ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PMORC2B140
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Spiranthes delitescens*
COMMON NAME: Canelo Hills Ladies'-Tresses; Canelo Ladies'-Tresses; Madrean Ladies'-Tresses; Reclusive Ladies'-Tresses
SYNONYMS: *Spiranthes graminea* Lindl. (in part)
FAMILY: Orchidaceae

AUTHOR, PLACE OF PUBLICATION: Sheviak, C.J. 1990. Rhodora 92:213-231.

TYPE LOCALITY: North of Canelo, Santa Cruz County, Arizona.

TYPE SPECIMEN: NYS. C.J. Sheviak 1 August 1984.

TAXONOMIC UNIQUENESS: The genus *Spiranthes* has undergone many taxonomic changes since its formal description in 1817 (Richard 1817). The genus is comprised of approximately 50 species distributed in the Americas, Eurasia, and Australia. 29 species occur in North America. Only one other species of *Spiranthes, S. romanzoffiana*, is known to occur in Arizona.

S. delitescens was first considered to be *S. graminea*, but was determined to be a different species due to morphological and cytological characteristics (Sheviak 1990). This taxonomy has been confirmed by Dueck and Cameron (2007) and Sheviak and Brown (2019).

DESCRIPTION: Slender, erect, terrestrial orchid. In bloom reaches 60.0 cm (24.0 in.) tall. Three to ten linear-lanceolate, grass-like leaves, up to 18.0 cm (7.2 in.) long and 1.5 cm (0.6 in.) wide, both basal and cauline in growth format. Fleshy, swollen roots about 5.0 mm (0.2 in.) in diameter. Twisted spike inflorescence may contain up to 45 tubular white flowers, consisting of wide-spreading lateral sepals and linear petals, with a pleated lip 6.0-8.0 mm (0.24-0.32 in.) long, creamy or pale-yellow center. Column slender, rostellum elongate and deeply bifid.

AIDS TO IDENTIFICATION: *S. delitescens* can be distinguished from other Mexican and southwest U.S. *Spiranthes* species by: (1) shape of medium-sized flowers: in lateral view base appears ascending but apex is horizontal or somewhat nodding, sepals curving outward and downward, distinct pubescence; trichomes glandular-capitate, tapered toward apex; (2) habitat and (3) elevation.

ILLUSTRATIONS:

Line drawing of habit and flower (Sheviak, 1990: Fig.1, p.214).
Color photo (USFWS 2021)

TOTAL RANGE: Known only from southern Arizona

RANGE WITHIN ARIZONA: Four cienegas in southern Arizona: one in Cochise County, and three in Santa Cruz County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous Perennial.

PHENOLOGY: Flowering occurs from July to early August during monsoon rainy season when temperatures range from 60° F at night to 100° F during day. During that time, precipitation averages 15-20 inches. Plants visible July-August. Fruits mature three weeks after flowers form, usually during August.

BIOLOGY: Like other orchids, *S. delitescens* produces small seeds lacking an endosperm, and is thus dependent nutrients from mycorrhizal symbionts for germination (McCormick and Jaquemyn 2014). *S. delitescens* is a geophyte, with nutrient storage structures occurring below ground, allowing plants to remain in a dormant subterranean state for more than one year. Geophyte dormancy may correlate to climatic variables, allowing plants to remain underground until conditions aboveground improve (Shefferson et al. 2005, Reintal et al. 2010). Vegetative growth of Canelo Hills Ladies'-tresses begins in late spring (MacClaran 1996). Flowering and seed production occur in summer, and plants die back in September or October, overwintering below ground (Gori 1994). The elapsed time for *S. delitescens* between germination and first appearing above ground is not known, but for many terrestrial orchids this initial below ground stage is measured in years. After first appearing above ground, *S. delitescens* is partially photosynthetic, but remains dependent upon its endophytic fungus for some amount of nourishment. It can revert to the underground state and remain below ground for a year or more. The number of years in the vegetative state before blooming is not known. After reaching blooming size, it does not always bloom in successive years, but can revert to either the vegetative or underground states. It is capable of going directly from the underground state to the blooming state without an intervening vegetative state. These periods of dormancy make determination of lifespan of the species difficult. Estimates range from three to four years (McClaran 1996), to many decades (Gori 1994), and perhaps up to a century (USFWS 2021). Drought stress can lead to mortality at any portion of the plant's lice cycle (Gori 1994).

The primary pollinators of *S. delitescens* appear to be bumblebees, most likely primarily the Sonoran bumblebee (*Bombus sonorous*) (Gori 1994, USFWS 2021). It is unknown if this orchid is capable of self-pollination or producing seed from unfertilized ovules, as has been documented in other *Spiranthes* species (Argue 2012). Seed production is robust, and small

seeds are well-suited for wind dispersal, but germination levels are low, as establishment requires suitable habitat and a suitable fungal association (Argue 2012).

