

# Ascension Island Biodiversity Action Plan

## GIANT PSEUDOSCORPION



Photo: N. Weber


### SUMMARY

**Taxonomy:** Kingdom: Animalia; Phylum: Arthropoda; Class: Arachnida; Order: Pseudoscorpiones; Family: Garypidae; Species: *Garypus titanius*

**Nativeness:** Endemic to Ascension Island

**Description:** Small, brownish arachnids with a flattened body and large pincer-like pedipalps that contain a poison gland used to subdue their invertebrate prey. As its name suggests, the giant pseudoscorpion is the largest species in this order, reaching lengths of 12 – 15 mm compared to 3 – 8 mm in most other species.

**IUCN Red List status:** Critically Endangered 

**Local trend:** Unknown 

**Threats:** Threats to *G. titanius* are poorly understood but are likely to be primarily from introduced predators and competitors.



**Distribution**

**Global**

Endemic to Ascension Island.

**Local**

*G. titanius* is known only from the important seabird nesting station of Boatswain Bird Island, a 5 hectare islet 300 m off the eastern coast of Ascension Island [1]. A brief survey in 2014 suggested it is more common on the rocky slopes below the summit plateau than on the flat, guano-covered plateau itself. However, more detailed work is needed to test this observation. Ashmole & Ashmole speculate that it may once have been more widespread, inhabiting the impressive seabird colonies that covered the main island of Ascension at the time of human discovery [2]. A combination of predation by introduced species and the extirpation of most of the mainland seabird nesting colonies by feral cats may explain the disappearance and continued absence of *G. titanius* from these areas.



**Figure 1:** Distribution of the giant pseudoscorpion, *Garypus titanius*.

**3. Status**

Population estimate:	Unknown	Trend:	Unknown	IUCN status:	Not Evaluated (NE)
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A brief survey conducted during a seabird research visit in October 2014 confirmed the continued presence of *G. titanius* on the summit plateau and more accessible western slopes of Boatswain Bird Island where it was easily located by searching under loose rocks and boulders. However, no baseline abundance data have been collected from which to infer trends. Ashmole & Ashmole speculate that *G. titanius* once occupied the seabird nesting colonies of the main island of Ascension but was exterminated there by introduced predators such as mice and the centipede *Scolopendra morsitans* [2]. Its current distribution may therefore be refugial, limited to the last fragment of suitable habitat not reached by these predators. A second possibility is that the decline in seabird nesting on the main island due to predation by feral cats during the 19th and 20th centuries contributed to the disappearance of *G. titanius* from these areas. Now that feral cats have been eradicated and large seabird colonies have re-established on the mainland may therefore be worth exploring whether *G. titanius* can be induced to expand its range.

**4. Ecology**

**Habitat & diet**

*G. titanius* is only found amongst the dense seabird nesting colonies of Boatswain Bird Island, a steep, rocky, guano-covered islet lying 300 m off the coast of Ascension Island. Unlike pseudoscorpions elsewhere, which tend to be tiny, cryptic species, *G. titanius* hunts for its invertebrate prey in the open on the surface of the guano [2]. It is mainly active at night, preferring to shelter from extremes of temperature in crevices and under rocks during the day. The diet of *G. titanius* has not been studied in detail, but is likely to include many of the insect and arachnid ectoparasites and scavengers that dominate the invertebrate community of Boatswain Bird Island’s seabird colonies [1]. Duffey reported that captive individuals readily consumed houseflies (*Musca* sp.), suggesting that it is capable of tackling quite large prey [1]. The evolution of such a large size and unique foraging behaviour in this species is probably related to the limited faunal diversity on Ascension Island prior to human colonisation. This has enabled the ancestors of the giant pseudoscorpion to occupy an ecological niche that is barred to its relatives elsewhere by competition and predation [2].



