the genus-level (Table 1; UNEP-WCMC 2012). The United States, the only range country for the species, has never reported trade in the species. There is also no recorded trade for *D. stolonifera* and *D. traskiae* since the species were transferred from Appendix I to Appendix II in 2000 and 2002, respectively. In fact, since the species were listed in 1983, there has been only one export reported for 2,461 artificially propagated specimens from France to Switzerland in 1985.

There are two records for seized specimens (8) from Mexico to the United States, which may have been a *Dudleya* species native to Mexico misidentified as *D. stolonifera* or *D. traskiae*.

As reported in the CITES Trade Database, 104 artificially propagated specimens of *D. traskiae* were exported from Belgium to Switzerland in 2010. According to the CITES Scientific Authority of Belgium,

the species in trade was not *D. traskiae* as reported but *Dudleya brittonii* (native to Mexico), which is not CITES-listed (F. Arijs, pers. comm., Sept. 19, 2012).

Table 1: UNEP-WCMC CITES trade data for *Dudleya* spp. 1984–1990.

| Year | Taxa | Exporter | Importer | Quantity | Source |
|---|---|---|---|---|---|
| 1984 | *Dudleya* spp. | Mexico | United States | 1 | Not reported |
| 1985 | *Dudleya* spp. | France | Switzerland | 2461 | Artificially propagated |
| 1986 | *Dudleya* spp. | Mexico | United States | 1 | Seized |
| 1990 | *Dudleya* spp. | Mexico | United States | 7 | Seized |

6.3 Parts and derivatives in trade

None known.

6.4 Illegal trade

There is no evidence of illegal trade from the United States in wild-collected specimens of *D. stolonifera* and *D. traskiae*. There is no indication that the removal of these species from CITES controls would encourage illegal collection of specimens for international trade.

6.5 Actual or potential trade impacts

According to the CITES trade database, there has been very little demand for specimens of *D. stolonifera* and *D. traskiae* (UNEP-WCMC 2012). Therefore, the removal of these species from Appendix II should not affect actual or potential trade in specimens, nor should it encourage illegal collection of specimens for international trade.

7. Legal instruments

7.1 National

In 1987, *D. stolonifera* was listed as threatened under the California Endangered Species Act of 1970, as amended (CDFG 2012). In 1998, the species was nationally listed as threatened under the U.S. Endangered Species Act of 1973, as amended (USFWS 1998). State and national listings prohibit wild-collection and possession of specimens from State and Federal lands, except for certain approved circumstances such as research.

Four occurrences, and the largest populations of *D. stolonifera*, occur on lands managed by city and county governments of California, and two occurrences are on private lands with no legal protections (USFWS 2010). However, private landowners are required to notify the California Department of Fish and Game 10 days prior to any disturbance to the land where *D. stolonifera* occurs so that plants can be salvaged (USFWS 2010).

In 1978, *D. traskiae* was listed nationally as endangered under the U.S. Endangered Species Act of 1973, as amended (USFWS 1978). In 1979, the species was listed as endangered under the California Endangered Species Act of 1970, as amended (CDFG 2012). State and national listings prohibit wild collection and possession of specimens from State and Federal lands, except for certain approved circumstances (e.g., research). *Dudleya traskiae* occurs entirely on Santa Barbara Island of the Channel Islands National Park under the management of the National Park Service. The National Park Service is required under the U.S. Endangered Species Act and agency regulations to conserve endangered and threatened species and their habitat and to avoid actions that may jeopardize the listed species' survival.

*Dudleya stolonifera* and *D. traskiae* are also protected by the U.S. Lacey Act, as such it unlawful to possess wild plants (including roots, seeds, and other parts) that are indigenous to any State and which is either CITES-listed, or listed pursuant to any State law that provides for the conservation of species threatened with extinction. According to the Act it is unlawful to import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce any wild plant and parts of taken, possessed, transported, or sold in violation of any State law or regulation. It is also unlawful to import, export, transport, sell, receive, acquire, or purchase any wild plant and parts of taken or possessed in violation of any United States law, treaty, or regulation or in violation of Indian tribal law.

7.2 International

*Dudleya stolonifera* and *D. traskiae* were included in Appendix I at CoP4 (Gaborone, 1983). At PC9 (Darwin, 1999), the Plants Committee reviewed the two species under the Periodic Review of the Appendices, and recommended that they be transfered to Appendix II. At CoP11 (Gigiri, 2000) and CoP12 (Santiago, 2002), *D. stolonifera* and *D. traskiae*, respectively, were transferred from Appendix I to Appendix II.

