

RECOVERY PLAN



**Chapman's
Rhododendron**

RECOVERY PLAN FOR
CHAPMAN'S RHODODENDRON, RHODODENDRON CHAPMANII A. Gray

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for
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I. INTRODUCTION

Background

Chapman's rhododendron, Rhododendron chapmanii A. Gray, family Ericaceae, is currently listed as Endangered by the Federal Government (Federal Register 44:24248-250, April 24, 1979) and by the Florida Department of Agriculture and Consumer Services (Sect. 581.185 Florida Statutes, 1980).

It is a small (0.5 - 2m in height), evergreen shrub with stiffly ascending branches. Leaves are alternate, 3 to 6cm long, obovate with tapered bases, obtuse or rounded apices, somewhat wrinkled, and with entire but curled undermargins. Shade leaves are less wrinkled and curled. Petioles are from 2 to 6mm long. New stems, petioles and under surface of leaves are usually scurfy, dotted reddish brown. Flowers, borne in terminal clusters, have light pink, funnel-shaped corollas about 3cm long with 5 fused petals. Fruit capsules, about 1cm long, are borne in clusters which persist several years and are present on almost all plants.

Rhododendron chapmanii is closely related to Rhododendron minus.

Duncan and Pullen (1962) concluded that these taxa are varieties of a single species which also includes R. carolinianum. However, most plant taxonomists continue to treat R. chapmanii as a distinct species (Godfrey 1979; Ward pers. comm.; Gensel pers. comm.)

Chapman's rhododendron is a rare Florida endemic (Godfrey 1979), occurring in three disjunct populations - two in the Florida panhandle and one in northeast Florida. It blooms prolifically with large clusters of pink flowers in late March to early April and is a valuable ornamental, which is one of the threats to its existence in the wild (Kral unpub.). It is also of value as breeding stock for the development of new, heat resistant varieties of ornamental rhododendrons (Skinner 1979).

Chapman's rhododendron grows on pinelands which are suitable for commercial slash pine plantations. The methods often used to clear such land and prepare it for these plantations are another threat to the plant's survival (Godfrey 1979). However, pine plantation management, with some adjustments to accommodate the rhododendron, may be the best hope for survival of most of the wild population. Drainage projects and fire protection are also threats to this species. Chapman's rhododendron and its natural associates are adapted to periodic fire (Milstead 1978).

Little research has been done on Chapman's rhododendron. No total population estimate based on field work has ever been reported. Milstead (1978) estimated a total population of just under 1000 based on conversations with people who had visited parts of the population for purposes other than making population estimates. The only individual site population estimates have been for Camp Blanding (Totten 1944). No detailed account of Rhododendron chapmanii habitat or associated species has been provided, nor have detailed range maps been published. Adverse influences and their effects on the population have gone largely unstudied, although Milstead (1978) documented the main threats.

Therefore, in order to establish a base of information, several field trips were undertaken in 1981 and 1982 with the result that all known sites were visited at least twice by the author and once by William Gensel. Gensel has done extensive investigation of the Gulf County sites and has contributed greatly to this report. Steven Riefler also visited most of the sites and discovered two sites in a drainage system where this species was previously unknown.

These field trips produced rough population estimates for all the known sites, a habitat description for each site, a plant list for each site, and a detailed range map which is not included in this plan because of the danger of plant removal. A general range map appears as Fig. 1. Also, observations were made with regard to adverse influences, management problems and opportunities, and the relative scarcity of Chapman's rhododendron habitat.

Population Status

Chapman's rhododendron was a very rare plant when it was first reported by A.W. Chapman in 1860. Since that time the population has been reduced somewhat by collecting of plants, habitat alteration and habitat destruction. The full extent of decline is not known, since no accurate population estimate has ever been made but at least 100 and perhaps several hundred plants have been removed or killed at each of the three main locations since 1940. Some habitat has been permanently lost. (For details and references, see section on adverse influences.)

The current wild population size is roughly 3000 or more plants, occurring in Gulf County, near Hosford in Liberty and Gadsden Counties, and on Camp Blanding in Clay County.

The population near Hosford is the largest, healthiest, least threatened and possibly the oldest. It occurs in a region of Florida that also contains many other species of rare or endemic plants: the Florida torreya, Torreya taxifolia; the Florida yew, Taxus floridana; and Harper's beauty, Harperocallis flava (Ward 1979). It is an area that has been emergent much longer than most of the state. The Apalachicola - Chattahoochee River system has provided a corridor for migration to the area from the southern Appalachian Mountains. Many species, such as Actaea pachypoda, Cornus alternifolia, and Dirca palustris, reach their southern limit in this part of Florida (Ward 1979). At least 2500 Chapman's rhododendron plants occur here scattered over three or four square miles in several groups of ten to 100 widely spaced individuals, and in two more densely populated spots. The total area of suitable habitat known is about 200 acres. One of the denser populations consists of 200 plants on about five acres which the St. Joe Paper Company has intentionally set aside as undisturbed for the plant. To the north of that area is a very dense population of perhaps 2000 plants located mostly on the undisturbed edge of about ten acres of planted pine. The elevation above sea level for the Hosford population ranges from 100 to 150 feet.

