# CHAPTER XI: UTE LADIES' TRESSES ORCHID

## A. Status of the Species

### 1. Listing History

Ute ladies'-tresses (*Spiranthes diluvialis*; SPDI) was listed as Threatened under the Act on 17 January 1992. At that time, the species was known from fewer than 6,000 individuals in 10 extant and 7 historical (and presumed extirpated) populations in Colorado, Nevada, and Utah. This species was considered extremely vulnerable to extinction from habitat loss/modification, small population size, and low reproductive rate (Service 1992). Since 1992, the number of extant populations of SPDI has increased to over 50 and its known range has expanded to Idaho, Montana, Nebraska, Washington, and Wyoming. Survey work and monitoring studies suggest that the global population may be over 83,000 individuals. New discoveries have also shed light on the plant's complex life history, dependence on natural and human induced disturbance, and response to existing and newly identified threats.

SPDI is also listed on Appendix II of the Convention on the International Trade in Endangered Species (CITES) and is protected from illegal export (Service 1995). Critical habitat has not been designated at this time. To date, no recovery plan has been approved for this species. However, a draft recovery plan has been written (Service 1995b). This species receives no formal protection under Idaho state law.

### 2. Description of the Species

SPDI was first collected by Marcus E. Jones in Salt Lake City, Utah in August 1880. Jones' specimen was initially identified as *S. romanzoffiana*, a widespread Cordilleran species, but was later referred to *S. cernua* by Correll (1950). While revising the taxonomy of the genus *Spiranthes* in the early 1980s, Charles Sheviak (1984) recognized that the Jones specimen and several others from eastern Nevada, western Utah, and northern Colorado belonged to an undescribed species that he named *S. diluvialis* in 1984.

SPDI is a perennial herb with erect, glandular-pubescent stems 12-50 cm tall arising from tuberous-thickened roots. Basal leaves are linear, up to 1 cm wide and 28 cm long, and persist at flowering time. Leaves become progressively reduced higher up the stem. The inflorescence is a loose spike 3-15 cm long of numerous, small white to ivory flowers arranged in a gradual spiral. The lip petal is oval to lance-shaped, narrowed at the middle, and has crispy-wavy margins. Sepals are free or fused only at the base (not forming a hood-like structure) and are often spreading at their tips (Fertig et al. 1994; Service 1995).

### 3. Life History and Habitat Requirements

Very little is known about the life history of SPDI (Service 1995). Much of what is presumed about the species' life history is drawn from knowledge of other orchids. Orchids generally have very small seeds that require symbiotic associations with mycorrhizal fungi for germination. Many species of orchids are saprophytic, underground plants that may

persist for many years underground before emerging above ground. The mycorrhizal stage is reported to last 8 years in *S. spiralis* and green leaves are first produced up to 11 years after germination in that species (Wells 1967). Studies of *S. magnicamporum* in western Kansas and Nebraska report that that species may bloom as rarely as once in 20 years. The mean life expectancy of *S. spiralis* plants studied over a nine year period was calculated to be more than 50 years (Service 1995).

Throughout its range, reproduction of the SPDI appears to be strictly sexual, with bumblebees (*Bombus* spp.) as the primary pollinators (Arditti 1992, Sheviak 1984). Flowers are protandrus (functionally male first and then female). As with other orchid species, it is thought that SPDI does not reach sexual maturity for 5 to 10 years (Service 1995). Each fruit can have several hundred to 10,000 seeds with an average of around 2,000 (Sipes and Tepedino 1994). These seeds may be dispersed by water (Carroll 2004) or wind (Wells 1967). The flowers, seed heads, and vegetative parts of the SPDI are palatable and can be incidentally eaten by grazing livestock. The possibility that grazers could disperse the seeds of this species has not been evaluated. The blooming period is from early August to early September, with fruits produced in mid-August to September (Fertig 2000). Not all individual mature SPDI bloom every year and some may remain dormant beneath the ground surface and not show any above ground parts for at least one growing season (Arft 1995).

SPDI occurs primarily on moist, sub-irrigated or seasonally flooded soils in valley bottoms, gravel bars, old oxbows, or floodplains bordering springs, lakes, rivers, or perennial streams at elevations between 550-2075 meters (1800-6800 feet) (Arft and Ranker 1998; Moseley 1998). Soils vary from sandy or coarse cobbley alluvium to calcareous, histic, or fine-textured clays and loams. Populations have been documented from alkaline sedge meadows dominated by *Carex aquatilis, C. praegracilis,* and *C. lanuginosa* (Heidel 1998), *Eleocharis rostellata, Elaeagnus commutata/Agrostis stolonifera, Salix exigua/Agrostis stolonifera,* and *Equisetum variegatum* cover types within riverine floodplains (Moseley 1998), flooded alkaline meadows adjacent to *Pinus ponderosa/Pseudotsuga menziesii* woodlands and sagebrush steppe (Washington Natural Heritage Program 1999), and streamside floodplains and meadows on alluvium (Stone 1998). Some occurrences are also found on agricultural lands managed for winter or early season grazing or hay production (Hazlett 1996, 1997). Known sites often have low vegetative cover and may be subjected to periodic disturbances (flooding, or grazing). Populations are often dynamic and “move” within a watershed as disturbances create new habitat or succession eliminates old habitat (Moseley 1998).

