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Division of Wildlife Resources—Utah Natural Heritage Program

PLANT INFORMATION COMPILED BY THE UTAH NATURAL HERITAGE PROGRAM: A PROGRESS REPORT

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Utah Division of Wildlife Resources
1594 W. North Temple
Salt Lake City, Utah
James F. Karpowitz, Director

PLANT INFORMATION
COMPILED BY THE UTAH NATURAL HERITAGE PROGRAM:
A PROGRESS REPORT

by

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Utah Division of Wildlife Resources
1594 W. North Temple
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Introduction

The Utah Natural Heritage Program (UTHP) was initiated in late summer 1988 and has functioned as an ongoing biological survey of the state with an emphasis on rare or declining species. It serves as a centralized data repository, acquiring range wide information regarding rare plant and animal species for use by land managers as well as for the evaluation of conservation needs. As well as being used by government agencies, data are used in responding to requests for information from non-government organizations and private interests. Data can be used in the assessment of species' conservation status state-wide and, in coordination with adjoining states, range-wide.

The Utah Division of Wildlife Resources developed a plan for a statewide inventory of sensitive species that was approved by the Utah Reclamation Mitigation and Conservation Commission in February 1995. A subsequent cooperative agreement funded, early on, a UTHP report (Stone 1998) that summarized "the distribution and status of rare and endemic plants in Utah." With it as a guide, funding continued to support the acquisition of data from numerous dynamic sources, i.e., herbarium collections, other-source survey reports, in-house completed surveys, published literature and knowledgeable individuals, and then the entry and incorporation of that data into a database of Element Occurrences, i.e., the habitat occupied by a local population. Notable sources of collection data have been the Stanley L. Welsh Herbarium, Brigham Young University, the Garrett Herbarium, University of Utah, and the Intermountain Herbarium, Utah State University. Having management responsibility for Utah's rare and endemic species, the Bureau of Land Management, U.S. Forest Service and the U.S. Fish and Wildlife Service have funded and shared the results of countless plant surveys. These herbaria and Federal management agencies have been and continue to be the primary sources for plant data.

The state of Utah is unique in the richness of its endemic and rare flora. Only four states, i.e., California, Florida, Texas, and Oregon, equal or exceed Utah in their numbers of rare plant species (Stone 1998). In the recent edition of *A Utah Flora* (Welsh et al. 2003) forty-one taxa new to science were named. As these new taxa are evaluated for potential addition to a dynamic list of species of conservation concern, there are others that have gone through the process of addition to Federal Agency sensitive species lists, field data gathering, a status reevaluation and, perhaps, the determination that they are not of conservation concern. These taxa are removed; others, however, remain at various levels of concern on agency sensitive species lists, and there are those few of significant enough conservation concern to be listed as threatened or endangered under the Endangered Species Act. Summarized here is information on 100 of those plants that remain, i.e., all of Utah's federally listed and candidate species, species for which data are still being gathered, most of which have Federal Agency status, and species that are newly named and potentially of conservation concern.

Species Accounts

Species accounts presented here are intended to provide a brief summary of information pertaining to the status of the 100 selected species of conservation concern in Utah. They include four sections. The TAXONOMY AND NOMENCLATURE section provides a taxonomic context for the species, including information about nomenclatural synonyms of recent use. Discussions of scientific names are provided in an attempt to resolve potential confusion resulting from the variability in nomenclature arising from recent systematic revisions and differences of opinion as to their conclusions. Likewise, due to a lack of stability in plant common names, discussions provide the more commonly used options found in regional floras, recent literature, reports and prominent Internet locations, for example, the Natural Resources Conservation Service's Plants Database. The second section identifies CONSERVATION STATUS DESIGNATIONS assigned by certain government agencies, such as listing status under the Endangered Species Act and inclusion on the sensitive plant species lists of the USDI Bureau of Land Management (BLM) and USDA Forest Service (USFS). The DISTRIBUTION AND ABUNDANCE section consists of a description of distribution in Utah, the habitats that are occupied, the sizes and trends of populations, and threats. These are among the factors of primary consideration in the assessment of conservation status.

A distribution map is included with each species account. Additional distribution maps, three taxa per page, are provided for a selection of plants of varying conservation concern, some of which, though rare within the boundaries of the state, have a broader distribution beyond them. Each map depicts distributional data from the UTHP database using a shaded relief map of Utah overlain with county boundaries as a backdrop. A map showing county names is provided in the Appendix. Occurrences are represented in UTHP's GIS database as polygons. The majority of these are quite small, some representing a single collection point, and are not visible when plotted at a statewide scale. For this reason, distribution symbols provided here represent a centrum point created for each polygon.

Passey's Onion
Allium passeyi

TAXONOMY AND NOMENCLATURE

FAMILY: Lily (Liliaceae, Alliaceae)

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies. Based on a perceived potential presence on BLM managed lands, it was formerly on the BLM Sensitive Plant List (Lamb 1996). It was formerly a category 2 candidate for listing under the Endangered Species Act 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

Endemic to east-central Box Elder County, this species is known from the south end of the North Promontory Mountains and north-northeast to the west slope of the West Hills, very near Idaho (UTHP 2005; Allen, pers. com. 1995; Phillips, pers. com. 2004). There are five general locations at which it occurs, i.e., four under private ownership and one within Golden Spike National Historic Site. It is found on "[s]hallow, stony, lithosolic soil over dolomitic limestone" (Williams and Hugie 1964) in a sagebrush steppe habitat.

Current status of populations, habitat condition and population size are not available for all sites. In a past reference to one site, Allen (pers. com. 1995) indicated that hilltops and slopes in the area had been mechanically treated to eliminate sagebrush. Both Allen (pers. com. 1995) and Mutz, et al. (1980) indicated that sheep grazing occurs in the area, however, the later source indicated that there was no evidence of overgrazing or damage to plants. An ongoing study (Phillips, pers. com. 2005) has acquired data from three of the five known sites. This information indicates that, though plant numbers can be high, sites are small in area, e.g., "575 and 840 m^2 and 48,000 and 20,000 plants respectively". This study has not yet documented habitat condition.

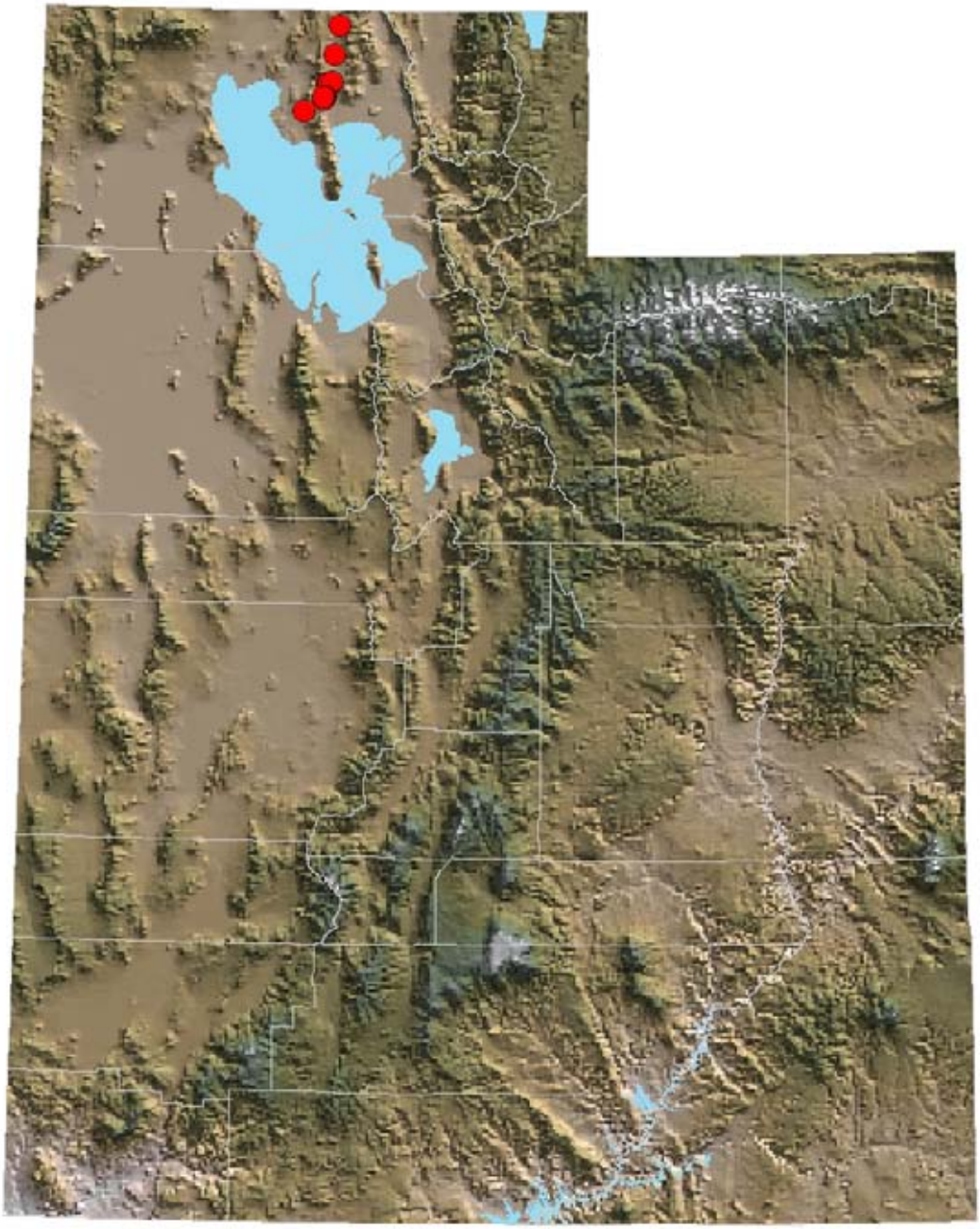

Figure 1. The distribution of Passey's onion (*Allium passeyi*).

Utah Angelica
Angelica wheeleri

TAXONOMY AND NOMENCLATURE

FAMILY: Parsley (Umbelliferae, Apiaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Wasatch-Cache National Forest's forest plan as a Recommended Sensitive species (USDA, FS 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This distinctive taxon is a Utah endemic known from seven counties, i.e., Cache, Salt Lake, Utah, Tooele, Juab, Sevier, and Piute, along the central "backbone" of the state. It grows in wet areas of riparian communities or in seeps and springs (Cronquist 1997, Welsh et al. 2003, UTHP 2005).

There has been recent field work for this taxon on the Uinta National Forest which resulted in the discovery of two new populations, i.e., Nebo Creek, Utah County, and Harker Canyon, Tooele Co. (Van Keuren, pers. comm. 2005a). Otherwise, throughout its distribution there is little information available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. However, though actual threats are not known, the riparian and wetland habitats required by this species are potentially impacted by urban development, stream channelization, water diversions and other watershed and stream alterations, recreation, and invasion by exotic plant species. The Wasatch-Cache National Forest has addressed, as perhaps other management agencies have, riparian habitat concerns in its revised forest plan (USDA, FS 2003) in which it provides specific direction to protect and/or minimize impacts to riparian habitats from various management actions (Padgett, pers. comm. 2005a).

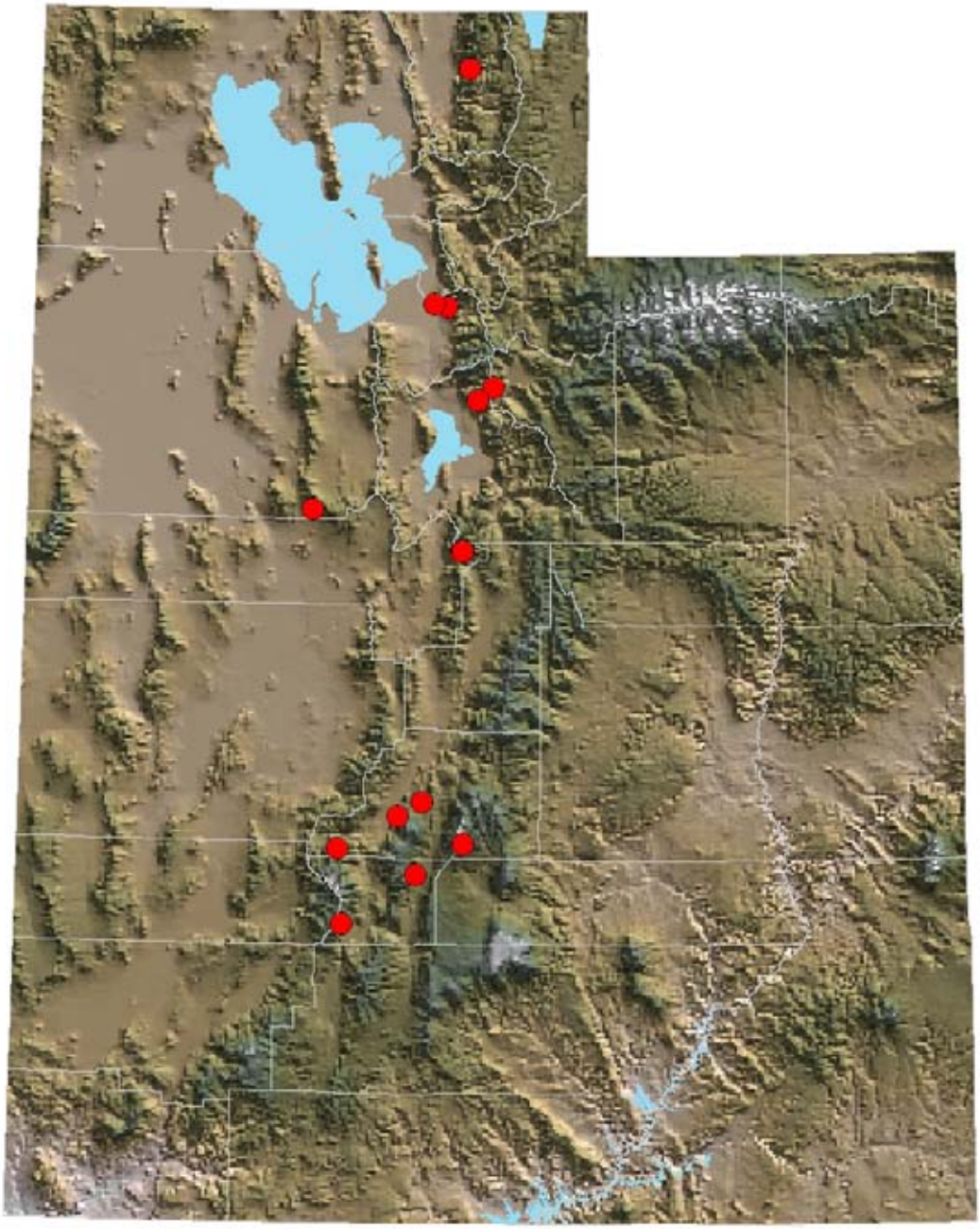

Figure 2. The distribution of Utah angelica (*Angelica wheeleri*).

Graham's Columbine
Aquilegia grahamii

TAXONOMY AND NOMENCLATURE

FAMILY: Buttercup (Ranunculaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to three deep canyons on the south slope of the Uinta Mountains north of Vernal, Uintah County. It grows out of cracks, on ledges or in soils of seeps or hanging gardens in cliffs of the Pennsylvanian-Permian Weber Sandstone. The surrounding plant communities vary from juniper-birch, sagebrush-snowberry to ponderosa pine-juniper-aspen (UTHP 2005).

The latest available estimates of over-all population size are 5,000-10,000 plants from 11 specific sites (Huber 1997). Information on known or potential threats is unavailable, but due to the isolated, steep habitat, there are very likely few if any.