The Gulf County population is more widely distributed, occurring along a line about ten miles long paralleling the coast with Port St. Joe in the middle. This line may have been rather continuous at one time but is now broken into small, distinct sites. The total number of plants is now about 500. The total area of habitat is about 200 acres. This part of Florida has been under the ocean relatively recently. It is flat and about 20 feet in elevation. This colony is about 50 miles from the Hosford population and was probably derived from it in the past.

The Camp Blanding (Clay County) population is now very small and restricted - 20 plants growing on one-tenth of an acre. Prior to 1940 there were probably several hundred plants growing on several acres (Totten 1944). It is at an elevation of about 170 feet and may be as old as the Hosford population. It seems unlikely that this population was planted by man, since it was considerably larger prior to 1944 (Totten 1944) and since it occurs in the proper habitat, quite rare in this part of Florida.

Habitat

Chapman's rhododendron seems to require light shade to full sun, good drainage with no chance of flooding, sandy soil with abundant organic matter, and a very stable, soft acid water table near the surface. This occurs only in a few areas, and usually supports a dense stand of broadleaved trees or large shrubs which would shade out R. chapmanii. Only along transition zones between longleaf pine forests and titi (Cliftonia) bogs

in areas of very nutrient-poor and porous soil does suitable habitat for Chapman's rhododendron occur. The layer of well-aerated soil in these areas is thin. Some of the associated shrubs, such as Quercus geminata, Quercus myrtifolia, Lyonia ferruginea, Lyonia lucida, Myrica cerifera and Cyrilla racemiflora are moderately to extremely dwarfed. Other associates, such as Serenoa repens, Ilex coriacea and Ilex glabra are below average in size, and the rest are mostly very small shrubs such as Kalmia hirsuta, Vaccinium myrsinites, Hypericum microsepala and Gaylussacia sp.

The plant association in which Chapman's rhododendron occurs has been variously described as sandy pine barrens (Chapman 1860), low pinelands (Small 1933), pine flatwoods and borders of titi swamps (Godfrey 1979), a zone between longleaf pine - turkey oak sandhill and Cliftonia - Cyrilla swamp (herbarium specimen - Florida: Gadsden County: 31 March 1961, R. K. Godfrey 60643 (FLAS) and sand pine scrub (herbarium specimen - Florida: Clay County: 24 March 1966, D. B. Ward 5488 (FLAS). While these descriptions give a good picture of the range of plant communities within and adjacent to Chapman's rhododendron habitat, they do not define the habitat itself as precisely as is desirable for locating new R. chapmanii sites and for finding suitable areas for establishing new populations. To obtain a better habitat description, plant lists were made for each site within each of the three populations of R. chapmanii.

It quickly became apparent that Chapman's rhododendron habitat is very constant. This species always occurs adjacent to (and often extending up to 100 yards away from) a titi (Cliftonia) bog, and it always occupies a habitat intermediate between pine flatwoods and sand pine scrub called scrubby flatwoods. This plant community is adapted to and maintained by fire. Plants associated with Chapman's rhododendron are:

Dominant species - always present and always abundant: Pinus palustris, (replaced by man with Pinus elliottii in many places) Serenoa repens, Quercus geminata, Lyonia ferruginea, Vaccinium myrsinites, Ilex glabra, Aristida stricta, and Pteridium aquilinum.

Species that are always present but never abundant: Osmanthus americana, Quercus myrtifolia, and Ilex coriacea.

Species often present and sometimes abundant: Pinus elliottii, Cyrilla racemiflora, Kalmia hirsuta, Hypericum microsepala, Myrica cerifera (dwarfed), Lyonia lucida, Leucothoe racemosa, Gaylussacia sp., Rubus sp., Quercus nigra, Vitis rotundifolia, Smilax auriculata, and Trilisa odoratissima.

Species sometimes present (by no means a complete list): Rhododendron canescens, Rhododendron viscosum, Hamamelis virginiana, Clethra alnifolia, Persea palustris, Ilex vomitoria, Asimina longifolia,

Cliftonia monophylla, Quercus chapmanii, Quercus laevis, Quercus laurifolia, Helianthus radula, Polygonella gracilis, Chrysopsis graminifolia, Chrysopsis gossypina, Chrysopsis mariana, Dasystema pectinata, and Lilium catesbaei.

The habitat adjacent to Chapman's rhododendron habitat on the downhill side is always an acid bog dominated by Cliftonia monophylla. Other plants usually present are sphagnum moss, Lyonia lucida, Cyrilla racemiflora and Smilax sp. Some other plants that may be present are Clethra alnifolia, Myrica inodora, Leucothoe racemosa, Rhododendron viscosum, Pinus serotina, Chamaecyparis thyoides, Nyssa biflora, Magnolia virginiana, and even Liriodendron tulipifera.

