Thomas' Lidflower
(*Calyptranthes thomasiana*)

5-Year Status Review:

Summary and Evaluation

(Photo: Omar A. Monsegur-Rivera, U.S. Fish and Wildlife Service)

U.S. Fish and Wildlife Service
Southeast Region
Caribbean Ecological Services Field Office
Boquerón, Puerto Rico
August 2024

5-YEAR REVIEW

Thomas' Lidflower (*Calyptranthes thomasiana*)

GENERAL INFORMATION

Current Classification: Endangered

Lead Field Office: Caribbean Ecological Services Field Office, Mayagüez, Puerto Rico

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Lead Regional Office: Atlanta Regional Office, Carrie Straight

Date of original listing: March 21, 1994 (59 FR 8138; February 18, 1994)

Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a status review is to assess each threatened species or endangered species to determine whether its status has changed and if it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) evaluated the biology, habitat, and threats of Thomas' lidflower to inform this status review. A notice of the initiation of this 5-year review was published by the Service in the Federal Register on May 11, 2023 (88 FR 30324), with a 60-day comment period. We received no public comments during this period. The primary sources of information used in this analysis were the recovery plan and amendment, personal communication with species experts, and other relevant literature. All recommendations resulting from this review are the result of thoroughly reviewing the best available information related to Thomas' Lidflower

FR Notice citation announcing the species is under active review:
May 11, 2023 (88 FR 30324)

Species' Recovery Priority Number at start of 5-year review (48 FR 43098**):** 11, Thomas' lidflower is recognized as a species with moderate degree of threat and low recovery potential.

Review History:
Previous 5-year reviews, recommending no change needed, were published on September 22, 2013 (Service 2013) and May 22, 2019 (Service 2019).

REVIEW ANALYSIS

Listed Entity

Taxonomy and nomenclature

Recent molecular phylogenetic work showed *Calyptranthes* to be related and sharing same ancestors (monophyletic) within *Myrcia*, resulting in a proposal to conserve the genus *Myrcia* against *Calyptranthes* (Lucas and Sobral 2011). This resulted in a research paper (Lucas et al. 2018), with a new group classification of the genus *Myrcia* in the broader sense, which includes the transfer of six Caribbean species from *Calyptranthes* to *Myrcia*. Consequently, the currently accepted name for *Calyptranthes thomasiana* O. Berg is *Myrcia neothomasiana* A.R. Lourenço and E. Lucas (2018). Although we accept this change in taxonomy, we will address the species as *Calyptranthes thomasiana,* as it was listed in the Act.

Although the list (50 CFR § 17.12) does not include a common name for this species, we are using the common name Thomas' lidflower because it is the name accepted for the species by practitioners (Center for Plant Conservation 2020, NatureServe 2024). The International Union for Conservation of Nature and Natural Resources uses the common name St. Thomas' lidflower (Barrios and Hamilton 2018).

Distinct Population Segment (DPS)

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing of a DPS to only vertebrate species. Because the species under review is a not a vertebrate, the DPS policy does not apply.

Recovery Criteria

Recovery Plan or Outline

Recovery Plan for the *Calyptranthes thomasiana* (Service 1997)
Amended Recovery Plan for *Calyptranthes thomasiana* (Service 2019)

Recovery plans are not regulatory documents and are intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved. If the recovery criteria defined in the plan are still valid, meeting recovery criteria can indicate that the species no longer requires protections under the Endangered Species Act (ESA; Act). However, when recommending whether a listed species should be delisted, the Service must apply the factors in section 4(a) of the Act (84 FR 45020).

The criteria for delisting Thomas' lidflower are as follows (Service 2019a):

1. The two (2) existing populations on the U.S. Virgin Islands, and two (2) existing populations on the British Virgin Islands show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factors A and E).

2. Populations that exist on privately owned lands on St. Thomas are protected and managed through a conservation mechanism (addresses Factor A).

3. Establish two (2) new populations on lands protected by a conservation mechanism, and these populations show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factors A and E).

4. Threat reduction and management activities have been implemented to a degree that the species will remain viable into the foreseeable future (addresses Factor C).

Currently, none of the criteria have been met.

Biology and Habitat Summary

At time that the recovery plan was approved, the Thomas' lidflower was known from the islands of Vieques (Puerto Rico), St. John (U.S. Virgin Islands), and Virgin Gorda (British Virgin Islands) (Service 1997). In the case of the population from Vieques Island, experts on the flora of the Caribbean have discovered that the specimens from Vieques were misidentified, and we now exclude the island from the range of the species (Axelrod 2011, Service 2013).

