

## 5-YEAR REVIEW

### Short Form Summary

**Species Reviewed:** Langford's Tree Snail (Akaleha', *Partula langfordi*)

**Current Classification:** Endangered

#### **FR Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90):28031–28034.

**Lead Region/Field Office:** Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai'i

#### **Name of Reviewer(s):**

Lauren Taylor, Fish and Wildlife Biologist, PIFWO

John Vetter, Animal Recovery Coordinator, PIFWO

Megan Laut, Recovery Team Manager, PIFWO

**Methodology used to complete this 5-year review:** This review was conducted by staff of the PIFWO of the U.S. Fish and Wildlife Service (USFWS), beginning in February 2024. The review was based on a review of current, available information since the last 5-year review for the Langford's tree snail (akaleha', *Partula langfordi*) (USFWS 2020, entire). The evaluation by Lauren Taylor, Fish and Wildlife Biologist, was reviewed by John Vetter, the Animal Recovery Coordinator, and Megan Laut, the Recovery Program Manager.

#### **Background:**

For information regarding the species' listing history and other facts, please refer to the USFWS Environmental Conservation Online System database for threatened and endangered species at <https://ecos.fws.gov/ecp/species/326>.

#### **Review Analysis:**

Please refer to the Recovery Plan for 23 Species in the Mariana Islands (USFWS 2023, entire) and the previous 5-year review for the Langford's tree snail published on August 7, 2020 (available at <https://ecos.fws.gov/ecp/species/326>), for a complete review of the species' status, threats, and management efforts. No new threats or no new information regarding the species biological status have come to light since listing to warrant a change in the Federal listing status of the Langford's tree snail as endangered.

The Langford's tree snail is a small land snail endemic to the island of Aguiuan. The adult shells are a buff color superimposed by a maroon band, with five whorls and a blunt apex, and grow up to 0.6 inches (14 millimeters) long and 0.4 inches (9 millimeters) wide (Kondo 1970, p. 77). The Langford's tree snail is found throughout the forests of Aguiuan on the undersides of large leaves of native trees and shrubs, including *Guamia mariannae* and *Aglaia* spp. and often co-occurs with the humped tree snail (*Partula*

*gibba*). No clear obligate relationship with any vegetation has been identified for the Langford’s tree snail, which consumes a diet of fungi and microalgae and lives in cool, shaded forest habitat and a microclimate of high humidity and reduced air movement that prevents excessive water loss. The species has generally been found in colonies numbering from a few individuals to less than a hundred snails, although Kondo (1970, p. 81) reported one colony of 168 Langford’s tree snails in 1952.

The lifespan of the Langford’s tree snail is unknown, but most partulids are slow-growing and long-lived snails. In captivity partulids become reproductively active around one year of age and live for over five years (Cowie 1992, p. 174), and most are ovoviviparous, meaning they produce live young from eggs which hatch within the body of the parent. The adult contains a small number of eggs and juveniles at different stages of development in the female reproductive tract and gives birth to single young at multi-week intervals. Langford’s tree snails are simultaneous hermaphrodites, meaning they have both male and female reproductive organs (Kondo 1970, pp. 76–77). In most partulids these organs are functional at the same time so that the species are capable of both outbreeding and self-fertilizing.

New status information:

- No surveys for tree snails have been conducted on Aguiguan since 2006, and the last recorded living observation of the species was made in 1992 (see USFWS 2020, entire). The number of living Langford’s tree snails in the wild is unknown. Systematic surveys should be performed throughout the suitable habitat for Langford’s tree snail on Aguiguan to determine if the species is extant.
- Overutilization is no longer considered a threat to the species as the practice of using partulid shells in jewelry and decorations appears to have ceased in the Mariana Islands (USFWS 2023, p. 21).

New threats:

- There are no new threats to the Langford’s tree snail known at this time.

New management actions:

- There are no new management actions for the Langford’s tree snail known at this time.

Table 1. Status and trends of the Langford’s tree snail from listing through current 5-year review.

<b>Date</b>	<b>No. Adult Wild Individuals</b>	<b>Downlisting Criteria Identified in Recovery Plan</b>	<b>Downlisting Criteria Completed?</b>
2015 (listing)	0	No recovery plan developed yet.	N/A
2020 (5-year review)	0	No recovery plan developed yet.	N/A
2023 (recovery plan)	Unknown	1. At least 10 stable populations distributed across its historical	No

		range. To be considered stable, each population must number at least 400 observed individuals distributed across all age classes, and 6 of the 10 populations must maintain populations greater than 400 observed individuals for 3 consecutive years. If differences in morphology or genetics are determined to exist based on geography, each must be represented by at least one population.	
		2. Each population in Downlisting Criterion 1 occurs in suitable habitat that is protected from development and invasive plants and animals (i.e., ungulate-free) and is managed to protect native forest vegetation.	No
		3. Biosecurity measures are in place to prevent the introduction of new predators to Aguiguan. The predation risk of each population in Downlisting Criterion 1 is evaluated and predators are absent or are controlled to a level where populations remain stable or increasing.	No
2024 (5-year review)	Unknown	1. At least 10 stable populations distributed across its historical range. To be considered stable, each population must number at least 400 observed individuals distributed across all age classes, and 6 of the 10 populations must maintain populations greater than 400 observed individuals for 3 consecutive years. If differences in morphology or genetics are determined to exist based on geography, each must be represented by at least one population.	No

		2. Each population in Downlisting Criterion 1 occurs in suitable habitat that is protected from development and invasive plants and animals (i.e., ungulate-free) and is managed to protect native forest vegetation.	No
		3. Biosecurity measures are in place to prevent the introduction of new predators to Aguiguan. The predation risk of each population in Downlisting Criterion 1 is evaluated and predators are absent or are controlled to a level where populations remain stable or increasing.	No

Table 2. Threats to the Langford's tree snail and ongoing conservation efforts.

