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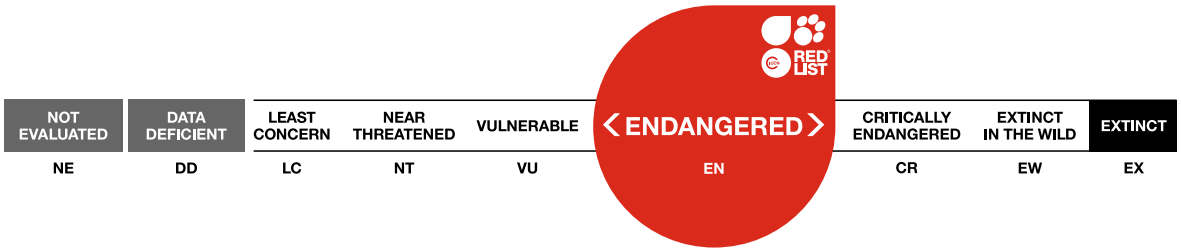
Jacobaea mouterdei, درات‌وم ةخيش

Assessment by: El Zein, H.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae

Scientific Name: *Jacobaea mouterdei* (Arènes) Greuter & B.Nord.

Synonym(s):

- *Senecio mouterdei* Arènes

Common Name(s):

- Arabic: دراتوم ةخيش
- English: Mouterde's Ragwort
- French: Jacobée de Mouterde

Taxonomic Source(s):

The International Plant Names Index. 2012. IPNI. Available at: http://www.ipni.org/. (Accessed: 17 June).
Mouterde, P. 1983. *Nouvelle flore du Liban et de la Syrie*. Dar El-Machreq Sarl., Beirut.

Assessment Information

Red List Category & Criteria: Endangered B1ab(iii,v)+2ab(iii,v) ver 3.1

Year Published: 2020

Date Assessed: February 26, 2020

Justification:

Jacobaea mouterdei is a restricted range endemic plant species of Mount Lebanon. It is known to occur exclusively in the "Valleys of Hell", in North Lebanon, where it can be locally abundant.

Both the extent of occurrence (EOO 24 km²) and the area of occupancy (AOO 24 km²) are very restricted, and the species is considered to occur in three locations. The population size is estimated above 6,000 individuals and the current trend of the population is decreasing due to human activities affecting some parts of the range of the species. The population is not considered as fragmented. The northern valleys could not be explored to spot the species during the recent fieldwork, however the presence of other subpopulations there is plausible and it could modify the actual EOO. Different threats affecting specifically *Jacobaea mouterdei* have been identified recently, for instance quarrying, unplanned urbanisation and agriculture. Further explorations are needed to complete the whole mapping of the distribution of the species and to calculate more accurate area of occupancy (AOO) and extent of occurrence (EOO).

The species is estimated as Endangered (B1ab(iii)+2ab(iii)) at the global level as a result of its restricted EOO and AOO, its number of locations and the continuing decline observed in its (iii) area, extent and/or quality of habitat. Threatening events could easily lead the species to Critically Endangered.

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Geographic Range

Range Description:

Jacobaea mouterdei (Arènes) Greuter & B.Nord, previously known as *Senecio mouterdei* Arènes, is a restricted range endemic plant species of Mount Lebanon. It is known to occur exclusively in the "Valleys of Hell" (Wadi Jahannam), in the districts of Danniye and Akkar, North Lebanon (El Zein 2020).

The species was first described by Paul Mouterde in 1946 (Mouterde, 1983). The author mentioned only one occurrence in the valley below the village of Hrar, downstream of the village of Qemmamin. He described the observed subpopulation as comprised of only a few individuals and located in a place difficult to access. Only one sample was collected at the date of visit of the author.

Since Paul Mouterde, no collector reported the presence of the species anywhere in Lebanon, until 2009 when Georges and Henriette Tohmé found the species in the surroundings of Qemmamin and next to Qabaait (Tohmé and Tohmé 2009). The authors described the species as being abundant in one of the valleys, coming from above Qemmamin.

In 2019, a research study funded by Mohammed bin Zayed Species Fund was carried out to estimate the size of the population and collecting data about its ecology (El Zein and Khater 2020). It confirmed the restricted distribution of the species at least for the southern parts of the area and its absence from the surrounding plateaus of Mrebbin and Qemmamin. Most of the individuals were observed in one side of the area (Wadi el-Qattara) and almost none were observed in the other part (Wadi Haql el-Kherbe). Yet, the latter and other areas could not be visited thoroughly and the species could be potentially extant in the northern parts of the area. Further investigations have to be carried out to clarify the northern edge of distribution of *Jacobaea mouterdei*.

