CANDIDATE CONSERVATION AGREEMENT

FOR

Castilleja christii
CHRIST'S INDIAN PAINTBRUSH

USDA Forest Service, Minidoka Ranger District
USDA Forest Service, Sawtooth National Forest
U.S. Fish and Wildlife Service, Snake River Fish and Wildlife Office

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EXECUTIVE SUMMARY

Castilleja christii (Christ's Indian paintbrush) is a showy perennial forb between 6 and 20 inches high with yellow to yellow-orange flowers. The species was discovered in 1950 by John Christ (sounds like "mist), and subsequently described in 1973. *Castilleja christii* is confined to one population (approximately 220 acres, 89 hectares) at the summit of Mount Harrison (elevation 9265 feet, 2824 meters) south of Burley, Idaho, Cassia County. This species is endemic to the snowbed, grassland, and sagebrush/grass plant communities on the summit of Mount Harrison, which is managed exclusively by the Sawtooth National Forest, Minidoka Ranger District. Due to its restricted distribution and vulnerability to threats, *Castilleja christii* is designated as a candidate species for Federal listing under the Endangered Species Act of 1973, as amended (40 FR 27924).

Permanent monitoring of the *Castilleja christii* population and its associated plant community was established in 1995 by the Idaho Conservation Data Center with funding from the USDA Forest Service and the U.S. Fish and Wildlife Service. Since 1995, monitoring has been conducted yearly with the exception of 1998, 1999, and 2001. Overall, this monitoring indicates the *Castilleja christii* population has experienced a decline since 1997 in terms of both plant density and numbers of reproductive stems per plant. There was a slight increase in plant density and reproductive effort (number of stems per plant) between 2004 and 2005. A full account of monitoring results and trends can be found in Motychak and Pierson (2005).

Three other species of *Castilleja* occur on and around Mount Harrison although they are much more widespread. Also occurring on Mount Harrison is another endemic plant, *Cymopterus davisii* (Davis' wavewing), which is locally abundant and is somewhat more widespread, occurring throughout the Albion Mountains. Conservation actions in this agreement will also benefit Davis' wavewing.

Impacts to the species include invasive non-native plants, especially smooth brome (*Bromus inermis*), recreation activities, off-highway vehicle use, hang gliding activities, collecting and harvesting plants, trespass cattle, road construction and maintenance, and naturally occurring impacts. However, many of these threats are being ameliorated through actions implemented by the Sawtooth National Forest. A Botanical Special Interest Area (BSIA) was designated in 2003 to protect the portion of the *Castilleja christii* population that was not included in the previously established Mount Harrison Research Natural Area (RNA) (designated in 1996). The USDA Forest Service has been actively managing for this species, including placing rock barriers to prevent off-highway vehicle use in the population and constructing fences to exclude livestock. The U.S. Fish and Wildlife Service provided funding and technical support to the USDA Forest Service to install interpretive signs and to conduct three years of treatments to control smooth brome.

This Candidate Conservation Agreement (Agreement) tiers to the Sawtooth National Forest Plan (Forest Plan), which contains specific protections for Threatened, Endangered, Proposed, Candidate, and Sensitive species (USDA Forest Service 2003). A

Conservation Assessment and Strategy (Strategy) prepared by the Sawtooth National Forest in 2002 is incorporated into the Forest Plan by reference (USDA Forest Service 2002). The Agreement continues many of the same proactive, ongoing, land management actions and responsibilities included in the Conservation Agreement for *Castilleja christii* that expired in 2000 (USFWS 1995). The new Agreement expands the existing actions and includes new actions to detect and control invasive species, provide outreach to public and user groups, and additional effectiveness monitoring and management involvement.

The U.S. Fish and Widlife Service ranking system assigns *Castilleja christii* a listing priority number 11 whereby the threats to this species, compared to other candidate species, are considered of a low to moderate magnitude and non-imminent (70 FR 24869, 67 FR 40657, 66 FR 54807, 61 FR 7595). Conservation actions listed in section IX of the Agreement include a commitment by the USDA Forest Service and U.S. Fish and Wildlife Service to continue to work together to protect this species during the 10-year term of the Agreement. The responsibilities of the USDA Forest Service and U.S. Fish and Wildlife Service are listed in detail this section (IX). The Agreement also describes specific tasks and their associated performance measures to assure that the conservation actions are effective at protecting this species, including feedback loops for involving management in this evaluation process (Appendix D). Also described are the anticipated timing, funding, and the responsible parties for implementing actions and tasks (Appendix E). The Agreement also will be reviewed and amended through annual reporting by the USDA Forest Service in coordination with the U.S. Fish and Wildlife Service. Implementation of this Agreement will continue to identify and eliminate, or significantly reduce, threats to the single population of *Castilleja christii* and its habitat. Successful implementation of conservation actions should prevent the species from becoming threatened or endangered within the foreseeable future under the ESA.

I. INTRODUCTION

Castilleja christii (Christ's Indian paintbrush) is endemic to subalpine meadow and sagebrush habitats in the upper elevations of the Albion Mountains, Cassia County, Idaho. The single known population of this species is restricted to the summit of Mount Harrison and covers approximately 220 acres (89 hectares) of land managed by the Sawtooth National Forest, Minidoka Ranger District. Due to its restricted distribution and vulnerability to threats, *C. christii* is designated as a candidate species for Federal listing under the (ESA) (40 FR 27924).

In 1995, Moseley and Hudak (1995) developed a Conservation Strategy to address threats and to recommend conservation actions that would protect the *Castilleja christii* population. In the same year, the U.S. Fish and Wildlife Service and USDA Forest Service signed a Conservation Agreement for *C. christii* to implement those actions (USFWS 1995). The original Conservation Agreement expired on September 25, 2000. The Sawtooth National Forest has prepared an updated and extensive Conservation Assessment and Strategy for *Castilleja christii* (USDA Forest Service 2002). This

Strategy provides detailed conservation action items to be implemented by the Sawtooth National Forest that promote the resolution of identified management concerns. Implementation of the action items will reduce or eliminate current and potential threats to the single known population.

This Agreement promotes the implementation of the conservation action items identified in the Strategy (USDA Forest Service 2002). This Agreement will focus on actions to protect and enhance habitat for *Castilleja christii* and identifies the commitments of the USDA Forest Service and U.S. Fish and Wildlife Service to ensure the long-term conservation of *C. christii.*

The primary purpose of this Agreement is to ensure the long-term conservation of *Castilleja christii* through implementation of conservation actions and minimization of threats through an adaptive management process.

II. SPECIES INVOLVED

The primary species involved in this Agreement is *Castilleja christii* (Christ's Indian paintbrush). For a full description of the biology of this species, consult the Strategy developed by the Sawtooth National Forest (USDA Forest Service 2002).

III. GOALS AND OBJECTIVES

The goals of this Agreement are to attain long-term conservation of *Castilleja christii* with proactive management of the species and the habitat upon which it depends, and to implement actions that ensure the long-term viability of the species.

The primary conservation objectives for *Castilleja christii* are the following:

1. Protect the only known population and occupied habitat of *Castilleja christii* to maintain its current geographic distribution.

2. Maintain the biological and ecological integrity of the *Castilleja christii* population and promote the long-term viability of this population on the Sawtooth National Forest.

3. Gain additional biological and ecological information pertaining to *Castilleja christii* through monitoring and research. This information will allow us to determine whether conservation measures taken on behalf of the species are maintaining population trends and viability.

4. Continue and maintain interpretive opportunities to educate the public, user groups, forest personnel, and permittees on the uniqueness of *Castilleja christii* and the importance of its conservation.

IV. INVOLVED PARTIES

USDA Forest Service (USFS)
Minidoka Ranger District
3650 South Overland Avenue
Burley, Idaho 83301
208-678-0430

USDA Forest Service (USFS)
Sawtooth National Forest
2647 Kimberly Road East
Twin Falls, Idaho 83301
208-737-3200

U.S. Fish and Wildlife Service (USFWS)
Snake River Fish and Wildlife Office
1387 South Vinnell Way, Room 368
Boise, Idaho 83709
208-378-5243

V. AUTHORITY

The authority for this Agreement rests with the USDA Forest Service and U.S. Fish and Wildlife Service pursuant to the Endangered Species Act of 1973, as amended (ESA), and the National Forest Management Act (1976). The National Forest Management Act (NFMA) and USDA Forest Service policies direct that Forest Service lands be managed to maintain viable populations of all native and desired non-native wildlife, fish, and plant species. A viable population is one that has the estimated numbers and distribution of reproductive individuals to ensure the continued existence of the species throughout its existing range within the Sawtooth National Forest (36 CFR 219.19).

In addition to those species listed as threatened or endangered under the ESA, or that are candidates for such listing, the USDA Forest Service has recognized the need to implement special management direction for other rare species on the lands it administers. The Regional Forester may designate these species as Sensitive as described in the Forest Service Manual 2670.22. The objectives of management for such species are to ensure their continued viability throughout their range on National Forest lands, and to ensure that they do not become threatened or endangered because of Forest Service actions (USDA Forest Service 1988). *Castilleja christii* is designated Sensitive on the Regional Forester's Sensitive List for the Intermountain Region.

A national interagency Memorandum of Understanding (MOU) (94-SMU-058) for the conservation of species tending toward federal listing issued on January 25, 1994, provided a framework for cooperation and participation among agencies for the conservation of species (USDA Forest Service *et al.* 1994). The U.S. Fish and Wildlife

Service and the USDA Forest Service signed this MOU. Although this MOU is currently expired, efforts are underway to renew this agreement.

VI. *CASTILLEJA CHRISTII* DISTRIBUTION AND LEGAL STATUS

Castilleja christii was first collected on Mount Harrison in the Albion Mountains, south of Burley, Idaho, in 1950 by John Christ. In 1966, Noel Holmgren and Jim Reveal collected this species again. Noel Holmgren formally described *Castilleja christii* as a new species in 1973 (Holmgren 1973).

Castilleja christii is known from one population that covers approximately 220 acres (89 hectares) on Mount Harrison, the highest peak at the north end of the Albion Mountains in Cassia County. The geographic area occupied by the *C. christii* is located 250 feet (76.2 meters) north of the fire lookout and parking area. The population continues north for approximately 0.75 mile (1.2 kilometer) below the summit. From east to west, the extent of the population is slightly over one mile (1.6 kilometer) in width. The population stretchs in a narrow linear fashion along the western ridge of Mount Harrison and terminates at rocky north facing cliffs (Moseley 1993). Two small areas, disjunct from the main body of the population, occur to the north and west. Appendix A provides a map of the known distribution of *C. christii.*

The entire population exists on land managed by the USDA Forest Service, Sawtooth National Forest, Minidoka Ranger District. Approximately 23 percent of the *Castilleja christii* population is within the boundary of the Research Natural Area (RNA) (Mancuso and Evenden 1996). The remaining 77 percent of the population is within the Botanical Special Interest Area (BSIA, Appendix A). The RNA was designated in 1996 (Mancuso and Evenden 1996; Dale Bosworth, USDA Forest Service, *in litt.* 1996), and the BSIA was designated in 2003 (Appendix A).

Castilleja christii is a yellow to yellow-orange flowered perennial forb, with erect stems occurring in a cluster. Its leaves are narrowly to broadly lanceolate. A detailed description of the *C. christii* appears in *Intermountain Flora* Volume 4 (Cronquist *et al.* 1984). Three other species of *Castilleja* occur on and around Mount Harrison. They can be distinguished from *C. christii* by the communities in which they are found and calyx characteristics. *Castilleja christii* is the only *Castilleja* occurring in the moist snowbed and graminoid communities on the summit of Mount Harrison.

Castilleja christii occurs primarily on gentle, north-facing slopes. Deep snows on the occupied habitat may last until mid-July or August in some years. Occupied habitat has been identified in three distinct communities on Mount Harrison:

1. Snowbed, which occurs in areas of the latest-lying snowbanks. The community is forb-dominated, with *Solidago multiradiata, Aster foliaceus*, and *Cymopterus davisii* being the most prominent members. *Castilleja christii* occurs at a low density in this community.

2. Graminoid, which is dominated by *Festuca idahoensis*, *Agropyron caninum*, and *Elymus trachycaulus*. *Artemisia tridentata* ssp. *vaseyana* is absent. *Castilleja christii* occurs at its highest density in this community.

3. *Artemisia tridentata* ssp. *vaseyana/Festuca idahoensis* habitat type, most of which is patterned in biscuit and swale topography. *Castilleja christii* density is inversely related to the density of the sagebrush. It generally only occurs in openings in the sagebrush and in the nearly shrubless swales between the biscuits (Moseley 1993).

The graminoid community has the highest density of *Castilleja christii*, while the snowbed and *Artemisia tridentata* ssp. *vaseyana/Festuca idahoensis* types have lower densities (Moseley 1993). The major difference between these communities is that the graminoid community lacks significant shrub cover and the snowbed community is devoid of shrubs. It is currently unknown if shrub encroachment is taking place in the graminoid community or if high snow deposition precludes the establishment and growth of sagebrush.

Occurring with *Castilleja christii* is another endemic plant, *Cymopterus davisii* (Davis' wavewing). Davis' wavewing is somewhat more widespread, occurring on Mount Harrison with *C. christii,* and on Independence Mountain and Graham Peak at the southern end of the range; it is considered locally abundant in its range. Although this Agreement was not developed specifically to conserve Davis wavewing, actions and comments contained herein will also benefit this species.

Additional information on the known phenology, life history, reproductive biology, and ecology of *Castilleja christii* is provided in the Strategy prepared by the Sawtooth National Forest (USDA Forest Service 2002).

Castilleja christii is currently a candidate for listing under the ESA and is on the U.S. Fish and Wildlife Service Notice of Review List (70 FR 24869). *Castilleja christii* is a Sensitive plant species on the Regional Forester's Sensitive Plant List for the Intermountain Region.

VII. EXISTING CONDITIONS

A. MANAGEMENT HISTORY

1. *Management and Conservation Plans*

In 1985, Atwood prepared the first management plan for *Castilleja christii* (Atwood 1985). This plan outlined specific management needs to promote the long-term conservation of this rare species. In 1995, Moseley and Hudak developed a Conservation Strategy to address the threats and recommend conservation actions that would protect the *C. christii* population (Moseley and Hudak 1995). Following the strategy, the U.S. Fish and Wildlife Service and USDA Forest Service signed a Conservation Agreement to

implement those actions. The 1995 Conservation Agreement outlined 21 conservation action items for the Sawtooth National Forest to implement for *C. christii.* This Conservation Agreement expired on September 25, 2000. Appendix B provides a status report of the ongoing and completed conservation action items as defined in the Conservation Agreement (USFWS 1995).

