

## Ascension Island Species Action Plan

# SPINY LOBSTER



Photo: J. Brown

### SUMMARY

**Taxonomy:** Kingdom: Animalia; Phylum: Arthropoda; Class: Malacostraca; Order: Decapoda;  
Family: Palinuridae; Species: *Panulirus echinatus*

**Nativeness:** Native, breeding

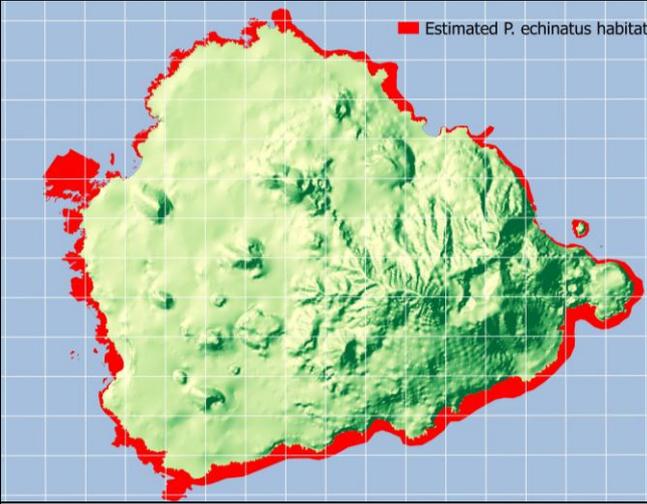
**Description:** Medium-sized, nocturnally active marine invertebrate with carapace length of up to 19cm (males) and 15cm (females). Found in rocky habitats where crevices and other refuges are present, down to a depth of around 30m. Adults are predominantly opportunistic, feeding on a variety of marine food sources, including scavenged material.

**IUCN Red List status:** Least Concern

**Local trend:** Unknown

**Threats:** Principle threat to this species harvesting in the recreational inshore fishery (at Ascension Island) and overexploitation by commercial and artisanal fisheries in many other areas of this species' range



Distribution	
<b>Global</b>	
Occurs in the tropical Western Atlantic and around islands of the Central Atlantic, including Ascension Island, St. Helena and Cape Verde [1,6,10,11].	
<b>Local</b>	
<p>Spiny lobster are found around the coast of Ascension Island, where there is rocky habitat, but are often seen more frequently on sublittoral lava flows such as those to the northwest, northeast and southwest of the island. However, distribution at a local scale is poorly understood, both due to their nocturnal nature and also a poor reporting rate from marine users, often due to concerns over “poaching” if locations are revealed. Suitable habitat is potentially distributed around the island, with the exception of several sandy bays but gaps in substrate mapping exist.</p>	
<p><b>Figure 1.</b> Distribution of estimated suitable habitat for <i>P. echinatus</i> around Ascension Island.</p>	

3. Status				
GLOBAL	Population estimate:	Unknown	IUCN status:	Least Concern
Global population size of spiny lobsters has not been formally assessed. However, elsewhere in the spiny lobster’s range several populations are experiencing a downward trend in densities, particularly at local scales [5, 8]. Despite the species being of commercial importance, particularly in Brazil, biological and stock information on this species is extremely lacking [6].				
LOCAL	Population estimate:	Unknown	Local trend:	Unknown
The increased population of Ascension Island in the 1970’s through to the 1990’s increased demand for spiny lobster caught on the island. Additionally, an informal enterprise of exporting spiny lobster from the island, particularly to the U.S.A. and U.S. bases in the Caribbean had noticeable effects on the abundance of spiny lobster in Ascension’s waters. Since the 2014 amendment to legislation which banned the export of spiny lobster from Ascension, consumption of lobster has been limited. However, a lack of baseline data and poor reporting of catches by recreational fishermen has resulted in the status of the stock around the island being unknown.				

