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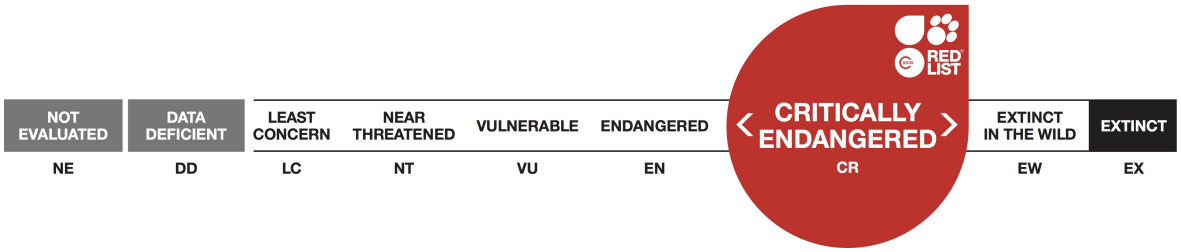
Pseudolaureola atlantica, Spiky Yellow Woodlouse

Assessment by: Lambdon, P.W.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Malacostraca	Isopoda	Armadillidae

Taxon Name: *Pseudolaureola atlantica* (Vandel, 1977)

Synonym(s):

- *Laureola atlantica* Vandel, 1977

Common Name(s):

- English: Spiky Yellow Woodlouse

Taxonomic Notes:

The evolutionary phylogeny of the Armadillidae requires further study. As presently defined, the genus *Pseudolaureola* Kwon, Ferrara & Taiti is comprised of just four species with a remarkably disjunct distribution across humid forests of the tropical Afro-Australasian zone; In addition to the Atlantic outpost occupied by *P. atlantica*, the other taxa are found in Madagascar, New Caledonia and western Australia (Schmalfuss, 2003). Related genera (e.g. *Laureola* Barnard) have a predominantly southern African distribution but extend as far as south-east Asia.

Assessment Information

Red List Category & Criteria: Critically Endangered B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i,ii); D ver 3.1

Year Published: 2015

Date Assessed: May 30, 2015

Justification:

As the population is now extremely small, the species is likely to qualify as Critically Endangered outright under Criterion D. Although there are more than 50 individuals known, not all of these should be considered as 'mature', since breeding has only been noted in females from the upper 10 - 20% of the size range. Over recent decades there has been clear evidence of decline in both the number and distribution of subpopulations and the number of individuals, with no obvious reason to assume that these trends have halted, and it is thought that the losses are heavily linked to a dwindling area of suitable habitat. The two tiny patches of forest where small numbers persist are very close together and effectively comprise the vestiges of a single subpopulation/location. These combined factors are sufficient to satisfy the additional Criteria under B and C.

Geographic Range

Range Description:

The Spiky Yellow Woodlouse is endemic to the island of St Helena, South Atlantic Ocean, where it is now believed to survive only in one area of cloud forest on the Central Ridge.

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The estimated extent of occurrence (EOO), based on the area of the minimum convex polygon around known localities, is 1,500 m^2. The actual area of occupied habitat is 621 m^2. The area of occupancy (AOO), based on a 2 km x 2 km grid, is 4 km^2. Following IUCN Red List Guidelines, the EOO is therefore increased to 4 km^2 to match the AOO.

A survey of the species was conducted in 2013 – 2014, during which most of the likely habitat areas on St Helena were covered. Individuals were found in only two places, separated by 100 m on the steep, south facing cliffs of High Peak. The first (and best known) of these localities lies in a pocket of Black Cabbage Tree woodland known as The Dell. The copse is less than 30 m wide, and even within it the species is highly localized; although a few scattered woodlouse individuals were sporadically found across the entire patch, the major concentration was restricted to a single fern stand spanning only seven by three metres. The second locality was first discovered during an abseil exercise in 2009 (M. Thorsen pers. comm.), but subsequent verification was hampered by the inaccessibility of the site. It lies on a steeply-sloping ledge surrounded by dense cloud forest vegetation, and can only be reached on ropes. The area is smaller than that of The Dell, lying entirely under the canopy of a single large Spoor tree (*Pittosporum viridiflorum* Sims).