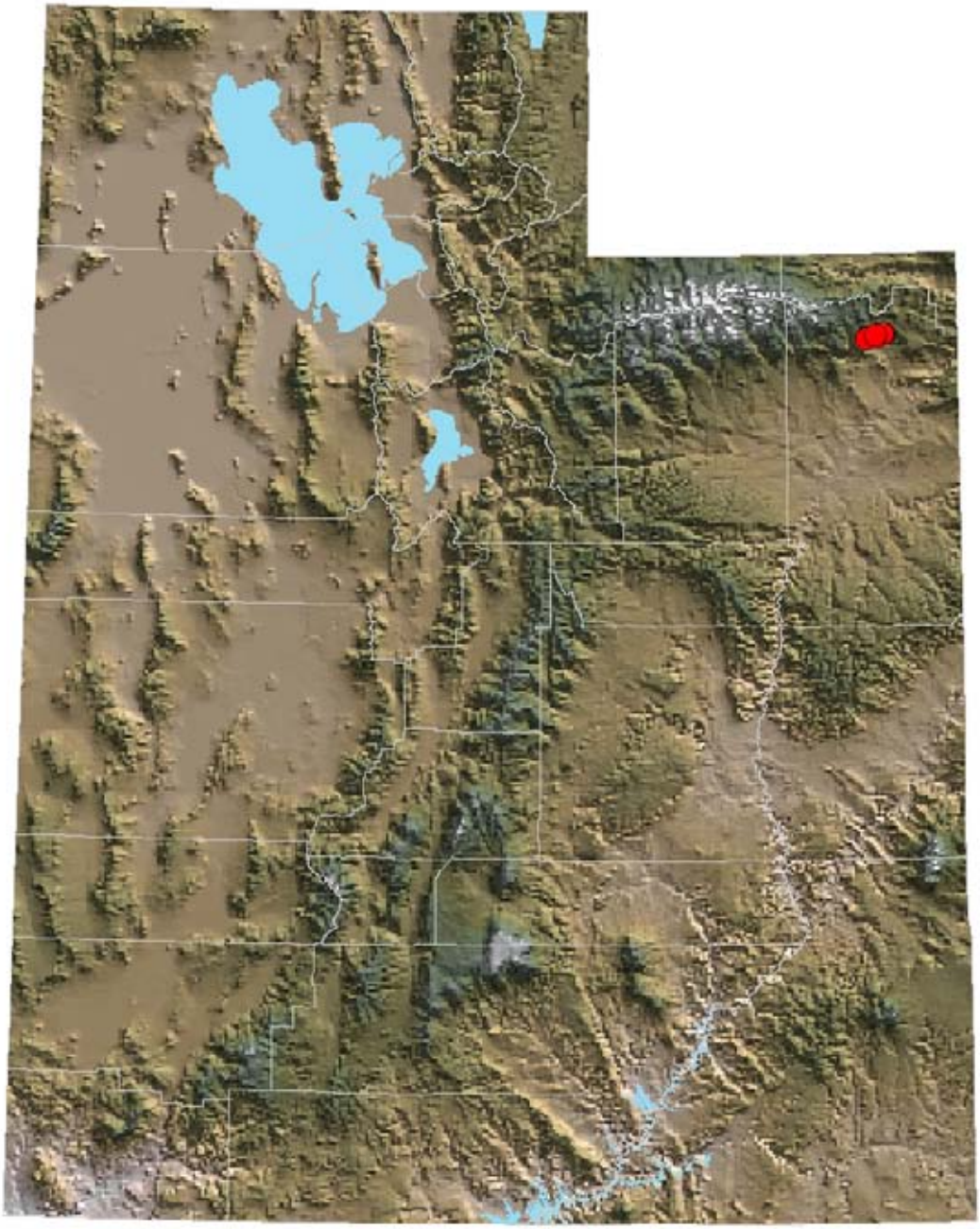

Figure 3. The distribution of Graham's columbine (*Aquilegia grahamii*).

Grouse Creek Rockcress
Arabis falcatoria

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Recently, species of the genus *Arabis* were transferred into *Boechera* (Dorn 2003). Holmgren et al. (2005) use *Boechera*. The common name "falcate rockcress" (e.g., Welsh et al. 2003) is also available.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is known from extreme northwest Utah in the Goose Creek, Grouse Creek and Raft River mountains, Box Elder County. It is also in adjacent Elko County, Nevada. It inhabits the curl-leaf mountain mahogany and piñon-juniper zones on windswept ridges in rocky, gravelly soils of quartzite and limestone. At a location in the Grouse Creek Mountains it is growing in the hard packed gravel parking area of a microwave tower (Dixon and Mancuso 2005, UTHP 2005).

Little information is available documenting the current status of populations, i.e., population size estimates, habitat condition or potential impacts. A recent survey of the Raft River Mountain portion of the Sawtooth National Forest did not locate this taxon (Dixon and Mancuso 2005).

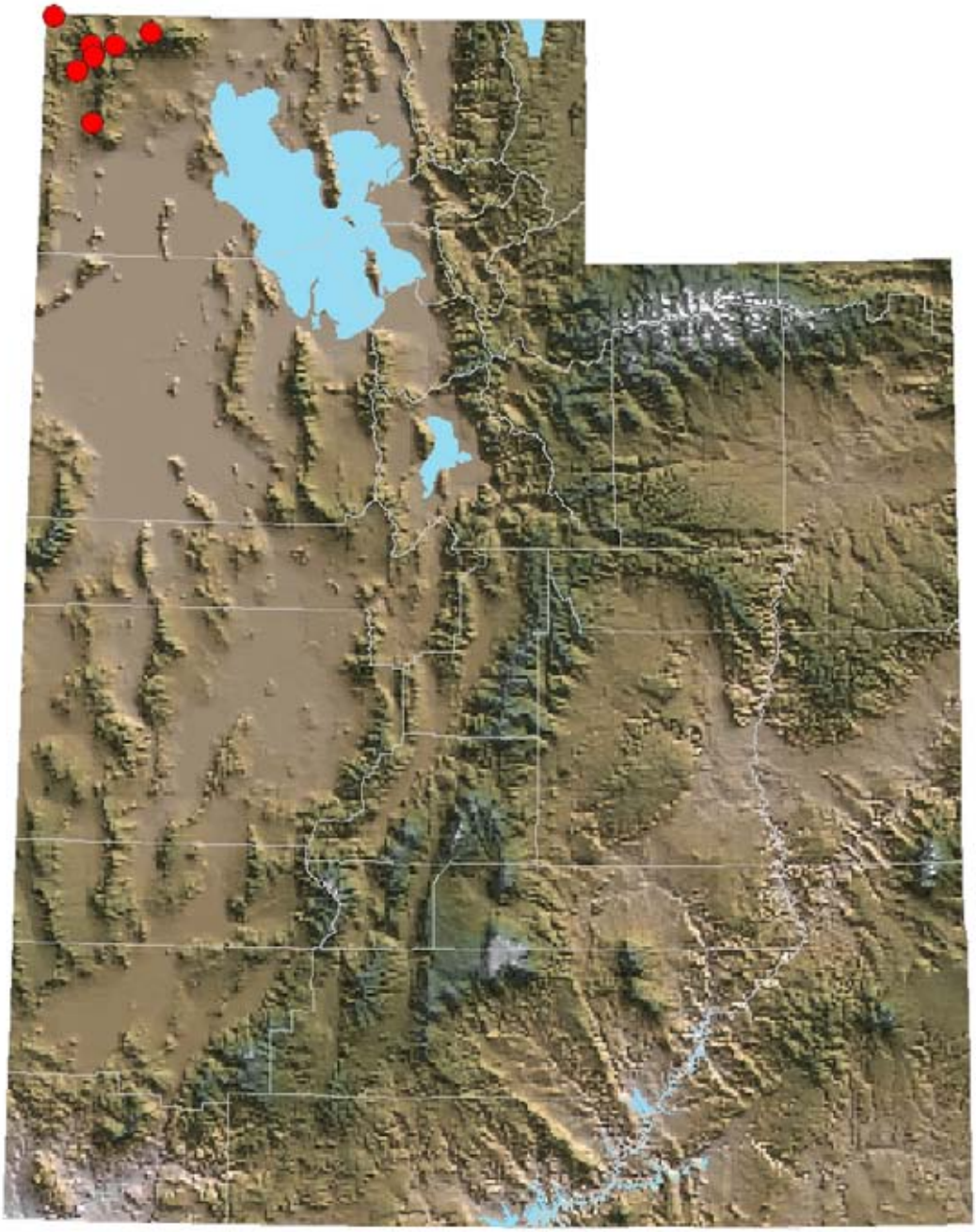

Figure 4. The distribution of Grouse Creek rockcress (*Arabis falcatoria*).

Dwarf Bearclaw-Poppy
Arctomecon humilis

TAXONOMY AND NOMENCLATURE

FAMILY: Poppy (Papaveraceae)

OTHER NAMES: The common names "low bearclaw-poppy" (Welsh et al 2003), "dwarf bear-poppy" by USFWS, and, questionably worth mentioning, "common bearpoppy" (NRCS 2005).

CONSERVATION STATUS DESIGNATIONS

On 6 November 1979, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 44 Federal Register No. 216). A document identifying recovery goals (USFWS 1985a) has been produced as a guide to management and conservation efforts. As a federal endangered species, it is of concern to USDI Bureau of Land Management, St. George Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Utah endemic known only from the vicinity of St. George, Washington County. It ranges on the west of its distribution, from north of Wittwer Canyon south to the highest point at the west end of White Hills and into upper Val Wash; and on the east, from Shinob Kibe south to Warner Ridge and Beehive Dome. Its habitat is that of rolling low hills and ridge tops composed of the gypsiferous clay soils of the Triassic Moenkopi Formation. It is found on barren, open sites in warm desert shrub communities where it is often associated with *Ambrosia dumosa*, *Ephedra torreyi*, *Atriplex confertifolia*, *Xylorhiza tortifolia* and *Dalea fremontii* (UTHP 2005).

St. George and surrounding communities are rapidly increasing in population. The resulting expansion and development has been into this plant's habitat, a habitat that immediately surrounds and has become intertwined with that development. Habitat has been and continues to be lost, and, as result of such activities as off-road vehicle use, the remaining is highly impacted. The Nature Conservancy has preserved a small portion of this plant's habitat by establishing a preserve specifically for it at Shinob Kibe. A U.S. Fish and Wildlife Service's Cooperative Endangered Species Conservation Fund grant was recently approved that will assist in the preservation of an estimated 20% of this plant's habitat as a rare plant preserve (Frates, pers. comm. 2005).

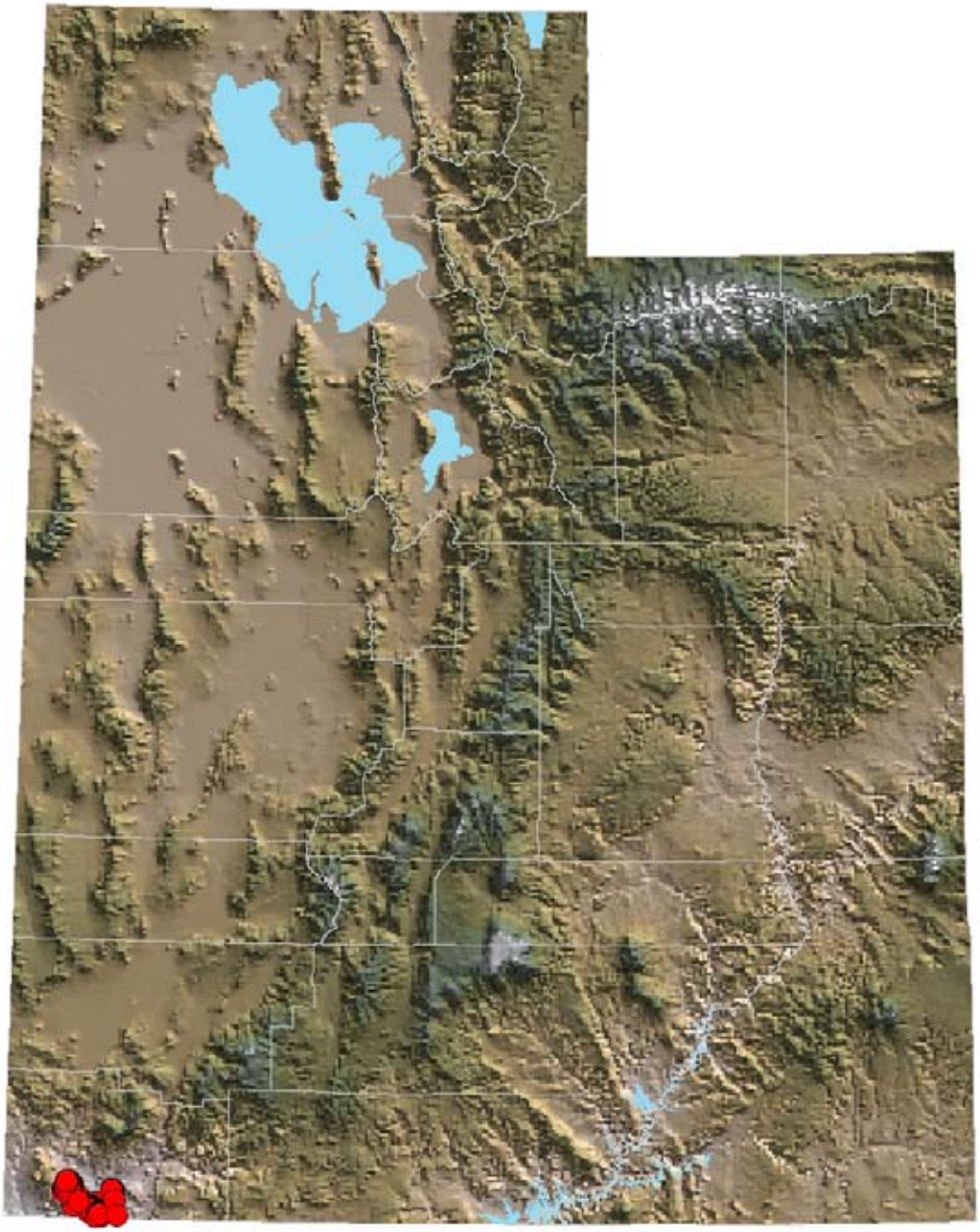

Figure 5. The distribution of dwarf bearclaw-poppy (*Arctomecon humilis*).

Welsh's Milkweed
Asclepias welshii

TAXONOMY AND NOMENCLATURE

FAMILY: Milkweed (Asclepiadaceae)

CONSERVATION STATUS DESIGNATIONS

On 28 October 1987, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 52 Federal Register No. 208). A document identifying recovery goals (USFWS 1992) has been produced as a guide to management and conservation efforts. As a federal threatened species, it is of concern to USDI Bureau of Land Management, Kanab Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is found in south-central Utah, Kane County, on the Coral Pink Sand Dunes, The Sand Hills, and on the state line in the Paria Canyon-Vermillion Cliffs Wilderness Area. It is found in sagebrush, juniper, and ponderosa pine communities on dunes derived from Navajo Sandstone (Franklin 1993).

Recent population estimates for The Sand Hills are approximately 350 "plants". Off-highway vehicle activity and cattle are present in the plant's habitat but are having only minimal impact on the population (Kneller 2002a). At the Coral Pink Sand Dunes a total of 71,500 "plants" were estimated. Observations made it apparent that off-highway vehicle activity does have an impact on this plant, but it was concluded that the extent of that impact is not yet clear. Kneller (2002b) suggests that now, with exact location and more accurate stem counts, comparisons with the results of future studies can be made to understand better the relationship between population fluctuation and human impacts. The Stateline Dune population had a population estimated at 566 "plants" in 1990, the year after its discovery. Impacts to this isolated site are minimal.