4. Ecology	
Habitat & diet	
Adult spiny lobster are a benthic crustacean, being found in rocky habitat in the shallow sublittoral to a depth of around 25-30m and is primarily nocturnal in habit [1,5,6,11]. A crevice-dweller, it is often more abundant in areas of high rugosity that provide physical refuges and caves [4,5,6,11]. The species has also been shown to be gregarious, with multiple lobster cohabitating suitable caves and refuges [11]. As with many members of the genus <i>Panulirus</i> , it is an opportunistic feeder [6]. Molluscs, crustaceans, polychaetes and echinoderms are relatively frequent components in the diet of the spiny lobster [6]. Green and calcareous algae are also important constituents of diet [6]. Evidence of fish material in stomachs of specimens has been attributed to scavenging behaviour, rather than active hunting [11].	
Reproduction & life history	
Sexual dimorphism exists in spiny lobsters, with males usually attaining larger overall length than females, possibly due to the increased metabolic cost of reproduction in females [6,8]. Estimated size at first physiological maturity	



<p>(i.e. <math>L_{50}</math> – size at which cumulative proportion of mature individuals reaches 50%) of <i>P. echinatus</i> in Brazil is 37 mm carapace length for males [15] and 13.5 cm total length for females [16]. Information on the breeding season of the spiny lobster at Ascension, and elsewhere, is limited though other tropical species in the genus <i>Panulirus</i> have breeding periods spread throughout the year and often varying durations [2]. Additionally, there are pauses in reproductive activity for moulting. Breeding seasons of tropical <i>Panulirus</i> species may be influenced by environmental conditions (temperature, photoperiod), resulting in interannual shifts in the start of breeding of up to 1 month [14]. Female spiny lobsters carry eggs on their ventral side using adapted pleopods, a stage where a female may be known as “berried” [8]. As with most decapod crustaceans, spiny lobster have an obligate planktonic phase as larvae, though in spiny lobster this is relatively lengthy, staying in the plankton for upwards of 12 months [3,7]. Pueruli eventually reach a settlement stage, after which they moult and become miniature versions of the adult body-form [5]. Both adults and juveniles are found in rocky areas with crevices [4,5]. During the planktonic period, larvae have limited swimming ability and so in areas where mean water movement is away from the shore, there may be limited larval retention [7].</p>
<p><b>Taxonomy &amp; population structure</b></p>
<p>The long planktonic phase of spiny lobster larvae allows for transport over large distance, carried by currents [10]. Around Ascension, mean water movement is towards the north and west, with larvae dispersion models showing significant transport of larvae towards Brazil [7,9,10]. However, with lower numbers of spiny lobster in the eastern Atlantic it is unlikely that significant volumes of spiny lobster larvae are transported to Ascension from elsewhere, suggesting a net larvae deficit.</p>

