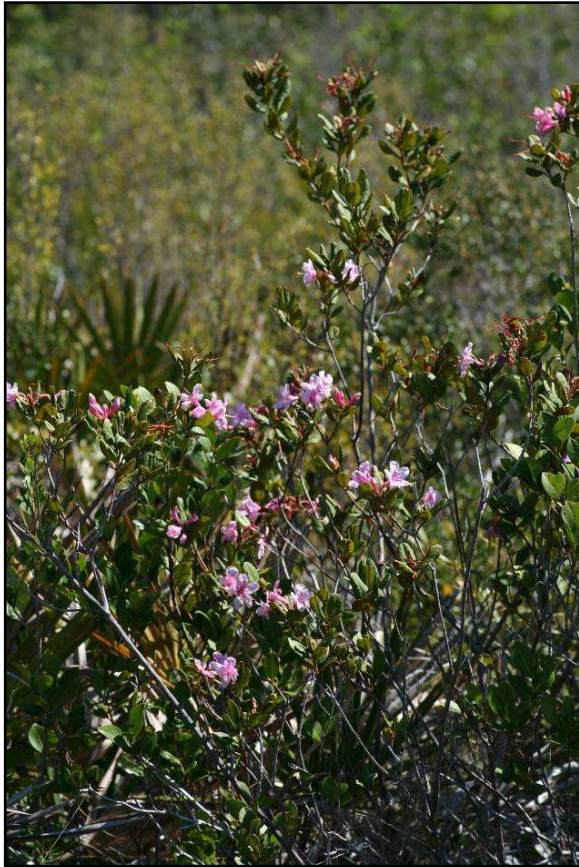


Rhododendron minus var. *chapmanii*
Chapman's Rhododendron

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



St. Joseph State Buffer Preserve, Gulf County
Photos by Vivian Negrón-Ortiz

**U.S. Fish and Wildlife Service
Southeast Region
Panama City Field Office
Panama City, Florida**



5-YEAR REVIEW
Rhododendron minus var. chapmanii*
(Chapman's Rhododendron)

[*see II C c for update on taxonomy]

I. GENERAL INFORMATION

A. Methodology used to complete the review

This review was accomplished using information obtained from the Recovery Plan of September 1983, unpublished field survey results, reports of current research projects, peer reviewed scientific publications, unpublished field observations by U.S. Fish and Wildlife Service (Service), State and other experienced biologists, and personal communications. These documents are on file at the Panama City Field Office. A *Federal Register* notice announcing the review and requesting information was published on April 9, 2009 (74 FR 16230). We received information from the Bok Tower Garden (BTG) related to live specimens, seeds and their conservation work. The comments were incorporated into the document as appropriate. No part of this review was contracted to an outside party. Comments and suggestions from peer reviewers were incorporated as appropriate (see Appendix A). This review was completed by the Service's lead Recovery botanist in the Panama City Field Office (PCFO), Florida.

B. Reviewers

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C. Background

- 1. FR Notice citation announcing initiation of this review**
74 FR 16230 (April 9, 2009)

2. Species status: Stable (Recovery Data Call 2009) for two of the three populations. The status for the Liberty/Gadsden population is unknown until the Element of Occurrences¹ (EOs or occurrences) are revisited. See section II.C.1.a. for current information.

3. Recovery achieved: 1 (1=0-25% recovery objectives achieved); see section II.B.3 for details on recovery criterion and actions, and how each action has or has not been met.

4. Listing history

Original Listing

FR notice: 44 FR 24248

Date listed: April 24, 1979

Entity listed: species

Classification: endangered

5. Associated rulemakings

Not applicable

6. Review History Status Review: 5-year review: November 6, 1991 (56 FR 56882), in this review different species were simultaneously evaluated with no species-specific in-depth assessment of the five factors, threats, etc. as they pertained to the species' recovery. The notices summarily listed these species and stated that no changes in the designation of these species were warranted at that time. In particular, no changes were proposed for the status of *R. chapmanii*.

Recovery Data Call: 2000, 2001, 2002, 2003; 2004; 2005; 2006; 2007; 2008; and 2009

Recovery Plan: 1983

7. Species' Recovery Priority Number at start of review (48 FR 43098):

The Chapman's Rhododendron is assigned a recovery priority of 8C because the degree of threat is moderate, and is a species that has a high recovery potential, but is in conflict with development and growth.

8. Recovery Plan

Name of plan: Chapman's Rhododendron Recovery Plan

Date issued: September 8, 1983

¹ Element Occurrence (EO): an area of land and/or water in which a species or natural community is, or was, present. For species, it corresponds with the local population (portion of a population or a group of nearby populations). It is also referred to as occurrence, location, or site.