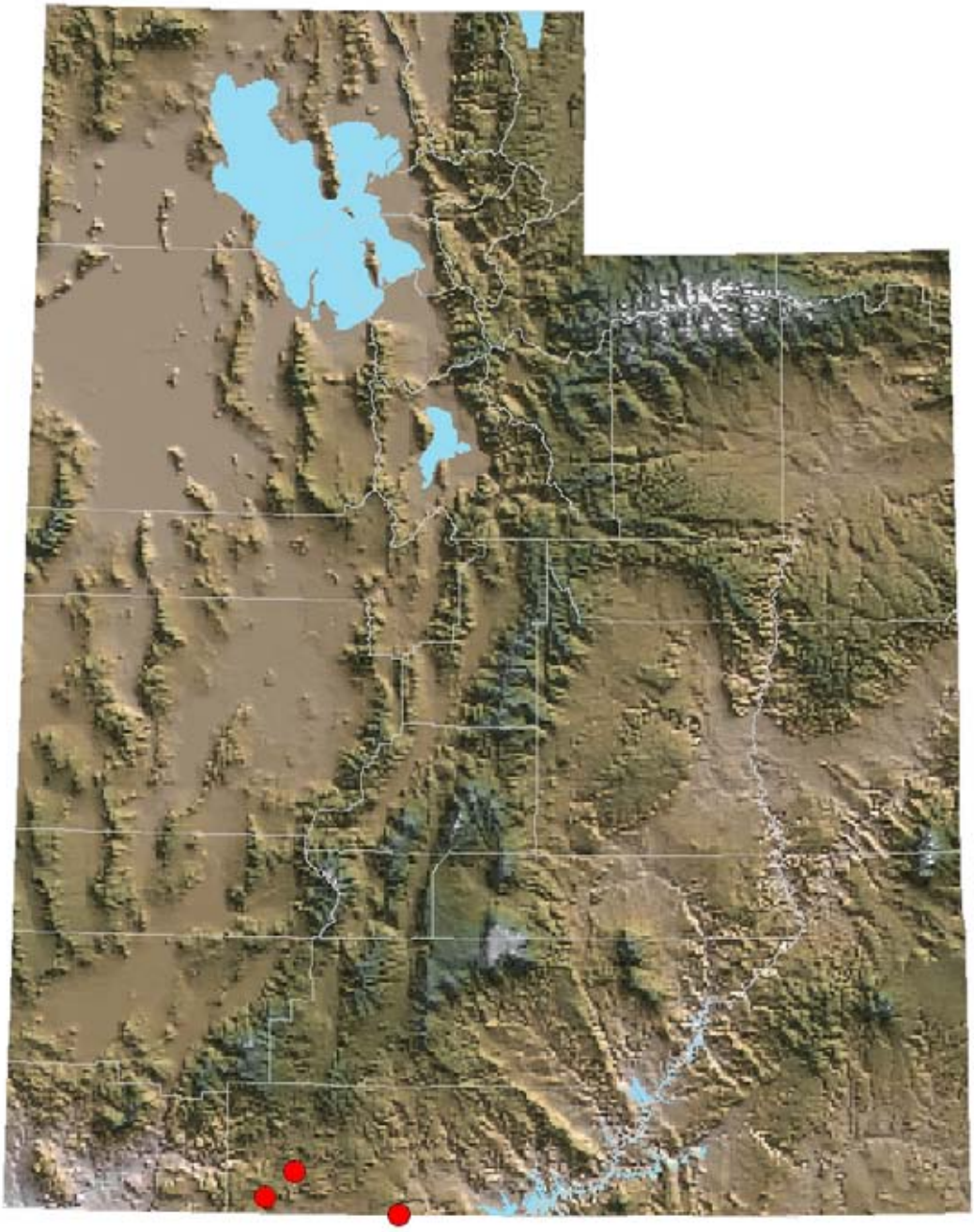

Figure 6. The distribution of Welsh's milkweed (*Asclepias welshii*).

Shivwits Milkvetch
Astragalus ampullarioides

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: The taxon *ampullarioides* was formerly considered to be a variety of the species *eremiticus* (e.g., Welsh et al. 1993). Barneby (1989) placed it in synonymy under that taxon. He wrote of it, "A robust but diffuse form…having pods potentially up to 12 mm diameter…. While perceptibly different, these forms evade exact definition and appear taxonomically inconsequential." The common name "Shem milkvetch" has been used.

CONSERVATION STATUS DESIGNATIONS

On 28 September 2001, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 66 Federal Register No. 189). As a federal endangered species, it is of concern to USDI Bureau of Land Management, St. George Field Office, and USDI National Park Service, Zion National Park.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to southwest Utah, Washington County. It is known from only a few scattered locations, from Pahcoon Spring Wash on the west to Rockville Bench, Zion National Park (UTHP 2005). It is restricted to unstable gypsiferous substrates of the Chinle Formation in warm desert shrub and juniper communities (Welsh et al. 2003, Van Buren and Harper 2004a).

Threats to this taxon include "development of land for residential and urban use, habitat modification from human disturbances, competition with nonnative plant species, and impacts from…grazing (USFWS 2001)", both domestic livestock and native grazers. One of its known locations is between the north- and southbound lanes of I-15 near Harrisburg historical site (Stone 1998), and another, near Harrisburg Junction has been extirpated (UTHP 2005).

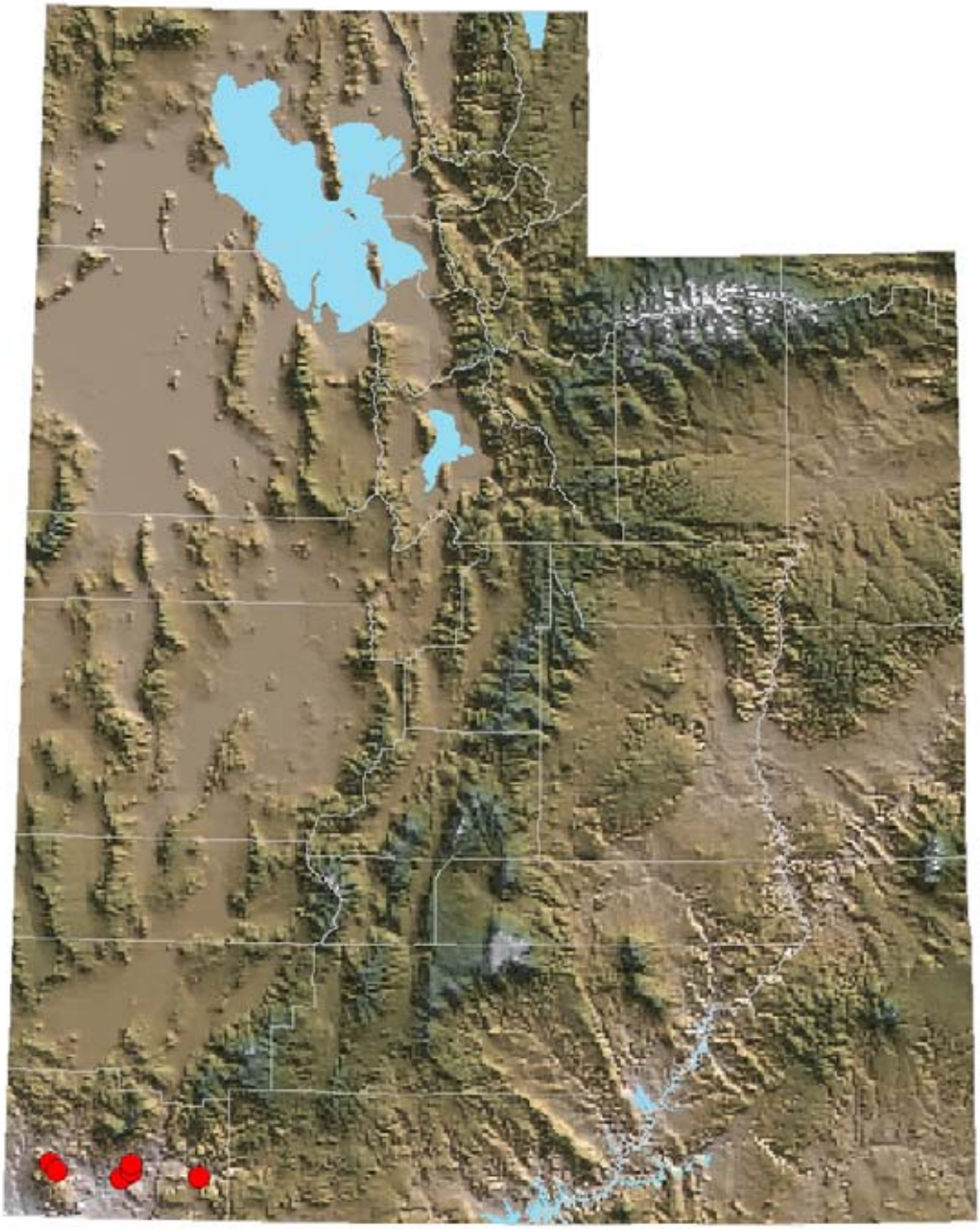

Figure 7. The distribution of Shivwits milkvetch (*Astragalus ampullarioides*).

Goose Creek Milkvetch
Astragalus anserinus

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

CONSERVATION STATUS DESIGNATIONS

Goose Creek milkvetch is included on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188). On 3 February 2004, the Snake River U.S. Fish and Wildlife Service office received a petition to list Goose Creek milkvetch.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs on Utah's edge of the Columbia Basin in the Goose Creek drainage of extreme northwestern Box Elder County, and is shared with immediately adjacent Nevada and Idaho. It grows on southern to western facing slopes in *Artemisia tridentata* and scattered *Juniperus osteosperma* communities, in ashy, sandy soils of the whitish to brownish tuffaceous sediments of the Tertiary Salt Lake formation (Baird, et al. 1991).

In response to the petition to list, during 2004 and 2005 surveys were completed in Idaho, Utah and Nevada. Totals for Utah's population, a combination of recent data and that of 1990 data (Baird, et al. 1991), are approximately 13,000 plants. Impacts / threats observed during recent surveys were livestock grazing, presence of leafy spurge, cheat grass and crested wheatgrass, and a recently built supply pipeline for watertroughs (UTHP 2005).

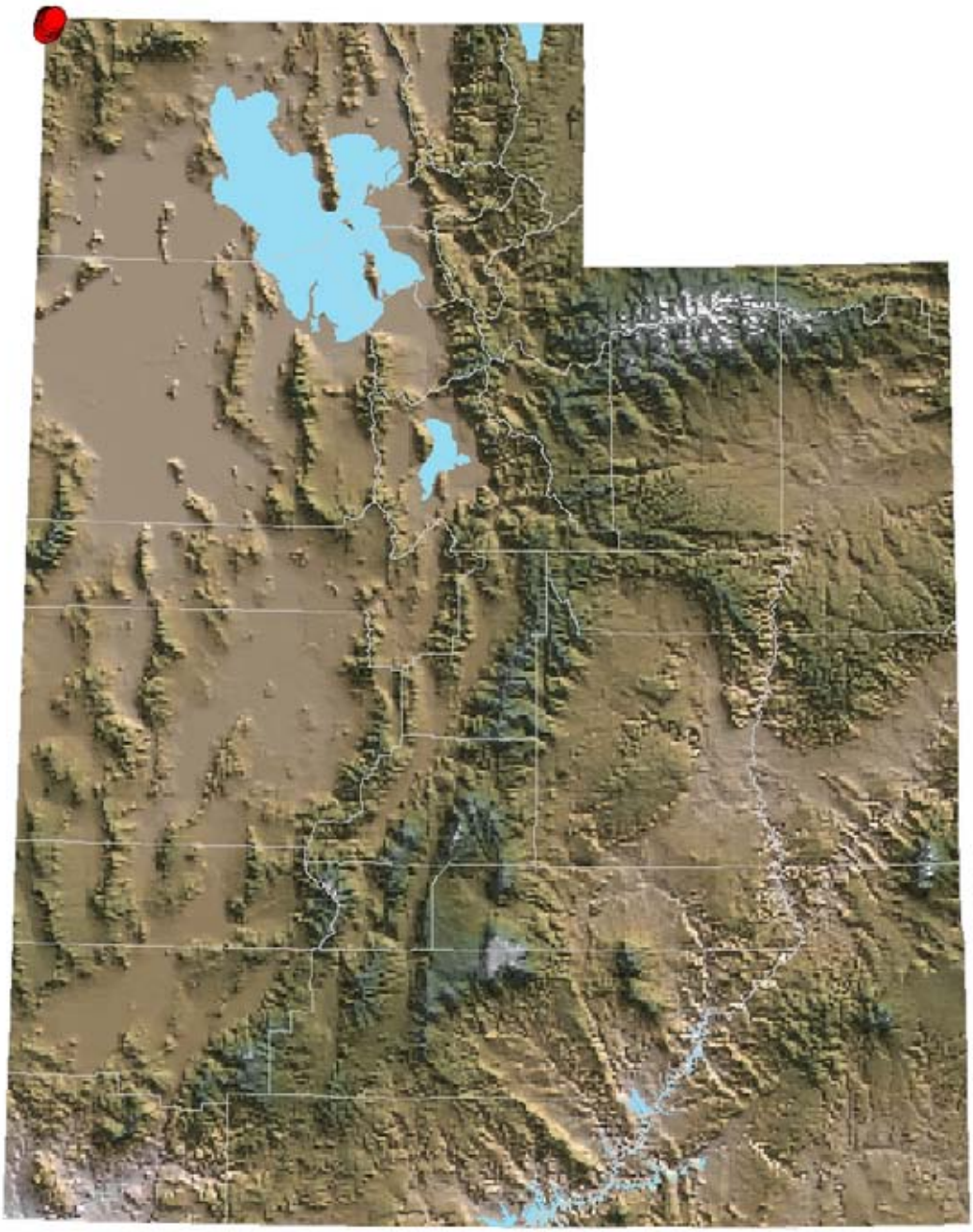

Figure 8. The distribution of Goose Creek milkvetch (*Astragalus anserinus*).

Avon Milkvetch
Astragalus avonensis

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: First documented as a new county of distribution for *Astragalus praelongus* var. *praelongus* (Franklin 1994a), it lay waiting in the Stanley L. Welsh Herbarium until recognized as new by Dr. Welsh and published as such in 2003. "[I]t apparently bears no obvious relationship to any Utah species (Welsh et al. 2003)."

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southwest Utah endemic in the Escalante Desert, central Iron County. Its habitat is, "[s]tabilized dunes and sandy hummocks in [a] playa, desert shrub community (Welsh et al. 2003)."

No information is available documenting the status of populations, i.e., population size estimates, habitat condition or potential impacts. Welsh et al. (2003) however do comment, "Following collection of the type specimen the collecting site has been dug through twice to emplace the great natural gas pip[e]lines carrying that product from Wyoming to California."

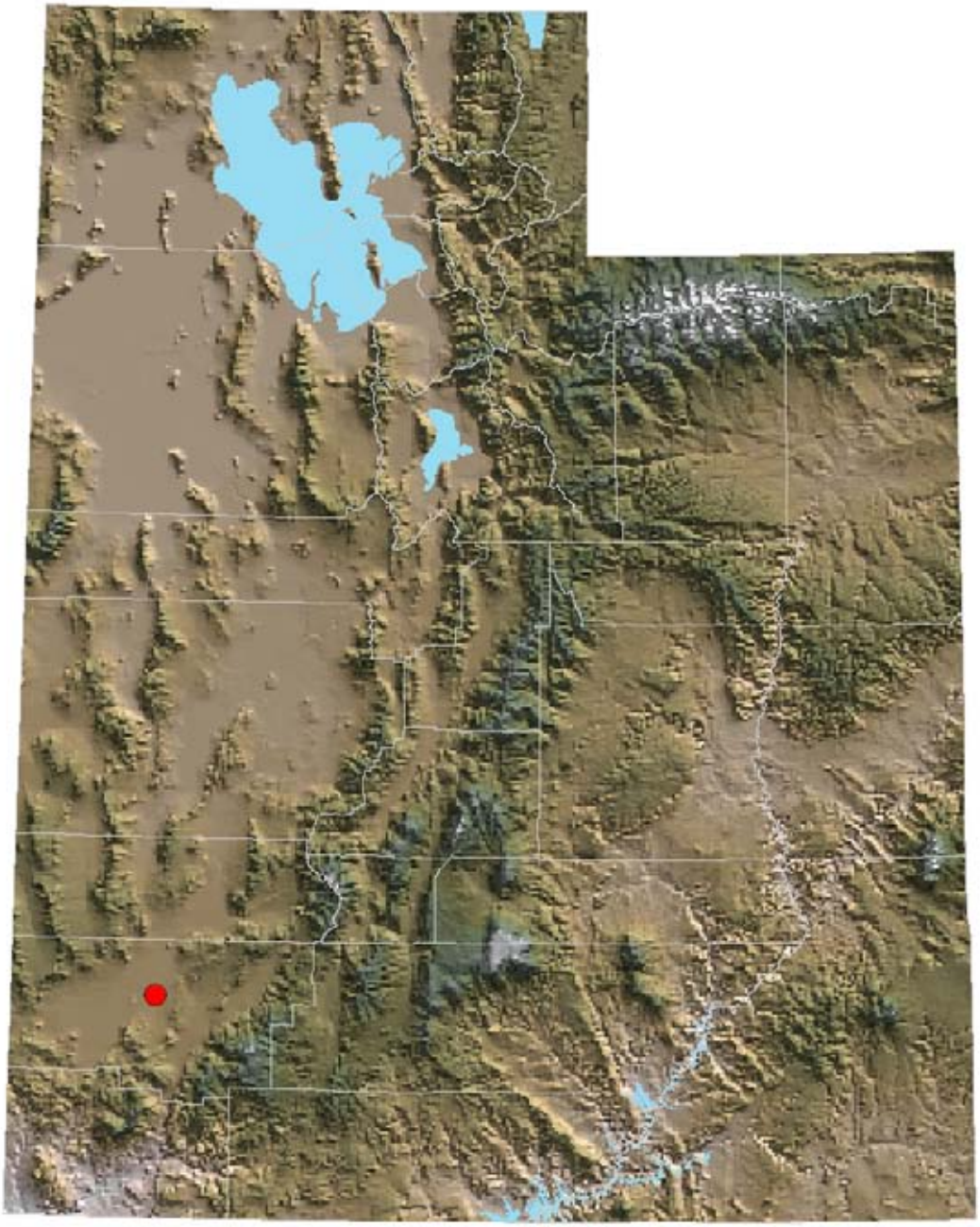

Figure 9. The distribution of Avon milkvetch (*Astragalus avonensis*).