SPDI is a late-blooming species, which is only recognizable while it is blooming. Despite their distinctive spikes of white flowers, blooming plants can be extremely difficult to see in the dense herbaceous understory vegetation they are associated with. Plants not yet blooming, plants past bloom, and vegetative plants are virtually impossible to distinguish from background vegetation. Because different plants come into bloom at different times within a single population, a population must be visited several times during the growing season for an accurate count.

4. Population Dynamics

The locations of populations within a watershed vary with the availability of suitable habitat. Sizes of populations fluctuate naturally and in some years not a single SPDI individual appears above ground. The number of flowering adults does not give an accurate picture of population size nor tell us anything about population structure. More information is necessary regarding population viability (Service 1995).

If estimated population size is based on the number of SPDI flowering spikes, then populations appear to fluctuate dramatically in size from year to year (Service 1992). For example, the primary site for the Boulder, Colorado population contained 5,435 plants in 1986, 200 plants in 1987, 131 plants in 1988, 1,137 plants in 1989, 1,894 plants in 1990, and at least 80 plants in 1991 (Service 1992). This variability in apparent population size is consistent with other observations made of other orchid species.

However, Wells (1967) questioned whether apparent fluctuations in orchid numbers were (and are) accurate descriptions of the actual dynamics of the orchid populations. According to Wells (1967), the criterion adopted for judging whether the number of orchids at a site has changed or not has been the number of flowering spikes displayed at the time of visit. This may be an unsatisfactory criterion for measuring a quantitative change in population because, as has been demonstrated, plants may spend several years as vegetative rosettes or as underground tubers (as many as 11 years) with no above-ground parts. Furthermore, according to Wells (1967), the autumn ladies'-tresses orchid (*S. spiralis)* grows mainly in short grassland which is typically maintained in that condition by some kind of grazing which can damage some of the flowering spikes making a visual estimate of number based on count of flowering spikes unreliable. Arft's (1995) work on SPDI supports this theory as well.

SPDI population levels and viability are, at least in part, determined by habitat conditions created and maintained by natural water processes. Therefore, the significance of population size and distribution within a watershed can, at least partially, be assessed in terms of the ability of the watershed factors to perpetuate it. However, the linkages between watershed processes, habitat conditions, and SPDI population response are complex and not completely understood.

In the January 1992 final listing rule, SPDI was reported from 10 extant populations and 7 historical localities in Colorado, Utah, and Nevada (Service 1992). Since then, nearly 100 additional locations have been discovered or relocated in Colorado and Utah as well as Idaho, Montana, Nebraska, Washington, and Wyoming (Fertig 2000, Franklin 1993, Hartman and Nelson 1994, Heidel 1996, 1998, Hildebrand 1998, Moseley 2000). Many of these “element occurrences” (as recognized by state natural heritage programs) fall within the same drainage or are otherwise in close proximity. In 2004, the Colorado Natural Heritage Program developed standardized criteria for delineating SPDI populations for the entire network of natural heritage programs. Under this system (NatureServe 2004), occurrences within 8.05 km (5 miles) in the same river or stream system are considered part of one natural, interbreeding metapopulation, as are upland meadow areas separated by less than

1.61 km (1 mile). Based on these new criteria, there are currently 61 SPDI populations recognized rangewide, of which 52 are extant.

Based on available survey data through 1991, the Service (1992) estimated the total number of SPDI to be less than 6,000 plants in 10 extant populations and about 170 acres of habitat. In 1995 this estimate was increased to 20,500 plants following the discovery or relocation of 21 additional populations from 1992-1994 (Service 1995). Since 1995, another 24 populations have been discovered, including several large occurrences along the Green, Snake, and Niobrara rivers. SPDI is now known to occupy 674-783 acres of habitat. The highest number of plants recorded in any one year was 38,438 in 1998, based on sampling 23 of 55 populations known at that time. Since these populations were not selected randomly, no useful extrapolations can be made to estimate rangewide numbers based on annual counts.

