A Regional Red List of

Montane Tree Species of the Tropical Andes:

Trees at the top of the world

N. Tejedor Garavito, E. Álvarez Dávila, S. Arango Caro, A. Araujo Murakami, S. Baldeón, H. Beltrán, C. Blundo, T.E. Boza Espinoza, A. Fuentes Claros, J. Gaviria, N. Gutiérrez, S. Khela, B. León, M.A. La Torre Cuadros, R. López Camacho, L. Malizia, B. Millán, M. Moraes R., A.C. Newton, S. Pacheco, C. Reynel, C. Ulloa Ulloa, O. Vacas Cruz

BGCI Plants for the Planet
FAUNA & FLORA INTERNATIONAL
Global Trees Campaign
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BOTANIC GARDENS CONSERVATION INTERNATIONAL (BGCI) is a membership organization linking botanic gardens in over 100 countries in a shared commitment to biodiversity conservation, sustainable use and environmental education. BGCI aims to mobilize botanic gardens and work with partners to secure plant diversity for the well-being of people and the planet. BGCI provides the Secretariat for the IUCN/SSC Global Tree Specialist Group.

FAUNA & FLORA INTERNATIONAL (FFI), founded in 1903 and the world's oldest international conservation organization, acts to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, are based on sound science and take account of human needs.

THE GLOBAL TREES CAMPAIGN is undertaken through a partnership between FFI and BGCI, working with a wide range of other organizations around the world, to save the world's most threatened trees and the habitats in which they grow through the provision of information, delivery of conservation action and support for sustainable use.

THE IUCN/SSC GLOBAL TREE SPECIALIST GROUP forms part of the Species Survival Commission's network of over 7,000 volunteers working to stop the loss of plants, animals and their habitats. SSC is the largest of the six Commissions of IUCN – The World Conservation Union. It serves as the main source of advice to the Union and its members on the technical aspects of species conservation. The aims of the IUCN/SSC Global Tree Specialist Group are to promote and implement global red listing for trees and to act in an advisory capacity to the Global Trees Campaign.

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Sangay National Park, Ecuador *(Flora of the World©)*

Tapichalaca, Ecuador *(Carmen Ulloa Ulloa)*

Acknowledgements

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Many experts from South American countries have contributed information and/or undertaken the assessments for this regional evaluation and their contributions are gratefully acknowledged.

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Foreword

Andean montane forests are a major global conservation priority owing to their biological richness and high level of species endemism. Botanically the Andes are very rich in species but they remain relatively unstudied. In common with montane forests elsewhere in the world, Andean forests are of great value for the provision of ecosystem services relating to water supply, regulation of regional climate and the capture and storage of carbon. The forests and their component species are however under threat.

This report summarises information drawn from a wide variety of sources to provide a regional Red List of trees of Andean tropical montane forests. The species evaluation process has drawn on published national red lists of threatened species, botanical literature, specimen databases, forestry information and expert knowledge. The outcome reflects the diligence of Natalia Tejedor Garavito in carrying out her PhD thesis and her ability to network with an extremely supportive network of botanists who care about the flora of the Andes.

The IUCN Red List Categories and Criteria have been used for the evaluation and a component of Natalia's PhD study has been to evaluate their use for species with limited and dispersed data. Understanding the geographical distribution of the species is very important in conservation assessment. The maps produced for this study are a valuable starting point for the Red Listing and a baseline for monitoring impacts of climate change.

In this assessment 70 species are recorded as globally threatened based on the IUCN Red List of Categories and Criteria out of 127 tree species evaluated. In addition 165 national endemic trees of the region have previously been evaluated as globally threatened based on the same IUCN process. In total therefore 235 tree species are currently considered to be threatened with extinction within the Andean montane forests.

This Red List report is the ninth in a series produced by the IUCN/SSC Global Tree Specialist Group since 2003. It is the second in a process to evaluate the conservation status and impact of climate change on the world's montane tree species - trees at the "Top of the World". In this way it complements and builds on the Red List of Mexican Cloud Forest Trees published in 2011. We aim to ensure that all the information included in the tree Red List reports is incorporated into the online IUCN Red List. In order for this to happen for the Andean trees supplementary information may be required and we will be most grateful for any feedback on the assessments included in this report. Thank you.

In the meantime our aim is also to stimulate conservation action for tree species that are under threat. BGCI will work with botanic gardens to enhance ex situ conservation for globally threatened tree species of the Andes where appropriate and to promote ecological restoration. The Global Tree Specialist Group will make information available for in situ planning and will promote sustainable use for local livelihoods working for example through the Global Trees Campaign.

The need for effective conservation assessments of tree species around the world remains an urgent priority. The Global Tree Specialist Group will continue in its aims of completing a Global Tree Assessment by 2020 and welcomes collaboration with all interested parties.

Sara Oldfield
Chair of the IUCN/SSC Global Tree Specialist Group

Pugyopamba, Ecuador *(Carmen Ulloa Ulloa)*

Introduction

Yanacocha, Ecuador *(Flora of the World©)*

This Red List of the tree species of the montane forests of the tropical Andes forms part of an ongoing research project to assess the conservation status and impact of climate change on the world's montane tree species - trees at the "Top of the World". The scope of this report is the tropical Andes in Argentina, Bolivia, Colombia, Ecuador, Peru and Venezuela.

Andean montane forests are currently a major global conservation priority owing to their biological richness and high level of endemism (Bush et al. 2007; Olson and Dinerstein 1997). These forests are of high value for the provision of ecosystem services related to water, the regulation of regional climate and the capture and storage of carbon (Cuesta et al. 2009); they are also amongst the least known ecosystems in the tropics (Ataroff and Rada 2000; Bubb et al. 2004; Gentry 1995; Kessler 2000; Stadtmüller 1986). Andean montane forests are considered to be highly threatened by the continuing rates of deforestation, fragmentation, degradation (Cabrera and Ramírez 2007; Tejedor Garavito et al. 2012) and the potentially considerable impacts of climate change (Cuesta et al. 2009; Herzog et al. 2011; Urrutia and Vuille 2009).

The Andean geographical region is unique, with 133 different types of ecosystem (Josse et al. 2009a, 2009b), and high habitat diversity, due to broad altitudinal and latitudinal gradients (Josse et al. 2003). In this report we focus mainly on tree species associated with moist, upper montane or cloud forests. Our definition of montane forest includes cloud forest (Northern Andean forests, Yungas forests and Bolivia-Tucuman forests) and seasonal (wet) forest above 1500 m a.s.l., with temperatures between 6-18°C and yearly mean precipitation above 1000 mm, (as described by Josse et al. 2009a, 2009b). An altitudinal minimum threshold of 1500 m a.s.l. was chosen as this is the altitude at which the species composition typically changes, as lowland or lower montane tree species are displaced by a floristically different assemblage of upper montane species (Josse et al. 2009a). However, some species associated with other types of vegetation, such as seasonal (moist) forests, have been included in the assessment, because there are areas where species occur in more than one vegetation type, as in the overlap between xerophitic and seasonal vegetation, and between seasonal and cloud forest vegetation. Trees are defined here as upright woody plants with a dominant above-ground stem that reaches a height of at least 3 m (Körner 1998), including palms and woody ferns.

National Red List assessments have been undertaken in Bolivia (Meneses and Beck 2005), Colombia (Calderón et al. 2002), Ecuador (León-Yánez et al. 2011), Peru (León et al. 2006) and Venezuela (Llamozas et al. 2003). The objective in this study is therefore to focus on species that are shared by more than one country to complement national efforts.

Information collection for conservation assessment

Our Red Listing process was implemented through the following steps:

- compilation of a list of tree species occurring within the montane forests of the region;
- compilation of spatial data indicating the geographical distribution of each species;
- production of distribution maps for each species, and use of these to estimate the extent of geographical range of each species, according to the IUCN Red List guidelines;
- validation of the distribution maps using expert knowledge;
- preliminary Red List assessment of each taxon using the IUCN Red List categories and criteria, in collaboration with experts within the region;
- review of the preliminary Red List assessments by BGCI and final review by the regional experts.

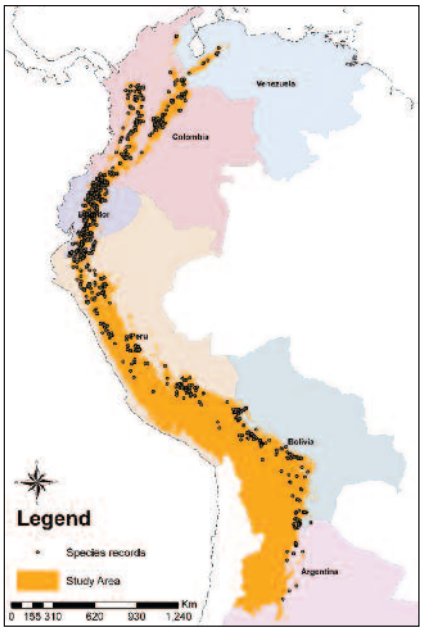


Figure 1. Georeferenced distribution of the species collections evaluated

Early in the assessment process, a workshop was held in Ecuador in May 2010 involving specialists from Argentina, Bolivia, Colombia, Ecuador, Peru and Venezuela. Based on the expert knowledge represented, a consolidated list of tree species in the Tropical Andes was produced. The development of this list was supported by accessing data from a range of sources, including the Missouri Botanical Gardens database (www.tropicos.org), regional herbaria: Colombian National Herbarium (COL), Venezuelan National Herbarium (VEN), Bolivian National Herbarium (LPB), Herbarium of the Universidad Pontificia Católica in Ecuador (QCA), San Marcos Herbarium of the Universidad Nacional Mayor de San Marcos, Peru (USM), regional floras and personal databases maintained by experts. The nomenclature was checked using The Plant List (www.theplantlist.org, accessed March 2011), to identify synonyms and species considered taxonomically unresolved. The Angiosperm Phylogeny Group III system (APG III 2009) was used to provide consistency on the family names.

Geographical distribution data for all the tree species were then compiled. The sources of this information included: personal records of the network of regional specialists involved in this assessment, the Missouri Botanical Garden database (www.tropicos.org), regional herbaria, and the Global Biodiversity Information Facility (GBIF: www.gbif.org, accessed November 2010). A spatial database incorporating these distribution data was created in ArcGIS v.10, and then critically examined in order to exclude those points that were incorrectly georeferenced. The database was used to identify those species occurring exclusively above 1500 m a.s.l. by overlaying data on a Digital Elevation Model (DEM) obtained from www.worldclim.org, with a grid space of 30 arc seconds (0.0083° or approximately 1 km). Species with any records below this threshold were excluded from further analysis and only species with records in more than one country were kept. A total of 1,663 distribution records were obtained for these species (Figure 1). The number of records per species varied among species, with 79 species having ≤10 unique records and four having > 50 unique records (Figure 2). Distribution maps of each taxon were then checked by the regional network of specialists.

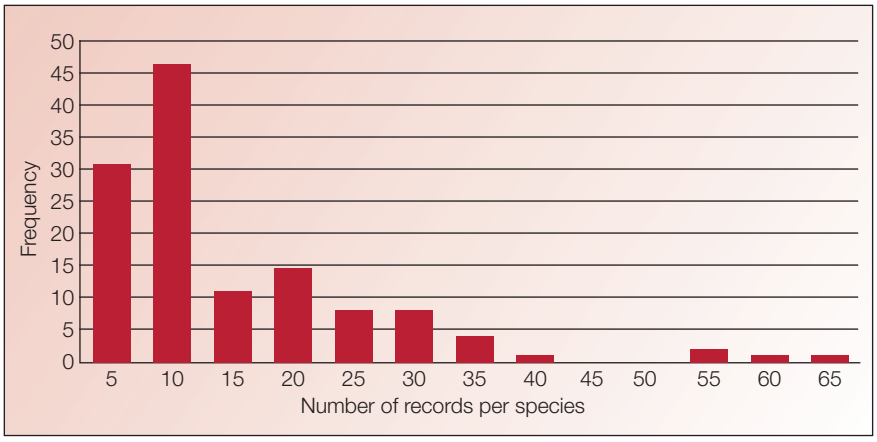


Figure 2. Frequency distribution of the abundance of species records for the 127 species evaluated under the RL categories and criteria.

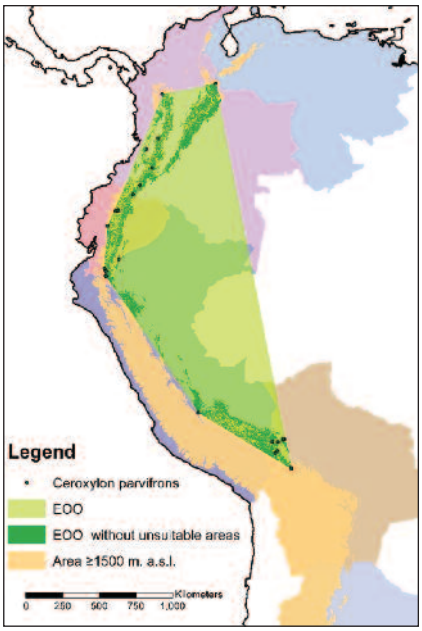


Figure 3. EOO for the species Ceroxylon parvifrons. Light green polygon shows the minimum convex polygon including the full extent of the distribution (EOO). Dark green polygon shows the EOO without unsuitable areas.

Conservation status	Number of species
Critically Endangered (CR)	1
Endangered (EN)	42
Vulnerable (VU)	27
Near Threatened (NT)	20
Least Concern (LC)	29
Data Deficient (DD)	8
Not Evaluated (NE)	0
Total	127

Table 1. Summary of results of this regional Red List report

Country	CR	EN	VU	NT	LC	DD	Subtotal	NE	Total
Ecuador	2	36	52	9	5	1	105	61	166
Peru	9	31	15	2	3	10	70	50	120
Colombia	4	5	5	2	1	0	17	60	77
Bolivia		5	1			1	7	94	101
Argentina							0	3	3
Venezuela							0		0
Total endemics	15	77	73	13	9	12	199	268	467
This regional assessment	1	42	27	20	29	8	127	0	127
Total Andes	16	119	100	33	38	20	326	268	594

Table 2. Number of endemic tree species by country in the tropical Andes (Calderón et al. 2002; IUCN 2010; León-Yánez et al. 2011; León et al. 2006; Llamozas et al. 2003; Meneses and Beck 2005) together with the results of this regional assessment.

Three different range estimates were calculated: extent of occurrence (EOO), EOO with unsuitable areas for the species excluded and area of occupancy (AOO). Further details on the methodology are given in Tejedor Garavito (2014). Figure 3 provides an example of EOO and EOO with unsuitable areas excluded for Ceroxylon parvifrons.

Conservation assessments were conducted by Natalia Tejedor Garavito, using the IUCN Red List Categories and Criteria version 3.1 (IUCN 2001) and the IUCN Red List Guidelines Version 9.0 (IUCN Standards and Petitions Subcommittee 2011); and in consultation with the network of specialists, during a second workshop in Lima, Peru in 2011. As required all the species were evaluated using all of the criteria and that the final category allocated to the species was the one associated with the highest category of threat (IUCN 2001) and the lowest level of uncertainty (See also Box 1).

Results of the evaluation

In this assessment, 127 tree species were evaluated using the IUCN Red List criteria, of which 70 species were classified within a threatened category (Critically Endangered, Endangered and Vulnerable). Over two thirds of the species evaluated are considered threatened or near threatened globally (Table 1).

The distribution of the 127 species across countries is shown in Figure 4. In this regional assessment Ecuador was the country with most species and Argentina the fewest (Figure 4). The most speciose family was Melastomataceae as shown in Figure 5. Prior to this regional Red List report, 199 endemic tree species have been evaluated in national Red Listing initiatives (Table 2). Taking into consideration these national evaluations and the results of this regional report, a total of 235 tree species have been identified as being under threat in the tropical Andes (Table 2).

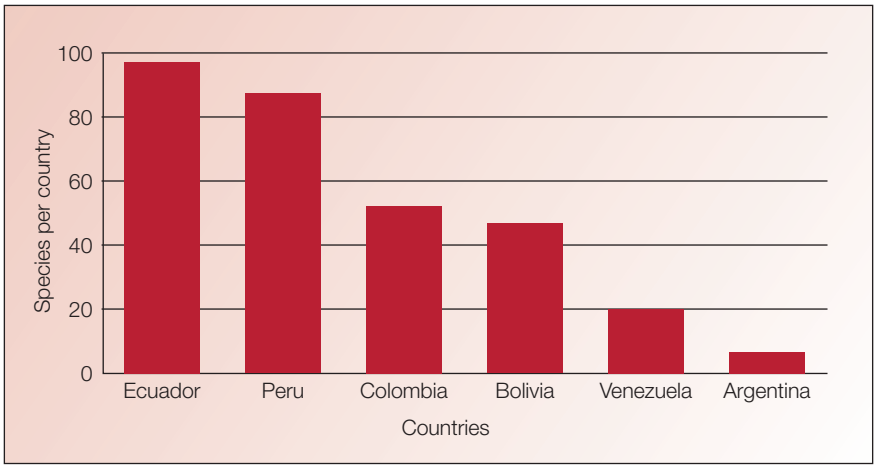


Figure 4. Number of species per country that were evaluated using the RL categories and criteria.

Conservation and research priorities for Andean montane trees

The tropical Andes is a centre of plant endemism (Kier et al. 2005; Morawetz and Raedig 2007; Myers et al. 2000). Assessments of biodiversity richness of the tropical Andes biodiversity hotspot, identified 45,000 plant species present, with 20,000 endemic (Brooks et al. 2002 and Myers et al. 2000). However, only 78 of these species are listed as threatened the IUCN Red List at present (www.iucnredlist.org, accessed May 2010). In contrast, 3,389 species of mammals, birds, reptiles and amphibians are present in the region, 1,567 of these species were identified as endemic, and the majority of these species are listed on the IUCN Red List (www.iucnredlist.org, accessed May 2010). Recent studies of birds, amphibians and fish all indicate the importance of this region as a biodiversity hotspot both in terms of the high species richness, high levels of endemic species, and also the high levels of threat to biodiversity (Orme et al. 2005; Young et al. 2001, Anderson and Maldonado-Ocampo 2011).

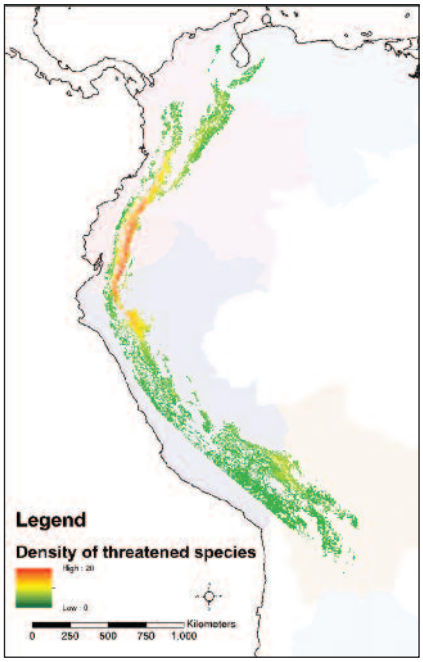
Many threats have been identified that have contributed to the loss and degradation of the Andean montane forests. A panel of experts from throughout the region, identified that livestock, deforestation for land use change to agriculture, logging and fragmentation are the major threats to these forests (Tejedor Garavito et al. 2012). Recent research has also identified that climate change will potentially have considerable impacts on these montane forests (Feeley et al. 2011; Herzog et al. 2011; Román-Cuesta et al. 2011; Tovar et al. 2013; Urrutia and Vuille 2009) (see also

Box 1. Uncertainty and use of expert opinion

Applying the Red List to plants and particularly to tree species has been recognized to have particular challenges, relating to the lack of accurate information on their population size and distribution (Newton and Oldfield 2008; Nic Lughadha et al. 2005). The different types and sources of uncertainty more generally in relation to the Red List have been identified and discussed by various authors (e.g. Akçakaya et al. 2000; Mace el al. 2008; Newton 2010). The incompleteness of distribution data to assess the species has been identified as a major constraint to the conservation planning process in tropical regions (Cayuela et al. 2009), and for carrying out conservation actions (Lavoie 2013). Although distribution data are increasingly being made available through digitized biological databases such as GBIF and the Missouri Botanical Garden database, which provide quantitative georeferenced species distribution data (Bachman et al. 2011; Beck et al. 2013), such data may not currently provide an accurate estimate of the full or accurate distribution of a species (Hjarding et al. 2014). The georeferenced data for the species used in this research, shown in Figure 1, illustrates gaps in the collection efforts, many of which are explicable in terms of the limited access to different locations (Feeley and Silman 2009). This lack of data in some species was related to their rarity and degree of habitat specialism, implying a restricted distribution (Feeley and Silman 2009) but may in some species have resulted in an underestimation of the species' ranges (Feeley and Silman 2009; Knapp 2002).

Distribution data are typically the most abundant resource available to experts undertaking Red List assessments (Bachman et al. 2011; Newton and Oldfield 2008). Therefore there is a tendency to rely on range (criteria B1 and B2) to list a species on the Red List (Newton and Oldfield 2008). This also reflects the reliance on herbarium collection data for range estimations in tree species, and in plant species more generally (Nic Lughadha et al. 2005). While range estimates based on herbarium specimens are repeatable and objective, they only form part of what is required by a comprehensive Red List assessment (Rivers et al. 2011). Expert judgment has been identified to be important in the Red Listing process (Hjarding et al. 2014), and it played a significant role in this regional Red List. For example, the use of experts allowed the identification of specific threats to each species, as well as validation of species distributions, especially when georeferenced data were lacking. The areas in which the experts had greater uncertainty were related to estimation of the AOO and EOO of those species that had relatively few distributional records. The current research supports the finding of Rivers et al. (2011), who suggested that there is a need for at least ten valid records in order to carry out a range estimate (90% accuracy) for use in a Red List assessment.

Perhaps the most significant area of uncertainty in the current assessment was the estimation of actual population size, as inventory data for the majority of tree species in the region is entirely lacking.



Box 2. The impact of climate change on the plants of the tropical Andes

Predictive modelling of climate change is an important and cost-effective tool for regional biodiversity assessments, biodiversity management and conservation planning (Elith et al. 2006). As part of her PhD project, Natalia Tejedor Garavito has also assessed the extinction risk for tree species under projected climate change of species in the tropical Andes (Tejedor Garavito 2014). Using species distribution modelling and the climate change A2 scenario, this study identified which species would be in a threatened category, based on the Red List Criterion A3 (population reduction). In addition these results can be analysed geographically to establish which areas should potentially be targeted for conservation actions, because they are expected to have a high density of threatened species as a result of climate change. The results showed that the areas with the largest number of threatened species resulting from climate change are found in Ecuador, south of Colombia and north of Peru (Figure 6).

Figure 6. Area where most threatened species occur under climate change Scenario A2, based on their current distribution.

