

*Gesneria pauciflora*  
(no common name)

**5-Year Review:  
Summary and Evaluation**



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

**5-YEAR REVIEW**  
*Gesneria pauciflora* (no common name)

**I. GENERAL INFORMATION**

**A. Methodology used to complete the review:** On February 20, 2009, the U.S. Fish and Wildlife Service (the Service) published a notice in the *Federal Register* (74 FR 7914) announcing the 5-year review of the plant *Gesneria pauciflora* and requesting new information concerning the biology and status of the species. With this notice, we opened a 60-day public comment period but received no new information on *G. pauciflora* from the public.

This 5-year review summarizes new information regarding this plant since the species was listed and its recovery plan was completed. In conducting this 5-year review, we relied on the best available information pertaining to historical and current distributions, life histories, habitats, and potential threats of this species. Specific sources included the final rule listing this species under the Endangered Species Act; the Recovery Plan; peer reviewed scientific publications/reports; and unpublished field observations by the U.S. Fish and Wildlife Service. This draft 5-year review was shared with several peer reviewers (see Appendix A). Comments received were evaluated and incorporated as appropriate.

**B. Reviewers**

**Lead Region:** Kelly Bibb, Southeast Region. (404) 679-7132.

**Lead Field Office:** Jan P. Zegarra, Caribbean Ecological Services Field Office, Boquerón, Puerto Rico. (787) 851-7297, extension 249.

**C. Background**

**1. Federal Register Notice citation announcing initiation of this review:** February 20, 2009; 74 FR 7914.

**2. Species Status:** 2012. Stable. *Gesneria pauciflora* is threatened by a limited distribution. The species is only known from three localities in Puerto Rico where it grows in rocky streambeds on wet serpentine rock. Landslides, flood, and storm damage also affect the steep, unstable slopes associated with the species habitat. No new threats have been identified for the species.

**3. Recovery Achieved:** 1 (1=0-25% species' recovery objectives achieved).

**4. Listing History**

Original Listing

FR notice: 60 FR 12483

Date listed: March 7, 1995

Entity listed: species

Classification: threatened

**5. Associated rulemakings:** Not applicable.

**6. Review History:** On March 7, 1995, the Service published the final rule listing this plant (60 FR 12483) and the *G. pauciflora* recovery plan was approved and signed on October 6, 1998 (USFWS 1998). Both the final rule and the recovery plan serve as reference point documents for this 5-year review.

Recovery Plan: 1998

Recovery Data Call: 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 2001, 2000, 1999, and 1998.

**7. Species' Recovery Priority Number at start of review (48 FR 43098):** 11. *G. pauciflora* is recognized as a species with moderate degree of threat and low recovery potential.

**8. Recovery Plan:**

Name of plan: Recovery Plan for *Gesneria pauciflora*.

Date issued: October 6, 1998.

## II. Review Analysis

### A. Application of the 1996 Distinct Population Segment (DPS) policy

The Endangered Species Act (ESA or 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 DPS to only vertebrate species of fish and wildlife. Because the species under review is a plant, the DPS policy is not applicable.

### B. Recovery Criteria

**1. Does the species have a final, approved recovery plan containing objective, measurable criteria?** No. Although the species has an approved recovery plan with criteria to delist the species, the criteria are not fully measurable. The number of new self-sustainable populations needed to delist the species was not specified at the time the recovery plan was finalized.

**2. Adequacy of recovery criteria**

**a. Do the recovery criteria reflect the best available (most up-to-date) information on the biology of the species and its habitat?** No. The recovery plan does not specify the number of self-sustainable populations and number of individuals per population needed to delist the species.

**b. Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?** No.

**3. List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information.**

The recovery plan specifies that *G. pauciflora* may be considered for delisting when:

1. A management plan that considers the protection and recovery of the species has been prepared and implemented for the Maricao Commonwealth Forest (MCF); and
2. New populations capable of self-perpetuation have been established within protected areas, such as other areas in the MCF or in the Susúa Commonwealth Forest.

