



Biogeography of the Orchids of Nevada

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Photo: *Corallorhiza maculata*, D. Gentilcore, Great Basin National Park NV

Introduction

Nevada (NV) is a diverse state with more than 2,500 species of vascular plants occupying a variety of habitats representing several major ecosystems. Often times the state is somewhat simplistically divided into Great Basin vs. Mojave, but that is not the whole story. Around the boundaries especially, there are other places in the state with significant influence from other vegetation regions. The Carson Range, an offshoot of the Sierra Nevadas which peaks into Washoe, Carson City, and Douglas counties in NV, contains vegetation typical of the Sierran Floristic Province. The Jarbidge Mountains in Elko County resemble the Snake River plateau of Idaho more than the rest of Nevada. The Ruby Mountains in Elko trend towards Rocky Mountains character. The Clover Mountains in Lincoln County are connected to the Wasatch and form an unusual East-West trending range with a large number of Colorado Plateau taxa found nowhere else in the state. The Newberry Range in the far south of the state features strong Sonoran character. There are also some areas in NV with character all of its own where endemics are found including the Carson Sink, central NV ranges (Toiyabe, Toquima, Monitor), Spring Mountains, and Ash Meadows.

The distribution and diversity of orchids, a diversified family adapted to many different habitats, exemplifies some of these unique habitats in Nevada even though only 13 taxa of the ~20,000 species in the family occur in the state. In NV there are 6 recognized orchid genera and 12 species, and 2 significant varieties. Phylogenetically, the related genera *Corallorhiza*, *Epipactis*, and *Listera* are in the subfamily Epidendroideae (Fig. 1). There may not be enough genetic difference to spate out *Epipactis* and *Listera*, though they remain strikingly morphologically distinct (Cameron (2004). The genera *Piperia*, *Platanthera* and *Spiranthes* are in the subfamily Orchidoideae (Fig 1). One species, Ash Meadows lady's tresses (*Spiranthes infernalis*) is a very restricted endemic found only at Ash Meadows in 4-5 pools/streams in Nye County, Nevada. *S. infernalis* is also the only species whose type specimen was collected in NV (Tiehm 1996).

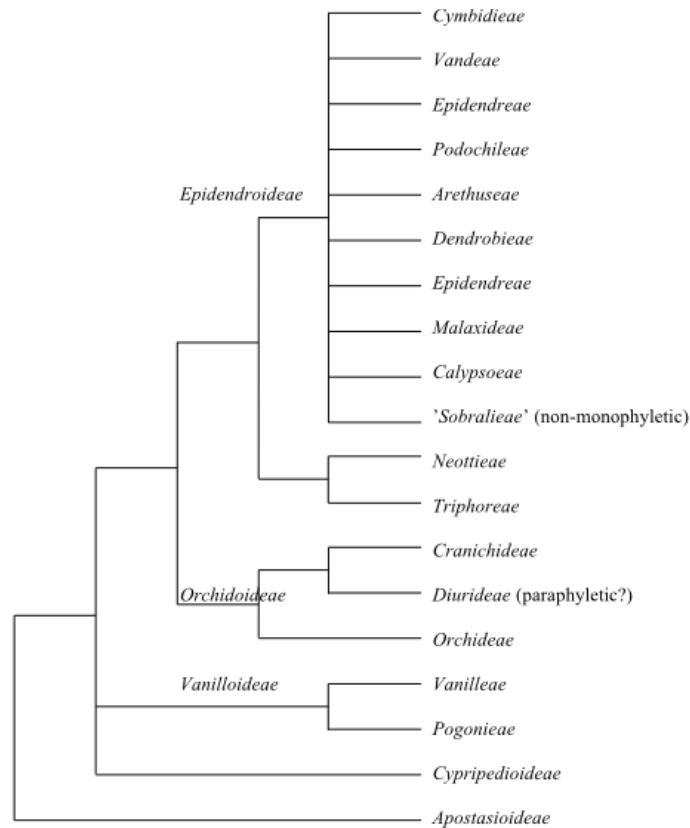


Figure 1: Cladogram of Orchidaceae based on DNA sequence data from Cameron (2004)

Methods

The distribution of the species was based on the Flora of North America (FNA) (FNA 1993+) in combination with a review of herbarium specimens. I was able to obtain a list of known county distribution used when writing FNA which is more specific than the general descriptions written in the published text (Tiehm 2016). In person visits were made this year to the herbaria at the Universities of Nevada in Reno (RENO) and Las Vegas who retain 127 and 70 sheets of orchids respectively. Previous visits have been made to the Eastern Nevada Landscape Coalition Herbarium (ENLC). Many of my specimens reside there including several orchid collections. A search was made for orchids of Nevada on intermountainbiota.org (Consortium of Intermountain Herbaria 2016) which netted another 142 records from 12 herbaria (Table 1). The initially assembled dataset had less than 100 georeferenced specimens. Georeferencing was done manually for all specimens possible at RENO and UNLV. Nomenclature agrees with FNA, but to achieve that some identifications found on specimens had to be redetermined or thrown out as invalid. I spent a full day at the Wesley E. Niles herbarium (UNLV) redetermining *Platanthera dilatata* specimens that were never identified to varietal level. Experts at the RENO

(Tiehm 2016), UNLV (Birgy 2016), and Intermountain Herbarium (UTC) (Barkworth 2016) were contacted to answer questions about specific specimens. A literature review was conducted of relevant Nevada floristic studies to determine if they mention any orchids.

For each species, one page is devoted to displaying a description, photo, distribution map, and list of records. The description contains information on distribution in NV and as a whole, the etymology of the names, the number of herbarium specimens representing the species, elevation range, flowering period, and common name. The distribution map produced contains dots for each georeferenced herbarium specimen and shading in each county where the species occurs. The list of records contains the date of the earliest known collection of each species from each county where it occurs.

Results

A total of 343 herbarium specimens of NV orchids were located, reviewed, and included in the data from a total of 15 herbaria (Table 1) and represent the 13 taxa from FNA. The top two herbaria RENO and UNLV together represented 57% of the total specimens. Seven of those 15 herbaria represented 97% of the total specimens. That is an average of just over 26 specimens per species. After georeferencing more than 100 specimens manually, the final set used for the points on the distribution maps contained 215 georeferenced specimens for an average of 16.5 georeferenced specimens per taxa. Three of the herbaria were visited in person and one other herbaria was contacted directly to answer questions. Compared with the known county distributions from FNA, the specimens I examined include 11 new county records and 1 county retraction.

