Inclusion of Satanas Beetle *Dynastes satanas* in Appendix II

Proponent: The Plurinational State of Bolivia

Summary: Satanas Beetle *Dynastes satanas* is a large black beetle found only in the districts of La Paz and Cochabamba in Bolivia, in an overall area indicated to be around 1000 km^2. It is one of a number of rhinoceros beetles in the subfamily Dynastinae, part of the family Scarabeidae. Males have a large pronotal "horn" and can reach 115 mm in length. Little is known about the biology of the species. Females lay between 25 and 40 eggs which go through three larval stages followed by a pupal stage; this process takes approximately two years, before adulthood is finally reached. Longevity of adulthood in the wild is unknown but in captivity individuals are thought to live for approximately nine months.

There are no published population estimates for *Dynastes satanas* and the area of distribution is unknown. However, the species is thought to have suffered from loss of habitat owing to settlement, deforestation and agricultural development.

Dynastes satanas is evidently sought after in Europe, the USA and parts of Asia (particularly Japan) for the pet trade, as fighting animals and for display. Individuals are offered for sale on the Internet as larvae and adults, in dried and live form, and can reach high prices (up to USD220 for a live adult male). Local communities in La Paz are reported to collect this species and the closely related *Dynastes hercules* in order to export specimens for the international pet trade. In recent years, a number of seizures have been made of *D. satanas* and requests documented for the supply of wild *D. satanas* from Bolivia. Further trade data are limited, although the US Fish and Wildlife trade database (LEMIS) reported a small amount of trade in dead *Dynastes* specimens originating in Bolivia in the period 2000–2007, some of which are likely to have been *D. satanas.*

Impacts of collection for trade are unclear; although communities involved in collection report declining yields of *Dynastes satanas* over the past five to six years, despite increased collection effort.

The species is protected in Bolivia and trade is therefore illegal. There are pilot projects under way aimed at the sustainable use of *Dynastes satanas.*

Analysis: There is insufficient information to determine whether *Dynastes satanas* meets the criteria for inclusion in Appendix II. The species has a relatively limited range in which it is likely to be affected by ongoing habitat loss, but information on population densities and overall population trends is lacking. There is anecdotal information of declines in capture rates in areas where the species is (illegally) harvested for trade, but it is unclear how extensive or marked any such declines might be, or whether harvest for trade has any significant impact on the population.

Supporting Statement (SS)	Additional information
Taxonomy	
Range	
Bolivia	

IUCN Global Category

	Not assessed

Biological and trade criteria for inclusion in Appendix II (*Resolution Conf. 9.24 (Rev. CoP14)* Annex 2 a)

A) Trade regulation needed to prevent future inclusion in Appendix I

Dynastes satanas is endemic to the "yungas" or moist green forests in the department of La Paz (occurring in Zongo, Suapi, Chairo, Pacallo, Charobamba, Coroico Viejo, Yolosa, Santo Domingo, Florida, Villa Aspiazu Chojlla, Chulumani, Irupana, Apa Apa and San Juan de la Miel) and Yungas del Chapare in the department of Cochabamba, Bolivia. It is found at altitudes of between 900 and 2 000 m, in a temperature range of seven to 24 ºC and where rainfall is between 1 500 to 6 000 mm per annum.	*The map in the supporting statement indicating the geographical location of the range of the species suggests a relatively extensive area of just over 1000 km^2; it is not clear whether the beetle is thought to occur throughout this area or not.* *According to Ledezma (2009),* Dynastes satanas *occurs in Cañadon, Cristal Mayu and Sehuencas in the department of Cochabamba in Bolivia.* *Lachaume (1985) recorded the highest altitudes for* Dynastes satanas *as 2300 m.* *No information was available on total population size or rates of population decline.*

B) Regulation of trade required to ensure that harvest from the wild is not reducing population to level where survival might be threatened by continued harvest or other influences