The plan specifies that these criteria are minimum requirements, and could be expanded upon if the regenerative or propagative potential of natural and *ex situ* populations proves insufficient. The plan also indicates that, if new populations of *G. pauciflora* are discovered, it may be preferable to place greater emphasis on protection rather than propagation in order to achieve the minimum number of plants for recovery (number not specified).

Although a specific MCF management plan has not been completed, we believe criterion 1 has been partially met. The Service and the Department of Natural and Environmental Resources (DNER) have a signed Cooperative Agreement under Section 6 of the ESA to establish endangered species programs in Puerto Rico. The species is listed by DNER as vulnerable and Commonwealth laws and regulations appropriately protect the species and their habitats within public forests. All public forests managed by the DNER emphasize the protection and conservation of species listed by the Commonwealth of Puerto Rico and the Service. The MCF is also designated as a Critical Wildlife Area (CWA) by the Commonwealth of Puerto Rico. The CWA designation constitutes a special recognition by the Commonwealth with the purpose of providing information to Commonwealth and federal agencies about the conservation needs of these areas and assisting permitting agencies in precluding negative impacts because of permit approvals or endorsements. The MCF is protected by the Law #133, as amended in 2000 (“Ley de Bosques de Puerto Rico” or The Puerto Rico Forest Law). Article 8, Section (a) of the Law protects the species by prohibiting damage to and collection of flora and fauna within public forests.

Criterion 2 has not been initiated. At present time, there is no information on establishment of new self-sustaining populations within protected areas. The recovery plan specifies that habitat requirements must be considered in order to ensure the success and relevance of transplanting propagated material. Propagation techniques for the species have not been developed.

## C. Updated Information and Current Species Status

### 1. Biology and Habitat

*G. pauciflora* is an endemic small gregarious shrub known to occur only on serpentine derived substrates with little or no soil formation and associated with wet habitats. The species was listed because of an extremely limited distribution and because of habitat threats and other natural threats like landslides. At the time of listing and when the recovery plan was signed, only three populations of this small shrub were known to exist in the western mountains of Maricao and Sabana Grande municipalities. Two of the three known populations are located in the Maricao Commonwealth Forest (MCF). The third locality lies on a Lajas River tributary outside of the MCF boundaries. Herbarium specimens indicate that the species has also been collected in the past from the Yagüez River and from “Cerro Las Mesas” in the Mayagüez municipality, but these sites have not been intensively surveyed. Landslides, storm damages, and floods are natural occurrences that may affect the steep, unstable slopes associated with this species’ habitat. Forest management practices such as trail construction may also directly affect this species. The recovery plan specifies that the largest population along the Maricao River locality has been estimated at approximately 1000 individuals and another population at 50 (Seco River locality).

Under a Cooperative Agreement with the U.S. Fish and Wildlife Service, the University of Puerto Rico, Rio Piedras campus, has initiated a two-year study that will generate fundamental information to improve our current knowledge on the vulnerability of this species and generate appropriate restoration and conservation plans. The goal of this project is to evaluate the vulnerability status of this species by studying its breeding system, its pollination and herbivore interactions, its phenology and demography dynamics and the possibility of inter-specific competition using monitoring techniques as well as *in situ* and *ex situ* experiments. This proposal will implement permanent plots that will be used for long-term monitoring.

- a. **Is there relevant new information regarding the species’ abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g. age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends?** Yes.

At least 1,050 individuals were known to occur in three populations in the western mountains of Maricao and Sabana Grande municipalities (Maricao River, Seco River and Lajas River tributary, Fig. 1) (USFWS 1998). During this review, the Service found that the DNER Natural Heritage Program has a record of a fourth population near the Bonelli River headwater within the MCF (Fig. 1), but does not include information on species’ abundance. This site was not visited during this review process, as it is in a remote location.