II. REVIEW ANALYSIS

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

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 DPS to only vertebrate species of fish and wildlife. Because *R. chapmanii* is a plant, the DPS policy is not applicable and not addressed further in this review.

B. Recovery Criteria

1. Does the species have a final, approved recovery plan containing objective, measurable criteria? Yes.

The recovery plan included a recovery objective for downlisting the species. The objective was to reverse the decline in population and increase it to the point that the listing status can be changed from endangered to threatened.

2. Adequacy of recovery criteria.

a. Do the recovery criteria reflect the best available and most up-to-date information on the biology of the species and its habitat?

No. The recovery criteria were based on the best available data at the time the plan was published 26 years ago.

b. Are all of the 5 listing factors² that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?

No. The recovery plan only addressed factor A – habitat destruction and modification, which is still a threat. See sections II.B.3 and II.C.2 for description of current information and threats.

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 criteria address factor A. Factor B is addressed by recovery action 2. Factor C is not relevant to *R. chapmanii*. Factor D, although relevant to this species, was not addressed by the Recovery Plan.

Evaluation of Criteria:

1. The dense 10-acre population near Hosford is maintained stable or increasing.

² A) Present or threatened destruction, modification or curtailment of its habitat or range;
B) Overutilization for commercial, recreational, scientific, or educational purposes;
C) Disease or predation;
D) Inadequacy of existing regulatory mechanisms;
E) Other natural or manmade factors affecting its continued existence.

We do not have data to assess this criterion.

2. The remaining part of the Hosford population continues to occupy at least 200 acres with at least 500 plants.

We do not have data to assess this criterion.

3. The Gulf County population continues to occupy at least 200 acres with at least 500 plants.

An estimated 983 (or plants) clumps are potentially present in the Gulf County locations (see IIC1a). This is an estimated number because the majority of the EOs has not been censused since 1997.

4. The Camp Blanding Military Installation (Camp Blanding) population continues to have at least 20 plants.

This population has 31 clumps (or plants) and is stable.

5. There is a permanent increase of about 1,000 plants in any combination of sites 2, 3, and 4 to increase to a total of at least 2,000 plants at these sites.

This criterion means at least 6,000 plants present at these sites. Based on FNAI 1997 surveys, Camp Blanding and Gulf County current data, an estimated 3,172 clumps (plants) are potentially present.

We summarize our progress under existing recovery actions below. Recovery actions 1-4 address factor A. Recovery action 1 addresses factor B.

Recovery Action 1: Stop population and habitat decline by protection, management and monitoring

This is an ongoing action.

Establish cooperative agreements with landowners

At present, cooperative agreements have not been established with the St. Joe Timberland Company (Timberland Company) for the Liberty/Gadsden population (Hosford population). According to A. Johnson (FNAI ecologist), The Nature Conservancy had an agreement with the Timberland Company in the 1980's.

Habitat protection

To date, two protected populations have been secured: one population of about 260+ clumps³ on the St. Joseph Bay State Buffer Preserve (SJBSBP), Gulf County, and one population at Camp Blanding, Clay County composed of 31 clumps. The Hosford population has not been secured. The land was proposed for state acquisition in 2002 as a Florida Forever project (Hosford Chapman's Rhododendron Protection Zone) but it was not ranked in the top two categories for acquisition, i.e. "top 21" or category A. It was ranked by the Acquisition and Restoration Council (ARC) council in Category B.

Individual plant protection

We have been closely working with the managers of the SJBSBP, and Camp Blanding.

³ Clump: genet; one or a cluster of rooted stems representing a plant.

Proper management

Management with prescribed fire has been implemented for the population at SJBSBP. This is done with a 3-5 yr interval burn rotation. The Camp Blanding staff cleared the encroaching vegetation at the *Rhododendron* site in 2005 (Hall 2005) and in subsequent 2008 and 2009 survey periods; prescribed fire is planned for 2010 (S. Oxenrider, 2010, pers. comm.).

The Hosford population was burned in 2001 by The Nature Conservancy under a grant with the Florida Natural Areas Inventory (FNAI); only 10 acres were burned (M. Jenkins, 2010, pers. comm.). The site appeared to have been burned in about 6-8 yr interval rotation. Presently, the Camp Blanding and the Hosford sites are in need of prescribed fire.

Monitoring

Monitoring was initiated in 2007 by the PCFO botanist for the SJBSBP population; the Camp Blanding population has been monitored since 2005 (see section II.C.1.a). Monitoring has not been implemented for the Hosford population. The Hosford and Gulf populations were surveyed by FNAI in 1996 in 6 plots initially set up by FNAI in 1985.