Thomas' lidflower was recently confirmed at Virgin Gorda and in a new locality at the Sage Mountain National Park in the island of Tortola (Barrios et al. 2017, Hamilton and Clubbe 2018). An assessment of the species in 2018 estimated between 1,000 and 2,000 mature individuals in the wild, but this inference was based on the availability of suitable habitat and not based on an actual population assessment (International Union for Conservation of Nature 2018). Based on the latest available information, the current estimate number of Thomas' lidflower individuals is approximately 690 plants of different age classes across its known range (Table 1). Based on known information, the recognized range is confined to the U.S. Virgin Islands (St. Thomas and St. John) and the British Virgin Islands (Virgin Gorda and Tortola) (Bárrios and Hamilton 2018). An account of each population is described in the following paragraphs.

St. Thomas, U.S. Virgin Islands. In 2019, the Thomas' lidflower population at St. Thomas, occurred in the general area between Signal Hill and Bolongo Bay, and was estimated between 30-40 individuals. The overall area where the species occurs in this population is surrounded by development, and the Service has identified the extirpation of individuals of other federally listed plants (e.g., *Zanthoxylum thomasianum*) in the area (Service 2022a). However, we have no information indicating this locality has been extirpated, thus, we continue to estimate 30-40 Thomas' lidflower individuals at this site (Table 1).

St. John, U.S. Virgin Islands. Based on historical records, we estimate approximately 100 individuals at the Bordeaux Mountain where a Thomas' lidflower population is known to occur (Table 1). In the previous species status review (Service 2019b), the Service reported approximately 1,000 individuals at the St. John population based on a Red Listing assessment (IUCN) (Bárrios, S. and M.A. Hamilton. 2018.). However, this estimate was based on a personal communication and not on a comprehensive population assessment, likely overestimating the population size. Moreover, a site visit by the Service to the Bordeaux site in December 2019

showed an adult population structure with abundant seedlings under the parent plants. However, there was no evidence of intermediate size classes and seedlings concentrated around the parent plant, suggesting a low seedling survival and recruitment along with little dispersal (Omar A. Monsegur-Rivera, Service, pers. obs., 2019). The reduction in the currently estimated number of individuals (100 adult plants) at Bordeaux Mountain compared to the previous status review does not imply a population decline and is instead a more conservative estimate based on the most recent observations by Service staff (Omar A. Monsegur-Rivera, Service, pers. obs., 2019). During the visit, evidence of trails and anthropogenic disturbance were also noted at this site, which is just near the boundary of the Virgin Islands National Park.

Virgin Gorda and Tortola, British Virgin Islands. In the 2019 status review, the Thomas' lidflower in the British Virgin Islands was estimated to be 80-110 individuals in the population at Virgin Gorda and 10 individuals within Sage Mountain National Park, Tortola (Barrios et al. 2017, Hamilton and Clubbe 2018). During recent visits to Virgin Gorda, surveyors estimated approximately 500 Thomas' lidflower individuals of different age classes, with an increase in the number of seedlings attributed to the canopy gaps associated to Hurricane Irma in 2017 (Barrios pers. comm. 2024; Table 1). Experts from Kew suggest that the number of individuals of the species may be greater, as the population may extend into adjacent suitable habitat that has not yet been surveyed (Barrios pers. comm. 2024). In the case of the population at Sage Mountain National Park, the most recent estimate is a maximum of 50 individuals (Barrios pers. comm. 2024; Table 1). Contrary to Virgin Gorda, at Sage Mountain there is no evidence of seedling recruitment, and the overall area shows a more closed canopy (Monsegur-Rivera, Service, pers. obs., 2024).

Table 1. Abundance of Thomas' lidflower at the four known localities in the U.S. Virgin Islands (UVI) and British Virgin Islands (BVI) (Service unpubl. data 2024).

Location	Historical Number of Adult Plants)	Current Number of Adults and Saplings (2024)
Bordeaux Mountain, St John, USVI	100º	100º
Signall Hill and Bolongo Bay, St. Thomas, USVI	1	30-40**
Gorda Peak National Park, Virgin Gorda, BVI	100º	500**
Sage Mountain National Park, Virgin Gorda, BVI	undetermined	50
Total	213	690**

º Number based on historical records, no information of current species abundance available.
** Numbers estimated based on past information or on observations from species' experts. No details on age classes are distinguished.

Available data on the habitat and distribution of Thomas' lidflower suggests the species occurs between 300 to 550 meters above sea level on Subtropical/Tropical Dry Forest (Gorda Peak) and

Subtropical/Tropical Moist Forest (Sage Mountain) (Barrios pers. comm. 2024). Flowering and fruiting of the species have been recorded between June to November (Barrios pers. comm. 2024).