During October and November 2009, Service biologists visited two of the four populations of *G. pauciflora* to conduct a rapid assessment and evaluate habitat and threats. During the visits, the Service biologists located and reviewed the

Lajas River tributary and Maricao River localities and recorded new information. Because of the growth pattern of the species and the arrangement of the plants within a single patch, it is difficult to establish population estimates for each colony. It is not clear how many distinct individuals of *G. pauciflora* occur in one colony. It is uncertain if a large aggregate of *G. pauciflora* plants contains several different individuals or is simply one individual with lots of offshoots. For the purpose of this review, we consider each locality as one population consisting of numerous colonies or subpopulations.

Based on the information in the recovery plan, the population at the Lajas River tributary consists of four colonies or clusters (USFWS 1998). The tributary and most of the river is located on privately owned lands outside of the MCF boundaries and no populations have been located on the Lajas River itself (Breckon and Kolterman 1994). On October 31, 2009, Service biologists visited this locality with Dr. Breckon and discussed current conditions at the area. During the visit, we evaluated one of the four colonies previously reported. We estimated this colony to have less than 20 individuals and one of the individuals was in flower (cover photo). We were not able to verify the status of the other 3 colonies identified by Breckon and Kolterman (1994). According to Dr. Breckon (UPR, personal communication, 2009), this colony was the largest he observed at this site. Although he did not specify the number of individuals, he suggested that the colony currently has fewer individuals of *G. pauciflora*.

Along the Maricao River, the recovery plan reports thirteen colonies or clusters scattered for a distance of approximately 1 kilometer (USFWS 1998). This locality was reported to contain the largest population, and has been estimated to have as many as 1,000 individuals (CPC 1992). During the first week of November 2009, Service biologists visited a section of the Maricao River locality for an assessment of the area. Table 1 summarizes rough estimates for each colony recorded during the visit. Colony locations are approximate and were mapped according to a GPS coordinate or using the USGS topographic map (Fig.2). Biologists covered approximately 2.4 km (ca. 1.5 miles) along the Maricao River including areas that had not been previously searched. We estimated a range of 780 to 1,425 individuals in 12 colonies of which 6 were within areas not previously searched (colonies 7-12, Fig. 2). Two large colonies (11 and 12, Fig. 2) were found by Service biologist Omar Monsegur off an unmarked trail within the Maricao River watershed. All 2009 colonies recorded along the Maricao River were in bloom and had juvenile plants. The largest colonies were the most isolated and closer to the rivers headwater and associated drainages (Table 1, Fig. 2, colonies 7-12). On November 2012, the same 2.4 km along the Maricao River were surveyed and all except one colony were still present and in good shape. One of the two colonies found off an unmarked trail was affected by a natural landslide, essentially eliminating nearly all individuals from that colony. The species' ability to recolonize a site where it previously occurred is unknown.

Although it appears some colonies have disappeared, other large colonies were found in areas that had not been searched before. Based on the information gathered in this review and the observations in the field, the number of individuals in the Maricao River is considered stable, but the number of individuals in the Lajas River may have decreased. The current number of individuals in Seco River and Bonelli River are unknown.

Figure 1. Populations of *G. pauciflora* at Maricao, Seco, Lajas and Bonelli Rivers