Recovery Action 2: Strengthening existing populations

Strengthening existing populations (augmentation) involves the addition of individuals to a geographic area that is currently known to contain the taxon. The goals are to increase the number of individuals and the genetic variability in a population. However, a major concern is that it may negatively alter the genetic composition of the pre-existing population. The risk of outbreeding depression is not trivial, so in order to reduce the risk, the source stock for augmentation should be chosen from the same or a geographically adjacent population (within a 1,000 meter radius of wild individuals without barriers to gene flow; http://www.botany.hawaii.edu/faculty/duffy/DPW/2003_MIP/Sec_1/16.pdf), and preferably after an assessment of the genetic variability within and among populations of *R.minus* var. *chapmanii* (hereafter *R. m. chapmanii*).

Augmentation could be initiated if the following changes occur (modified from http://www.botany.hawaii.edu/faculty/duffy/DPW/2003_MIP/Sec_1/16.pdf):

1. If the numbers of mature individuals show declines of 10% for two subsequent years and there is no significant seedling recruitment, and
2. If the numbers of mature individuals decline >20% in a single year

According to the Recovery Plan, 100-200 plants were taken from the Hosford population by growers and planted in Tallahassee, FL for ornamental purposes. The Plan suggested reintroducing cuttings from the collected plants to the wild in the areas where they were taken. Augmentation is not plausible at the moment because we do not have 1) the locations where these plants are currently growing; 2) an agreement with the private landowner to conduct this action; and 3) an assessment of the genetic variability within and among populations.

Augmentation was also recommended for the Camp Blanding population if the number of clumps decreases below 20 per acre, and if the site shows a decline of more than 30% of rhododendrons after the initiation of monitoring. At present, the population is composed of 31 clumps and seems to have been stable since 2005 (see section II.C.1.a. for details), thus augmentation is not currently necessary.

Therefore, this recovery action, specific for the Hosford and Camp Blanding populations, has not been taken, and perhaps it should be revoked as a compelling action.

Recovery Action 3: Establish new populations

This recovery action has been partially met.

Establishing new populations could be accomplished via reintroduction or translocation. The goal is the establishment of a viable reproducing population where cross-pollination can occur, genetic variation is maintained, and minimal long-term management is required. Reintroduction should be restricted to the historic geographical range of the species. Translocation, the introduction of a species to a site outside the known historical range, could offer a best management option if the site provides the only place safe from the threats that brought the species to endangerment, or if the historical range no longer contains the most appropriate habitat including suitable moisture and soil composition.

Determine historical range

Historic geographical range represents the entire geographical distribution of a species known to date. *Rhododendron m. chapmanii* is at present endemic to Florida, and occurs in Gulf, Liberty, Gadsden, and Clay counties.

Locate suitable habitat

FNAI did an aerial survey for *R. m. chapmanii* in the 1980's at a time when it was blooming; they found numerous potential habitats between the Gulf and Gadsden county populations but without *R. m. chapmanii*. Thus, this action could include a combination of aerial photographs to survey between Gadsden/Liberty counties and Clay County, and species distribution modeling methods to initially determine potential sites, with subsequent validation or inspection of the sites for plants and suitability of habitat.

Obtain permission and cooperation for establishing planting

No projects have been identified at this time.

Collect seeds

There are 1,700 seed in refrigerated storage at the Bok Tower Garden (BTG), Lake Wales, FL from collections made in 2007 at the SJBSBP.

Grow plants

Bok Tower Garden had no success with root or stem cuttings despite quite successful and widely used commercial protocols (Gensel and Blazich 1985). According to BTG, germination rates were high, but seedlings died around three months of age from unknown causes. Mycorrhizal association has been reported for other rhododendron species (Usuki et al. 2003), therefore it is plausible that fungal colonization is important in the establishment and survival of *Rhododendron m. chapmanii*' seedlings.

***Recovery Action 4:* Research**

This recovery action is ongoing.

Reproduction

The pollination and mating system is currently being investigated by the PCFO botanist. This research will help determining whether seed are sexually produced and viable, and the importance of self vs. cross pollination. *In-situ* seed germination and seedling establishment have not been observed in the wild, consequently, if the established individuals are eliminated, they cannot re-establish themselves. The lack of in-situ germination appears to be a limiting factor for seedling recruitment in the wild; therefore, germination studies are needed.

Trial planting

Experimental planting has not been and should not be initiated until all plausible habitats having *R. m. chapmanii* are searched. Complete surveys in plausible habitats will provide a better understanding of this plant's natural distribution and habitat requirements.

Forest management practices

For details see Recovery action 1-Proper management.