2. *Inventories*

Extensive survey and inventory work has been conducted for *Castilleja christii* since its original discovery by John Christ in 1950. Holmgren (1973), in the original publication on *C. christii* stated, "I have searched in vain for this Harrison Mountain endemic in the neighboring mountain ranges as well as other peaks in the same range." Shultz (1980) completed an extensive survey of the Burley Ranger District (Black Pine, Sublet, Raft River, and Albion Mountain Divisions) for plant species proposed for listing as threatened or endangered, specifically *C. christii,* but was unsuccessful in locating additional populations. Moseley (1993) surveyed Mount Harrison, the Independence Mountains, and Graham Peak, and failed to discover additional populations of *C. christii.*

3. *Monitoring*

In accordance with the signed Conservation Agreement for *Castilleja christii* (USFWS 1995) between the USDA Forest Service and the U.S. Fish and Wildlife Service, a monitoring program was established. The primary objective of this monitoring program was to examine the impacts to the *C. christii* population associated with recreational uses. At that time, it was determined that impacts from livestock grazing did not need to be examined given the administrative closure to livestock use. As part of the monitoring schedule, inventories to determine the population trend (expanding or contracting) were required. Additionally, recommendations for changes to the monitoring program were to be identified if monitoring results indicated that deleterious impacts were taking place.

The USDA Forest Service retained the services of Idaho Conservation Data Center (ICDC) through a challenge cost-share agreement. The objectives of the agreement required that the ICDC: (1) establish permanent monitoring transects within each of the three community types identified by Moseley (1993), (2) collect density and frequency data for *Castilleja christii* individuals, (3) collect ecological information on its habitat, and (4) establish permanent photo points at each transect. Additionally, ICDC was required to delineate the three community types on a large scale aerial photograph, and using population data estimate the population size of *C. christii.* Monitoring was to be conducted on an annual basis for the first five years of the agreement, though monitoring has continued in subsequent years following the expiration of the 1995 agreement.

The monitoring procedures and plot designs are detailed in Moseley (1996). Monitoring of population trends of *Castilleja christii* was conducted in 1995, 1996, 1997, and 2000 in 20 permanently marked plots in the *C. christii* population (Moseley 1996, 1997, 1998; Mancuso 2001). Results of monitoring are summarized in the Conservation Assessment (USDA Forest Service 2002), and are detailed in separate documents (Moseley 1996,

1997, 1998; Mancuso 2001, 2003). The U.S. Fish and Wildlife Service provided funding for the monitoring in 1995 and 1997 through the Section 6 program under the ESA. The population monitoring shows that the annual abundance of reproductive stems has fluctuated widely since 1995 and it is postulated that this fluctuation is due to rainfall patterns on Mount Harrison (Mancuso 2003). Plant community monitoring transects in 1995, 2000, and 2002 displayed few overall changes in plant composition (Mancuso 2003). However, in 2000, six new graminoid species were found in community transects including two introduced grass species (Mancuso 2001).

In 2001, Mancuso, in association with the USDA Forest Service, added a measuring element to the original design that attempted to measure additional impacts to the population and the habitat. The ICDC was funded by the U.S. Fish and Wildlife Service to complete this work. At each measuring station, monitors examined for invasive species (species, density, cover), recreational impacts (ATV tracks, fire rings), grazing impacts (herbivory and trampling), and other impacts (wildlife burrowing, etc). Transects were monitored using both the new and original methodology in 2002, 2003, and 2004. Mancuso (2003) describes the results for the 2002 monitoring.

During the 10 years since monitoring was established for *Castilleja christii* on Mount Harrison (Moseley 1996), the only known population has suffered a significant overall decline. Initially, plant density (plants per square meter) and reproductive output (flowering stems per plant) increased slightly from the monitoring established in 1995 (Moseley 1996) and the monitoring conducted in 1997 (Moseley 1998). Between 1997 and 2004, *C. christii* plant density and reproductive output (stems/plant) have decreased by more than 50 percent (Motychak and Pierson 2005). Data collected in 2005 indicate that this decline was reversed. There was an increase in both plant density and reproductive output between 2004 and 2005; however, the 2005 population statistics are still significantly lower than those reported in 1997 for each community type (Motychak and Pierson 2005). The *C. christii* population is smaller and less productive in 2005 compared to the 10-year average but the data from 2005 indicate a reversal of this decline in all three community types (graminoid, mountain sagebrush, snowbed, Motychak and Pierson 2005). Further monitoring is needed to determine if this short term upward trend will continue.

The density of *Castilleja christii* has remained the most stable over the past 10 years in the sagebrush community, but this is also the lowest occurrence of the plant in any of the three community types (Motychak and Pierson 2005). Densities of *C. christii* have fluctuated most in the graminoid communities over the 10-year period. Plant densities increased most dramatically in the graminoid communities between 2004 and 2005, while the number of reproductive stems/plant increased more in the snowbed communities (Motychak and Pierson 2005).

Population fluctuations of *Castilleja christii* may be the result of a variety of causative factors including biological interactions, direct human disturbances, and environmental effects. In terms of biological interactions, most attention has been given to the possible effects of invasive, non-native weeds, with special emphasis on the introduced grass

smooth brome (*Bromus inermis*). Data for invasive weed occurrence by cover class indicate increases in mean weed density in each community between 2002 and 2005 (Motychak and Pierson 2005). Distributions of invasive weeds, especially smooth brome, appear to follow areas of past disturbance such as the paved and unpaved roads and the buried electric line established in1995. There is a clear trend of increase for weed density on Mount Harrison, however when compared to the population statistics of *C. christii*, all correlations are positive (Motychak and Pierson 2005). There is a documented increase in both weed density and density of *C. christii* since 2004. The impact of introduced grass species on Mount Harrison is currently unclear. There is little evidence to indicate that invasive weeds are negatively impacting the population density or reproductive effort of *C. christii* on Mount Harrison. Native and non-native plant populations both increased between 2004 and 2005. To explain this trend, two potential scenarios exist: (1) native and non-native plant populations are both independently responding to improved growing conditions (changes in annual climate, specifically precipitation and temperature), or (2) the *C. christii* population is increasing because of the increase in non-native plant densities.

The first scenario was explored using climate data for the Idaho southwest highlands available from the Western Regional Climate Center (Motychak and Pierson 2005). When fluctuations of *Castilleja christii* density (plants per square meter) were compared to average annual temperature and average annual precipitation from 1995 to 2004 the correlations were positive but low (0.38 correlation with temperature; 0.14 correlation with precipitation). When *C. christii* population data for reproductive output (reproductive stems per plant) were compared to the same climate data, the correlation of stems per plant with annual precipitation was 0.70, and the correlation between flowering and average annual temperature was –0.66. Thus, reproductive output increases with increased annual precipitation, and decreases with higher annual temperatures (Motychak and Pierson 2005).

Castilleja christii overall plant density (plants per square meter) is relatively unaffected by variations in climate for the years 1995 to 2004. Since 1995, this area has experienced drought conditions, increased average annual temperatures, and decreased average annual precipitation. This suboptimal trend in growing conditions may account for the decrease in reproductive output in the *C. christii* population (Motychak and Pierson 2005). A crucial part of this comparison would include climate data for the 2005 growing season compared to the *C. christii* population increase between 2004 and 2005. The 2005 climate data is currently unavailable. The *C. christii* population and the non-native weed populations may both be increasing as a response to more favorable annual growing conditions, but there is little evidence of competition between these groups.

The second scenario for increases of native and nonnative plant populations is that the population dynamics and health of the available host species is closely tied to the health of *Castilleja christii* populations. Research on other *Castilleja* species demonstrates that these species extract water, nutrients and alkaloids from host plants, which in turn increases the fitness of those *Castilleja* species studied (Shenk and Holsinger 2001; Hansen 1979; Alder 2000, 2003; Press and Phoenix 2005). For a full discussion of the

interactions between *C. christii* and host plants, see Motychak and Pierson (2005) and section 4 (Research) below.

Other monitoring for *Castilleja christii* has been conducted in relation to USDA Forest Service projects on Mount Harrison. An additional monitoring transect was added in 1996, following the burial of an electric cable within the *Castilleja christii* population. This transect was monitored to assess the recovery along the part of the cable route that traverses occupied and suitable-appearing potential habitat. Results of monitoring for each of three years examined are also detailed in the aforementioned documents (Moseley 1997, 1998; Mancuso 2001). A separate monitoring effort was designed for *Castilleja christii* in 1997 to assess the impacts to the *C. christii* population and its potential recovery following the paving of the Howell Canyon road. Christine Frisbee, Forest Botanist (1997 to 2001), established five permanent monitoring plots to examine the effects associated with the road widening, preparation, and paving (Frisbee 1998). Thirteen *C. christii* plants were lost during the paving process. These transects were resampled in 1998 and 1999 following maintenance of the Howell Canyon Road. In 2001, major portions of the road were removed and repaved by the Burley Highway District. Kim Pierson, Forest Botanist (2001 to present), resampled the permanent transects concurrent with the repaving and resurfacing effort. Monitoring of these permanent plots (1998, 1999, 2001) indicates that the number of individuals in roadside plots is stable or increasing (K. Pierson, *in litt.* 2002).

4. *Studies/Research*

Studies funded cooperatively by the USDA Forest Service, U.S. Fish and Wildlife Service, and other agencies have been initiated to improve basic knowledge on the biology of this endemic species since it was described in 1973. To date, the focus of these studies has been on seed germination and pollinators.

In accordance with the Conservation Agreement (1995) between the USDA Forest Service and the U.S. Fish and Wildlife Service for *Castilleja christii,* the Denver Botanical Garden maintains an off-site seed storage program. In addition, seed germination studies conducted by the Denver Botanical Garden indicate *C. christii* has a strong dormancy. It is speculated seeds may require prolonged (three months or longer) cool and moist conditions to germinate. Approximately 3,000 seeds are in seed storage at the National Seed Storage Laboratory in Fort Collins, Colorado (ICDC 2005). A new collection of seeds will be made as part of this agreement.

In 2002, Dr. Vince Tepedino, USDA Bee Biology and Systematics Laboratory, examined the pollinator ecology of *Castilleja christii* and the three other species of *Castilleja* that occur on Mount Harrison. Dr. Tepedino collected several native bee species visiting *C. christii,* including: *Megachile frigida, M. melanophaea,* and *Osmia grindeliae* (Vince Tepedino, Utah State University, *in litt.* 2002).

Megachile frigida was also observed visiting *Castilleja miniata* and *C. linarifolia.* Currently, it is unknown if hybridization is occurring between *Castilleja* species on

Mount Harrison. If hybridization is occurring, Dr. Tepedino's findings indicate that *M. frigida* is the primary agent contributing to hybridization between the *Castilleja* species. The risks to genetic diversity and species persistence are discussed below under Natural Threats (Vince Tepedino, *in litt.* 2002).

All *Castilleja* species are considered hemiparasites. *Castilleja* species are opportunist and able to parasitically exploit a wide range of other plants, including more than 100 different host species from a variety of plant families (Press and Phoenix 2005). A proposal by the ICDC to examine the host specificity of *Castilleja christii* was received by the Sawtooth National Forest in 1999 (Moseley, *in litt.* 1999). Although it was never funded, the project proposed to determine the host(s) of *C. christii in situ* during July and August. A few plants would have been excavated and all roots would be examined for their haustorial connections. Host species would have been identified, and preferences for particular hosts would have been determined if possible.

Based on host data from other *Castilleja* species, probable native hosts on Mount Harrison include Mountain Sagebrush (*Artemnesia tridentata* var. *vaseyana*), Silvery Lupine (*Lupinus argenteus*), Idaho Fescue (*Festuca idahoensis*), and Slender Wheatgrass (*Agropyron tracycaulum*). In the snowbed communities, Rocky Mountain Goldenrod (*Solidago multiradiata*) is the most common plant species sympatric to *Castilleja christii* and may be a host in that community. *Castilleja* species are known to opportunistically parasitize grasses (native and non-native), and *Castilleja* population distributions can rapidly expand to match invasions of non-native grasses (Adler 2003).

5. *Establishment of Botanical Special Interest Area and Interpretive Displays*

In 2003, the BSIA was established. A BSIA is a unit of land that contains plant species, plant groups or plant communities that are significant because of their form, color, occurrence, habitat, location, life history, ecology, or rarity. These areas are set aside to be protected and managed for public use and enjoyment as part of the National Forest System (36 CFR 294.1). This 350-acre (142 hectare) area was established to provide additional protection for the *Castilleja christii* population not located within the RNA, to protect intact portions of the tall forb community, and to provide for the maintenance of botanical resources unique to this region. A management plan for the BSIA will be completed in fall 2005. This plan will outline additional protection measures and will describe appropriate activities for the BSIA, management actions and needs (*i.e.*, weed treatment, increased signing, etc.), and will outline management objectives to maintain the botanical characteristics for which it was established. Actions described in this management plan for the BSIA will be incorporated in the Conservation Actions of this Agreement (section IX, USDA Forest Service Administrative responsibility number 7), based input from the technical team (ongoing general conservation action 6).

In 2004, a tri-panel kiosk and seven additional interpretive signs were placed within the Mount Harrison Interpretive Area (defined as the RNA and the BSIA). Signs provide information to encourage the conservation and protection of *Castilleja christii.* Themes found within the interpretive information include: (1) designated travel corridors to

encourage use of main travel routes and to discourage off-road travel, (2) designated camping and picnicking areas to encourage use in designated sites only, (3) weed identification and methods to reduce the risk of introduction and spread,(4) plant viewing and protection etiquette to aid in preservation of *C. christii* and its unique habitat, (5) alpine and subalpine ecology, (6) fire ecology, (7) tall forb community information, (8) wildlife found in the area, (9) paintbrush (*Castilleja*) identification information for the four species that occur on Mount Harrison and (10) other special interest information for the area (*i.e.*, plane crash of 1947). The tripanel kiosk also discusses the history of preservation of *C. christii* and the ongoing conservation efforts (*i.e.*, monitoring, meeting with special user groups, rock barriers, and invasive species eradication efforts).

To ensure longevity of the interpretive signs, they will be removed from existing stands each fall and stored in the fire lookout. Each spring the signs will be reinstalled and replaced as needed over time (signs are expected to last three years before they need to be replaced). If new threats are identified or if additional information is necessary, the signs will be amended to provide relevant information.

B. Existing and Potential Threats

Due to its restricted range and specific habitat requirements, *Castilleja christii* is vulnerable to human disturbance. The existing and potential threats to the only known population of *Castilleja christii* include:

1. Non-native plant introduction and establishment
2. Recreational impacts
3. Unauthorized livestock use impacts
4. Road construction, maintenance, and facilities
5. Natural threats (fire, hybridization, disease, etc.)

These threats are ranked in order, the greatest threat being invasion of non-native plants, and natural biological and environmental threats being the lowest. The U.S. Fish and Widlife Service ranking system assigns *Castilleja christii* a listing priority number 11 whereby the threats to this species compared to other candidate species are considered of a low to moderate magnitude and non-imminent (70 FR 24869, 67 FR 54807, 66 FR 54807, 61 FR 7595).

As previously stated, planned action items, effectiveness objectives, and implementation measures to address and minimize or remove threats are summarized in Appendix C.

1. *Non-native plant introduction and establishment*

Invasion of non-native species and disturbance species into *Castilleja christii* habitat could pose a serious threat to the species' viability. Competition from invasive non-native species and noxious weeds can result in the loss of habitat, loss of pollinators, species composition conversion, decreased vegetation integrity, and loss or decline of threatened, endangered, proposed or candidate (TEPC) species viability.

According to The Nature Conservancy, alien species are one of the leading threats to U.S. species and ecosystems. Non-native species have contributed to the decline of 42 percent of threatened and endangered species in the United States (Rapp 2005).