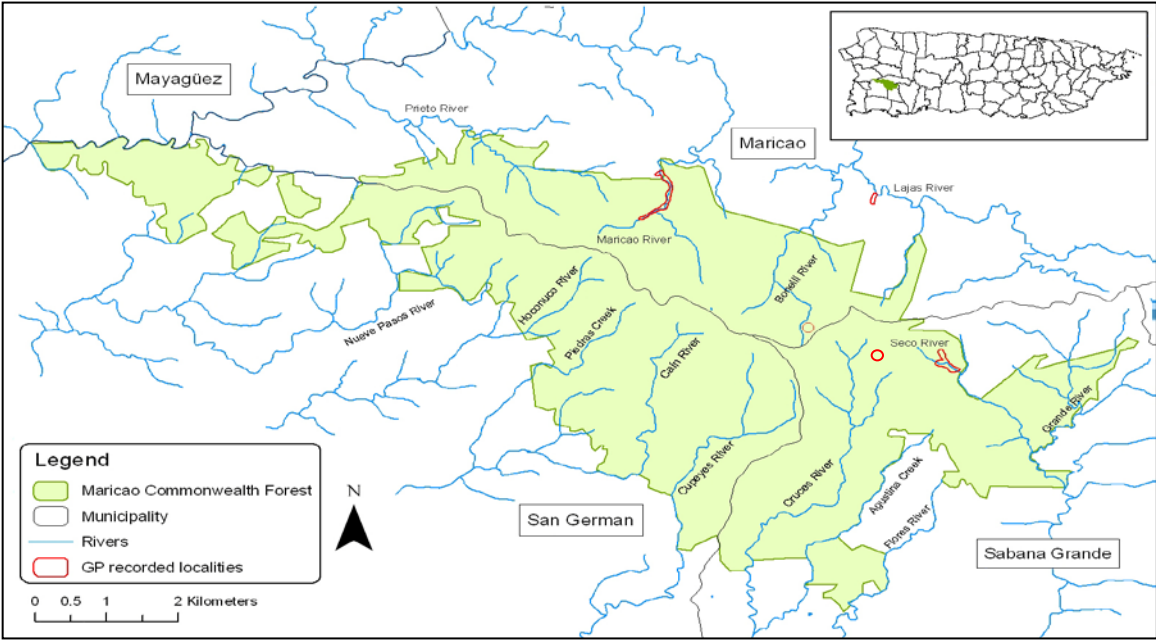
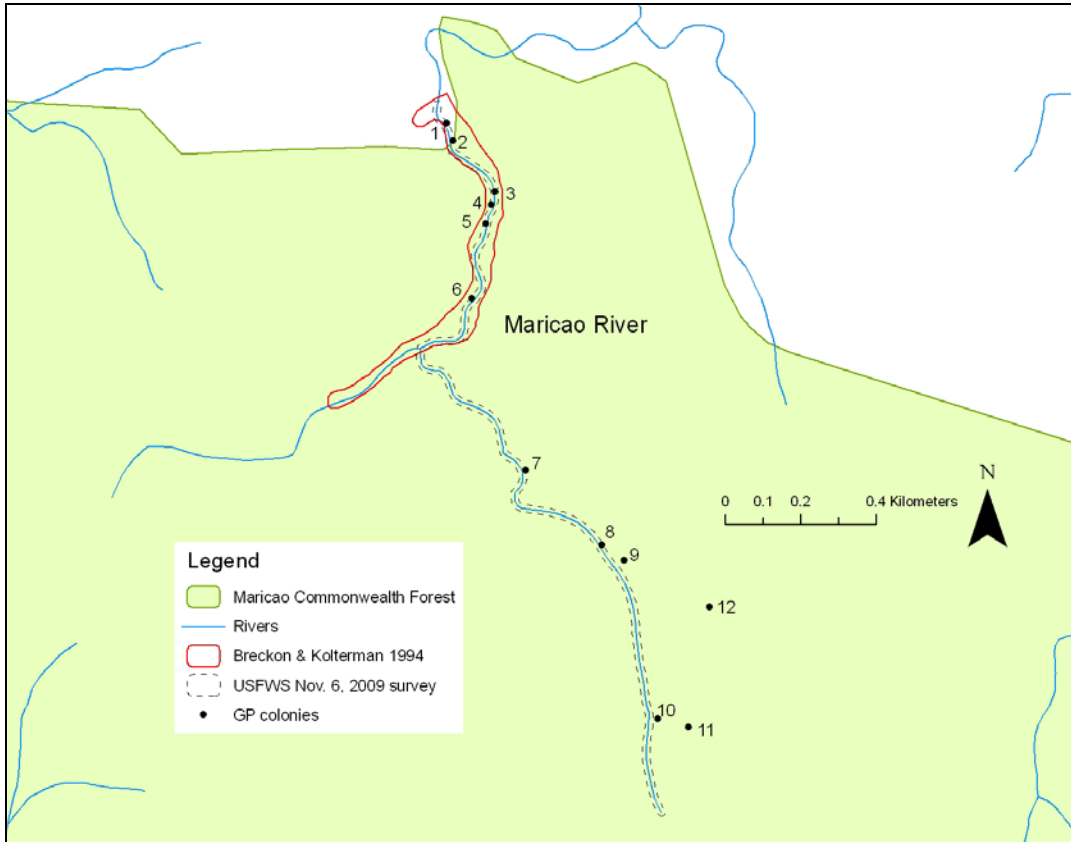