C. Updated Information and Current Species Status

1. Biology and Habitat

a. Abundance, population trends

Rhododendron m. chapmanii is restricted to Florida, where it is known from only three populations: coastal Gulf County; Liberty and Gadsden counties in the vicinity of Hosford; and in Clay County on Camp Blanding Military Installation (Fig. 1). The population near Hosford is the largest; the land is privately owned and used for tree farming. The smallest and most geographically isolated of these populations is within the Florida National Guard post at Camp Blanding, about 165 miles east of the Hosford population. Several surveys and censuses had been conducted for these populations, but we have incomplete information regarding

trends because the last comprehensive census for two of the three populations was conducted in 1997. The information below is organized by county.

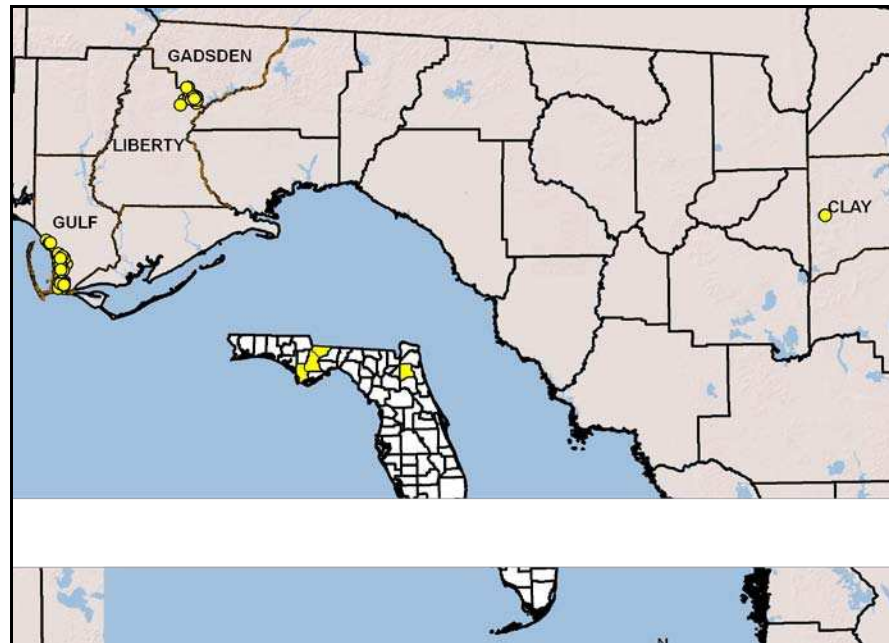


Fig. 1. Map of Florida (inset) showing the counties and locations of *R. chapmanii*.

Clay County

The Clay County population was first reported by Totten in 1944, who observed over 60 clumps of *R. m. chapmanii* at Camp Blanding. The majority of the Camp Blanding area was developed in the early 1940's by engineering work along Black Creek; therefore, this population likely covered a much larger area. It was also reduced by collectors for the purpose of the nursery trade (USFWS 1983, Hall 2005). The Recovery Plan mentioned that this site "seems unlikely" to be "planted by man"; therefore it raised the possibility of being artificial.

In 1985, Hardin and Redmond comprehensively censused the population and reported 32 clumps with a total of 94 stems (Table 1). Compared to Totten's 1944 observations, this represents a 53 % decline in numbers of clumps. The clumps occur as two sub-populations (Camp Blanding north and Camp Blanding south) separated by 130 meters, and one isolated clump (Fig. 2). Since points

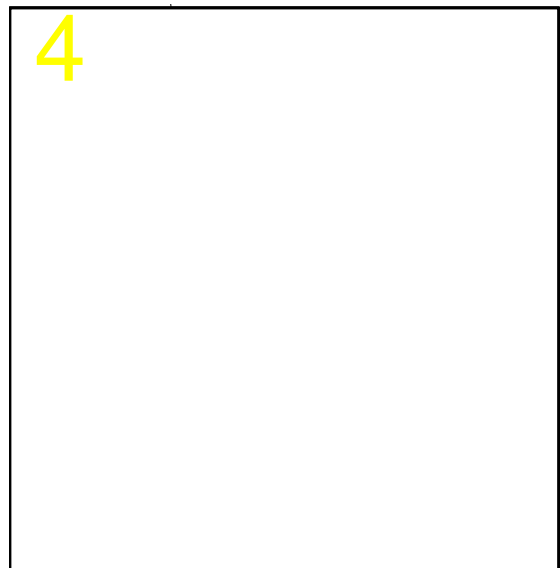


Fig. 2. Sub-EOs of *R. chapmanii* at Camp Blanding. Figure from Hall (2005).

within 1 km should all be associated with one EO; these subpopulations should technically be considered one EO, with perhaps three sub-EOs.

