

# Ascension Island Biodiversity Action Plan

## ASPLENIUM ASCENSIONIS



Photo: M. Hamilton

### SUMMARY

**Taxonomy:** Kingdom: Plantae; Phylum: Polypodiophyta; Class: Polypodiopsida; Order: Polypodiales; Family: Aspleniaceae; Species: *Ptisana purpurascens*

**Nativeness:** Endemic to Ascension Island

**Description:** Small, creeping fern generally found in crevices on damp to moderately dry cinder banks and rock faces around the middle elevations of Green Mountain. Can spread via plantlets produced from the frond tips forming small patches of continuous cover.

**IUCN Red List status:** Vulnerable 

**Local trend:** Unknown 

**Threats:** The major threat to *Asplenium. ascensionis* is competition with invasive plant species; secondary threats include climate change-induced drought and habitat alteration.



Distribution	
Global	
Endemic to Ascension Island.	
Local	
<p><i>Asplenium ascensionis</i> is predominantly distributed on the southern and eastern slopes of Green Mountain at altitudes between 550 m and 760 m. Major population centres include Breakneck Valley and several of the other valleys draining the south side of Green Mountain. It is also locally abundant on manmade scoria banks created during the cutting of Elliot’s Path and on the stone walls of the now derelict marine barracks. A flourishing population of several thousand individuals also exists in sheltered gullies on the north side of Cricket Valley at an altitude of around 440m, the lowest recorded altitude for this species. All other outlying localities are extremely small and fragmented. It is occasionally found along lower south-facing slopes of Green Mountain from Castle Hill to Weather Post and Middleton’s Ridge. A small satellite population of several hundred individuals is also located in a deep ravine on the north side of Green Mountain (Mulberry Ravine). Lambdon et al. speculate that it may once have been more abundant on less exposed, northern aspects before these habitats were heavily invaded by maidenhair ferns and other introduced weeds [1]. Cronk reported a single specimen growing in a crevice close to the summit of White Horse Hill, a trachyte dome 3 km to the east of Green Mountain [2], although its presence here has not been confirmed recently.</p>	 <p>Distribution of <i>Asplenium ascensionis</i> in March 2014 (AIG Conservation Department, unpublished data). Symbol sizes are scaled according to total numbers of plants encountered.</p>

3. Status					
Population estimate:	7000 – 50000 mature individuals	Trend:	Unknown	IUCN status:	Vulnerable
<p>Estimating the total population size of <i>Asplenium ascensionis</i> is challenging due to its habit of forming dense patches of continuous cover. Small numbers of outlying plants are also scattered across a wide area of inaccessible terrain. At the most recent census in March 2014 there were estimated to be 26,500 mature individuals growing in its known strongholds, although this did not include a single inaccessible population located above Palmer’s Farm. The abundance of <i>As. ascensionis</i> has been monitored annually since 2003 and has apparently fluctuated between 7,392 and 51,015 mature individuals. However, monitoring methods are too coarse and have been too variable to reliably infer trends over this period. Nevertheless, a significant decline has certainly occurred since the mid-19th century, when it was described by Joseph Hooker as forming a carpet on the ground under other ferns and shrubs. It has now been almost completely excluded from such habitats by introduced weeds and is largely confined to rock faces. Extant specimens are smaller and less vigorous than those collected by Hooker [2] suggesting that its current habitats are refugial. Even in these refuges, many apparently suitable areas are now overwhelmed by weeds and there is no evidence to suggest that this advance has ceased. In view of the potential threat this poses to <i>Asplenium ascensionis</i>, it seems realistic to assume a slow, long-term decline.</p>					



4. Ecology	
Habitat	
<p>This small fern grows in crevices on damp to moderately dry cinder banks and rock faces at altitudes between 440 and 730m. Most of the extant population is restricted to southern aspects which receive the bulk of the moisture from incoming clouds carried by the prevailing south-easterly trade winds. It does not co-occur with other native species to a great extent in its extant localities, although it appears that it once formed abundant ground cover beneath the native fern sward on Green Mountain before being displaced by introduced species [1,2]. In a few heavily-shaded situations it still grows as a carpet on the ground and it seems likely that its present, cliff habitats are refugial.</p>	
Reproduction & life history	
<p>Judging by the wide scattering of outlying plants away from main population centres, spores of <i>As. ascensionis</i> are efficiently dispersed by the wind. Deep shade and/or moderate levels of moisture appear to be necessary for germination, and most of the gametophytes and sporelings occur in deep crevices or very sheltered microhabitats. Adult plants can also reproduce vegetatively and colonize drier rock-faces via proliferous plantlets which are produced from near the frond tips. If spreading via this means, small areas of continuous cover can develop.</p>	
Taxonomy & population structure	
<p><i>As. ascensionis</i> is closely related to <i>As. erectum</i>, which occurs in tropical Africa and on the island of St. Helena 800 miles to the south east [3]. <i>As. ascensionis</i> frequents drier, rockier habitats, and never attains the size and luxuriance of <i>As. erectum</i>, although in one small area of St. Helena <i>As. erectum</i> grows in a diminutive form on dry rocks, where it is extremely close in appearance to <i>As. ascensionis</i> [3]. Indeed, Cronk suggests that <i>As. ascensionis</i> could be regarded as a variety of <i>As. erectum</i> [2]. A genetic study is needed to assess the true level of separation between the species.</p>	