Cutler's Milkvetch
Astragalus cutleri

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: This taxon continues to be treated by some sources as a variety of the species *preussii* (e.g., NRCS 2005, NatureServe 2005). The common name "Copper Canyon milkvetch" is also used (NatureServe 2005).

CONSERVATION STATUS DESIGNATIONS

It is listed as an "Endangered" species, on the Navajo Nation (NNDFW 2005). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a narrow endemic along a short stretch of the San Juan River, San Juan County, Utah. On the Navajo Nation, it is at the mouths of Copper and Nokai canyons on the south side of Lake Powell. Opposite Copper Canyon in Glen Canyon National Recreation Area, it is known at the mouth of Castle Creek and, to the east, in Mike's Canyon and at the base of Red House Cliffs near Clay Hills Crossing. It grows in salt desert shrub and blackbrush communities primarily in shallow, clay soils along dry washes and on flats below and within hills of the Shinarump and Chinle formations (Roth, pers. comm. 2005a).

There is no recent information for Glen Canyon National Recreation Area. The reservoir currently does not reach as far east as this plant's habitat, making the north side of the river virtually inaccessible (Roth, pers. comm. 2005a). On the Navajo Nation, after several years of survey with little or no success, this year's survey efforts discovered several thousand plants. The first monitoring plots were established. It is speculated that during drought years, when populations are naturally low, grazing by wild donkeys is a severe threat to this plant. In response to this and other concerns, feral donkeys and horses are no longer protected on the Navajo Nation. Cattle also graze in the area (Roth, pers. comm. 2005a).

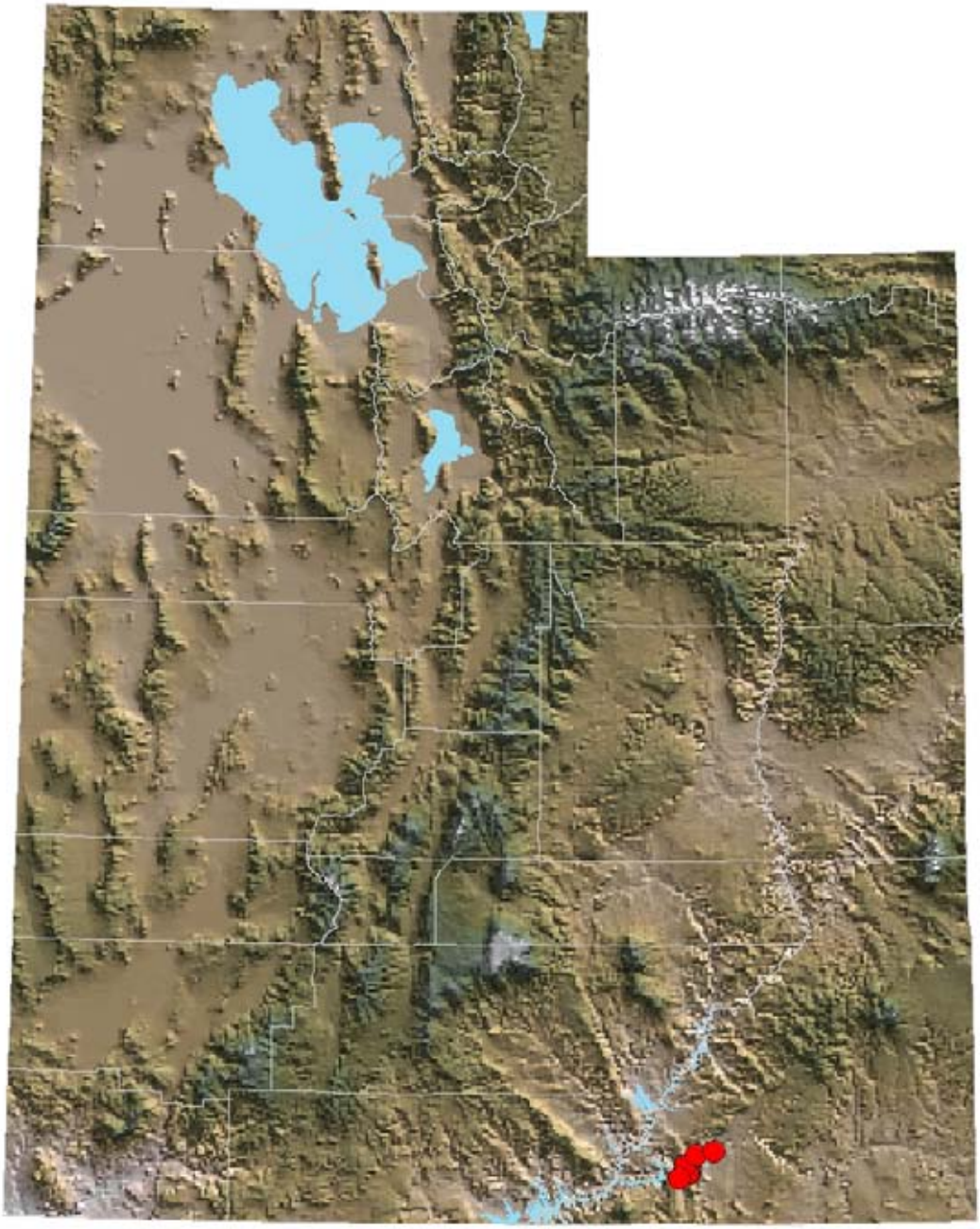

Figure 10. The distribution of Cutler's milkvetch (*Astragalus cutleri*).

Deseret Milkvetch
Astragalus desereticus

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

CONSERVATION STATUS DESIGNATIONS

On 20 October 1999, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 64 Federal Register No. 202). On 30 June 2005, several conservation organizations headed by the Center for Native Ecosystems filed a suit against the Secretary of Interior for failure to "designate critical habitat" and to "develop and implement a recovery plan for the species". It is not known to occur on federal lands.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a narrow endemic on the east side of Thistle Creek valley near the town of Birdseye, Utah Co. It is known "exclusively on sandy-gravelly soils weathered from…the Moroni Formation". It grows in a piñon-juniper community and prefers the natural disturbance of steep south and west facing slopes but also does well on the disturbed surfaces of adjacent road cuts (Franklin 1990a).

The Utah Division of Wildlife Resources and several private landowners own the habitat. The largest portion is the Division's in the form of the Northwest Manti Wildlife Management Area (WMA). Bench tops, above the plant's habitat, have been chained and seeded by the Division to improve its use as big game winter range. Summer grazing occurs, however, due to the steepness of the plant's habitat, frequent access by the cattle is unlikely (Franklin 1990a; Stone 1994a). The private portion of this plant's habitat is a narrow stretch between U.S. Route 89 and the WMA. Concern for the potential loss of this habitat was recently expressed in the filing of a lawsuit in which "suburban sprawl" and "highway expansion" were key phrases (CNE 2005). No current information is available on the status of the occurrence, and there has been no recent documentation of population size estimates or habitat condition.

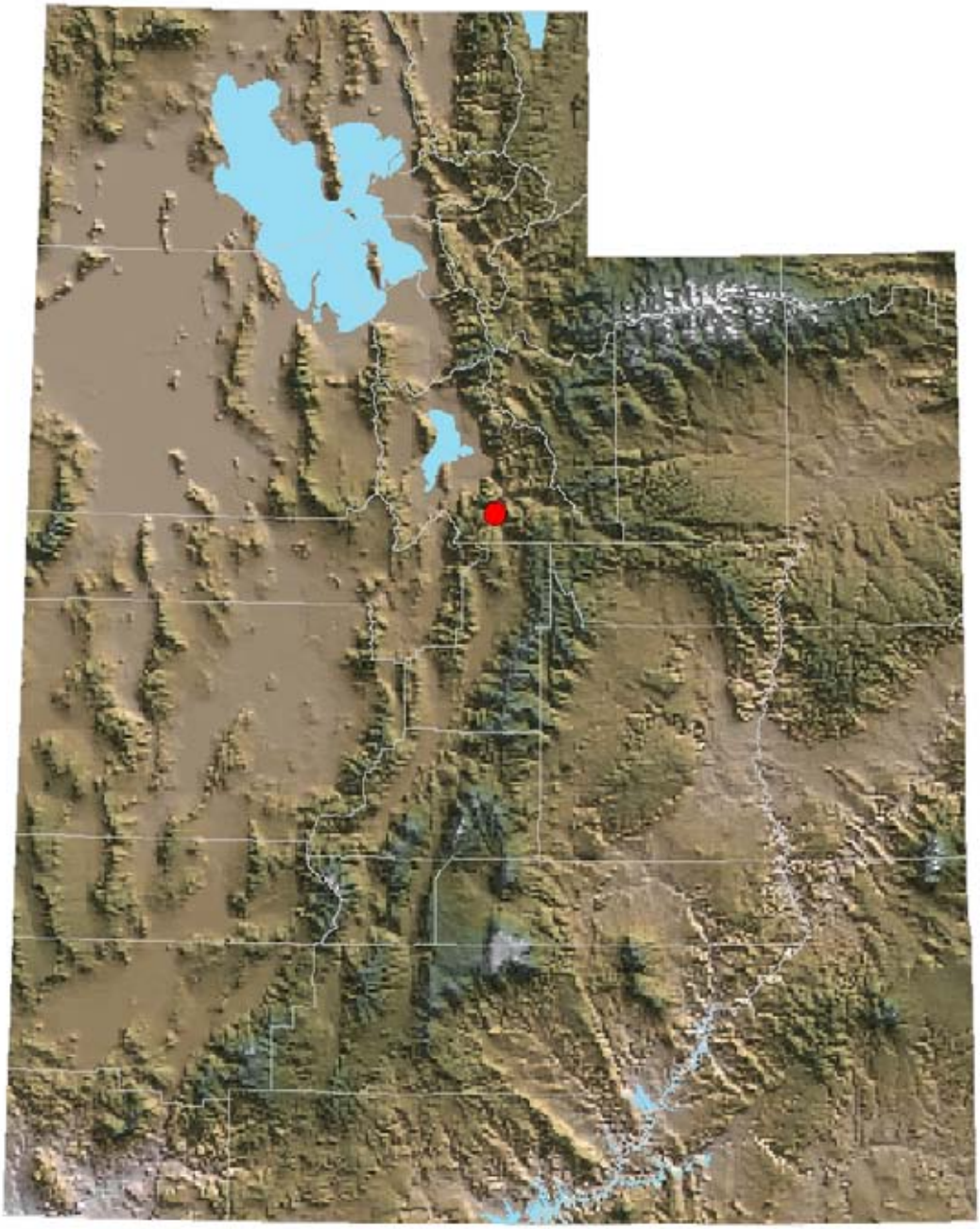

Figure 11. The distribution of Deseret milkvetch (*Astragalus desereticus*).

Horseshoe Milkvetch
Astragalus equisolensis

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: Some authors (e.g., Barneby 1989) consider this taxon to be a variety. As a variety, it is recognized under the name *Astragalus desperatus* var. *neeseae*.

CONSERVATION STATUS DESIGNATIONS

On 27 September 1985, this species was designated as a category 1 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 50 Federal Register No. 188). Following the 1996 discontinuation of category 1 and 2 candidates, it remained a candidate taxon, ready for proposal. As a federal candidate species, it is of concern to USDI Bureau of Land Management, Vernal Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

In the Uinta Basin, this species is known from the vicinity of Horseshoe Bend on the Green River, Uintah County. Here, within an outer-limits boundary encompassing perhaps less than twelve square miles, it is found at scattered locations from Horseshoe Bend, east to Walker Hollow and south to Baser Wash. In the Basin, where always associated with the Duchesne River Formation, it grows in mixed desert and salt desert shrub communities. It is found in sandy-silty soils, river terrace sands and gravels, and ground level crevices of rock outcrops (Franklin 1992). Once thought to be a Uinta Basin endemic, it is now considered to be disjunct near Gateway, Mesa County, Colorado (Barneby 1989; Welsh et al. 2003).

Franklin (1992) estimated the Horseshoe Bend population at approximately 10,000 plants, but its current status, both size estimates and habitat condition, is unknown. Sheep and cattle are grazed in its habitat, but long-term effect to the species is unknown. Oil and gas development has had impacts in the past (Welsh and Neese 1984; Franklin 1992), and the ever-present potential for such impacts has been an ongoing concern (Welsh and Neese 1984; Franklin 1992). The Uinta Basin has again become an area of intense oil and gas exploration and development, and, with the current oil crisis, the development of both tar sands and oil shale are again of interest in the Basin.

With the acceptance of this taxon's distribution into Colorado, at a location approximately 100 miles distance from known Utah locations, it is likely that its status as a candidate will be reevaluated.

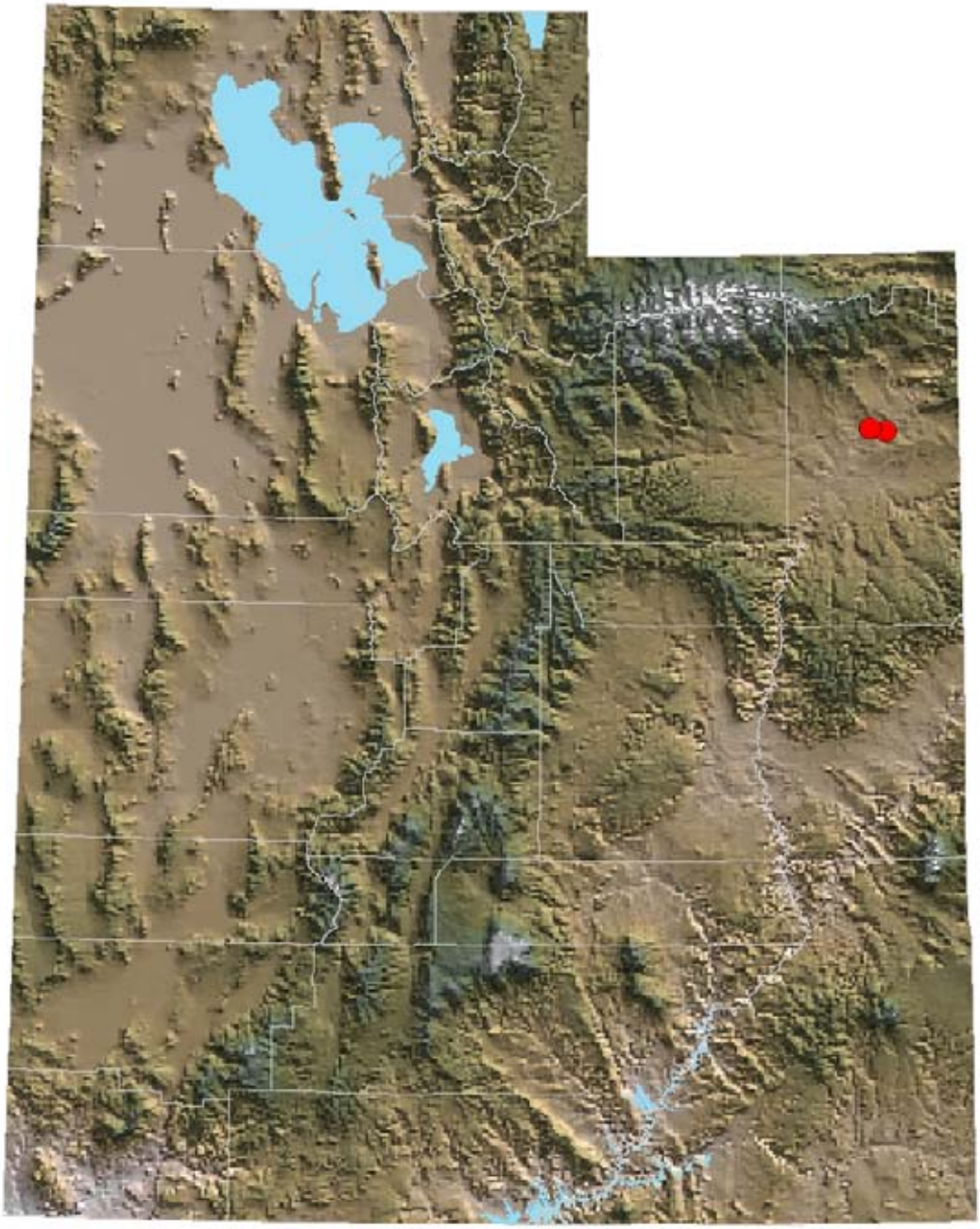

Figure 12. The distribution of Horseshoe milkvetch (*Astragalus equisolensis*).