Thirty-one clumps were relocated in 2005 by the Camp Blanding staff, and censused consistently for four years (Hall 2005; Table 1). The censuses include relocating the clumps and recording whether the clumps have flowers, fruits, buds or neither (presence and absence). Based on these censuses the population appears to be stable since 2005.

The census protocol used by Hardin and Redmond (1985) and modified by PCFO botanist (Appendix B) should be at least used every three to five years to clearly document long-term population trends, important for the recovery of the species. Camp Blanding staff plans to count the number of stems and manage the habitat with prescribed fire this year (S. Oxenrider, Environmental specialist; 2010, pers. comm. to Negron-Ortiz).

Table 1. Number of clumps and stems reported on six censuses conducted on one *R. m. chapmanii* EO at the Camp Blanding population. ‘-’ represents no data.

Year censused	# of clumps	# of stems	% clumps with buds, open flowers, or fruits
1944	60+	-	-
1985	32	94	63
2005	31	-	87
2006	31	-	100
2007	31	-	96
2009	31	-	87

Gulf County

Three surveys conducted between 1982 and 1997 indicated the presence of 21 locations, totaling 811 clumps (Schultz and Johnson 1997). Overall, the surveys indicated an increase in the numbers of EOs; the numbers of individuals showed an increase from 1985 to 1997 (Table 2). Thirteen sites that were censused in both 1985 and 1997 showed a 9% decline in numbers of clumps; two sites were not re-surveyed in 1997 and two sites had zero plants (for one of which the site may not have been re-located correctly).

Table 2. Number of EOs and clumps reported on surveys/censuses conducted on *R. m. chapmanii* in Gulf County population.

Year surveyed/censused	# of EOs	# of clumps
1982	6	700
1985	15	568
1997	20	811

Three newly found EOs with a total of 27 plants were documented in 2002 (FNAI 2009). Jean Huffman (manager of the SJBSBP) systematically surveyed and identified each clump with GPS at SJBSBP in 2007, totaling about 283 individuals. A subset of the SJBSBP population has been monitored for two years

by the PCFO botanist, and the data indicated that this population is quite stable. St. Joseph Bay State Buffer Preserve is well maintained with prescribed fire, thus the populations' stability could be a response to this management practice.

Overall, eight surveys conducted in Gulf County locations between 1982 and 2007 indicated the presence of 24 EOs, with a maximum of 1,697 documented clumps (Schultz and Johnson 1997, Huffman 2007, FNAI 2009); currently, about 983 clumps are potentially present in these locations. Potentially this represents a 55% decline (if there was a year in which all 1,697 clumps were alive). This is an estimated number because the majority of these EOs have not been censused since 1997 therefore; a comprehensive census is needed in order to update this information and accurately evaluate the status of these populations.

Liberty/Gadsden counties (Hosford population)

Four surveys conducted in Liberty and Gadsden counties' locations between 1982 and 2001 indicated the presence of 30 EOs (17 EOs in Gadsden County; three EOs in Liberty/Gadsden counties, and 10 EOs in Liberty County; FNAI 2009), totaling a maximum of 2,942 clumps (Schultz and Johnson 1997). Only two populations were censused in 2001, and one additional EO was documented with about 107 clumps. Overall, the surveys indicated an increase in the numbers of EOs and clumps for the 1985 survey (Table 3). Of the 19 sites censused in both 1985 and 1997, seven (37%) showed no change and 12 (63%) showed a decline in numbers of rhododendrons (Schultz and Johnson 1997). These EOs have not been censused since 1997 therefore; a comprehensive census is needed in order to update this information and accurately evaluate the status of this species in these counties. In general, the data indicate that this population is the largest and land acquisition should be considered a priority.

Table 3. Number of EOs and clumps reported on surveys and census conducted on *R. m. chapmanii* in the Hosford population.

Year censused	# of EOs	# of clumps
1982	9	2,510
1985	27	2,835
1997	29	2,158

b. Genetics, genetic variation, or trends in genetic variation:

Genetic studies have not been conducted in this genus.

c. Taxonomic classification or changes in nomenclature:

Kingdom: Plantae
 Division: Magnoliophyta
 Order: Ericales
 Family: Ericaceae
 Genus: *Rhododendron*
 Species: *minus*
 Variety: *chapmanii*
 Common name: Chapman's Rhododendron

Rhododendron is a widely distributed genus found in North America, Europe, Asia, and Australia. The species, which are either shrubs or small to (rarely) large trees, are divided into several subgenera (<http://www.efloras.org>). In North America, the subgenus *Rhododendron* is represented by about 25 species. One of the species, *R. minus*, is located in the southeastern United States and is represented by two varieties: *R. minus* var. *chapmanii* and *R. minus* var. *minus* (Duncan and Pullen's 1962). These two varieties were considered two species by Kartesz (1994). Luteyn et al. (1996) accepted Duncan and Pullen's (1962) treatment, recognizing two varieties of one species. The Flora of North America circumscribed *R. minus* broadly considering *R. m. chapmanii* to be a distinct variety (www.efloras.org). The name *R. minus* Michaux var. *chapmanii* (Alph. Wood) Gandhi & Zarucchi was recently validated by Gandhi and Zarucchi (2009)⁴. Therefore, the name in FWS system should be changed to be consistent with official nomenclature. The two varieties are distinguished by the shape of leaf apices, depressed leaf veins, petiole length, and branches held erect and rigid.