Box 2). The species conservation assessments and identification of threats in this Red List report should help to focus conservation planning and mitigate biodiversity loss. It is important to reinforce the role of existing protected areas, promote the creation of new protected areas, and promote forest restoration and sustainable forest management more widely (Tejedor Garavito et al. 2012). Furthermore, this Red List report can be used to assist land management policies aimed at the conservation of biodiversity in productive rural landscapes. Conservation of threatened tree species is a vital component in securing biodiversity and sustainable livelihoods in the Andes.

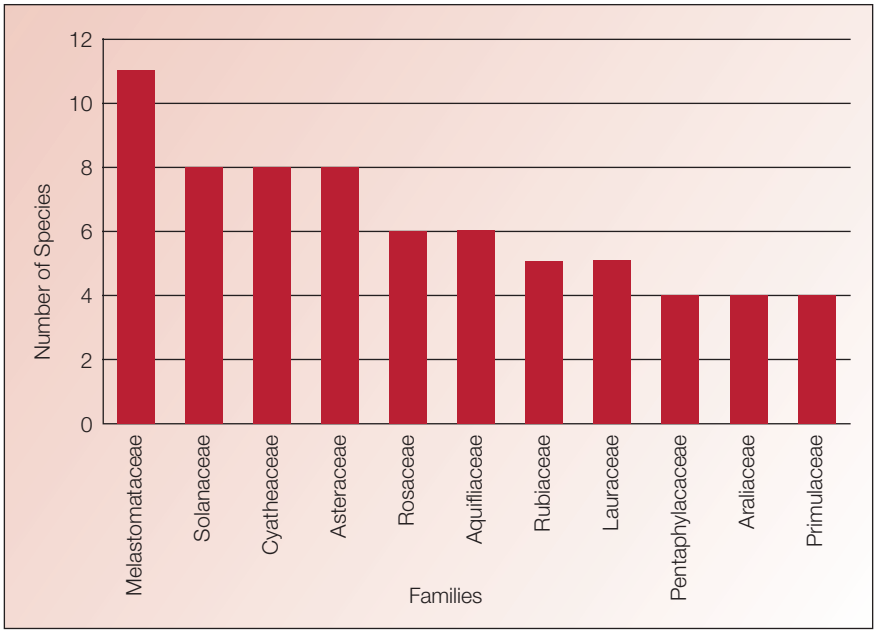


Figure 5. The ten families with the largest number of species included in the assessment.

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GLOBALLY THREATENED AND NEAR THREATENED SPECIES

Distribution maps are provided for all the threatened species based on the regional map shown in Figure 7, which shows the study area described in the introduction and protected areas (89).

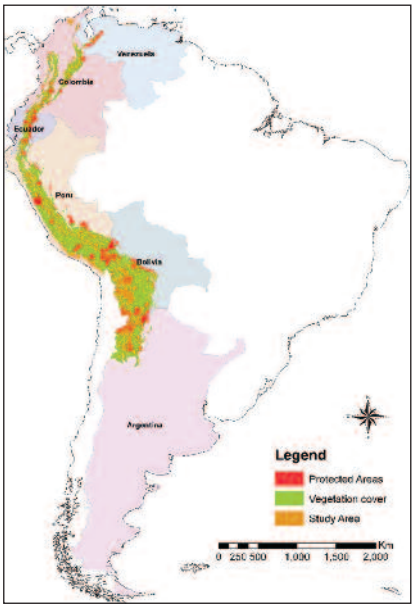
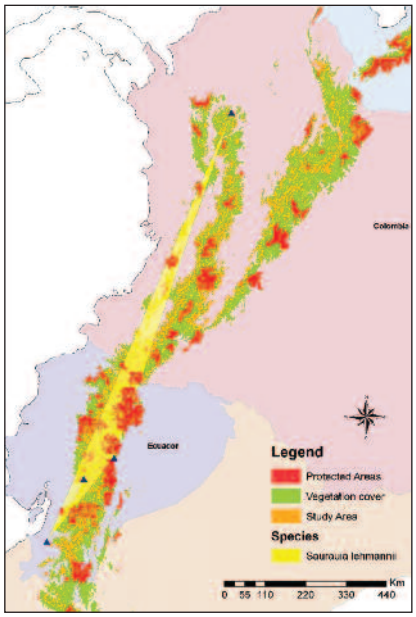


Figure 7. Study area showing forest and protected area coverage.

ACTINIDIACEAE

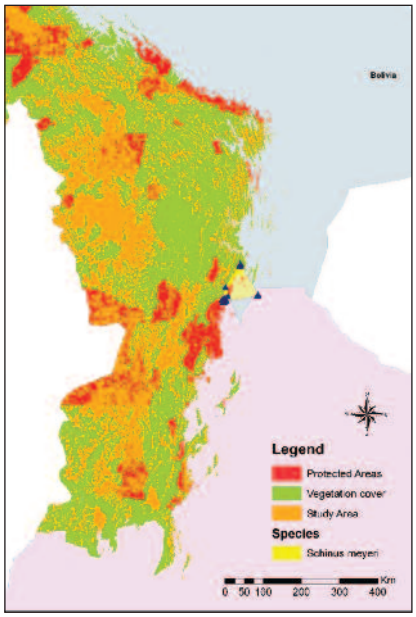
Saurauia lehmannii Hieron.
NT
Colombia, Ecuador



This species has a wide altitudinal range and there are 10 recorded localities in Colombia and Ecuador. The area of suitable habitat above 1500m is estimated to be 20,865 km^2. In Ecuador it is found in Azuay, Cotopaxi, Pichincha and the coastal province El Oro from 0 – 500 m so it is not restricted to the Andes. The species is affected by habitat loss due to conversion of forests to grasslands and suffered declines from the construction of the Guayaquil – Cuenca road in the early 1990s. The wood is also used for 'tumbados' (rooftops). A Near Threatened category is given due to its restricted range and is threatened by increased habitat destruction.
Elevation: up to 3,000 m
Assessors: OV, EA, RLC
References: 1, 2, 3, 23, 71

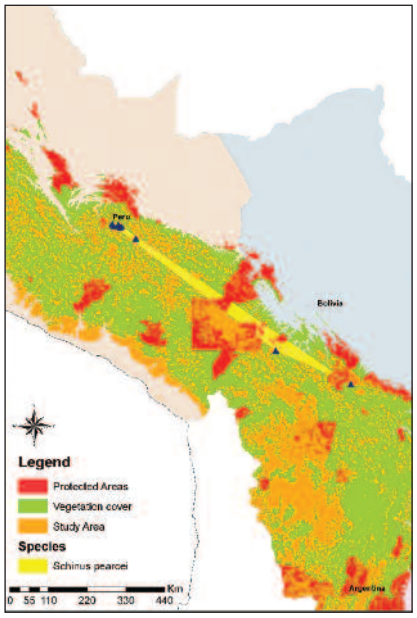
ANACARDICEAE

Schinus meyeri F.A.Barkley
VU B2ab(iii)
Argentina, Bolivia



A small tree, up to 6 m tall, found in semi-deciduous forest vegetation with *Polylepis* and *Podocarpus* spp. The habitat quality is declining and this species is exploited for timber. At least 19% of habitat is now unsuitable or fragmented. In Argentina, it is an understory tree in montane wet temperate "*aliso-podocarpus*" forest 1600-1800 m in Salta, where it is not thought to be used for timber. It is also found in Los Toldos Valley in NW Argentina. It has a very limited distribution over an area of 1,200 km^2.
Elevation: 1,600 – 2,100 m
Assessors: LM, CB, SP, MM, AAM, AF
Reference: 4

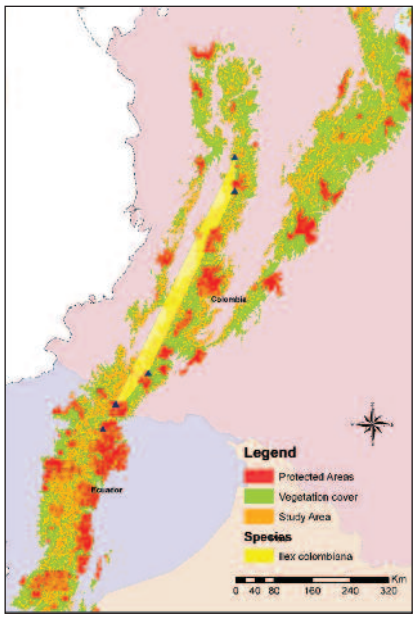
Schinus pearcei Engl.
EN B2ab(iii)
Bolivia, Peru



A tree 5-12 m tall only known to remain in fragmented dry forest vegetation. Only two records are known from Bolivia. In Peru, it grows in Apurimac, Cusco and Puno but individuals are scarce. The estimated area of forest is 14,329 km^2 of which 12% is unsuitable habitat due to illegal mining and collection of the wood for carpentry and fuelwood. The population/habitat is inferred to have declined by 30% according to deforestation rates. The species is considered Endangered based on its AOO which is estimated at 40 km^2, using a 4km^2 cell size.
Elevation: 2,500 - 3,300 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 2, 26, 10

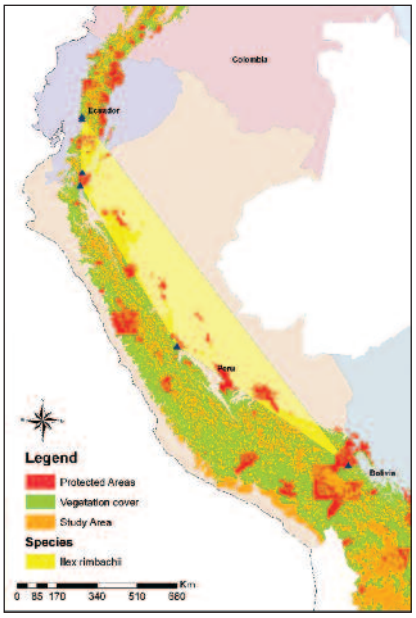
AQUIFOLIACEAE

Ilex colombiana Cuatrec.
EN B2ab(iii,v)
Colombia, Ecuador



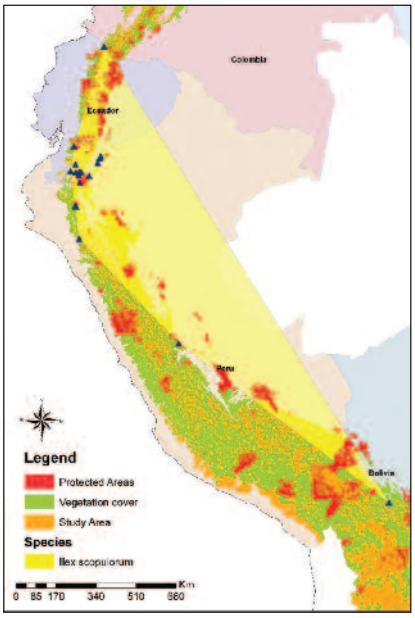
An evergreen shrub known from four collections in Colombia in Cauca (Belalcazar) and the páramo region of Santo Domingo up to 3,600 m in Mojarro. It is rare in Ecuador and only found in one locality in Carchi. The wood is used for timber to build furniture. Its habitat is fragmented and approximately 40% has been lost due to deforestation. The estimated suitable area is 6,800 km^2. The AOO is estimated at 24 km^2, using a 4km^2 cell size.
Elevation: 3,300 - 3,600 m
Assessors: OV, EA, RLC
References: 1, 5, 17

Ilex rimbachii Standl.
NT
Ecuador, Peru



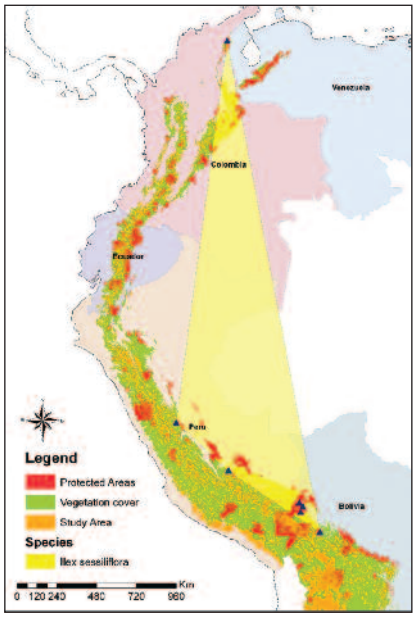
A tree growing in wet montane forests. In Ecuador it occurs in Tungurahua, Zamora and Bolivar and in Peru in Cajamarca and Pasco. The species is known from only seven records and at least three are in areas deforested for agriculture. It is rare in Ecuador with few individuals, although it is present in Podocarpus National Park. In Peru, although the records suggest a wider distribution its distribution is disjunct. The population is estimated to be in decline as it is found in deforested areas. The wood is used for tools and furniture. The EOO is 340,000 km^2 with an estimated 55,245 km^2 of suitable habitat. The Near Threatened category is assigned to this species as much of its suitable habitat is being lost due to deforestation.
Elevation: 2,000 - 3,000m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Ilex scopulorum Kunth.
NT
Ecuador, Peru



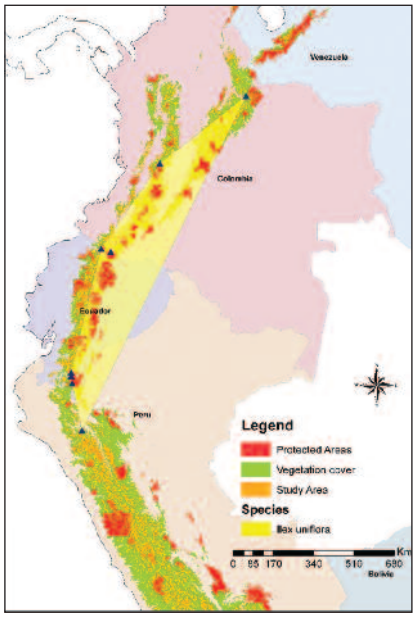
A shrub or tree known from fragmented forests highly susceptible to deforestation. The subpopulations are small and there are only few records for this species throughout its range. In Ecuador this species occurs in Azuay, Loja, Zamora, and Morona. The forests in Zamora and Morona are fragmented and have been transformed for intensive artisanal mining and road construction. In northern Peru, it occupies western and eastern slopes. It is also found in Cajamarca and with scattered populations known from Pasco. As with some other *Ilex* species it has been overexploited for timber. The EOO is 746,705 km^2 with an estimated 116,768 km^2 of suitable habitat. The Near Threatened category is assigned to this species as much of its habitat is being lost due to deforestation.
Elevation: 2,000 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Ilex sessiliflora Triana & Planch.
NT
Bolivia, Colombia, Peru



There are many records in Peru from Puno, San Martin, Pasco and Huánuco. At the edge of its range in Bolivia, it is more restricted with four locations in the fragmented forests of upper montane forest. It has been reported to be abundant in Colombia north of Santander and also in Tolima. There is only one record in Cesar in the Serrania del Perijá in the border with Venezuela. There are no known uses of wood. It is widely distributed and the area of suitable habitat remaining is 71,607 km^2 which is declining due to agricultural pressure. The Near Threatened category is given as there is some decline in habitat quality and extent.
Elevation: up to 4,000 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, JG, NG, EA, RLC, TEBE
References: 6, 28, 38

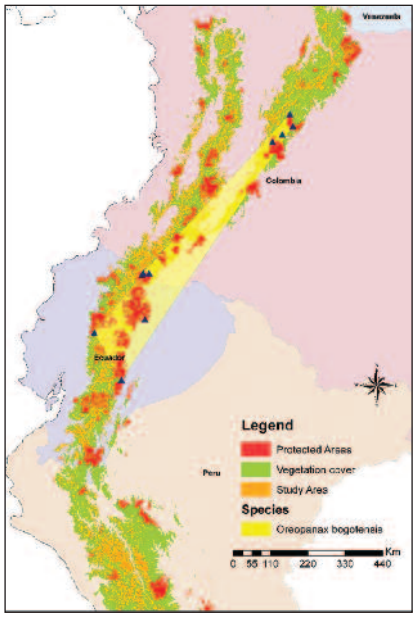
Ilex uniflora Benth.
EN B2ab(iii)
Colombia, Ecuador, Peru



In Peru, it occurs in few localities in Oxapampa and is not abundant and the habitat is subject to alteration and land use change. In Colombia, it has been recorded in Boyacá at 2,790 m, Valle del Cauca, Tulua and Quindío. There is also a report of 41 individuals per ha in Pasto. Subpopulations in Ecuador occur in highly fragmented landscapes. The species is used for timber and it is likely that deforestation rates have reduced the population by at least 30%. It does, however, occur in some protected areas. The area of suitable habitat is 74,322 km^2. The species is considered Endangered based on its AOO which is around 32 km^2.
Elevation: 2,790 – 3,500 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE
References: 1, 8, 29

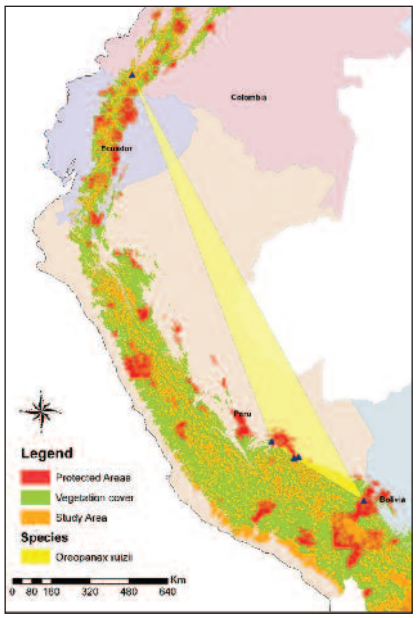
ARALIACEAE

Oreopanax bogotensis Cuatrec.
VU B2ab(iii,v)
Colombia, Ecuador, Venezuela



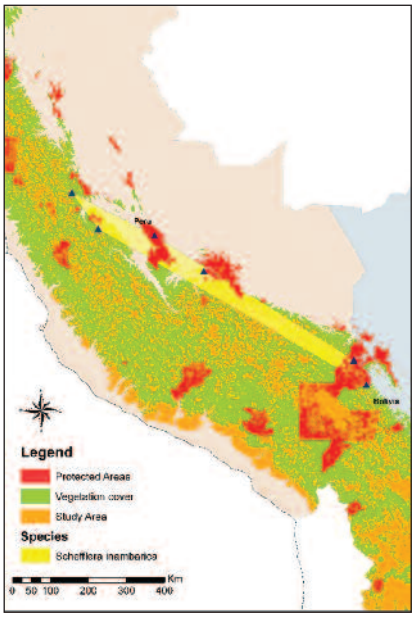
In Colombia this tree occurs in Cundinamarca, Meta and Cauca. In Ecuador it occurs in Carchi Imbabura and Cotopaxi but in Venezuela it is scarce. It occurs in areas of high deforestation. At least 27% of its range is unsuitable habitat. The wood is used for handicrafts and woodwork. Urbanisation and agriculture have caused the population to become fragmented. The area of suitable habitat remaining is 31,190 km^2. The species is considered Vulnerable based on its AOO which measures 1,000 km^2 using a 100 km^2 grid cell size (as agreed by the assessors). There were no georeferenced data for Venezuela, therefore range estimates are preliminary.
Elevation: 2,400 –3,500 m
Assessors: OV, EA, RLC, JG, NG
References: 1, 8

Oreopanax ruizii Decne. & Planch. ex Harms
EN B2ab(iii,v)
Bolivia, Colombia, Peru



A shrub or tree up to 5 m in height with very few known localities. In Peru, it occurs in highly fragmented landscapes, in or around two protected areas, Rio Abiseo and Manu National Parks. In Colombia, it occupies corridors between protected areas, e.g. Pitalito biological corridor between Purace and Cueva de los Guacharos. From Nariño to Antioquia it occurs in areas with fragmentation. This species does not regenerate easily and therefore has a slow recovery. There is some uncertainty as to whether it is under-recorded or actually rare. In Bolivia, it was recorded in Apolobamba, in forest relicts. The EOO is estimated at 234,173 km^2 with an area of suitable habitat of 13,248 km^2. The species is considered Endangered based on its AOO which measures 24 km^2.
Elevation: 3,000 – 4,000 m
Assessors: EA, RLC, HB, SB, MATC, CR, TEBE
References: 10, 41

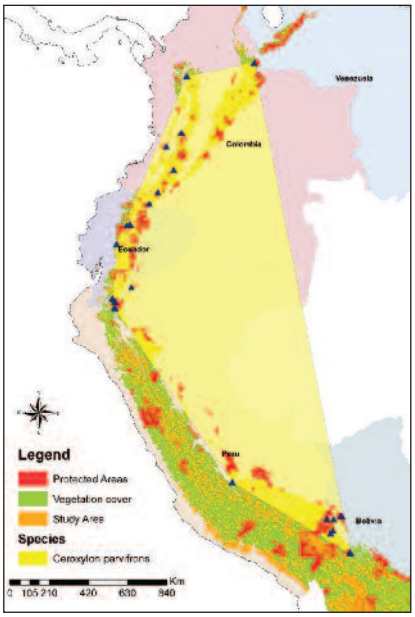
Schefflera inambarica Harms
VU A2c+3c; B2ab(ii,iii)
Bolivia, Peru



A shrub or tree up to 10 m tall, found in fragmented forests. It was originally recorded from southern Peru, at sites which are now highly modified by human activities. Its distribution extends from central (Pasco) and southern (Cuzco and Puno) Peru to northern Bolivia (La Paz). Threats to this species are habitat change due to fires, proximity to populated areas, and exploitation for its use as incense. The suitable habitat remaining is estimated to 21,272 km^2. This is however based on old records. It is inferred that the habitat/population has been reduced by 30% and will continue to do so at the same rate. The species is considered Vulnerable based on its AOO which measures <2,000 km^2 using a 100 km^2 grid cell size (as agreed by the assessors).
Elevation: 1,200 – 2,500 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 10, 15, 90

ARECACEAE

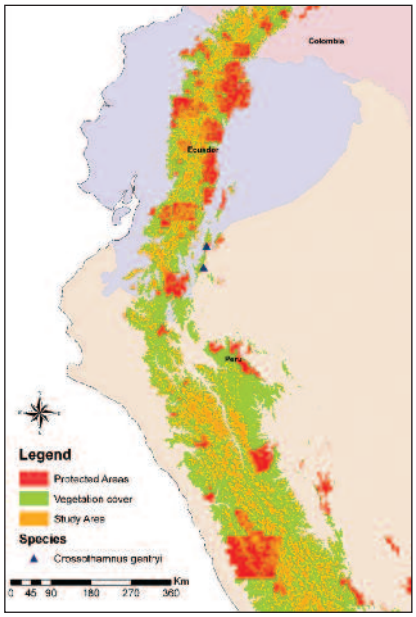
Ceroxylon parvifrons (Engel) H.Wendl.
EN B2ab(iii,iv,v)
Bolivia, Colombia, Ecuador, Peru, Venezuela