During the search some taxa were encountered as possible candidates for inclusion, but eventually all but those from FNA were thrown out. A specimen of *Listera cordata* at Brigham Young University (BRY) (Tiehm 11443) was identified incorrectly and should be *Listera convallarioides* (Tiehm 2016). Some old specimens labeled *Platanthera hyperborea* were thrown out because under the modern species concepts that once more widely applied name is restricted to Greenland. There were specimens at UTC that were accidentally entered in the database as *Goodyera oblongifolia*, but their curator confirmed that was done in error and the specimens were not *Goodyera oblongifolia* (Barkworth 2016). A single specimen I never saw at a small herbarium was labeled *Habenaria viridis*. I did not include it simply because I could not verify the identification and found it unlikely. It was certainly not enough evidence to go against FNA.

Table 1: Overview of Herbarium Specimens by Institution. Institutions in bold were visited in person by the author. The institution in italics was contacted directly to review specimens.

Herbarium (Abbreviation)	Institution	Count	Location
Reno Herbarium (RENO)	University of Nevada-Reno	127	Reno, NV
Wesley E. Niles Herbarium (UNLV)	University of Nevada-Las Vegas	70	Las Vegas, NV
S. L. Welsh Herbarium (BRY)	Brigham Young University	56	Provo, UT
<i>Intermountain Herbarium (UTC)</i>	<i>Utah State University</i>	55	<i>Logan, UT</i>
The Herbarium at the University of California, Riverside (UCR)	University of California, Riverside	14	Riverside, CA
Eastern Nevada Landscape Coalition Herbarium (ENLC)	Eastern Nevada Landscape Coalition	6	Ely, NV
Desert Botanical Garden Herbarium (<i>DES</i>)	Desert Botanical Garden	5	Phoenix, AZ
8 Other Herbaria		12	
Total		343	

The only published flora that contains all known orchids from NV is the FNA (Table 2). It is by far the best reference for keying out an unknown orchid anywhere in Nevada. The volume containing Orchidaceae was released in 2006 and has all the latest taxonomy. The out of date and never really complete Flora of Utah and Nevada (Tidestrom 1925) contained only 6 of the 13 taxa now known to occur in the state. Nevada has still yet to have a useful comprehensive flora published. FNA comprehensively covers the Orchidaceae and other families for which it is available, but as of May 2016 they have only published 164/268 families they intend to cover when complete. A Utah Flora (Welsh et al. 1993), while not written with NV in mind, contains 11/13 of the species in the state. I do not have access to an updated version to check the 5th edition of A Utah Flora, but it likely contains 12/13 NV orchid taxa assuming they have included *Platanthera tescamnis* was only recently described (Sheviak and Jennings 2006). The Intermountain Flora (IF)(Cronquist et al. 1977) is semi-complete as of the publication of the 8th volume in 2012. All families have been published, but one more volume is in preparation which will contain closing material, a comprehensive index, and some taxonomic revisions to officially close the project (Tiehm 2016). The IF is a well-written, comprehensive key that includes everything between the Sierra and Rocky Mountains, but it does not cover the Mojave which is a significant portion of Southern NV and the plant taxa that occur within the state. All together, IF covers 10 of the NV orchid taxa but is missing some due to new species described since it was published. The Jepson Manual (Baldwin et al. 2012) was written for California, but still proves itself one of the better references for NV. It also contains 10/13 of the NV orchid taxa. The Flora of the North and South Snake Ranges (Clifton 2012) and Arizona Flora (Kearny and Peebles 1960) contain 6/13 NV orchid taxa. The Flora of the Spring Mountains contains 3-4/13 NV orchid taxa (Niles and Leary 2013). Vascular Plants of the Nevada Test Site and Central-

Southern Nevada: Ecologic and Geographic Distributions (Beatley 1976) and A Flora of the White Mountains, California and Nevada (Lloyd and Mitchell 1973) contain 2/13 NV orchid taxa. Nevada Vascular Plant Types and Their Collectors (Tiehm 1996) and Vegetation of the Virgin Mountains (Armstrong 1969) each contain one NV orchid taxa. A Flora of the Desert National Wildlife Range, Nevada (Ackerman et al. 2003), A Floristic and Vegetation Analysis of the Newberry Mountains (Holland 1982), Vegetation of the McCullough Mountains (Bostick 1973), and Vascular flora of the Muddy Mountains (Knight 1983) do not mention any orchids.

Table 2: Orchids of Nevada. Note: References W – Z were examined, but contained no orchids.

Genus	Specific Epithet	Sources
Corallorhiza	maculata	A, B, C, D, E, F, L
	striata	A, B, C, D, F
Epipactis	gigantea	A, B, C, D, E, F, G, I, K, L
Listera	convallarioides	A, B, C, D, E, F
Piperia	unalascensis	A, B, C, D, L
Platanthera	dilatata var. albiflora	A, B, C
	dilatata var. leucostachys	A, B, C, D, E, G, L
	sparsiflora	A, B, C, D, E, F, G*, H, I, L
	tescamnis	A, D, G
Spiranthes	diluvialis	A, B
	infernalis	A, H**, J
	porrifolia	A, B, C, D
	romanzoffiana	A, B, C, D, E, F, L

A: Flora of North America (FNA 1993+); B: A Utah Flora (Welsh et al. 1993); C: Intermountain Flora (Cronquist et al. 1977); D: The Jepson Manual (Baldwin et al. 2012); E: Flora of the North and South Snake Ranges (Clifton 2012); F: Arizona Flora (Kearny and Peebles 1960); G: The Flora of the Spring Mountains (Niles and Leary 2013); G*: Niles and Leary indicate their *Platanthera sparsiflora* specimens may actually all be *P. tescamnis*; H: Vascular Plants of the Nevada Test Site and Central-Southern Nevada: Ecologic and Geographic Distributions (Beatley 1976); H**Beatley identifies a collection as *Spiranthes romanzoffiana* which is later described as *S. infernalis*. I: A Flora of the White Mountains, California and Nevada (Lloyd and Mitchell 1973); J: Nevada Vascular Plant Types and Their Collectors (Tiehm 1996); K: Vegetation of the Virgin Mountains (Armstrong 1969); L: Flora of Utah and Nevada (Tidestrom 1925); W: A Flora of the Desert National Wildlife Range, Nevada (Ackerman et al. 2003); X: A Floristic and Vegetation Analysis of the Newberry Mountains (Holland 1982); Y: Vegetation of the McCullough Mountains (Bostick 1973); Z: Vascular flora of the Muddy Mountains (Knight 1983)

The 215 georeferenced specimens cover most of NV and show hotspots of orchid density (or at least hot spots of orchid collection) (Figure 2). Every county in NV has orchids except for Churchill and Eureka Counties (Table 3). Elko County has the most orchid diversity with 8 taxa occurring in the county including 1 found only in that county in NV. Washoe and White Pine counties both have 6 taxa. Washoe has 1 taxa found only in that county in NV. Douglas and Nye both have 5 taxa. Nye has 1 endemic taxa found only in that county. Humboldt and Lincoln both have 4 taxa. Lincoln has 1 taxa found only in that county. Carson City, Lander, and Mineral all have 3 taxa. Clark, Esmerelda, and Pershing all have 2 taxa. Lyon and Storey have 1 taxa.