Note: A taxonomic study is encouraged for discerning whether the two varieties are really sufficiently distinct to maintain variety status or whether they should be lumped.

d. Spatial distribution, trends in spatial distribution or historic range

Rhododendron m. chapmanii is endemic to Florida and restricted to Gulf, Liberty/Gadsden and Clay counties. The present patches are separated by clear cuts, pine plantations or residential/commercial development.

In 1983, when the Recovery Plan was written, it was estimated there were about 3,020 clumps in the four counties. To date, the species is still constrained to the same counties, but the number of clumps has slightly increased to about 3,168. Development and timbering have resulted in (or potentially resulted in) extirpation of several EOs, and have left other sites highly fragmented.

e. Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

Rhododendron m. chapmanii usually occurs in a transitional area between upland mesic or scrubby flatwoods and floodplain swamps or baygalls. This species is also found within mesic pine flatwoods or on the lower elevations of the sandhills. Consequently, it appears to require acidic sandy soil, good to moderately well-drained to somewhat poorly drained sandy soils of 0-5% slope, and no flooding. The Camp Blanding population grows on the edge of xeric hammock next to a stream bank. The plants tolerate full sun to moderate shade (Negron-Ortiz, 2009, pers. observ.), and heavy shade once they are mature as at Camp Blanding (Hall 2005).

⁴ According to fundamental principles of nomenclature, taxonomic names have to be effectively and validly *published* with proper author citations.

The habitat where this species occurs is defined as a fire-dependent community. The sites at the Gulf and Liberty/Gadsden populations are dominated by wiregrass (*Aristida beyrichiana*), longleaf pine (*Pinus palustris*) and/or slash pine (*P. ellioti*). The Camp Blanding plants are found on a slope growing under a canopy dominated by sand live oak (*Quercus geminata*), laurel oak (*Q. hemisphaerica*) and water oak (*Q. nigra*), rather than in open flatwoods (Hardin and Redmond 1985). According to the natural communities' classification, this community would be classified as xeric hammock (FNAI/FDONR 1990). *Rhododendron m. chapmanii* resprouts and flowers prolifically following a burn (Negron-Ortiz, 2009, pers. observ.).

2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

a. Present or threatened destruction, modification or curtailment of its habitat or range

Habitat loss and modification remain the main threats to date for this species as a result of urban development, logging, and conversion of *R. m. chapmanii*'s habitat for silviculture practices. Timbering, urban development, and fire management and suppression in this region have changed the ecosystems; the threats are discussed in more detail below:

Forestry practices and residential/commercial development

The timber industry in North Florida became well established in the 1850s (FNAI 2005). Privately owned companies farm trees for their byproducts by mechanically preparing the site for planting, planting seedlings, and mechanically harvesting the trees typically by thinning and later clear cutting the site; then the process is repeated. The St. Joe Timberland Company (Timberland Company) is currently the largest timber company in the eastern region of the panhandle with over 450,000 acres in silviculture, plus several other timber companies operate in the panhandle. There is no indication that the timber industry will decline in the foreseeable future. Therefore, tree farming remains a threat to this species in that there may be sites within these silvicultural areas that could support this species but have not yet been identified and are not being managed for its protection.

In addition to being one of the largest private landowners in northwest Florida, the Timberland Company is also one of the largest real estate operating companies in the Southeast. This Company develops both residential and commercial properties along roadways and near or within business districts in the region. Urbanized land in Florida, statewide, is projected to double by 2060 along with doubling of the population to 36 million (<http://www.1000friendsofflorida.org/PUBS/2060/01-Northwest-Florida>). Since the species occurs on Company-owned property in Gulf, Liberty, and Gadsden counties, Florida, there is no guarantee that these properties will not be utilized

for residential or commercial development in the near future. Therefore, residential or commercial development is a threat.