This solitary palm species is widely distributed in Colombia occurring in the Cordillera Occidental in Cauca and Valle de Cauca, Cordillera Central and Colombian Massif from Antioquia to Putumayo and in the Eastern Andes from Norte de Santander to Cundinamarca. In Ecuador it occurs in the provinces of Pichincha, Sucumbíos, Bolivar, Loja and Zamora. It occurs in restricted patches of forest fragmented between pastures. Its leaves are heavily exploited for religious uses and populations have slow regeneration. It is a food species for toucans. It is widespread with an area of remaining habitat of 196,690 km^2. The species is considered Endangered based on its AOO which measures 128 km^2 using a 4 km^2 grid cell size (as agreed by the assessors).
Elevation: 2,000 – 3,500m
Assessors: MM, AAM, AF, OV, EA, RLC, HB, SB, MJG, NG, TEBE
References: 1, 17, 30, 31, 38, 71

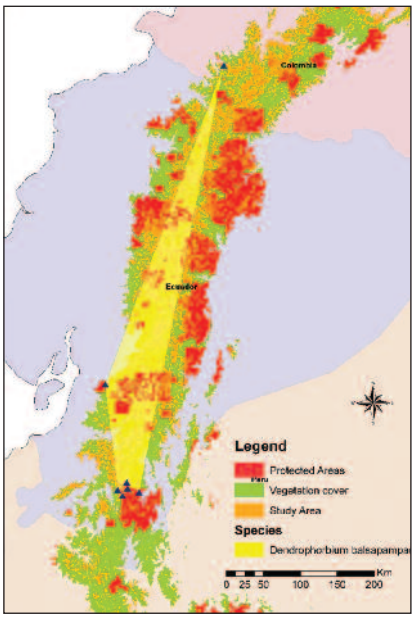
ASTERACEAE

Crossothamnus gentryi R.M.King & H.Rob.
VU B1ab(iii)
Ecuador, Peru



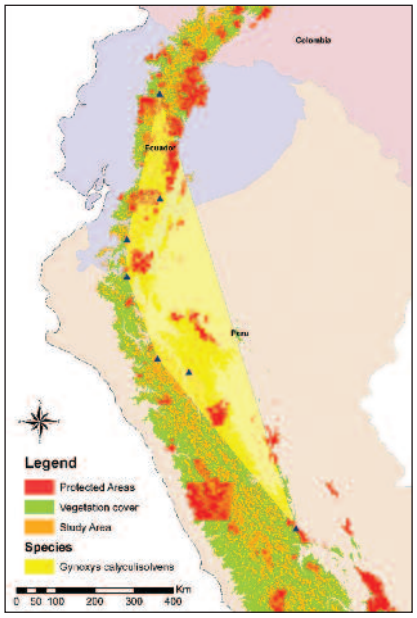
This species was previously thought to be endemic to Ecuador but has also been found in Peru, at Cordillera del Cóndor, where it occurs as a shrub and may have been under-recorded as is the case with other species of the genus. There are three records which occur in fragmented landscapes. It has been reported to be found in Peru in Amazonas and Piura. In Peru it is possible that this species occurs in protected areas but further information is needed to confirm this. The species is considered to be Vulnerable due to an EOO of <10,000 km^2 (estimated by the assessors due to low number of records) and continuous pressure from deforestation.
Elevation: 2,000 – 2,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 32

Dendrophorbium balsapampae
(Cuatrec.) B.Nord.
EN B2ab(iii)
Colombia, Ecuador



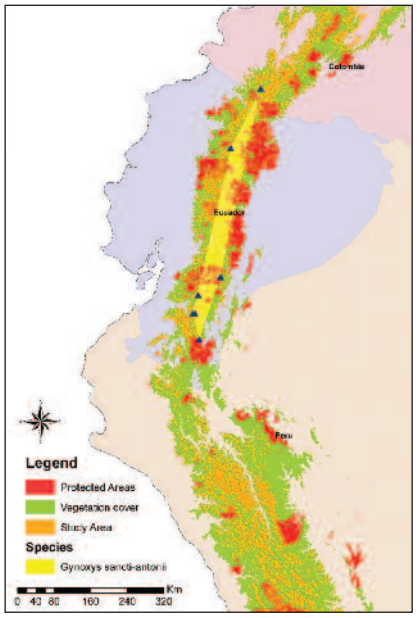
Previously considered endemic to Ecuador, this species of tree or shrub occurs in three locations in Ecuador and one in Colombia. In Ecuador the species occur in remnants of natural vegetation, in the north near Balzapamba and near Loja. In Colombia this species occurs in fragmented habitats that have been converted into cropland. It does also occur in or near la Planada nature reserve. Its wood is used for roofing. Previously recorded as Vulnerable, it is most certain to have suffered further declines through deforestation and only half of the calculated EOO of 25,020 km^2 may be suitable habitat. The species is considered Endangered based on its AOO of 28 km^2.
Elevation: 2,500 – 3,000 m
Assessors: OV, EA, RLC
References: 1, 33

Gynoxys calyculisolvens Hieron.
VU A2cd+3cd; B2ab(iii,iv,v)
Ecuador, Peru



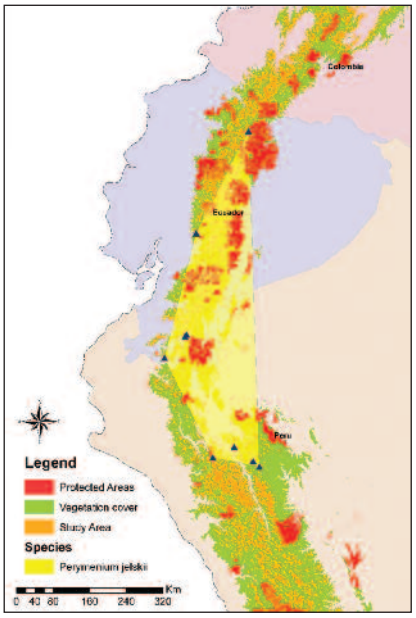
A shrub or small tree species growing to 3-7 m tall in high montane dwarf forest. The wood is utilised and the population is in decline; although it is more common as a shrub. There are three old records in transformed forests that perhaps are not present today, one of which lies in a protected area. In Ecuador this species occurs in Loja and Morona. It is more abundant in Peru, although populations in the western slopes might be threatened by habitat transformation. The area of suitable habitat remaining is 53,386 km^2. The species is listed as Vulnerable based on an AOO of 700 km^2 using 100km^2 cell size (as considered appropriate by the assessors)
Elevation: 1,600– 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 8, 26, 34, 90

Gynoxys sancti-antonii Cuatrec.
NT
Colombia, Ecuador



In Colombia, this species is restricted to the south of the country in the Colombian Massif with 16 records from the same region. Here it occurs within highly fragmented forests. The species is more abundant in Ecuador in a range of more than 10 locations in Pichincha, Pululahua, Azuay, Cajas and Loja and occurring in some protected areas. The EOO is estimated at 18,080 km^2 and area of available habitat is around 8,457 km^2 The AOO is estimated at 32 km^2 using a 4 km^2 cell size. The Near Threatened category is given as despite restricted range the overall population is considered stable with some populations in protected areas.
Elevation: 2,500 – 3,500 m
Assessors: OV, EA, RLC
References: 1, 38

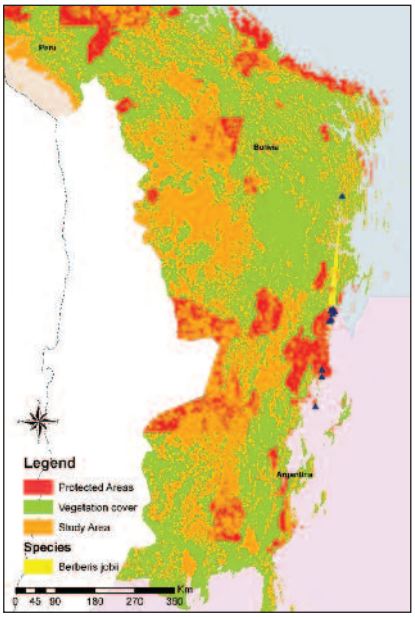
Perymenium jelskii (Hieron.) S.F.Blake
VU B2ab(iii)
Ecuador, Peru



A small tree or tall shrub growing to 6 m tall in areas of highly fragmented forests that continue to be under pressure from deforestation. In Ecuador it occurs in Bolivar, Cañar, Loja, Chimborazo, and Pichincha. In Peru it is found in Amazonas, Cajamarca and Piura. The EOO based on these records is estimated at 94,746 km^2. At least 15% of its EOO is in unsuitable vegetation and is in areas of high fragmentation. As a shrub it is likely to have been under-recorded. Assessors considered that an AOO of 800 km^2 with a scale of 100km^2 grid cell size was appropriate for this species, resulting in a Vulnerable rating.
Elevation: 1,000 – 2,650 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 8, 35

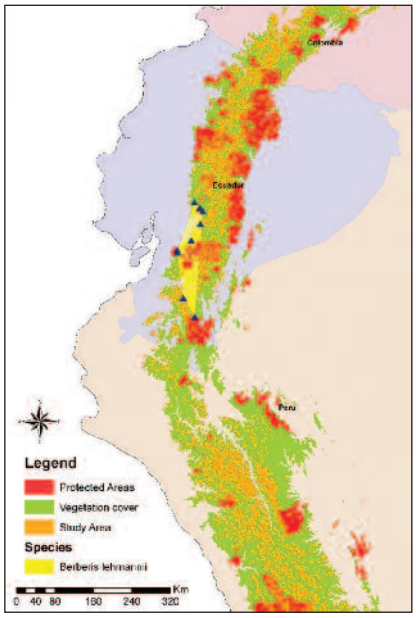
BERBERIDACEAE

Berberis jobii Orsi
NT
Argentina, Bolivia



A rare species with restricted distribution, the EOO is estimated at 2,808 km^2, there is no current decline of its population or habitat. More than 10 locations of this understory tree are known in Argentina (Salta and Jujuy) and Bolivia. The AOO is 52 km^2. A Near Threatened category is given as despite restricted range the species population is considered stable.
Elevation: 1,600 – 2,200 m
Assessors: LM, CB, SP, MM, AAM, AF
Reference: 36

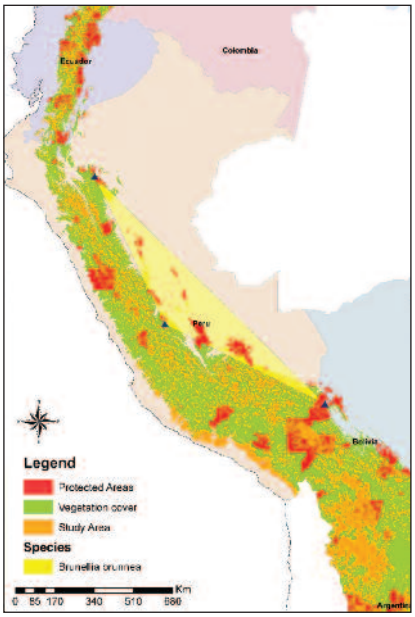
Berberis lehmannii Hieron.
VU A2c+3c; B1ab(iii)+2ab(iii)
Ecuador, Peru



A small tree or shrub occurring in fragmented landscapes that have been converted for agriculture. It is used for fencing and beekeeping. The bark and leaves are boiled to treat yellow fever. In northern Peru it occupies both Andean slopes; however it is thought to be under-recorded. The species is listed as Vulnerable based on an AOO of 800 km^2 using 100km^2 cell size (as considered appropriate by the assessors). There were no georeferenced data for Peru, so range estimates are preliminary.
Elevation: 1,500 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 2, 90

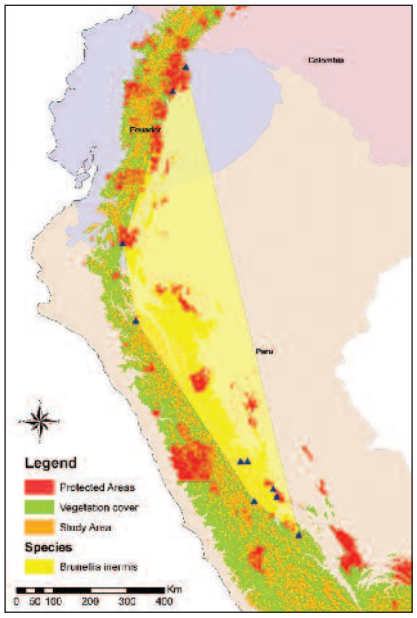
BRUNELLIACEAE

Brunellia brunnea J.F.Macbr.
EN B2ab(iii)
Bolivia, Peru



A rare species restricted to a few locations. In Peru (San Martin and Cusco) it occurs in forests subject to deforestation and fragmentation; it also occurs on the western boundary of Manu National Park. The wood is used locally for construction. In Bolivia it is found on montane forest ridges. The area of suitable habitat remaining is 27,516 km^2. AOO is estimated (as there are only three unique records) to be less than 50 km^2. (In the national Red Lists, *Brunellia brunnea* was not evaluated in Peru (73), due to lack of records. It is considered NT in Bolivia, as it is found in areas of no deforestation, but lacks records for its evaluation.)
Elevation: 2,000 – 2,500 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 8, 34, 73

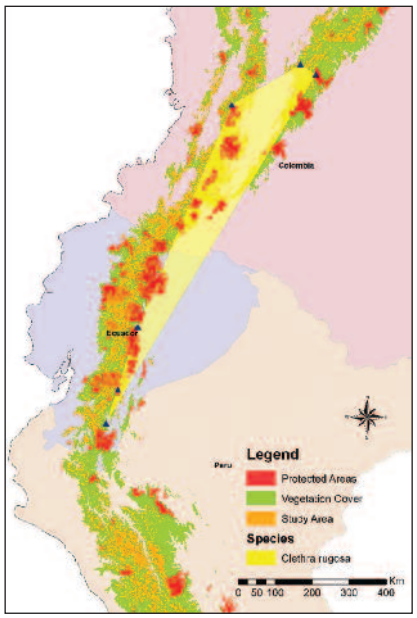
Brunellia inermis Ruiz & Pav.
EN B2ab(iii)
Ecuador, Peru



A tree growing up to 25 m tall. Records occur from areas of montane forest together with some old records from remnant forests and in areas that are now converted to cropland. Ecuador has few records in Loja and Zamora provinces with one in Napo in total with an estimated 250 individuals. In Peru this species is known from 5 locations, including populations in Yanachaga-Chemillen National Park. The area of suitable habitat remaining is 57,240 km^2. It is a species with wide distribution, but population decline is inferred as its habitat is affected by deforestation and degradation. The species is considered Endangered based on an AOO of 40 km^2.
Elevation: 1,050 – 3,500m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 2

CLETHRACEAE

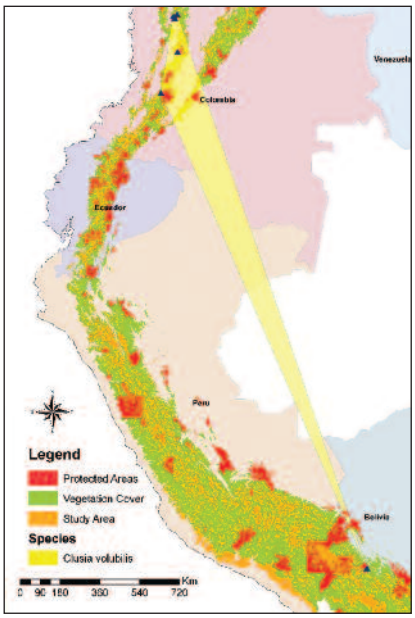
Clethra rugosa Steyerm.
VU A2cd+3cd; B2ab(iii)
Colombia, Ecuador



A tree found in primary forests, secondary forests and shrublands. In Colombia it occurs in Antioquia, Gacheta and Guatavita. In Ecuador it has been recorded in Azuay, Bolivar, Morona-Santiago, Tungurahua and Zamora. Although this species is widespread it is used for timber, and is threatened by deforestation and habitat degradation. The area of remaining forest is 28,887 km^2. The AOO was estimated to 600 km^2 using the 100 km^2 grid cell size appropriate for the species, to give species a conservation rating as Vulnerable.
Elevation: 2,500 – 3,500 m
Assessors: OV, EA, RLC
References: 1, 35, 37, 38, 90

CLUSIACEAE

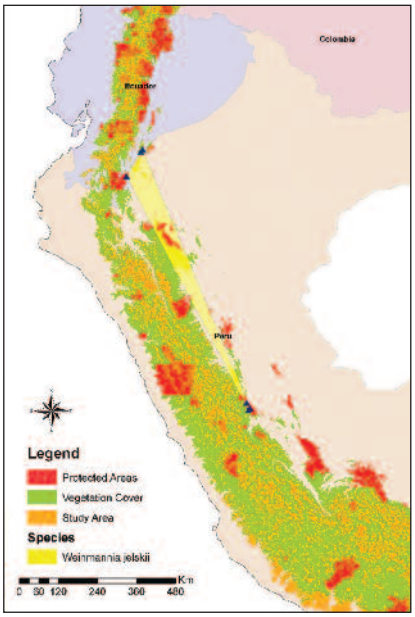
Clusia volubilis Kunth
EN B2ab(iii)
(Bolivia,) Colombia



A tree or shrub with a disjunct distribution. It occupies the three mountain ranges in Colombia in highly fragmented areas. In Bolivia, the specimens are sterile and are believed to be misidentified. The area of remaining forest is 20,000 km^2, but could be smaller if the specimens in Bolivia do not belong to this species. The species is considered Endangered based on an AOO of 24 km^2.
Elevation: 2,300 – 3,100 m
Assessors: MM, AAM, AF, EA, RLC
References: 38, 71

CUNONIACEAE

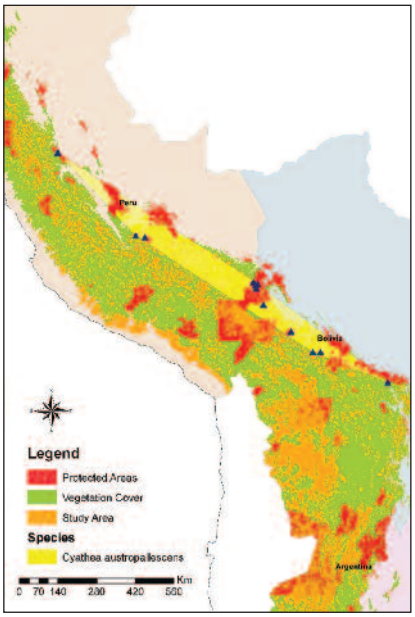
Weinmannia jelskii Szyszył.
EN B2ab(iii,v)
Ecuador, Peru, Venezuela



A tree growing to 6 m in height that occurs in high montane forest, which are now highly fragmented. This species was once considered endemic to Peru known from Cajamarca and Pasco (Yanachaga-Chemillen National Park). However, it also exists in Ecuador (Loja, Morona and Zamora) and Venezuela (with no georeferenced data points). Its population is restricted and its wood is sought after. The area of remaining forest is 8,425 km^2. The species is considered Endangered based on an AOO of 24 km^2. Range estimates may be underestimated as no georeferenced data was available for Venezuela.
Elevation: 2,100 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, JG, NG, TEBE
References: 10, 39

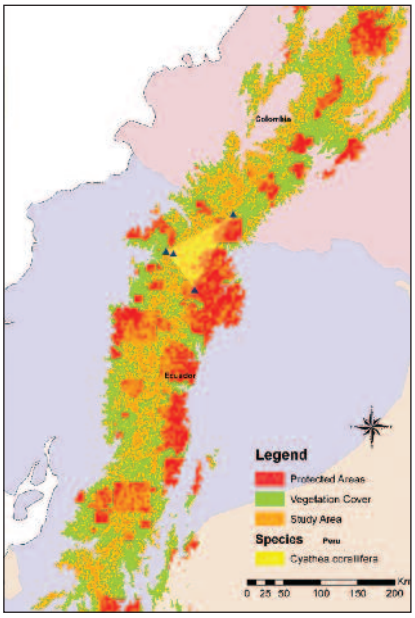
CYATHEACEAE

Cyathea austropallescens Lehnert
VU B2ab(iii)
Bolivia, Peru



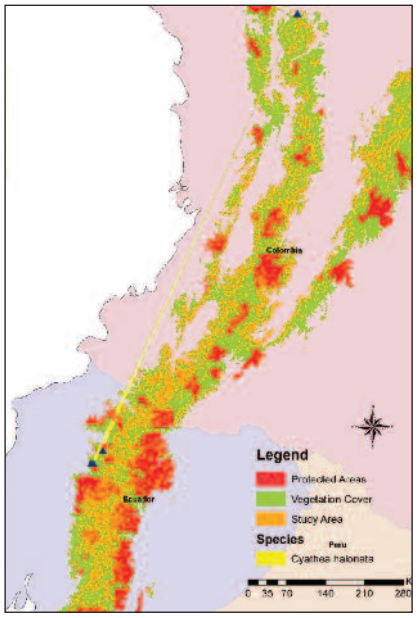
This tree fern originally know from Bolivia occurs in Peru in wet montane forest. In Peru it is a locally dominant species, in Manu and Yanachaga Chemillen National Parks, and Machu Picchu National Sanctuary. However, its habitat is highly fragmented due to crop production in areas with dense human inhabitation. The plant could be potentially used for medicinal purposes and therefore at risk of potential overexploitation. The area of remaining forest is 56,875 km^2. The species is considered Vulnerable based on an AOO of 1,200 km^2 with a 100 km^2 cell size (as considered appropriate for this species).
Elevation: 2,500 – 3,890 m
Assessors: MM, AAM, AF, IJ, HB, SB, MATC, CR, TEBE, AT
Reference: 19

Cyathea corallifera Sodiro
NT
Colombia, Ecuador



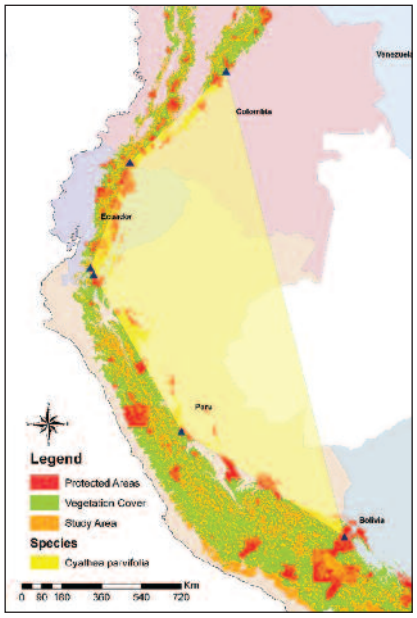
This tree fern was thought to be endemic to Ecuador but may also occur in Colombia from one record in the Flora of Cundinamarca 1966, illustrated in the catalogue of the plants of Cundinamarca. The review of Cyathea of Colombia in 2003 (91) does not recognize the species. It has been recorded in 2009 in the state of Antioquia (voucher Giraldo LF 2092), where it was found on well forested volcanic slopes which have limited accessibility. However, the trunk has been used as posts for fences and houses. The area of remaining forest is 1,807 km^2 suggesting it may be more threatened.
Elevation: 1,400 – 3,460 m
Assessors: OV, EA, RLC
References: 23, 43, 71, 91