Both the extent of occurrence (EOO 24 km²) and the area of occupancy (AOO 24 km²) are very restricted, and the species is considered to occur in three locations. There is no evidence that the EOO and AOO were larger in the past as the historical botanic reference mentioned this species to be restricted to this valley. A decrease in AOO is suspected since, the habitat quality have severely been degraded in the lower parts of the valleys during the last decades; however no information is available concerning a decrease in of the number of subpopulations.

Country Occurrence:

Native, Extant (resident): Lebanon

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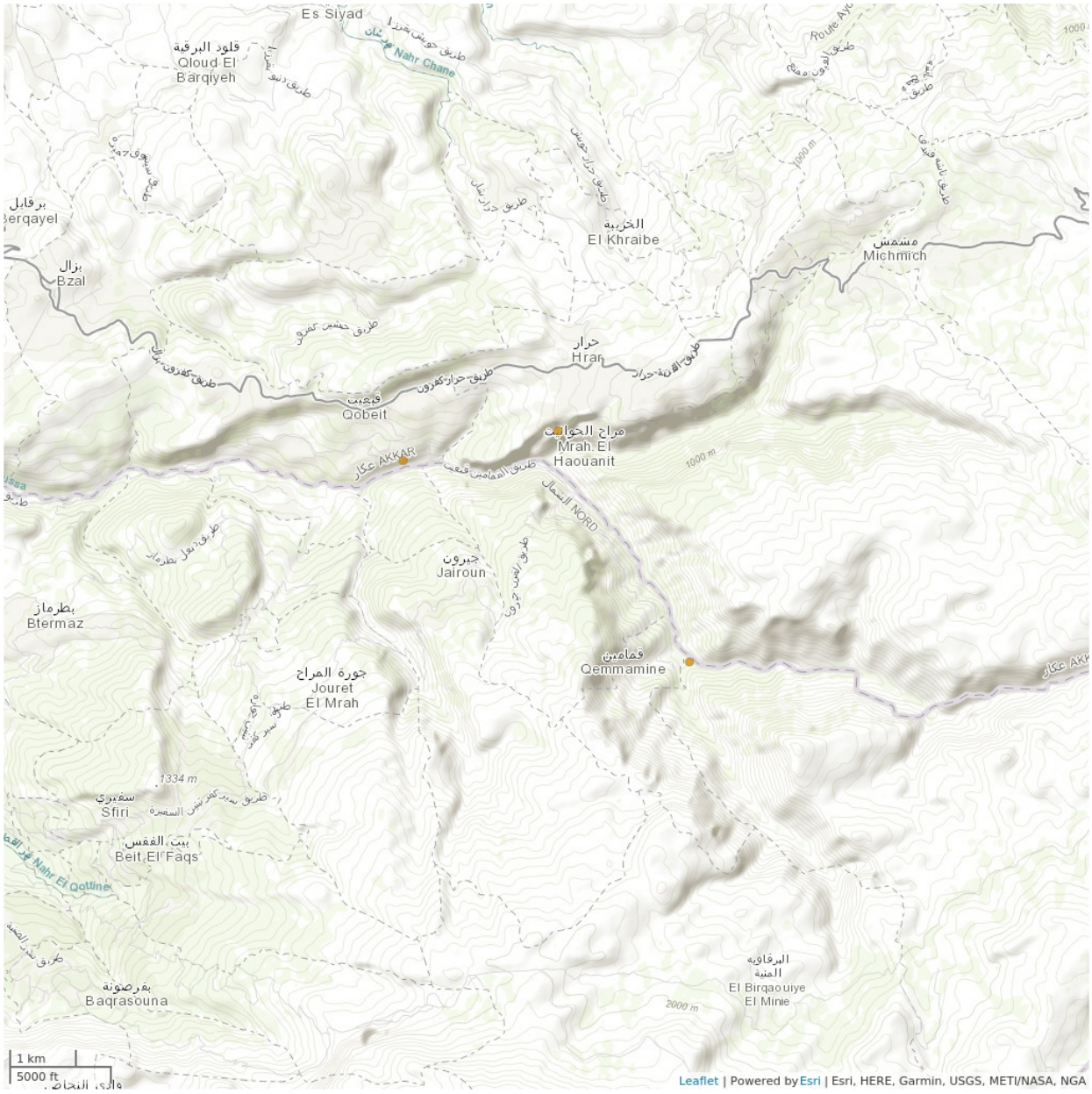
Distribution Map