5. Historic and Current Distribution

When it was first listed under the Act in 1992, SPDI was known only from north-central Colorado, northern and south-central Utah, and southeastern Nevada. Since 1993, SPDI has been discovered in southeastern Wyoming (Hartman and Nelson 1994), southwestern Montana (Heidel 1996), western Nebraska (Hazlett 1996), eastern Idaho (Moseley 1997), and north-central Washington (Bjork 1997) and new populations have been documented in northwestern Colorado (Ward and Naumann 1998) and northern Utah (Franklin 1993, Stone 1993).

SPDI populations occur on a mix of private, federal, tribal, state, county, and city lands. All or portions of 33 populations (54.1%) are on private lands and cover approximately 380 acres (48.7% of occupied habitat). Fifteen populations (24.6%) occur on federal lands managed by the BLM, Bureau of Reclamation, National Park Service, USFS, and Service. These lands cover about 339 acres (43.3% of all occupied SPDI habitat). Four populations (6.6%) covering about 52 acres occur wholly or in part within the Uintah and Ouray Indian Reservation in northeastern Utah. Fourteen other populations (23%) are found partly or completely on state, county, or city managed lands that cover about 100 acres (12.8% of occupied habitat).

SPDI was first discovered in Idaho by Mabel Jones in 1996 along the South Fork of the Snake River (Moseley 1997). The species is now known from Bonneville, Fremont, Jefferson, and Madison counties along the Snake River and from wetland sites along the Henry's Fork River (Mancuso 2004). All occurrences along the South Fork of the Snake River are considered part of the same metapopulation (Murphy 2004). Within the scope of the Idaho Roadless Area analysis, known SPDI populations are only found on the Targhee portion of the Caribou-Targhee National Forest in the Garns Mountain Roadless area.

6. Critical Habitat

Critical habitat has not been designated for SPDI; therefore, no critical habitat will be affected by this action.

## B. Environmental Baseline

1. Status of the Species in the Action Area

Virtually all known occurrences within the state of Idaho are or at one time were associated with the Snake floodplain in early to mid-seral riparian habitats. Within the scope of the Modified Roadless Rule, all known occurrences fall within the Garns Mountain IRA on the Targhee portion of the Caribou-Targhee National Forest.

2. Factors affecting the Species in the Action Area

Throughout the species' range, urban, residential, agricultural, or recreational development within riparian or lacustrine floodplain areas could threaten SPDI populations. These activities historically have likely been a primary cause of the fragmentation of populations now currently observed. Incompatible agricultural or other land management practices could also threaten the SPDI. The orchid is tolerant of grazing and other forms of land and vegetation disturbance. However, continuous grazing during the flowering season, severe trampling and soil compaction, untimely herbicide applications, proliferation of aggressive native and exotic plant species indicative of site degradation, and practices that result in habitat alteration from grass/forb/sedge to shrub/tree dominance, can result in loss of vigor and eventual demise of the orchid and/or orchid pollinators. Many riparian and other wetland and wetland/upland habitats suffer from these impacts.

Alterations of stream hydrology could also threaten SPDI. The orchid is supported by moist soil throughout the growing season, and by wet habitats that are dominated by grass/forb/sedge communities. During the past 150 years, and continuing today, water development, diversions, stream channel alterations for flood control or other purposes (including oil and gas development and mining), and changes in hydrograph have altered hydrology, floodplain geomorphology, and vegetation composition and trends. While in some streams and reaches this may have provided improved conditions for the orchid, in many cases it has resulted in the loss of suitable habitat and likely fragmentation or loss of the orchid within watersheds (Service 2004).

The following discussions provide more specific information related to the abovementioned factors in Idaho:

*Changes in Hydrology*

The past and present impacts to SPDI in the action area may have included increases or decreases in habitat suitability due to irrigation developments and other human-caused changes to stream hydrology. Human-caused changes to stream hydrology have taken the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water depletions from surface waters. Many historical projects exist that have changed stream hydrology.

*Invasive Plants*

Invasive plant species do occupy much of the Idaho range of SPDI area and herbicide use to control these invasive species has been undertaken by private citizens or performed by County weed control districts. It has not been observed at present that any invasive plants may be adversely impacting any SPDI plants within the action area. However, it is likely that invasive plants could impede the ability of SPDI to spread and reproduce.

*Forage Production*

Livestock grazing, haying, or mowing occur within the Idaho range of SPDI. Grazing activities on BLM-administered lands are authorized by the BLM through a permitting process. Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. These activities may be beneficial to SPDI through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual SPDI plants.

*Herbivory*

Another impact to SPDI in the action area may be herbivory by wildlife. Herbivory of the flowering spikes of SPDI by voles (Arft 1994), deer (Fertig 2000), and moose (Moseley 1998) is frequent at some locations. Wells (1967) documented significant flowering stalk herbivory of the autumn ladies'-tresses orchid by rabbits. Arft (1994) speculated that vole herbivory could be the greatest single threat to the long-term survival of SPDI at one study site. It is plausible that similar damage to SPDI in the action area could be attributed to wildlife as well.