Cyathea halonata R.C.Moran & B.Øllg.
EN B1ab(iii)
Colombia, Ecuador



A tree fern previously thought to be endemic to Ecuador. Records in Colombia suggest that populations are increasing in disturbed habitats showing an increase of 42 individuals to 58 from 1997 to 2002 on 20 ha. In 2009 it was recorded in the collection of wild flora of the jurisdiction of CORANTIOQUIA as vulnerable. Its wood is used for crafts. It is also found in pastures which have been otherwise deforested due to the hard trunk of Cyathea halonata. Therefore, individuals may persist in disturbed areas and are able to regenerate but the number of individuals remains very low. The area of remaining forest may not therefore be highly significant but is estimated at 950 km^2.
Elevation: 1,800 – 2,000 m
Assessors: OV, EA, RLC
References: 44, 45, 71

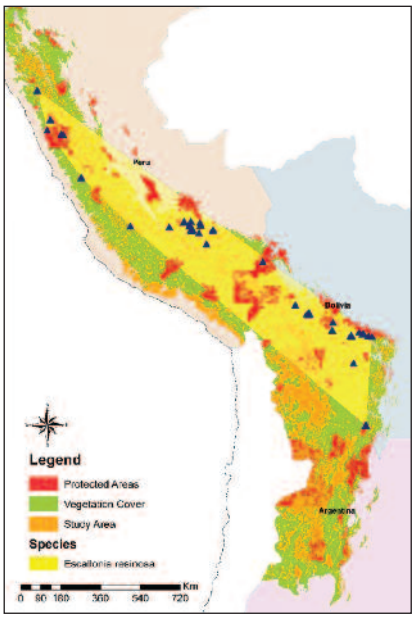
Cyathea parvifolia Sodiro
VU B2ab(iii)
Bolivia, Colombia, Ecuador, Peru



This species belongs to the *C. caracasana* complex, which is widely distributed and locally abundant, it could be at risk due to forest fragmentation. In Bolivia is believed to be a different species similar to *C. brevipites* which is a synonym. It is found in rare locations in Bolivia with few scattered individuals. The area of remaining forest is 63,269 km^2. The species is considered Vulnerable based on an AOO of 600 km^2 measured with a 100 km^2 cell size (the most appropriate cell size for this species according to the assessors).
Elevation: 2,500 – 3,500 m
Assessors: MM, AAM, AF, IJ, OV, HB, SB, MATC, CR, TEBE, EA, RLC
Reference: 19

ESCALLONIACEAE

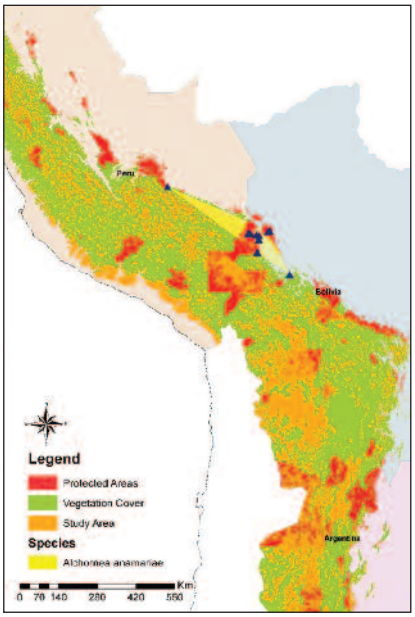
Escallonia resinosa (Ruiz & Pav.) Pers.
NT
Bolivia, Peru



A shrub or tree found in fragmented forests, sometimes with Polylepis. In deforested areas it is found to grow alone. It is widespread but due to its uses for firewood and inks it could be in danger in the near future with overexploitation and/or deforestation. The area of remaining forest is 286,889 km^2.
Elevation: 2,000 – 4,500 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 26, 46

EUPHORBIACEAE

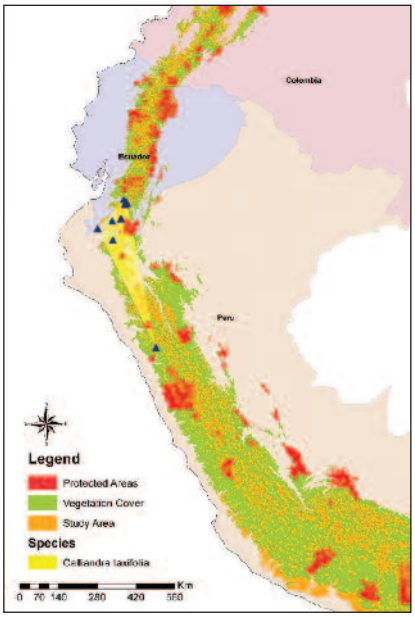
Alchornea anamariae Secco
NT
Bolivia, Peru



A small tree or liana, with the majority of its population in Bolivia with a new record in 2003 for Peru found in western Manu National Park. It occurs in protected areas of Madidi, Apolobamba and Cochabamba. Illegal logging and degradation could lead to future population reduction. The area of remaining forest is 13,859 km^2.
Elevation: 1,500 – 2,000 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 8, 15, 72

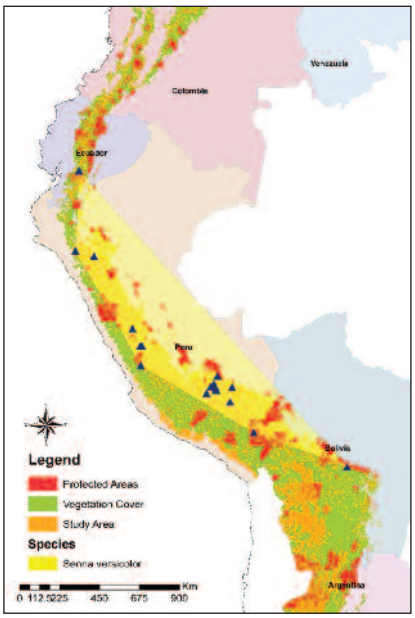
FABACEAE

Calliandra taxifolia (Kunth) Benth.
VU A2c+3c; B2ab(iii)
Ecuador, Peru



This tree grows in disturbed areas dominated by cropland and in humid and xeric shrublands. It has been found in densities of 126 individuals per ha in Ecuador. In Peru it occurs in Ancash, Cajamarca, La Libertad and Piura. The area of remaining forest is 17,751 km^2 but is likely to be under-recorded. The species is considered Vulnerable based on the AOO of 800 km^2 using a 100 km^2 cell size and decline in habitat quality and extent.
Elevation: (700 -) 1,500 – 3,200 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 47, 90

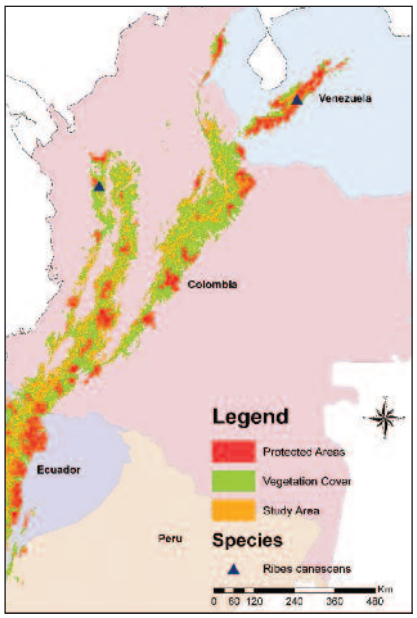
Senna versicolor (Meyen ex Vogel) H.S.Irwin & Barneby
NT
Bolivia, Ecuador, Peru



This species grows as a shrub or small tree up to 3 m in height in semi-arid highlands. In Ecuador it occurs in Pichincha, Napo, Cañar and probably Azuay. It grows around Lake Titicaca in Bolivia. It is used for timber. Its habitat is affected by human activities and the plantation of exotic species such as Eucalyptus. The species is sometimes mistaken for *Senna birostris*. The area of remaining forest is 204,256 km^2.
Elevation: 2,900 – 4,000 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
References: 6, 8

GROSSULARIACEAE

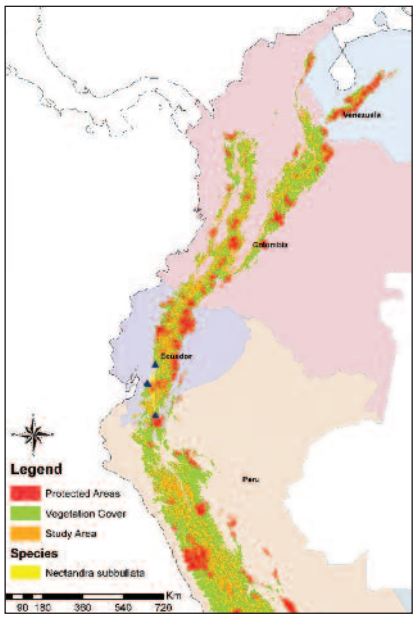
Ribes canescens Pittier
EN B2ab(iii)
Colombia, Venezuela



A shrub or small tree up to 5 m in open páramo and high montane forest with Polylepis. It has only been collected in four localities but may be under-collected. In Colombia the species is restricted to two localities with three specimens from Mérida and one from Antioquia. The population has distant subpopulations in fragmented forests and is under pressure from livestock grazing. In Venezuela it occurs in Santo Domingo in a protected area near Sierra Nevada National Park. AOO was estimated by assessors to <500 km^2.
Elevation: 3,200 – 4,300 m
Assessors: EA, RLC, JG, NG
References: 8, 38, 71

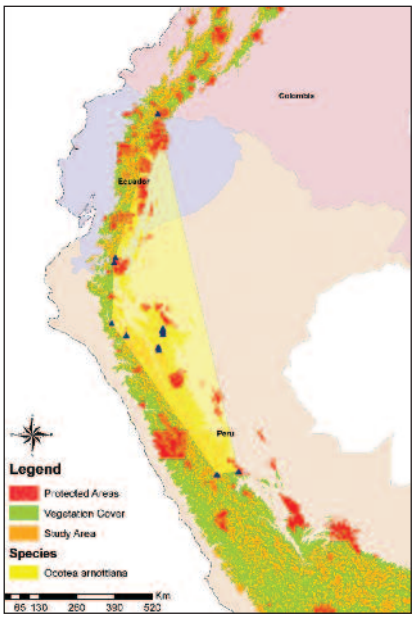
LAURACEAE

Nectandra subbullata Rohwer
EN B1ab(iii,v)+2ab(iii,v)
Ecuador, Venezuela



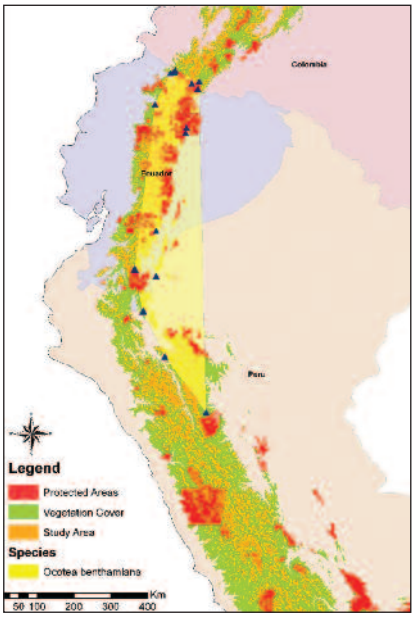
A timber species up to 15 m tall, originally thought to be endemic to Venezuela and recorded in the national Red Data Book as Endangered. This species has also been found in Ecuador, with three subpopulations or collections which are restricted in disturbed forests or remnants of pristine primary forests. Although it seems to be in protected areas in Venezuela it is a timber species and in areas with pressure from agriculture. In Guaramacal it was found in a protected area on a plot but has not been recorded again. The EOO is estimated at 4,645 km^2 and at least 13% of habitat within this area is considered unsuitable based on land use maps. The AOO is 28 km^2. The species is considered Endangered based on both EOO and AOO measures. There were no georeferenced data for Venezuela, so range estimates are preliminary.
Elevation: 1,500 –2,500 m
Assessors: OV, JG, NG
References: 1, 48, 69

Ocotea arnottiana (Nees) van der Werff
EN B2ab(iii,v)
Ecuador, Peru, Venezuela



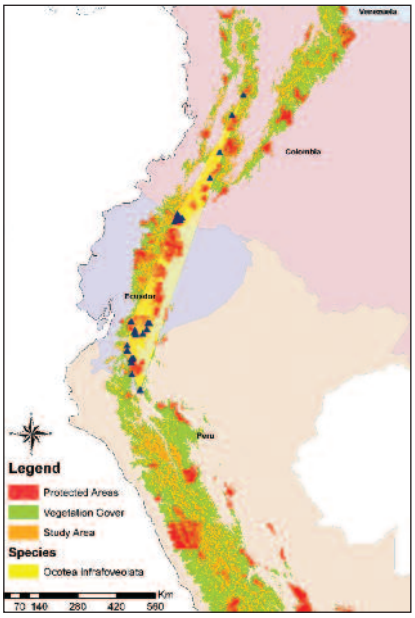
A tall shrub up to 15 m, previously considered endemic to Peru with records in Amazonas, Cajamarca and Pasco (Oxapampa). In the north there is pressure from gas exploration and mining but this has encouraged the protection of forests where present. In Ecuador this species occurs in Loja, Zamora and Imbabura with few records and individuals per hectare. The wood is occasionally sought. It is thought to be naturally rare but may be under-recorded. The area of remaining forest is 70,158 km^2. It is inferred that the habitat quality continues to decline. The species is considered Endangered based on the AOO of 56 km^2. There were no georeferenced data for Venezuela, so range estimates are preliminary.
Elevation: 2,000 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, JG, NG, TEBE
References: 8, 48, 69

Ocotea benthamiana Mez
EN B2ab(iii,v)
Ecuador, Peru



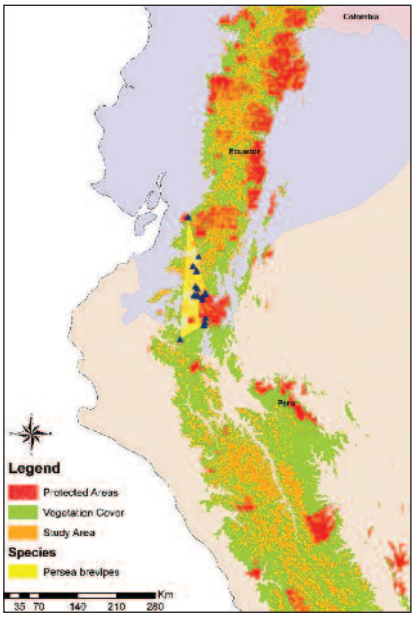
A tree growing in a variety of habitats including humid forests, montane forests, low elfin forest, páramo and ecotone scrub. In Ecuador it is known from Carchi, Napo, Pichincha, Zamora and Morona. In Peru is known from the north eastern Andean slopes, in Amazonas, Cajamarca, and San Martín (Rio Abiseo National Park) (87). This species is exploited for carpentry and charcoal production. There is illegal trade of the wood in Ecuador. The area of remaining forest is 42,929 km^2. The species is considered Endangered based on its AOO of 84 km^2.
Elevation: 1,400 – 3,100 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 8, 10, 49, 50, 87

Ocotea infrafoveolata van der Werff
EN A2cd+3cd; B2ab(iii)
Colombia, Ecuador, Peru



A tall canopy tree growing up to 35 m tall in montane wet forest. It is found in few locations and in areas of high deforestation. Its timber is highly sought after. In Ecuador it has been recorded from Carchi, Napo, Sucumbíos, Morona, Zamora, Loja, Azuay. Carchi and Azuay have the highest deforestation rates in Ecuador. In Colombia it is found in the Colombian massif and the Western Cordillera in northern Cauca. In Peru it has been found in Cajamarca. The area of remaining forest is 39,218 km^2. The species is considered Endangered based on the AOO of 152 km^2.
Elevation: 2,400 – 3,600 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE
References: 1, 38, 90

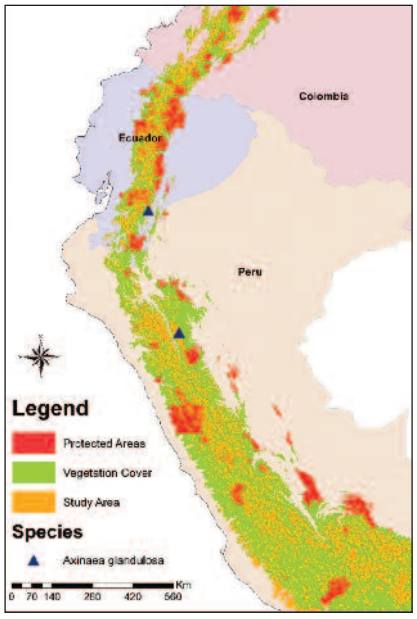
Persea brevipes Meisn.
EN B1ab(iii)+2ab(iii)
Ecuador, Peru



A shrub or small tree with a small distribution range in areas of high fragmentation and deforestation. In Ecuador it is known from Loja, Zamora and Azuay. It grows in the San Francisco reserve in Loja. In Peru it is recorded from only one location in western Piura. The area of remaining forest is 3,199 km^2. This measure of EOO and the measure of AOO (76 km^2) were used to classify the species as Endangered.
Elevation: 2,200 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 8, 10

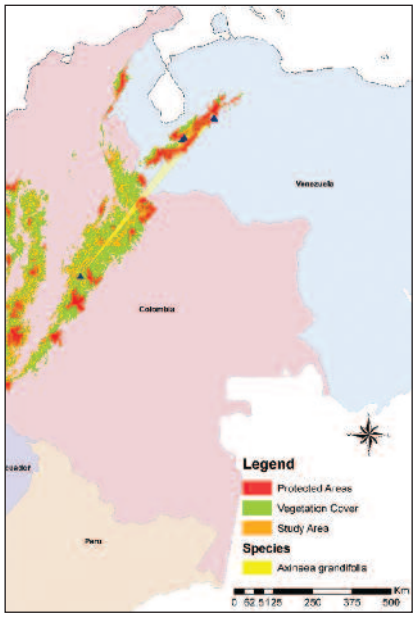
MELASTOMATACEAE

Axinaea glandulosa Ruiz & Pav. ex D.Don
EN B2ab(ii,iii)
Ecuador, Peru



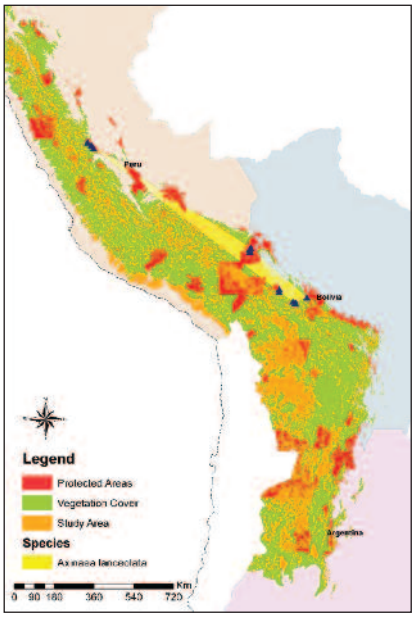
A tree between 4-16 m tall only found in few localities in areas of high deforestation and continuous pressure from livestock. In Ecuador there is only one record from 1990, in an area of high deforestation and degradation from mining in Morona Santiago. It was originally recorded from central Peru in the 18th century in Huánuco; however in 1977 and 1982 reports include sites in Peru located in an area in Machu Picchu National Sanctuary, and near Tingo Maria National Park; it is also reported in Amazonas. The AOO was estimated by the assessors (as there were too few records available) to be <500 km^2. It is known to occur in more than 4 locations. Previously reported in Bolivia, but this was a misidentification.
Elevation: 2,285 – 3,200 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
References: 8, 73, 79

Axinaea grandifolia (Naudin) Triana
VU A2c; B2ab(iii,iv)
Colombia, Peru, Venezuela



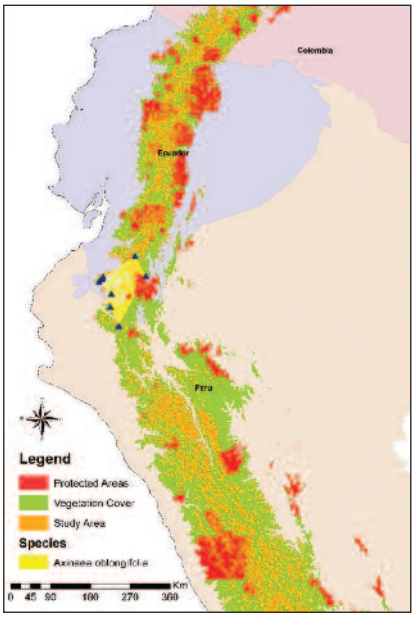
This small tree species was previously considered endemic to Venezuela where it is widely distributed but it is also found in Peru (Amazonas and Huánuco) and one subpopulation in Colombia (which may no longer exist because of the high deforestation rate 1985-2005 in the location where the records was collected in 1982in Bogota). The area of remaining forest is 5,120 km^2. The AOO is 500 km^2 using a 100 km^2 cell size. It was reported for Peru in old documents but not reported since 1936 (55) and 1993 (74). There were no georeferenced data for Peru, so range estimates (EOO and AOO) are preliminary and possibly an underestimate.
Elevation: 1,500 – 2,600 m
Assessors: EA, RLC, HB, SB, MATC, CR, JG, NG, TEBE
References: 8, 38, 53, 55, 74, 90

Axinaea lanceolata Ruiz & Pav.
EN B2ab(iii)
Bolivia, Peru



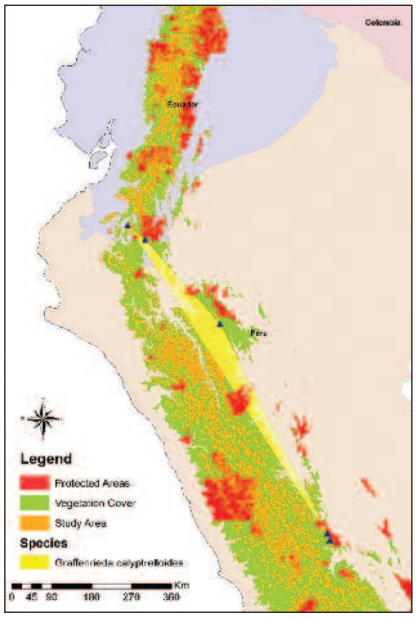
A rare cloud forest treelet or shrub with a restricted and highly fragmented distribution. In Bolivia (La Paz) it occurs in areas of deforestation at densities of 15 individuals per ha. For Peru, detail distribution and population data are lacking, but there are only a few records found all in heavily deforested areas. The population is declining due to habitat degradation. The area of remaining forest is 33,565 km^2. The AOO is 72 km^2.
Elevation: 2,300 – 2,700m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
Reference: 54