Legend

EXTANT (RESIDENT)

Compiled by:

Lebanon national plant Red List 2018

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

In result to the study carried out in 2019 about the species (El Zein and Khater 2020), the population size was estimated with accurate counting. Only the southern part of the "Valleys of Hell" was comprehensively visited and the vegetation was sampled to spot and count the number of individuals of *Jacobaeae mouterdei*.

The species was observed in 96 quadrats and 3,271 individuals were counted. According the environmental parameters and the local abundance of the species in some particular locations, the number of individuals occurring in the southern part of the area is estimated above 6,000. As explained in the distribution part, there is a probability for more individuals to be present in the northern valleys which could not be sufficiently explored during this fieldwork.

The observed number of subpopulations is three: the largest in Wadi el-Qattara (1), another in the valley below Qemmamin (2) and the smallest downstream in the section stretching from below Hrar to Qabaait (3). These subpopulations are disconnected by relatively short distances: a distance of around one kilometre was calculated between Wadi el-Qattara and Qemmamin and a distance of two kilometers was calculated between the subpopulation of the valley below Qemmamin to the one located downstream around Hrar and Qabaait. Even so, the population is not considered as severely fragmented as gene flow can be easily undertaken through these distances by pollinators which disseminate the pollen.

The calculations allowed to estimate that the subpopulation of Wadi el-Qattara (1) is constituted of around 6,000 individuals as 3,154 individuals were counted there. Only 96 individuals were observed in the second subpopulation (2). In the lower subpopulation (3), 21 individuals were counted. In these two areas the altitude is lower, the slopes of the valley are very steep and locally quite disturbed by human activities, which could explain the inadequate conditions for the presence of the species.

In some areas within the valley Wadi el-Qattara, important densities of Jacobaea mouterdei were recorded, for instance the highest record counted 157 individuals within 80 m², being 1.96 individuals per square meter. The average calculated of number of individuals in preferred habitat types (check Habitats and Ecology Part) was of 58.71 individuals per 80 m².

Current Population Trend: Decreasing

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

The species is a perennial herbaceous that can reach heights of 150 cm.

The study carried out in 2019 on *Jacobaea mouterdei* (El Zein and Khater 2020) allowed the collection of new information about the ecology of the species. The plant sprouts between March to April depending on the altitude and aspect. It grows up to 60 cm in height during this first part of development. Each individual produces variable numbers of stems, from one to 50, depending on the age of the individual and the environmental parameters. There is an interesting polymorphism at the level of the shapes of the leaves: they can vary from almost entire to deeply pinnately lobed between different groups of individuals. The flowering time clearly extends from June to August, although some isolated individuals can still partly flower in September and early October. The flowering stems can reach up to 150 cm in

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height. One individual can produce up to 1,000 flowers. A flower head carries an average of 12 ray flowers and 40 disc flowers. Inflorescence type is a compound corymb. It was also observed that important amounts of seeds are produced by each individual and there is a low success rate because of the presence of maggots feeding on the fruits.

Jacobaea mouterdei, like many species of the genus *Jacobaea*, is anemochorous, which means that its seeds are dispersed by wind. It has the capacity to settle in recently disturbed mineral soils which make it quite resilient to the construction of non-asphalted roads or trails. Nevertheless, the species takes time to settle properly due to its slow growth and its fragility during the first years of development. Therefore the perturbation of the habitat should not be repetitive.

Jacobaea mouterdei was mostly observed on soil formed from sandstone bedrock. Only few individuals were observed on soils derived from limestone bedrock. The species occurs within woodlands, shrublands, grasslands and rocky outcrops. Different types of woodlands meet the requirements for *Jacobaea mouterdei*: In pine (*Pinus brutia*) woodlands, the species was present but in relatively small amount. In evergreen oak (*Quercus coccifera*) woodlands, deciduous (*Styrax officinalis*) woodlands, and mixed conifer broadleaved woodlands the species was relatively abundant. Nevertheless, shrublands, grasslands and rocky outcrops are the preferred habitat types of *Jacobaea mouterdei* and sheltered the highest densities in terms of number of counted individuals (see Population Part).

