

**UTE LADIES TRESSES (SPIRANTHES DILUVIALIS) IN IDAHO:
PART B: 2000 STATUS REPORT**

by

**Chris Murphy
Conservation Data Center**

December 2000

**Idaho Department of Fish and Game
Natural Resource Policy Bureau
600 South Walnut, P.O. Box 25
Boise, Idaho 83707
Rod Sando, Director**



**Prepared for:
Upper Snake River District, Bureau of Land Management
(DAAOOO203)
and
Targhee National Forest, U.S. Forest Service
(15-CCS-99-20)**

SUMMARY

The 2000 status report for Ute ladies tresses compliments the 1997 through 1999 status reports (Moseley 1998a; 1998b; 2000) and contains new or updated information about the species and its habitat in Idaho. The same format is used in this update as in the previous reports, which should be consulted for information not covered here (reports are found at the Conservation Data Center homepage: www2.state.id.us/FISHGAME/cdchome.htm). Major findings reported here include:

- For the third consecutive year there were no Ute ladies tresses observed at Squaw Creek Island (020). Since 1998, only *Spiranthes romanzoffiana* has been observed at this site.
- Historic aerial photos indicate that the Black Canyon (022) occurrence found in 1999 is the only one on the South Fork known from a fluvial landform created since the construction of Palisades Dam. Surveyors should broaden their view of potential Ute ladies tresses habitat.
- Portions of two other occurrences, Annis Island (006) and Warm Springs Bottom (003), also occur on recently deposited substrates. The sites, however, were created mostly by human activities. Pits revealed soil profiles that were not significantly different than those from occurrences on naturally created fluvial landforms.
- There was a drop in cover of herbs, *Salix exigua*, moss, and *Equisetum variegatum* from 1999 at the Warm Springs Bottom permanent monitoring transect. The site was grazed and very dry; plants were drying early due to summer heat and drought. Similar vegetation conditions and changes were documented at the Black Canyon (022) occurrence and elsewhere.
- As part of on-going habitat-flood plain modeling research, Mike Merigliano collected soil samples from all Ute ladies tresses occurrences on public land for lead isotope dating.
- Though there were 810 less Ute ladies tresses observed than last year, the total was virtually identical to the 1998 count. However, the Lufkin Bottom (011) and Warm Springs Bottom (003) occurrences approximately doubled in numbers of plants over 1999.
- A drop of nearly 1,200 plants was observed at Annis Island (006). At Rattlesnake Point no plants were observed. The main cause of these two significant decreases was heavy, late-season trespass livestock grazing. Noxious weed invasions and OHV use were also documented at several Ute ladies tresses occurrences.

ACKNOWLEDGMENTS

Funding was provided to the Conservation Data Center (CDC) for its 2000 Ute ladies tresses work by the Upper Snake River District of the Bureau of Land Management (BLM) and the Caribou-Targhee National Forest. Most field work was conducted by Karen Rice, Susan Murdock (we'll miss your help), Cleve Davis, Pam Druliner, Michelle Williams, and Monica Zimmerman of the BLM and Rose Lehman of the Caribou-Targhee National Forest; their information contributed greatly to this report. Mike Merigliano diligently collected soil samples and worked on habitat modeling, while also answering questions regarding flood plain ecology of the South Fork. Mabel Jankovsky-Jones and Terry Vernholm reviewed the manuscript. Finally, thanks to Bob Moseley for his contributions toward Ute ladies tresses research and conservation.

TABLE OF CONTENTS

SUMMARY	i
ACKNOWLEDGMENTS	i
TABLE OF CONTENTS	ii
LISTS OF TABLES, FIGURES, AND APPENDICES	iii
TAXONOMY LEGAL OR OTHER FORMAL STATUS	1
DESCRIPTION AND IDENTIFICATION	1
DISTRIBUTION	
Rangewide distribution	1
Idaho distribution	1
Precise occurrences in Idaho	2
Extent of surveys in Idaho	2
HABITAT	
Plant communities	2
ASSESSING POTENTIAL HABITAT	2
FLOOD PLAIN DYNAMICS IN RELATION TO UTE LADIES TRESSES HABITAT	
Vegetation monitoring	3
Flood plain and vegetation dynamics research-An update	11
POPULATION BIOLOGY	
Phenology	13
Population size and condition	13
Population genetics	15
Reproductive biology	15
Competition	15
Herbivory	15
Land ownership and management responsibility	15
Land use and possible threats	15
ASSESSMENT AND RECOMMENDATIONS	
General assessment of vigor, trends, and status	19
Recommendation to the U.S. Fish and Wildlife Service	19
Recommendations to the other federal agencies	19
Recommendations to the Heritage Network	19
Recommendations regarding present or anticipated activities	19
MONITORING WORK FOR 2001	19
REFERENCES	21

LIST OF TABLES

Table 1. Vegetation of the permanent monitoring transect 98SD03C at Warm Springs Bottom (003) for 1998-2000.