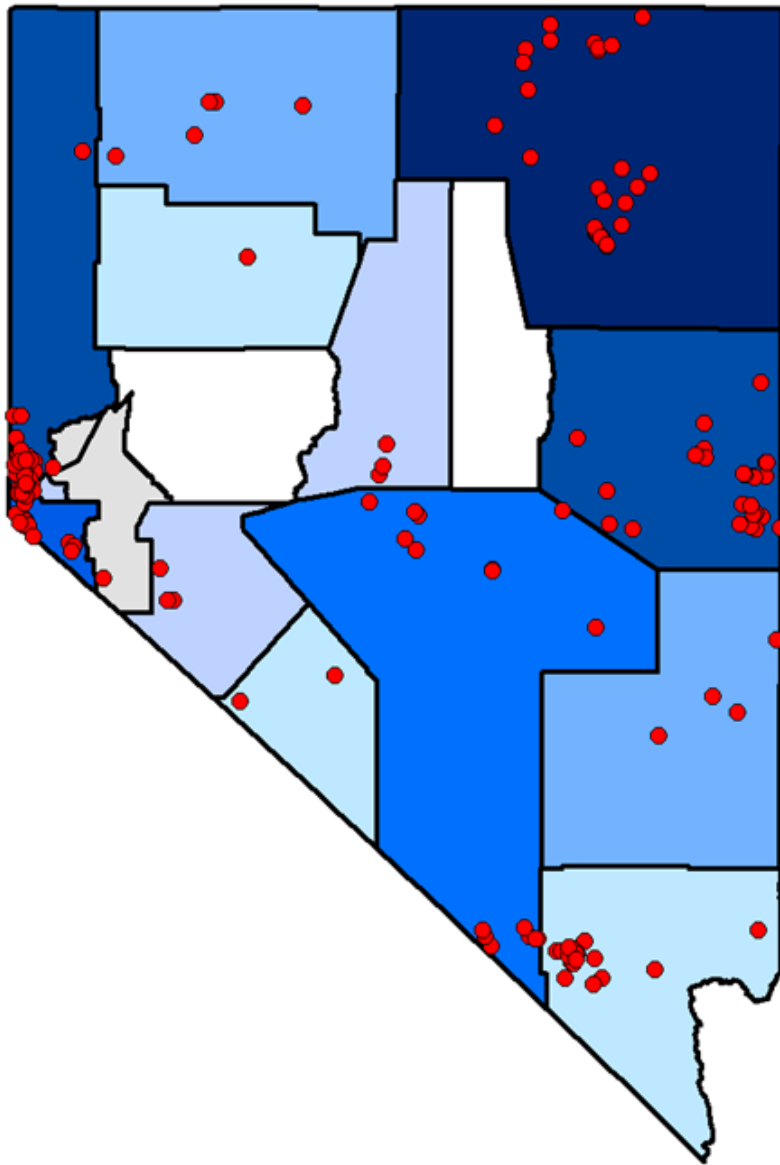


Figure 2. Distribution of herbarium specimens and number of taxa per county. Darker counties have more taxa. Dots indicate each of the 215 georeferenced herbarium specimen records.

Table 3. NV Orchid diversity and endemism by county

County	# taxa	# found only in that county	#found only in 2 counties
Elko	8	1	3
Washoe	6	1	2
White Pine	6		1
Douglas	5		
Nye	5	1	
Humboldt	4		
Lincoln	4	1	
Carson City	3		1
Lander	3		
Mineral	3		
Clark	2		
Esmerelda	2		1
Pershing	2		
Lyon	1		
Storey	1		
Churchill	0		
Eureka	0		

Corallorhiza maculata

Corallorhiza (Gr. coral root) *maculata* (L. spotted) is a mycotrophic orchid that does not photosynthesize. It is one of the more broadly distributed orchids in NV and can be locally common. It occurs throughout the Sierran and Great Basin provinces of the states as well as the Jarbidge Mountains, Ruby Mountains, and White Rock Range. The herbaria examined contain 35 specimens. It occurs from 1768 – 2805 m elevation. It is known to flower from 22 June – 25 August. The species as a whole is widespread across North America. The common name is spotted coralroot. (Plate 1, Fig. 3)



Plate 1

Photo: D. Gentilcore, Great Basin National Park, NV

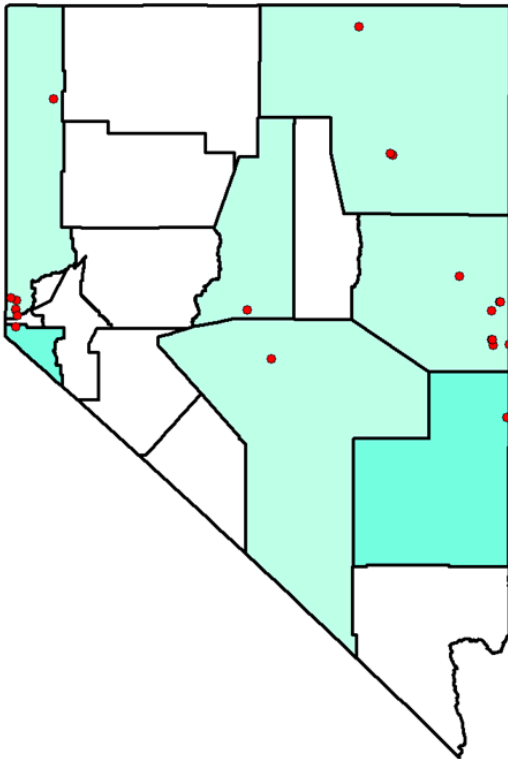


Figure 3: *C. maculata* distribution

County Records

Format: Year – County (Collector #)

Bold indicates counties not listed in FNA

1908 – Elko (A.A. Heller 9348)

1931 - Lander (J.M. Linsdale s.n.)