In some cases Chapman's rhododendron occurs from the edge of one titi bog across a low ridge and down to a second parallel titi bog, in which case there is no adjacent uphill habitat. In most cases, however, there is an adjacent uphill habitat, which can be either longleaf pine - turkey oak sandhill or longleaf pine - sawpalmetto flatwoods or an intermediate community type.

Turkey oak and Cliftonia only rarely extend into the habitat of R. chapmanii, and then only on the very edge of the habitat. Therefore, the moisture tolerance of Chapman's rhododendron might be described as ranging from the extreme wet end of the range of tolerance of turkey oak to the extreme dry end of the range of tolerance of Cliftonia. Both longleaf pine and Cyrilla, broadly overlap R. chapmanii habitat.

Population dynamics

In our surveys of the wild population, no dead plants were observed. Although the tops of plants are easily killed by fire, logging or mechanical choppers, they resprout vigorously from the roots or base. On the other hand, no seedlings or obviously young plants were observed. There was some asexual reproduction occurring, mostly by the rooting of procumbent branches and by sprouts from the base or roots near the base of the parent plant.

It appears, then, that individual plants are long-lived, but that little reproduction is occurring, and perhaps none at all from seed. It should be noted, however, that it would be very difficult to find a few widely scattered seedlings in the wild. The widely scattered distribution of plants or groups of plants, of sites, and of the main populations would seem to indicate reproduction by seed in the past. The seed is certainly viable, and seedlings are easy enough to grow in cultivation. The observation of asexual reproduction raises the question of how much genetic variability exists in the population of perhaps 3000 plants. Judging from the amount of variation in flower form and color, it is clear that each of the larger sites has at least several genotypes. However, it is possible that many of the small groups and even some small sites, such as the Camp Blanding one, might represent one clone.

The two major obstacles to reproduction by seed may be frost and lack of moisture. The cutting of the original pine overstory and the reduced frequency and intensity of fires might make both of these hazards worse (see section on adverse influences). Drainage projects have also adversely affected Chapman's rhododendron habitat.

Adverse influences

Total destruction of habitat has been, and will probably continue to be, the single most serious threat to Chapman's rhododendron. The habitat at Camp Blanding was largely destroyed by engineering work along 200 yards of Black Creek in 1944, leaving only the two ends of the population consisting of about 60 clumps (Totten 1944). By 1980, one of the two ends was gone and the number of clumps was down to about six (about 20 plants). In Gulf County there are many examples of habitat destruction, as one might expect with a town being located in the middle of the population. Only the Hosford population has largely escaped extensive habitat destruction.

Habitat alteration has affected all known sites. The first impact was the logging of the old growth longleaf pine. The second impact affecting all sites has been lack of fire. Many of the associated plants, such as wax myrtle and species of Quercus and Lyonia, can overtop and shade out Chapman's rhododendron in the absence of fire. Shrub growth also becomes denser, increasing transpiration and drying out the site (Folkerts 1982). This could affect the competitive advantage of individual plants as well as their ability to reproduce. These effects are very evident at Camp Blanding, where the site is completely overgrown by oaks. The plants are weak and have not produced viable seed for the past two or three years, although they still bloom and reproduce by the rooting of low-lying branches.

The most far reaching, damaging, and permanent alteration has been drainage. The Hosford population has been little affected so far, but all the sites in Gulf County have been at least moderately affected, and the remaining habitat at Camp Blanding has been severely drained. A change in drainage affects both soil moisture and the water table. For Chapman's rhododendron, which is very narrowly adapted in this regard, these changes could be disastrous.

Another impact on most of the sites is the establishment and management of slash pine plantations. This can be either good or bad for Chapman's rhododendron, depending on the methods used and on the alternative uses for the site. The main adverse impacts so far have been from preparing the land to plant pines. The results of site preparation have varied widely. A 200-300 acre population of Chapman's rhododendron near Highland View in Gulf County was apparently totally wiped out (Gensel pers. comm.) by methods apparently similar to those used in the Liberty-Gadsden populations where most plants survived (Salter pers. comm.). Bedding was done in both areas. This shows the need for research and for great care in the treatment of the remaining population.