The survey was not entirely comprehensive because numerous parts of the Central Ridge are very steep and some patches of the favoured habitat are extremely difficult to access. Even in those places which were visited, the species can be hard to detect amongst the dense fern swards it frequents. At the time of writing, only a few of the most promising habitat patches have yet to be visited, and it seems reasonably safe to say that substantial subpopulations are unlikely to have been missed. It is, however, possible that a few small, scattered colonies may survive outside the current known range, either elsewhere at High Peak or along Diana's Peak Ridge.

Country Occurrence:

Native: Saint Helena, Ascension and Tristan da Cunha (Saint Helena (main island))

Distribution Map

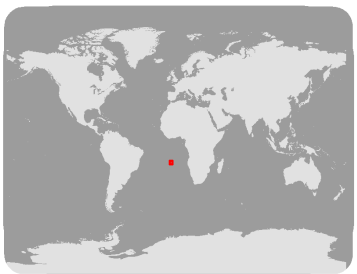
Pseudolaureola atlantica

NE DD LC NT VU EN CR CRITICALLY ENDANGERED EW EX

Range

Extant (resident)

Compiled by:
St Helena National Trust, Jamestown



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

Due to the difficulty of locating these elusive woodlice, direct population estimates are unlikely to be very accurate. A mark-recapture study at The Dell (April – August 2013) was only partially successful because the markings tended to last only a short period before the exoskeleton was shed. However, from numerous repeated counts, it was estimated that the site held no more than 40-50 individuals, ranging from four to 10.5 mm in length (newly hatched broodlings observed in July and August were excluded from the total).

No counts were made from the area below the High Peak Spoor tree because any incursion into the habitat would have risked causing substantial damage. A cursory inspection of the upper edge of the fern patch revealed at least 11 individuals, and it is probable that the total for the area was comparable to that at The Dell.

This suggests that the world population may comprise approximately 100 individuals (juvenile and adult), assuming that there are no other undetected extant sites. In 2013, only three very large females at the Dell were found with broods, though one other female was of a similar size and may have also bred. It is not known when males reach sexual maturity; they could potentially do so at a smaller size. Tentatively, the total mature population is given as 10-20 individuals, but the estimate is only an approximate guideline and could be slightly conservative.

Current Population Trend: Decreasing

Habitat and Ecology **(see Appendix for additional information)**

The Spiky Yellow Woodlouse inhabits St Helena's cloud forest zone, occupying a vegetation band which exists only between 700 m asl and the island's highest summits (not exceeding 820 m asl). The species lives almost exclusively on the fronds of tall ferns, although when more numerous it was also noted to occasionally forage on the trunks and branches of nearby trees. It generally avoids hairy or scaly hosts such as the Tree Fern (*Dicksonia arborescens* L'Hér), and favours the abundant Black-Scale Fern (*Diplazium filamentosum* (Roxb.) Cronk), but it will also use Brown-Scale Fern (*Pseudophagopteris dianae* (Hook.) Holttum) and other rarer glabrous species where encountered. Although potentially suitable hosts are widespread amongst upland vegetation, the colonies are apparently restricted to the understorey of heavily shaded woodland. The dominant forest species is almost invariably Black Cabbage Tree (*Melanodendron integrifolium* (Roxb.) DC.), whose widely-spreading branches and thick, leathery leaves form a dense canopy between three to four metres above the ground. The non-native Spoor is a relatively scarce species at high altitudes, but is structurally similar to Black Cabbage and creates similar micro-habitat conditions at the surviving High Peak colony.

Spiky Yellow Woodlice are clearly well adapted to an 'arboreal' lifestyle. They apparently never descend to the ground but live and feed exclusively amongst the fronds, where long legs and hooked tarsal claws allow them to clamber with agility and cling efficiently to the smooth surfaces. The habitat presents challenges to a crustacean with book lungs which are highly sensitive to desiccation. The extent of the respiratory surface is somewhat limited compared to other woodlice (Taiti *et al.* 1998), which may be a partial physical adaptation to reduce water loss. However, unlike other terrestrial isopods which hide under stones or amongst soil and leaf litter during dry periods, the elevated foliage provides little opportunity to retreat to crevices in order to conserve moisture. This probably constrains the

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distribution to the shelter of Black Cabbage canopies, which trap atmospheric moisture particularly effectively. Indeed, within the stand at The Dell, occupied microhabitats correspond well with those parts of the copse where the relative humidity never drops below 90%.