Mancuso (2001) noted the invasion of six new graminoid species in the 20 permanent transects located on Mount Harrison. Two of these species, *Bromus inermis* (smooth brome) and *Agropyron* sp. (wheatgrass cultivar) are introduced species that may have been part of the seeding mix used for restoration following the road paving in 1997. Mancuso (2001) reported that these species were found in the majority of the graminoid community plots. Both species are rhizomatous and have extremely invasive tendencies (Sather 2000).

The smooth brome (non-native grass) infestation on Mount Harrison may temporarily provide new host plants for *Castilleja christii*, and increases in plant density of *C. christii* may be a direct result of the increase of this invasive plant. However, this association is not likely to be beneficial to the long-term fitness of the *C. christii* population on Mount Harrison. *Castilleja* plants are able to draw water and nutrients from grasses, but not alkaloids, as grasses do not produce them. Alkaloids from host species are essential for *C. christii* defense against herbivory and in pollination success. *Castilleja* plants parasitizing lupines (nitrogen-fixing, alkaloid-producing) are more attractive to pollinators and produce three times more seeds than *Castilleja* plants parasitizing grasses which are non-nitrogen fixing and non-alkaloid producing (Adler 2003). The conclusion is that the population of *Castilleja christii* on Mount Harrison depends upon the stability of the native plant assemblage and not the apparently temporary host smooth brome.

Castilleja christii on Mount Harrison will have a higher likelihood of long-term survival if the assemblage of host plants remains stable. Invasive grasses may result in short-term parasitic associations, but it is likely that reproduction and long-term persistence of *C. christii* depends upon associations with native hosts. Non-native grasses, such as smooth brome, can be responsible for a decline in overall community biodiversity, resulting in a monoculture of non-native species. On Mount Harrison, the mountain sagebrush and silvery lupine are likely to be the most important hosts, but this remains to be confirmed. Invasive plants may alter native communities and negatively affect the *C. Christii* population in the long-term.

The Minidoka Ranger District and U.S. Fish and Wildlife Service have jointly provided funding to remove/treat smooth brome in 2003, 2004, and 2005. Hand grubbing, seed head threshing, and hand wicking with Round-up® were the treatments used to attempt to treat the infestation of smooth brome. Permanent photo-points of smooth brome infestation in the *Castilleja christii* population were established in 2003. These photo points were established in association with the weed treatment effort. Future efforts will include additional treatment areas, using a global positioning system (GPS) to delineate the infestations, and combined threshing/treating efforts. In 2005, a challenge cost share between the USDA Forest Service and the U.S. Fish and Wildlife Service funded aggressive treatment for smooth brome. Treatment occurred prior to inflorescence

development ("boot" stage) and focused on eliminating this species prior to seed set. To be most effective in treating smooth brome, Roundup® was used (Sather 2000).

In August, the Forest Botanist, Kim Pierson, examined all areas treated chemically for success of treatment and effects to *Castilleja christii* individuals. In this examination, no *C. christii* individuals appeared to be affected indirectly by the chemical treatment. A few individuals appear to suffer some die-back, but not complete mortality, in those areas where drift of herbicide might have accidentally occurred. Overall, it did not appear that the *C. christii* individuals were impacted indirectly or directly by chemical treatment (Motychak and Pierson 2005). A risk assessment examining the potential costs and benefits to *C. christii* of continued herbicide treatment of smooth brome should be completed within 6 months of the signing of the Candidate Conservation Agreement (Appendix D).

Spotted knapweed (*Centaurea maculosa*) and rush skeletonweed (*Chondrilla juncea*) have been reported as occurring on the lower portions of the Howell Canyon Road. Every effort must be made to ensure that these extremely invasive species do not migrate into the *Castilleja christii* population. Close monitoring is needed given the easy access to the population provided by the paved road and the large number of visitors to the lookout. Dyer's woad (*Isatis tinctoria*), an extremely aggressive and alleleopathic species, has been observed on the Raft River Unit of the Minidoka Ranger District. Indirect introduction of noxious weeds could occur as a result of permitted recreation and grazing activities (discussed above). As with the other invasive species, every effort must be taken to ensure that these species are not introduced into the *C. christii* population.

2. *Recreation Impacts*

Visitation and associated trampling - The paving of Howell Canyon Road in 1997 significantly increased the number of visitors accessing the summit of one of the highest peaks in southwestern Idaho and the lookout area. A small interpretive trail surrounds the fire lookout at the top of Mount Harrison. Human trampling impacts to sub-alpine vegetation near the lookout and the interpretive stations appear to have increased as of September 2001, although no apparent increase in human trampling was observed in occupied habitat for *Castilleja christii*. There are no designated trailheads at the summit. The Skyline Trail, which is west of, and approximately 800 feet (244 meters) below the summit, does provide for some limited hiking. The hikers and lookout visitors walking adjacent to the summit and lookout area could potentially impact individual *Castilleja christii* plants, the viability of this population, habitat quality, and contribute to soil compaction and erosion in occupied habitat. Some evidence of dispersed camping has been documented within the population (*i.e.*, fire rings, trampling).

Off-road vehicles and associated impacts - The Sawtooth National Forest has a permanent year-long closure to vehicle traffic (including high clearance vehicles, ATVs, two-wheeled motorized vehicles, and bicycles), outside of established roads and trails on the summit of Mount Harrison (36 CFR 261.53a, b). This special closure is in place for

the protection of: (a) threatened, endangered, rare, unique or vanishing species of plants; and (b) special biological communities. Designated roads and trails in this area are open from May 1 to November 30, given snow conditions, and are open to all vehicles. One main road is paved to the lookout on top of Mount Harrison. One dirt road branches off Howell Canyon Road near the summit. The dirt road goes through occupied habitat to access the hang glider launch site and the electronic site on Peak 9033. In accordance with the 1995 Conservation Agreement, rock barriers have been placed along the road to discourage unauthorized off-road travel. Additionally, rock barriers were installed to block access to other pioneered tracks and signs have been placed to discourage motorized/mechanized vehicle use into adjacent meadows. This area is currently open to cross-country winter travel and snowmobiling. The effects of this activity are not known and are difficult to quantify. No obvious impacts have been observed at this time.

Although the RNA, the BSIA, and surrounding area (including the entire *Castilleja christii* population) are closed to off-road travel (R designation) (USDA Forest Service 2003), there is evidence that some unauthorized travel occurs in occupied habitat. Direct and indirect impacts from off-road vehicles have been a primary concern for many years (Atwood 1988, Moseley 1993). Motorcycles on the hills along Howell Canyon Road have been the cause of erosion gullies in occupied habitat. Channels made by pocket gophers in this area cause the off-road vehicles in these areas to sink deeper into the soil thus creating even larger eroded channels (Moseley 1993). Some of the off-road vehicle impacts are the result of late-lying snowdrifts blocking the road. By driving out across the relatively gentle slopes to get around the drifts, vehicles create large erosion channels and small gullies in occupied habitat. Vehicles driving off-road and parking off-road in occupied habitat could potentially impact individuals, the viability of the population, habitat quality, and contribute to soil compaction and erosion in occupied habitat. Mountain bikes are currently not posing threats to the population of *C. christii.*

Hang gliding and associated impacts - A hang glider launch site (approximately 120 squared yards) (100 squared meters) is within the occupied habitat boundary for *Castilleja christii* and the adjacent tall forb community. The increased use of the hang glider launch site could potentially impact individuals, the viability of the population, habitat quality, and contribute to soil compaction and erosion in occupied habitat. Individual hang gliders are not required to obtain a permit for launching. However, a local hang gliding group applies annually for a non-commercial special use permit for a fly-in event (permit required for greater than 75 people in attendance). Under the permit authority (36 CFR 251.54), conditions can be added to the permit to ensure resource protection. As part of the annual permit, education of the group and monitoring efforts by Forest personnel are required and appear to reduce impacts in occupied habitat. Kim Pierson, Forest Botanist, met with the hang gliders in 2001 at their annual fly-in event (greater than 90 hang gliders and equipment) to discuss the uniqueness of *C. christii,* to discuss conservation concerns, and to examine opportunities for interpretation and reduction of impacts in the launch site area. Appropriate action (denial of special use permit) will be taken if permittees fail to prevent impacts at annual events. To date, all permittees have been compliant with the conditions of the permit and no changes have been necessary.

Indirect effects of recreation, such as the introduction of noxious weeds, may also result within the *Castilleja christii* population. Of primary concern are the hang glider launch site and the activities associated with it. As part of the annual fly-in event, hang gliders from many states and regions come to participate. Noxious weeds and non-native species could be transported to Mount Harrison from surrounding states where infestations of such species are currently threatening native vegetation. Prevention activities to reduce introduction of noxious weeds in this area are outlined below in the conservation action items.

Collection and Harvesting - Wildflower picking and collection may become an increasing problem, given the increased access to the summit of Mount Harrison. In 2004, interpretive signs were placed at the lookout, within the population, and along the walkways. These signs educate visitors about the unique habitat, special plant species including *Castilleja christii,* and unique plant communities in the area. Signs encourage viewing and photographing of plants and discourage collecting plants within the area. The Sawtooth National Forest Land and Resource Management Plan does not allow for the collection of sensitive plants except for research or scientific purposes under the direction of the Forest or Regional Botanist (USDA Forest Service 2003). Additionally, under the Forest Plan standards for the Management Areas, commercial plant or seed collection is not allowed to ensure rare plant species remain in the area (Standards 1521, 1626, 1722) (USDA Forest Service 2003).

3. *Unauthorized Livestock Use Impacts*

Livestock grazing was administratively excluded from the summit of Mount Harrison upon establishment of the Mount Harrison Research Natural Area (Mancuso and Evenden 1996). Since this administrative closure, however, unauthorized livestock use has occurred in the area. Livestock impacts were identified as a management concern in Atwood's Status Reports (1988). Livestock occupation of the Lake Cleveland and Thompson Flat Campgrounds has been a concern by recreationists for many years.

In the summer of 1999, unauthorized livestock use occurred near the fire lookout and in various areas of occupied habitat. Herbivory appeared low, but trampling impacts were of concern, and prompted a petition to the U.S. Fish and Wildlife Service to list *Castilleja christii* as threatened or endangered in late summer 1999. The Sawtooth National Forest and U. S. Fish and Wildlife Service agreed to work with the permittees and identified several actions that would eliminate unauthorized livestock use in occupied habitat during the 2000-grazing season. Impacts from livestock grazing and trampling could potentially impact individuals, the viability of the population, habitat quality, and contribute to soil compaction and erosion in occupied habitat. *Castilleja christii* stems are extremely brittle when in bloom and are easily broken by physical insult. Reproductive success could be curtailed if flowering stalks are broken prior to seed-set or seed maturation.

To eliminate unauthorized livestock use from occurring in 2000, permittees repaired existing fences, built new fence and set up electric fence. Along the south and west boundaries, approximately 1.5 miles (2.4 kilometers) of fence was rebuilt. Small sections of new fence were installed on the southwest and northwest boundaries of the allotment. On the south side of the lookout structure, about 1.25 miles (2 kilometers) of let-down fence was built. Permittees continue to install the let-down fence every year when the area becomes accessible by vehicle to minimize the threat of unauthorized livestock use to *Castilleja christii* individuals. Fences are inspected and maintained by permittees prior to livestock moving into adjacent units. Additionally, permittees inspect fences regularly when the livestock are near the occupied habitat. Inspection reports are submitted to the District Ranger. Appropriate action will be taken by the Sawtooth National Forest if permittees fail to properly maintain fence and/or allow unauthorized livestock use.

Despite the efforts of the USDA Forest Service and the permittees to limit unauthorized livestock use, cows have been documented in the plant population. In 2001, Forest Service personnel (K. Pierson, pers. comm. 2001a) observed over 30 cows within the population on two separate occasions. In 2001, concerned watch groups and special use permit holders (recreation and telecommunication permittees) reported cattle within the population and adjacent Research Natural Area. In each case, the permittees were contacted and immediate action to remove the cattle from the area was taken. The actions needed to eliminate the threat of unauthorized livestock use and its associated impacts are discussed below.

Many indirect effects of grazing may impact the Research Natural Area and the Botanical Special Interest Area within these regions. Indirect impacts from livestock grazing may include the introduction of non-native invasive species, soil compaction, and trampling of pollinators. Mancuso (2001) documented the encroachment of non-native and invasive plant species that are currently invading the *Castilleja christii* population. Soil compaction through trampling can also adversely impact seed germination and establishment. Ground nesting bees were documented in 2001 (K. Pierson, pers. comm. 2001b) as possible pollinators for *C. christii*. Trampling associated with unauthorized livestock use could cause severe damage to the nesting bees and their progeny, thus indirectly affecting the reproductive success of *C. christii*.

In 2002, the Minidoka Ranger District (formerly known as the Burley/Twin Falls Ranger District) personnel explored the existing fencing and natural topographic barriers available to prevent unauthorized livestock use within the administratively closed region (Scott Nannenga, USDA Forest Service, *in litt.* 2002). It was determined that one additional fence was needed to restrict livestock access to the RNA. This strategic fence (see map, Appendix A) was added in the RNA adjacent to the small lake to prevent livestock from entering the lower portion of the RNA, which could provide potential access to the *Castilleja christii* population. In 2003 and 2004, reports of unauthorized livestock within the population and RNA were greatly reduced.

In 2003, several cows were observed in the western-most portion of the population (G. Glenne and K. Pierson, pers. comm. 2003). Investigation of the situation revealed that a

recreational gate had been left open. The Minidoka Ranger District will attempt to install a trail cattle guard in 2005 to limit access.

4. *Road construction, Maintenance, and Facilities*

Original Construction - The largest direct loss of *Castilleja christii* habitat is attributed to road construction. Howell Canyon Road underwent considerable improvement in the 1960's and many plants were likely lost in the construction effort. In 1997, the road (Howell Canyon Road) to the lookout was paved. The contractor and Forest Service personnel closely monitored the paving project. In 1997, permanent plots were established to monitor the direct impacts of the paving on the individuals nearest the road. Thirteen individuals were lost during the paving process. However, monitoring of these permanent plots in subsequent years, 1998, 1999, and 2001, indicate that the number of individuals in roadside plots are stable or increasing (K. Pierson, *in litt.* 2002).

Reconstruction and Maintenance - In 2001, major portions of the Howell Canyon road were removed and repaved. A large milling machine removed asphalt from the original road prism. New asphalt was then applied in those areas and large rolling machines finalized the process. The entire Howell Canyon road was resurfaced with tack and gravel. In accordance with the 1995 Conservation Agreement (USFWS 1995), the Forest Botanist was present during all construction activities to ensure no impacts occurred within occupied habitat. Flagging was used to delineate the areas of avoidance during the construction period. All equipment turned around in designated sites only. This often meant driving two additional miles (3.2 kilometers) to turn around in predetermined sites. No individuals were impacted during the repaving and resurfacing (K. Pierson, pers. comm. 2001c). Snow removal currently occurs only if there is a need for the fire lookout employee to staff the summit tower prior to natural snow melting.