Effects of some currently available site preparation methods are roughly as follows: Windrowing is very destructive, killing many plants and damaging the soil. Bedding the soil, a more common practice, is less destructive but kills some plants. The percentage kill varies with time of year, weather, soil conditions type and placement of machinery, and

previous disturbances. Bedding may change the drainage patterns and soil moisture to the detriment of Chapman's rhododendron. Machine chopping may kill a few plants, but it may also have the same benefits as fire. One possible alternative to the above methods which has been little used in slash pine management, but which is becoming more popular, is the application of herbicides (Kerr 1982). This could be deadly for Chapman's rhododendron. Another practice which has been little used so far, but which could also be very destructive, is fertilization. Chapman's rhododendron is adapted to conditions of low fertility and abundant sunlight. If its habitat is fertilized, some of its competitors, such as oaks and wax myrtle, might quickly crowd it out. Some concern has been expressed that the high density of planted pines may produce too much shade and root competition. If prescribed burning is begun by age ten, thereby reducing understory competition and killing some lower branches, this shouldn't be a serious problem.

The taking of wild plants for ornamental use is another threat (Kral 1977). Large numbers of plants were removed from Camp Blanding in the late 1940's by nurserymen from Jacksonville (Noel Lake pers. comm.). About 100 to 200 plants were removed from a Hosford location about 15 years ago by well-intentioned people from Tallahassee in anticipation of the logging and conversion of the site to a slash pine plantation (Salter and Johnson pers. comm.). However, the plants that remained survived the logging, site preparation and slash pine plantation management, although this obviously could not have been foretold (Salter pers. comm.). Plants continue to be dug sporadically, and large scale removal

is still a possibility. Cuttings are often taken as well. These activities are unnecessary, as Chapman's rhododendron is easy to grow from seed, the collection of which does no harm. The taking of a limited amount of cuttings, however, may be desirable as a part of the recovery effort.

Cultivation potential

Chapman's rhododendron produces abundant, viable seed in the wild and in cultivation. A million seeds could easily be collected each year, with no harm to the wild populations. Seeds sprout and grow readily on moist sphagnum. The seedlings are easy to transplant in winter to gallon cans filled with a light, well-aerated, acid soil. They transplant into the wild or into gardens easily, and grow with virtually no maintenance on well-drained acid soil with a permanent water table near the surface. They will grow without a water table when watered. They are easily killed by root rot, particularly when in containers, rootbound, in heavy soil or too wet.

Plants can also be grown from cuttings, although it is more difficult, and the number of plants that can be grown is smaller. However, this is the only practical way of producing the exact genotypes found in the wild. Using standard rooting techniques, Gensel (pers. comm.) has had survival rates above 50 percent with rapid growth rates.

Rooted cuttings should be used to establish clone banks and to reestablish to a particular site plants that are now in cultivation and are known to have come from that site. However, if it becomes necessary to bolster declining wild populations, it would be undesirable to continually take cuttings from the remaining plants, because genetic diversity would continue to be lost to mortality with no new genetic diversity added. The result would be declining genetic diversity as well as a shift in the genetic makeup of the population. Therefore, seedlings should be used for this purpose, so that genetic diversity can be maintained or increased, even though it will also probably lead to changes in the genetic makeup of the population.

There are specimens of Chapman's rhododendron in many botanical gardens and in some home gardens, particularly in Tallahassee. Nurseries in Madison and Chipley, Florida sell plants.

Determination of priorities

Habitat requirements were looked at from a plant association point of view to get an idea of how narrowly adapted Chapman's rhododendron is. Once identified, the habitat was looked for in the area of the natural populations and in several other locations to get an idea of how much unoccupied habitat there might be.

It appears that Chapman's rhododendron is narrowly adapted to a restricted habitat. This makes preserving the currently occupied habitat of utmost importance and makes the prospect of introducing plants to new locations speculative. For example, a population might be established on a site that seemed suitable in every way except that the indicator of a very stable, permanent water table - Cliftonia - is not present. The population might grow very well for thirty years, only to be destroyed by a severe drought or flood.

II. RECOVERY

A. Objective

The recovery objective is to reverse the decline in population and increase it to the point that the listing status can be changed from Endangered to Threatened. This should be possible by the year 2000 if the existing populations are protected and managed so that:

1. The dense 10-acre population near Hosford is maintaining a stable or increasing population of healthy plants.
2. The remaining part of the Hosford population continues to occupy at least 200 acres with at least 500 plants.
3. The Gulf County population continues to occupy at least 200 acres with at least 500 plants.
4. The Camp Blanding population continues to have at least 20 plants.
5. There is a permanent increase of about 1000 plants at any combination of sites 2, 3, and 4 above to provide a total of at least 2000 plants at these sites.

B. Step-down Outline

- 1) Stop population and habitat declines by protection, management and monitoring.
 - 11) Establish cooperative agreements with landowners.
 - 111) First priority - St. Joe Paper Company.
 - 112) Second priority - Camp Blanding.
 - 12) Habitat protection.
 - 121) Cooperate with land owners and managers.
 - 122) Keep them informed.
 - 123) Discourage use of habitat for construction sites, roads, canals, power lines, land fills, etc.
 - 124) Prevent federal involvement in habitat destruction.
 - 13) Individual plant protection.
 - 131) Work with land owners and managers.
 - 132) Support state and federal laws offering protection.
 - 133) Establish clone bank.
 - 14) Proper management.
 - 141) Create a friendly working relationship with owners and managers.
 - 142) Discourage changes in surface drainage.
 - 143) Encourage a shift in pine plantation management toward gentle site preparation, longer rotations and more prescribed burning.