Generally diurnal, individuals are active for only short periods when weather conditions are suitable for foraging, and rarely travel far. Few marked specimens strayed more than one metre over several weeks of monitoring, although there is no indication of territoriality and up to six woodlice of mixed sexes occasionally occupied the same frond. During quiescence, they rest on the undersides of the fronds and are somewhat cryptic against the background of foliage. It is not yet clear what the species feeds on but, almost uniquely amongst the ecology of woodlice as currently documented, it does not appear to be a detritivore in the typical sense. The fern swards are usually almost clean of debris and, even when encountered, such potential food sources are usually ignored. During bouts of foraging behaviour, observed specimens tended to halt and press their mouthparts to the substrate at reasonably regular intervals, but the particles they consumed were too small to be obviously seen. It seems likely that they were grazing algae or feeding on fern spores liberated onto the surface, although they do not visit sporangia. They have also been observed consuming a fragment of petal, their own shed exoskeletons and, at a time when Redwood (*Trochetiopsis erythroxylon* (G. Forst,) Marais) were planted near The Dell in an earlier attempt at habitat restoration, they regularly attended the flowers to obtain pollen (pers. comm., R. Cairns-Wicks). These combined findings tend to indicate a favoured diet of small, lipid-rich particles.

The age structure of the population suggests that individuals survive for at least two years, perhaps more. In autumn, a continuous size range was recorded, from four to 10.5 mm in length. At least during their first year, the growing juveniles shed their exoskeletons regularly, perhaps as frequently as once every two weeks. Breeding appears to be restricted to the winter months and only those females above 0.9 mm in length were observed to carry young, which are held under a membrane on the ventral surface of the abdomen known as a marsupium. This parental care ensures a reasonably high rate of survival, but only eight to 10 hatchlings can be accommodated in a brood. The newly-hatched woodlice are approximately 1.0 – 1.5 mm long and do not develop yellow pigmentation for several weeks.

Systems: Terrestrial

Use and Trade

The Spiky Yellow Woodlouse is not collected or utilized locally, but has some cultural value on St Helena. Following the extinction of large, charismatic species such as the Giant Earwig (*Labidura herculeana* Fabricius) and Giant Ground Beetle (*Aplothorax burchellii* Waterhouse), it is the most widely recognized surviving endemic invertebrate on the island, and has become a national symbol for the ecological preservation of threatened upland habitats.

Threats (see Appendix for additional information)

It is difficult to determine how extensively the distribution of the Spiky Yellow Woodlouse has declined due to the paucity of historical records. Nineteenth century authors such as Melliss (1875) were unaware of it entirely, which may suggest that the distribution has been confined to few, very restricted and isolated localities for some time. However, despite its striking colour and appearance, this is a remarkably cryptic species which can easily escape detection. The first comprehensive entomological

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survey of St Helena was conducted by the Royal Museum of Central Africa, Tervuren (Belgium) in the 1960s (Basilewsky 1977). They recorded the species only from High Peak. A further detailed study of the Central Peaks in 2005-06 (Mendel *et al.* 2008) identified a separate subpopulation near Mt Actaeon (the most northerly of three summits along Diana's Peak Ridge), and reported additional accounts from locals of the species occurring nearby in Wells' Gut. More recently, a number of islanders report seeing the Spiky Yellow Woodlice at the head of Byron's Valley within the past decade (this could conceivably be the same locality as that of Mendel *et al.* 2008). Other accounts, from the few older residents familiar with the upland forests (also Q. Cronk pers. comm. 2014), describe seeing more general sightings, without specific location. A small subpopulation could possibly have existed at Wash House.

These records provide little more than suggestions, but they are sufficient to at least conclude that the range appears to have contracted substantially in the Diana's Peak area, where the species could well now be extinct. There can be little doubt that it has also suffered considerable declines from the sites where it has definitely been known at High Peak. At least two accounts describe it as plentiful at The Dell as recently as the late 1990s (R. Cairns-Wicks and V.E. Thomas pers. comm.). It was recorded in a cave on the north side of High Peak by P. and M. Ashmole in 2005-06. Recent visits found no evidence of continued presence and there appears to be little surrounding habitat to support the species. A further sighting was made in a hollow below The Dell in 2010 (K. Herian and L. Malan pers. comm.), but no individuals could be found here in 2013. The reasons for the decline are probably complex, but appear to be associated most strongly with the loss of Black Cabbage Tree woodland. As a species, Black Cabbage remains a moderately common component of the cloud forest flora, but stands of several trees growing in close proximity are required to create the dark, humid conditions necessary to support a characteristic understorey community, and these are extremely rare. Although The Dell comprises 25 mature individuals, few other copses of more than three trees survive. Even in areas where there are concentrations of Black Cabbage, the understorey is sometimes dominated by tree ferns, accumulating a heavy, acid leaf litter which smothers the open ground necessary for more diverse herbaceous species to establish.