Access and Road Use - A dirt access road branches off from the main Howell Canyon road near the summit and winds through occupied habitat to the hang glider launch site. This dirt access road has one additional spur road that provides access to the electronic site on Peak 9033. In accordance with the Conservation Agreement (USFWS 1995) for *Castilleja christii,* large rock barriers and signs were placed along both roads to prevent four-wheeled vehicle access to the population and to minimize impacts to *C. christii* individuals. Additionally, the area is closed to cross county travel for the protection of threatened, endangered, rare, unique or vanishing species of plants, and special biological communities (36 CFR 261.53 a, b). The Sawtooth National Forest is currently undergoing an environmental assessment of its travel plan. Those areas currently open to off-road travel will be reclassified to designated open routes only (K designated areas on the current travel map) (Sawtooth National Forest 2003). This will not effect the *C. christii* population or associated habitat but could indirectly benefit the area by restricting off-road travel and associated direct and indirect resource damage.

Facilities - The Raft River Electric Company installed an underground power cable in 1969 and 1970 from a point near the lookout north to a microwave site just north of Lake Cleveland. Installation of the cable disturbed a portion of occupied habitat. It is

unknown whether individuals were lost during the construction. *Castilleja christii* individuals appear to have re-established on the disturbed cable line. In 1996, the Raft River Electric Company installed a new cable line through occupied habitat. Howard Hudak (USFS), Bob Moseley (ICDC), and Pete Peterson (USFS) surveyed the new electric cable route to minimize impacts to *C. christii,* and a permanent monitoring transect was established on the disturbed line. Monitoring completed in subsequent years (1996, 1997, 2000, 2002, and 2003) indicates that *C. christii* individuals are recovering along the disturbed line (Moseley 1997, 1998; Mancuso 2001, 2003; Motychak and Pierson 2005).

Future Maintenance Needs - Road construction, improvements, routine maintenance, introduced non-native grass species, and herbicide spraying could potentially impact *Castilleja christii* individuals, the viability of the population, habitat quality, and contribute to soil compaction and erosion in occupied habitat. In future road related projects, a qualified botanist must be present during all construction and maintenance activities within the *C. christii* habitat (see section IX).

5. Natural Threats

Naturally occurring events - Natural disturbance events may cause losses to a population even under natural conditions. Species with low population size or limited distribution may become extinct because of various stochastic events that exacerbate each other (Gilpin and Soule 1986). Climate oscillations causing changes in a small geographic area could affect the continued existence of *Castilleja christii* (Pauli *et al.* 1996, Root *et al.* 2003). Unpredictable uncharacteristic events such as insect or disease infestation could extirpate portions or all of the only known population of *C. christii.*

Wildfire - There has been little if any impact from fire on top of Mount Harrison in recent years. The effects of direct impact from fire to *Castilleja christii* are currently unknown but are estimated to be low because the soils generally remain moist well into August. Due to the lack of fuels in occupied habitat, fire is not expected to be hot enough to destroy the underground root structure of *C. christii* or its host plant(s).

Genetic Diversity and Hybridization - The amount of genetic variation in *Castilleja christii* is unknown. Some rare species suffer from a lack of genetic diversity. Genetic uniformity can render populations more susceptible to epidemics of disease (Falk and Hoslinger 1991). Disease outbreaks can cause heavy mortality in plants with little genetic diversity (Silvertown and Lovett Doust 1993). Lack of genetic variation can also make such populations less likely to survive moderate to large-scale disturbances (Gaston 1994), including climactic changes. If the level of genetic diversity of *C. christii* is depressed, it could render this population to be more susceptible to disease, environmental fluctuations, and the stochastic event of genetic drift. There may not be enough genetic variation to allow adaptation to any altered conditions or environmental challenges.

Hybridization involves the successful matings between individuals from two populations or species, which are distinguishable on the basis of one or more heritable characters (Arnold 1997). Rare plants may be at risk of extinction through hybridization if two species co-occur in an area, if the two species are able to readily hybridize, if a pollinator is available to facilitate hybridization, and especially if the common species is more abundant than the rare species. Given the narrow distribution of *Castilleja christii,* the documented cross-visitation by *Megachile frigida*, and the observation of potentially intermediate hybrids between *Castilleja* species on Mount Harrison, it is likely that hybridization may be occurring. Furthermore, climatic change has been shown to differentially affect individual species in a community. A general trend has been documented for plant species to extend their distribution to higher elevations as a response to increases in annual temperatures (Grabherr *et al.* 1994, Pauli *et al.* 1996, Root *et al.* 2003). This ecological shift may allow lower elevation *Castilleja* species to move into, and become more common within, *C. christii*'s habitat. Therefore, the threat from hybridization may pose a conservation concern for the species.

A review of the research literature pertaining to other *Castilleja* species supports the hybridization concern. Findings from this research effort on other well-studied *Castilleja* species may also apply to *C. christii*. *Castilleja* species apparently have a self-incompatibility mechanism that results in low seed production and low viability in crosses of closely related plants (Kaye and Lawrence 2003). Hybridization and the formation of hybrid swarms of *Castilleja* species have been documented, especially in the Intermountain West, due to the lack of inter-specific mating barriers in the genus *Castilleja* (Kaye and Lawrence 2003). *Castilleja christii* may be at risk of losing its genetic integrity as a species as a result of its small population distribution and the likelihood of hybridization with other sympatric species of *Castilleja*.

C. 1995 Conservation Agreement Implementation

The 21 conservation action items outlined for implementation by the USDA Forest Service in the 1995 Conservation Agreement, their status, and effect of implementation are summarized in Appendix B. All 21 conservation actions were either completed or are currently ongoing. The success of implementation, effectiveness of action items, and need for change were considered in designing the new action items presented in this Agreement.

As part of the implementation of the 1995 Conservation Agreement, the following actions are currently promoting the conservation of *Castilleja christii*:

1. The USDA Forest Service maintains *Castilleja christii* on the Regional Forester's Sensitive species list to ensure that National Environmental Policy Act (NEPA) analyses are completed to determine impacts of planned projects on the existing population and/or habitat. The USDA Forest Service has the primary responsibility for implementation of specific conservation actions to protect habitat for *C. christii* and to maintain a viable population throughout its range.

2. Interpretive signs placed at the summit surrounding the fire lookout educate visitors about the uniqueness of *Castilleja christii,* the fragile sub-alpine community, and special plant species in the area. These signs discourage visitors from walking in the population or picking wildflowers.

3. The USDA Forest Service restricts vehicle traffic to established roads and trails (36 CFR 261.53a, b). The Minidoka Ranger District placed restrictive rock barriers and signs along the roads to discourage off-road vehicle travel.

4. The Mount Harrison RNA was established in November 1996. Approximately 23 percent of the *Castilleja christii* population was included in the RNA boundary. The remaining 77 percent of the population occurs in the newly established BSIA (established 2003, USDA Forest Service 2003).

5. The USDA Forest Service restricts management activities within the Mount Harrison RNA boundaries. Approximately 90 acres (36.4 hectares) of the *Castilleja christii* population is inside the RNA boundary. Livestock grazing is prohibited within the boundary of the RNA.

6. Livestock grazing is administratively excluded from the summit of Mount Harrison. Electric and let-down fences have been installed along the west and south allotment boundaries. Permittees maintain fences annually when the area becomes accessible to vehicles.

VIII. LAND AND RESOURCE MANAGEMENT PLAN DIRECTION

A. Sawtooth National Forest Plan Direction

In July 2003, the Sawtooth National Forest finalized the Forest Plan (USDA Forest Service 2003). Appendix C summarizes the management protection that is afforded by the Forest Plan. The table in Appendix C is organized by threat. For each threat to *Castilleja christii*, the table contains a list of the existing management direction in the Forest Plan that is designed to prevent or mitigate effects to this species and its associated habitat.

Chapter III of the Sawtooth National Forest's plan describes management direction that guides Forest personnel to achieve desired outcomes and conditions. This direction is organized into two sections: (1) Forest-wide management direction, and (2) Management Area description and direction. These two sections are closely interrelated and need to be considered together in order to understand the full scope and intent of Forest management direction.

The Forest-wide management direction section provides general direction for all Forest resources and the foundation for more specific direction at the Management Area level. For more efficient and effective management, the Forest has been divided into smaller units called Management Areas (MA) that are organized around watershed and

administrative boundaries. The MA section describes these areas in detail, highlights resource areas of concern and/or importance, and describes specific management direction to address these concerns (see section B below).

This Conservation Assessment and Strategy tiers to the Forest Plan; the Forest Plan is incorporated herein by reference (USDA Forest Service 2002, USDA Forest Service 2003). The Conservation Strategy (USDA Forest Service 2002) has standards and guidelines that provide additional direction or protection measures. The Forest Plan requires that the Conservation Strategy be implemented in the Albion Mountain (15), Howell Canyon (16), Independence Mountain (17) Management Areas, and other areas where it may apply.

B. FOREST PLAN MANAGEMENT AREA DIRECTION

Within MA's, Management Prescription Categories (MPC) have been assigned. MPC's are defined as "management practices and intensity selected and scheduled for application on a specific area to attain multiple goals and objectives" (36 CFR 219.3). MPC's are broad categories based on Forest Service definitions developed at the national level and represent management themes ranging from Wilderness (1.0) to Concentrated Development (8.0). MPC's were assigned by subwatershed where possible. MPC's have an additional set of standards and guidelines. MPC management emphasis is further defined by Forest-wide and MA direction.

Management Area direction was developed for the Albion Mountain, Independence Lakes, and Howell Canyon Management areas. *Castilleja christii* and its habitat occur in these three management areas. The direction below is provided for the Albion Mountain Management Area (MA). References to the direction for the Independence Lakes and Howell Canyon Managements are made below and can be found in full text in the Sawtooth National Forest Plan (USDA Forest Service 2003).

Botanical Resources for the Albion Mountain Management Area	Objective	1514	Preserve botanical resources in the Mount Harrison RNA consistent with the establishment guidelines. *See also 1619 and 1715.*
	Objective	1515	Establish the Mount Harrison Botanical Special Interest Area to maintain the Christ's Indian paintbrush population, tall forb communities, and other botanical resources. *See also 1621 and 1717.*
	Objective	1516	Develop and implement a management plan for the Mount Harrison Botanical Special Interest Area. *See also 1622 and 1718.*
	Objective	1517	Develop and implement an interpretive program to reduce risks to Christ's Indian paintbrush and educate the public of its uniqueness. *See also 1620 and 1716.*
	Objective	1518	Maintain and restore populations and occupied habitats of threatened, endangered, proposed, candidate, species (TEPCS) species, including Christ's Indian paintbrush and Davis' wavewing, to contribute to long-term viability of these species. *See also 1623 and 1719.*
	Objective	1519	Emphasize reducing Canada thistle, spotted knapweed, and non-native species within TEPCS plant actual and potential habitat. *See also 1624 and 1720.*
	Standard	1520	Maintain habitat and populations of Christ's Indian paintbrush consistent with the conservation strategy developed and signed by the Sawtooth National Forest. *See also 1625 and 1721.*

IX. CONSERVATION ACTION ITEMS

The various conservation actions and tasks that are needed to implement this candidate agreement are subdivided into four categories as follows:

A. Administrative Responsibilities. The first category includes actions that would be implemented and carried out primarily under the direction of the USDA Forest Service as a part of their ongoing, general administration of federal lands (actions 1A through 9A).

B. Management and Coordination Responsibilities. A second category includes more specific land management and coordination responsibilities of the USDA Forest Service. Two sets of these conservation actions are listed; those that apply to general conservation for *Castilleja christii* (actions 1 through 11), and those actions that apply to specific threats to this species (12 through 31). These specific actions include: non-native plant

introduction and establishment (actions 12 through 18); recreational impacts (19, 20, and 21); unauthorized livestock use impacts (actions 22, 23, and 24); road construction, maintenance, and facilities (actions 25 and 26); and natural threats (actions 27 through 31).

C. Coordination and Partnership Responsibilities. The last set of conservation actions applies specifically to the U. S. Fish and Wildlife Service as a signatory agency to this agreement (actions 32 through 42).

D. Reporting. This section describes the reports that will be completed each year by the USDA Forest Service in coordination in the U.S. Fish and Wildlife Service.

The tasks referred to in parentheses under the action items listed below are described in Appendix D. These tasks are subset of the conservation actions that are part of this agreement.

A. USDA Forest Service Administrative Responsibilities

1. Assume primary responsibility for implementation of specific conservation actions to protect known occupied habitat for *Castilleja christii* and ensure that the population remains viable on National Forest Lands.

2. Complete National Environmental Policy Act (NEPA) analysis for implementation of proposed projects in occupied habitat for the protection and maintenance of *Castilleja christii* population viability and habitat. Involve the U.S. Fish and Wildlife Service and appropriate State agencies as cooperators or partners throughout the NEPA process for all projects likely to affect habitat (see also number A5).

3. Retain *Castilleja christii* on the Regional Forester's Sensitive species list to ensure that Biological Evaluations are conducted to determine effects of planned projects within the existing population or potential habitat for this species.

4. Implement this *Castilleja christii* Conservation Agreement including the Conservation Assessment and Strategy (USDA Forest Service 2002) and incorporate provisions of this Agreement into agency planning documents and budgets.

5. Adopt a "no net loss of habitat" policy for *Castilleja christii*. Due to its restricted distribution, any loss of occupied habitat should be considered detrimental to the long-term conservation of this population.

6. Ensure that management activities comply with Forest Plan Direction. Provide direction to promote the long-term conservation of *Castilleja christii* and its habitat.

7. Complete and implement the management plans for the Mount Harrison Research Natural Area and the Botanical Special Interest Area. Ensure that the plans are compliant with the Forest Plan and this Agreement.

8. Maintain administrative closures for livestock grazing and travel restrictions for the Mount Harrison Research Natural Area and Botanical Special Interest Area.

9. Continue coordination with U.S. Fish and Wildlife Service, permittees, interested parties, and the public.

B. USDA Forest Service Management Responsibilities and Conservation Action Items:

The following responsibilities or action items consist of ongoing general conservation efforts and action items to be implemented. Specific action items are grouped by threat and prioritized within each group. Where tasks have been identified, the corresponding number from Appendix D has been provided. Appendix D links the tasks, performance metrics, thresholds, management responses, and reporting products for conservation actions. All the tasks outlined in Appendix D are part of this Agreement. Funding provided for conservation actions and scheduling of these actions is described in Appendix E.

Ongoing General Conservation Actions:

1. Continue to conduct inventories of potential habitat for *Castilleja christii*. All survey data will be submitted to the ICDC and U.S. Fish and Wildlife Service for inclusion in their databases.

2. Continue to meet with user groups, the public, permittees, the highway district, and interested parties to promote the education and conservation of *Castilleja christii* and to eliminate or reduce negative impacts to the population and habitat.

3. Issue and modify special use permits to ensure compliance with the Forest Plan and this Agreement (*Tasks – 17.1, 18.1, 22.1*).

4. Maintain the interpretive signs and information on Mount Harrison. Replace as needed. Continue the education and interpretive program to increase awareness of the unique habitat, special plant species, sub-alpine communities, non-native plants, recreation and travel restrictions, and conservation measures of the summit area (*Tasks – 20.1, 21.1, 21.2*).

5. Monitor established permanent population density and frequency plots and photo points annually until 2007, and at least every other year following 2007, for the duration of this agreement (2015). Use monitoring data to determine the effectiveness of Conservation Agreement actions taken on behalf of the species toward the objective of maintaining population occurrence levels. Provide annual monitoring reports to the U.S. Fish and Wildlife Service (*Tasks – 12.1, 21.1, 21.2, 22.1, 27.1)*.