According to local people, the populations of *Dynastes satanas* have reduced significantly over time. The proposal states that, using light-traps, Vidaurre and Guerra (2008) captured 500–600 individuals over five nights in one locality within the Nor Yungas province of La Paz. *Dynastes satanas* is popular because of its size, horns, attractiveness and harmlessness to humans. These characteristics make it a desirable pet and mean it can be used for fighting in exhibitions. Based on internet searches, the supporting statement indicates that trade poses a major threat to *D. satanas* and that the species is in high international demand, consequently promoting local people to become involved in the illegal collection of specimens. The supporting statement suggests that adult specimens are harvested from the wild.	*No population estimates could be found in the literature. However, as mentioned in the supporting statement, Vidaurre and Guerra (2008) attempted to estimate the population size of* Dynastes satanas *in Coroico Viejo and Santo Domingo in Nor Youngas province, La Paz. Two light-traps were set up for five consecutive nights, for 11 hours per night. However, no specimens (not 500–600) were captured; this was believed to be because the study was conducted in the first week of June when the beetles are not flying and are therefore difficult to catch (Vidaurre, 2009).* *Internet searches reveal that* Dynastes satanas *can be obtained online, both as adults and larvae, and as dried (for display) or living specimens. Prices varied from approximately EUR40-65 per larva, USD120-375 per adult and USD300–475 per pair. Prices for individuals varied depending on the size and sex of the specimens, large males being the most desirable. Prices were higher for* D. satanas *than for* D. hercules*, implying* D. satanas *is rarer and more highly valued.* D. satanas *is said to be preferred by collectors (both adults and children) wanting a pet because they are not noisy or complicated to feed and do not have a strong odour (Jemio, 2007), whilst the larger,* D. hercules *is thought to be preferred by those wanting to use the beetles for fighting (Quispe, 2009).* *On most of the websites viewed, the source of the beetles was not specified. However, on one site wild specimens (seven males and 11 females) were listed and, on another website, seemingly the same provider was advertising specimens from* Cochabamba, *Bolivia, where* Dynastes satanas *is endemic. Jemio (2007) suggested*

In December 2006, two Japanese collectors requested 200 *Dynastes satanas* be collected and transported to the city of Osaka, Japan. The authorities of Bolivia refused permission. In 2007, Hosogushi Masatsugu, a Japanese national, attempted to transport 423 beetles illegally from Bolivia but they were seized in Ecuador; 211 of these beetles were later returned to Bolivia and these are now part of the pilot community project in Nor Yungas province. The supporting statement also details a seizure of *D. satanas* which were transported from the town of Coroico to the city of La Paz where the traffickers were stopped; the planned final destination was unknown.

D. satanas *could be obtained on the Internet for USD100, whilst Quispe (2009) and Anon (2009) reported that* D. satanas *could sell for up to USD350 (the source of the specimens was not mentioned). It has also been noted that during the 1980s,* D. satanas *could sell for up to USD1000 each, but they are now cheaper owing to the large numbers being taken from the wild and exported for international trade (Ledezma* et al.*, 2007). "Wanted" adverts were mainly from people residing in Asia, USA and Europe and Vidaurre (2009) stated that wild* D. satanas *were generally illegally exported to Japan and France.*

Data (2000–2007) from the US Fish and Wildlife Service's data reporting system (LEMIS), which records trade import to and exports, including re-exports, from the USA, showed just three imports of Dynastes *from Bolivia. These included one consignment of 16 wild-taken specimens imported to Chile in 2000 (purpose unspecified) and two consignments of five ranched specimens imported to Japan, one in 2004 and one in 2005 (for commercial purposes). All specimens were "bodies" and since they were not identified to species level, could either have been* D. satanas *or* D. Hercules, *both of which occur in Bolivia.*

According to Moore (2006) and Guerra (2005), in order to supply D. satanas *to collectors, Japanese beetle enthusiasts are rearing* D. satanas *in captivity. The breeding of exotic beetles has become increasingly popular in Japan in the past few years and the number of breeders is said to be growing (Kameoka and Kiyono, 2003). Despite this, a study by TRAFFIC did not reveal any records of* D. satanas *for sale, yet four other* Dynastes *species were found for sale (one of which was* D. hercules *from Bolivia) (Kameoka & Kiyono, 2003).*

Of the 423 specimens seized in 2007 and the 211 returned to Bolivia, it is not known how many were Dynastes hercules *and how many were* D. satanas*. Those that died were preserved and are currently in Ecuador (Quispe, 2009).*

A TRAFFIC report (2008) detailed that a "kingpin in the world of illegal butterfly collecting" was apprehended in 2007 for smuggling a number of specimens (including Dynastes satanas*) into Los Angeles.*

A request to export 70 Dynastes satanas *from Bolivia by one trader for commercial purposes has also been documented (Ledezma* et al.*, 2007).*

According to Ledezma et al. *(2007), local collectors get paid approximately 15 Bolivianos (USD2.14) for one* Dynastes satanas*, although another source suggested local people could get around 300 Bolivianos (over USD40) per pair (Jemio, 2007). Money made from selling the beetles is used to subsidize a principal income, which is usually derived from agriculture. As larger specimens are more desirable, it is common practice for collectors to keep them in their houses for up to three months in order to "feed them up" and therefore obtain a higher price (Vidaurre, 2009).*