It is not clear if, or why, the distribution of Black Cabbage Tree has changed, although several factors could have contributed. The cloud forest zone, which was probably once almost continuous along the Central Ridge, had become heavily depleted as a result of land clearances for pasture by the early 1800s. In the early part of the 20th century, extensive plantations of New Zealand Flax (*Phormium tenax* J.R. Forst. & G. Forst.) were established over the steeper slopes, effectively destroying many of the remaining refuges. It is quite possible that Black Cabbage woodland was particularly affected by this wave of devastation, since it seems to develop most fully in sheltered conditions below the summits, occupying the zone which was almost completely obliterated. Scattered trees survived at higher altitudes, but it may be less able to dominate in such areas, where forced to compete against Tree Ferns and exposed to strong winds.

Fragments of cloud forest are now confined only to High Peak and the Diana's Peak range, but even these have been substantially degraded following invasion by numerous non-native plant species. Vigorous competitors such as Whiteweed (*Austroeupatorium inulifolium* (Kunth) R.M. King & H. Rob., Small Fuchsia (*Fuchsia coccinea* Curt. in Aiton), Bilberry Tree (*Solanum mauritianum* Scop.) and Blackberry (*Rubus pinnatus* Willd.) are noted problems, but other small, ground cover species are likely to have imposed more subtle yet important pressures on the native species. Black Cabbage Tree is a member of the Asteraceae and possesses light, wind-blown seed which requires bare ground to

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germinate. The native flora contains few low-growing, clonal spreading herbs, and the habitats they occupied would thus would have originally contained plenty of gaps. The arrival of pasture grasses and the introduced Feather Moss (*Pseudoscleropodium purum* (Hedw.) Fleisch in Broth.) have increasingly removed openings, resulting in more limited germination opportunities for endemic trees. These changes may have further influenced the ability of Black Cabbage to form continuous clusters. There are concerns that this dominant component of the upland forests is declining (Lambdon and Ellick 2015), and, in particular, that further habitat losses will become apparent as the current older cohort dies.

In addition to the long term deterioration in habitat quality, the Spiky Yellow Woodlouse faces other important threats. Habitat fragmentation undoubtedly imposes major limitations on the ability to recover. The species appears to be highly sedentary and since it is confined to the fern layer, can presumably only normally travel by clambering from one frond to another. A gap of only a few metres thus imposes severe constraints on dispersal. Meanwhile, under the highly dynamic successional processes operating in St Helena's cloud forest, any individual habitat patch is unlikely to persist for no more than a few decades. The combined pressures could result in a high rate of local extinction.

The impacts of predators and diseases are less certain. Numerous invertebrate threats (e.g. the Woodlouse Spider, *Dysdera crocata* C.L. Koch) have been introduced to St Helena, although the recent study did not record any incidences of losses to them and few potential antagonists were noted. Rats and Mice (*Rattus rattus* L., *Rattus norvegicus* Berkenhout and *Mus musculus* L.) are prevalent near The Dell, but are unlikely to present an acute threat as they are too heavy to climb onto the fern fronds. Occasional predation by African Grass Frog (*Strongylopus grayi* Smith) is another consideration, and a few individuals have been heard calling in the area. This introduced amphibian was not seen near the main colony area during repeated day and night searches in 2013, but its distribution and potential impacts require further research.

Conservation Actions **(see Appendix for additional information)**

All potential habitat for the Spiky Yellow Woodlouse now lies within the Central Peaks National Park (part of the recently designated National Conservation Area network), and will be protected under the National Conservation Area development plans, which are expected to be in place in 2015. The species will also be protected under the new Environmental Protection Ordinance, presently in the final stages of drafting and expected to be issued in 2015.