6. Establish an oversight technical team to review the Conservation Strategy and Agreement (USDA Forest Service 2002) and to determine the effectiveness of the conservation measures being implemented. This technical team should include: USDA Forest Service personnel, U.S. Fish and Wildlife Service personnel, Idaho Conservation Data Center personnel, Academic institutions and representatives from interested parties.

7. Conduct annual meetings of the oversight technical team to review this Agreement and the Forest Service's Strategy (USDA Forest Service 2002) and to determine effectiveness of the action items and conservation measures being implemented. Results from implementation and effectiveness monitoring will be examined. The technical team will provide recommendations to the Forest Service regarding changes in action items, priorities, or land management practices.

8. Provide an annual report on the success of implementation of this Agreement to the U.S. Fish and Wildlife Service. Summarize implementation of measures and their effectiveness and/or describe changes or improvements as appropriate.

9. Maintain the Mount Harrison mineral withdrawal. Mineral withdrawal expires in 2018.

10. Continue to assess threats and use adaptive management to address and minimize impacts.

11. Ensure that seeds and plants used for seedings and plantings in revegetation projects on Mount Harrison originate from local sources of genetically native species. Coordinate with Forest Botanist for the selection of appropriate species (*Tasks – 11.1, 29.1*).

Non-native plant introduction and establishment:

12. Annually, aggressively control and monitor smooth brome infestations on the summit of Mount Harrison, particularly within the *Castilleja christii* population (*Task – 12.1*).

13. Monitor the *Castilleja christii* population and occupied habitat for invasion of non-native species and noxious weeds. Hand spray and/or hand grub non-native and disturbance species in the *C. christii* population. Spraying in or near populations of *C. christii* should be evaluated on a site-specific and herbicide-dependent basis prior to application to alleviate negative impacts to the species and its potential pollinators (*Task – 12.1*).

14. If noxious weeds are identified within the Howell Canyon Area, identify and treat with appropriate techniques (*i.e.*, hand grubbing, hand spraying, etc.) to eradicate infestations and to prevent spread into the *Castilleja christii* population or its habitat (*Task – 14.1*). Prepare a monitoring plan mutually agreed to with the U. S. Fish and Wildlife Service for monitoring the smooth brome within the *Castilleja christii* population on Mount Harrison within six months of signing the agreement (Appendix D).

15. Continue to consult with the Burley Highway Department on an annual and project-specific basis regarding herbicide spraying, the use of toxic chemicals, spraying on windy days and within 200 feet (61 meters) of occupied habitat, routine road maintenance, and the use of non-native plants/seeds for revegetation in road right-of-ways (*Task – 15.1*).

16. Implement the Forest Wide Noxious Weed Program when completed (anticipated in 2006) (*Task – 16.1*).

17. Coordinate with special use permittees (grazing, recreational, telecommunications, and advertisement agencies), the public, and user groups to reduce the risk of invasion by non-native plants and noxious weeds (*Task – 17.1*).

18. Require use of equipment or washing stations for organized/permitted recreation group events to minimize risk of introduction of non-native or noxious species by these groups (*Task - 18.1*).

Recreational Impacts:

19. Ensure that signs, maps, and other materials promote the enforcement of travel restrictions in the *Castilleja christii* population and Mount Harrison RNA/BSIA and provide information for organized camping areas outside of these areas (*Task - 20.1*).

20. Continue to maintain or improve rock barriers and signs to limit the impacts on *Castilleja christii* individuals from off-road vehicle travel and unauthorized use (*Task – 20.1*).

21. If new recreational impacts are detected or reported, use adaptive management and educational outreach to offset impacts and minimize threats to *Castilleja christii* and its habitat (*Tasks – 21.1, 21.2*).

Unauthorized Livestock Use Impacts:

22. Continue to inform the Elba, Willow Creek, Land, Marsh Creek, and Albion allotment permittees of the need to protect *Castilleja christii* and its habitat in the Annual Operating Instructions (*Task – 22.1*).

23. If unauthorized livestock are observed on the summit of Mount Harrison, permittees will be contacted immediately. Permittees will remove unauthorized livestock as quickly as possible (*Task – 23.1*).

24. Ensure that fences and natural barriers are maintained to prevent unauthorized livestock use within the RNA and BSIA. Ensure that fences and access barriers are maintained and in place prior to cattle movement into grazing units adjacent to the *Castilleja christii* population (*Task –24.1*).

Road Construction, Maintenance, and Facilities:

25. Ensure that road construction or road maintenance activities within the *Castilleja christii* habitat are not allowed outside of the existing road prism on the summit (*Task – 25.1*).

26. For any construction or maintenance project, a botanist or qualified representative will be present during all construction activities within the *Castilleja christii* habitat. No staging activities shall be permitted within or adjacent to the *C. christii* population. Flagging or other materials will be used to clearly identify areas to be avoided during construction (*Task 25.1*).

Natural Threats:

27. Document and monitor the presence of hybrids within the existing monitoring transects to track the frequency of hybridization (*Task – 27.1*).

28. Ensure that the Forest Botanist (or qualified individual) be involved in the Wildland Fire Situation Analysis (WFSA) process for fires on Mount Harrison. Decisions for fire management resources (such as retardant, staging areas, and helipads) should be made in coordination with a Resource Advisor with knowledge of the extent of the *Castilleja christii* population (*Task – 28.1*).

29. Ensure that the Burned Area Recovery (BAER) Team coordinates with the Forest Botanist prior to any decision to reseed or revegetate within *Castilleja christii* habitat (see also action number 11) (*Task – 29.1*).

30. Support funding of studies and scientific research to better understand the biology and ecology of *Castilleja christii*.

31. Continue cooperation with the Denver Botanical Garden or Berry Botanical

Garden and the U.S. Fish and Wildlife Service to maintain an off-site seed storage program for *Castilleja christii*.

C. U.S. FISH AND WILDLIFE SERVICE RESPONSIBILITIES:

32. Continue to assess the status of *Castilleja christii* and determine appropriate conservation status under the ESA.

33. Partner with the USDA Forest Service and others to pursue and secure funding for *Castilleja christii* conservation actions.

34. Provide support and technical assistance to the USDA Forest Service's annual *Castilleja christii* monitoring efforts (Conservation actions 1, 4, 5, 6, 7, 10, 12, 13, 27, 31, 30).

35. Request and review annual reports from the USDA Forest Service that summarize monitoring results as well as the conservation actions implemented each year.

36. Participate in annual meetings with the USDA Forest Service to review and revise, if necessary, this Agreement and its implementation.

37. One year before this Agreement expires, work with the USDA Forest Service to review conservation efforts, carried out under this Agreement and revise as necessary.

38. Work with the USDA Forest Service and other interested parties to develop studies and research projects that further the implementation of this Agreement.

39. Work with the USDA Forest Service and others to address the threats *Castilleja christii* faces through implementing conservation actions outlined in this Agreement.

40. Work with the USDA Forest Service and others to develop and implement, through adaptive management, new conservation strategies to address new or changing threats to *Castilleja christii*.

41. Work with the USDA Forest Service and others to control the smooth brome invasion of the *Castilleja christii* population through funding conservation efforts, providing technical assistance, and assisting with effectiveness monitoring.

42. Continue coordination with the USDA Forest Service, permittees, interested parties, and the public concerning the conservation of *Castilleja christii*.

D. REPORTING

The USDA Forest Service will be responsible for delivery of an annual report on the Agreement implementation by January 31 each year to the U.S. Fish and Wildlife Service. Information in the annual report will include, but is not limited to: (1) the status of each identified threat to *Castilleja christii* and its relative importance to the species; (2) the status of implementation of each USDA Forest Service Responsibility (section IX. A.); (3) the status of each conservation item including the reporting described in Appendix D and a brief update for conservation actions in section IX.B; (4) recommendations for future *Castilleja christii* management activities consistent with the Agreement; and (5) copies of plans completed that year that involve actions to reduce threats to the species including the Botanical Special Interest Area Management Plan, the Forest Wide Noxious Weed Implementation Plan, and other plans.

X. AGREEMENT TERMS

This agreement shall become effective at the date of the last signature and will remain in effect for 10 years. It may be terminated in writing at any time the Sawtooth National Forest and/or U.S. Fish and Wildlife Service authorized officers determine that it is no longer necessary. This agreement will be reviewed and amended as needed.

The cooperators shall use appropriate procedures to ensure adherence to all legal requirements in analyzing changes and establishing new management direction for habitat conservation. When appropriate, this will include amendment or revision of Forest Plan or changes to the cooperator's directive systems. These amendments and/or changes, in addition to a signed Candidate Conservation Agreement, will provide a basis for, and commitment to, the new direction.

IT IS MUTUALLY AGREED AND UNDERSTOOD BY ALL PARTIES THAT:

1. FREEDOM OF INFORMATION ACT (FOIA). Any information furnished to the USDA Forest Service under this Agreement is subject to the Freedom of Information Act (5 U.S.C. 552).

2. PARTICIPATION IN SIMILAR ACTIVITIES. This Agreement in no way restricts any party from participating in similar activities with other public or private agencies, organizations, and individuals.

3. RESPONSIBILITIES OF PARTIES. The USDA Forest Service and the other parties and their respective agencies and office will handle their own activities and utilize their own resources, including the expenditure of their own funds, in pursuing this Agreement. Each party will carry out its separate activities in a coordinated and mutually beneficial manner.

4. PRINCIPAL CONTACT. The principal contacts for this instrument are:

Forest Service Contact	USFWS Contact
Kim Pierson	Jeff Foss
Forest Botanist	Field Office Supervisor
Sawtooth National Forest	U. S. Fish and Wildlife Service, Snake River Fish and Wildlife Office
2647 Kimberly Road East Twin Falls, Idaho 83301	1387 S. Vinnell Way Boise, Idaho 83709
Phone: 208-737-3212	Phone: 208-378-5243
FAX: 208-737-3236	FAX: 208-378-5262

5. NON-FUND OBLIGATING DOCUMENT. This Agreement is neither a fiscal nor a funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between the parties to this instrument will be handled in accordance with applicable laws, regulations and procedures including those for Government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority. Specifically, this instrument does not establish authority for noncompetitive award to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

6. ESTABLISHMENT OF RESPONSIBILITY. This Agreement is not intended to, and does not create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity, by a party against the United States, its agencies, its officers, or any person.

7. COMMENCEMENT/EXPIRATION/TERMINATION. This Agreement is executed as of the date of the last signature and is effective through September 6, 2015, at which time it will expire. This Agreement may be extended or amended by mutual consent of the parties, by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed. Any party, in writing, may terminate their participation in this Agreement in whole, or in part, at any time before the date of expiration.

8. AUTHORIZED REPRESENTATIVES: By signature below, the cooperator certifies that the individuals listed in this document as representatives of the cooperator are authorized to act in their respective areas for matters related to this agreement.

XI. APPROVALS

IN WITNESS WHEREOF THE PARTIES HERETO have executed this Agreement to be in effect on the date of the last signature below.

Ruth M. Monahan — September 6, 2005

Ruth Monahan,
Forest Supervisor,
USDA Forest Service
Sawtooth National Forest

Date

Sept. 6, 2005

Jeff Foss, Field Office Supervisor,
U.S. Fish Wildlife Service,
Snake River Fish and Wildlife Office

Date

THE AUTHORITY AND FORMAT OF THIS INSTRUMENT HAS BEEN [illegible] FOR SIGNATURE.

AGREEMENTS COORDINATOR — DATE 9/6/05

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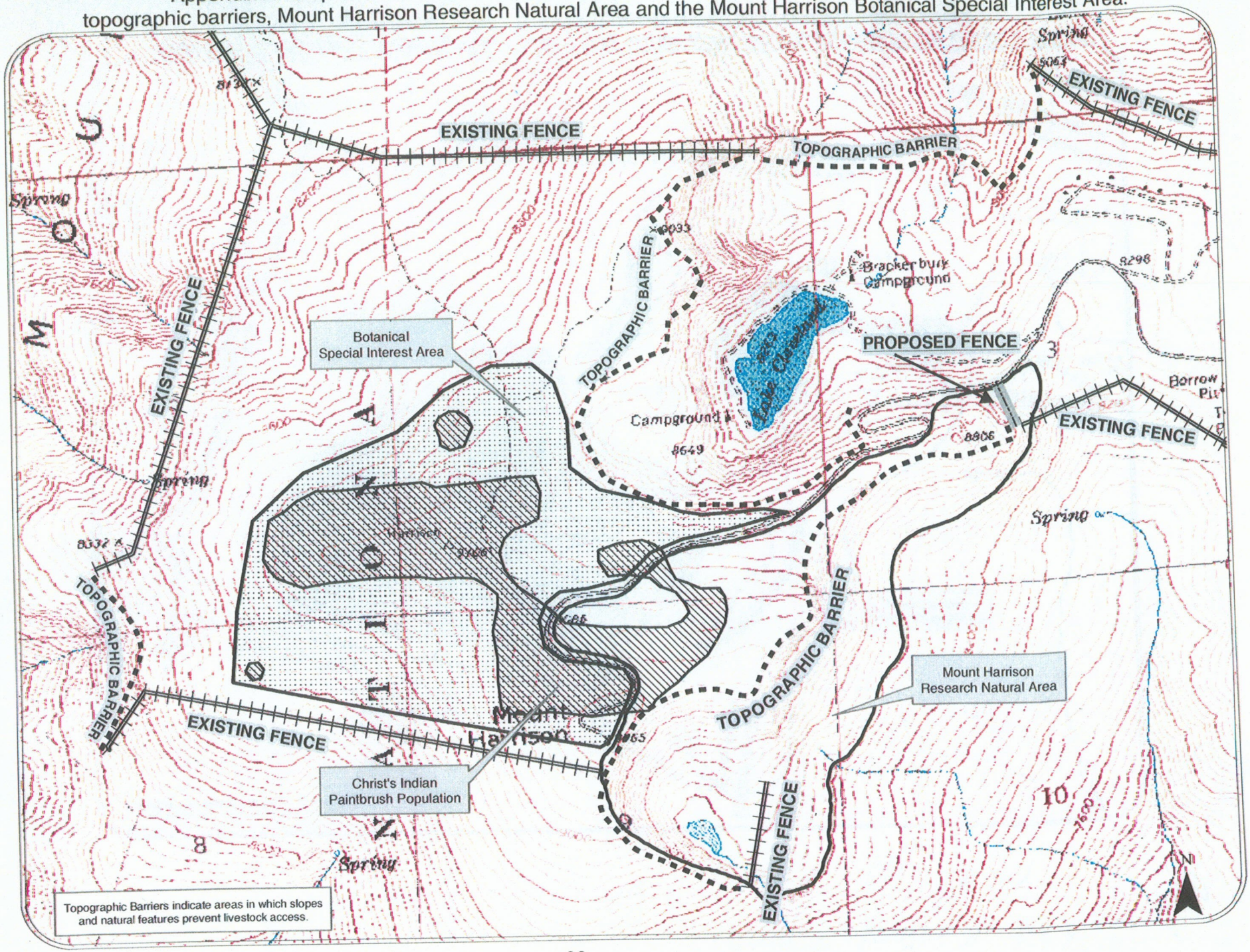
APPENDICES

Appendix A. Map of Christ's Indian Paintbrush (Castilleja christii) population with existing fences, topographic barriers, Mount Harrison Research Natural Area and the Mount Harrison Botanical Special Interest Area.