Threats (Five-Factor Analysis) Summary

The status of a species is determined from an assessment of factors specified in section 4 (a)(1) of the Act. A detailed review of the species' threats can be found in the previous 5-year status reviews (Service 2013, 2019b) and in the recovery plan (Service 1998) of the species. A summary of current threats is detailed below.

A. Present or threatened destruction, modification or curtailment of its habitat or range:
The Thomas' lidflower continues to be threatened by habitat destruction and modification, especially in locations that are not protected and managed for conservation of protected species. In St. John, the Thomas' lidflower is found within the Virgin Island National Park, a federal land managed for conservation. At the time of listing, the Service considered that the species was threatened by park management practices and the presence of feral pigs and donkeys. At present, the best available information does not indicate park management practices are a current threat to the species. However, the population at Bordeaux Mountain is adjacent to Road 108, which runs through the Virgin Island National Park. Future improvements to this road may impact this population, and at present, the site shows evidence of erosion and remains vulnerable to potential landslides associated to the road embankment (Omar A. Monsegur-Rivera, Service 2019, pers. obs., 2019). In addition, the proximity of this population to the park boundary, makes the habitat vulnerable to modification from potential development in the adjacent private lands. For example, the Thomas' lidflower population in St. Thomas occurs within private lands surrounded by development, and the Service has identified the extirpation of individuals of other listed plants (e.g., *Zanthoxylum thomasianum*) in the area due to residential development (Service 2022a). It is likely that Thomas' lidflower is at risk in this location as well.

Exotic mammals such as white-tailed deer (*Odocoileus virginianus*) and wild domestic mammals such as feral goats (*Capra aegagrus hircus*), pigs (*Sus scrofa*), and donkeys (*Equus asinus*) are found throughout the range of the Thomas' lidflower in St. John and Virgin Gorda (Clubbe et al. 2003, Omar A. Monsegur-Rivera, Service, pers. obs., 2019). It is likely that these exotic mammals are modifying the forest structure by grazing and altering the seed dispersal mechanisms of rare and endangered plants (Chakroff 2010). Despite the lack of ongoing long-term monitoring of the Thomas' lidflower populations, the Service has evidence of adverse impacts caused by exotic mammals to other federally listed species (e.g., *Solanum conocarpum*) that occurs in neighboring habitat (Service 2022b).

In British Virgin Islands, despite the Thomas' lidflower populations at Virgin Gorda and Sage Mountain occurring within national park lands, there is potential for human trampling of individuals in the trail systems of the park and at the proximity of the trails (Clubbe et al. 2003; Barrios pers. comm. 2024).

B. Overutilization for commercial, recreational, scientific, or educational purposes:
Based on the available information; we have no evidence indicating the species is currently threatened by overutilization for commercial, recreational, scientific, or educational purposes.

C. Disease or predation:
Malumphy et al. (2019) recorded several insect pests (e.g., *Ceroplastes rubens* (pink wax scale), *C. stellifer* (stellate scale), *Paratachardina pseudolobata* (lobate lac scale) and an undetermined asterolecaniid (pit scale)) on mature Thomas' lidflower individuals. These pests may result in a lower photosynthetic efficiency and gas exchange, causing reduced growth and in some cases cause necrosis of the foliage, leaf loss, die back, and death of susceptible plants (Malumphy et al. 2019, Barrios pers. comm., 2024). These insect pests were documented in the British Virgin Islands, in addition at least one (lobate lac scale) has been documented in the U.S. Virgin Islands and has been documented as "much of the *Calyptranthes* at Hawk Hill on St. Thomas are heavily infested with this pest" (Lindsay et al. 2015). In infested populations, these pests may cause significant threat to individuals health and population viability.

D. Inadequacy of existing regulatory mechanisms:
At present the U.S. Virgin Island has adopted regulations that recognize and provide protection for the Thomas' lidflower. A detailed account of these regulatory mechanisms is included in the previous species status reviews (Service 2013, Service 2019b). As for the British Virgin Islands, the Thomas' lidflower occurs at the Gorda Peak and Sage Mountain National Parks, in areas managed for conservation and with well-defined boundaries (Barrios and Hamilton 2018). However, these protections are not fully adequate to protect the Thomas' lidflower from threats of habitat modification on non-conservation lands and threats caused by non-native species, the insect pests described above, nor the impacts from climate changes described below.

E. Other natural or manmade factors affecting its continued existence:
As described in the previous status reviews (Service 2013 and 2019), the species continues to be at risk from threats because of its limited distribution, specialized ecological requirements, and likely limited genetic variation making it difficult for the species to respond to catastrophic and stochastic events. In addition, the species is directly and indirectly impacted by invasive species, hurricanes, and climate change. Invasive species (e.g. *Leucaena leucocephala* and *Megathyrsus maximus*) may spread and colonized the Thomas' lidflower habitat, and it could alter fire regimes, microclimate, and nutrient cycling of the habitat that the species depend.