Table 2. Record of photo-points and their archived photo sets at Warm Springs Bottom (003) permanent monitoring transect 98SD03C.

Table 3. Vegetation of the Black Canyon (022) occurrence for 1999-2000.

Table 4. Ute ladies tresses population counts at each occurrence for 1996-2000.

Table 5. Habitat conditions, threats, and conservation actions at each Ute ladies tresses occurrences for 2000.

LIST OF FIGURES

Figure 1. Photo overlooking Black Canyon (022) occurrence and Warm Springs Bottom (003) permanent monitoring transect 98SD03C.

Figure 2. Repeat photos, 1999-2000, of photo-point 98-2 at Warm Springs Bottom (003) permanent monitoring transect 98SD03C.

Figure 3. Photo showing cattle grazing impacts in Ute ladies tresses habitat at Rattlesnake Point (002).

LIST OF APPENDICES

Appendix 1. Soil pit information from 19 Ute ladies tresses population occurrences along the South Fork of the Snake River, 1999-2000 data.

TAXONOMY

No major changes from 1997-1999 status reports. See "Description and Identification" section below for a discussion of Ute ladies tresses (*Spiranthes diluvialis*) morphological variation.

LEGAL OR OTHER FORMAL STATUS

No change from 1997-1999 status reports.

DESCRIPTION AND IDENTIFICATION

No major changes from 1997-1999 status reports. However, there is a note of interest related to specimens collected from a recently discovered population on the Columbia River in Washington. C.J. Sheviak confirmed an apparent specimen of *Spiranthes romanzoffiana* collected within this *Spiranthes diluvialis* population, but, in Sheviak's words, "Because *S. diluvialis* is an allotetraploid derivative of *S. romanzoffiana* and *S. magnicamporum*, it of course varies some between the ancestral parental species. As a polyploid, this variation is generally suppressed and tends to cluster about the mean. On the other hand, chromosomal segregation can yield individuals with more chromosomes from one parent than from the other. These then can look very much more like one parent than normal" (Sheviak e-mail communication). In other words, surveyors must still trust their identification of *Spiranthes* based on current keys while knowing that nature may throw us an occasional curveball.

Spiranthes romanzoffiana occurs mixed within *Spiranthes diluvialis* populations on the South Fork of the Snake River from Warm Springs Bottom (003) upstream (Moseley 2000). This observation was confirmed again this year but *S. romanzoffiana* were not tallied at most sites since they were in seed (or gone) during periods of survey in late August. Mixed populations of *Spiranthes diluvialis* and *S. romanzoffiana* are rare but also known from Utah and Washington (Moseley 2000).

DISTRIBUTION

Rangewide Distribution: No change from 1997-1999 status reports.

Idaho Distribution: No change from 1997-1999 status reports. There were no Ute ladies tresses distribution changes discovered in 2000. It is still only known from the South Fork of the Snake River flood plain in Jefferson, Madison, and Bonneville counties of eastern Idaho. Populations are scattered along 49 river miles from near the confluence of the Henry's Fork, upstream to Swan Valley, 9 river miles below Palisades Dam.

Precise Occurrences in Idaho: No major changes from 1997-1999 status reports. In 2000, there were no new occurrences found or significant expansions or contractions of prior known occurrences. For the third consecutive year there were no Ute ladies tresses observed at Squaw Creek Island (020). As noted in previous status reports (Moseley 1998b; 2000), all *Spiranthes* observed at Squaw Creek Island since 1998 have been *Spiranthes romanzoffiana*. Due to unpredictable Ute ladies tresses phenology in 2000 and the potential for mis-timed surveying, one more year of careful searching for *S. diluvialis* should occur before this occurrence is removed from the database. There were no Ute ladies tresses observed at Gormer Canyon #5 (012), the case two out of the last three years. The Gormer Canyon #5 (012) occurrence may be on its way to extirpation because it is infested with spotted knapweed and contains only marginal habitat. Nevertheless, future surveys should occur at this site which once supported Ute ladies tresses individuals.

The Ute ladies tresses populations along the Snake River are generally considered one large meta-population, although 22 occurrences have been delineated in the CDC data base based on management and geographic considerations (Moseley 2000). The precise occurrence records, with detailed location data, for Idaho populations were updated in late November 2000 (Murphy and Stephens 2000).