APPENDIX B – Status of Conservation Actions for *Castilleja christii* described in the 1995 Conservation Agreement.

Conservation Action	Status	Effect of implementation
A1 - Assume primary responsibility for implementation of specific conservation actions to protect habitat for *Castilleja christii*, Christ's Indian Paintbrush (CACH), and ensure viable population(s) are maintained throughout its range on National Forest Lands.	ONGOING	The conservation actions completed (as described below) have improved the conservation status of CACH. Many action items are ongoing and may need to be modified or refined to improve their protectiveness.
A2 - Retain CACH on the Regional Forester's sensitive species list to ensure that Biological Evaluations are conducted to determine effects of planned projects within the existing population(s) or potential habitat for this species.	ONGOING	*Castilleja christii* has been retained on sensitive species list for Region 4. Biological evaluations by Kim Pierson in 2002 and Howard Hudak in 1998 have been completed for all projects that have occurred with the population or potential habitat. Mitigation for protection of CACH has been implemented.
A3 - Provide for administrative procedures to implement the Conservation Agreement and strategy, and incorporate provisions of this (1995) agreement into agency planning documents and budget to ensure consistent implementation.	ONGOING	In 2001, the USDA Forest Service (USFS) entered into consultation discussions for the revised forest plan effort for the Sawtooth National Forest. CACH was included in the effects analysis, management direction, and biological assessment for this revision effort under the direction of the programmatic consultation Memorandum of Understanding (MOA).
A4 - Identify and implement actions required to reduce existing and potential threats to known populations of CACH.	ONGOING	Action items including placement of rock barriers and permanent let-down fences have reduced threats from recreation and unauthorized livestock use. The 2005 Candidate Conservation Agreement (Agreement) outlines specific action items that may improve the effectiveness of such structures or methods for reduction of threats. Weed treatment efforts began in 2003 and were repeated in 2004. More aggressive treatment occurred in 2005 to attempt to control the invasive smooth brome population.
A5 - Expedite the review and establishment of the proposed Mount Harrison Research Natural Area (RNA). Seek opportunities to establish additional management areas such as Botanical Areas.	RNA established 1996– BSIA established 2003	The Mount Harrison RNA was established on November 11, 1996. Only 23 percent of the CACH population falls within the RNA boundaries. Mount Harrison Botanical Special Interest Area (BSIA) was established in 2003 (USDA Forest Service 2003). The BSIA contains the remaining percent of the population and the surrounding habitat.
A6 - Support the funding of studies and scientific research developed to better understand the biology and ecology of CACH.	ONGOING	The Sawtooth National Forest has attempted to obtain funding in the past to determine hemi-parasitism requirements for CACH. Dr. Vince Tepedino, USDA Bee Biology and Systematics laboratory examined pollination ecology in 2002.
A7 - Ensure that National Environmental Policy Act (NEPA) analysis is completed for the proposed projects in habitat for this species and for the protection and maintenance of viable population(s). Fully involve the U.S. Fish and Wildlife Service (USFWS) and appropriate State agencies as cooperators throughout the NEPA process for all projects likely to affect habitat for Christ's Indian Paintbrush.	ONGOING	NEPA analysis was conducted in 2002 for a project in this area. The project included the examination of natural barriers and fencing. A fence was built in the RNA adjacent to the small lake to prevent access into the RNA and potentially into the population. An additional fence will be built near the Lake Cleveland access road in 2005 to prevent access to the main road to the summit and prevent access to the population via the road.

Conservation Action	Status	Effect of implementation
A8 - Implement effective restrictions to prevent unauthorized vehicle use within habitat occupied by Christ's Indian paintbrush. Such restrictions can include closing the gate at Howell Canyon Road (located near Pomerelle Ski Area) to prevent vehicle access to the lookout via the existing designated road. Restrict vehicle use through a "limit to existing roads and trails only" designation. If needed, post signs to identify closures and/or sensitive plant habitat.	ONGOING	Signs have been posted to limit unauthorized vehicle use in the area. Follow-up surveys and work will ensure that signs are still in place and effective. The travel management map currently designates this area as closed to motorized vehicle traffic. New interpretive signs were installed in 2004 that show designated routes and trails. These will be replaced as needed.
A9 - Determine whether any additional road or trail closures should be implemented to protect habitat for this species and implement such closures.	6/95 - ONGOING	
A10 - Improve vehicle access to and at the parking lot at the fire lookout. Design drainage for the parking area so that runoff will not flow into the CACH habitat.	Completed in 1997	In 1997 the parking lot was paved, which limits the amount of sedimentation and silt that occurs in the C. christii population. Proper drainage for the parking lot was included in the paving process.
A11 - Install barriers in areas where unauthorized vehicle use could occur in order to restrict vehicle use to established roads and parking areas. Types of barriers used for this purpose can include: boulders, logs, split-rail fencing, cement highway dividers, or other materials as appropriate.	ONGOING	Rock barriers have been placed along the access road to the hang-glider launch site and the telecommunications towers. The rocks have greatly reduced the impacts from unauthorized vehicle use in the population. Additional barriers were installed/replaced to improve the overall restriction in the population as needed. Rock barriers will be placed around the hang-gliding launch site as needed.
A12 - Proposed road construction activities within the species habitat should not be allowed outside the existing clearing limits on the summit. For any construction projects (*e.g.*, road or pipeline projects), a botanist or qualified representative should be present during all construction activities with the species habitat. No staging activities shall be permitted within or adjacent to CACH habitat. Flagging or other materials shall be used to clearly identify areas to be avoided during construction.	ONGOING	Forest botanists have been present throughout entire road construction or maintenance projects that occurred in the CACH population. Flagging, onsite monitors, and education efforts in these projects have minimized or eliminated effects to individual CACH plants. Staging has occurred well above (parking lot) or well below (Lake Cleveland turnoff) the population. Botanists will be present in future repaving or maintenance efforts.
A13 - Notify the U.S. Fish and Wildlife Service prior to any construction projects that will occur within or adjacent to CACH habitat.	ONGOING	Forest botanist or wildlife biologists have contacted USFWS for all construction projects proposed within the area.
A14 - Establish a monitoring program in 1995 for CACH. A primary objective of this program should be to monitor impacts to the CACH population associated with recreational uses (*e.g.*, hang-gliding, hiking, off-road vehicles). As part of the monitoring schedule, conduct inventories of existing habitat to determine if the population is expanding or contracting. Accommodate the needed changes if monitoring determines that deleterious impacts are taking place. Monitoring will be conducted on an annual basis for at least the first five years of this agreement.	Completed in 1995, 1996, 1997, 2000, 2002, 2003, 2004, 2005	A monitoring program was established by Idaho Conservation Data Center in 1995 (Moseley 1996). Resampling of permanent transects occurred 1996, 1997, and 2000. Results are summarized in Moseley, 1996, 1997, and 1998, Mancuso 2000, and in the Conservation Strategy and Assessment (USDA Forest Service 2002). USFWS provided funding to resample plots in 2002. USFS personnel assisted the Idaho Conservation Data Center (ICDC) in monitoring efforts in 2002, and became skilled in techniques sufficient to complete monitoring annually through 2007. Sampling was also completed in 2003, 2004, and 2005.

Conservation Action	Status	Effect of implementation
A15 - Delimit CACH populations on a large-scale map (*e.g.*, approximately 4 inches to 1 mile) by the three community types present (these community types can be used as a surrogate for density). Monitoring plots should be established in each of these community types. Establish permanent photo plots; photos will be retaken each year and evaluated for apparent changes in density or distribution of CACH.	Completed in 1996	The CACH population was delineated on a large scale map with the 3 community types in 1996 by Moseley. Monitoring was established in all of the three community types and annual monitoring designed in 1996. The population and photo monitoring has been conducted annually. Additional monitoring is being conducted in 2005 by the ICDC with Section 6 funds under the Endangered Species Act of 1973, as amended, to investigate the current CACH population monitoring.
A16 - Develop an interpretation program for visitors to increase awareness of the area's biological and geological significance. (Refer to the CACH Conservation Strategy for specific recommendations), increase on-the-ground enforcement and education/outreach efforts at the site by USFS staff and volunteers. Onsite volunteers or staff will have a good botanical background to help with enforcement of Conservation Agreement stipulations.	Completed in 2000. New interpretive signs were placed in 2004 with assistance and funding from USFWS.	Interpretive signs were installed at the fire lookout in 2000 and replaced in 2004. Additional signs were placed in the population and at the hang-gliding site. Viewing signs were also installed within the population. The signs educate visitors about the unique habitat, special plant species (CACH in particular), non-native plants, etiquette, travel routes, designated camping sites, and unique plant communities in the area. The signs discourage visitors from walking out into the habitat or picking wildflowers.
A17 - Complete the mineral withdrawal for the area including the CACH population.	Completed in 1998.	The withdrawal of National Forest system lands for the Howell Canyon Recreation Complex was published in the Federal Register on January 2, 1998. This order withdrew 3,805.87 acres (1,540 hectares) of National Forest system lands from mining for a period of 20 years to protect the Howell Canyon Recreation Area. Follow-up is needed to extend withdrawal period or renew the mineral withdrawal which expires in 2018.
A18 - Cooperate with the Denver Botanical Garden and the USFWS to maintain an off-site seed storage program. If additional seed collection is determined to be necessary, follow the Center for Plant Conservation seed collection guidelines.	ONGOING	Denver Botanical collected seeds in 1992. Approximately 3,000 seeds are in seed storage at the National Seed Storage Laboratory in Fort Collins, Colorado.
A19 - Continue the livestock grazing closure at the summit.	ONGOING	Closure in still enforced. Unauthorized livestock use has occurred on occasion over the past few years. A permanent let-down fence was constructed on some portions of the Elba allotment. Follow-up on the extent of fencing and natural barriers occurred in 2002. NEPA analysis to fence and/or utilize natural barriers on the Mount Harrison summit was completed in 2002. Fences were installed in 2003.
A20 - Conduct inventories of potential habitat for CACH on the Sawtooth National Forest as funding is available. Baseline data will be gathered for any new populations found. All surveys data will be submitted to the Idaho Conservation Data Center for inclusion in their database.	ONGOING	No new populations have been located as of 2004.

Conservation Action	Status	Effect of implementation
A21 - Provide annual monitoring reports to the USFWS no later than September 30 each year for this duration of this agreement	Agreement expired in 2000.	Agreement expired in 2000. Annual reports will be prepared as a part of the new Agreement.
B1 – Provide technical assistance in the implementation of this Conservation Agreement to ensure that adequate management and protection is occurring.	Ongoing	The USFWS botanists, biologists, and outreach specialists in the Snake River Fish and Wildlife Office have participated in the design of interpretive signs, annual monitoring of threats, and annual monitoring of the population and funding/monitoring of smooth brome treatment for CACH.
B2 – Work with State agencies, the USFS, and other interested parties to develop studies and research project that further the implementation of this Conservation Agreement	Ongoing	The USFWS has coordinated with the ICDC, the USFS, and selected researchers on annual monitoring, in designing and funding Section 6 studies and other studies on the population.
B3 – Until the threats have been removed, CACH will be retained as a candidate species.	Ongoing	Threats have been reduced, but not eliminated since the 1995 Conservation Agreement was implemented. Even after this Conservation Agreement expired in 2000 the USFS continued efforts to reduce threats. A new threat from smooth brome that was detected in 2001 is being reduced and monitored by USFS actions.

APPENDIX C. Management Direction in Chapter III of the Sawtooth Forest Plan (USDA Forest Service 2003) that addresses the conservation of *Castilleja christii*. *See the Sawtooth Forest Plan for explanation of the codes below.*

Threats to *Castilleja christii*	**Management Direction in Chapter III of Forest Plan**
Non-native Plant Introduction and Establishment	**Threatened, Endangered, Proposed, and Candidate species under ESA (TEPC species)** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB03, TEOB07, TEOB18, TEOB19, TEOB20, TEOB21, TEOB27; Standards TEST01, TEST04, TEST05, TEST06, TEST08, TEST09, TEST10; Guidelines TEGU02, TEGU03, TEGU06, TEGU07, TEGU08 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB08, BTOB09, BTOB11, BTOB14; Standards BTST01, BTST03, BTST04, BTST05; Guidelines BTGU01, BTGU02, BTGU03, BTGU05 **Vegetation** – Goals VEGO04, VEGO05, VEGO06; Objective VEOB06; Guidelines VEGU01, VEGU04, VEGU05, VEGU06 **Non Native Plants** - Goals NPGO01, NPGO02, NPGO03, NPGO04, NPGO05; Objectives NPOB01, NPOB02, NPOB03, NPOB04, NPOB05, NPOB06, NPOB07, NPOB08; Standards NPST01, NPST02, NPST03, NPST04, NPST05, NPST06, NPST07, NPST08, NPST09, NPST10, NPST11, NPST12; Guidelines NPGU01, NPGU02, NPGU03, NPGU04, NPGU05, NPGU06 **Conservation Strategy for *Castilleja christii*, Research Natural Areas** – management plan (anticipated 10/2005); **Botanical Special Interest Area** – management plan (anticipated 10/2005); **See (Management Area) MA direction; See Range, Recreation, Fire, and Mechanical/Vegetation section**
Mechanical and Vegetation Treatment	**MPC (Management Prescription Categories) 2.2** – Standard 1, 3; **MPC 4.2** - Guideline 1; **MPC 6.1** – Guidelines 1, 2; **TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB03, TEOB07, TEOB20, TEOB21; Standards TEST01, TEST04, TEST05, TEST06, TEST08, TEST09, TEST10; Guidelines TEGU02, TEGU03, TEGU06, TEGU07 **Vegetation** – Goals VEGO04, VEGO05, VEGO06, VEGO07; Objectives VEOB04, VEOB06; Guidelines VEGU01, VEGU04, VEGU05, VEGU06 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08, BTOB09; Standards BTST01, BTST03, BTST04, BTST05; Guidelines BTGU01, BTGU02, BTGU03, BTGU05 **Timberland Resources** – Goals TRGO01, TRGO02; Standard TRST06 **Research Natural Areas** Goals RNGO01, RNGO02; Objectives RNOB01, RNOB02 **Conservation Strategy for *Castilleja christii* Research Natural Areas** – management plan (anticipated 10/2005); **Botanical Special Interest Area** – management plan (anticipated 10/2005); **See MA, See Non-native Plant section above**