Paradox Milkvetch
Astragalus holmgreniorum

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: The common name "paradox (i.e., pair-o'-docs, Drs. Noel and Patricia Holmgren) milkvetch" was given to this plant by the species author, Dr. Rupert C. Barneby (e.g., Barneby 1989). However, the common name "Holmgren's milkvetch" is most used.

CONSERVATION STATUS DESIGNATIONS

On 28 September 2001, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 66 Federal Register No.189). As a federal endangered species, it is of concern to USDI Bureau of Land Management, St. George Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

Mostly in Utah, this species is endemic to extreme south-central Washington County and immediately adjacent Arizona, Mohave County. It grows in sparsely vegetated warm desert shrub communities associated always with *Acamtopappus sphaerocephalus* and *Lycium andersonii*. It is found in shallow soil on surfaces overlain with a gravelly veneer and is topographically positioned to receive water "run-off" from adjacent slopes. These habitat features are believed to improve moisture reception and retention (Harper and Van Buren 1997b).

As a short-lived species, this plant must frequently reestablish itself from seed (Harper and Van Buren 1997). Monitoring of its habitat has documented that the predominant plant cover, in a habitat of naturally limited cover, is provided by exotic species, i.e., species that emerge early reducing the availability of nutrients and moisture for young seedlings. Trampling by cattle has been shown to disturb seedlings significantly (Van Buren and Harper 2004b). Observations indicate that hiking, off-road vehicle use and equestrian traffic are increasing in this plant's habitat. Perhaps the greater concern is the absolute loss of habitat resulting from residential growth and other associated urban development (Van Buren and Harper 2004b).

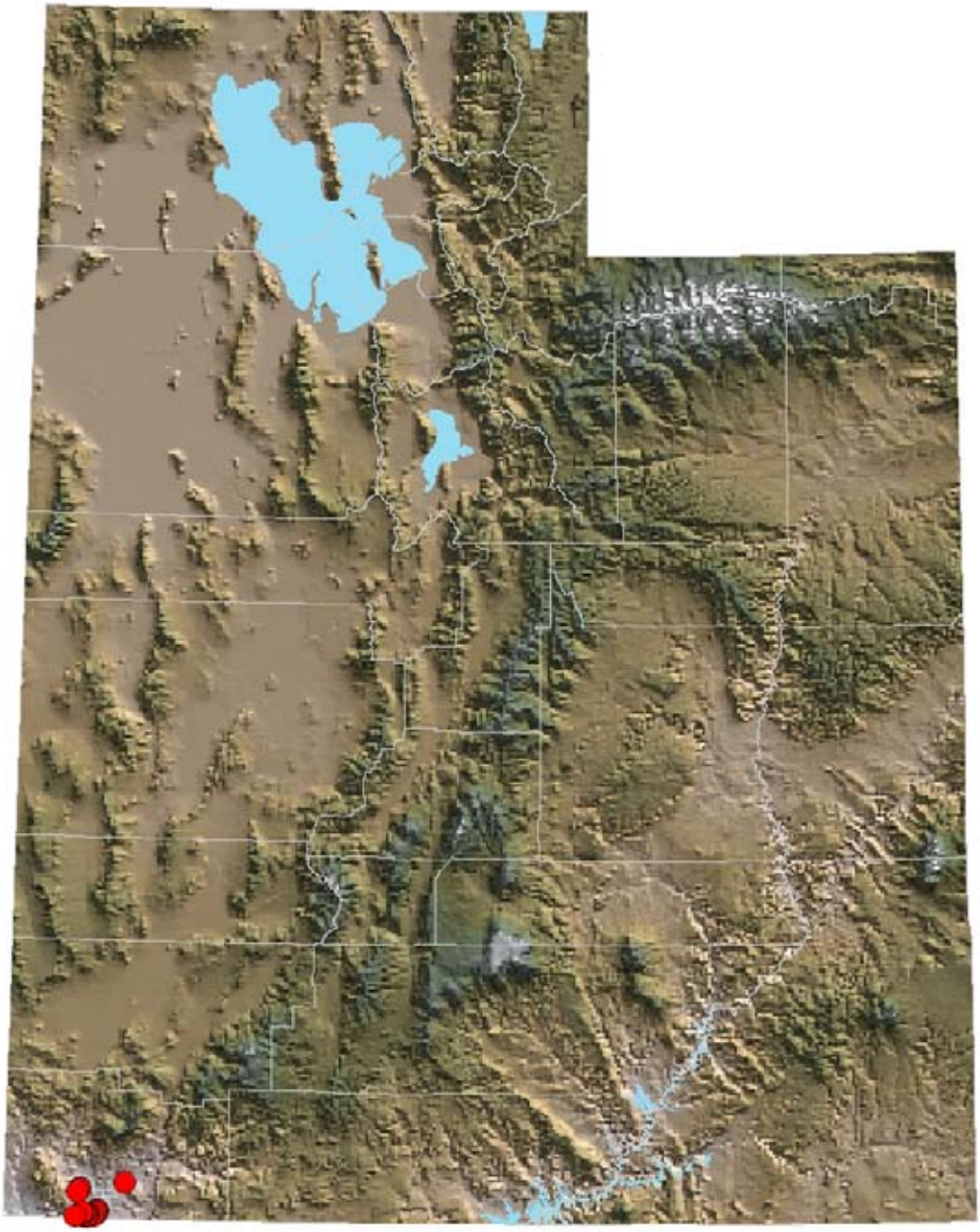

Figure 13. The distribution of paradox milkvetch (*Astragalus holmgreniorum*).

Isely's Milkvetch
Astragalus iselyi

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies. It was formerly on the BLM Sensitive Plant List (Lamb 1996), and a category 2 candidate for listing under the Endangered Species Act 1973, as amended (Vol. 58 Federal Register No. 188). Though known on Manti-La Sal National Forest, it is not on the Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004).

DISTRIBUTION AND ABUNDANCE IN UTAH

Isely's milkvetch is endemic to the west slope of the La Sal Mountains, Grand and San Juan counties. It is currently known from Onion Creek, the only Grand County site, Brumley Ridge and the Pack Creek area and sporadically south, with one apparent unoccupied stretch of four miles, to the vicinity of La Sal Junction. Its habitat is in piñon-juniper and desert shrub communities on sandy to gravelly clay slopes and in draws on substrates weathered from the Morrison and Mancos formations (Franklin 2003a).

There appears to be a misperception concerning the abundance of the species. Its seed dispersal, in part, begins from stable "source site" locations. Seeds travel down-slope along naturally disturbed drainage bottoms into larger wash bottoms and, along the way, onto locations of man-caused disturbance, e.g., roadside ditches and little used 4x4 tracks, where they become, at least temporarily, established. Some years, this plant is very abundant on these unnaturally disturbed locations; many of the current herbaria collections are from such locations. This occasional roadside-abundance has perpetuated a false impression of this plant's overall abundance. The stable "source site" locations actually appear to be extremely limited (Franklin 2003a). Loss of these sites may be the greatest threat to the persistence of this plant's populations. The Morrison and Mancos formations are a source for uranium. Due to uranium price increases, there is an ongoing rush in the restaking of old claims by claimants and in the staking of new ones (Trotter, pers. comm. 2005).

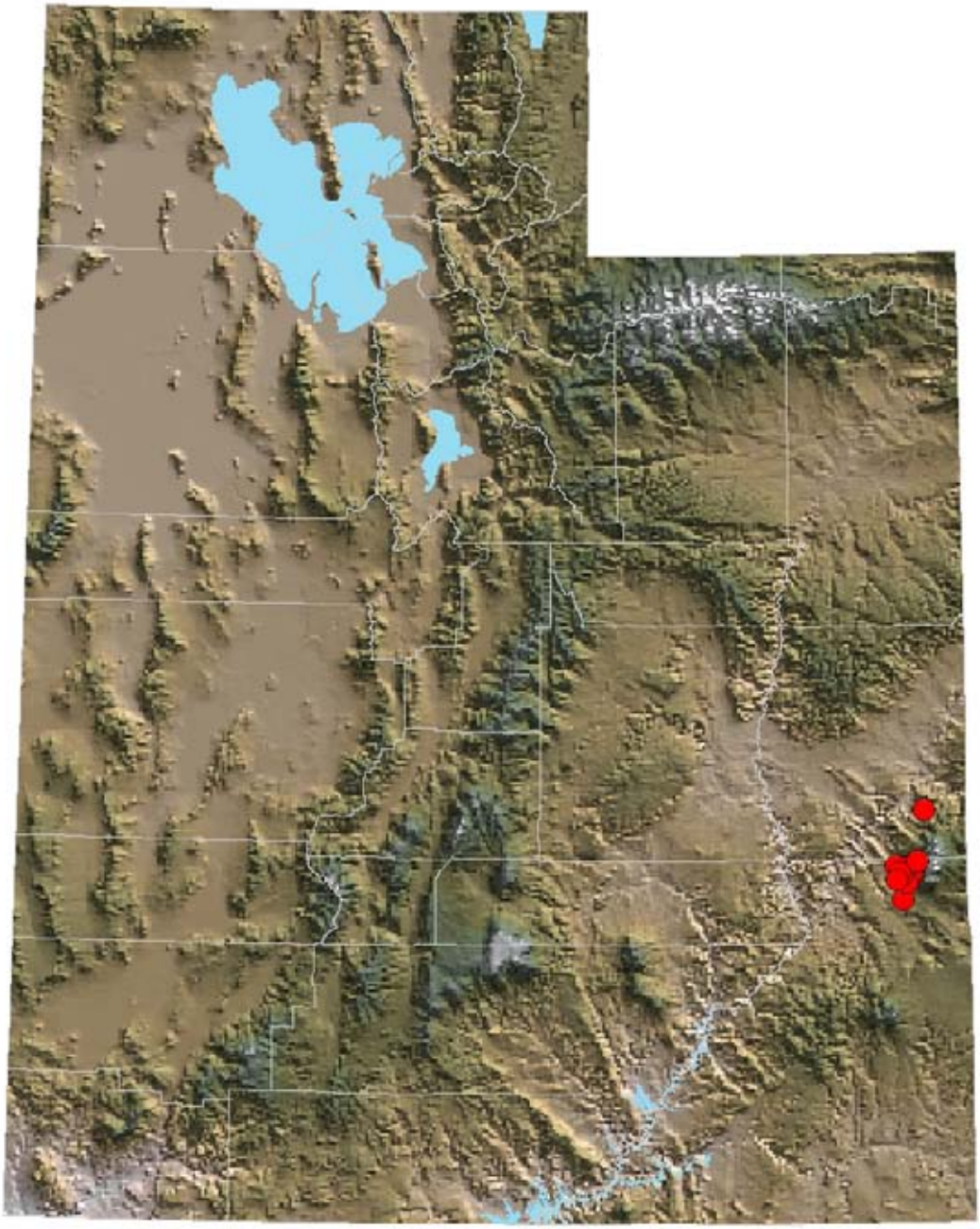

Figure 14. The distribution of Isely's milkvetch (*Astragalus iselyi*).

Heliotrope Milkvetch
Astragalus montii

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: Some authors (e.g., Barneby 1989) consider this taxon to be a variety of the species *Astragalus limnocharis*. The common names "Mont's milkvetch" and "Mont Lewis' milkvetch" have also been used (e.g., Barneby 1989, Stone 1994).

CONSERVATION STATUS DESIGNATIONS

On 6 November 1987, this species is designated as threatened under the Endangered Species Act of 1973 (Vol. 52 Federal Register No. 215). In 1995, the FWS announced the availability of a draft recovery plan (Vol. 60 Federal Register No. 187); it has not been implemented. As a federal threatened species, it is of concern to USDA U.S. Forest Service, Manti-La Sal National Forest.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to the southern Wasatch Plateau on Ferron, Heliotrope and White mountains in Sanpete and Sevier counties. It grows on high elevation barren areas in communities of cushion plants and other low-growing species scattered within a more extensive subalpine conifer forest. It is found in shallow, very rocky soils derived from Flagstaff Limestone (Tuhy 1990).

It is known from only three populations with a total estimate of 145 acres of occupied habitat and a total estimated population of nearly 2 million plants, 65% occurring in one population. In 1989 the last remaining area of what forest personnel thought could be potential habitat was surveyed; no new locations were discovered. Of primary concern are impacts to the preferred hard, pavement-like surface on which it grows. Disturbance results in an increase of exposed mineral soils and a shift in species composition, i.e., the degradation of preferred habitat. Trailing through and bedding on habitat by domestic sheep are causes of such disturbance, but current policy dictates that its habitat is to be avoided (Tuhy 1990). Tuhy (1990) also indicates that if introduction to new sites were to be considered, there are unoccupied sites of apparent potential habitat.

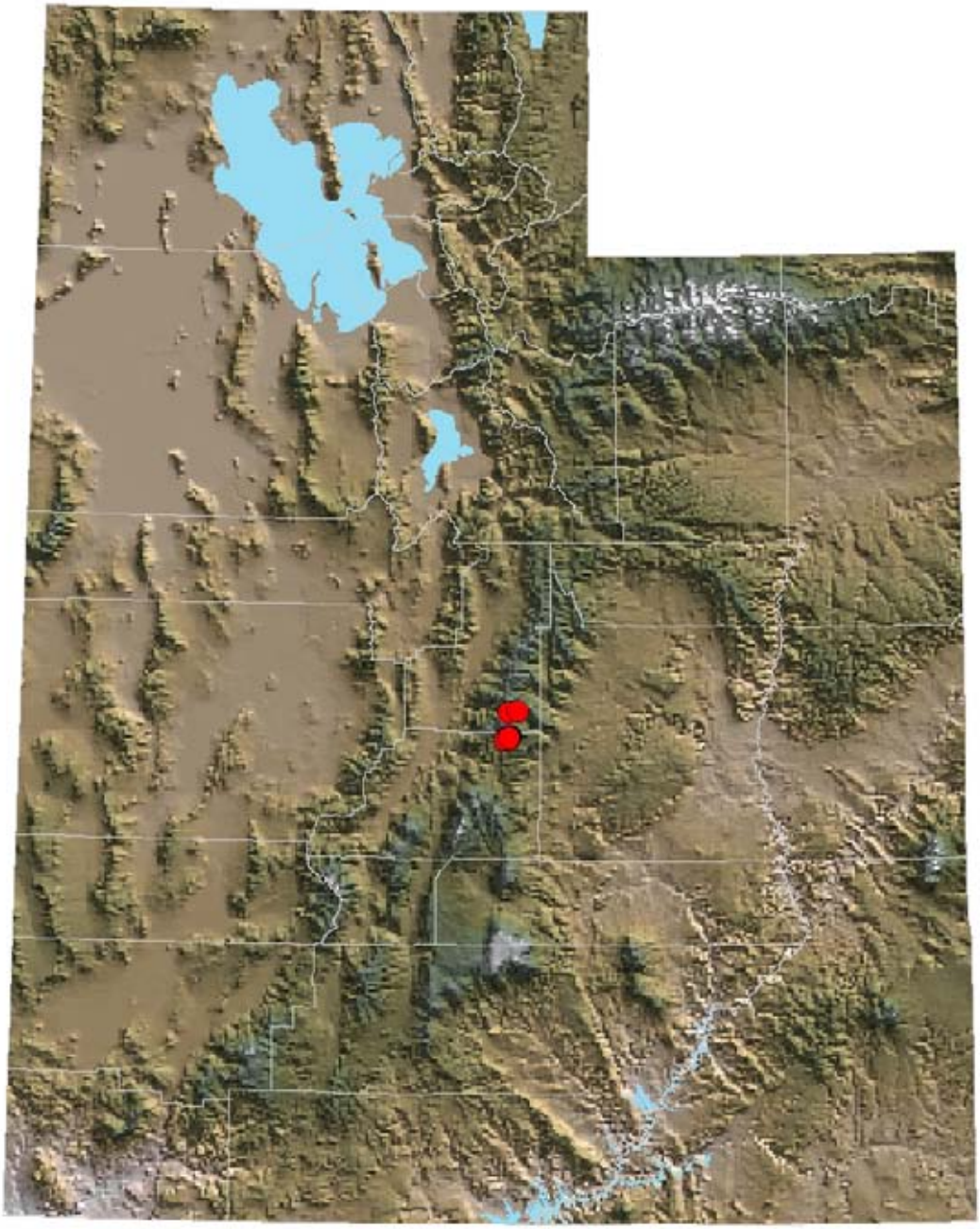

Figure 15. The distribution of Heliotrope milkvetch (*Astragalus montii*).