8. Species management

8.1 Management measures

The range of *D. stolonifera* lies entirely within the boundaries of the Central/Coastal subregion of the California Natural Communities Conservation Planning area (USFWS 1998). Populations of *D. stolonifera* on State and Federal lands are protected and impacts to the species must be taken into consideration for all proposed activities occurring within the species' habitat.

The U.S. Fish and Wildlife Service is responsible for the recovery, listing status, and law enforcement efforts for the protection of *D. stolonifera* and *D. traskiae*, and has published a recovery plan for *D. traskiae* (USFWS 1985). The prime objectives of the recovery plan are to secure *D. traskiae* in a vigorous self-sustaining condition, expand the distribution to include 95 percent of the suitable habitat, and eventually delist the species from the U.S. Endangered Species Act (USFWS 1985).

The National Park Service is responsible for the management and protection of *D. traskiae* on Santa Barbara Island. As such, it has implemented numerous management actions to restore the natural biological processes and to remove external sources of disturbance on the island. Actions taken include: eradication of all hares and rabbits from the island; removal of non-native iceplant; removal of visitor walking trails near sites of *D. traskiae*; restricting visitors to designated trails, camp areas, and boat landing area on the island; and prohibiting off-trail exploration (USFWS 2012). The National Park Service routinely monitors populations of *D. traskiae* and conducts plant surveys on the island for additional plants.

8.2 Population monitoring

The U.S. Fish and Wildlife Service and the California Department of Fish and Game are responsible for monitoring populations of *D. stolonifera.*

The National Park Service is responsible for monitoring populations of *D. traskiae*. In 1984, the National Park Service instituted long-term plant community monitoring program on Santa Barbara Island and routinely monitors populations and conducts plant surveys for additional plants of *D. traskiae* on the island.

8.3 Control measures

8.3.1 International

International trade does not appear to be a factor affecting the status of *D. stolonifera* and *D. traskiae*. The CITES Trade Database has only one record for artificially propagated specimens of *Dudleya* spp. (UNEP-WCMC 2012). There is no evidence that international trade in wild-collected specimens is likely to occur as a result of removing the species from Appendix II.

8.3.2 Domestic

*Dudleya stolonifera* and *D. traskiae* are protected species under the U.S. Endangered Species Act and under California State law as listed species. Additionally, the species are also protected by the U.S. Lacey Act.

Further protection measures are in place for *D. traskiae* because it occurs entirely within a National Park, which prohibits the collection of native plants. To prevent poaching of plants, all visitors on Santa Barbara Island are restricted to a designated trail system, camp areas, and boat landing area, and off-trail exploration is prohibited (USFWS 2012).

8.4 Captive breeding and artificial propagation

The extent of artificially propagated plants of *D. stolonifera* and *D. traskiae* is unknown. Artificially propagated plants of *D. traskiae* are available in a few nurseries in California.

8.5 Habitat conservation

The State of California and local governments preserve and protect the habitat of *D. stolonifera* on public lands. No such protections are afforded to the habitat on privately-owned land.

The National Park Service is responsible for the management and protection of *D. traskiae* and its habitat on Santa Barbara Island. It has been effective in minimizing present-day habitat disturbance and the recovery of the native vegetation on the island from past land use (Clark and Halvorson 1989; USFWS 2012). The Park Service has implemented numerous management actions to restore natural biological processes and to remove external sources of disturbance on the island (USFWS 2012).

8.6 Safeguards

*Dudleya stolonifera* and *D. traskiae* are protected by State and Federal laws and regulations, which prohibit the wild-collection of plants on public lands and mandate that the species be fully considered during preparation of environmental documents relating to changes in their environment and status. The species are also protected under the U.S. Lacey Act, which prohibits trafficking in illegal plants and plant products of listed species. The species will continue to be monitored by the responsible State and Federal agencies.

9. Information on similar species

*Duleya stolonifera* and *D. traskiae* are the only CITES-listed species in the Crassulaceae family. There are no look-a-like concerns with other CITES-listed plant species.

10. Consultations

Consultation letters were sent to appropriate State and Federal agencies in California; agency responses received support delisting the species from CITES.

11. Additional remarks

None.

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