Threats to *Castilleja christii*	Management Direction in Chapter III of Forest Plan
Fire Effects • Fire Inclusion • Fire Exclusion • Fire Fighting	**MPC 2.2** – Guideline 1; **MPC 4.2** - Guideline 1; **MPC 6.1** – Guidelines 1, 3; **TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB03, TEOB07, TEOB18, TEOB19, TEOB20, TEOB21, TEOB22; Standards TEST01, TEST04, TEST06, TEST08, TEST09, TEST10, TEST17, TEST18; Guidelines TEGU02, TEGU03, TEGU06, TEGU07, TEGU08; **Vegetation** – Goals VEGO04, VEGO05, VEGO06; Guidelines VEGU01, VEGU05, VEGU06 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08, BTOB14; Standards BTST01, BTST03, BTST04, BTST05; Guidelines BTGU01, BTGU02, BTGU03, BTGU05 **Fire Management** – Goals FMGO03, FMGO05; Objectives FMOB01, FMOB02, FMOB06; Guidelines FMGU01, FMGU02, FMGU04, FMGU05 **Conservation Strategy for *Castilleja christii*, Research Natural Areas** – management plan (anticipated 10/2005); **Botanical Special Interest Area** – management plan (anticipated 10/2005) **See MA Direction, See Non-native plant section above**
Unauthorized Livestock Use - Rangeland improvements	**TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB05, TEOB07, TEOB18, TEOB20, TEOB21; Standards TEST01, TEST04, TEST06, TEST08, TEST10, TEST22, TEST23, TEST24, TEST26; Guidelines TEGU02, TEGU03, TEGU06, TEGU07, TEGU08, TEGU09 **Vegetation** – Goals VEGO04, VEGO05, VEGO06; Objective VEOB06; Guidelines VEGU01, VEGU04, VEGU05, VEGU06 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08; Standards BTST01, BTST03; Guidelines BTGU01, BTGU05 **Rangeland Resources** – Goals RAGO01, RAGO02, RAGO03; Objectives RAOB03, RAOB04; Guidelines RAGU05, RAGU06 **Research Natural Areas** Objective 1, 2; Guideline 1 **Research Natural Areas** Goals RNGO01, RNGO02; Guideline RNGO01 **Conservation Strategy for *Castilleja christii*** (USDA Forest Service 2002), **Research Natural Areas** – management plan (anticipated 10/2005); **Botanical Special Interest Area** – management plan (anticipated 10/2005); **See MA direction, See Non-native plant section below**
Recreational impacts	**TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB01, TEOB03, TEOB07, TEOB21, TEOB27; Standards TEST01, TEST04, TEST06, TEST08, TEST10; Guidelines TEGU02, TEGU07 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08, BTOB09, BTOB11; Standards BTST01, BTST03, BTST05; Guidelines BTGU01, BTGU05 **Recreation** – Goals REGO04, REGO05, REGO07; Objectives REOB01, REOB10, REOB17, REOB18, REOB20, REOB21; Standard REST04; Guidelines REGU03, REGU07, REGU16, REGU17, REGU18, REGU20, REGU21, REGU27 **Research Natural Areas** Objectives RNOB01, RNOB02; Guideline RNGU02 **Conservation Strategy for *Castilleja christii*, Research Natural Areas** – management plan (anticipated 10/2005); **Botanical Special Interest Area** – management plan (anticipated 10/2005); **See Non-native Plants section below, See Roads below**
• ORV use	**Recreation** – Standard REST04 **Research Natural Areas** - management plan; **Botanical Special Interest Area** – management plan (anticipated 10/2005) **Conservation Strategy for *Castilleja christii*, See Recreation Standards above**
• Hang gliders	**CONSERVATION STRATEGY** **See Recreation Standards above**
• Hiking/trampling	**Conservation Strategy for *Castilleja christii***

Threats to *Castilleja christii*	Management Direction in Chapter III of Forest Plan
	See Recreation Standards above
Roads • Construction • Maintenance • Obliteration	**MPC 2.2** - Standard 2; **MPC 6.1** – Guideline 2 **TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB03, TEOB07, TEOB21, TEOB27; Standards TEST01, TEST04, TEST06, TEST08, TEST10; Guidelines TEGU02, TEGU03, TEGU06, TEGU07, TEGU13 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08; Standards BTST01, BTST03, BTST04; Guidelines BTGU01, BTGU02, BTGU03, BTGU05 **Facilities and Roads** – Goal FRGO01; Objective FROB01, FROB04, FROB10; Standard FRST04; Guidelines FRGU01, FRGU02, FRGU04, FRGU07, FRGU09, FRGU11; **See Non-native Plants section above, See Recreation Standards above**
Loss of Pollinators	**TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB03, TEOB05, TEOB07, TEOB18, TEOB19, TEOB20, TEOB21; Standards TEST01, TEST04, TEST05, TEST06, TEST08, TEST09, TEST10; Guidelines TEGU02, TEGU07 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO04, BTGO06; Objectives BTOB08, BTOB11, BTOB13; Standards BTST01, BTST03, BTST04, BTST05; Guidelines BTGU02, BTGU03, BTGU05 **Conservation Strategy for *Castilleja christii***
Mining	**TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB07, TEOB21, TEOB26; Standards TEST01, TEST04, TEST06, TEST08, TEST11, TEST27, TEST28, TEST30, TEST31; Guidelines TEGU02, TEGU03, TEGU06 **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08, BTOB14; Standards BTST01, BTST03, BTST04, BTST05; Guidelines BTGU01, BTGU02, BTGU03, BTGU05 **Minerals and Geology** - Goal MIGO04; Objective MIGO08; Standards MIST01, MIST02; Guidelines MIGU06, MIGU11 **Conservation Strategy for *Castilleja christii*** **Mineral Withdrawal** **See Lands and Special Uses section below**
Facilities, Transmission Lines, Energy Development, and Lands and Special Uses	**TEPC Species** - Goals TEGO01, TEGO02, TEGO03, TEGO04, TEGO05, TEGO06; Objectives TEOB03, TEOB07, TEOB21, TEOB25, TEOB26; Standards TEST01, TEST04, TEST06, TEST08, TEST09, TEST10, TEST11, TEST31; Guidelines TEGU02, TEGU03, TEGU06, TEGU10, TEGU11, TEGU12, TEGU13; **Botanical Resources** – Goals BTGO01, BTGO02, BTGO03, BTGO04, BTGO05, BTGO06; Objectives BTOB02, BTOB03, BTOB08, BTOB14; Standards BTST01, BTST03, BTST04, BTST05; Guidelines BTGU01, BTGU02, BTGU03, BTGU05 **Lands and Special Uses** – Goals LSGO03, LSGO04, LSGO05; Objective LSOB12; Standards LSST05, LSST08; Guidelines LSGU01, LSGU08, LSGU09, LSGU11, LSGU16, LSGU18 **Conservation Strategy for *Castilleja christii*** **See Mining section above**
Collection and Harvesting	**Botanical Resources** - Objectives BTOB05, BTOB06, BTOB07, BTOB11; Standard BTST02; Guideline BTGU04 **Conservation Strategy for *Castilleja christii***

Threats to *Castilleja christii*	Management Direction in Chapter III of Forest Plan
Insect and Disease	**TEPC Species** – Standard TEST05; **Timberland Resources** – Goals 1, 2
Herbicide/Pesticide Application	**TEPC Species** – Standard TEST05; **Non-native Plants** – Objective NPOB08
Land Exchange	**TEPC Species** – Guideline TEGU10; Objective TEOB25; **Lands and Special Uses** - Guideline LSGU01

APPENDIX D. *Castilleja christii* Candidate Conservation Agreement Threats, Conservation Actions, Tasks, Performance Metrics, Thresholds, Management Responses, and Reporting Products.

Threat	Conservation Action Item and Description	Tasks	Performance Metrics	Threshold (If....)	Management Response (then...)	Reporting Product
Smooth brome introduction, establishment and expansion	12[1] - Annually, aggressively control and monitor smooth brome infestations... monitor and treat infestations	12.1 - Annually treat smooth brome infestations by: (a) handwicking, (b) spot spraying, and/or (c) removal of seed heads prior to seed set	Area treated	If the aerial extent of smooth brome as initially measured by Geospatial Positioning System (GPS) in 2005 increases by 10 percent (absolute)[2] within the *Castilleja christii* (CACH) population boundary in 10 years, If treatments do not occur annually, if treatment areas are inadequate or if unexpected effects occur to non-target species	Change herbicide, change treatment techniques, use multiple techniques and timing, change intensity and frequency	(1) Provide map and associated GPS electronic data / metadata of areas treated, (2) discuss treatments and application periods, (3) Cover classes of smooth brome within transects compared with current (2005) cover classes

[1] Only selected conservation items from Section IV of the CACH Conservation Agreement are in need of adaptive management provisions.

[2] For example, if 30 acres (12 hectares) of smooth brome within the population of CACH were measured with GPS in 2005, a 10 percent increase of 3 acres (1.2 hectares) over the duration of the agreement of smooth brome would trigger the management response listed in the table.

APPENDIX D. ***Castilleja christii*** **Candidate Conservation Agreement Threats, Conservation Actions, Tasks, Performance Metrics, Thresholds, Management Responses, and Reporting Products.**

Threat	Conservation Action Item and Description	Tasks	Performance Metrics	Threshold (If....)	Management Response (then...)	Reporting Product
Smooth brome introduction, establishment and expansion (cont'd.)	12 – Annually, aggressively control and monitor smooth brome infestations... monitor and treat infestations	12.2 - GPS known infestations	Aerial extent as delineated by GPS and densities of smooth brome measured by GIS polygons (measure at least every three years – starting in 2005)	If percentage of aerial extent of smooth brome measured by GPS in 2005 increases by greater than 10 percent (absolute) within the CACH population boundary in 10 years	Change herbicide, change treatment techniques, use multiple techniques and timing, change intensity and frequency	(1) Map summarizing changes in aerial extent and densities, (2) a monitoring plan mutually agreed upon between the USDA Forest Service (USFS) and U.S. Fish and Wildlife Service (USFWS) for smooth brome within six months following the signature of the agreement. The plan will include a risk analysis for CACH from treatment strategies that will be implemented
Establishment of invasive and non-native plants	11 – Ensure that seeds and plants used in projects on Mount Harrison originate from native sources	11.1 – Coordinate with the Forest botanist or qualified representative to ensure that native/appropriate species are used in revegetation and seeding projects	As projects occur - coordinate as per threatened, endangered, proposed or candidate (TEPC) standard 09	If projects are proposed with inappropriate/ non-native species for Mount Harrison	Forest botanist or qualified individual will ensure that weed free hay and mulch will be used, certified weed free seed will be used, and native, appropriate, and genetically local species will be used	As projects occur, provide USFWS with appropriate species used - none currently anticipated

APPENDIX D. ***Castilleja christii*** **Candidate Conservation Agreement Threats, Conservation Actions, Tasks, Performance Metrics, Thresholds, Management Responses, and Reporting Products.**

Threat	Conservation Action Item and Description	Tasks	Performance Metrics	Threshold (If....)	Management Response (then...)	Reporting Product
Establishment of invasive and non-native plants (cont'd.)	14 – If noxious weeds are identified in Howell Canyon Area, treat appropriately	14.1 – When noxious weeds are found in the Howell Canyon Area, treat with appropriate techniques (*i.e.*, hand grub, hand spray, etc.) to eradicate infestations and prevent spread into CACH population or habitat	New invasive species identified within Howell Canyon or on Mount Harrison	If any new noxious weeds or invasive species are identified in the Management Areas	Appropriate treatment procedures will be implemented	New infestations reported, map of new infestations, new treatment methods used if applicable, a risk analysis for CACH from treatment strategies prior to treatment
	15 – Continue to work with Burley Highway Department regarding spraying, treatments, and native plant seeding	15.1 – Annually meet with the Burley highway district and weed crews on herbicide treatment and the use of appropriate plants/seeds for revegetation in road right-of-ways.	New invasive species identified within Howell Canyon or on Mount Harrison	If any new noxious weeds or invasive species are identified in the Management Areas	Appropriate treatment procedures will be implemented	New infestations reported, map of new infestations, new treatment methods used if applicable
	16 - Implement Forest Wide Noxious Weed Program	16.1 - Implement Forest Wide Noxious Weed Program (when completed -anticipated 2006).	New invasive species identified within Howell Canyon or on Mount Harrison	If new noxious weeds or invasive species are identified in the Management Areas	Appropriate treatment procedures under the Weed Program will be implemented	New infestations reported, map of new infestations, new treatment methods used if applicable
	17 – Coordinate with special user groups, permittees and the public to reduce risk of noxious weed invasion	17.1 - To reduce the risk of noxious weed invasion, meet with user groups, permittees, and public and provide education/information. Complete compliance checks for Annual Operating Instructions (AOI)/permit as needed.	Direction and/or education included as a condition in permit and included in AOIs	If new infestations are discovered or new introductions occur	(1) Increase education, efforts with permittees on new weeds, (2) if problems persist, consider denial of permit/ limiting access due to resource concerns	Number of permits authorized; educational events held; and location, size, and species of any new infestations

APPENDIX D. *Castilleja christii* Candidate Conservation Agreement Threats, Conservation Actions, Tasks, Performance Metrics, Thresholds, Management Responses, and Reporting Products.

Threat	Conservation Action Item and Description	Tasks	Performance Metrics	Threshold (If....)	Management Response (then...)	Reporting Product
Establishment of invasive and non-native plants (cont'd.)	18 - Require use of equipment inspection/wash stations for organized recreation events	18.1 – Require use of inspection/wash stations for organized, permitted recreation group events. Complete compliance checks for meeting terms of permit.	Direction and/or education included as a condition in permit	If new infestations are discovered or new introductions occur	(1) Provide education at key points regarding the biology and conservation of CACH, and (2) consider denial of permit if resource concerns persist.	Number of permits authorized; educational events held; success of wash/inspection stations; and location, size, and species of any new infestations
Recreation Impacts - (*i.e.*, vehicles: OHV, ATV, or other)	20 – Reduce impacts from off-road vehicles and unauthorized use	20.1 - Continue to maintain or improve rock barriers and signs to limit impacts	Signs and barriers in place, maps with travel restrictions available	If unauthorized removal of rocks and/or signs occur or problem areas are identified	Replace barrier rock and signs as needed	Rock replacement areas, sign replacement reports – as needed
	21 – If new recreational impacts are detected or reported, use adaptive management/ education to offset impacts/threats	21.1 - Monitor for tire tracks within existing CACH transects and surrounding area.	Number of unauthorized motorized/ mechanized vehicle tracks	If the number of authorized vehicle tracks increases by 10 percent in monitoring transects or noticeably in surrounding areas	(1) Provide additional signing and education at key points regarding the biology and conservation of CACH, and (2) increased enforcement of travel restrictions	Number of new tracks/impacts detected, efforts completed to offset effects
Recreation Impacts (*i.e.*, camping, hiking, flower collecting, trampling)	21 – If new recreational impacts are detected or reported, use adaptive management/ education to offset impacts/threats	21.2 - Monitor for signs of dispersed disturbance (*i.e.*, fire rings, suspected tent sites)	Number of disturbances recorded in monitoring transects and surrounding area	If the number of recreation related disturbances increases by 10 percent in monitoring transects or noticeably in surrounding areas	(1) Provide additional signing and education at key points - biology and conservation of CACH, (2) encourage use in designated sites, and (3) disperse fire rings	Number of disturbances recorded, efforts taken to offset effects

APPENDIX D. *Castilleja christii* Candidate Conservation Agreement Threats, Conservation Actions, Tasks, Performance Metrics, Thresholds, Management Responses, and Reporting Products.