Members of the Santa Rosa community in La Paz who have been involved in

collecting beetles from the wild for many years, say that eight years ago they were able to collect 150 beetles per month and are now only managing to find 70 per month. These figures refer to both Dynastes satanas *and* D. hercules *(Anon, 2009).*

Local communities in Coroico Viejo and Santo Domingo in Nor Youngas province (La Paz), when interviewed, were found to collect 250 pairs of Dynastes satanas *per year (over four months: February–May). However, they unanimously agreed that the number of specimens collected had decreased over the last five to six years despite a reported three-fold increase in collection effort and an increase in the number of families participating in collection (Vidaurre and Guerra, 2008; Vidaurre, 2009). In Coroico Viejo, 31.4% of families were involved in collecting and selling* D. satanas, *of which 73% had been involved in the trade for three to five years and 27% had been involved in the trade for seven to eight years. In Santo Domingo, only one family was involved in the collection and selling of* D. satanas *and had been so for the past seven to eight years. All those involved in the trade were born in the area and all the families said they collected specimens from February to April and sometimes in May. Only three families used light-traps to collect the specimens, whilst the other families used lights on the exterior of their home to attract and collect the beetles.*

Information derived from consultation with traffickers suggests D. satanas *can live approximately nine months in captivity (Vidaurre, 2009). No other information regarding the species's biology could be derived from the literature or from consultation with experts.*

D. satanas lay between 25 and 40 eggs. The egg cycle takes about two months, the larval stages last between one and a half and two years before the pupal stage is reached. The pupa then takes approximately two months before it becomes an adult.

Inclusion in Appendix II to improve control of other listed species

A) Specimens in trade resemble those of species listed in Appendix II under Res. Conf. 9.24 (Rev. CoP14) Annex 2 a or listed in Appendix I

B) Compelling other reasons to ensure that effective control of trade in currently listed species is achieved

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Other information

Threats

Bolivia has seen considerable deforestation and agricultural development over the last few decades. The proposal implies that *Dynastes satanas* can be found in areas where considerable alteration of vegetation has occurred. Conversion of forests to coca and fruit plantations, slash and burn practices and the resulting soil erosion have all led to a significant loss of habitat for this species.

Similar species

A number of species have been listed in the supporting statement, including: *Dynastes granti* (which occurs in Arizona, USA), *Dynastes hercules* (occurs in Central and South America), *Dynastes hyllus* (occurs in Mexico, Belize, El Salvador, Honduras, Guatemala and Nicaragua), *Dynastes maya* (occurs in Mexico and Guatemala), *Dynastes miyashitai* (occurs in Mexico), *Dynastes neptunus* (occurs in Colombia) and *Dynastes tityus* (occurs in USA).

Of the species listed in the supporting statement, only Dynastes hercules *is found in Bolivia.* D. hercules *is much larger than* D. satanas *and male* D. hercules *have olive green wing covers with brown speckles, while* D. satanas *males are totally black and therefore they should be easily distinguishable.*

Conservation, management and legislation

There are no international laws in place to protect this species. However, trade in *Dynastes satanas* is illegal in Bolivia and the National Environment Competent Authority is responsible for domestic controls, in co-ordination with decentralized departments and other wildlife departments. There are various laws and control/enforcement bodies in place to protect species. Current legislation includes: *Supreme Decrees*, number *22641* and *25458,* which prohibit collection or storing of any wild fauna unless their use is sustainable. The sustainable use of a species is determined through management plans and studies or inventories by taxonomic experts, who must conclude whether sustainable exploitation is possible and, if so, quotas must be established every two years. Scientific research is also controlled by a resolution (number 024).

At present there is no sustainable management plan in place for *Dynastes satanas*, however there are currently pilot community projects focusing on the sustainable use of *D. satanas* currently underway. The aim of these projects is to promote captive breeding of the species and to ensure wild specimens are conserved.

The community project in Santa Rosa began in 2008 and involves 32 families that seek to conserve Dynastes satanas*. They plan to breed and sell live beetles and to produce beetle souvenirs, such as key chains with beetles in resin etc. (Anon, 2009).*

Captive breeding/artificial propagation

As specified above, captive breeding programmes may be implemented if community projects are fully implemented.

Other comments

Reviewers:
J. Ledezma, B. Ratcliffe, T. V. Sanchez.

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