Fire suppression

Suppression of fire continues to threaten pineland and savanna flora as fire is an important factor in the maintenance of flatwoods (Abrahamson and Hartnett 1990). Fire influences community structure and composition (Abrahamson and Hartnett 1990), and with insufficient frequency in longleaf pine communities, a woody midstory quickly develops (Glitzenstein et al. 1995), negatively affecting the understory diversity. Several studies have shown that frequent prescribed fire regimes are important for maintenance of flatwoods diversity (Hiers et al. 2007). Frequent prescribed burns are needed to maintain optimal habitat for *R. m. chapmanii* populations; it avoids the encroachment of *Cyrilla racemiflora* L. (swamp titi); it might influence seed germination; and avoid long, leggy stems that are not as hardy.

Drainage

Drainage of adjacent bogs to increase areas of pine plantings affects seasonal hydrology. Consequently, the sites become more desiccated affecting processes such as seed germination and seedling establishment. Therefore, drainage is still a threat due to tree farming activities.

b. Overutilization for commercial, recreational, scientific, or educational purposes:

The Recovery Plan identified this as a threat to *R. m. chapmanii*. Specifically, the Plan suggested that this species was taken from the wild for ornamental purposes (Tatum and Lake 1979). According to USFWS (1983), numerous plants were removed in the late 1940's from the Camp Blanding for the nursery trade. Similarly, 100-200 plants were removed from the Hosford population (USFWS 1983). Therefore, this species was a 'commercially exploited plant'⁵ and is still sold by several nurseries (e.g., http://local.floridata.com/Chapmans_Rhododendron_Tallahassee_FL-r1189282-Tallahassee_FL.html; Negron-Ortiz 2010, pers. comm. to several nurseries in Tallahassee). This activity does not currently seem to be a problem because most cuttings and seeds come from plants collected in the past. However, we cannot discard the possibility of sporadic plant removal.

c. Disease or predation:

There is no evidence to suggest that this factor is a threat.

d. Inadequacy of existing regulatory mechanisms:

The Endangered Species Act of 1973, as amended (Act) prohibits the removal of federally listed threatened and endangered plants or the malicious damage of such plants on areas under federal jurisdiction, or the destruction of endangered plants

⁵ Commercially exploited plant: species native to the state which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale

on non-federal areas in knowing violation of state law or regulations or in the course of any violation of a state criminal trespass law. However, the Act does not provide protection for plants on private lands or unless it is in violation of state law. Several populations of *R. m. chapmanii* occur on private timberland. While the Act requires Federal agencies to carry out programs for the conservation of endangered and threatened species, no such programs are stipulated for private landowners. Neither section of the Act provides protection for plants on private lands as long as the activity is permissible under state/local laws.

Seeds of both threatened and endangered species found on Federal land are regulated under the Act. In addition, the seeds of an endangered species are regulated if they are going to be purchased/traded/bartered in interstate commerce. Since *R. m. chapmanii* is an endangered species, the seeds are regulated under the specified conditions. However, the seeds are not regulated if they are provided freely (no exchange of money, goods, or services; 7 CFR 319.37.2, USDA 2008).

The State requires permission of private landowners for collecting of state-listed plants from their property. *Rhododendron m. chapmanii* is protected under Florida State Law, chapter 85-426, which includes preventions of taking, transport, and the sale of the plants listed under the State Law. The rule Chap. 5B-40, Florida Administrative Code, contains the "Regulated Plant Index" (5B-40.0055) and lists endangered, threatened, and commercially exploited plant species for Florida; defines the categories; lists instances where permits may be issued; and describes penalties for violations (<http://www.virtualherbarium.org/EPAC>).

The existing regulatory mechanisms are inadequate for plants.

e. Other natural or manmade factors affecting its continued existence
Reference Factor a for details related to fire suppression.

D. Synthesis

Rhododendron m. chapmanii is mainly threatened by habitat destruction/modification. Urban development, timbering, and inadequate fire management, i.e., fire suppression, are the main pressures reducing or eliminating the number of EOs and clumps. Development pressures in the Florida panhandle are extreme; urbanized land is projected to increase two-fold in the near future. Conversion of much of the forest land to pulpwood plantations (clearcutting, mechanical site preparation, and pine plantations) has extirpated some EO's. Overcollection was a threat of high importance in the past, but the present magnitude has been reduced. No problems have been detected with disease and predation.

The species occurs on both private and public lands. The populations at Camp Blanding and the EOs at the SJSBP are protected and adequately managed. The privately owned

population at Liberty/Gadsden counties is not protected and conservation measures are needed for the recovery of the species.

Current survey information indicates a decline in the number of clumps. Fifty-five EOs distributed throughout this species range were documented between 1944 and 2007 with an estimated 4,699 clumps. Based on current survey information, the estimated maximum counts of clumps decreased to about 3,279 (30% decline). However, most of the EOs for the Gulf and Liberty/Gadsden counties have not been censused since 1997; a comprehensive census is needed in order to update this information and accurately evaluate the status and current classification of this species.