Threat	Conservation Action Item and Description	Tasks	Performance Metrics	Threshold (If....)	Management Response (then...)	Reporting Product
Impacts from unauthorized livestock use	22 – Continue to inform permittees of the need to protect CACH in AOIs	22.1 – Manage livestock grazing to avoid potential for impacts through exclosure and administrative closure.	Number of livestock related disturbances recorded in monitoring transects and surrounding area	If any new livestock related disturbances recorded in monitoring transects or surrounding area	(1) Continue annual meetings with allotment permittees, (2) continue communication with permittees to ensure exclosure maintenance efforts are occurring, and (3) inform in AOI about the biology and conservation of CACH	Number of new livestock disturbances recorded in transects or CACH population, actions taken to offset or minimize effect
	23 – Address unauthorized livestock and associated impacts	23.1 – If livestock are observed in population or surrounding area, permittees will be contacted immediately and livestock will be removed as soon as possible	Number of unauthorized livestock use incidents	If any unauthorized use is observed	(1) Contact permittee immediately, remove unauthorized livestock as quickly as possible, (2) modify AOIs to prevent future occurrences of unauthorized livestock use/access	Number of incidents of unauthorized livestock use, any modifications to AOIs
Impacts from unauthorized livestock use (cont'd.)	24 – Ensure fences and natural barriers are maintained	24.1 – Annually, check fences and barriers to ensure fences and natural barriers and ensure maintenance to prevent unauthorized livestock use within Mount Harrison Research Natural Area and Botanical Special Interest Area.	Fence maintenance reports from permittees and USFS spot checks	If fence or barriers are not maintained	(1) Work with permittees to ensure maintenance occurs, (2) modify AOIs to prevent future occurrences of unauthorized livestock use/access	Fence maintenance reports and reports from USFS spot checks

APPENDIX D. *Castilleja christii* Candidate Conservation Agreement Threats, Conservation Actions, Tasks, Performance Metrics, Thresholds, Management Responses, and Reporting Products.

Threat	Conservation Action Item and Description	Tasks	Performance Metrics	Threshold (If....)	Management Response (then...)	Reporting Product
Impacts associated with road construction or maintenance	25 Ensure road construction or maintenance within CACH habitat does not occur outside of road prism	25.1 – A botanist or qualified representative should be present during all construction activities within the CACH habitat to prevent potential impacts	Historically, flagging and botanist presence has been successful – USFS will use same protocol for future projects	If construction, maintenance, or associated activities (staging, resurfacing) occurs within CACH habitat	Forest botanist or qualified representative will be present throughout all construction activities within CACH habitat to provide resource advice and direction to avoid impacts to CACH and its habitat.	As needed: results of coordination with Forest botanist or qualified representative, responses, decisions, and actions taken to ensure impacts occur outside of CACH habitat
Hybridization within population	27 - Examine the population for the frequency of hybridization	27.1 – Document and track the number of hybrids within permanent monitoring transects	Number of hybrids within monitoring transects	If the percentage of hybrids is greater than 10%	Meet with USFWS and technical team to determine whether any management actions are needed	Number of hybrids detected in monitoring transects and any change in management actions
Impacts from wildfire and related fire suppression activities	28 – In Wildland Fire Situation Analysis, ensure botanist or qualified individual is involved in decisions for fire management resources	28.1 - Ensure Forest botanist or qualified individual (or Resource advisor) with knowledge of the CACH population is involved in the Wildland Fire Situation Analysis process and decisions for fire resources.	Resource advisor or botanist coordinating with fire management personnel on determinations for resources (helipads, staging, retardant use, dozers)	If fire occurs within or adjacent to CACH habitat	Resource advisor or botanist will coordinating with fire management personnel on determinations for resources to minimize or avoid impacts to CACH and its habitat	As needed: report results of coordination with Forest botanist or qualified representative, responses, decisions, and actions taken to ensure to minimize or avoid impacts to CACH and its habitat
	29 - Ensure that Burned Area Recovery Team coordinates with Forest botanist or qualified individual	29.1 – Forest botanist or qualified individual with knowledge of CACH will be involved with Burned Area Recovery Team to contribute to any decision to reseed or revegetate within CACH habitat	Reseeding and/or revegetation activities	Reseeding and/or revegetation activities are needed	Appropriate weed free hay and mulch will be used, certified weed free seed will be used, native, appropriate, and genetically local species will be used	As needed: results of coordination with Forest botanist or others, location of seeding, composition of seed mixes used

APPENDIX E. *Castilleja christii* Candidate Conservation Agreement Conservation Actions, Tasks Description and Frequency, Responsible Parties, Legal Requirements, Funding, and Comments. Legal and Forest Plan Requirements abbreviations are defined in the Sawtooth NF Forest Plan.

Conservation Action(s)	Action Item	Task and Years Implemented	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Ongoing General Conservation Actions									
Continue to conduct inventories for CACH	1	Provide all survey results to Idaho Conservation Data Center (ICDC) and U.S. Fish and Wildlife Service (USFWS) within year conducted	USDA Forest Service (USFS)	Threatened, endangered, proposed and candidate (TEPC) standards, National Forest Management Act (NFMA)	As projects arise within potential habitat	USFS – project related funding	Contract funding if available – $10,000	Variable	Contract could allow for wide survey if funds available
Long-term demographic monitoring	5, 10, 11, 21, 27, 34, 39	Long-term demographic and disturbance monitoring (includes 21.1, 30.1, 30.2, 36.1)	USFS, USFWS	TEPC standard TEST10, 1518, 1623, 1625	Annually	USFWS -$2,500 USFS -$2,500 (both in kind)	Unknown	$5,000	Consider moving to monitoring every 2 years after 2007
		2005	USFS, USFWS	As above	Annually	As above	Unknown	$5,000	Cost for personnel monitoring will likely increase each year, Monitoring will continue to be a priority for funding by both agencies
		2006	USFS, USFWS	As above	Annually	As above	Unknown	$5,000	
		2007, 2009,2011, 2013, 2015	USFS, USFWS	As above	Bi-annually	Cost for out-year planning variable. Currently, the USFS provides 2-3 employees and the USFWS provides 2-3 employees to complete the work. Monitoring takes approximately 3 days. Employee costs will continue to increase over time. The USFS will continue to request funding for this priority item, as will the USFWS.			

APPENDIX E. *Castilleja christii* Candidate Conservation Agreement Conservation Actions, Tasks Description and Frequency, Responsible Parties, Legal Requirements, Funding, and Comments. Legal and Forest Plan Requirements abbreviations are defined in the Sawtooth NF Forest Plan.

Conservation Action(s)	Action Item	Task and Years Implemented	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Establish oversight team, review agreement for effectiveness	6, 7, 36, 27	All	USFS, USFWS	National Forest Management Act, Forest Plan Direction	Annually	USFWS, USFS in kind time, 1 day per year	Unknown	Variable	
Provide annual report on success of implementation	8,35	All in 2005-2015	USFS – provide USFWS – review	Signed Agreement	Annually	USFS –preparation/review $1,500 in kind annually USFWS – review/response $1,500 in kind annually		$30,000 for life of the Agreement, 1 report per year	Costs for preparation and review will vary by data collected and synthesis needs
Maintain administrative closure for livestock grazing, mineral withdrawal and travel restrictions	8A	All	USFS	National Forest Management Act Forest Plan direction	Annually	Mineral withdrawal expires in 2018 – no costs associated with maintaining administrative closures		None – ongoing closures	No changes anticipated or desired
Continue to meet with user groups, publics, and interested parties	2, 17	All	USFS, USFWS		As needed	USFS, USFWS as needed	None	Variable as needed	This is an ongoing effort and will continue to occur.
Support funding of studies and scientific research	30, 33, 38	Support funding of studies and scientific research developed to better understand the biology/ ecology of CACH	USFS, USFWS	National Forest Management Act	As funding and opportunities are available	USFS, USFWS as funding is available	Unknown	Variable	Opportunities for determining pollinators, host plants, and hybridization are available.

APPENDIX E. *Castilleja christii* Candidate Conservation Agreement Conservation Actions, Tasks Description and Frequency, Responsible Parties, Legal Requirements, Funding, and Comments. Legal and Forest Plan Requirements abbreviations are defined in the Sawtooth NF Forest Plan.

Threat	Action Item #	Task Description and Frequency	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Conservation Actions and Tasks arranged by threat (see also Appendix C)									
Smooth Brome introduction, establishment and expansion	12, 41	21.1 - Annually treat Smooth Brome by handwicking, spot spraying and/or seed head removal prior to seed set (2005)	USFS, USFWS	TEST10, TEST10, TEST08, NPGU01, NPS11, Management Area (MA) direction - 1522, 1627, 1723	Annually	USFWS -$5,000 USFS -$2,500	Unknown	$7,500	The USFS will continue to request funding for this eradication effort. The USFS will continue to partner with USFWS and will utilize all funds that become available.
	12, 41	21.1 – 2006 to 2015	USFS, USFWS	Same as above	Annually	Top threat priority for funding request for USFS – Funding amount may vary due to effectiveness of control techniques.	Variable as results dictate		
	12	21.2 - GPS known infestations (2005)	USFS, USFWS	Same as above	Every three years starting in 2005	USFWS -$2,500 USFS -$2,500 (both in kind)	Unknown	$5,000	
	12	21.2 - 2008, 2011, 2014	USFS, USFWS	Same as above	Every three years starting in 2005	As above, cost may be higher due to increases in employee costs	Variable as monitoring results dictate	Variable	Changes over time may be more detectable over a 2-year period, consider GPS work every other year
Establishment of invasive non-native plant species	11	20.1 – Coordinate with botanist or qualified representative to ensure use of native/ appropriate species	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621, NEPA, NFMA	Annually and/or as needed	USFS (as needed)	Variable as projects and/or needs arise	Variable	

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Threat	Action Item #	Task Description and Frequency	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Establishment of invasive non-native plant species	14	23.1 – When noxious weeds are found in the Howell Canyon Area, treat with appropriate techniques to eradicate infestations and prevent spread into CACH population or habitat	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621, NEPA, NFMA	Annually	USFS - Variable dependent upon infestation extent	Variable as projects and/or needs arise		The USFS will continue to complete NEPA analyses as projects arise. The USFS will meet with weed crews, the highway district, and permittees annually to provide resource input. The USFS has a weed crew that is funded to complete this work
	15	24.1 – Annually meet with Burley Highway District and weed crews on herbicide treatment and the use of appropriate plants/seeds for revegetation in road right of way.	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621, NEPA, NFMA	Annually	Variable	None	$1,250 – may be more costly over time due to salary increases	
	16	25.1 – Implement Forest Noxious weed Program (when completed-anticipated 2006).	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621	Annually	USFS – Will become integrated part of current weed treatment program	None		
	17	26.1 – Meet with user groups, permittees, and public to provide education/information. Complete compliance checks for Annual Operating Instructions (AOI)/permit as needed	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621	As needed	USFS (as needed)	Variable		The USFS will provide a botanist /qualified rep. to inform users and complete checks
	18	27.1 – Require use of equipment inspection/wash for organized recreation events	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621	As needed	USFS (as needed)	Variable		Will be a condition in organized recreation permit

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Threat	Action Item #	Task Description and Frequency	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Recreation impacts vehicles (OHV, ATV, or other and camping, hiking, flower collecting, trampling)	20	29.1 – Maintain or improve rock barriers and signs (2005 –2015 as needed)	USFS, USFWS	TEST08	Signs will likely need to be replaced every 3 years	As available	Approx. USFS- $2,500, USFWS - $2,500 as needed	$15,000 if replaced every 3 years during the life of the Agreement	Price for replacement and updates will likely increase over time, request and budget as needed
	21	30.1 and 30.2 – If new recreational impacts are detected or reported, use adaptive management/education to offset impacts/threats	USFS, USFWS	TEST10, 1518, 1623, 162	Annually until 2006 then bi-annually until 2015	USFS, USFWS costs detailed above under continue long term demographic monitoring	See above	See above	Number of tracks, disturbances, and impacts will be recording in monitoring transects
Impacts from unauthorized livestock use	22	31.1– Manage livestock grazing to avoid potential for impacts through exclosure and administrative closure	USFS	TEST08, TEST10, TEST22, TEST 26, TEGU09	Annually meet with permittees, inform in AOIs	USFS (annual operating funds for grazing permits)	Unknown	-	The USFS will continue to meet with permittees annually. AOI will include info about CACH conservation
	21	32.1 – Reduce unauthorized livestock and associated impacts – contact permittees immediately if livestock are observed in population or surrounding area	USFS	TEST08, TEST10, TEST22, TEST 26, TEGU09	As needed - permittees contacted if unauthorized livestock observed. Immediate removal action	USFS	Variable	Variable	

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Threat	Action Item #	Task Description and Frequency	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Impacts from unauthorized livestock use	24	33.1 - Ensure fences and natural barriers are maintained to prevent unauthorized livestock use in RNA, BSIA, and CACH population (2005-2015)	USFS	TEST08, TEST10, TEST22, TEST 26, TEGU09	Annually, check fences and barriers	USFS - $1,500 for material for new fence in 2005, will request if needed in future years	Permittees will install fence with materials provided by USFS in 2005	Variable, costs will range if replacements are needed	Adaptive management used to evaluate fences and barriers and make improvements as needed
Impacts associated with road construction or maintenance	25	34.1 - Ensure road construction or maintenance within CACH habitat does not occur outside road prism– botanist or qualified individual present throughout all activity (2005 –2015 as needed)	USFS	TEST08, TEST10, TEST05, TEST11, TEST 31, TEGU07, TEGU10	As needed	USFS- need to fund time for botanist or qualified individual to be present during activities	None	Variable, as needed	The USFS will continue to meet annually with the Burley Highway district to coordinate efforts for road maintenance, reconstruction.
Hybridization within population	27	36.1 – Examine the population for the frequency of hybridization	USFS, USFWS	National Forest Management Act	Sampled in monitoring transects – see schedule for monitoring above	USFS, USFWS as part of annual or bi-annual monitoring – see costs above	Funding could be used to complete genetic analysis - $15,000	Variable given level of analysis	USFS and USFWS will look for opportunities to fund this research.
Impacts from wildfire and related fire suppression activities	28	37.1 – Ensure Forest botanist or qualified individual involved in the Wildland Fire Situation Analysis process and decisions for fire resource. (2005 –2015 as needed)	USFS	TEST08, TEST09, TEST11, TEST17, TEST18, TEST31, TEGU06, TEGU07, TEGU08, 1532, 1603, 1627	As needed	USFS	None	Variable, as needed	The USFS will ensure that the Forest botanist or a qualified individual will be involved if a fire should occur on or near Mount Harrison

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Threat	Action Item #	Task Description and Frequency	Responsible Parties	Legal or Forest Plan Requirement	Timing	Funding Provided and Party	Other Funding Needed	Total Costs	Comments
Impacts from wildfire and related fire suppression activities	29	38.1- Forest botanist or qualified individual with knowledge will be involved with Burned Area Emergency Recovery (BAER) team coordinates with for appropriate revegetation and seeding (2005 –2015) as needed	USFS	NPGU01, MA direction 1519, 1624, 1720,1628, 1620, 1621, NEPA, NFMA	As needed	USFS	Unknown	Unknown	The USFS will ensure that the Forest botanist or a qualified individual will be involved in BAER activities to select appropriate revegetation/ seeding techniques and species.