Systems: Terrestrial

Use and Trade **(see Appendix for additional information)**

There is no information about the use of this species.

Threats **(see Appendix for additional information)**

The species is considered to occur in three locations. In this particular case, the number of subpopulations was equal to the number of locations. The specific threats affecting *Jacobaea mouterdei* have been identified in the explored area during the study carried out in 2019 (El Zein and Khater 2020). Other threats could occur in the northern parts of the range that could not be visited during this study. The identified threats are:

The creation of quarries constitutes the major threat for the species in the area as it irreversibly destroys its natural habitats and the potential seed bank remaining in the soil. Although it has been recurrently denounced by some locals, this illegal activity is quite spread in Lebanon and chaotic quarries are currently multiplying in the area between Jayroun, Qabaait and Hrar.

Urbanisation and the construction of roads constitute important threats that affect the species marginally. Although these threats are not spread over the range of the species, they have irreversible impacts as they permanently destroy the natural habitat of *Jacobaea mouterdei*. Within the village of Qemmamin, the construction of houses remains marginal, nevertheless a few houses built between 2015 and 2020 have destroyed some individuals of *Jacobaea mouterdei*. Urbanisation and road construction have a more significant impact in the area between Hrar and Qabaait where the density of inhabitants is larger and the villages keep on spreading.

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The creation of agricultural lands including fields for crops such as bean, corn, potatoes but mostly for the plantation of orchards of apple trees, plums, cherries and other fruit trees constitute the most spread threat to the species in the surroundings of Qemmamin and particularly in the lower parts of the valley Wadi el-Qattara where the largest subpopulation is located. This activity had an important value in the area of Qemmamin which explains the large area reserved for it. Due to the disturbance occurring on the vegetation in these agricultural lands, such as ploughing and the use of herbicides, *Jacobaea mouterdei* cannot survive in the cultivated areas. Other old and abandoned terraces located in the valleys can however constitute surprising shelters for wild plants, including *Jacobaea mouterdei* if its environmental requirements are met.

The collection of wood of evergreen oak (*Quercus coccifera*) is the second most important rural activities in the valleys, after agriculture. Local woodcutters target a different slope of woodland each year and harvest from spring to autumn. The activity has serious impacts on the flora even though it is selective. The major part of the lower shrubby vegetation is removed to allow constant back and forth of the workers and their donkeys, destructive trampling permanently destroys the herbaceous stratum and erodes the fragile soil structure, several small terraces are built at different levels of the slope to set fire to the high conic piles of branches to make charcoal on the site, small branches are not collected and lie down creating an important risk of forest fires during the long Mediterranean dry season. Few annual species could be favoured by this activity but *Jacobaea mouterdei* is considered to be greatly affected as it was always found absent on the areas where oak charcoal production occurred, even on sites that were exploited 20 years ago.

The grazing activity is not popular in Wadi el-Qattara due to the steepness of the valley. However, on the plateaus and the higher parts of the valleys, grazing has an important impact on the vegetation and can be qualified as over-grazing. Flocks of goats and sheep are driven through the high plateaus overhanging the valleys, in which cedars and junipers thrive, to reach the higher parts of Wadi el-Qattara. *Jacobaea mouterdei* is not the preferred species of the herbivorous during spring and early summer, yet in the end of summer and in autumn when most of the grass and forbs have turned dry and yellow, then it becomes seriously grazed to the base of the stems. Usually at this time of the year, the species has already completed part of their seed production. The palatability of *Jacobaea mouterdei* is also confirmed as donkeys appreciate it all year round to the last leaf. Taking into consideration the relatively lower impact of overgrazing on *Jacobaea mouterdei* in the explored areas, it is not considered here as a main threat. Further investigations would help understanding how grazing could constitute a major threat in the other valleys where the activity is more intense.

The presence of maggots feeding on the seeds inside the flowers heads was found on almost every inspected individual. The species of fly responsible for these damages could not be identified and it is unknown if it is a specific or generalist parasite. It is yet possible that the flies were present in the region and laying their eggs on the flowers of *Jacobaea mouterdei* way before the arrival of human activities in the valleys. This threat is considered as minor although it affects most of the individuals (90%).