1966 - Nye (M.J. Williams 66-C-2)

1973 - Washoe (A. Risser s.n. –
Recollected 1 month later by M.J.
Williams)

1974 - White Pine (H.N. Mozingo 74-44)

1985 – Humboldt (A. Tiehm 9994)

1987 – Douglas (A. Pinzl 7984)

2011 - Lincoln (D. Gentilcore 66)

Corallorhiza striata

C. striata (L. striped) is a mycotrophic orchid that does not photosynthesize. It occurs in Northeastern NV in the Ruby Mountains and the Snake Range. The species as a whole is broadly distributed across the Western US, Northern Midwest, and Canada. The herbaria examined contain 3 specimens of the species. It occurs from 2134 – 2438 m. It is known to flower from 28 June – 8 July. The common name is striped coralroot. (Plate 2, Fig. 4)



Plate 2

Photo: Patrick Alexander, Sacramento Mountains, NM

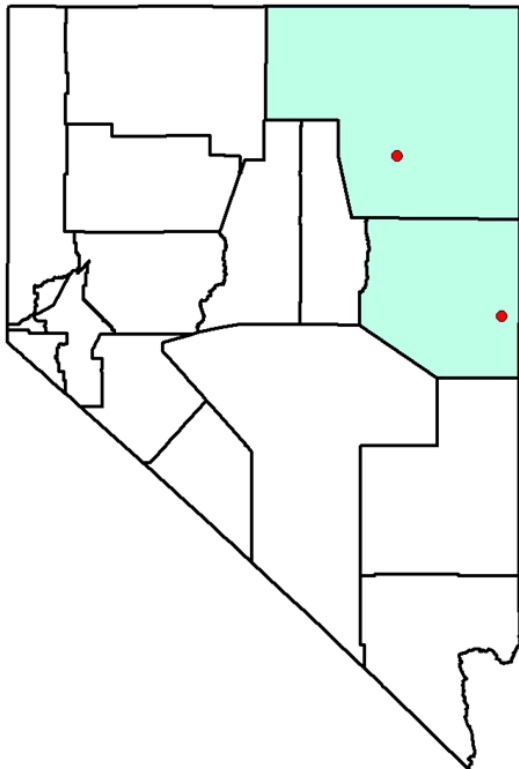


Figure 4: *C. striata* distribution

County Records

Format: Year – County (Collector #)

1941 - Elko (A. Holmgren 1356)

1990 - White Pine (J.C. Lyman 1045)

Epipactis gigantea

Epipactis (Gr. plant used to curdle milk) *gigantea* (L. gigantic) is broadly distributed across the state and occupies the widest elevational range of any of the NV taxa. It occurs mostly around springs, seeps, and streams. In Southern NV, it is a common member of the azonal hanging garden community type. The herbaria examined contain 50 specimens of the species. It occurs from 600 – 2439 m elevation. It is known to flower from 11 April – 25 July. The species as a whole is broadly distributed across Western North America. The common name is stream orchid. (Plate 3, Fig 5)



Plate 3

Photo: Max Licher, Oak Creek Canyon, AZ

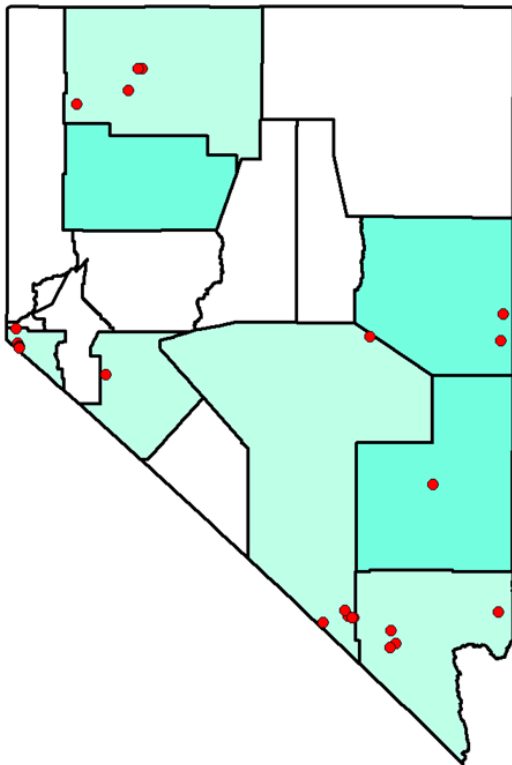


Figure 5: *E. gigantea* distribution

County Records

Format: Year – County (Collector #)

Bold indicates counties not listed in FNA

- 1936 - Clark (I.W. Clokey 5423)
- 1937 - Douglas (T.L. Breene 582)
- 1937 - Nye (P. Train 1237)
- 1959 - Mineral (L.E. Mills s.n.)
- 1990 – Pershing (N.D. Atwood 13794)**
- 1990 – White Pine (J.C. Lyman 880)**
- 1990 – Humboldt (T.A. Knight 2017)
- 2015 – Lincoln (G.G. Gust 2772)**

Listera convallarioides

Listera (after Martin Lister, English botanist) *convallarioides* (gr. Looks like Lily of the Valley) is the only member of the genus in the state despite some misidentifications of this species as *L. cordata* that have been perpetuated. In NV, the species has a disjunct distribution in the Sierran and Great Basin provinces and the Ruby Mountains. The herbaria examined contain 16 specimens of the species. It occurs from 1737 – 2590 m elevation. It is known to flower from 2 July – 23 August. The species as a whole is broadly distributed across the Western US, Northern Midwest and Canada. The common name is broad-leaved twayblade (Plate 4, Fig. 6).