Axinaea oblongifolia (Cogn.) Wurdack
EN B2ab(ii,iii)
Ecuador, Peru



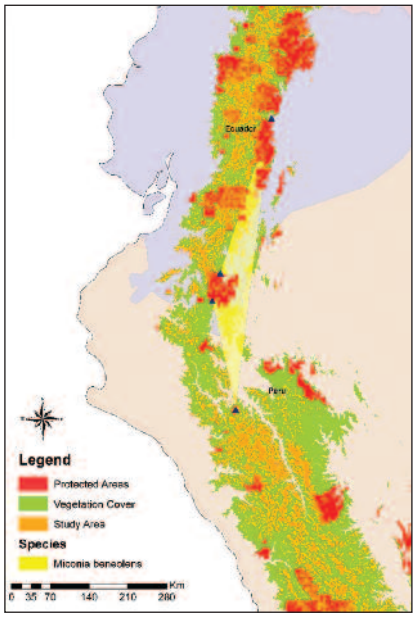
This species of small tree or shrub is affected by high levels of forest fragmentation and deforestation throughout its range, especially due to road construction. It is not known to occur in protected areas. It has a narrow distribution with few records in areas of transition between forest and páramo. In Ecuador the populations are limited to Zamora and Loja. In Peru it is known from Cajamarca and Piura. It has not been recorded in the last 10 years. The area of remaining forest is 4,271 km^2. The AOO is around 36 km^2 qualifying the species as Endangered.
Elevation: 1,000 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Graffenrieda calyptrelloides Wurdack
EN B2ab(iii,iv)
Ecuador, Peru



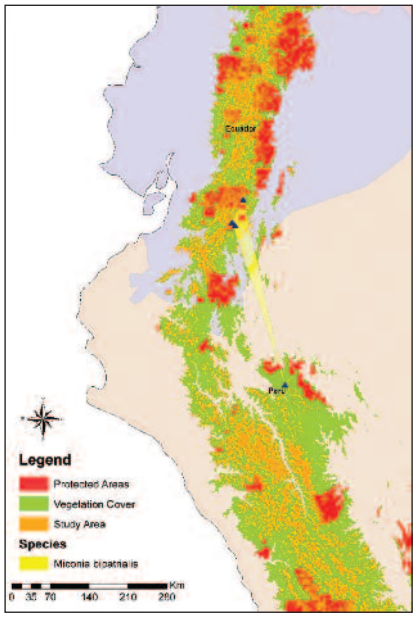
This tree is rare in Peru, and is known from only two collections from Ecuador in Loja and Zamora. It is sought after for its wood; and its habitat has become fragmented and degraded by mining and deforestation. The area of remaining forest is 12,161 km^2 in less than 5 locations. The AOO is 20 km^2 qualifying the species as Endangered.
Elevation: 2,195 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Miconia beneolens Wurdack
EN B2ab(iii)
Ecuador, Peru



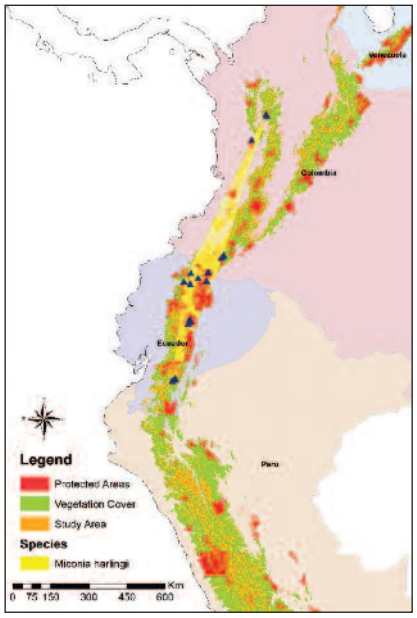
A cloud forest tree which has only been recorded in two locations in Ecuador, known mainly from Loja and one record in Peru located in Cutervo (Cajamarca). The habitat occurs in areas of high deforestation which have become fragmented and degraded by conversion for agriculture. The area of remaining forest is 8,403 km^2. The AOO is 16 km^2.
Elevation: 1,500 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 23, 80

Miconia bipatrialis Wurdack
VU B1ab(iii)+2ab(iii)
Ecuador, Peru



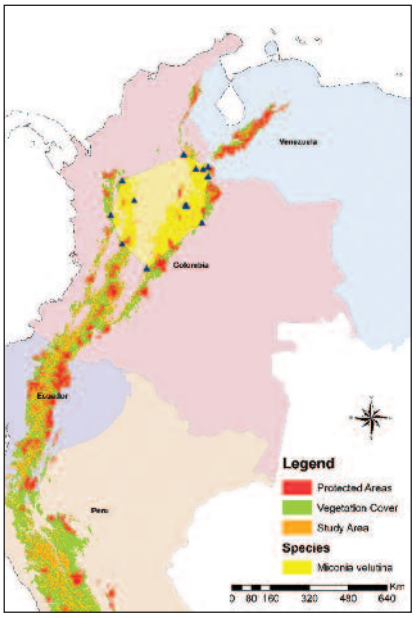
A shrub, treelet or tree thought to be rare and endemic to Ecuador only known from Azuay. The cloud forest habitat is highly fragmented by deforestation. This species was evaluated in Ecuador as Vulnerable and because there is data deficiency to make an evaluation in Peru, the classification from Ecuador was used. The area of remaining forest is 1,303 km^2. The AOO is around 24 km^2.
Elevation: 2,000 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 23, 55, 80

Miconia harlingii Wurdack
VU B2ab(iii)
Colombia, Ecuador



A shrub or tree found in high altitude vegetation and páramo. In Ecuador it is found in Imbabura, Azuay, Carchi, Sucumbíos and Morona. It has also been found in Colombia, in Nariño at densities of 266 individuals per ha. Given its wide distribution it is likely to occur in some protected areas such as the Podocarpus National Park (Ecuador). It is estimated that at least 30 % of its habitat has declined and is fragmented. In Colombia this species is in severely fragmented areas, for example along the road from Pasto in direction of the Amazons. The area of remaining forest is 29,048 km^2. The AOO is 1,900 km^2 using a 100 km^2 cell size, qualifying the species as Vulnerable.
Elevation: 2,500 – 4,000 m
Assessors: OV, EA, RLC
References: 1, 38, 80

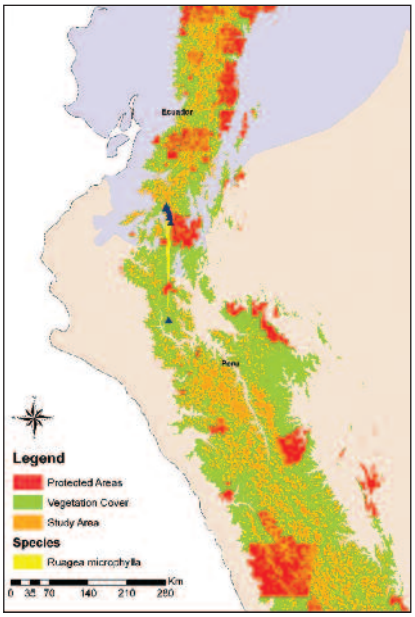
Miconia velutina Triana
EN B2ab(i,ii,iii)
Colombia, Venezuela



A small tree growing to 3-4m, thought to be rare and only known from few collections. It is estimated that least 20% of its area of distribution has been subject to high rates of deforestation. Records in Colombia are from the Central Cordillera, Sierra Nevada de Santa Marta, Antioquia and Yarumal. The area of remaining forest is 42,585 km^2. The AOO is 56 km^2.
Elevation: 1,800 – 3,000 m
Assessors: EA, RLC, JG, NG
References: 8, 38, 71, 80

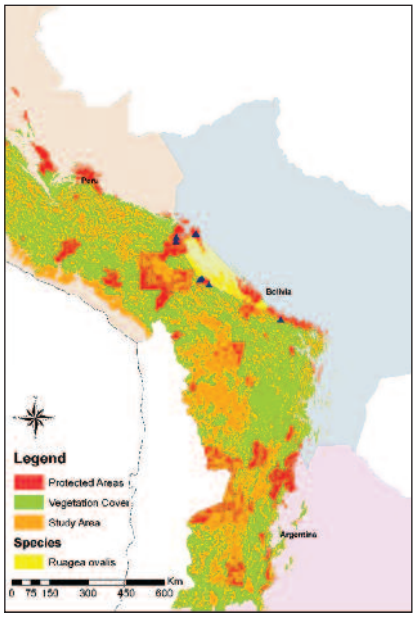
MELIACEAE

Ruagea microphylla W.Palacios
EN B1ab(iii,v)+2ab(iii,v)
Ecuador, Peru



A shrub or tree found in high Andean cloud forest. It was described as endemic to Ecuador known only from Loja, but it is also known from one locality in northern Peru (Cajamarca). At least 13% of its habitat is unsuitable and fragmented by deforestation. The wood is utilised for construction. The area of remaining forest is 876 km^2. The AOO is around 32 km^2.
Elevation: 2,200 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 57, 58

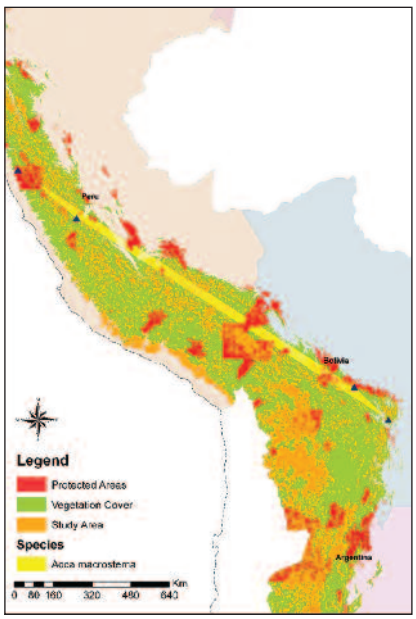
Ruagea ovalis (Rusby) Harms
NT
Bolivia



A tree up to 10 m tall originally known from Bolivia. Previously reported in Ecuador but incorrectly identified. The habitat quality is declining due to mining and tourism. It is still present in large protected forests in Bolivia where it occurs in the centre and north of the country with small populations. The area of remaining forest is 16,400 km^2. The AOO is around 48 km^2. A Near Threatened category is given even though the species have a restricted range and is under some threat, as it is found in many locations and the habitat is not severely fragmented.
Elevation: 1,900 – 2,600 m
Assessors: MM, AAM, AF, OV
Reference: 8

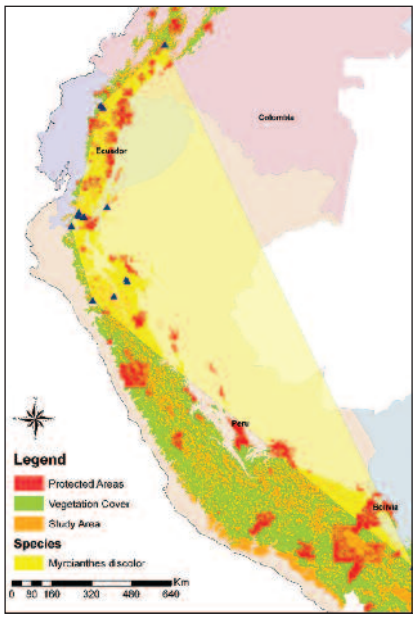
MYRTACEAE

Acca macrostema (Ruiz & Pav. ex G.Don) McVaugh
EN B2ab(iii)
Bolivia, Peru



This species originally known from western Peru is rare and naturally fragmented in areas of high deforestation. It occurs in shrubby forest transitional from humid to dry vegetation with *Myrcianthes, Weinmannia, Polylepis* and *Schinus* on hill slopes. It is known from few localities, two in Peru and two in Bolivia. The area of remaining forest is 36,726 km^2 which is projected to decline by a further 30% by deforestation rates. The AOO is around 16 km^2.
Elevation: 2,500 – 3,000 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 2, 59, 60

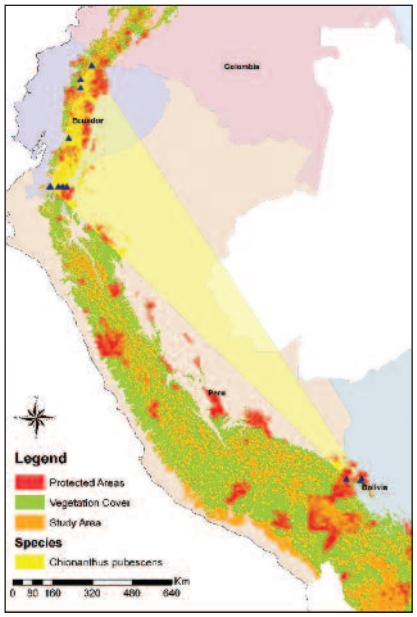
Myrcianthes discolor (Kunth) McVaugh
EN B2ab(iii)
(Bolivia,) Colombia, Ecuador, Peru



This is a widespread but rare shrub or tree with very few records occurring in areas with deforestation and fragmentation. In Peru it occurs in Amazon, Cajamarca, La Libertad and Piura. It occurs in Colombia in Cauca and in Ecuador in Azuay (between Cuenca and Molletur) and Loja. The records from Bolivia have not been found in the herbarium so presence in the country is uncertain. Its wood is utilised as firewood. The area of remaining forest is 119,931 km^2. The AOO is around 68 km^2 qualifying the species as Endangered.
Elevation: 1,500 – 3,000 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
Reference: 1

OLEACEAE

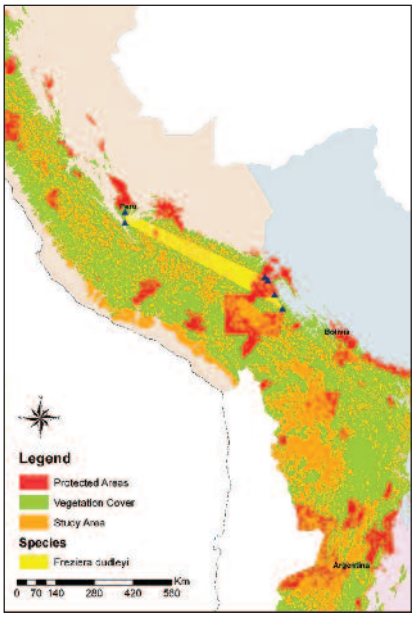
Chionanthus pubescens Kunth
NT
Bolivia, Ecuador, Peru



A tree with pink flowers and cultivated for use as an ornamental. It is native to drier valleys and is widespread. There are many recorded subpopulations in Ecuador from Imbabura, Pichincha, Loja and Azuay. It is scarcer in Peru and Bolivia, possibly planted and not native. In Bolivia, dry inter-Andean valleys are threatened as they are one of the most useful ecosystems for agriculture. The area of remaining forest is 36,330 km^2.
Elevation: 1,000 – 3,000 m
Assessors: MM, AAM, AF, OV
Reference: 1

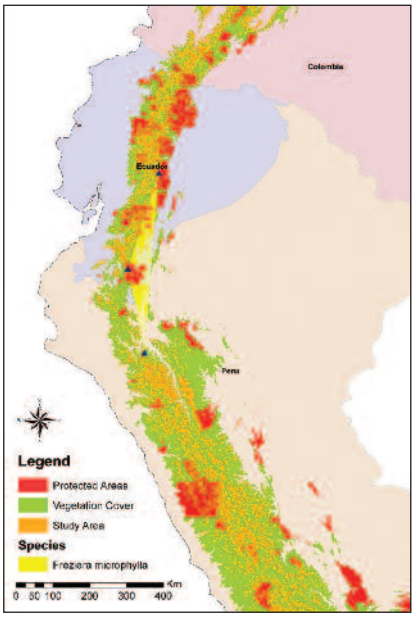
PENTAPHYLACAEAE

Freziera dudleyi A.H.Gentry
EN B2ab(iii)
Bolivia, Peru



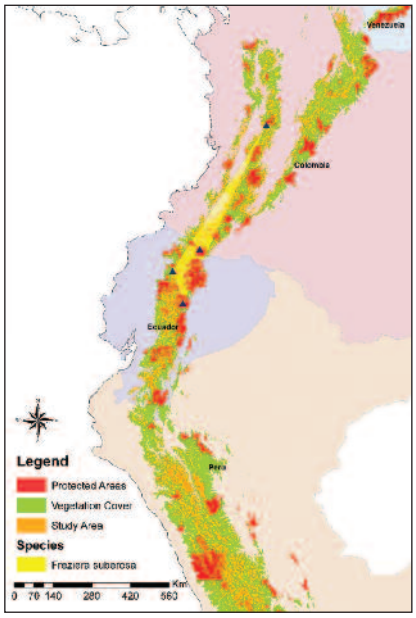
A tall forest tree growing to 18 m, 10 cm in diameter with green flowers. It has a restricted distribution with a narrow altitudinal range. In Peru it is only known from few localities in Cusco. It is threatened by deforestation for coca cultivation and oil pipelines. It is known from less than 10 locations in Bolivia in areas of preserved forest and fragmentation in Apolobamba Madidi and south Larecaja. This is a timber species but is not heavily exploited. Estimates of the reduction in forest cover between 2001 and 2009 are at least 30% in the areas where the species is present. The area of remaining forest is 20,852 km^2. The AOO is 28 km^2.
Elevation: 2,000 – 2,500 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 6, 92

Freziera microphylla Sandwith
EN A3c; B2ab(iii)
Ecuador, Peru



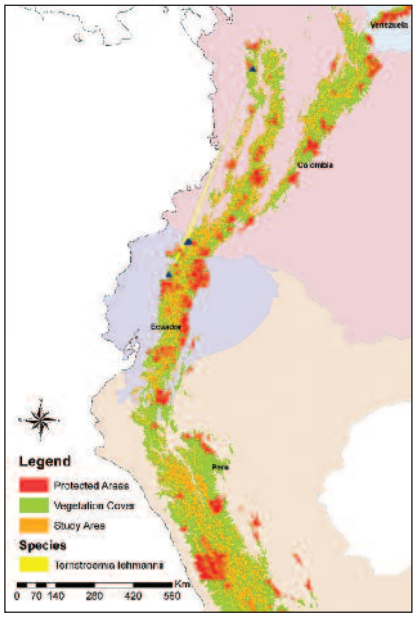
A shrub with currently known from only five locations and few individuals. It occurs in the province of Zamora which has high rates of deforestation for informal mining and ranching. There are few records in Ecuador occurring in severely fragmented landscapes threatened by coca plantation, illegal mining, livestock and land use change for agriculture and human settlement. It is estimated that the population in Ecuador has declined considerably over the recent years. In Peru it has only been collected at two locations, one of which is under threat of deforestation. It can be inferred that at least 30% of the population has been reduced and it is projected to decline by a further 50 % in the future (100 years). The area of remaining forest is 7,873 km^2. AOO is less than 20km^2.
Elevation: 2,650 – 4,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 90

Freziera suberosa Tul.
EN A2c; B2ab(ii,iii,iv,v)
(Colombia,) Ecuador



A slow growing shrub or small tree previously listed as Vulnerable due to its restricted distribution known over a very small area and less than 5 locations. In Colombia, it has potentially disappeared. In Ecuador it occurs in the provinces of Carchi and Napo. It is present in areas of high deforestation rates for livestock pasture and coffee plantations and it is sought after for its wood. This area is highly fragmented with few relict forests which are not protected. The area of remaining forest is 13,779 km^2. The AOO is 16 km^2.
Elevation: 3,000 – 4,000 m
Assessors: OV, EA, RLC
References: 1, 17, 61, 90

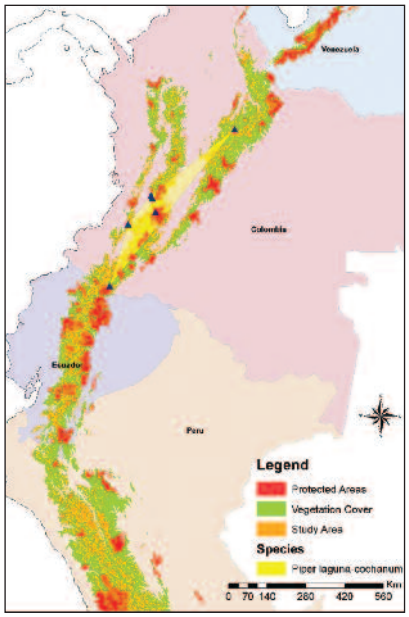
Ternstroemia lehmannii (Hieron.) Urb.
EN B1ab(iii,v)+2ab(iii,v)
(Colombia), Ecuador



Although with a provisional record in Antioquia, Colombia located in pockets of forest in the páramo, this slow-growing tree species is widely distributed in pristine cloud forests of Ecuador in Napo, Guayas, Imbabura, Carchi, Loja, Azuay and El Oro. It is naturally rare, occurring at about 5 locations. As it can grow to considerable size at high altitude its wood is sought after. The population has been reduced by at least 30% through deforestation for selective logging and livestock grazing. The remaining habitat is fragmented over an area of 1,150 km^2. The AOO is around 16 km^2.
Elevation: 1,500 – 3,500 m
Assessors: OV, EA, RLC
References: 1, 71

PIPERACEAE

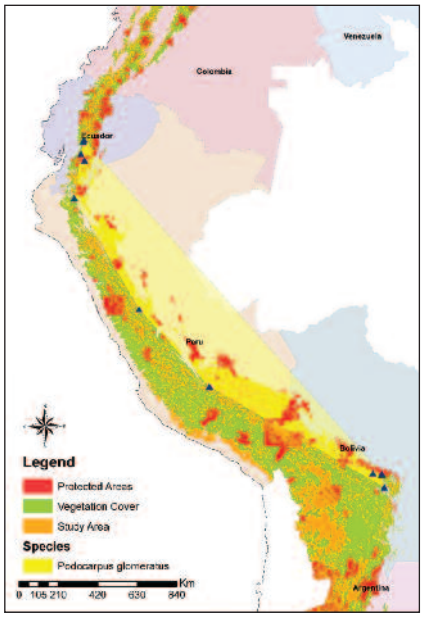
Piper laguna-cochanum Trel. & Yunck.
VU B1ab(iii,v)
Colombia, Ecuador, Venezuela



A rare species of tree or shrub up to 5 m in height, known from few localities in fragmented forests. In Colombia there are three localities in areas of high deforestation. In Ecuador it has been recorded in Napo, Sucumbíos and Pastaza. It is considered very scarce with few individuals. In Venezuela the collections occur in areas with high anthropogenic pressure. The area of remaining forest is 14,830 km^2. There were no georeferenced data for Venezuela, so range estimates are preliminary and possibly an underestimate.
Elevation: 2,500 – 3,500 m
Assessors: OV, EA, RLC, JG, NG
References: 1, 38, 71

PODOCARPACEAE

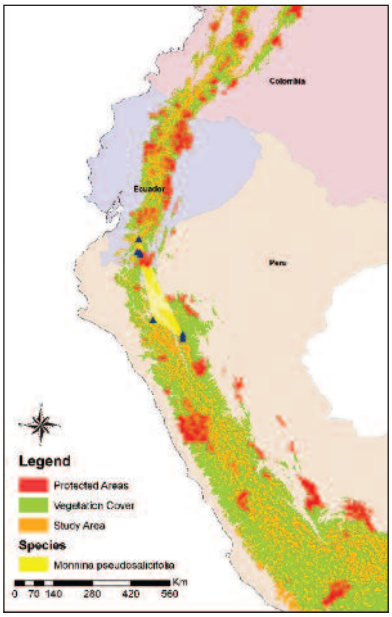
Podocarpus glomeratus D.Don
NT
Bolivia, Ecuador, Peru



An evergreen shrubby dwarf species known from scarce but widespread localities. It is known from Peru (Cusco, Apurimac, Huánuco, Junín and Pasco), Ecuador (Chimborazo, Azuay, Cañar and Loja), and Bolivia (Cochabamba, Santa Cruz transitional Yungas forests and Bolivian-Tucuman). At lower altitudes, it is has declined due to selective logging pressure for its durable timber. Its habitat has also declined and become fragmented from agricultural expansion (especially in the seasonally dry habitats) and there are a few individuals remaining in areas of potato production. The cloud forests are under pressure from livestock browsing in the dry season. The area of remaining forest is 150,441 km^2. The AOO is around 48 km^2. It is listed as Vulnerable in National Red List of Bolivia due to overexploitation. The category of threat could be increased to Vulnerable in the near future due to its disjoint distribution and threats.
Elevation: 2,000 – 4,000 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
References: 1, 26, 62, 76.