Table 1. Number of estimated individuals of *G. pauciflora* within each colony at the Maricao River locality (USFWS, unpublished data 2009).

Colony	Individuals per colony	Colony	Individuals per colony
1	5	7	50-75
2	50-100	8	100-200
3	15-30	9	100-200
4	10-20	10	75-150
5	100-150	11	100-200
6	75-100	12	100-200

Figure 2. *G. pauciflora* approximate locations of colonies within the Maricao River watershed.



- b. **Is there relevant new information regarding the species’ genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.)?** No.
- c. **Is there relevant new information regarding taxonomic classification or changes in nomenclature?** No.
- d. **Is there relevant new information regarding the species’ spatial distribution, trends in spatial distribution (e.g., increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g., corrections to the historic range, change in distribution of the species within its historic range, etc.)?** Yes. Although we did not search all the reaches of the river searched by Breckon and Kolterman (1994, Fig. 2), it appears we found less colonies. A personal communication (2009) with Rubén Padrón (former MCF forest manager), mentioned that one of the Maricao River colonies was completely gone after the pass of Hurricane Georges, but that other colonies remained. Other colonies at the Maricao River within Breckon and Kolterman’s (1994) search area (Fig. 2) might have disappeared because of hurricanes or other natural events (see the five factor analysis section). Nevertheless, based on our findings we believe that additional intensive surveys in the area may result in additional colonies in the watershed. There are still potential areas that have not



been previously searched. The prevalence of an existing colony seems to be directly related to the size and growth of the colony itself and its persistence to natural events (i.e., landslides, hurricanes, erosion). Larger colonies that endure through time will serve as source colonies for *ex situ* and *in situ* establishment of other populations.

A habitat predictability model was developed for the species by Service biologists. This model is being tested as part of a Cooperative Agreement with the University of Puerto Rico researchers. Preliminary results indicate that despite the availability of habitat, the distribution of the species is extremely limited. The species' ability to recolonize a site where it previously occurred is unknown, although it may be extremely low, based on the fact that no individuals have been found in some of the historical records for the species as in the Mayagüez "Cerro Las Mesas" locality.

- e. **Is there relevant new information addressing habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem)?** Yes. At the Maricao River locality, all colonies observed were associated with wet environments and most were on steep rock faces. Most had colonized the east side of the river and we observed some individuals submerged along the river's edge. The largest colonies were found in the headwaters within the Maricao River watershed. Some of these were associated with drainages.

Based on the habitat information available for this species, we can deduce and suggest potential suitable habitat for *G. pauciflora*. Three factors appear to be common habitat denominators for the species: (1) serpentine substrates, (2) wet habitats, (3) and predominantly areas on steep rock faces with little or no soil formation (i.e., steep seepages, waterfall spray zones, and above deep pools). In addition, the majority of the colonies described by Breckon and Kolterman (1994) were on north to northeast or northwest facing slopes and in situations where direct sun would be in the form of sunflecks. *G. pauciflora*'s highly specific habitat where few other species occur, suggests that its restriction to serpentine is due to the combination of tolerance (to low nitrogen and calcium levels, and to high levels of heavy metals) and poor competitive ability (Breckon and Kolterman 1994). The authors explain that rather than requiring serpentine for growth and reproduction, many serpentine endemics grow better on non-serpentine soils. However, it appears to be true for *G. pauciflora* that off serpentine, the species cannot compete with other non-serpentine species or they are subject to pathogens that occur on non-serpentine soil (Breckon and Kolterman 1994).