<b>Threat</b>	<b>Listing Factor</b>	<b>Current Status</b>	<b>Conservation/Management Efforts</b>
Agricultural and urban development	A	Potential	None
Invasive animals (goats)	A	Ongoing	None
Invasive animals (rats, shrews)	A, C	Ongoing	None
Invasive animals (brown treesnakes)	A	Potential	Research into control methods for landscape-level use.
Invasive invertebrates (ants), including predation	A, C	Potential	None
Invasive plants	A	Ongoing	None
Typhoons and climate change	A, E	Ongoing	None
Predation by invasive invertebrates (New Guinea flatworms, predatory snails)	C	Ongoing	None
Inadequate existing regulatory mechanisms	D	Ongoing	Enhanced coordination between USFWS and Commonwealth of the Northern Mariana Islands Department of Lands and

			Natural Resources, Division of Fish and Wildlife (DFW), including the snail working group.
Wildfire	E	Potential	None
Limited numbers	E	Ongoing	None

### Synthesis:

The current range-wide population of the Langford’s tree snail is unknown. Downlisting and delisting objectives are provided in the Draft Recovery Plan for 23 Species in the Mariana Islands (USFWS 2023, pp. x–xi, 49–52). To be downlisted, at least 10 stable populations of at least 400 observed individuals distributed across all age classes must be observed throughout Aguiguan, and six of these populations must maintain a population of at least 400 observed individuals for three consecutive years. If differences in morphology or genetics are determined to exist based on geography, each must be represented by at least one population. The populations must be in suitable habitat protected from development and invasive plants and animals, and managed to protect native forest vegetation. In addition, predators must be absent or controlled to a level where these populations of Langford’s tree snails remain stable or increasing. There are no known sites of managed forest habitat on Aguiguan, secure from future development or vegetation clearing, or protected from predatory New Guinea flatworms (*Platydemus manokwari*) or other key threats to the species. Systematic surveys have not been performed throughout the suitable habitat for Langford’s tree snail on Aguiguan and it is not known if the species is extant, and if so, how many populations are remaining. Because there are no populations known to meet the downlisting requirements, the Langford’s tree snail continues to meet the definition of endangered, as it remains in danger of extinction throughout its range.

### Recommendations for Future Actions:

- Surveys and inventories – Exploratory surveys of suitable habitat are required to determine if the species is extant. Estimate the current population size island wide, and the structure (age classes) and distribution of the Langford’s tree snail within each colony site. Establish long-term monitoring sites, tracking trends and distribution of the colonies.
- Surveys and inventories – Map the remaining habitat for the Langford’s tree snail and assess the severity of threats, including from development and wildfires, to the persistence of the species in these areas.
- Surveys and inventories – Identify the degree of diversity within and between populations to assess the genetic connectivity throughout Aguiguan.
- Surveys and inventories – Track individual snails using telemetry to determine their activity patterns and ability to disperse.
- Surveys and inventories– Standardize recommended survey methodology and monitoring protocols for Langford’s tree snail colonies.

- Research – Perform dietary studies for the Langford’s tree snail to determine what constitutes a high-quality habitat to meet the species’ feeding needs. Assess what other microhabitat factors influence successful reproduction and distribution of the Langford’s tree snail.
- Research – Research to determine the best way to control or eradicate the New Guinea flatworm from essential Langford’s tree snail habitat will be critical to ensure the long-term persistence of the Langford’s tree snail.
- Conserve and enhance populations – At this time there are not sufficient colonies of number and size to support the population requirements needed to meet recovery criteria. Securing and managing the long-term conservation value of any colonies, i.e., by conservation easements or landowner agreements, is recommended for the persistence of the species. Protect the colonies from wildfire, development, and invasive animals and plants modifying habitat and preying on the Langford’s tree snail.
- Regulatory protection – Facilitate or encourage regulations and policy under Commonwealth of the Northern Mariana Islands laws to ensure protection of the Langford’s tree snail and control of the threats of ungulates and wildfire to occupied recovery sites.
- Regulatory protection – Facilitate or encourage comprehensive land use planning in Aguiguan, such as habitat conservation plans, conservation benefit agreements, fire management plans, and other conservation and restoration initiatives, to generate long-term commitments and partnerships for the recovery of the Langford’s tree snail.

**References:**

*See previous 5-year reviews for additional references.*

Cowie, R.H. 1992. Evolution and extinction of Partulidae, endemic Pacific Island land snails. *Philosophical Transactions: Biological Sciences* 335:167–191.

[USFWS] U.S. Fish and Wildlife Service. 2020. 5-year review for Langford’s tree snail (*Partula langfordi*). Pacific Islands Fish and Wildlife Office, Pacific Islands Interior Region 1, Honolulu, Hawaii. 10 pp.

[USFWS] U.S. Fish and Wildlife Service. 2023. Recovery Plan for 23 Species in the Mariana Islands. Portland, Oregon. xiv+102 pp.

**U.S. FISH AND WILDLIFE SERVICE**  
SIGNATURE PAGE for 5-YEAR REVIEW on Langford's Tree Snail (Akaleha',  
*Partula langfordi*)

**Pre-1996 DPS listing still considered a listable entity?** \_\_\_N/A\_\_\_

**Recommendation resulting from the 5-year review:**

- Delisting
- Reclassify from Endangered to Threatened status
- Reclassify from Threatened to Endangered status
- No Change in listing status

**Review Conducted By:**

Lauren Taylor, Fish and Wildlife Biologist, Pacific Islands Fish and Wildlife Office  
John Vetter, Animal Recovery Coordinator, Pacific Islands Fish and Wildlife Office  
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