Extent of Surveys in Idaho: No change from 1997-1999 status reports.

HABITAT

Plant Communities: No major changes from 1997-1999 status reports. See the "Flood Plain Dynamics, Vegetation Monitoring" section below for a discussion of 2000 habitat data collection.

ASSESSING POTENTIAL HABITAT

Evidence from historic aerial photos indicates that the Black Canyon (022) occurrence found in 1999 is the only one on the South Fork known on a fluvial landform (e.g., flood deposits) post-dating the construction of Palisades Dam in 1956 (Merigliano e-mail communication). Portions of two other occurrences, Annis Island (006) and Warm Springs Bottom (003), also occur on substrates deposited since Palisades Dam. These sites, however, were created mostly (or in-part) by human disturbance (Moseley 1998b). The Black Canyon (022) occurrence, in contrast, is on a relatively young island (probably about 40 years old) with Ute ladies tresses growing on a cobble point-bar which has only been vegetated since about 1974 (Figure 1). Consequentially, the site has thin sandy soil forming a matrix between numerous cobbles and stones. The relatively sparse vegetation, described below in the "Flood Plain Dynamics, Vegetation Monitoring" section, reflects the cobble-dominated ground.

The importance of the Black Canyon (022) occurrence is that surveyors on the South Fork of the Snake River should broaden their view of potential Ute ladies tresses habitat. Recent fluvial landforms similar to the Black Canyon site exist along the river and should be more closely scrutinized for their potential to support Ute ladies tresses.

FLOOD PLAIN DYNAMICS IN RELATION TO UTE LADIES TRESSES HABITAT

Vegetation Monitoring: Currently, vegetation succession is monitored yearly at only two Ute ladies tresses populations. These were chosen because their habitat reveals much about the influence of floodplain dynamics on vegetation. The upstream portion of the Warm Springs Bottom (003) occurrence was heavily impacted by the June 1997 flood while the Black Canyon (022) occurrence is on an annually flooded, young fluvial landform (Figure 1).

Warm Springs Bottom (003) -For the past two years vegetation monitoring has occurred on a portion of the Warm Springs Bottom (003) occurrence (Figure I) that was apparently extirpated by June 1997 flood deposits (Moseley 1998b; 2000). The flood deposited 18 cm of sand on the site, apparently beyond the threshold depth that Ute ladies tresses can withstand (Moseley 1998b). It is unknown if Ute ladies tresses persist beneath the sand and need more time to reach the surface. During 1998, vegetation composition and structure was studied on the extirpated patch and additional photographs taken (Moseley 1998b). In 1999, a permanently marked (with orange potato-digger bars) belt transect was established and measured to provide baseline data for monitoring vegetation succession related to flood plain dynamics (Moseley 2000). Photo-points were also established. The transect (plot 98SD03C) has an azimuth of 17°, with 17° E declination, and a GPS location of N 43° 35.469, W 111° 27.766. The Warm Springs Bottom transect and photo-points were also monitored in 2000 (using methods of Moseley 1998b) and results are described below.

Vegetation Data:

Below is a comparison of composition and cover estimates from 1998-2000 (Table 1). *Equisetum variegatum* was the first species to invade the sands deposited by the June 1997 flood and it continued to increase in cover until it dominated the transect (Moseley 2000). By 1999, *Agrostis stolonifera*, the dominant herb on the site before the flood, also appeared to increase in cover. The *Elaeagnus commutata* shrubs on the site prior to the flood never resprouted (Moseley 2000). Both species richness and moss cover increased dramatically from 1998 to 1999.

On September 1, 2000 vegetation data was again collected at transect 98SD03C. Several factors made vegetation data difficult to collect and interpret this year. First, someone removed the orange potato-digger bars and the exact placement of the transect had to be relocated using last year's repeat photography. The potato-digger bars were replaced within about 20 cm or less of their original location. Second, trespass cattle had recently grazed the transect (as well as some wild ungulates) resulting in a significant drop in cover of total graminoids and forbs, *Salix exigua*

(due to browsing), moss, and *Equisetum variegatum* (due to trampling) from 1999 (Table 1). Finally, the site was very dry and plants were drying early due to abnormally high summer heat and drought. As a result, litter cover was much higher and *Equisetum variegatum* cover much lower than in 1999. In general, the height and cover of woody species increased slightly with growth of a *Salix lasiandra* individual now along the transect. The cover of *Agrostis stolonifera* remained similar to 1999 but that of *Poa pratensis* increased. The cover of *Medicago lupulina*, a nitrogen-fixing, early-seral exotic species of both moist and dry sites, also increased notably. There was no significant change in species richness.