Consequently, *R. m. chapmanii* continues to meet the definition of an endangered species as a result of habitat destruction or modification due to development and timbering and the effect of this threat in this plant's present narrow distribution. In addition, the lack of seed germination and seedling recruitment in the wild pose a problem because if the established individuals are eliminated, populations cannot re-establish themselves. Also, criteria 1, 2, and 5 (see section II.B.3) for delisting the species have not been met. The taxonomic name in FWS system should be changed to be consistent with official nomenclature. A taxonomic study is encouraged for discerning whether the two varieties are really sufficiently distinct to maintain variety status or whether they should be lumped. The existing recovery plan contains objective, measurable criteria that need to be updated when the recovery plan is revised.

III. RESULTS

A. Recommended Classification:

No change is needed

B. New Recovery Priority Number N/A

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

- Acquisition of the following private lands will benefit the status of this species:
 - Several land parcels adjacent to the SJSBP, Gulf County that has Chapman's Rhododendron and a suite of other rare species
 - The Hosford population located in Liberty and Gadsden counties
- Conduct systematic studies to examine the current taxonomic classification. A systematic study with emphasis on both *R. minus* var. *minus* and *R. minus* var. *chapmanii* involving multi-data approaches (e.g., morphology, molecular studies) is encouraged for discerning its taxonomy.

- Conduct a population genetic study to determine the levels and distribution of genetic diversity within and among populations of *R. m. chapmanii*. The study should test whether the Camp Blanding population is an artificial (planted) population. The Recovery Plan deemed it "unlikely" that this population was planted, but this would provide a further test.
- Complete a comprehensive census (e.g., the total number of individuals, number of flowering vs. non-flowering plants, and whether seedling recruitment is occurring) throughout the present distribution.
- Studies on the viability of seeds, *in-situ* germination and seedling establishment, and whether a persistent seed bank is present are needed.
- Conduct surveys for new populations where similar habitat exists. This action can include the use of aerial photographs and species distribution modeling methods to initially determine potential sites, with subsequent validation or inspection of the sites for plants.
- Garden propagation and reintroduction. An *ex-situ* seed collection should be actively pursued and implemented.
- The taxonomic name in FWS system should be changed to be consistent with official nomenclature.
- Follow a standardized method for accurate population counts to ensure consistency in collected data (see Appendix B).
- The recovery plan should be updated to define objective measurable criteria and better address the five factors.

V. REFERENCES

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APPENDIX A

Summary of peer review for the 5-year review of *Rhododendron minus* var. *chapmanii* (Chapman Rhododendron)

A. Peer Review Method:

The document was reviewed internally by Ms. Lorna Patrick and Dr. Donald Imm in the Panama City Field Office. Once the comments were added to the document, it was sent to three outside reviewers (see below). The outside peer reviewers were chosen based on their qualifications and knowledge of the species.

B. Peer Review Charge: The below guidance was provided to the reviewers.

1. Review all materials provided by the Service.
2. Identify, review, and provide other relevant data that appears not to have been used by the Service.
3. Do not provide recommendations on the Endangered Species Act classification (e.g., endangered, threatened) of the species.
4. Provide written comments on:
 - Validity of any models, data, or analyses used or relied on in the review.
 - Adequacy of the data (e.g., are the data sufficient to support the biological conclusions reached). If data are inadequate, identify additional data or studies that are needed to adequately justify biological conclusions.
 - Oversights, omissions, and inconsistencies.
 - Reasonableness of judgments made from the scientific evidence.
 - Scientific uncertainties by ensuring that they are clearly identified and characterized and those potential implications of uncertainties for the technical conclusions drawn are clear.
 - Strengths and limitation of the overall product.
5. All peer reviews and comments will be public documents, and portions may be incorporated verbatim into our final document with appropriate credit given to the author of the review.

C. Summary of Peer Review Comments/Report

Ms. Oxenrider (including other Camp Blanding staff) provided a few editorial comments. She recommended incorporating a standardized method to ensure consistency in collecting data (see Appendix B).

Dr. Johnson clarified issues related to cooperative agreements, and Florida Forever (FF) projects; suggested to convince the ARC to upgrade the Hosford Chapman's Rhododendron Protection Zone of FF to the "top 21" list; indicated that FNAI did an aerial survey for *R. m. chapmanii* in the 1980's at a time when it was blooming between the Gulf and Gadsden county populations but failed to find the plants.

Due to current commitments, **Dr. Huffman** was not able to provide comments.

D. Response to Peer Review

All peer reviewer comments were evaluated and incorporated where appropriate.