- 144) Encourage special consideration for particularly valuable sites (about 15 acres at Hosford, five acres in Gulf County and one acre at Camp Blanding).
- 15) Monitoring.
 - 151) Search for new sites.
 - 152) Map all sites and make accurate population counts.
 - 153) Recount every five years and make notes on changes, on time of last fire, on average heights of R. chapmanii and competitors.
- 2) Strengthening existing populations.
 - 21) Hosford population - crossroad site.
 - 211) Locate and take cuttings from the plants that were removed from this site and planted in Tallahassee 15 years ago.
 - 212) Grow plants (no more than five from each parent) in gallon containers (no more than 200 total).
 - 213) Plant southeast of intersection and wherever plants were removed.
 - 22) Camp Blanding population-remove competing oaks.
 - 23) If populations show a decline due to management problems, try to solve the problems.
 - 24) If a site drops below 20 plants per acre and shows a decline of more than 30 percent since monitoring began, begin a replanting effort.
 - 241) Collect seed in October from all plants on the site.

- 242) Grow plants until one to two feet tall (two years) in gallon cans.
 - 243) Plant out in December - January at a rate of 40 plants per acre.
- 3) Establish new populations.
- 31) Determine historical range.
 - 32) Locate suitable habitat.
 - 321) At possible extirpation sites.
 - 322) At Camp Blanding or elsewhere in Black Creek headwaters areas.
 - 323) In the Apalachicola National Forest.
 - 33) Obtain permission and cooperation for establishing planting.
 - 34) Collect seed.
 - 341) From Camp Blanding for Clay County sites.
 - 342) From a mix of Hosford and Gulf County sites for the Apalachicola National Forest.
 - 343) Perhaps a mix from all sites for some other new plantings.
 - 35) Grow plants as outlined in task 24), p. 28, and plant out in December - January at a 20 by 20 foot spacing (about 100 per acre).
- 4) Research.
- 41) Reproduction.
 - 411) Investigate factors affecting reproduction from seed in nature.

- 412) Determine management practices which will help obtain reproduction.
- 42) Trial plantings.
 - 421) In suitable habitat at new locations.
 - 422) At the upper edges of shrub and herb bogs in the western panhandle.
 - 423) With Cyrilla in scrubby flatwoods sites lacking Cliftonia.
 - 424) In central Florida scrub areas with Cyrilla.
- 43) Forest management practices.
 - 431) Work with the St. Joe Paper Company monitoring the effects of their management practices.
 - 432) Set up trials of new or untested techniques on sites that have been planted to R. chapmanii (not on native sites).

C. Narrative

1) Highest priority for the recovery of Chapman's rhododendron should be to reverse the habitat and population declines that are occurring in the wild population. This can be accomplished through a combination of protection, management and monitoring. Most important in accomplishing this goal is to establish and maintain a strong, friendly and longlasting working relationship with the St. Joe Paper Company, which owns over 99 percent of the wild population and its habitat. The Company has expressed a willingness to help (pers. comm.), and, indeed, has already taken some steps to protect the species and its habitat. Camp Blanding guards the small population there rather closely, and has expressed willingness to help manage the site (pers. comm.).

11) Establish cooperative agreements with landowners.

111) The first step must be to make contact with the St. Joe Paper Company and establish a cooperative agreement for the protection and management of Chapman's rhododendron and its habitat. Since this is such an important goal, with the outcome determining the fate of most of the rest of this plan, accomplishment of this task is imperative.

- 112) The second priority is to establish a cooperative agreement with Camp Blanding, with the aim of preserving or increasing the rhododendron at this site.
- 12) The most important task is to protect the habitat. The species is in trouble mostly because the limited habitat has been further reduced by man. Even if large numbers of plants are killed or stolen, replacements can be grown and replanted as long as some plants remain. However, if habitat is irreparably destroyed, there is no remedy. Involved landowners should be impressed with the importance of this fact. They should be encouraged to cooperate in trying to prevent any further loss of habitat to roads, canals, power lines, construction projects, landfills, etc. It is also important to discourage any further drainage projects near the habitat.
- 13) The small number of plants at many sites makes them vulnerable to being completely wiped out by collectors. Therefore, protection of the plants is important, and the landowners and managers should be encouraged to continue their efforts to protect them, both from their own employees and from others. The Preservation of Native Flora of Florida Act and the Federal Endangered Species Act, which offer some protection, should be rigidly enforced.

If a practical means can be found, it would be beneficial to set up and maintain a clone bank of plants derived from cuttings from all sites of the wild population and containing individual genotypes judged best from a horticultural point of view, as well as a broad base of other genotypes. This would provide a place other than the wild population for nurserymen to collect both cuttings and seed. It would also provide a stock from which an extirpated population could be reintroduced.