POLYGALACEAE

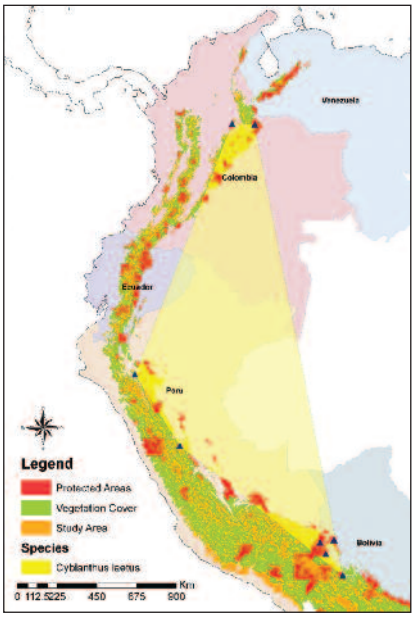
Monnina pseudosalicifolia Ferreyra
EN B2ab(iii)
Ecuador, Peru



This shrub species originally known from northern Peru (Piura) occupies open shrublands and ecotones of páramo and upper montane forests. In Peru is also present in Cajamarca, and Amazonas in areas of deforestation. In Ecuador the subpopulation which occurs in Loja is not known to be protected, but it may also occur in Podocarpus National Park. The area of remaining fragmented forest is 8,126 km^2. The species is considered Endangered based on its AOO of 32 km^2.
Elevation: 2,400 – 3,100 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 8

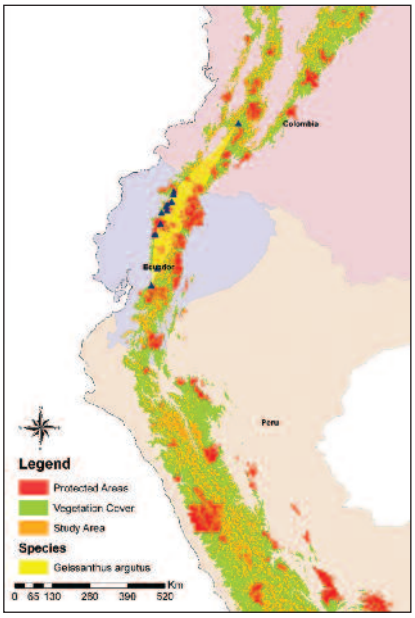
PRIMULACEAE

Cybianthus laetus (Mez) G.Agostini
VU A2c+3c; B2ab(iii)
Bolivia, Colombia, Peru



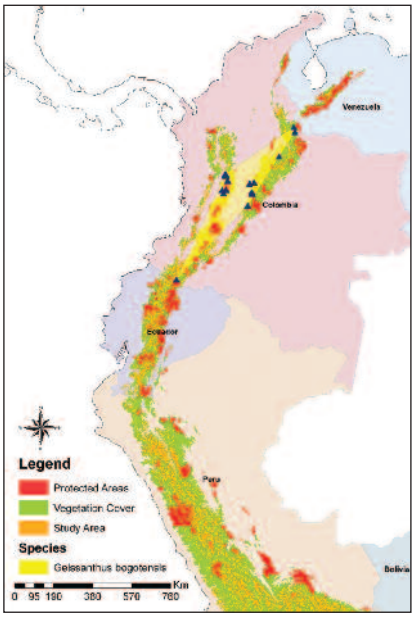
A shrub or small tree growing 2-6 m tall in primary cloud forest with elfin forest and low shrubs. There are some stable populations in Amazonas and Huanuco in Peru. In Colombia it is found in the Cordillera Oriental, in the northern part of in Boyacá. In Bolivia, although generally found in severely fragmented landscapes it also occurs within the Apolobamba and Madidi protected areas. The area of remaining forest is 86,337 km^2. AOO is around less than 2,000km^2 qualifying the species as Vulnerable.
Elevation: 1,800 – 2,850 m
Assessors: MM, AAM, AF, EA, RLC, HB, SB, MATC, CR, TEBE
References: 8, 34, 38, 90

Geissanthus argutus (Kunth) Mez
VU B1ab(iii)
Colombia, Ecuador



This species is found in only two localities in Colombia, in Nariño and Cauca, where it occurs in fragmented forests under high pressure of deforestation. In Ecuador most collections are from Pichincha, in a protected area (Pululahua), but previously only known from Cotopaxi. The species has no known uses. The area of remaining fragmented forest is 17,288 km^2.
Elevation: 2,000 – 2,500 m
Assessors: OV, EA, RLC
References: 1, 38

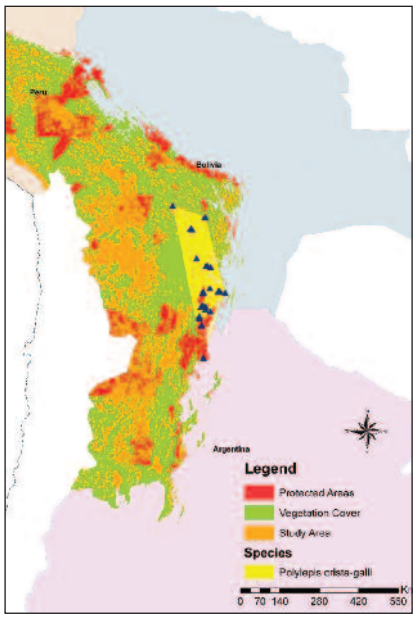
Geissanthus bogotensis Mez
EN B2ab(iii)
Colombia, Ecuador



In Colombia this species occurs in areas around Bogota that have suffered deforestation in recent decades. There are 41 collections in Colombia: in the state of Cundinamarca and in different parts of the department of Risaralda, indicating that it may be quite abundant. One individual is located in La Planada. There are fewer collections towards Ecuador where it is known from Napo and Carchi. It is considered to be rare but occurs in protected areas. The forest in Cundinamarca is severely fragmented. The trees are used as natural living fences. Around 37% of its habitat has been transformed by humans. The area of remaining fragmented forest is 31,799 km^2. The AOO is estimated at 88 km^2 and the threat category is based on this.
Elevation: 3,000 – 3,500 m
Assessors: OV, EA, RLC
References: 1, 38

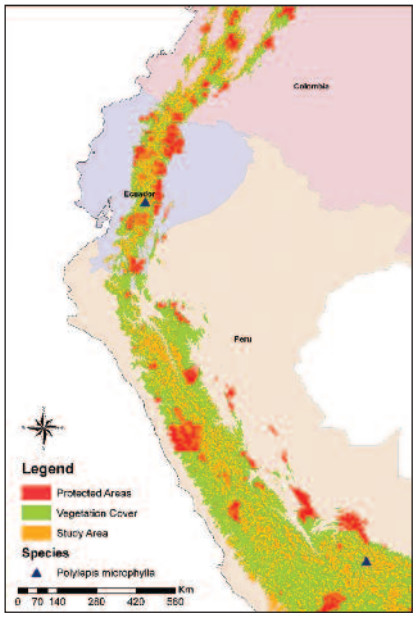
ROSACEAE

Polylepis crista-galli Bitter
EN B2ab(iii)
Argentina, Bolivia



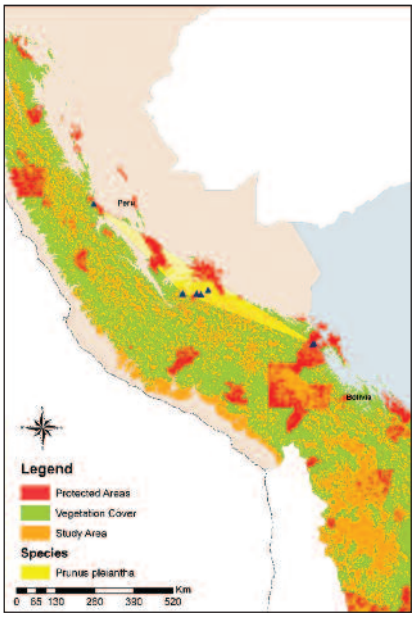
An evergreen shrub of high altitude found in dry ravines, and pastures above the montane forests and at lower altitudes in mixed *Podocarpus-Alnus* forests. It occurs in small stands and was previously thought to be endemic to southeast Bolivia over an area less than 100 km^2. There are collections found in Argentina, and forest fragmentation in the Yungas is relatively low. Livestock grazing is a threat to the species together with utilisation for wood and fuel. At least 16% of its habitat has become unsuitable with a potential remaining area of 33,137 km^2. The species is considered Endangered based on the AOO of 124 km^2.
Elevation: 2,500 – 4,000 m
Assessors: LM, CB, SP, MM, AAM, AF
References: 63, 76, 78

Polylepis microphylla (Wedd.) Bitter
CR B2ab(iii)
Ecuador, Peru



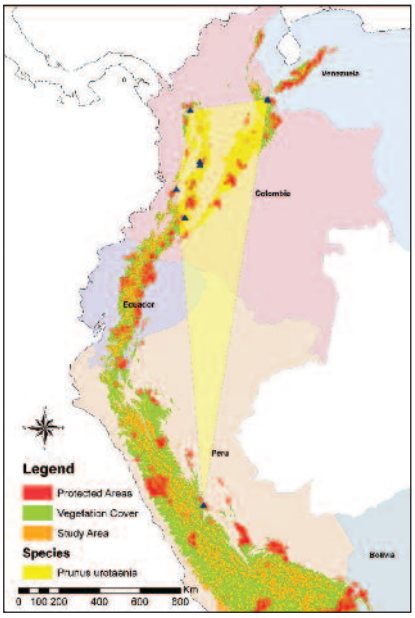
A tree or shrub 1.5-4 m, described as an endemic to Ecuador where its distribution is restricted to Chimborazo. It also occurs in Peru in Arequipa, Cusco and Lima. It is found in the protected Private Conservation Area of Huayllapa. The records from Cusco seems as it might represent a historical transplantation (86). There are only 100 juvenile individuals in an area of 6 km^2. The AOO was estimated by the assessors (due to low record numbers) to be less than 10 km^2.
Elevation: 3,000 – 4,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 23, 81, 86

Prunus pleiantha Pilg.
VU B1ab(iii)
Bolivia, Peru



This tree species originally known from central Peru (Huánuco) occupies montane forests. The records of Peruvian subpopulations in Cusco, Huánuco and Pasco are old, and these sites have been suffering from fragmentation of habitat. In Cusco it occurs in cloud forest in the western area of Manu National Park. It is used as a source of timber. It has been collected recently in Bolivia where it is known from five locations and is found in protected areas. It is not abundant at these localities. The area of forest habitat remaining is 20,000 km^2.
Elevation: 1,500 – 2,000 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 8, 64

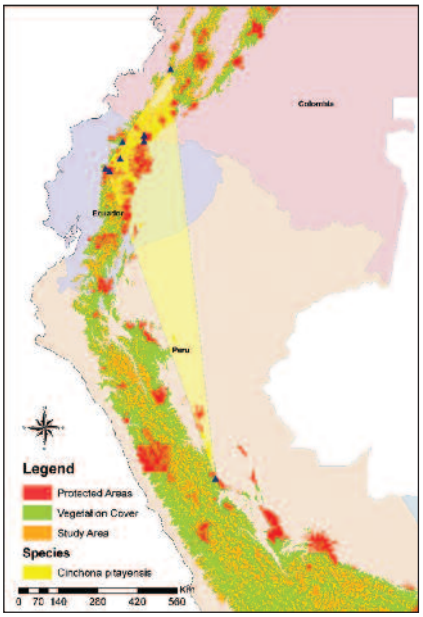
Prunus urotaenia Koehne
NT
Colombia, (Peru, Venezuela)



This tree species is widely distributed in Colombia. Some records in Venezuela are in doubt as they include Aragua on low lying areas of the coast. It is only known from one record in Peru making it difficult to evaluate. It occurs in fragmented landscapes over an area of 69,797 km^2 but is likely to be considerably less. If the records in Venezuela and Peru are not correct, the threat category may change.
Elevation: 1,960-2,850 m
Assessors: EA, RLC, HB, SB, MATC, CR, TEBE
References: 8, 71

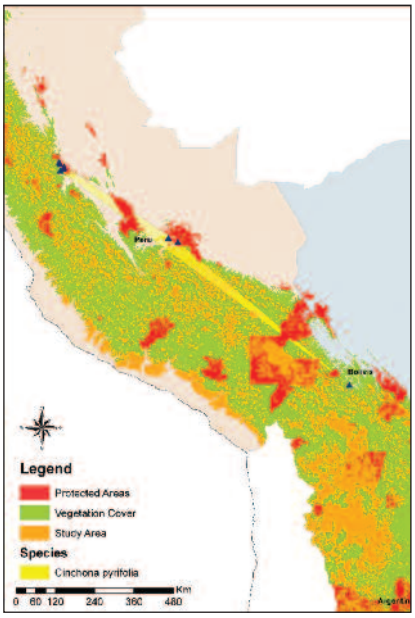
RUBIACEAE

Cinchona pitayensis (Wedd.) Wedd.
VU A2cd+3cd
Colombia, Ecuador, Peru



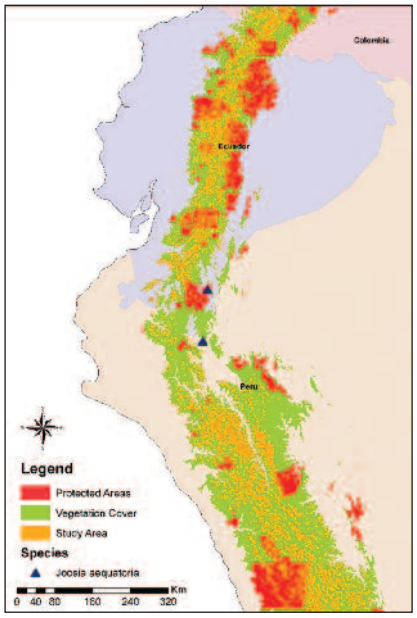
This tree species grows on very steep slopes, in regions with heavy rainfall. It does not regenerate well after fire or other forms of disturbance. In Colombia, it is known from Nariño, Cauca and one location near Bogota, the most recent collection in Putumayo estimates it to be relatively common. Tree explorations in 1945 discovered widespread subpopulations in Ecuador. The bark of this tree is used for medicinal purposes as a source of quinine and has been exported to USA for many years. The population has declined due to overexploitation, estimated at 60 tonnes annually. Although some areas were left to recover, deforestation continues to cause fragmentation and degradation where the species remains. The current area is estimated to be 27,507 km^2. Assuming it is still heavily exploited this area is likely to be considerably less.
Elevation: 1,500 – 3,230 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE
References: 1, 27, 38, 65, 90

Cinchona pyrifolia L.Andersson
VU B1ab(iii)
Bolivia, Peru



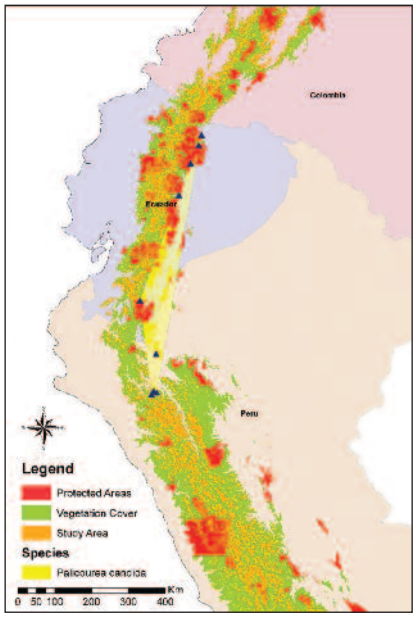
A species of primary forest. Its habitat is subject to deforestation for agriculture. In Peru this species is found in Pasco, Huánuco and Cusco. It was described in 1998 and is still poorly known from an area of 11,146 km^2. For a national Red List assessment for Bolivia, there was not enough data; the record from Bolivia may be of *C. officinalis*.
Elevation: 2,227 – 2,500 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 8, 65, 73

Joosia aequatoria Steyerm.
EN B1ab(iii,v)+2ab(iii,v)
Ecuador, Peru



This species grows as a shrub or tree producing good timber. In its few locations there is high rate of deforestation and land conversion for agriculture. In Ecuador, it is restricted to Zamora. It is rare in Peru. According to the 2004 published Red List assessment there are 2 subpopulations in Ecuador within the Podocarpus National Park on the north and south border. In Peru, its populations are found outside Tabaconas-Namballe National Sanctuary. As it is sought after for its timber it can be inferred that the number of individuals has and continues to decline. Range has been estimated by the assessors (due to low number of records). The AOO is estimated at less than 100 km^2 from two locations and the EOO is estimated at 180 km^2.
Elevation: 1,930 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 66

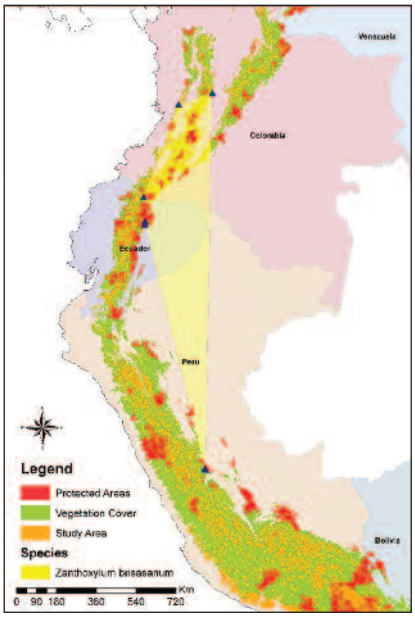
Palicourea candida C.M.Taylor
VU B1ab(iii)+2ab(iii)
Ecuador, Peru



A small understory tree or shrub found in cloud forests. In Ecuador it occurs in Napo, Tungurahua, Pastaza, Zamora and possibly Morona. In Peru it has been found in Cajamarca and but may be under-recorded. Both regions suffer high deforestation rates. At least 11% of its habitat is estimated to be unsuitable vegetation with a remaining area of 11,117 km^2. The species is considered Vulnerable based on its AOO of 1000 km^2 calculated using a 100 km^2 cell size.
Elevation: 1,500 – 2,750 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 8

RUTACEAE

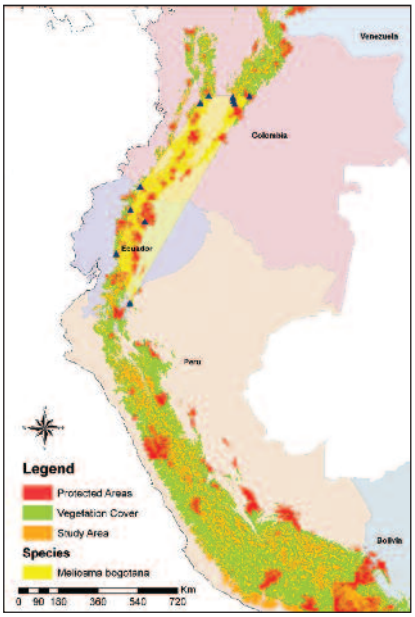
Zanthoxylum brisasanum (Cuatrec.) P.G.Waterman
EN A3cd; B2ab(iii,v)
Colombia, Ecuador, Peru



A timber species growing up to 12 m tall in very humid primary and secondary forest. It is rare in Colombia, known from two locations in Tolima and Valle del Cauca, both areas of high deforestation. It also occurs in the Nevados Park. In Ecuador, there are two collections in Napo and it has been described from Sucumbíos. In Peru, it can be found in Junín and Pasco. This species has restricted and isolated subpopulations in areas of high deforestation and land use change. There has been a decline in the number of mature individuals due to exploitation for its wood known as “tachuelos“, which is used for turning. The area of forest habitat remaining is 33,734 km^2. The AOO is around 28 km^2.
Elevation: 1,580 – 2,500 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE
References: 1, 38, 90

SABIACEAE

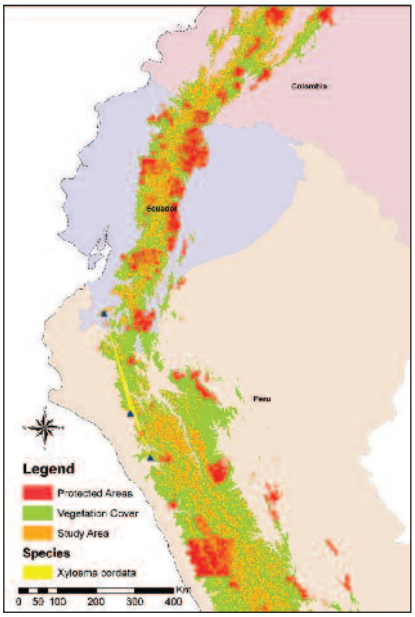
Meliosma bogotana Steyerm.
VU A2c+3c; B2ab(iii)
Colombia, Ecuador



A primary forest tree growing up to 16 m tall. It has also been recorded near road sides in fragmented forests. In Ecuador, it occurs in Napo, Carchi, Zamora, Pichincha, Azuay. In Colombia, it has been recorded in Antioquia in the western cordillera. It is threatened by high deforestation rates with the population fragmented over an area of 64,294 km^2. The species is considered Vulnerable partly based on its AOO of 1100km^2 using a 100 km^2 cell size.
Elevation: 2,000 – 2,500 m
Assessors: OV, EA, RLC
References: 1, 38, 90