Cisco Milkvetch
Astragalus sabulosus var. *sabulosus*

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: Recently the variety *vehiculus* was differentiated from this, the typical variety (Welsh 1998).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003). As a full species, it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This variety of *Astragalus sabulosus* is known from scattered locations in the Cisco Desert; to the east, from the vicinity of the "town" of Cisco, Cisco Mesa, and Bread Knolls, and to the west, with a break of approximately 13 miles, southeast of Thompson around the half-circle shaped line of hills that border Whipsaw Flat (Franklin 1999).

Numbers of plants and even whether mature plants persist at a location over time has proven to vary from survey to survey (Franklin 1988a; Atwood 1995; Franklin 1999). High numbers documented in 1988 were due to a high percentage of seedlings (Franklin 1988a). Speculation is that observed fluctuations in numbers result from a corresponding fluctuation in precipitation, i.e., first, is there sufficient moisture at the right time for seeds to germinate, and second, if they germinate, will they survive the hot summer and persist. Though a single monitoring site was established in 1998, it has not been revisited. The continuous collection of data would be useful for evaluating trends. At the several locations of this taxon, Atwood (1995) notes evidence of excessive livestock grazing, i.e., its having an effect on native vegetation, the invasion of cheat grass, excessive trailing; past and present highway construction and maintenance; and oil and gas pipelines, drill pads and access roads. Suggestions as to possible solutions to the above concerns are provided along with preliminary recommendation as to locations that should be considered as essential habitat.

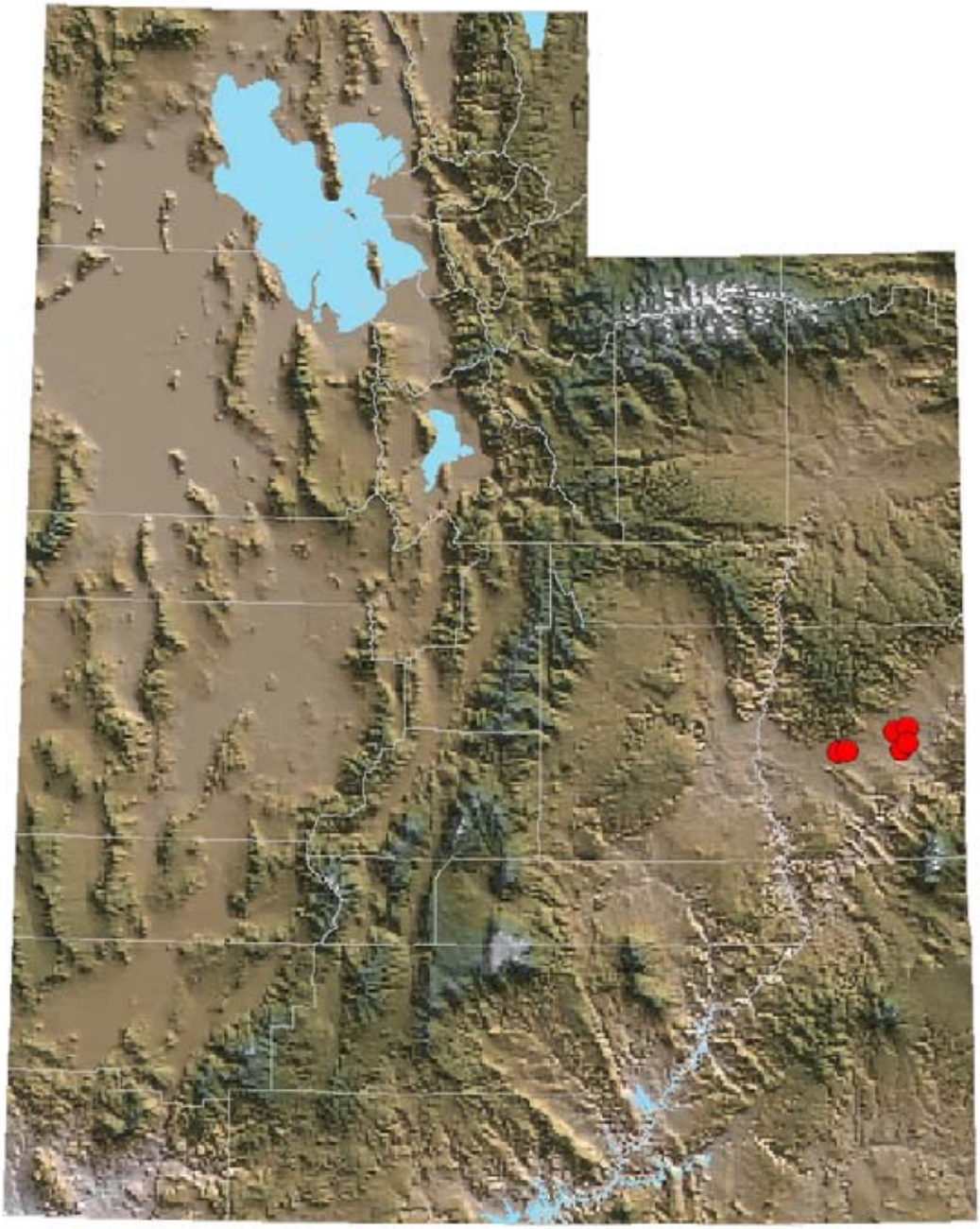

Figure 16. The distribution of Cisco milkvetch (*Astragalus sabulosus* var. *sabulosus*).

Stage Station Milkvetch
Astragalus sabulosus var. *vehiculus*

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: The name, "stage station milkvetch", is "derived from the type locality which is near a historic stage coach station along the pioneer trail from Moab to Green River (Welsh et al. 2003)."

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003). The full species *sabulosus* was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This variety of *Astragalus sabulosus* occurs approximately 13 miles northwest of Moab, north and east of Courthouse Rock. It is known only from this single location. It grows primarily in an *Atriplex confertifolia - Hilaria jamesii* community, but on benches and along upper draw slopes, it is occasionally found in an *Atriplex confertifolia - Coleogyne ramosissima* mix. It is on fine textured soils derived from the Early Cretaceous Cedar Mountain formation (Franklin 1988a and 1999).

There have been as many as an estimated 10,000 plants with 50% of them being indicated as mature (Atwood 1995); during later drought years, these numbers were much lower. The habitat is dissected by a primary recreation access road that is heavily used by mountain bikers and 4x4 vehicles. The area is open to cattle grazing and a power line transects the habitat. Trampling of seedlings by grazing livestock and major power line maintenance could have a significant impact on the species. As a selenophyte, and likely poisonous, it is doubtful that cattle eat it. It is possible that the implementation of an off-road use plan and coordination with the power company would assist in preventing negative impacts (Atwood 1995; Atwood and Franklin 1996).

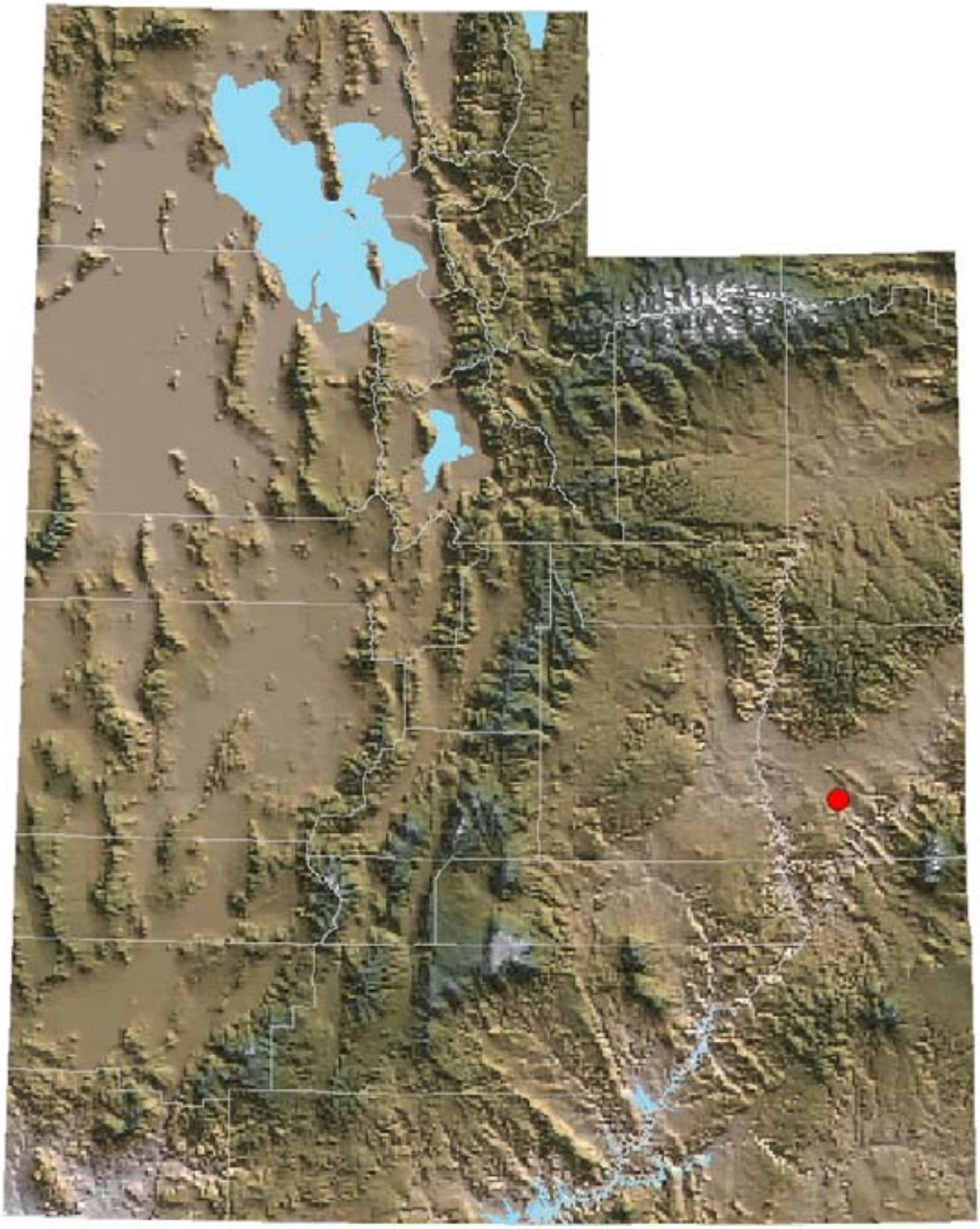

Figure 17. The distribution of stage station milkvetch (*Astragalus sabulosus* var. *vehiculus*).

Currant Milkvetch
Astragalus uncialis

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon occurs in west-central Utah, Millard County, and east-central Nevada in the vicinity of Currant, northeastern Nye County. In Utah, it is known from the slopes of Long Ridge, north of Sevier Lake, south to the shores of Sevier Lake and down its western edge as far as Steamboat Wash. It has a north-to-south distribution of approximately 34 miles and east-west "varying from approximately 15 miles at its widest, across the north end of Sevier Lake, to a variable < 1 up to 3 miles down the lakes west side (Franklin 1996a)." It inhabits salt desert shrub communities with *Atriplex confertifolia*, *Artemisia spinescens*, *Kochia americana*, *Ephedra nevadensis*, *Tetradymia nuttallii*, *Hilaria jamesii*, and *Krascheninnikovia lanata*, on "soil [that] is a light gray to white, seldom buff colored clay overlain with gravels; both soil and gravels are of calcareous origin and the soil probably alkaline (Franklin 1996a)".

Franklin (1996a) estimated the population for the sites actually visited at 70,000 plants with a combined area of approximately 1,700 acres. Its habitat is within winter sheep grazing allotments and a summer cattle allotment that is on a rest rotation cycle. No immediate impacts from either were observed; "long term impacts to [it] and its habitat, if any, are unknown." Oil exploration activities were present on the east side of the lake but not the west. Additional survey to define better boundaries, especially around Long Ridge, was recommended.

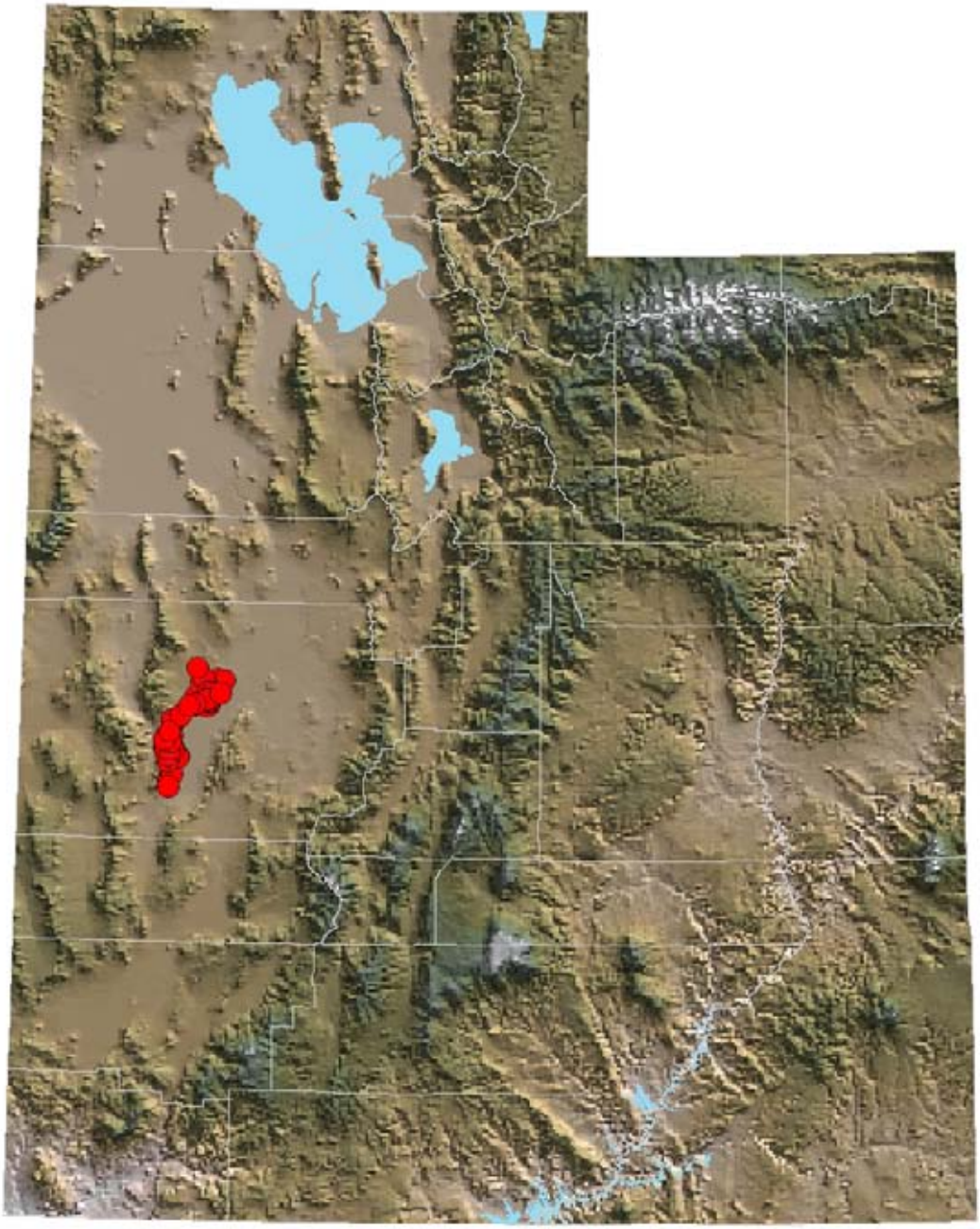

Figure 18. The distribution of Currant milkvetch (*Astragalus uncialis*).