The immediate practical challenge lies in protecting the remaining colonies. The condition of The Dell has deteriorated substantially in recent years due to a combination of factors. The site is isolated on three sides by pasture which limits further colonization and spread of plant species, and leaves the copse exposed to very strong winds which scour the upper parts of High Peak for much of the year. A number of trees have fallen during storms since 2008. This has further opened the canopy, making the site even more vulnerable to tree losses and reducing the ability to trap humidity. The fern layer can be heavily buffeted over winter leaving many fronds ragged. In addition, Tree Ferns appear to be spreading through the understorey, competing directly with the favoured host, Black-Scale Fern, whereas Kikuyu Grass (*Pennisetum clandestinum* Hochst. ex Chiov.) has encroached onto areas of open ground where light now penetrates.

In response to this critical situation, the Flagship Species Fund (Flora & Fauna International/DEFRA, UK) facilitated an initial study to assess the study to assess the status and ecology of the Spiky Yellow

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Woodlouse, conducted in 2013 by the St Helena National Trust. Much current understanding of the species' biology stem from the work undertaken. Subsequently, the Darwin Initiative have supported a further Trust project aimed at species recovery. The principle aims of these current efforts are: (1) to stabilize and expand the area of suitable habitat around the Dell, creating 1 Ha of new Black Cabbage Tree woodland; (2) to establish an *ex situ* colony of Spiky Yellow Woodlouse for breeding purposes; and (3) to develop a longer term management plan for recovery of the species and its critical habitat.

Ultimately, more areas of extensive Black Cabbage Tree woodland are required around the lower-altitude, sheltered parts of the cloud forest zone, with greater linkages between them. The habitat not only supports the Spiky Yellow Woodlouse, but is also vitally important for the survival of highly threatened epiphytes (e.g. Common and Dwarf Tongue-Ferns, *Elaphoglossum conforme* (Sw.) Schott and *Grammitis ebenina* (Maxon) Tardieu), and several specialized invertebrate species (e.g. the Rainbow Leaf Beetle *Vernonia wollastoniana* White and the endemic spider *Tecution mellissii* O. P.-Cambridge).

The captive breeding colony will be housed at St Helena Government's conservation facilities on-island (the 'Scotland' site), and will aim to secure a nucleus of individuals under protected management which can be used to populate an eventual reintroduction programme.

Credits

Assessor(s): Lambdon, P.W.

Reviewer(s): Gerlach, J.

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Citation

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.9. Forest - Subtropical/Tropical Moist Montane	Resident	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Past, unlikely to return	Whole (>90%)	Very rapid declines	Past impact
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Past, unlikely to return	Majority (50-90%)	Rapid declines	Past impact
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.1. Species mortality		
7. Natural system modifications -> 7.3. Other ecosystem modifications	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.1. Unspecified species	Ongoing	Unknown	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Dysdera crocata)	Ongoing	Unknown	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Fuchsia coccinea)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Pseudoscleropodium purum)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Phormium tenax)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Austroeupatorium inulifolium)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Mus musculus)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Rattus norvegicus)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Rattus rattus)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Strongylopus grayii)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Rubus pinnatus)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Solanum mauritianum)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
12. Other options -> 12.1. Other threat	Ongoing	Whole (>90%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.3. Indirect ecosystem effects		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: Yes
Systematic monitoring scheme: No
In-Place Land/Water Protection and Management

Conservation Actions in Place
Conservation sites identified: Yes, over entire range
Occur in at least one PA: Yes
Percentage of population protected by PAs (0-100): 91-100
Invasive species control or prevention: No
In-Place Species Management
Successfully reintroduced or introduced beningly: No
Subject to ex-situ conservation: No
In-Place Education
Subject to recent education and awareness programmes: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.2. Invasive/problematic species control
2. Land/water management -> 2.3. Habitat & natural process restoration
4. Education & awareness -> 4.1. Formal education
4. Education & awareness -> 4.2. Training
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.4. Habitat trends

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Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 4
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 4
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 1
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 740
Upper elevation limit (m): 775
Population
Number of mature individuals: 10-20
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: Yes
No. of subpopulations: 1
Continuing decline in subpopulations: Yes
Extreme fluctuations in subpopulations: Unknown
All individuals in one subpopulation: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Movement patterns: Not a Migrant

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The IUCN Red List Partnership

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