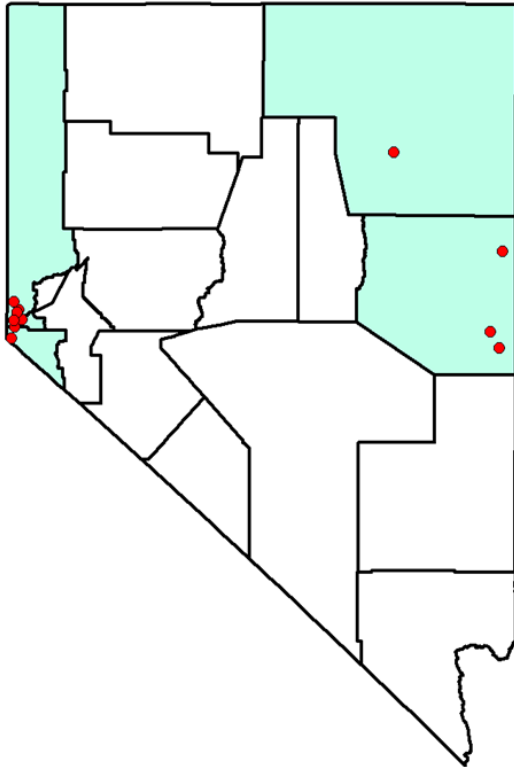


Figure 6: *L. convallarioides* distribution



Plate 4

Photo: Kier Morse, Yosemite National Park, CA

County Records

Format: Year – County (Collector #)

- 1912 – Washoe (A.A. Heller 10525)
- 1936 – Douglas (L.R. Miller s.n.)
- 1936 – Elko (P. Train 799)
- 1937 – Carson City (J. Henrichs 314)
- 1962 – White Pine (H.N. Mozingo s.n.)

Piperia unalascensis

Piperia (after C.V. Piper, botanist for AES Pullman, WA) *unalascensis* (from Unalaska, Alutian Island) has an unique disjunct distribution known from the Ruby Mountains as well as one site in Esmerelda County. It is rare in NV. The herbaria examined contain 3 specimens of the species. It occurs from 2164 – 2590 m elevation. It is known to flower from 15 July – 30 July. The species as a whole is broadly distributed across the Western US, Northern Midwest and Canada. The common name is Alaska piperia (Plate 5, Fig. 7).



Plate 5

Photo: Kier Morse, Yosemite National Park, CA

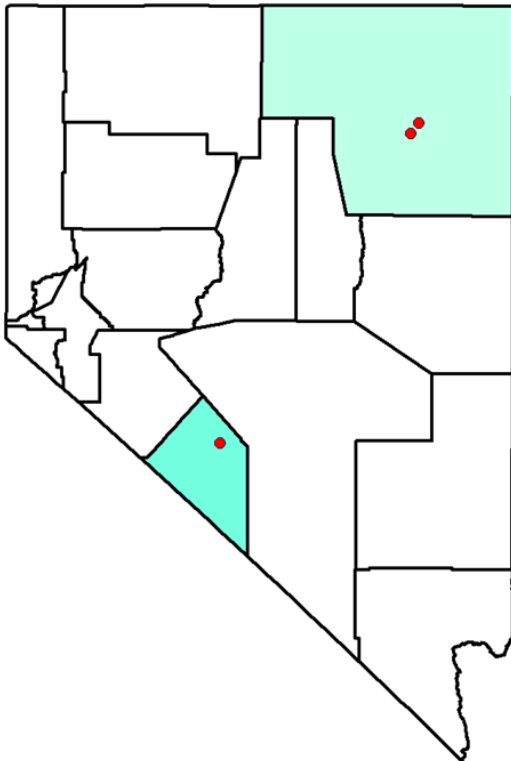


Figure 7: *P. unalascensis* distribution

County Records

Format: Year – County (Collector #)

Bold indicates counties not listed in FNA

1908 - Elko (A.A. Heller 9106)

1983 – Esmerelda (Tiehm 8256)

Platanthera dilatata var. *albiflora*

Platanthera (Gr. flat anther) *dilatata* (L. dilated in ref. to base of lip) var. *albiflora* (L. white flowered) is only known from the Ruby Mountains in NV further emphasizing their uniqueness in the state and adding to the diversity of Elko county. The herbaria examined contain 3 specimens of the species. It occurs from 2012 – 2988 m elevation. It is known to flower from 14 July – 12 August. The species as a whole is distributed across the Pacific Northwest into British Columbia. The common name is scentbottle (Plate 6, Fig. 8).



Plate 6

Photo: Ron Hanko, WA

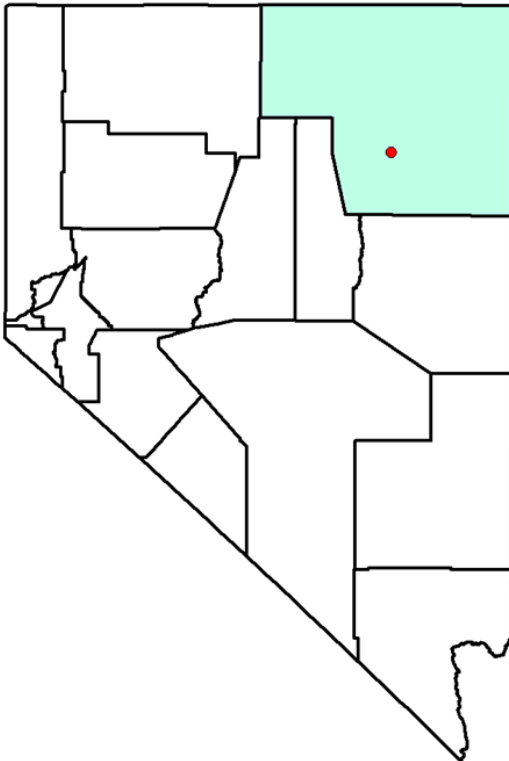


Figure 8: *P. dilatata* var. *albiflora* distribution

County Record

Format: Year – County (Collector #)

1971 – Elko (M.J. Williams s.n.)

Platanthera dilatata var. *leucostachys*

P. d. var. leucostachys (Gr. white spike) is the most common orchid in NV. It occurs in many Great Basin sky island mountain ranges as well as the Sierras, Jarbidge Mountains, and Ruby Mountains. It has a more connected range in the state occurring in several of the central NV ranges possibly due to its tolerance of slightly lower elevations than some of the other species. The herbaria examined contain 124 specimens of the species. It occurs from 1455 – 3050 m elevation. It is known to flower from 1 June – 18 September. The species as a whole is broadly distributed across Western North America. The common name is white bog orchid (Plate 7, Fig. 9).