Guard Milkvetch
Astragalus zionis var. *vigulus*

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: The common name "Browse milk-vetch" has been used (e.g., Stone 1998). The type collection came from along the "Browse road to Guard station" (Welsh et al. 2003), hence the common names.

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southwest Utah endemic on the east slopes of the Pine Valley Mountains, Washington County. It grows in "pinyon-juniper, mountain mahogany, and oak-Garrya communities (Welsh et al. 2003)".

This taxon has not had a systematic survey to document the status of its populations, i.e., to estimate numbers of plants, to evaluate the condition of its habitat or to observe potential impacts. Livestock grazing, recreation and perhaps other multiple-use activities are occurring on Forest-managed lands.

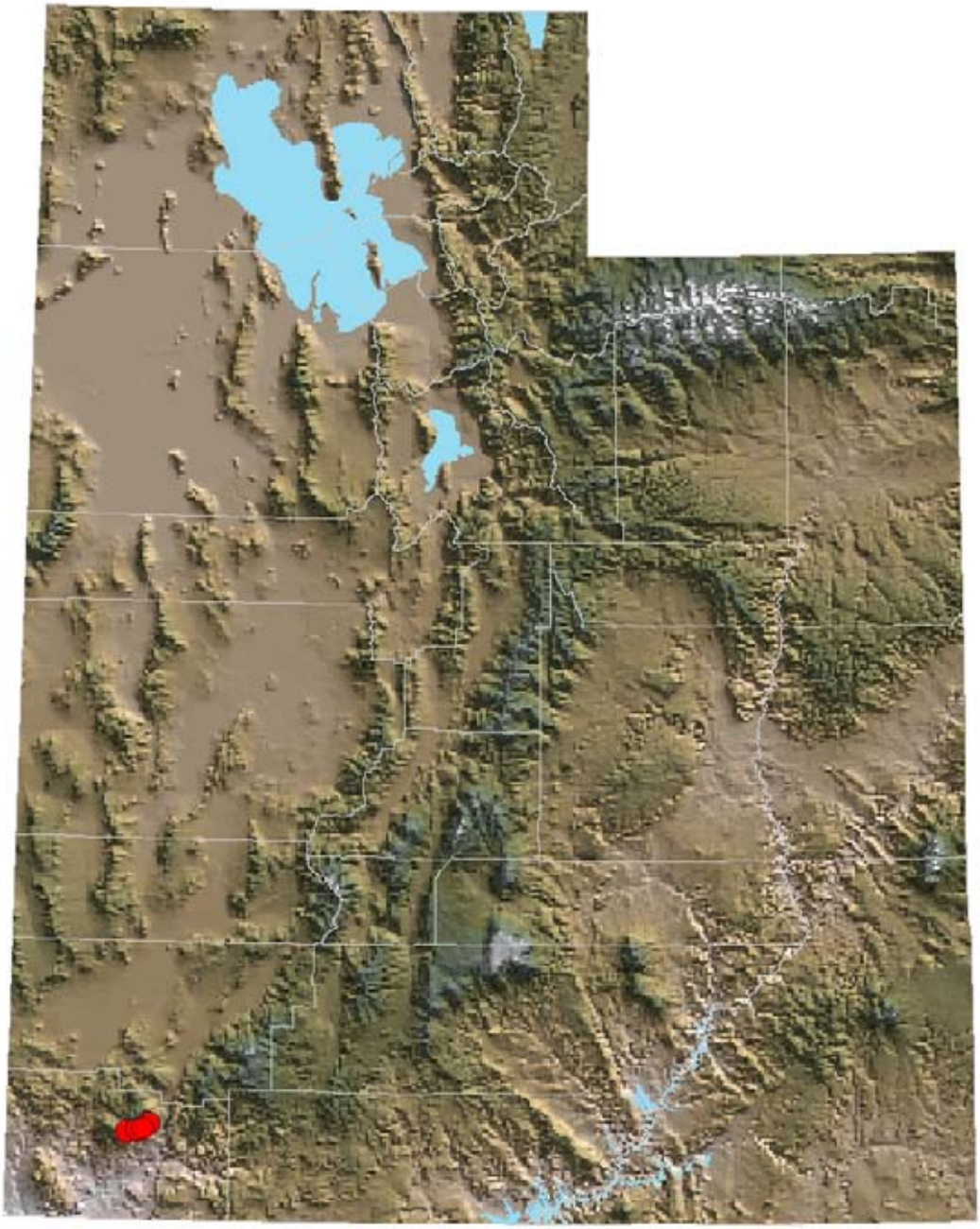

Figure 19. The distribution of Guard milkvetch (*Astragalus zionis* var. *vigulus*).

Dainty Moonwort
Botrychium crenulatum

TAXONOMY AND NOMENCLATURE

FAMILY: Adder's Tongue (Ophioglossaceae)

OTHER NAMES: Some authors (e.g., Welsh et al. 2003) consider this taxon to be a synonym of *Botrychium lunaria*. Other common names that are currently or that have been applied to this taxon are "crenulate moonwort", "scalloped moonwort", and "wavy moonwort".

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188). Though on BLM managed lands, it has not yet been included on the BLM's Sensitive Plant Species List (Fortner 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species ranges widely beyond Utah. It is known from all western states north and west of Arizona and Colorado (NatureServe 2005). In Utah, there are two recently documented locations, Silver Meadow, Wasatch County, and Tony Grove, Cache County. Silver Meadow is a saturated wet meadow community with perennial herbs, *Carex* sp., and *Juncus* sp. and with *Salix wolfii* growing in scattered clumps in the wettest part of the meadow. There are four additional historic locations, i.e., another site in the Bear River Range, Cache County, Dead Horse Pass and the Spirit Lake area, Summit County, and in the Deep Creek Range, Juab County (UTHP 2005).

The Tony Grove location had only two or three plants, however, the recent estimate at only the densest portion of the Silver Meadow population was 40,000 plants (Van Keuren, pers. comm. 2005b). Tony Grove plants are in an area open to sheep grazing and are located immediately adjacent to a foot trail; there are potential impacts from both activities. Adjacent to Silver Meadow is a popular undeveloped camping area that has resulted in past human-caused impacts, i.e., the presence of recreational stock and some ATV use. A fence has been built to help prevent continuing impacts. The relocation of historic populations would assist in the evaluation of this plant's status in Utah.

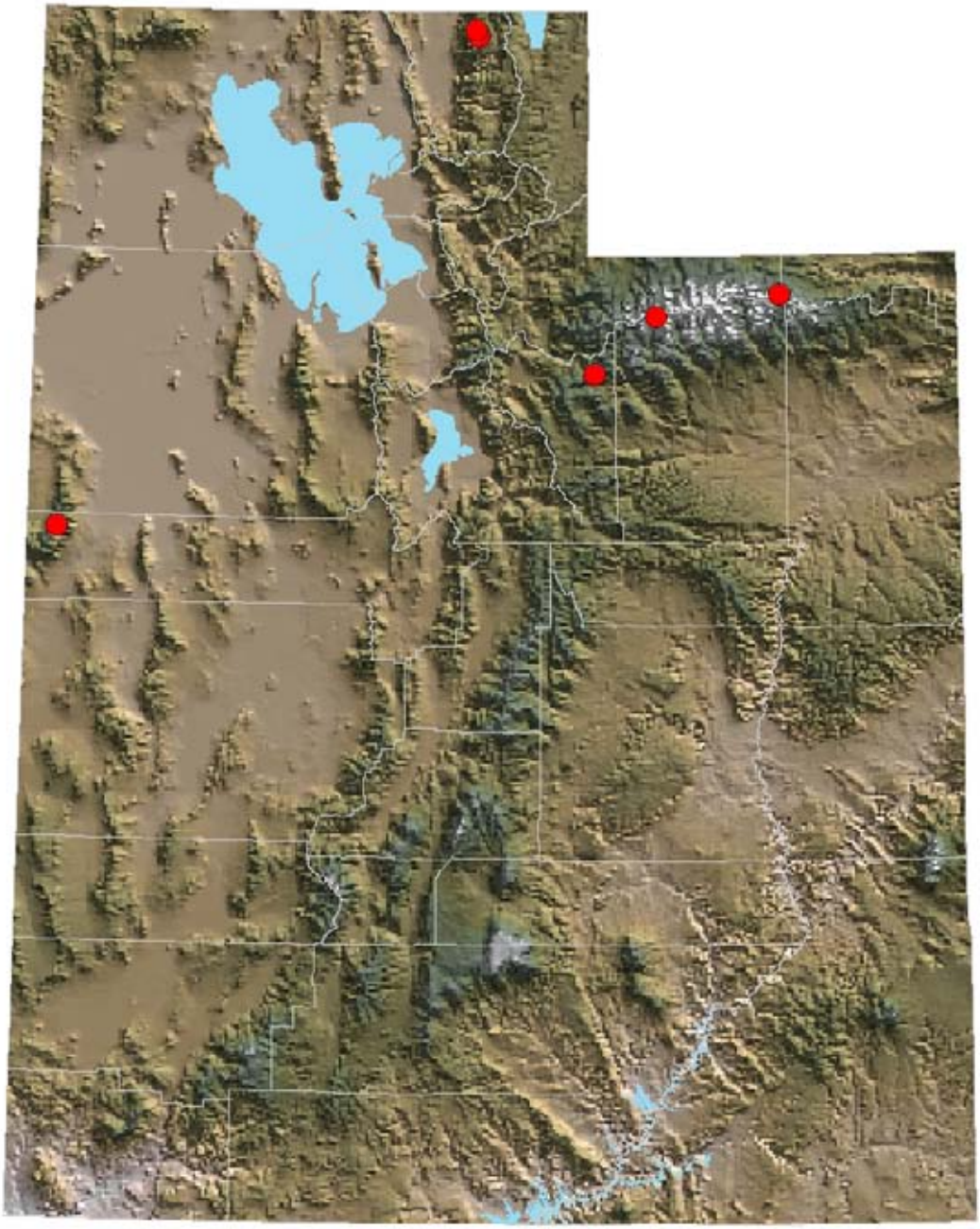

Figure 20. The distribution of dainty moonwort (*Botrychium crenulatum*).

Slender Moonwort
Botrychium lineare

TAXONOMY AND NOMENCLATURE

FAMILY: Adder's Tongue (Ophioglossaceae)

OTHER NAMES: Welsh et al. (2003) do not recognized this taxon, nor do they place it anywhere in synonymy. Other common names available are "linearleaf moonwort", "skinny moonwort" and "narrowleaf grapefern".

CONSERVATION STATUS DESIGNATIONS

On 30 September 1993, this plant was designated as a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188). Following the 1996 discontinuation of category 2 candidates, it was removed from the list. Following a 1999 petition to list from the Biodiversity Legal Foundation, on 6 June 2001, slender moonwort was designated as a candidate for listing (Vol. 66 Federal Register No. 109). As a federal candidate species, it is of concern to the Wasatch-Cache and Ashley National Forests.

DISTRIBUTION AND ABUNDANCE IN UTAH

From beyond Utah, this taxon is known from all of the northwest states and into Canada. In Utah, it is known from only two historic collections, i.e., from "near Silver Lake" in Big Cottonwood Canyon, Salt Lake County, and from the "Summit of Indian Canyon, Duchesne-Price Road", either Duchesne or Carbon County. No habitat is provided for the Silver Lake location, but in the area are both wet and dry meadows and forest understory. The Indian Canyon collection provides, "dense shade of aspen-fir with *Pachystima* as ground cover (UTHP 2005)."

No information is available documenting the status of populations. Although in 2003 and 2004 intensive surveys were conducted in what is presumed to be historical habitat at Silver Lake, the moonwort was not relocated. The area around Silver Lake and much of Big Cottonwood Canyon is devoted to recreation. Elevated walkways have been constructed through the dry to wet meadow communities surrounding the lake, protecting potential habitat from recreation impacts (Padgett, pers. comm. 2005a). An unsuccessful effort was made to relocate it at the head of Indian Canyon in 2005 (Goodrich, pers. comm. 2005). Here, livestock grazing, recreation and perhaps other multiple-use activities are occurring on Forest-managed lands.

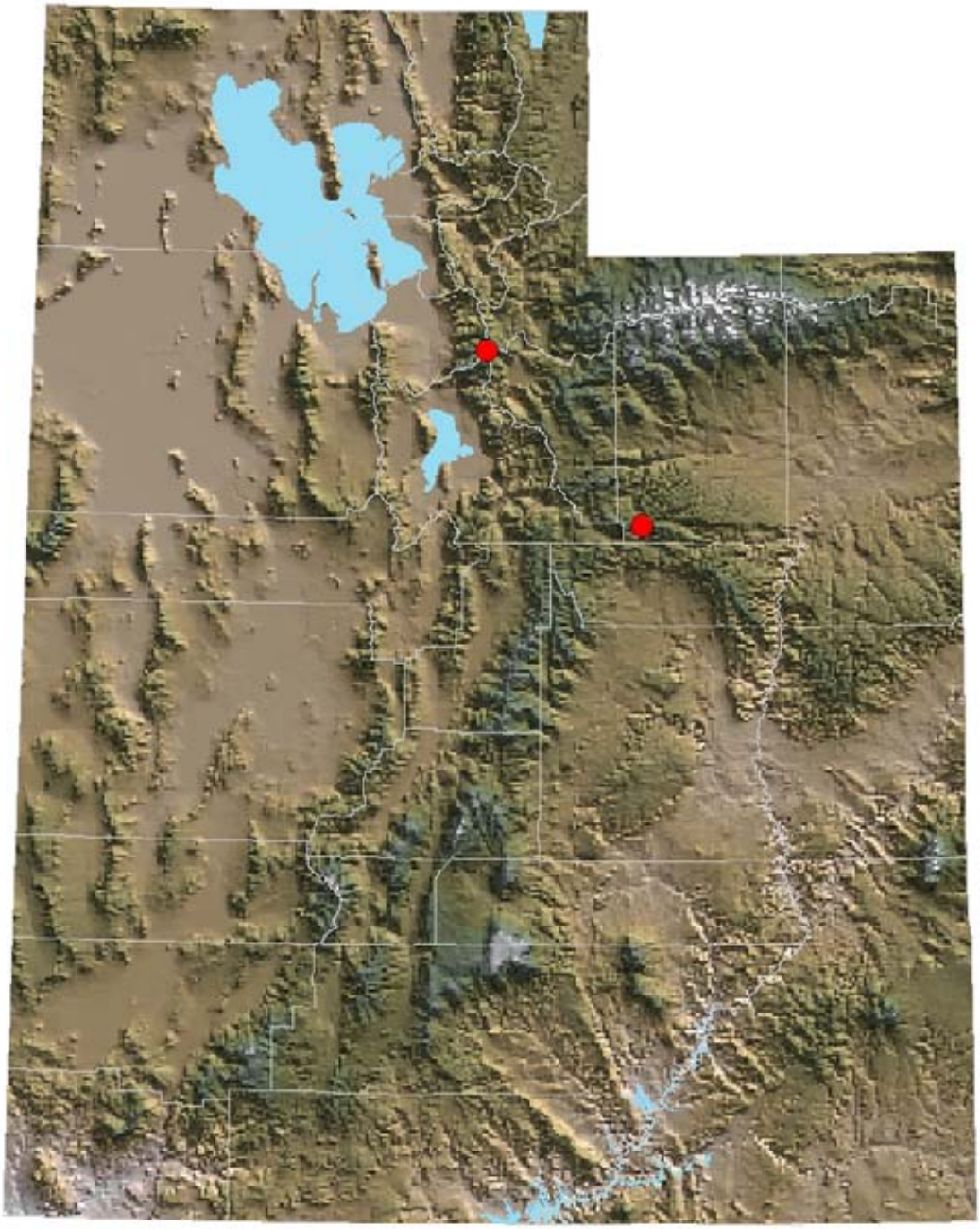

Figure 21. The distribution of slender moonwort (*Botrychium lineare*).

Navajo Sedge
Carex specuicola

TAXONOMY AND NOMENCLATURE

FAMILY: Sedge (Cyperaceae)

OTHER NAMES: Goodrich, in Welsh et al. (2003), does not recognize the presence of this taxon in Utah. After having examined specimens from along the San Juan River, Goodrich (pers. comm. 2004) writes, "it became evident that specimens from Utah that had been identified as C. specuicola are not convincingly C. specuicola. They match those of C. parryiana much better…. These 2 species look similar and they appear to grade into each other." However, Roth (pers. comm. 2005b) remains convinced that the single Navajo Nation, Utah, occurrence is correctly identified. Spence (pers. comm. 2005) indicates that Glen Canyon National Recreation Area will follow Welsh et al. (2003).