- f. **Is there any other relevant information on species?** Yes. An ongoing experiment that looks at the breeding system of *G. pauciflora* was initiated in September 2012 as part of the Cooperative Agreement with the University of Puerto Rico, Rio Piedras campus. Preliminary data suggests that this species is not apomictic (incapable of asexual reproduction through flowers) and that instead

flowers need to undergo the process of pollination to develop fruits. Hummingbirds are the only flower visitors so far observed but visit rates, however, are very low (e.g. maximum visitation rate was 0.004 flower visited/time observation/flower observed) and so is natural fruit production (32.5% of fruits end up maturing fruits). Flowers seem to be capable of some autogamy (self fertilization) but the rate of this process is low (10.6%).

Ongoing work under the Cooperative Agreement with the University of Puerto Rico, Rio Piedras campus, suggests that co-occurring riparian species (*Sellaginella* sp and *Chusquea* sp.) may be potential competitors as they are often found in similar habitats. Experimental removal experiments are being designed as a way to evaluate the germination (and colonization) potential of *G. pauciflora* in the presence or absence of these species. Seed viability and germination rates will also be carried out in field and laboratory conditions (the last one using a growth chamber). These experiments will provide us information about variables precluding or enhancing *G. pauciflora* establishment and will be an additional way to identify the habitat in which re-introductions could be performed.

## **2. Five-Factor Analysis**

### **(a) Present or threatened destruction, modification, or curtailment of its habitat or range:**

At the time of listing, trail construction within the MCF was identified as a threat because it may increase the potential for erosion of the steep unstable slopes where the species occurs. However, former MFC managers (Adrian Muñíz and Rubén Padrón, PRDNER, personal communication, 2009) confirmed that no trails have been constructed in the MCF for over 50 years and that maintenance of current trails does not affect known populations of *G. pauciflora* in the forest, because the species does not occur within or near the existing trails. These trails are maintained 2 to 3 times per year with hand machinery (trimmers and machetes) and are repaired only if significant erosion has occurred because of natural events. Two of the twelve colonies of *G. pauciflora* at the Maricao River watershed were found off an unmarked trail that runs almost parallel to the river (Fig. 2, colonies 11 and 12). If that trail is improved without implementing protective measures, it can adversely affect these colonies. On November 2012, one of these colonies was observed to have been almost completely extirpated because of a natural landslide that occurred in that area (see Factor E).

Based on the observations during the site visit of the Lajas River tributary, habitat modification related to landslides was documented. The area is located outside of the boundary of the forest and is privately owned. There was evidence of a small landslide on the rock wall at the entrance of the tributary. We also observed a PVC tube running up along the tributary and evidence of a footprint trail along the edge. The dirt road leading up to the tributary is open to the public and we observed five all-terrain vehicles heading up the road, possibly contributing to erosion on that locality. This locality is adjacent to a highly visited waterfall and natural pool area known as “Salto Curet”. The

human activities in the area may contribute to erosion of the small tributary and may modify the habitat conditions needed by the species. If the access to the “Salto Curet” area is expanded, or amenities are developed, these activities may affect the individuals at this locality.

Based on the above, we believe that the species is currently threatened by habitat modification.

**(b) Overutilization for commercial, recreational, scientific or educational purposes:**

At present time, we are not aware of overutilization of this species for commercial, recreational, scientific or educational purposes. We believe that this factor should not be considered a threat for the species.

**(c) Disease or predation:**

Ongoing monitoring studies under the Cooperative Agreement with the University of Puerto Rico, Rio Piedras campus has shown that bud and flower predation is not uncommon in *G. pauciflora*. A total of 119 buds distributed across 15 plants were monitored and 24.37% were parasitized by a plume moth of the family Pterophoridae. Planned phenology studies will help us identify the extent by which this herbivore is capable of depressing reproduction in *G. pauciflora*. At this time, we believe that this factor should not be considered a threat to the species. More information is needed on the degree of threat that flower predation represents on *G. pauciflora* and how it may be a potential risk for this species (limiting fruit production).