14) Proper management is the other key ingredient of this recovery plan, second in importance only to habitat protection. The amount of land involved is about 400 acres owned by the St. Joe Paper Company and about one acre at Camp Blanding.

141) Success is completely dependent on the willing cooperation of the land owners and managers.

142) Changes in surface drainage should be discouraged.

143) The St. Joe Paper Company should be encouraged to adjust their pine plantation management as follows:

Site preparation should be limited to burning or, if necessary, burning and chopping. If oak sprouts become a problem after a few years, they could be removed by hand. Longer rotations, perhaps 30 to 40

years, would be very beneficial, particularly if several thinnings were done. Finally, prescribed burning should be done every four or five years, preferably with a fire hot enough to burn down into the titi. Herbicides and fertilizers should never be applied to Chapman's rhododendron habitat.

These management tactics should enable Chapman's rhododendron to grow and prosper in its native habitat. However, they are untested. Therefore, it would be wise to attempt to maintain the very best site at each of the three main populations in as close to its natural condition as possible. The St. Joe Paper Company has already begun this for the Hosford population by leaving undisturbed, except for logging, a zone of habitat containing the largest known population of Chapman's rhododendron. This site is in two parts, a small, wide patch of about 200 plants south of the road; and a longer but narrower patch of perhaps 2000 plants north of the road. It is unfortunate that it was logged, for it will be more difficult to burn properly without the benefit of longleaf pine needles. Ideally, the preserve area should be widened north of the road,

and a longleaf pine overstory should be reestablished. The section north of the road where slash pine has been planted can wait until the end of the rotation when the pines are harvested. The ideal eventual size of the preserve area would be about 15 acres. The area should be burned as hotly as is safe and practical on a 4-year cycle. If some of the oaks are not killed, girdling by hand should be done.

The St. Joe Paper Company has been negotiating with William H. Gensel (pers.comm.) regarding establishment of a similar preserve site in Gulf County. A suitable spot has been chosen, and they should be encouraged to proceed. The site is about five acres on the north side of a power line right-of-way.

- 144) The Camp Blanding site is only about one acre in size, with rhododendrons on just part of it. This site would require a lot of work to restore to a longleaf pine overstory with healthy shrubs and wiregrass but the attempt should be made. Oaks could be girdled in April or May, and longleaf pines planted the next winter. Competing vegetation would then have to be cut back for a couple of years until the first prescribed burn could be

done while the pines are still in the grass stage. After the burn, clumps of wiregrass could be planted. The preserve should include an area of flat upland, where the buildings used to be, that is at least as large as the area of slope down to the creek.

Fire is essential for the success of preserves. If the preserves are established, but left unburned, they would have been much better off being managed as commercial slash pine plantations as discussed in 3.

15) A monitoring program is necessary.

151) The first step is to find all the known sites and make a search for new ones. Next, the sites should be located on U.S.G.S. Quadrangle maps and mapped individually in detail.

152) Accurate population counts need to be made, preferably when the plants are in bloom around April 1. Future decisions will be based on these counts, so they need to be done carefully and consistently. Four people counted the tiny and not particularly dense population at Camp Blanding one day and came up with numbers ranging from 6 to 30. A dense thicket of shrubs like the big one at Hosford will be a real challenge.

153) After this data base is established, the population needs to be recounted every five years using the same methods. Important environmental parameters such as estimated time of the last fire, average height of the rhododendrons and of competing species, and any significant changes (a drainage ditch near by, a logging operation, etc.) should be recorded.

2) Strengthening existing populations by planting nursery-grown plants is clearly less important than habitat protection and management. It may nevertheless prove to be essential for long-term survival of the species. It provides a tested (plantings have been done by Simons in the wild in Suwannee, Levy and Putnam Counties with 100 percent success rates) and easy method to quickly strengthen a population.

21) The single largest documented case of removal of Chapman's rhododendron plants from the wild was the taking of 100 to 200 plants from the site near Hosford. Less than 100 plants remain there with much empty habitat. Many of the plants that were removed are still growing in Tallahassee (Salter pers. comm.). Therefore, the opportunity exists to bring this population back to its former abundance with some of the genetic material that was removed. This should be done by taking about ten cuttings from each plant that can be located and verified as coming from the

Hosford area. These should be rooted and grown to a plantable size - one to two feet tall in gallon cans (smaller containers result in too small a root system to reliably survive outplanting where no watering will be done). They should then be planted at the crossroads site in the areas from where the plants were originally taken. In order not to significantly change the total genetic makeup of the population at this site, no more than five plants from each parent plant should be used, and no more than 200 total should be planted.