No *Spiranthes diluvialis* were observed along the transect which now appears as very dry , marginal habitat. However, one *Spiranthes diluvialis* was observed blooming only 8 m immediately down slope of the end of transect 98SD03C. It was growing in a *Salix exigua*/mesic graminoid community located on the margin of a moist flood channel dominated by *Phalaris arundinacea*. The transect will continue to be monitored in 2001.

Figure 1. Photo overlooking Black Canyon (022) occurrence and Warm Springs Bottom (003) permanent monitoring transect 98SD03C.

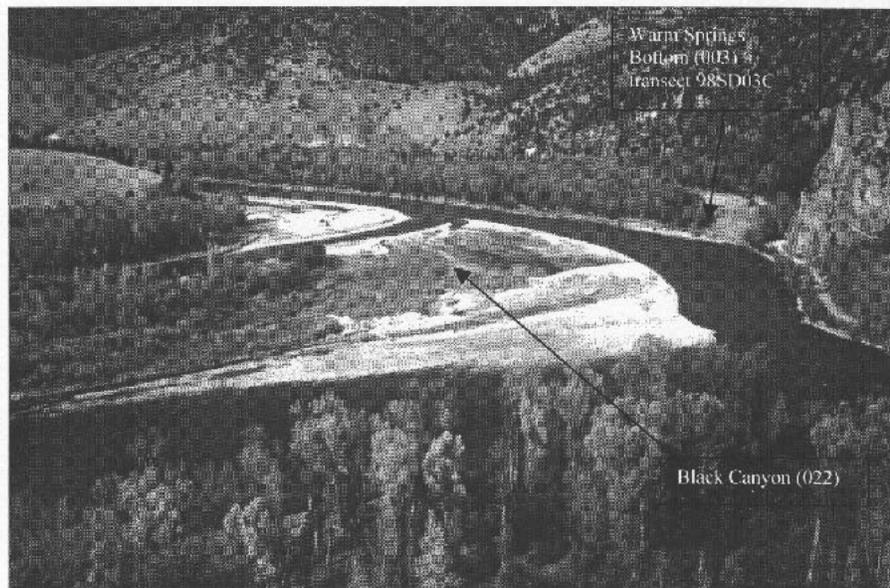


Table 1. Vegetation of the permanent monitoring transect 98SD03C at Warm Springs Bottom (003) for 1998-2000.

Vegetation Data for 98SD03C	1998 % cover	1999 % cover	2000 % cover
WOODY SPECIES			
<i>Betula occidentalis</i>		seedling	
<i>Elaeagnus commutata</i>	dead stems	dead stems	
<i>Populus angustifolia</i>	1	1	1
<i>Salix exigua</i>		3	1
<i>Salix lasiandra</i>			3
<i>Salix lutea</i>	1		1
GRAMINOIDS			
* <i>Agrostis stolonifera</i>	3	10	10
<i>Juncus ensifolius</i>		1	
<i>Juncus tenuis</i>			1
*? <i>Phalaris arundinacea</i>		1	
* <i>Poa pratensis</i>		1	3
Unknown grass		1	
FORBS & PTERIDOPHYTES			
<i>Aster ascendens</i>		1	1
* <i>Cirsium vulgare</i>			1
<i>Epilobium ciliatum</i>		1	
<i>Equisetum variegatum</i>	60	80	10
<i>Geum macrophyllum</i>			1
* <i>Medicago lupulina</i>		3	10
<i>Solidago missouriensis</i>	1	3	3
* <i>Taraxacum officinale</i>		1	

* <i>Trifolium repens</i>		3	1
<i>Viola</i> sp.			1
Unknown forb		1	
TOTAL SPECIES	5	16	15
LIFE FORM DATA			
Woody Cover / Mean Ht. (m)	1 / 0.5	1 / 0.8	1 / 1.1
Graminoid Cover / Mean Ht. (m)	3 / 0.4	10 / 0.4	3 / 0.3
Forb Cover / Mean Ht. (m)	60 / 0.1	90 / 0.1	3 / 0.2
GROUND COVER			
Soil (sand)	70	60	30
Gravel	0	0	0
Rock	0	0	0
Litter	1	1	60
Wood	1	1	1
Moss	0	30	10
Basal Vegetation	30	10	10

* = exotic spp.