SALICACEAE

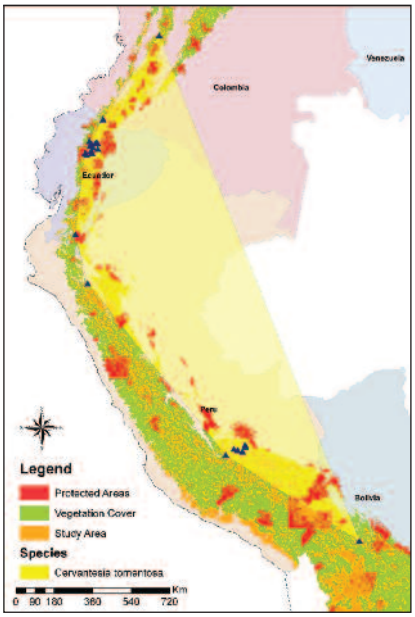
Xylosma cordata (Kunth) Gilg
EN B1ab(iii)
Ecuador, Peru



A thorny tree or shrub. A species originally known from northern Peru, it is found in western and eastern Andean slopes in Cajamarca, Piura, Amazonas, Tumbes and San Martin and is not known to occur in protected areas. In Ecuador it occurs in Loja. All records originate from heavily deforested areas. The area of forest habitat remaining is 2,073 km^2.
Elevation: 2,500 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 10, 67

SANTALACEAE

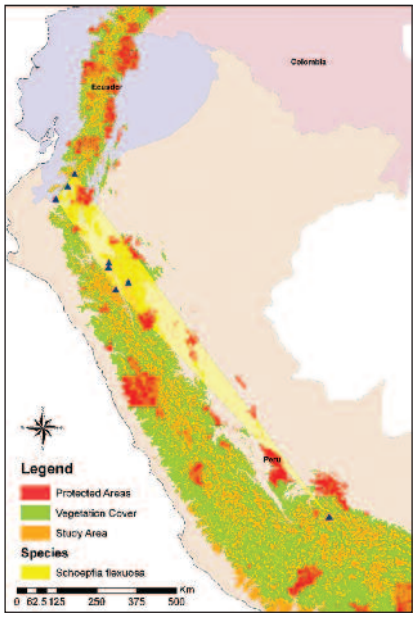
Cervantesia tomentosa Ruiz & Pav.
NT
Bolivia, Colombia, Ecuador, Peru



A small tree growing up to 10 m tall. It has a widespread distribution but is rare within its range. It has declined with habitat loss and selective logging for its wood. In Colombia, it has become rare and old records now lie in fragmented areas by coffee production in the Quindío mountains. In Ecuador, the species is well represented in Pichincha and Loja provinces, with other collections elsewhere in the country. In Peru the species occurs from Cusco up to Cajamarca. Records in Bolivia are scarce. The area of forest habitat remaining is 155,770 km^2. The AOO is around 92 km^2.
Elevation: 1,900 – 4,000 m
Assessors: MM, AAM, AF, OV, EA, RLC, HB, SB, MATC, CR, TEBE
References: 2, 17

SCHOEPFIACEAE

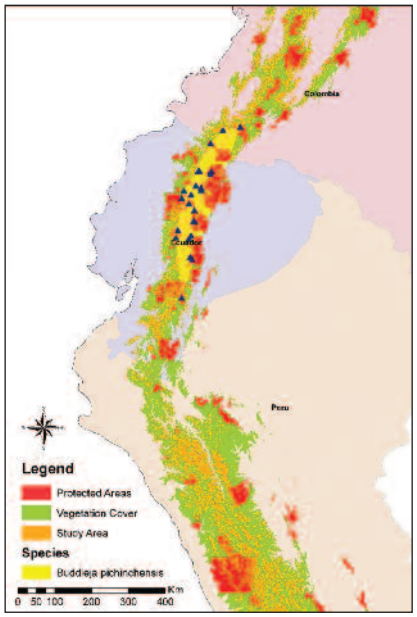
Schoepfia flexuosa (Ruiz & Pav.) Schult.
NT
Ecuador, Peru



A small tree growing to 5 m tall in dry forests in western and eastern Andean slopes. In Peru it is recorded from Amazonas, Cajamarca (west), Cuzco, Huánuco, Junín, La Libertad (west) and Pasco. In Ecuador it occurs in Azuay (4 records) and Loja (3 records). It is a source of timber. It probably occurs in a protected area. In Ecuador it is in decline as it is found in areas of fragmentation. The species is more common in Peru. The area of forest habitat remaining above 1500m is 32,850 km^2.
Elevation: 1,100 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 2

SCROPHULARIACEAE

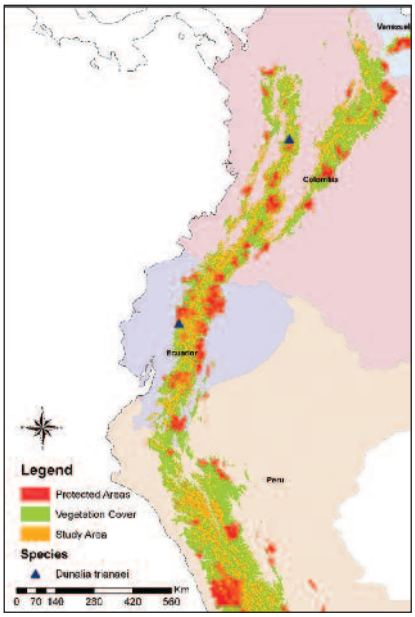
Buddleja pichinchensis Kunth
VU B1ab(iii,v)
Colombia, Ecuador



A small tree or shrub growing in wet forests, shrubland and high altitude páramo. It is widespread but many records are old and in areas of deforestation and agricultural conversion, particularly in Nariño, Colombia. In Ecuador the species occurs in Carchi, Chimborazo, Napo and Pastaza. The species has not been collected recently in Colombia where its habitat is severely fragmented. The wood is used to make ploughs, furniture, charcoal and for construction. The area of forest habitat remaining is 15,797 km^2.
Elevation: 2,800 – 4,200 m
Assessors: OV, EA, RLC
References: 8, 38

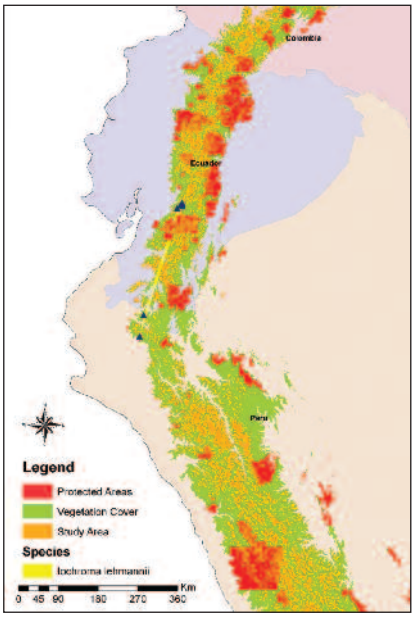
SOLANACEAE

Dunalia trianaei Dammer
EN B2ab(iii)
Colombia, Ecuador



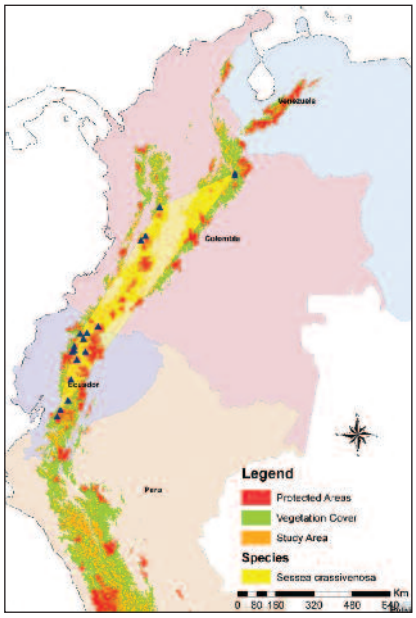
A tree or shrub known from transformed landscapes in Cotopaxi, Napo and Pichincha in Ecuador. It occurs within the Nevados National Park in Caldas in the Cordillera Central in Colombia, although this locality is still highly deforested and fragmented. AOO has been estimated by the assessors (due to low number of records) to be less than 500 km^2.
Elevation: 2,600 – 3,500 m
Assessors: OV, EA, RLC
References: 1, 38

Iochroma lehmannii Dammer ex Bitter
EN B1ab(iii)+2ab(iii)
Ecuador, Peru



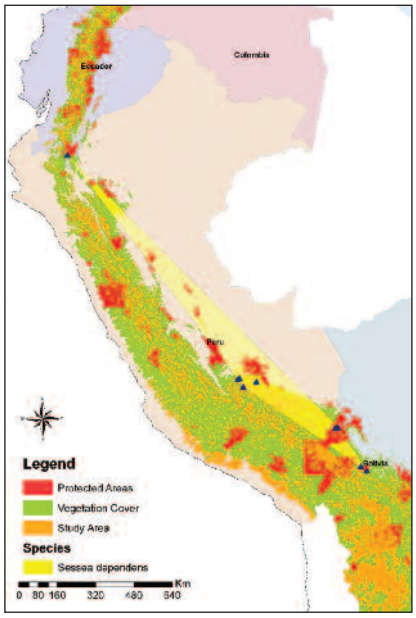
A small tree growing 4–10 m tall. It has a narrow distribution range on the western Andean slopes where is restricted to few locations. It was previously thought to be endemic to Ecuador where it grows in Azuay and Chimborazo in fragmented vegetation. However, it has also been found in Peru in a single location in Piura. The area of forest habitat remaining is 1,475 km^2. Previously categorised as Vulnerable, the AOO is around 28 km^2 qualifying this species as Endangered.
Elevation: 2,500 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 7

Sessea crassivenosa Bitter
NT
Colombia, Ecuador



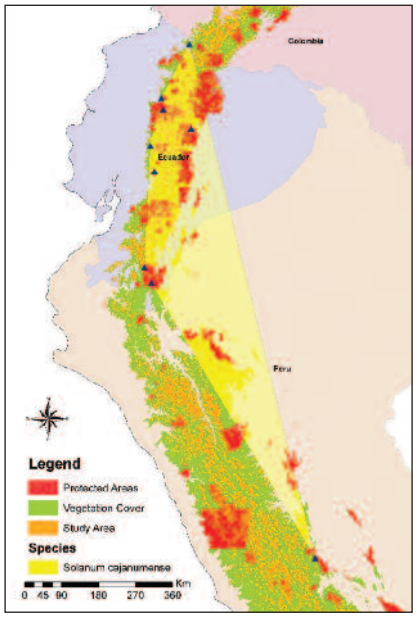
This species is widely distributed and although it is found in disturbed habitats it seems to withstand fragmentation. In Colombia, it occurs in Boyaca, Valle del Cauca, Tolima, Caldas and Santander. In Ecuador, it occurs in Carchi, Pichincha, Azuay, Bolivar, Cañar, Chimborazo, Cotopaxi, Tungurahua and possibly Loja. The AOO is around 72 km^2.
Elevation: 2,500 – 4,500 m
Assessors: OV, EA, RLC
References: 1, 38

Sessea dependens Ruiz & Pav.
NT
Bolivia, Ecuador, Peru



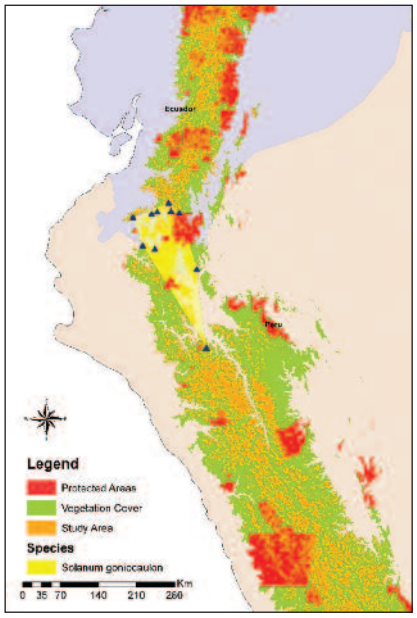
A small tree widely distributed in cloud forests. In Bolivia it occurs in Madidi in forest remnants altered by grazing and fire wood extraction, in Tiraque, Cochabamba, Independencia, Cochabamba, Pocohuaya south from La Paz and Queara and Mojos de la Paz, in deep valleys with patches of forest and open grasslands. It is an abundant pioneer species. In Peru it occurs in Huánuco and Cusco. In Ecuador there is only one record in Loja. The area of forest habitat remaining is 44,760 km^2. The AOO is estimated at 40 km^2; however, as it is a pioneer species and thought to occur in more than 10 locations and not in severely fragmented areas a Near Threatened category is given.
Elevation: 1,207– 3,500 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
References: 2, 8

Solanum cajanumense Kunth
NT
Colombia, Ecuador, Peru



A small shrub or tree that is widely distributed from the coast to the high Andes. In Peru it has been recorded in Amazonas, Cajamarca, Piura and Pasco, between 700 - 2450 m. In Ecuador it occurs in Carchi, Chimborazo, Pichincha, Azuay, Boliviar, Cotopaxi and Loja. The AOO is around 36 km^2 but it is thought to be more widely distributed than the records available. A Near Threatened category is given, as the range is potentially small, its wood is sought after and the species occurs outside protected areas.
Elevation: 500 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

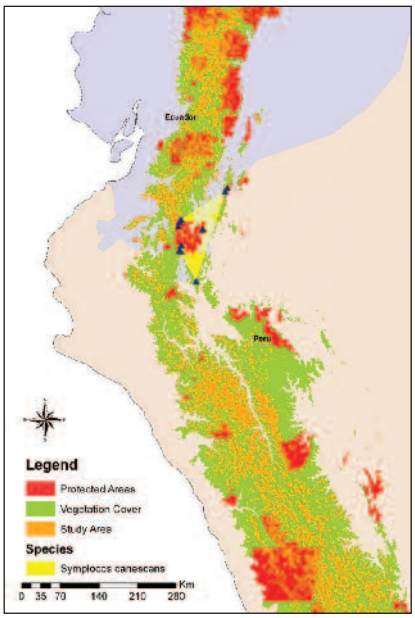
Solanum goniocaulon S.Knapp
VU B1ab(iii)
Ecuador, Peru



A shrub or tree threatened by deforestation and habitat loss and selective logging for its timber. In Peru it occurs in Cajamarca, San Martin, Piura and Ayacucho. In Ecuador it occurs in Loja and Zamora. Its distribution is within the Podocarpus National park, Ecuador, and Rio Abiseo National Park, Peru. The area of forest habitat remaining is 7,819 km^2.
Elevation: 2,000 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 8, 10

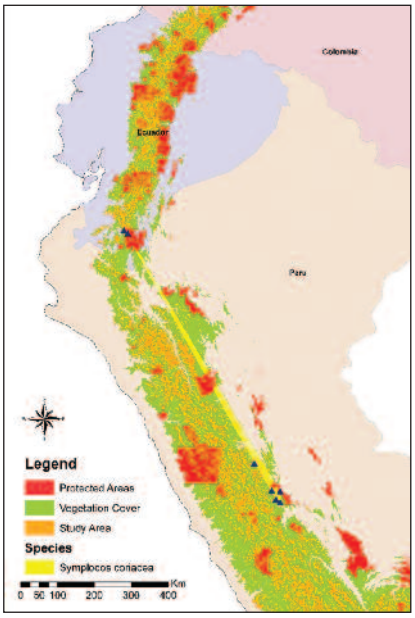
SYMPLOCACEAE

Symplocos canescens B.Ståhl
VU B2ab(iii)
Ecuador, Peru



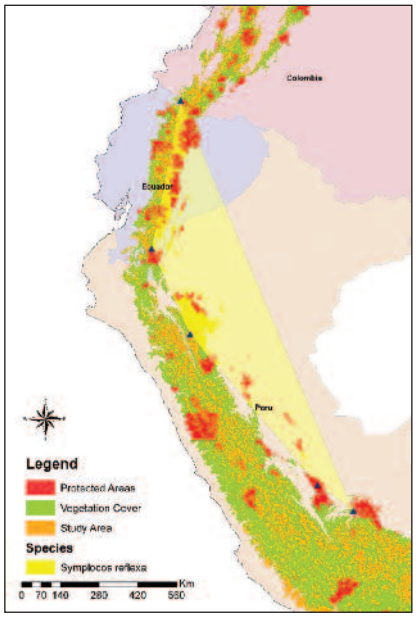
This species grows as a shrub or tree. It was previously thought to be endemic to Ecuador where it occurs in Loja, Zamora and Morona. Only one of the four subpopulations is protected in the Podocarpus National Park. The flowers and fruits are present all year round. It is threatened with high rates of deforestation and fragmentation and it is also used for its wood. In Peru there is only one record in Cajamarca. The AOO is estimated at 900 km^2 using a 100 km^2 cell size was more appropriate for this species, qualifying the species as Vulnerable.
Elevation: 2,000 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 9

Symplocos coriacea A.DC.
VU B1ab(iii)+2ab(iii)
Ecuador, Peru



A rare tree restricted to a few subpopulations. In Peru it occurs in Huánuco, Pasco, and San Martín. There are records of subpopulations from two protected areas (Rio Abiseo and Yanachaga-Chemillén National Parks) but the forest habitat elsewhere is fragmented. In Ecuador it is known from Carchi, Pinchincha, Chimborazo Azuay and Loja. The wood of this species is utilised. The area of forest habitat remaining is 7,500 km^2. The AOO is estimated at 700 km^2 using a 100 km^2 cell size, qualifying the species as Vulnerable.
Elevation: 2,500 – 3,460 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 10

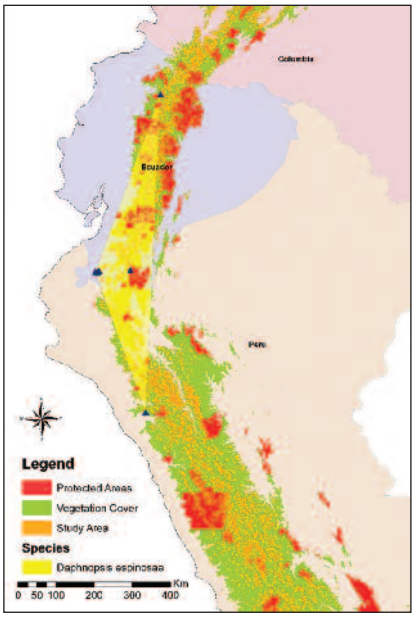
Symplocos reflexa A.DC.
EN B2ab(iii)
Ecuador, Peru



A shrub or small tree found in shrubland and dwarf forest with rich epiphyte diversity. In Peru it occurs in Amazonas, Cusco and Pasco and is recorded in the Yanachaga Chemillen National park. In Ecuador it is recorded from highly fragmented habitats in Carchi, Loja and Cañar. It has a wide distribution but the habitat is experiencing fragmentation and its wood is sought after. The area of forest habitat remaining is 38,468 km^2. The AOO is around 20 km^2 qualifying this species as Endangered.
Elevation: 2,500 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 11

THYMELAEACEAE

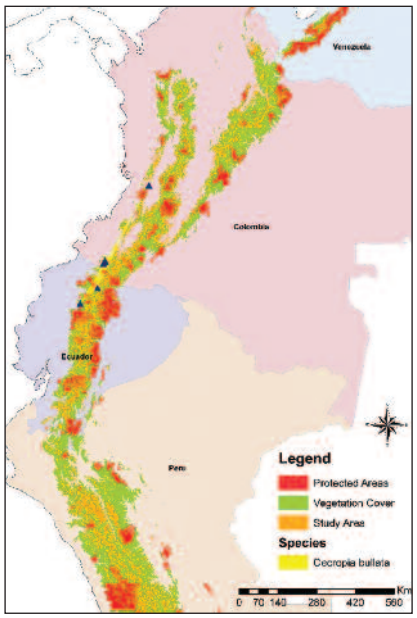
Daphnopsis espinosae Monach.
EN B2ab(iii)
Ecuador, Peru



A shrub, treelet or tree with a small distribution, few records surrounded by deforested areas. Information for this species is lacking. In Ecuador it is restricted to Loja and may occur in the Podocarpus National Park and in Pichincha near the Pululahua Geobotanical Reserve. It is considered to be Near Threatened in Peru. The area of forest habitat remaining is 33,496 km^2. The AOO is estimated at 32 km^2 qualifying this species as Endangered.
Elevation: 2,000 – 4,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 2

URTICACEAE

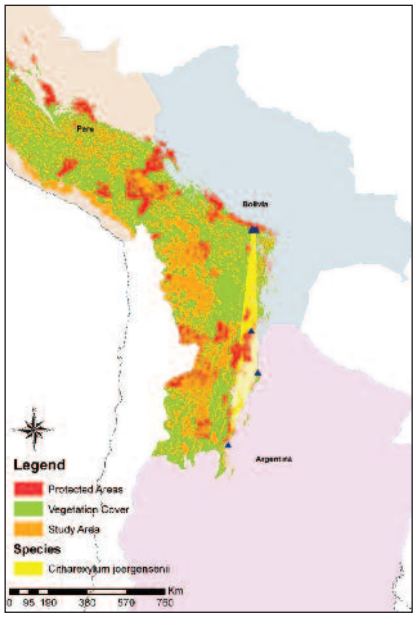
Cecropia bullata C.C.Berg & P.Franco
EN B1ab(iii)+2ab(iii)
Colombia, Ecuador



A large tree up to 25 m tall used for timber. It is a dominant species of montane forests in Nariño, Chocó, Valle del Cauca and Antioquia. In Ecuador, there is pressure for agricultural expansion in Pichincha and Carchi. It was recorded in the Ilinizas nature reserve in Ecuador but illegal logging continues in the area. The area of forest habitat remaining within its known range is 3,311 km^2 however this is likely to be an underestimate as further locations are known (without georeferenced records). The AOO 400 km^2 using a 100 km^2 cell size, qualifying the species as Vulnerable.
Elevation: 1,600 – 2,200 m
Assessors: OV, EA, RLC
References: 1, 12, 13, 71

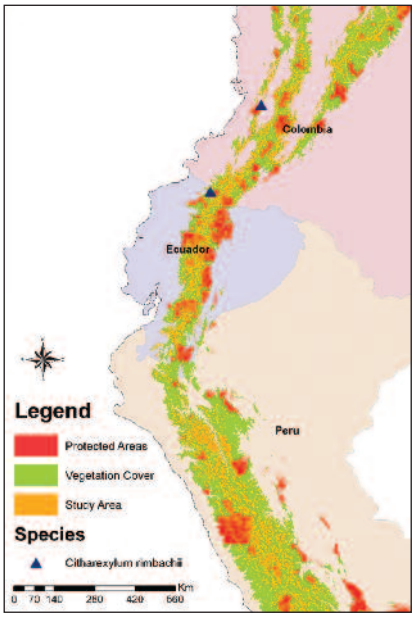
VERBENACEAE

Citharexylum joergensenii (Lillo) Moldenke
VU B2ab(iii)
Argentina, Bolivia



A tree growing to 12 m in height and 20 cm dbh found in humid montane forests. Subpopulations occur in disturbed and deforested areas. It occurs in Argentina in Jujuy, Salta, Tucuman and Catamarca. In Bolivia it is more abundant in secondary forests and forest edges exposed to high human impacts. The area of forest habitat remaining is 28,823 km^2. The AOO is 700 km^2 using a 100 km^2 cell size, qualifying the species as Vulnerable.
Elevation: 2,100 – 2,700 m
Assessors: LM, CB, SP, MM, AAM, AF
Reference: 8