Plate 7

Photo: D. Gentilcore, Tahoe Meadows, NV

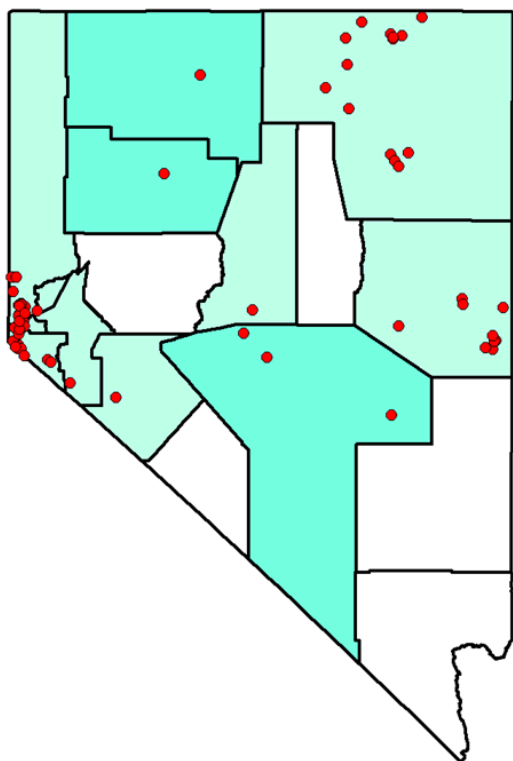


Figure 9: *P. dilatata* var. *leucostachys* distribution

County Records

Format: Year – County (Collector #)

Bold indicates counties not listed in FNA

1906 – Washoe (P.B. Kennedy 1223)

1908 – Elko (A.A. Heller 9315)

1915 – Humboldt (F.A. Herral 37)

1927 – White Pine (F.E. Gray 278)

1937 – Carson City (T.L. Breene 572)

1937 – Storey (R.A. Allen 173)

1938 – Mineral (W.A. Archer 6885)

1939 – Douglas (P. Train 3128)

1940 – Lyon (P. Train 4371)

1979 – Nye (S. Goodrich 13237)

1979 – Lander (S. Goodrich 13366)

1984 – Pershing (A. Tiehm 9201)

Platanthera sparsiflora

P. sparsiflora (L. sparsely flowered) is a Sierran species that is only known from the Carson Range in NV (a spur of the Sierra Nevadas) under the new species concepts developed since the description of *P. tescamnis* (Sheviak and Jennings 2006) which moved most of the specimens in the state into that species. However, many of the *P. sparsiflora* in the herbaria remain yet to be officially redetermined. More work may be needed to confirm the range boundary. The herbaria examined contain 15 specimens assuredly known to still be *P. sparsiflora*. It occurs from 1981 – 2957 m elevation. It is known to flower from 12 June – 6 September. The species as a whole is distributed across the West Coast. The common name is sparsely flowered bog orchid (Plate 8, Fig. 10).

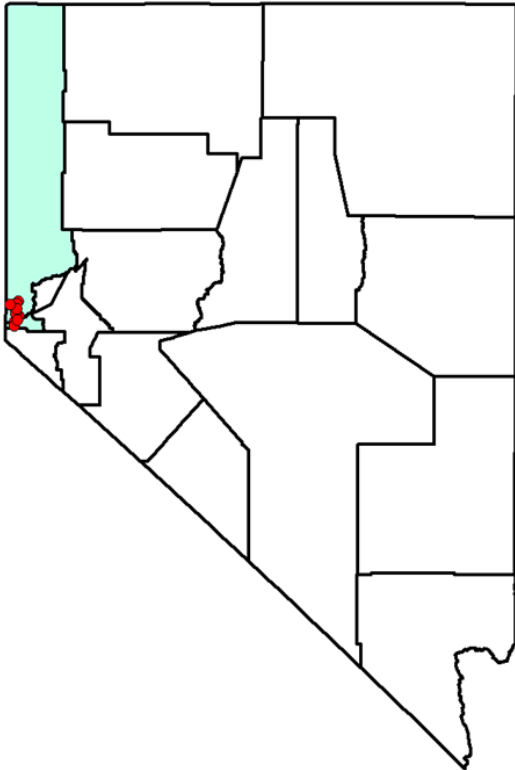


Figure 10: *P. sparsiflora* distribution

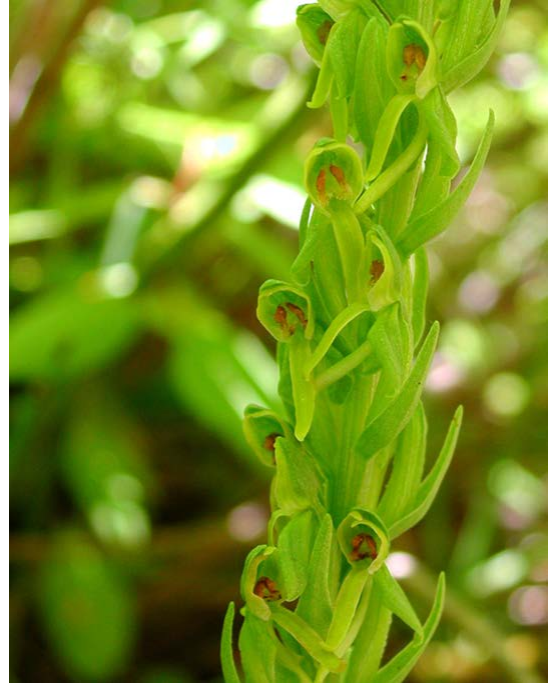


Plate 8

Photo: Max Licher, Oak Creek Canyon, AZ

County Records

Format: Year – County (Collector #)

1906 – Washoe (P.B. Kennedy 1223)

1976 – Carson City (L. Wise 142-cr)

Platanthera tescamnis

P. tescamnis (L. swift flowing desert stream) is a recently described species that occurs commonly throughout the Great Basin and Mojave. It is separated from *P. sparsiflora* in variable flower morphology and the occupation of drier habitats and slightly lower elevations (Sheviak and Jennings 2006). The herbaria examined contain 67 specimens of the species. It occurs from 1310 – 2900 m elevation. It is known to flower from 22 June – 9 September. The species as a whole is common across the Southwestern US. The common name is intermountain orchid (Plate 9, Fig. 11).

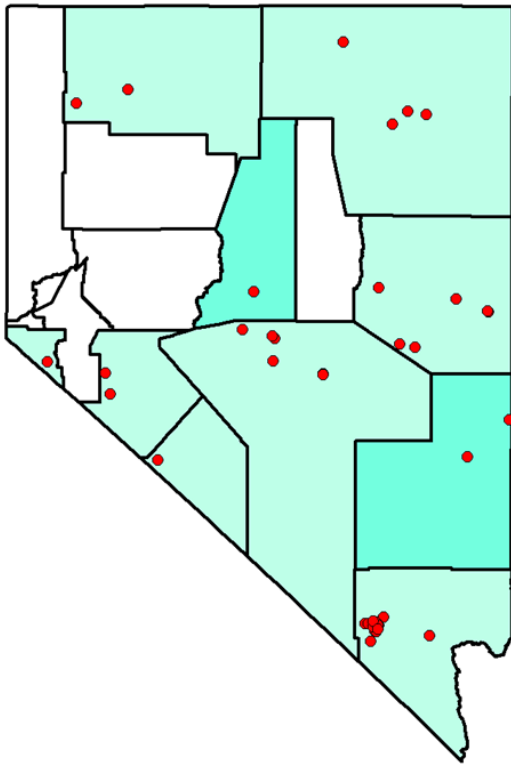


Figure 11: *P. tescamnis* distribution



Plate 9

Photo: Raymond Prothero Jr.