- 22) The oaks at the 1-acre Camp Blanding site should be girdled to prevent them from shading Chapman's rhododendron.
- 23) If the population at any site declines, the first action should be to try to determine the cause. If the decline can possibly be reversed by management techniques, this should be tried first.
- 24) If a site drops below 20 plants per acre and shows a decline of more than 30 percent since monitoring began, a replanting effort should be started. Seed should be collected in October from all the plants still growing on the site. Using some seed from each plant, seedlings should be grown as described in the section on cultivation

- 4) Research is the lowest priority, because it seems least important from the standpoint of the immediate and near-term needs of the species. However, the farther one looks into the future, the more important research is. The amount of research recommended here is the minimum necessary to provide for implementation of this recovery plan.
- 41) One of the management objectives is to obtain more on-site reproduction, particularly from seed. Therefore, the factors affecting reproduction from seed in nature need to be investigated and management practices which will facilitate reproduction need to be determined and tested.
- 42) Another objective of the plan is to establish new plantings. New areas of habitat identical to the wild habitat may be impossible to find. Therefore, experimental plantings should be done in several different places in the best habitat available and the results carefully monitored. This could be done in conjunction with part 3 of the recovery plan. In addition, some clearly different, but similar, habitats should be tried. Some examples are the upper edges of shrub and herb bogs in the western panhandle, with Cyrilla in scrubby flatwoods sites lacking Cliftonia, and in central Florida scrub areas with Cyrilla.

- 43) Finally, some guesses have been made in this plan as to the best forest management practices to use for Chapman's rhododendron habitat. These management practices need to be monitored and refined in cooperation with the St. Joe Paper Company and, after new plantings are established, with others. Trials of new or untested techniques are necessary. These should not be done on the original wild populations, but at sites that have been planted elsewhere.

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PART III.

IMPLEMENTATION SCHEDULE

Priorities within this section (Column 4) have been assigned according to the following:

Priority 1 - Those actions absolutely necessary to prevent extinction of the species.

Priority 2 - Those actions necessary to maintain the species' current population status.

Priority 3 - All other actions necessary to provide for full recovery of the species.

Chapman's Rhododendron

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency			Estimated Fiscal Year Costs			Comments/Notes	
					FWS	Region	Program	Other	FY 1	FY 2		FY 3
	Establish cooperative agreements with:	11										
A 3	St. Joe Paper Co.	111	1	1 yr	4			GFC	5K			
A 3	Camp Blanding	112	1	"	4			GFC	2K			
M 3	Habitat protection:	12							2K	1K		
M 3	Cooperate with owners	121	1	Continuing	4			GFC				
M 3	Keep them informed	122	2	"	4			GFC				
O 1	Discourage adverse use of habitat	123	1	"	4			SJ, CB, GFC				
O 3	Prevent federal destruction of habitat	124	2	Continuing	4							
	Plant protection:	13										
O 1	Work with owners	131	2	Continuing	4			GFC				
O 2	Support laws	132	2	"	4			DACS, GFC				
M 1	Establish clone bank	133	3	"	4							
	Proper management:	14										
M 7	Cooperate with owners	141	2	Continuing	4			GFC				
M 3	Discourage drainage	142	2	"	4			GFC				
M 3	Encourage beneficial plantation management	143	2	"	4			GFC				
M 3	Encourage preservation of valuable sites	144	2	"	4			SJ, CB, GFC				

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency			Estimated Fiscal Year Costs			Comments/Notes	
					FWS	Region	Program	Other	FY 1	FY 2		FY 3
	Monitoring:	15							12K	5K	5K	
I 1	Search for new sites	151	3	1yr	4		GFC					
I 1	Map, count all sites	152	3	"	4							
I 1	Recount every 5 years	153	2	Continuing	4							
	Strengthen populations at:	2										
	Hosford site:	21										
M 1	Locate cuttings	211	3	1yr	4			1K				
M 1	Rear plants	212	3	2yrs	4			1K				
M 2	Replant site	213	3	1yr	4		SJ	1K				
M 3	Girdle oaks at											
M 7	Camp Blanding	22	1	1yr	4		CB, GFC	1K				
	Detect and solve other management problems	23	3	Continuing								
M 2	Replant declining sites:	24	2		4			3K				
M 1	Collect seed	241	2	1yr	4					3K		
M 1	Grow plants	242	2	2yrs	4							
M 2	Replant	243	2	1yr	4							
	Establish new populations:	3	3									
I 14	Determine historical range	31	3	1yr	4							
I 14	Locate suitable sites	32	3	"	4							
A 3	Obtain permission for plantings	33	3	"	4							
M 1	Collect seed	34	3	"	4							
M 1	Raise and plant	35	3	2yrs	4							