Reproduction & life history
The reproductive ecology of <i>G. titanius</i> has never been described, but much can be inferred from studies of related species. In other Garypid pseudoscorpions, mating occurs without physical contact. Males deposit a package of sperm called a spermatophore onto the substrate which is somehow located by females and drawn into a genital opening called a gonopore [3]. Eggs are fertilised and begin developing internally and are then transferred to an external brood sac where they mature until protonymphs emerge [3]. These remain with the female for a short period and eventually disperse for a solitary existence [3]. Nymphs pass through three moult cycles before reaching maturity, after which they do not moult any further [3]. Many species spin protective, silken cocoons in which to moult or develop their brood sac [3].
Taxonomy & population structure
<i>Garypus</i> is a cosmopolitan genus comprised of approximately 25 species distributed throughout temperate and tropical areas of Africa, South Asia, Oceania, Mediterranean Europe and the Americas [3]. It seems likely that the ancestors of <i>G. titanius</i> reached Ascension Island by hitchhiking on the plumage of seabirds or on the legs of insects [2]. Such phoretic behaviour is common in pseudoscorpions, which frequently disperse by clinging to more mobile organisms [3].

4. Threats*		
8.1.1 Invasive non-native/alien species/diseases (unspecified species)	Impact:	UNKNOWN
<p><i>G. titanius</i> evolved its large size and distinctive foraging behaviour in an environment with low faunal diversity and very limited competition and predation. However, this situation is changing as a result of species introduced by people. At least one species of ant and several large species of cockroach colonised Boatswain Bird Island sometime between the surveys of Duffey (1958) [1] and Ashmole &amp; Ashmole (2000) [2] and are now highly abundant. The impacts of these introductions on <i>G. titanius</i> are unknown, but it is clear that even modest additions to the relatively simplistic invertebrate fauna of Boatswain Bird Island have the potential to fundamentally alter community structure. Moreover, Ashmole &amp; Ashmole speculate that predation by mice and larger, introduced invertebrates such as centipedes may have been responsible for exterminating <i>G. titanius</i> altogether on the main Island of Ascension [2]. If this is the case, their continuing presence will likely prevent any future range expansion, either natural or assisted. If allowed to reach Boatswain Bird Island, the consequences for <i>G. titanius</i> would be potentially disastrous.</p>		
*Threats are classified and scored according to the <a href="#">IUCN-CMP Unified Classification of Direct Threats</a> [4]		

Relevant policies and legislation
Local
<p><i>Garypus titanius</i> is protected locally under the <a href="#">Wildlife Protection Ordinance 2013</a>, which prohibits the damaging, killing or possession of protected species without license.</p> <p>Boatswain Bird Island is designated as a Sanctuary under the <a href="#">National Protected Areas Order 2014</a> and <a href="#">National Protected Areas Regulations 2014</a>, which prohibit all access to the Island without permit.</p>

Management notes
<p>The almost complete lack of information on the threats currently facing giant pseudoscorpions and on the status of the population means it is difficult to prescribe management measures or to assess the need for action. A re-assessment of the status and composition of the invertebrate community of Boatswain Bird Island and the collection of baseline abundance data is therefore needed as a first step in developing more focussed objectives, and could be combined with a more comprehensive reassessment of the Territory's understudied invertebrate fauna. Although specific threat data are lacking, the giant pseudoscorpion's highly restricted range is clearly one of its key vulnerabilities. Exploring whether the species can be induced to expand its range into the recently re-established mainland seabird nesting colonies may therefore be a worthwhile experiment. The Zoological Society of London has previously expressed an interest in developing a captive breeding programme which could provide a source of</p>



individuals for re-introduction trials, although the presence of non-native predators on the mainland may limit success. Preventing the introduction of these predators to the giant pseudoscorpion's remaining refuge of Boatswain Bird Island will be critical to the long term survival of the species and should be possible thanks to the strict access restrictions that apply to this site. Scientists and Government conservation staff undertaking seabird research are the only regular visitors to the Island and should adhere to a rigorous biosecurity policy to ensure that unwanted species are not accidentally introduced via equipment, clothing and bags.

## References

1. Duffey E (1964) The terrestrial ecology of Ascension Island. *Journal of Applied Ecology* **1**, 219–251.
2. Ashmole NP & Ashmole MJ (2000) *St Helena and Ascension Island: a natural history*. Anthony Nelson, Oswestry.
3. Harvey MS (2011) *Pseudoscorpions of the World, version 2.0*. Western Australian Museum, Perth.  
<http://www.museum.wa.gov.au/catalogues/pseudoscorpions>.
4. Salafsky N et al. (2008) A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions. *Conservation Biology* **22**, 897–911.