County Records

Format: Year – County (Collector #)

Bold indicates counties not listed in FNA

- 1908 – Elko (A.A. Heller 9201)
- 1935 – Clark (I.W. Clokey 5424)
- 1940 – Mineral (P. Train 4101)
- 1966 – Nye (M.J. Williams 66-C-11)
- 1979 – Esmeralda (A. Pinzl 2402)
- 1979 – Lander (S. Goodrich 13289)**
- 1983 – White Pine (A. Pinzl 5460)
- 1997 – Douglas (J. Bair 201)
- 1998 – Lincoln (W.E. Niles 5904)**
- 2000 – Humboldt (A. Tiehm 2000)

Spiranthes diluvialis

Spiranthes (Gr. coil flower) *diluvialis* (L. of the flood) is only known from a single location near Panaca. The original collection was made in 1936. For many years, it was presumed extirpated. In 2005, it was rediscovered by the Greater Las Vegas Orchid Society. It has been observed again in 2006 and 2011. The herbaria examined contain 2 specimens of the species. It occurs from 1440 – 1445 m elevation. It is known to flower from 29 July – 30 July. The species occurs throughout the Rocky Mountains in the US and Canada. It is listed as Threatened by the FWS and is on the NV. Natural Heritage Program At-Risk Species List. The common name is Ute ladies' tresses. (Plate 10, Fig. 12)

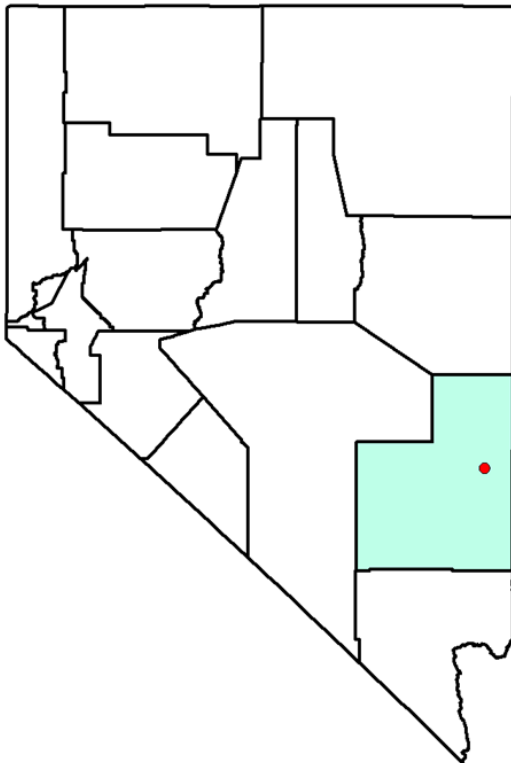


Figure 12: *S. diluvialis* distribution



Plate 10

Photo: Janel Johnson, NNHP, Panaca, NV

County Record

Format: Year – County (Collector #)

1936 - Lincoln

Spiranthes infernalis

The first time *S. infernalis* (L. hellish) was collected by Reveal and Beatley in 1968, it was incorrectly identified as *S. romanzoffiana* before realizing a new species had been discovered. When Sheviak went to recollect a type specimen to properly describe the species, it had been extirpated from the original collection location. Some nearby populations were located in other pools which became the type location, but the original population has never been observed again (Sheviak 1989). The herbaria examined contain 6 specimens of the species. It occurs from 668 – 671 m elevation. It is known to flower from 19 June – 4 July. The species is an endemic restricted to Ash Meadows National Wildlife Refuge. It only occurs in around a half dozen small streams and pools. It is on the Nevada Natural Heritage Program At-Risk Species List. The common name is Ash Meadow's ladies' tresses. (Plate 11, Fig. 13)



Plate 11

Photo: USFWS, Ash Meadows, NV

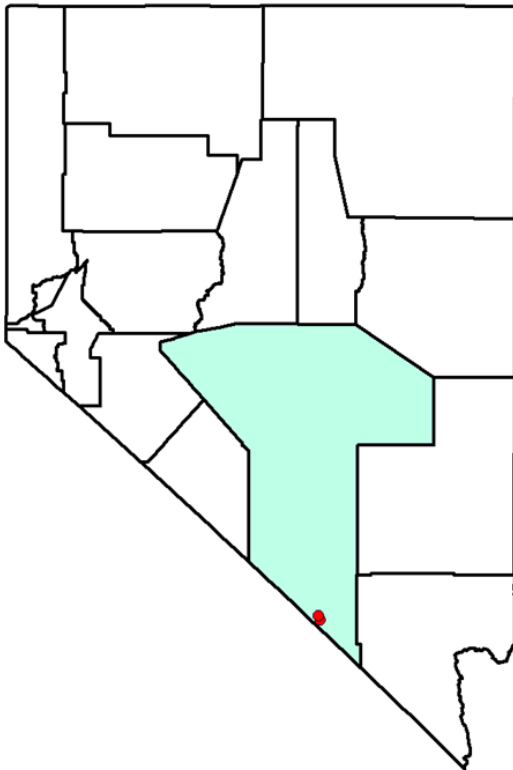


Figure 13: *S. infernalis* distribution

County Record

Format: Year – County (Collector #)

1968– Nye (Reveal 1488)

Type Specimen

1984 – Nye (Sheviak 2741)

Spiranthes porrifolia

S. porrifolia (L. leek green leaves) is another localized species known from a very restricted range in NV. It occurs only in the Sierra Range around Tahoe Meadows and few other meadows in that area. While more widely distributed throughout the Northwest, there is only a small chunk of that type of mountainous meadow habitat in NV. The herbaria examined contain 4 specimens of this species. It occurs from 1753 – 2782 m elevation. It is known to flower from 24 July – 21 August. The species as a whole is distributed across the West Coast of North America. The common name is Western ladies' tresses. (Plate 12, Fig. 14)