**(d) Inadequacy of existing regulatory mechanisms:**

At the time of listing, this factor was considered because *G. pauciflora* was not yet listed under Commonwealth law. At present time, local laws and regulations protect the species. In 1999, the Commonwealth of Puerto Rico approved the Law # 241 known as the New Wildlife Law of Puerto Rico. The purpose of this law is to protect, conserve and enhance both native and migratory wildlife species; declare property of Puerto Rico all wildlife species within its jurisdiction, regulate permits, regulate hunting activities, and regulate exotic species, among others. The Puerto Rico DNER approved in 2004 Regulation 6766 to regulate the management of threatened and endangered species in the Commonwealth of Puerto Rico. In this document, DNER designated *G. pauciflora* as vulnerable. Regulation 6766 under Article 2.06 prohibits collecting, cutting, removing, among other activities, listed plant individuals within the jurisdiction of Puerto Rico.

One fact to consider is that enforcement on private lands has always been a challenge and accidental damage or removal of plants may occur due to the lack of knowledge of the species by private landowners.

Based on the above, this factor is no longer considered a threat to the species.

**(e) Other natural or manmade factors affecting its continued existence:**

Landslides, storm damage, and floods are natural occurrences that may affect the steep, unstable slopes associated with *G. pauciflora* habitat and may result in loss of individuals, as they may be smothered, washed or simply ripped off their substrate and rock faces. These effects are further aggravated by tropical storms and hurricanes in Puerto Rico. After the last known *G. pauciflora* investigation report (Breckon and Kolterman 1996), two hurricanes have affected the island. Hurricane Hortense passed in September 1996 and Hurricane Georges in September 1998 significantly affecting the island's landscape. A personal communication (2009) with Rubén Padrón (former MCF forest manager), mentioned that one of the Maricao River colonies was completely gone after the pass of Hurricane Georges, but that other colonies remained. As mentioned earlier, two of the twelve colonies of *G. pauciflora* at the Maricao River watershed were found off an unmarked trail that runs almost parallel to the river (Fig. 2, colonies 11 and 12). On November 2012, one of these colonies was observed to have been almost completely extirpated because of a natural landslide that occurred in that area. This demonstrates the vulnerability of the species to such natural events, as most of the remaining colonies seem to be susceptible to landslides.

Based on the above, we believe that the species is currently threatened by other natural and manmade factors.

**D. Synthesis**

*Gesneria pauciflora* is an endemic small gregarious shrub known to occur only on serpentine derived substrates with little or no soil formation and associated with wet habitats. It was listed as threatened in 1995 because of an extremely limited distribution and because of habitat threats.

At the time of listing and when the recovery plan was signed, at least 1,050 individuals in three populations were known to exist in the western mountains of Maricao and Sabana Grande municipalities. Two of the three populations were located within the MCF.

Based on the information gathered for this review and observation during an assessment conducted by Service biologists, we recorded between 800 to 1,500 individuals in the two visited populations. The number of individuals in the remaining two known populations is unknown. *G. pauciflora* status seems stable, but not without concern. The species is currently threatened by Factor A, C and E. Human activities that cause habitat disturbance may adversely affect susceptible colonies, particularly those outside of the MCF boundaries. Landslides, storm damage and floods may also adversely affect the species' habitat and may result in the loss of individuals.

### III. RESULTS

#### A. Recommended Classification:

  X   No change is needed

#### B. New Recovery Priority Number: No change.

### IV. RECOMMENDATIONS FOR FUTURE ACTIONS

Establish the number of populations and number of individuals per population needed in order to consider delisting the species.

Develop propagation techniques, establish *ex situ* populations in botanical gardens, and introduce individuals in protected areas.

Model potential suitable habitat using GIS tools to search for new populations and continue searching within known localities for new colonies.