4. Threats*		
<b>11.1 Climate change &amp; severe weather: habitat shifting and alteration</b>	<b>Impact:</b>	MEDIUM
<p>The physical structure of the habitat favoured by spiny lobster is unlikely to be directly affected by climate change. However, changes in water movement patterns may affect the dispersal of larvae and also sediment transport in inshore areas, possibly leading to the smothering of rock habitat in some areas.</p>		
<b>11.3 Climate change &amp; severe weather: temperature extremes</b>	<b>Impact:</b>	MEDIUM
<p>Rising temperatures may have unforeseen effects on spiny lobster populations. Studies have suggested that higher water temperature may in-fact increase growth rates in juvenile lobsters of the genus <i>Panulirus</i> (conducted in experimental conditions) [12]. However, calcareous algae have been shown to be an important resource for spiny lobster (aiding re-calcification following moulting) [6] so with the possibility of ocean acidification resulting from climate change there may be a negative effect on spiny lobster health and growth in wild populations. Also, tropical <i>Panulirus</i> species are more susceptible to shifts in the timing of onset of breeding due to temperature change [14].</p>		
<b>5.4.4 Fishing &amp; harvesting aquatic resources (unintentional effects, large scale)</b>	<b>Impact:</b>	HIGH
<p>This species of spiny lobster is of increasing commercial importance throughout its range, particularly in Brazil and associated offshore islands [4,6,7]. Interestingly, despite this importance there is no current legislation covering this species [8]. However, overexploitation of spiny lobster, either targeted or as bycatch, is considered the main pressure on stocks [2,5]. In Brazil, catches involving diving and spearfishing/gaffing have been shown to be significantly underreported [2], making assessment of stocks based on returns very challenging. Given the gregarious nature of the species [11] there is the potential for local populations to decline very quickly, even with fewer targeted fishing events [5]. The possibility of limited larval retention around Ascension Island may increase the pressures of population removal on spiny lobster stocks.</p>		
<b>8.1.2 Invasive non-native/alien species/diseases (named species)</b>	<b>Impact:</b>	MEDIUM
<p>Due to their long larval stages, <i>Panulirus</i> are considered to have strong potential as marine invaders using ballast water as a vector [3]. While multiple species of spiny lobster coexist in other regions, the effects of an invasive species of spiny lobster on a previously single-species lobster community are unclear. The spread of two species of lionfish <i>Pterois volitans</i> and <i>P. miles</i> may increase predation of smaller and juvenile spiny lobster as these predators are not native to Ascension Island but are rapidly increasing their range along the Brazilian coast [12].</p>		
<b>9.2.1 Industrial &amp; military effluents (oil spills)</b>	<b>Impact:</b>	LOW



Although unlikely, a major petrochemical spill at Ascension Island could have disastrous localised effects on the immediate marine environment.	
<b>9.1.2 Domestic &amp; urban waste water (run-off)</b>	<b>Impact:</b> NEGLIGIBLE
The currently small population of Ascension Island and distribution of habitat makes the effects of this threat very low.	
*Threats are classified and scored according to the <a href="#">IUCN-CMP Unified Classification of Direct Threats</a> [37]	

<b>Relevant policies and legislation</b>
<b>International</b>
No international legislation covering the spiny lobster <i>Panulirus echinatus</i> .
<b>Local</b>
Concerns over the overexploitation of spiny lobster stocks have resulted in some local legislative protection. Legislation preventing the export of spiny lobster from Ascension Island is included in the Ascension Island Customs Ordinance, CAP A6. A ban on the collection and harvesting of female spiny lobsters carrying eggs (or “in berry”) is covered by the Ascension Island Wildlife Protection Ordinance, enacted in 2013.

<b>6. Management notes</b>
Harvesting of spiny lobsters continues to be the key threat to stocks around the island. Underreporting of catches in the recreational fishery confounds the issue further. The implementation an inshore licencing scheme (for all marine resource extraction), including mandatory catch returns for selected species is a priority when attempting to understand the status of lobster populations around Ascension Island. In addition to this, information and data on the life history in this local stock is also important.

**SPECIES ACTION PLAN**

PROPOSED ACTION	OUTCOME(S)	TIMEFRAME	PROPOSED START	PRIORITY	LEAD*
Policy & Legislation					
Marine legislation through fisheries protection ordinance is enacted.	Legislation enacted	1 year	September 2016	HIGH	Director of Fisheries (AIG)
Develop, approve and implement policy document for fishing licences in the inshore fishery	1 policy document	1 year	September 2016	HIGH	Director of Fisheries (AIG)
Management					
Implementation of compulsory inshore fishery reporting scheme through fishing licences	Reporting scheme implemented	1 year	December 2016	HIGH	Head of Conservation (AIG)
Research & monitoring					
Conduct sub-littoral abundance surveys for <i>P. echinatus</i> using a combination of underwater visual censuses and fishing effort	1 report produced	1 year	April 2017	MEDIUM	Marine & Fisheries Unit (AIG)
Communication & Awareness Raising					
Erect information boards at access points and key fishing areas to inform of current legislation regarding banned practices, best practice and any licencing regulations	10 signs installed	1 year	October 2016	MEDIUM	Marine & Fisheries Unit (AIG)

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