General Category	Plan Task	Task Number	Priority	Task Duration	Responsible Agency			Estimated Fiscal Year Costs			Comments/Notes
					FWS			FY 1	FY 2	FY 3	
					Region	Program	Other				
	Research	4	3		4	Research					
R 14	Investigate	411	3	3yrs	4			5K	5K	5K	Funding incl. 412
R 14	Determine favorable management for reproduction	412	3	Unknown	4						
R 13	Trial plantings	42	3	"	4						
M 3	Forest management	43	3		4					10K	
M 3	Monitor existing management practices	431	3	Continuing	4				SJ		
R 4	Try new management techniques	432	3	Unknown	4				SJ		
GFC =	Florida Game and Fresh Water										
SJ =	St. Joe Paper Company										
CB =	Camp Blanding, Florida National Guard										
DACS =	Florida Department of Agriculture and Consumer Services										

GENERAL CATEGORIES FOR IMPLEMENTATION SCHEDULES *

Information Gathering - I or R (research)

1. Population Status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Other - O

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

* (Column 1) - Primarily for use by the U.S. Fish and Wildlife Service.

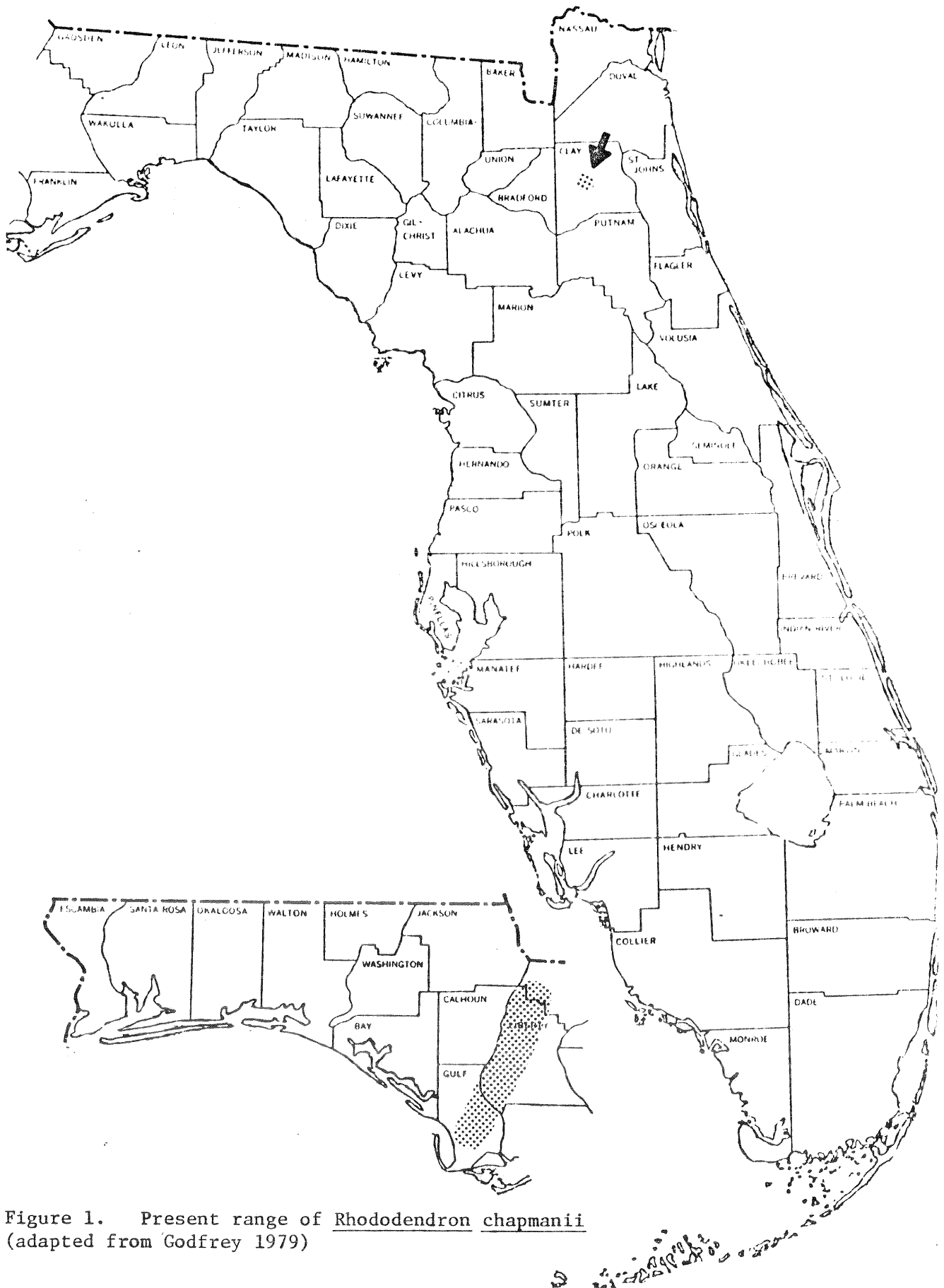


Figure 1. Present range of *Rhododendron chapmanii* (adapted from Godfrey 1979)

APPENDIX

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