Many species of orchid require periodic low to medium levels od disturbance to reduce competing vegetation and maintenance of appropriate light levels for germination and growth (IUCN/SSC Orchid Specialist Group 1996). It appears *S. delitescens* benefits from periodic disturbance. The species has been shown to increase when density of competing vegetation is reduced (McClaran 1996, Gori 1994). Historically, low levels of grazing and low severity fires may have provided appropriate disturbance regimes (Harlow 2015, Brunelle et al. 2018).

HABITAT: Marshy wetland or cienega intermixed with tall grasses and sedges. Grows on slope near water so soil is drained (aerated) although saturated. Grows in very dense vegetation. Winter precipitation is strongly correlated to groundwater recharge and presence of Canelo Hills Ladies'-tresses (Stromberg et al. 2017, Brunelle et al. 2018).

ELEVATION: 1,433 to 1,524 meters (4,700-5,000 ft).

EXPOSURE: Full sun.

SUBSTRATE: Finely grained, highly organic, seasonally or perennially saturated soils with scouring floods uncommon (Harlow 2015, Hendrickson and Minckley 1984).

PLANT COMMUNITY: Associated plant species include: *Bidens* spp., *Carex* spp., *Cyperus* spp., *Juncus* spp., *Eleocharis* spp., *Typha* spp., and *Equisetum* spp.

POPULATION TRENDS: A lack of information regarding historical populations and the dormant nature of this orchid makes accurate estimates of population trends difficult. There are currently known to be four populations within 97 ha (240 ac) total area (USFWS 2021). Population numbers have varied widely between populations and between years. As of 2021, three populations (Canelo Hills, Babocomari, and San Rafel) had not been found aboveground in more than ten years. The Turkey Creek population was last found aboveground in 2019, with 3 individuals observed. Despite negative surveys and small observed population sizes, all four populations are still considered extant by the Fish and Wildlife Service (USFWS 2021).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LE (USDI, FWS 1997)
[PE USDI, FWS 1996]
[C1 USDI, FWS 1994]
[PE USDI, FWS 1993]
[C1 USDI, FWS 1993]

STATE STATUS: Highly Safeguarded (ARS, ANPL 2016, 1993)

OTHER STATUS: Not Forest Service Sensitive (USDA, FS Region 3 2013, 1999)
[Forest Service Sensitive USDA, FS Region 3, 1990), status designated under *Spiranthes graminea*]

MANAGEMENT FACTORS: Major threats to the future persistence of the species include: 1. Loss and reduction of cienega habitat, 2. Pollinator decline, 3. Small population size and lack of connectivity, and 4. Herbivory and predation.

Of 155 known cienegas, 87 percent are either dead or compromised beyond restoration (Cole and Cole 2015). Remaining cienegas are greatly reduced in size and many are severely incised (Cole and Cole 2015). The main factors associated with reduction and loss of cienega habitat include; historic intensive grazing of domestic livestock, historical removal of beaver (*Castor canadensis*), agricultural re-contouring and aquifer depletion, drought and climate change, loss of wetted habitat, and alteration of fire regimes (including encroachment of woody species and nonnative plants) (USFWS 2021).

The Sonoran bumble bee is believed to be the primary pollinator of Canelo Hills Ladies'-tresses. This species is considered in decline throughout its range (Cameron et al. 2012, Committee on the Status of Pollinators in North America 2007).

Small, isolated populations are susceptible to loss of genetic diversity, genetic drift, and inbreeding. The loss of genetic diversity may reduce the ability of a species to adapt to random environmental changes and resist threats and stressors (Shaffer and Stein 2000).

The small size of populations also makes this species more vulnerable to threats such as herbivory during the reproductive season and collection pressure from rare plant enthusiasts (Gori 1994, Sundt and McClaran 1988, Harlow 2015).

PROTECTIVE MEASURES: Listed Endangered under the ESA in 1997. Periodic monitoring of all populations. Surveys of likely habitat have been undertaken. The Nature Conservancy purchased the 165 acres, including the site of the largest subpopulation of the Canelo Hills population. At this site, management actions taken have included stopping livestock grazing, managing headcuts, introducing prescribed fire, removal of nonnative plants, and supporting research on species ecology and restoration techniques. at one location, and seed collection from one population (USFWS 2021). The subpopulation occurring on Coronado National Forest land has been protected by a livestock exclosure fence since 1998 (USFWS 2021). Populations on private lands are grazed, though the grazing regimes are unknown.

SUGGESTED PROJECTS: Monitor known sites, augment known sites or establish new sites, preserve seeds and mycorrhizae, seek conservation agreements, recontour and restore land, reintroduce or maintain a regular light to moderate disturbance regime.

LAND MANAGEMENT/OWNERSHIP: The Nature Conservancy - Canelo Hills Cienega; USDA Forest Service - Coronado National Forest; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

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1991-10-20 (BKP)
1994-08-18 (DBI)
1994-08-31 (PLW)
1995-05-15 (DBI)
1997-01-07(SMS)
1998-12-04(DJG)
2000-03-24 (RAC)
2021-06-10 (KSL)

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