Hurricane Irma resulted in significant impacts to the forest structure at Virgin Gorda and Tortola. However, an assessment by Hamilton and Clubbe (2018) suggested the remnant native forest where the Thomas' lidflower occurs is resilient to hurricane impacts. A recent assessment of the habitat at the Sage Mountain population showed an intact forest structure with an open understory and little evidence of habitat encroachment by weedy exotics (Omar A. Monsegur-Rivera pers. obs., 2024). In the case of the Virgin Gorda population, experts noted an increase in the number of seedlings and saplings following the openings in the canopy as the result of Hurricane Irma (Barrios, Kew, pers. comm., 2024). However, long term monitoring is needed to determine if those new individuals effectively recruit into the population and contribute to the natural expansion of the species, and to determine if the canopy disturbance does not favor the habitat encroachment by weedy exotics in the long term.

Although hurricanes may provide some canopy openings, beneficial to Thomas' lidflower, other changes in climate like rising temperatures, increases in extreme heat events, and extreme

precipitation events (Runkle et al. 2022) could cause temporary or permanent impacts to the species. It is unknown what level of impact these changes may have on the species, but could impact pollination, seed production, and recruitment. Extreme precipitation associated with storms has resulted in landslides that could result in direct mortality of individuals.

Synthesis

Thomas' lidflower is a small evergreen shrub or small tree known only from the U.S. Virgin Islands and the British Virgin Islands. In 2018, the Thomas' lidflower numbers based on suitable habitat was estimated to be between 1,000 to 2,000 mature individuals in the wild. Based on the latest available information, the current estimated number of Thomas' lidflower individuals is approximately 690, divided in four natural populations across the species range: St. John and St. Thomas in the U.S. Virgin Islands and Tortola and Virgin Gorda in the British Virgin Islands. The St. John population remains vulnerable due to potential future road improvements, erosion, and potential landslides associated with road embankments. The St. Thomas population occurs within private lands and remains vulnerable to residential development. Across its range the Thomas' lidflower may be adversely impacted by exotic mammals altering its habitat and pest species which may result in damage and potentially death of susceptible plants. Changes in climate may have some future impact on the species. However, the Thomas' lidflower appears to have been resilient to the impacts from Hurricane Irma in 2017. Based on the ongoing threats, the species' habitat requirements, limited geographic distribution, low number of individuals, and little evidence of natural recruitment, we recommend the Thomas' lidflower remain listed as endangered.

RECOMMENDATIONS FOR FUTURE ACTIVITIES

A detailed discussion of recovery actions is presented in the Recovery Plan (Service 1997) and past 5-year status reviews (Service 2013, 2019a). In the course of this status review new and/or targeted potential recovery activities were identified and are included below.

Recovery Activities

- Develop and refine propagation protocols for the species.
- Assess and develop a protocol to rescue seedlings aiming to augment, reestablish, or introduce populations.
    - Prioritize identification of sites for population enhancement or species introduction.

Monitoring / Research Activities

- Conduct a comprehensive assessment of the Thomas' lidflower status (e.g., distribution, abundance, and threats).
- Conduct studies on the species' phenology and reproductive biology.
- Conduct studies to determine the patterns of species' genetic variation in order to develop a plan to preserve its germplasm.
- Monitor known populations on a regular basis and conduct additional surveys after hurricanes, landslides, or other major disturbances. All the known populations of the Thomas' lidflower should be monitored on the long term to determine its trend.

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RESULTS / SIGNATURES

U.S. FISH AND WILDLIFE SERVICE

Status Review of Thomas'Lidflower (*Calyptranthes thomasiana)*

Status Recommendation:

On the basis of this review, we recommend the following status for this species. A 5-year review presents a recommendation of the species status. Any change to the status requires a separate rulemaking process that includes public review and comment, as defined in the ESA.

___ Downlist to Threatened
___ Uplist to Endangered
___ Delist *(Indicate reasons for delisting per 50 CFR 424.11)*:
    ___ *The species is extinct*
    ___ *The species does not meet the definition of an endangered or threatened species.*
    ___ *The listed entity does not meet the statutory definition of a species.*
_X_ No change needed

FIELD OFFICE APPROVAL:

Field Supervisor, Caribbean Ecological Services Field Office, Fish and Wildlife Service

Approve LOURDES MENA Digitally signed by LOURDES MENA Date: 2024.08.01 10:04:27 -04'00' _____