At least four illegal dumps have been spotted in the lower part of the main valley, between Qabaait to the way up that leads to Jayroun. Important amount of rubbish are directly thrown by the locals and the municipalities straight inside the valley down to the river. The solid pollution has clearly a negative impact on other components of the ecosystem, especially on water quality. Nevertheless, once in a while, the dump is set on fire to reduce its volume and then can cause serious threat to the surrounding

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natural habitats by starting uncontrolled forest fire. This is what happened in 2018 below the road that leads to Jayroun. The fire was controlled and burned a relatively limited part of the slope. Dumps constitute a risk of forest fire that could destroy the species and its habitat on a more or less large scale.

Climate change should be considered as a future threat affecting most of the individuals with significant impacts on the species survival if drought events intensify in the coming decades (MedECC 2019).

In the first location, located in the lower part of the main valley in the area of Qabaait, Hrar and Jayroun, the major occurring threat is the creation of quarries. Urbanisation and the construction of asphalted roads constitute the second major threat considering the level of destruction of the species.

In the second location, located in the surroundings of the village of Qemmamin, the major threat occurring is the exploitation of the lands for agricultural activities, especially terraces of fruit orchards. Here also, urbanisation, even though having potential higher impacts on the species, is ranked as the second most important threat.

In the third location which includes the individuals located within the valley of Wadi el-Qattara, the major threat is also the creation of terraces for agriculture and their associated activities. Secondarily, grazing plays a role but has relatively slow significant impacts on part of the individuals.

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

The species does not occur in any protected areas. There is no action recovery plan, *ex situ* conservation action, education and awareness programmes, and legislation for *Jacobaea mouterdei*. However, further to the study targeting the species in 2019 (El Zein and Khater 2020), one potential conservation site was identified in the valley of Wadi el-Qattara, above the village of Qemmamin. This study aimed at collecting data on the size of the population, life history and ecology of the species (habitats, flowering period, and seed dispersal), the specific threats affecting it and the potential existence of harvest by locals.

Although the southern area was thoroughly explored during 2019 (El Zein and Khater 2020), further fieldwork is necessary to map the complete distribution of the species in order to calculate more accurate area of occupancy (AOO) and extent of occurrence (EOO), identify the threats occurring in the northern valleys.

Conservation actions should be implemented as soon as possible regarding the quick pace at which destructive and illegal human activities are spreading throughout Mout Lebanon since the three last decades and seriously affecting natural habitats, species, landscapes and rural lifestyle. Endemic species are part of the natural heritage of the country and more attention should be given to their survival.

Credits

Assessor(s): El Zein, H.

Reviewer(s): Bou Dagher Kharrat, M. & Véla, E.

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Contributor(s): Khater, C.

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External Resources

For Supplementary Material, and 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 -> 1.4. Forest - Temperate	Resident	Suitable	Yes
3. Shrubland -> 3.4. Shrubland - Temperate	Resident	Suitable	Yes
4. Grassland -> 4.4. Grassland - Temperate	Resident	Suitable	-

Plant Growth Forms

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

Plant Growth Form
F. Forb or Herb

Threats

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

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (50%)	Very rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.1. Small-holder plantations	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.1. Nomadic grazing	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
3. Energy production & mining -> 3.2. Mining & quarrying	Ongoing	Minority (50%)	Very rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
7. Natural system modifications -> 7.1. Fire & fire suppression -> 7.1.1. Increase in fire frequency/intensity	Ongoing	Minority (50%)	Very rapid declines	Medium impact: 7

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11. Climate change & severe weather -> 11.2. Droughts	Future	Whole (>90%)	Slow, significant declines	Low impact: 5
12. Other options -> 12.1. Other threat	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6

Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: No
Percentage of population protected by PAs: 0
Area based regional management plan: No
Occurs in at least one protected area: No
In-place species management
Subject to ex-situ conservation: No
In-place education
Subject to recent education and awareness programmes: No
Included in international legislation: No
Subject to any international management / trade controls: No

Conservation Actions Needed

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

Conservation Action Needed
1. Land/water protection -> 1.1. Site/area protection
2. Land/water management -> 2.1. Site/area management

Research Needed

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

Research Needed
1. Research -> 1.2. Population size, distribution & trends

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Research Needed
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 24
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km²): 24
Continuing decline in extent of occurrence (EOO): Unknown
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 3
Continuing decline in number of locations: Unknown
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 500
Upper elevation limit (m): 1,750
Population
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: No
Continuing decline in subpopulations: Unknown
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

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The IUCN Red List Partnership

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