Mark and protect colonies 11 and 12 located at the Maricao River watershed to minimize possible effects, if the trail is improved.

Establish a once a year monitoring schedule for known populations and after any significant weather event (i.e. hurricanes).

Conduct studies of the known populations to determine intra- and inter-population genetic diversity.

Investigate pollination and seed dispersal mechanisms to determine the species strategies for dispersal.

Evaluate seed viability and germination and growth requirements.

Conduct studies to evaluate the degree of threat that flower predation in *G. pauciflora* represents a potential risk for this species (limiting fruit production).

Conduct studies to evaluate if common pioneer species of riparian areas are potential habitat competitors for *G. pauciflora*.

Select appropriate sites for population introduction.

Explore the opportunity to enter into a Service Partner's for Fish and Wildlife Agreement with the landowner to conserve the area and restore suitable habitat for the species.

## V. REFERENCES

- Breckon, G.J. and D.A. Kolterman. 1994. Final Report on *Gesneria pauciflora*. Cooperative Agreement No. 1448-0004-93-973 between the U.S. Fish and Wildlife Service and the University of Puerto Rico, Mayagüez Campus.
- Breckon, G.J. and D.A. Kolterman. 1996. Final Report on *Gesneria pauciflora*. Cooperative Agreement No. 1448-0004-94-9113 between the U.S. Fish and Wildlife Service and the University of Puerto Rico, Mayagüez Campus.
- Center for Plant Conservation. 1992. Report on the rare plants of Puerto Rico. Center for Plant Conservation, Missouri Botanical Garden, St. Louis, Missouri.
- Department of Natural and Environmental Resources. 2004. Reglamento para Regir el Manejo de las Especies Vulnerables y en Peligro de Extinción en el Estado Libre Asociado de Puerto Rico. 60pp.
- U.S. Fish and Wildlife Service. 1998. Recovery Plan for *Gesneria pauciflora*. Atlanta, Georgia. 16pp.

**U.S. FISH AND WILDLIFE SERVICE**  
**5-YEAR REVIEW of *Gesneria pauciflora* (No common name)**

**Current Classification:** Threatened


**Recommendation resulting from the 5-Year Review:**

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change is needed

**Review Conducted By:** Jan P. Zegarra, Caribbean Ecological Services Field Office

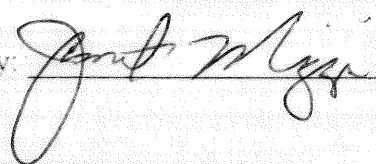
**FIELD OFFICE APPROVAL:**

**Edwin E. Muñiz, Lead Field Supervisor, U.S. Fish and Wildlife Service**

Approved By:  Date 3/6/13

**REGIONAL OFFICE APPROVAL:**

**Cynthia Dohner, Lead Regional Director, Fish and Wildlife Service**

Approved By:  Date 4/24/13

**Appendix A. Summary of peer review for the 5-year review of *Gesneria pauciflora* (No common name)**

**A. Peer Review Method:** We requested peer review from several knowledgeable individuals. Responses were received from the University of Puerto Rico peer reviewers.

Dra. Elvia Meléndez-Ackerman and Melvin E. Pérez (PhD candidate)  
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Department of Natural and Environmental Resources  
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San Juan, Puerto Rico 00940  
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E-mail: jsustache@drna.gobierno.pr

**B. Peer Review Charge:** Peer reviewers were asked to evaluate the document and the science presented in it. They were asked to share any new information or comments/edits they had on the evaluation. They were not asked to comment on the status recommendation.

**C. Summary of Peer Review Comments/Report:** Consolidated comments were received from University of Puerto Rico representatives. Peer reviewer responses were supportive of the information and conclusions presented in this review and limited to updated species information as a result of an ongoing cooperative agreement for the recovery of the species between the Service and the UPR, Rio Piedras campus.

**D. Response to Peer Review:** The Service was in agreement with all comments and concerns received from peer reviewers. Comments were evaluated and incorporated into the 5-year review where appropriate.