Additional potential effects from activities could result in the loss of habitat or direct damage to individual and flowering parts of SPDI. Alterations or changes to stream, wetland or riparian habitats could affect the ability of the plant to reproduce, disperse through seeds, and remain functioning. Seed dispersal mechanisms of SPDI are poorly known, but it is probably through transport by flowing water or wind. The species grows in clumped patterns suggesting that seed dispersal distances are relatively short but the scattered distribution of populations suggest seed dispersal could occur over great distances. It is unlikely that projects under the Forest Plan Special Theme would fragment populations of SPDI above the current situation.

## C. Effects of the Proposed Action

The previous section presented factors and activities that can affect the species in the action area. This section focuses on those activities that may result from future actions undertaken as allowed by the MIRR. Unlike most USFS project analyses of alternatives and environmental consequences, the analysis of the MIRR does not include an analysis of project implementation and resulting direct effects; it is an analysis of activities that could occur pursuant to the MIRR and the indirect and cumulative effects that could occur from

those actions. It is an analysis of what is allowed under the rule versus an analysis of the on-the-ground activities, and therefore has no direct effects.

Virtually all known occurrences within the state of Idaho are or at one time were associated with the Snake floodplain in early to mid-seral riparian habitats. Within the scope of the MIRR, all known occurrences fall within the Garns Mountain IRA on the Targhee portion of the Caribou-Targhee National Forest. The Garns Mountain IRA falls within the Forest Plan Special Area theme – areas that are governed by specific Agency directives and forest plan direction. Since the MIRR does not propose or recommend management direction for these lands, the known populations of SPDI and potential habitat which falls within this IRA will not be affected by this action. However, due to the cryptic nature (up to 10-year dormancy) of this species' life history and the relatively broad characterization of potential habitat throughout its large range, it is impossible to rule out that new populations may yet be found in other roadless areas or be affected by this action until more thorough inventories are conducted at the individual project level.

## D. Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area. Since any future actions unrelated to this action would require their own separate consultation(s) pursuant to Section 7 of the Act, no further consideration beyond the current scope is evaluated at this point in time.

Little development is occurring within areas occupied by SPDI in Idaho. Several landscape-level threats to SPDI were cited by Murphy (2004) along the Snake River. These include floodplain alteration from levee maintenance and construction, road and bridge development, bank stabilization activities (riprapping, dredging, etc.), and recreational access activities. Cultivated or native pasture agriculture may limit the size of suitable riparian wetlands due to plowing/mowing or pesticide applications to control grasshoppers may impact native insect pollinators all of which could affect SPDI populations. Grazing of riparian areas may increase the suitability of areas by reducing the density of competing vegetation but may also destabilize streams creating channelization effects and reducing the amount of suitable sub-irrigated floodplain. Late season grazing may also reduce seed production within a population by eliminating flowers and fruits. Effects cannot be determined at this time to undiscovered SPDI populations that may be present in uninventoried IRAs.

## E. Conclusion

The Service has reviewed the current status of SPDI, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the species continued existence. Our conclusion is based on the Management of IRAs proposed by the MIRR has a low likelihood of impacting SPDI. The only known occurrences on National Forest Service lands, found within the Garns Mountain Roadless area, will not be affected by the MIRR since they fall within the Forest Plan Special Area theme. However, because potential habitat for SPDI in Idaho is still relatively broadly characterized and road construction/reconstruction, mineral activities,

timber cutting may be permitted within other IRAs under MIRR, adverse affects to undiscovered SPDI populations in un-surveyed potential habitat cannot be completely discounted.

## F. Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying these species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants is provided to the extent that the Act prohibits the removal and reduction to possession of Federally listed plants, the malicious damage of endangered plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

1. Amount or Extent of the Take – No incidental take is exempted herein as a result of the Forest Service adopting the MIRR.

2. Effect of the Take – Not applicable to this Opinion.

3. Reasonable and Prudent Measures and Terms and Conditions – As there is not take exemption under 7(o) of the Act in this Opinion, the Service is not providing Reasonable and Prudent Measures or Terms and Conditions

## G. Conservation Recommendations

1. All projects which impact wetlands will be evaluated for suitability for SPDI (i.e., below 6,800 feet elevation; non-saline soils; open palustrine wetlands with no overstory; perennial water source).

2. Wetlands that may be disturbed with characteristics suitable for SPDI will be surveyed prior to disturbance according to Service guidelines to determine presence/absence of the species.

3. Wetlands that may be disturbed that have SPDI present will be restored and protected in a manner which preserves topsoil from the affected areas and utilizes it for reclamation thus preserving the seed bank, propagules, and other biological materials.