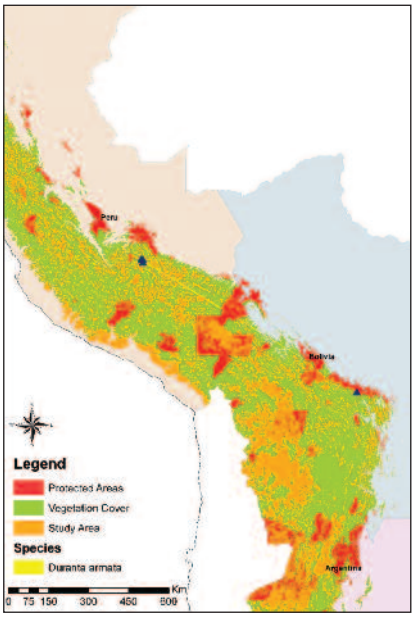
Citharexylum rimbachii Moldenke
EN A2c+3c; B1ab(iii)+2ab(iii)
Colombia, Ecuador



This poorly known and rare tree is only recorded from three locations surrounded by transformed and fragmented landscapes. It was previously thought be endemic to Ecuador in Bolivar and Los Rios. EOO estimated as 224 km^2 and AOO of less than 100km^2 as there are only two locations one in each country.
Elevation: 2,000 – 3,000 m
Assessors: OV, EA, RLC
References: 1, 8, 14, 90

Species evaluated as data deficient

Duranta armata Moldenke
NT
Bolivia, Peru



A shrub or tree growing up to 7 m tall. It was originally recorded from southern Peru. It is locally abundant in Peru, in rocky, open sites of high montane shrub and dry upland forests with *Polylepis*. Possible threats are habitat modification by fire and other human activities. The AOO is around 16 km^2.
Elevation: 1,920 – 4,000 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
References: 8, 90

AQUIFOLIACEAE

Ilex maasiana Loizeau & Spichiger
DD
Ecuador, Peru
A shrub or tree growing in "Elfin Forest" on boggy, peaty soil. It is recorded from Zamora close to the border with Peru. In Peru there is only one record from 1969 located in a protected area Cerros del Sira Communal Reserve.
Elevation: 1,290 – 2,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

CUNONIACEAE

Weinmannia cundinamarcensis Cuatrec.
DD
Bolivia, Colombia, Peru
Possibly a widespread species.
Taxonomic notes: Unresolved name, may be a *synonym* of *W. tomentosa* or *W. microphylla*.
Elevation: 1,850 – 3,162 m
Assessors: MM, AAM, AF, EA, RL, CHB, SB, MATC, CR, TEBE
References: 8, 38

CYATHEACEAE

Cyathea arnecornelii Lehnert
DD - Taxonomically unresolved
Bolivia, Peru
This tree fern originally recorded from Bolivia occupies fragmented forests. It is known from 6 collections in Bolivia and one in Peru, but with 3 unique locations. In Peru is rare, with few individuals per population in Cuzco and near Yanachaga-Chemillen National Park, in Pasco. In Bolivia it occurs in national parks and in topography with difficult access and low deforestation. There is, however, some threat of landslides. The area of remaining forest is 18,814 km^2.
Elevation: above 2,500 m
Assessors: MM, AAM, AF, IJ, HB, SB, MATC, CR, TEBE, AT
References: 40, 76, 77

Cyathea carolihenrici Lehnert
DD - Taxonomically unresolved
Bolivia, Ecuador, Peru
Tree-fern growing up to 9 m tall. It was originally described for Bolivia. In Peru this species is found in Cuzco including subpopulations in western areas of Manu National Park. In Ecuador is known from subpopulations in Zamora within Podocarpus National Park. Some of the records in Peru and Ecuador are from areas that are now deforested. In Bolivia the habitat is protected by the rugged topography although natural landslides could threaten the species in the rainy season. It is found near Cotapata National Park. In Bolivia it is classified as EN. The area of remaining forest is 40,953 km^2. The population overall is not severely fragmented and the habitat is not in decline.
Elevation: above 2,000 m
Assessors: MM, AAM, AF, IJ, OV, HB, SB, MATC, CR, TEBE
References: 42, 77

Cyathea catacampta Alston
DD
Bolivia, Colombia, Peru
This tree fern originally known from Colombia reaches 20 m high; it occupies open sites in fragmented forests and ecotones. The species is naturally fragmented and collection records are from forests that are now surrounded by agriculture. In Colombia is known from Antioquia, Cauca, Cundinamarca, Nariño, Risaralda, and Santander. In Bolivia is found in protected forests. There have been collections in Madidi and Apolobamba but there are only three records. In Peru it is found in isolated subpopulations, in Amazonas, Cuzco, Pasco and San Martín.
Elevation: 2,000 – 3,000 m
Assessors: MM, AAM, AF, IJ, HB, SB, MATC, CR, TEBE
References: 15, 25

(Natalia Tejedor Garavito)

ROSACEAE

Prunus muris Cuatrec.
DD
Colombia, Ecuador
This species is unresolved. Reported in Colombia in the northwest of the country, in Antioquia.
Assessors: OV, EA, RLC
Reference: 71

SAPINDACEAE

Allophylus coriaceus Radlk.
DD
Ecuador, Peru
A tree growing to 18 m tall in primary montane forest. Only known from three localities, two in Peru (Cajamarca and Pasco) and one in Ecuador (Napo). Its wood is used for firewood and construction and its fruits are edible. Colleagues in Peru consider that this species to be LC, there are high deforestation rates in Oxapampa with selective logging.
Elevation: 1,900 – 2,600 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 68

URTICACEAE

Phenax laxiflorus Wedd.
DD
Ecuador, Peru
A subshrub or small tree. In Peru, it occurs in Apurimac, Cajamarca and Huánuco. In Ecuador it occurs in Chimborazo, Imbabura and Carchi at the agricultural frontier where there is high deforestation.
Elevation: 2,000 – 3,350 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 16

SPECIES EVALUATED AS LEAST CONCERN

ACANTHACEAE

Aphelandra acanthus Nees
LC
Colombia, Ecuador
A small shrub tree which is abundant within and outside forests with stable subpopulations. It is found in various protected areas such as the Cayambe-Coca ecological reserve in Ecuador. In Colombia it is found in Cordillera Central and Occidental. It occurs over an area of 33,652 km^2.
Elevation: 2,500 – 3,500 m
Assessors: OV, EA, RLC
References: 1, 17, 71

ACTINIDIACEAE

Saurauia bullosa Wawra
LC
Colombia, Ecuador
It is widely distributed in transformed areas in Colombia. It is widespread throughout Ecuador with good subpopulations. It occurs over an area of 56,537 km^2.
Elevation: 1,500 – 4,000 m
Assessors: OV, EA, RLC
References: 1, 38, 71

ARALIACEAE

Oreopanax seemannianus Marchal
LC
Colombia, Ecuador
A shrub or tree that is widespread although occurring in a matrix of transformed areas. It is widespread in the south of Colombia and in Ecuador over an area of 13,559 km^2.
Elevation: 2,000 – 4,000 m
Assessors: OV, EA, RLC
References: 1, 84

ASTERACEAE

Baccharis latifolia (Ruiz & Pav.) Pers.
LC
Argentina, Bolivia, Ecuador, Peru, Venezuela
A small tree of the undergrowth this species is widely distributed in areas of low deforestation rates in Argentina, Bolivia and Peru. It is relatively rare in Argentina. There are no apparent threats.
Elevation: 1,000 – 4,100 m
Assessors: OV, HB, SB, MATC, CR, TEBE, MM, AAM, AF, LM, SB, SP, JG, NG
Reference: 8

Diplostephium cinerascens Cuatrec.
LC
Colombia, Ecuador
In Colombia there are 17 records of this species in Chocó, Risaralda, Huila, Antioquia, Valle del Cauca, Cauca, and Tolima where it is widely distributed including protected areas such as Purace, Tatama and Farallones. This species has three varieties in Colombia. In Ecuador it is rare with around 20 ind/ha in Sucumbios but it occurs in areas that are not severely fragmented.
Elevation: 3,000 – 4,000 m
Assessors: OV, EA, RLC
References: 1, 17, 18

Smallanthus fruticosus (Benth.) H.Rob.
LC
Ecuador, Peru
A small tree up to 4 m in height, this species is widespread although its habitat, in parts of its range, have been converted for agriculture. It occurs over an area of 21,487 km^2.
Elevation: 2,000 – 4,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 2

BERBERIDACEAE

Berberis grandiflora Turcz.
LC
Colombia, Ecuador, Peru
A widespread shrub that has not been frequently recorded or collected. In Colombia it occurs in Cauca, Nariño and Antioquia. It occurs scattered at altitudes over 2400 m. There are no uses known. It occurs over an area of 51,503km^2.
Elevation: 2,400 – 4,000 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE
References: 38, 71

BORAGINACEAE

Tournefortia lilloi I.M.Johnst.
LC
Ecuador, Peru
This is a widely distributed species. As T. undulata it is considered EN in Ecuador and LC in Peru.
Elevation: 1,800 – 3,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Tournefortia polystachya Ruiz & Pav
LC
Colombia, Ecuador
In Colombia it is widely distributed and abundant. In Ecuador there are fewer records available.
Elevation: 1,800 – 3,000 m
Assessors: OV, EA, RLC
References: 8, 71

CLUSIACEAE

Clusia pseudomangle Planch. & Triana
LC
Bolivia, Ecuador, Peru, Venezuela
A widespread tree growing beyond the range of Andes, but with only few records.
Elevation: 1,030 – 3,000 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE, JG, NG
Reference: 1

Clusia sphaerocarpa Planch. & Triana
LC
Bolivia, Colombia, Ecuador, Peru
A widespread shrub or tree growing throughout the Andes. In Bolivia, it is of some concern because it occurs in areas of high deforestation. The population is inferred to be stable as it is abundant and widespread.
Elevation: 1,500 – 3,100 m
Assessors: MM, AAM, AF, OV, EA, RLC, HB, SB, MATC, CR, TEBE
Reference: 1

CUNONIACEAE

Weinmannia auriculata D.Don
LC
Bolivia, Ecuador, Peru, Venezuela
Although widely distributed the subpopulations of this canopy tree species are small. In Bolivia it is widely distributed and abundant but in an altitude range with high human impact. Collection for firewood and habitat conversion from forest to grassland, are impacting this species within its range. In Ecuador there are few individuals in Pichincha and Napo.
Synonyms: Weinmannia caucana Killip, Weinmannia dryadifolia Moric. ex Ser., *Weinmannia nebularum* Diels, *Weinmannia ovata* Ruiz & Pav., *Weinmannia silvatica* Engl.
Elevation: 2,000 – 3,500 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE, JG, NG
Reference: 10

CYATHEACEAE

Cyathea frigida (H.Karst.) Domin
LC
Colombia, Ecuador, Peru, Venezuela
This is a widespread tree fern from Colombia to Peru. In Ecuador it occurs in Carchi, Imbabura, Pichincha, Chimborazo, Azuay and Zamora. In Peru has been collected in isolated sites Amazonas, Huánuco, Pasco and Junín. This species inhabits montane rain forests, as does Peruvian endemic, Cyathea nephele Lehnert. Some records are from disturbed areas.
Elevation: 1,595 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE, JG, NG
References: 19, 71

ERICACEAE

Bejaria mathewsii Fielding & Gardner
LC
Colombia, Ecuador, Peru
A shrub or small tree found in Colombia, Ecuador and Peru with various synonyms recorded. A widespread species, although there are only a few records in Ecuador (Azuay and Loja). There are threats of general deforestation and informal mining which may indicate that the species could be NT.
Elevation: 1,500 – 4,000 m
Assessors: OV, VUU, EA, RLC, HB, SB, MATC, CR, TEBE
References: 1, 10

ESCALLONIACEAE

Escallonia myrtilloides L.f.
LC
Bolivia, Peru
It is abundant in Bolivia but is found in fragmented landscapes. In Peru it is widespread and there is some fragmentation of its habitat.
Elevation: 1,000 – 3,800 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
Reference: 8

LAMIACEAE

Aegiphila bogotensis (Spreng.) Moldenke
LC
Colombia, Ecuador, Venezuela
A shrub that is endemic to the Andes, widely distributed from Ecuador to Venezuela. It is a pioneer species that propagates well and is used for restoration of disturbed areas.
Elevation: 2,200 – 3,200 m
Assessors: OV, EA, RLC, JG, NG
References: 20, 21, 69, 71

Aegiphila cuatrecasasii Moldenke
LC
Colombia, Ecuador
Although only known from a small number of records, this small tree or shrub species is widely distributed and grows naturally in disturbed landscapes. It is used for live fencing and also for medicinal purposes.
Elevation: 1,700 – 2,900 m
Assessors: OV, EA, RLC
References: 22, 70, 71

Aegiphila ferruginea Hayek & Spruce
LC
Colombia, Ecuador
A small tree, previously thought to be restricted to Ecuador and considered to be NT, it has now also been recorded in Colombia. In vitro propagation has been carried out for conservation purposes as previously considered Vulnerable. The record in Colombia is from a disturbed forest.
Elevation: 2,500 – 4,000 m
Assessors: OV, EA, RLC
References: 1, 23, 24, 38

MELASTOMATACEAE

Meriania radula (Benth.) Triana
LC
Ecuador, Peru
A tree or shrub up to 7 m tall growing in montane forests and Páramo. It is widely distributed in Peru. In Ecuador it occurs in the Podocarpus National Park in Loja and probably Zamora. The forest areas are fragmented. In Peru is found in Amazonas, Cajamarca, Libertad, Pasco, Huanuco and San Martin. Possibly protected in Pasco. It is able to persist in its disturbed and fragmented habitats. Threats include general forest fragmentation and decline; and logging as its wood is collected for timber. The area of remaining forest is 32,509 km^2.
Elevation: 2,500 – 3,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

PIPERACEAE

Piper andreanum C.DC
LC
Ecuador, Peru
A tree or shrub that is widespread. The population is declining with deforestation and fragmentation of the forest habitat. In Ecuador it is very widespread.
Elevation: 2,000 – 4,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Piper bogotense C.DC.
LC
Colombia, Ecuador, Peru, Venezuela
A tree species that is frequent in primary and secondary forest. In Venezuela it is known from Merida, Tachira, Lara and Trujillo. In Colombia it is abundant and used for restoration. In Ecuador is widespread and commonly used for carpentry. In Peru occurs in Amazonas, Cajamarca and Piura in disturbed areas.
Elevation: 1,600 – 3,500 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE, JG, NG
References: 1, 38

PRIMULACEAE

Myrsine oligophylla Zahlbr.
LC
Bolivia, Peru
A small tree or shrub that has a wide altitudinal distribution in Peru although the records are few, it has been found in areas of coca plantation and fragmented landscapes. It grows in secondary forests. It occurs over an area of 36,916 km^2.
Elevation: 1600 – 2600 m
Assessors: MM, AAM, AF, HB, SB, MATC, CR, TEBE
Reference: 26

ROSACEAE

Hesperomeles cuneata Lindl.
LC
Bolivia, Ecuador, Peru
A shrub or small tree that is widely distributed in secondary forests. It may be fire-resistant. There are few localities in Ecuador but the species is more abundant in Peru and Bolivia.
Elevation: 2800 – 4000 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
Reference: 8

RUBIACEAE

Randia micracantha (Lillo) Bacigalupo
LC
Argentina, Bolivia
A shrub or small tree between 1-4 m tall. It is an understory species that is relatively frequent in the montane forest with a wide altitudinal range. Although it is considered to be LC, in Bolivia it is found in areas experiencing degradation and the remaining habitat of 2,613 km^2 continues to decline, which could lead to an increase in category in the near future. However it is found in protected forest areas and some of the locations occur in the Tariquia reserve
Elevation: 600 – 2,300 m
Assessors: LM, CB, SP, MM, AAM, AF
Reference: 8

SALICACEAE

Azara salicifolia Griseb.
LC
Argentina, Bolivia
A widely distributed small tree species of undergrowth occurring in areas of low deforestation rates. Commonly found across the altitudinal gradient and with no apparent threats
Elevation: 1,100 – 4,450 m
Assessors: MM, AAM, AF, LM, CB, SP
Reference: 8

SCROPHULARIACEAE

Buddleja coriacea Remy
LC
Bolivia, Ecuador, Peru
A widespread small tree. Until the 1980s this species was collected for firewood in Peru but agro-forestry projects are restoring this species and populations have improved. In Bolivia the species is planted and there are only a few records of natural subpopulations around Lake Titicaca.
Elevation: 3,200 – 4,200 m
Assessors: MM, AAM, AF, OV, HB, SB, MATC, CR, TEBE
References: 8, 34

SOLANACEAE

Cestrum peruvianum Willd. ex Roem. & Schult.
LC
Ecuador, Peru
A widespread tree or shrub with no apparent threats, it is a pioneer species and regenerate readily.
Elevation: 1,500 – 4,000 m
Assessors: OV, HB, SB, MATC, CR, TEBE
Reference: 1

Bellavista, Ecuador *(Carmen Ulloa Ulloa)*

Solanum stenophyllum Dunal
LC
Colombia, Ecuador
This treelet is abundant and widely distributed and has been recorded at very high altitudes in páramo.
Elevation: 2,500 – 4,500 m
Assessors: OV, HB, SB, MATC, CR, TEBE
References: 1, 38, 71

URTICAEAE

Cecropia telenitida Cuatrec.
LC
Colombia, Ecuador, Peru, Venezuela
A common and widespread tree occurring from Venezuela to Peru. In Peru it occurs in degraded areas.
Elevation: 1,400 – 3,000 m
Assessors: OV, EA, RLC, HB, SB, MATC, CR, TEBE, JG, NG, TEBE
References: 1, 12, 58, 71, 85

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ANNEX 1
IUCN RED LIST CATEGORIES AND CRITERIA

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time-frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time-frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN)
A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

THE CRITERIA FOR CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

A. Reduction in population size based on any of the following:
   1. An observed, estimated, inferred or suspected population size reduction of ≥90% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
      (a) direct observation
      (b) an index of abundance appropriate to the taxon
      (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
      (d) actual or potential levels of exploitation
      (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

   2 An observed, estimated, inferred or suspected population size reduction of ≥80% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may

not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of ≥80%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of ≥80% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:
   1. Extent of occurrence estimated to be less than 100 km^2, and estimates indicating at least two of a-c:
      a. Severely fragmented or known to exist at only a single location.
      b. Continuing decline, observed, inferred or projected, in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) area, extent and/or quality of habitat
         (iv) number of locations or subpopulations
         (v) number of mature individuals.
      c. Extreme fluctuations in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) number of locations or subpopulations
         (iv) number of mature individuals.

   2. Area of occupancy estimated to be less than 10 km^2, and estimates indicating at least two of a-c:
      a. Severely fragmented or known to exist at only a single location.
      b. Continuing decline, observed, inferred or projected, in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) area, extent and/or quality of habitat
         (iv) number of locations or subpopulations
         (v) number of mature individuals.
      c. Extreme fluctuations in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) number of locations or subpopulations
         (iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:
   1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR

   2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
      (a) Population structure in the form of one of the following:
         (i) no subpopulation estimated to contain more than 50 mature individuals, OR
         (ii) at least 90% of mature individuals in one subpopulation.
      (b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

A. Reduction in population size based on any of the following:
   1. An observed, estimated, inferred or suspected population size reduction of ≥70% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
      (a) direct observation
      (b) an index of abundance appropriate to the taxon
      (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
      (d) actual or potential levels of exploitation
      (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of ≥50% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of ≥50%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of ≥50% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:
   1. Extent of occurrence estimated to be less than 5000 km^2, and estimates indicating at least two of a-c:
      a. Severely fragmented or known to exist at no more than five locations.
      b. Continuing decline, observed, inferred or projected, in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) area, extent and/or quality of habitat
         (iv) number of locations or subpopulations
         (v) number of mature individuals.
      c. Extreme fluctuations in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) number of locations or subpopulations
         (iv) number of mature individuals.

   2. Area of occupancy estimated to be less than 500 km^2, and estimates indicating at least two of a-c:

      a. Severely fragmented or known to exist at no more than five locations.
      b. Continuing decline, observed, inferred or projected, in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) area, extent and/or quality of habitat
         (iv) number of locations or subpopulations
         (v) number of mature individuals.
      c. Extreme fluctuations in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) number of locations or subpopulations
         (iv) number of mature individuals.

C. Population size estimated to number fewer than 2500 mature individuals and either:
   1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future) OR

   2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
      (a) Population structure in the form of one of the following:
         (i) no subpopulation estimated to contain more than 250 mature individuals, OR
         (ii) at least 95% of mature individuals in one subpopulation.
      (b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:

A. Reduction in population size based on any of the following:
   1. An observed, estimated, inferred or suspected population size reduction of ≥50% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are: clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
      (a) direct observation
      (b) an index of abundance appropriate to the taxon
      (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of ≥30% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of ≥30%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of ≥30% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:
   1. Extent of occurrence estimated to be less than 20,000 km^2, and estimates indicating at least two of a-c:
      a. Severely fragmented or known to exist at no more than 10 locations.
      b. Continuing decline, observed, inferred or projected, in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) area, extent and/or quality of habitat
         (iv) number of locations or subpopulations
         (v) number of mature individuals.
      c. Extreme fluctuations in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) number of locations or subpopulations
         (iv) number of mature individuals.

   2. Area of occupancy estimated to be less than 2000 km^2, and estimates indicating at least two of a-c:
      a. Severely fragmented or known to exist at no more than 10 locations.
      b. Continuing decline, observed, inferred or projected, in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) area, extent and/or quality of habitat
         (iv) number of locations or subpopulations
         (v) number of mature individuals.
      c. Extreme fluctuations in any of the following:
         (i) extent of occurrence
         (ii) area of occupancy
         (iii) number of locations or subpopulations
         (iv) number of mature individuals.

C. Population size estimated to number fewer than 10,000 mature individuals and either:
   1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future) OR

   2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
      (a) Population structure in the form of one of the following:
         (i) no subpopulation estimated to contain more than 1000 mature individuals, OR
         (ii) all mature individuals are in one subpopulation.
      (b) Extreme fluctuations in number of mature individuals.

D. Population very small or restricted in the form of either of the following:
   1. Population size estimated to number fewer than 1000 mature individuals.

   2. Population with a very restricted area of occupancy (typically less than 20 km^2) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.

E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

Source: IUCN (2001)

A Regional Red List of

Montane Tree Species of the Tropical Andes:

Trees at the top of the world

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United Nations Decade on Biodiversity