4. Threats*		
<b>8.1.2 Invasive non-native/alien species/diseases (named species)</b>	<b>Impact:</b>	MEDIUM
<p>Competition with introduced plant species represents the greatest threat to <i>Asplenium ascensionis</i>. Maidenhair ferns (<i>Adiantum cappilus-veneris</i> and <i>A. raddianum</i>) are probably the most serious competitors and are now dominant over many rock faces. Broadleaved weeds such as <i>Clidemia hirta</i> and <i>Begonia hirtella</i> have also invaded some suitable habitat. The spread of these aggressive colonists has almost certainly led to the displacement of <i>Asplenium ascensionis</i>, which is almost never observed to co-exist with either <i>Adiantum</i> species [3].</p>		
<b>11.2 Climate change &amp; severe weather: Drought</b>	<b>Impact:</b>	UNKNOWN
<p>Since <i>As. ascensionis</i> appears to be dependent on humid, shady places for germination and does not establish easily on dry, open rock faces, climate change could pose a threat in the future if Ascension were to become significantly drier [3]. However, it is difficult to predict long-term changes in precipitation at Ascension Island with any degree of confidence [4], and the true effects on the species have not been evaluated.</p>		
<p>*Threats are classified and scored according to the <a href="#">IUCN-CMP Unified Classification of Direct Threats</a> [5]</p>		

Relevant policies and legislation	
Local	
<p><i>Asplenium ascensionis</i> is protected under the <a href="#">Wildlife Protection Ordinance 2013</a>, which prohibits the damaging, killing or possession of protected species without license.</p>	
<p>All known populations are contained within Green Mountain National Park designated under the <a href="#">National Protected Areas Order 2014</a>. The <a href="#">National Protected Areas Regulations 2014</a> restrict all forms of development within the national park.</p>	



### Management notes

Relatively little work has been conducted on this species. It is the most abundant of the endemic species on Green Mountain, and as populations are fairly persistent and seem relatively stable, it is currently regarded as the lowest priority. Since current funding does not yet stretch even to other higher priorities, there is little immediate hope of extending it to this species. However, this does not imply that further work is not needed. We know very little about the ecology of all of the mountain endemics and there is no clear evidence to show whether or not the habitats are gradually being lost to invasive weeds, particularly maidenhair fern (*Adiantum* species), which are now dominant over many of the rock faces. Progress to date is starting to fill-in some of the knowledge gaps. Most of the main accessible populations are currently being monitored during the annual plant census and this should be continued. The use of photo quadrats and quadrat analysis software has recently been adopted as a means of accurately assessing changes in the coverage of *Asplenium* and competing invasives at fixed monitoring plots and should allow any gradual declines in habitat quality to be detected.

**SPECIES ACTION PLAN**

PROPOSED ACTION	OUTCOME(S)	TIMEFRAME	PROPOSED START	PRIORITY	LEAD
Research & monitoring					
Establish an island-wide network of precipitation/temperature monitoring stations to refine habitat classifications and expand the range of baseline meteorological data available for climate change monitoring and research.	10 monitoring stations deployed	1 month	May 2015	MEDIUM	Chief Scientist (AIG)
Produce an endemic plant monitoring manual to clarify the aims of the monitoring programme and document methods for data collection, storage and analysis.	1 report produced	1 month	February 2015	LOW	Assistant Conservation Officer (AIG)
Clean existing endemic plant monitoring data stored in departmental databases and update database structures in line with current monitoring and research needs.	1 database produced	1 year	September 2014	MEDIUM	Assistant Conservation Officer (AIG)
Monitor the coverage of <i>Asplenium ascensionis</i> and competing weeds in a representative sample of photo-quadrats established across its range.	20 quadrats monitored; 1 survey completed	1 week	September 2015	MEDIUM	Assistant Conservation Officer (AIG)
Map the extent of occurrence and area of occupancy of <i>Asplenium ascensionis</i> to update the 2010 Red List assessment,	1 GIS layer created; 1 report produced	1 week	September 2016	MEDIUM	Assistant Conservation Officer (AIG)
Communication & Awareness Raising					
Produce an updated information leaflet on the flora of Ascension Island.	250 leaflets produced	3 months	June 2015	LOW	Tourism & Media Officers (AIG)

## References

1. Lambdon P, Stroud S, Clubbe C, Gray A, Hamilton M, Niissalo M, Pelembe T & Renshaw O (2009) *A plan for the conservation of endemic and native flora on Ascension Island*.
2. Cronk QCB (1980) Extinction and survival in the endemic vascular flora of Ascension Island. *Biological Conservation* **17**, 207–219.
3. Lambdon PW, Stroud S, Gray A, Niissalo M & Renshaw O (2012) *Asplenium ascensionis*. In: *The IUCN Red List of Threatened Species. Version 2014.3*. <[www.iucnredlist.org](http://www.iucnredlist.org)>. [accessed 2015 Feb. 5].
4. Gray A (2009) *Ascension Spurge Euphorbia origanoides L. climate and viability study: Final Report*. Unpublished report. Centre for Ecology and Hydrology, Edinburgh Research Station.
5. Salafsky N et al. (2008) A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions. *Conservation Biology* **22**, 897–911.