Plate 12

Photo: D. Gentilcore, Tahoe Meadows, NV

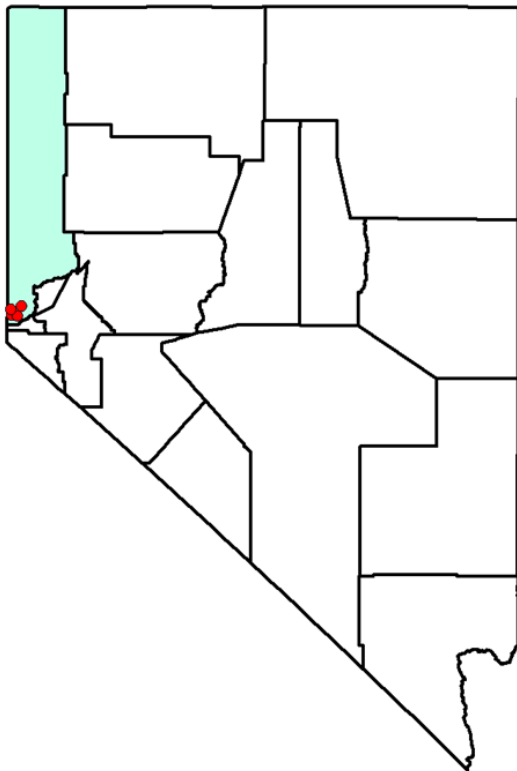


Figure 14: *S. porrifolia* distribution

County Record

Format: Year – County (Collector #)

1907 – Washoe (C.L. Brown s.n.)

Spiranthes romanzoffiana

S. romanzoffiana (Named for Nicholas Romanzof, Russian minister of state while Alaska was still a Russian territory (Coleman 2002)) has a disjunct distribution with populations occurring in the Sierran floristic province, the Ruby Mountains, and the Jarbidge Mountains. The herbaria examined contain 15 specimens of the species. It occurs from 1737–3050 m elevation. It is known to flower from 4 July – 8 Sept. The species as a whole is broadly distributed across the Western US, Northern Midwest and Canada. The common name is Hooded ladies' tresses. (Plate 13, Fig. 15)



Plate 13

Photo: Max Licher, San Francisco Peaks, AZ

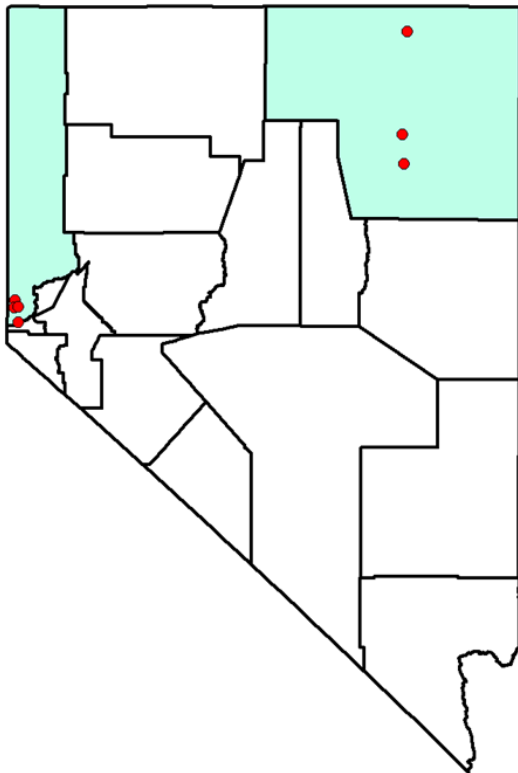


Figure 15: *S. romanzoffiana* distribution

County Records

Format: Year – County (Collector #)

Bold indicates retractions from FNA

- 1908 – Elko (A.A. Heller 9264)
- 1938 – Washoe (W.A. Archer 6607)
- **Not Nye! (Reveal 1488 is *S. infernalis*)**

Discussion

The distribution of orchids in NV reflects their love of water. The majority of the orchids are restricted to the higher elevations in the state that receive more moisture. Even at the high elevations, the orchids tend to occur in riparian areas such as meadows, streambanks, springs, or seeps.

Several patterns are seen in the distribution of the orchids in NV. The first group of Orchids in NV are the hemicircumboreal species which occur in a broad band across the northern latitudes of North America from southern Alaska to Greenland as far south as the Sierras, Rockies, northern Midwest and including bits of NV's mountains. This group included *Corallorhiza striata*, *Listera convallarioides*, *Piperia unalascensis*, and *Spiranthes romanzoffiana*. These species all have disjunct distributions and are found in the Sierran floristic province as well as the Ruby Mountains, Jarbidge Mountains, and sometimes the Snake Range.

The next group is distinguished by their adaptation for lower elevations. Four of these species are the most common orchids in NV, but the fifth is the rarest endemic. This semi-arid group includes the moderately low elevation species *Corallorhiza maculata*, *Platanthera dilatata* var. *leucostachys* and *Platanthera tescamnis* and extremely low elevation *Epipactis gigantea* and *Spiranthes infernalis*. *C. maculata* and *P. d. leucostachys* are mostly Great Basin. *P. tescamnis* is everywhere except the Sierran. *E. gigantea* is the throughout the Mojave and western Great Basin. *P. infernalis* is restrict to Ash Meadows.

There are two Sierran species that occur only in a small corner of the state near Tahoe: *Spiranthes porrifolia* and *Platanthera sparsiflora*. There is a Rocky Mountain species that only occurs in the Ruby Mountains: *P. d. var. albiflora*. There is one Colorado Plateau species that only occurs near Panaca: *S. diluvialis*. Each of these regions have many other unique plants and other biota that coincide with these examples illustrated using orchids. A similar pattern could be seen using other diverse genera such as *Astragalus*, *Cryptantha*, *Eriogonum*, *Lotus*, *Luipnus*, or others.

The distribution of orchids in NV represents more of a Gleasonian than Clementsian distribution pattern. There are some groups of species that occur together in different ecosystems, some generalists that occur broadly across major types, and a highly restricted endemic. There is no one life history strategy, but several different types of life history strategies and range types found among the orchids of NV.

Even today it is true that there remains a paucity of information regarding the distribution of species. Despite the popularity of orchids, concentration of people around water sources, and hundreds of thousands (perhaps over a million) herbarium specimens collected from NV, there remains new county records being collected for orchids in the state as recently as 2015 and more than 9 records since 1990. Certainly, the rate is slowing down compared with earlier periods of botanical exploration, but the discovery of novel populations and range extensions continues. It is likely in the future, that orchids will continue to be discovered in more places in the remote reaches of the state.

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