Repeat Photography:

Photos were re-taken on September 1 and again on September 6, 2000 at a series of photo-points established during 1996, 1997, and 1998 at 98SD03C (Moseley 2000). The decrease in total graminoid, *Equisetum variegatum*, and *Salix exigua* cover between 1999 and 2000 is obvious from the photos (Figure 2). Below is the list of repeat photo sets archived at the CDC (Table 2).

Figure 2. Repeat photos, 1999-2000, of photo-point 98-2 at Warm Springs Bottom (003) permanent monitoring transect 98SD03C. The arrows point to matching landmarks.

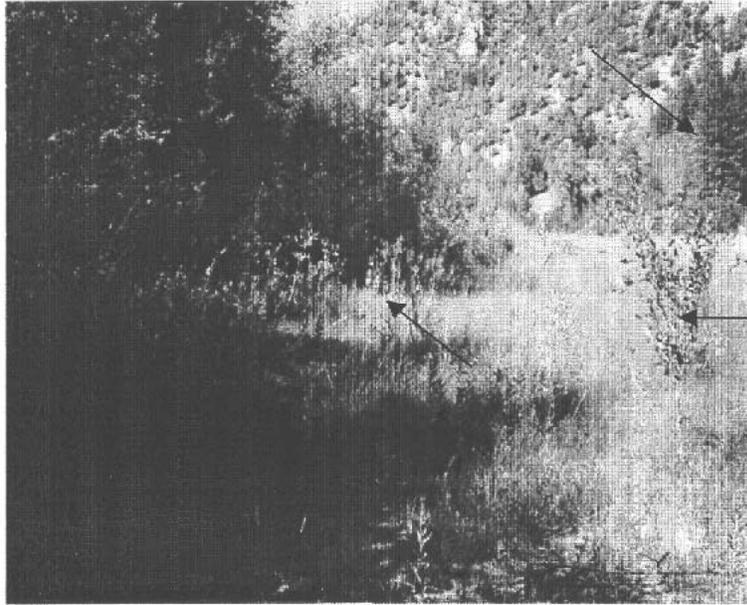


Photo-point 98-2 taken on August 16, 1999. Note the thick and tall grass.

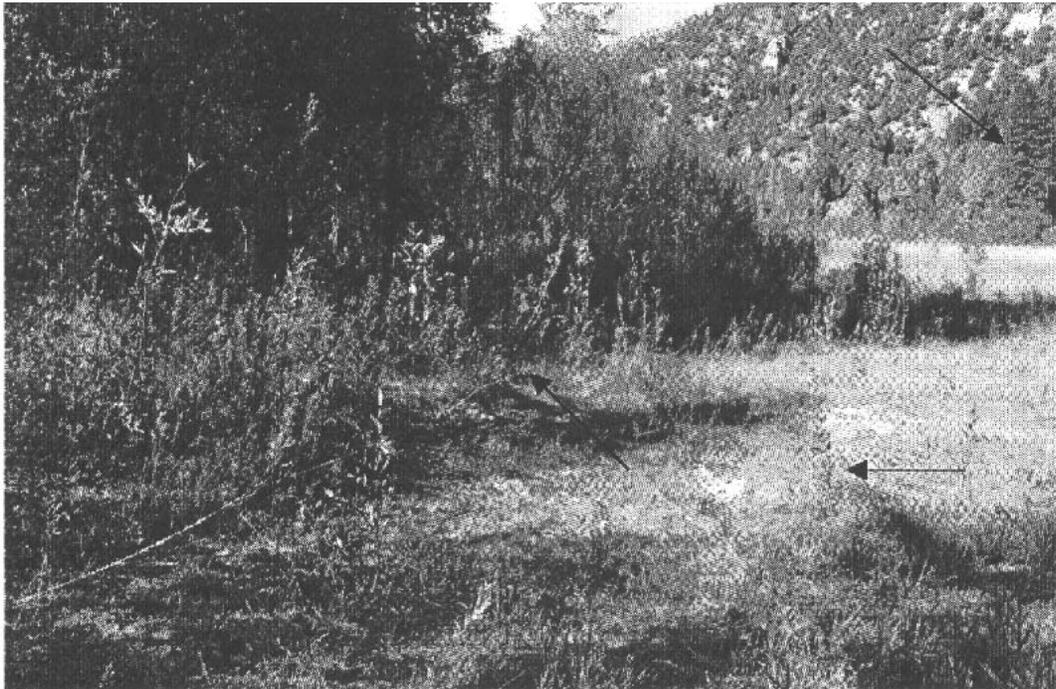


Photo-point 98-2 taken on September 6, 2000. Note the large amount of exposed sand and lower graminoid cover. The shrub in the lower-right of picture (arrow) is severely browsed.