CONSERVATION STATUS DESIGNATIONS

On 8 May 1985, Navajo sedge was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 50 Federal Register No. 89). It is an "Endangered" species on the Navajo Nation (NNDFW 2005).

DISTRIBUTION AND ABUNDANCE IN UTAH

Though more abundant in adjacent Arizona, this species occurs at a single southeast Utah location, i.e., along Chinle Wash, Navajo Nation, San Juan Co. It is found growing "along seeps and springs in hanging gardens, on vertical sandstone cliffs and alcoves of Navajo Sandstone." Associated species include *Mimulus eastwoodiae*, *Aquilegia micrantha* and *Epipactis gigantea* (Roth 2004).

The original site, in a side canyon of the main Chinle Wash, is gone. The cause for its disappearance is unknown, however speculation is that it resulted from a flash flood event, plants were next to the streambed, or overgrazing, numerous livestock are present in the lower canyon. A new site was recently located upstream in the same canyon (Roth, pers. comm. 2005b).

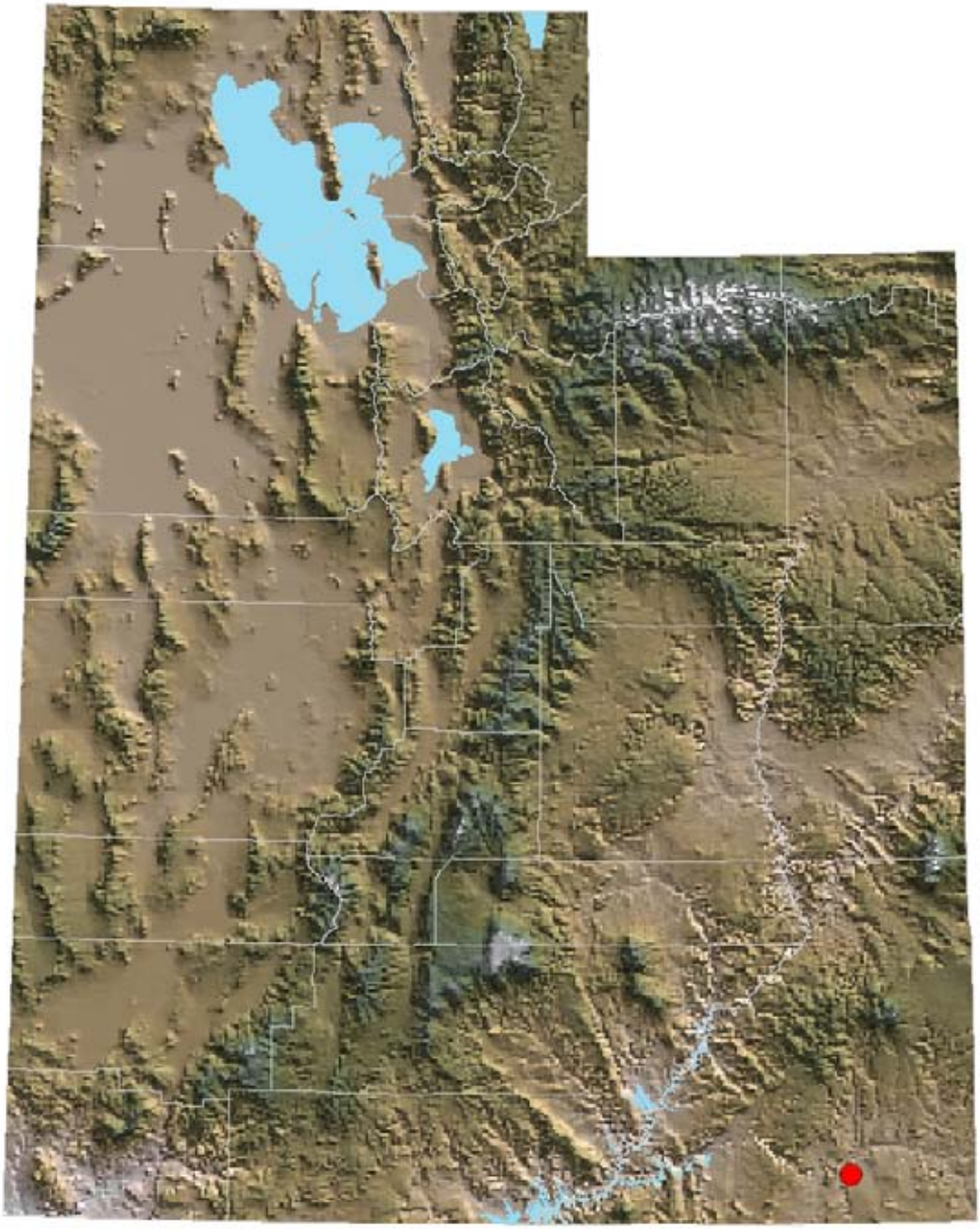

Figure 22. The distribution of Navajo sedge (*Carex specuicola*).

Aquarius Paintbrush
Castilleja aquariensis

TAXONOMY AND NOMENCLATURE

FAMILY: Buttercup (Ranunculaceae)

CONSERVATION STATUS DESIGNATIONS

On 15 December 1980, this species was designated as a category 1 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 45 Federal Register No. 242). This designation, indicating a taxon with "sufficient information" to support listing, was removed in 1983 and restored in 1985. Following the 1996 discontinuation of category 1 and 2 candidates, it remained a candidate species, ready for proposal. As a federal candidate species, it is of concern to USDA Forest Service, Dixie National Forest.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to south-central Utah at high elevations on the Aquarius Plateau and Boulder Top, Garfield and Wayne counties. It occurs in openings containing silver sagebrush - sheep fescue communities that are interspersed with conifer-aspen forest patches, and in soils that are mostly clay loams or clay sands containing gravel, often with angular cobbles and rocks (Tuhy 1991).

Tuhy (1991) reported seven known populations containing an estimated 42,000 plants, the largest being on Boulder Top. Monitoring plots established in 1990 (Tuhy 1991) have been read yearly as a requirement of the 1996 conservation agreement (USFS and USFWS 1996) for this species. In 2004, in response to an internal review of candidate species by the U. S. Fish and Wildlife Service, the Dixie National Forest initiated an effort to revisit known sites of this taxon. Of the sites revisited, nearly half had declined in numbers of individuals present. However, the total for all sites combined was an increase over 1990's figures by approximately 67%. New sites were also discovered. It was observed that plants continue to be grazed by sheep and cattle, there are disturbances resulting from the presence of roads, and, in 2005, there was a grasshopper and Mormon cricket infestation. It was concluded that additional survey and continued site revisits were needed to understand better the threat of these impacts (Groebner 2005a).

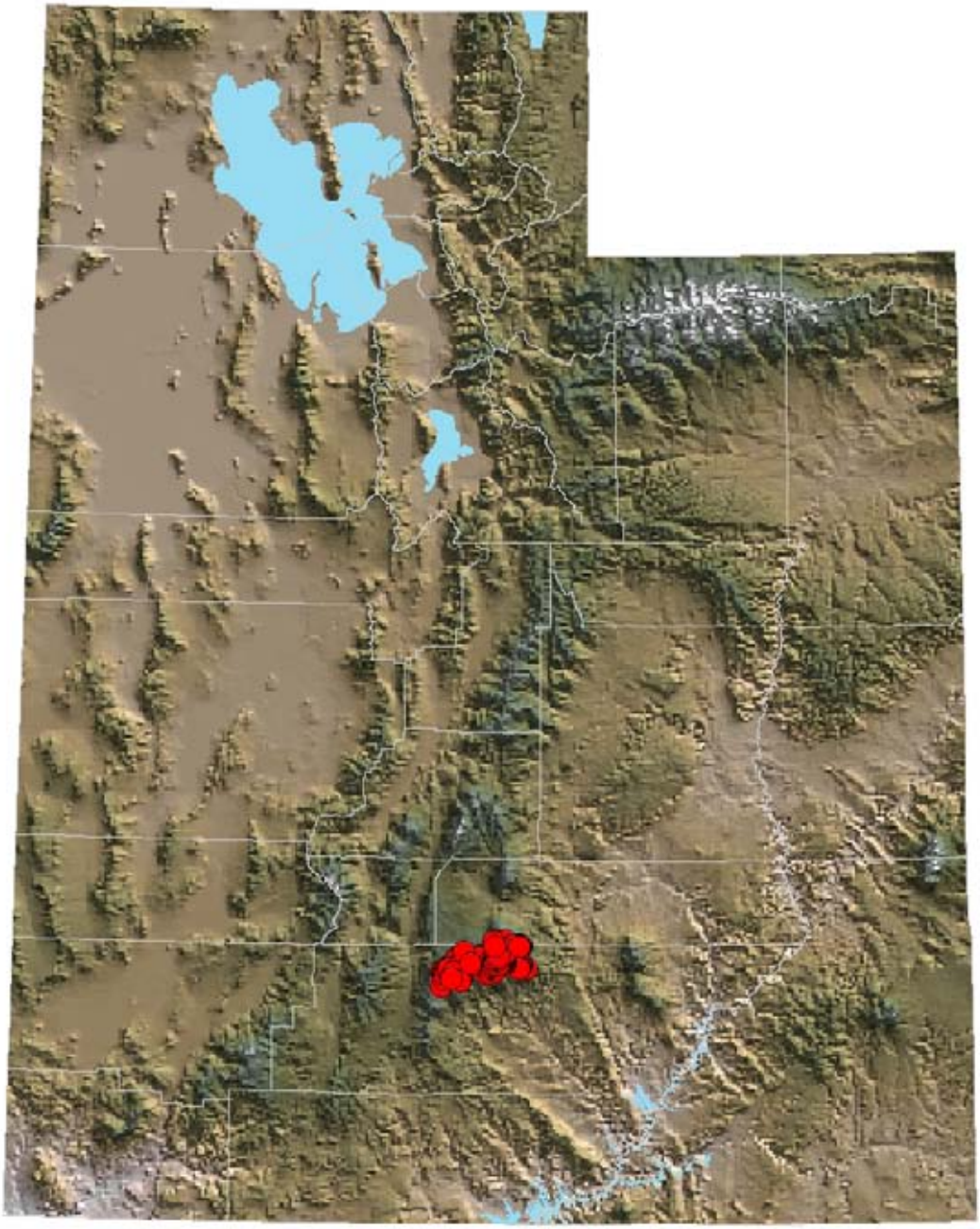

Figure 23. The distribution of Aquarius paintbrush (*Castilleja aquariensis*).

Reveal's Paintbrush
Castilleja revealii

TAXONOMY AND NOMENCLATURE

FAMILY: Buttercup (Ranunculaceae)

OTHER NAMES: Welsh et al. (2003) recognize this taxon as a variety of *Castilleja parvula*. The common names "Reveal's Indian paintbrush" (e.g., NatureServe 2005) and "Bryce Canyon Indian paintbrush" (e.g., NRCS 2005) are also in use.

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a southeast Utah endemic in Garfield, Kane and Iron counties, where it is known from the Paunsaugunt Plateau, Bryce Canyon breaks, the upper drainage of the East Fork Sevier River, the Escalante Mountains and the west margin of the Markagunt Plateau. It grows in "[b]ristlecone and ponderosa pine communities" on the Claron Formation limestone (Welsh et al. 2003, Stone 1998)."

There is little information available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. A portion of this plant's habitat occurs within the Red Canyon Botanical Area, Dixie National Forest, and it is present within the typically protective management jurisdiction of the national park system, i.e., it is in Bryce Canyon National Park.

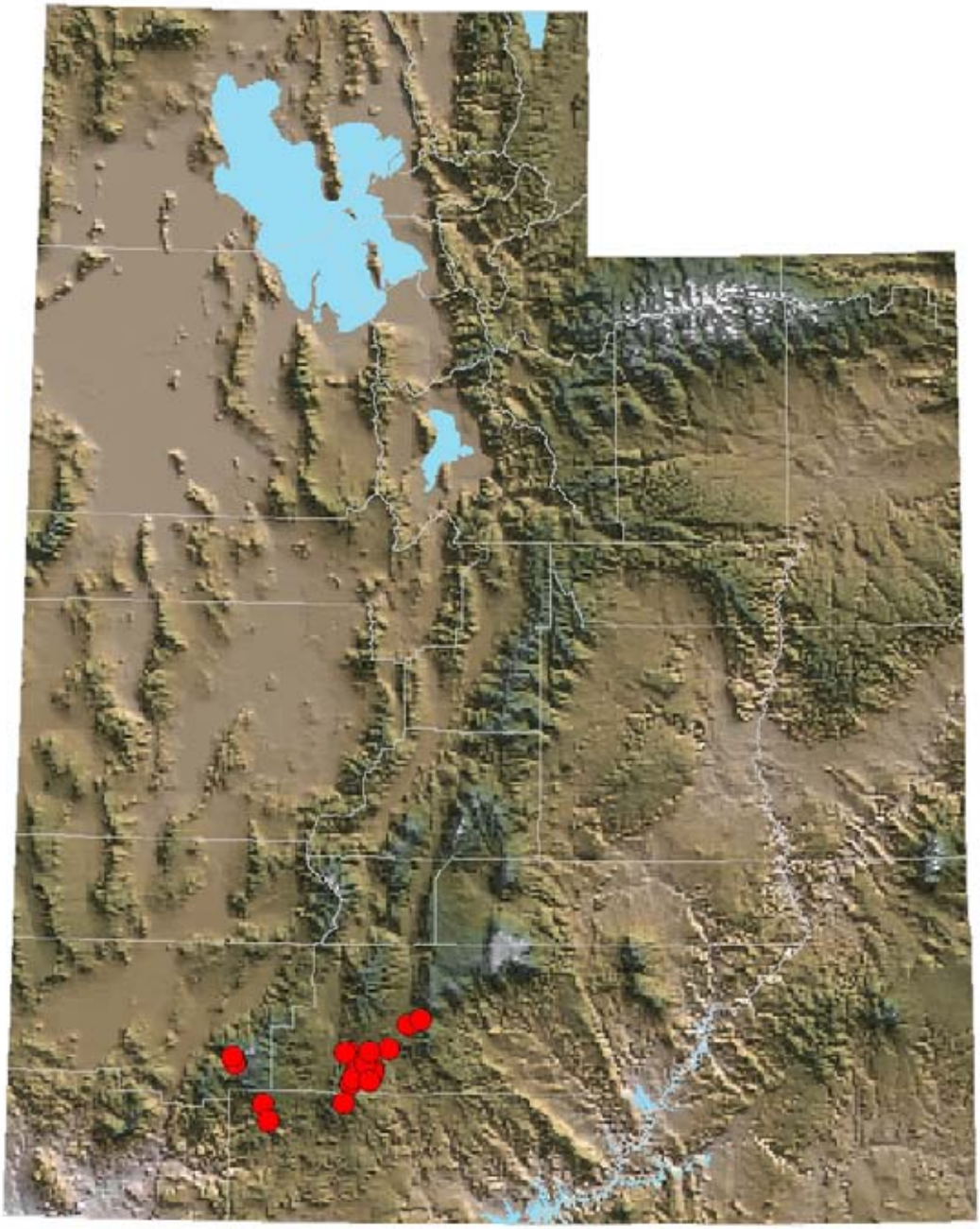

Figure 24. The distribution of Reveal's paintbrush (*Castilleja revealii*).

Rainbow Rabbitbrush
Chrysothamnus nauseosus subsp. *iridis*

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Recently the species *nauseosus* was transferred into the genus *Ericameria* (Nesom and Baird 1993).

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies. It was formerly on the BLM Sensitive Plant List (Lamb 1996), and was a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to central Utah in the middle Sevier River Valley, Sanpete and Sevier counties. It grows on semi-barren slopes and ridges of Arapien Shale-hills along the east side of the valley from Ninemile Reservoir, north of Mayfield, south to Rainbow Hills near Glenwood. It grows in scattered piñon-juniper, salt desert shrub and mixed desert shrub communities with alder-leaf mountain mahogany, shadscale, green Mormon tea and cliff-rose (Fitts, pers. comm. 2005a, UTHP 2005).

A 2004 partial survey of the Arapien Shale documented plants from Ninemile Reservoir to Rainbow Hills. The number of plants was estimated to exceed 100,000. Throughout the habitat there is evidence of past gypsum mining and, though mining has slowed, it is ongoing. It was observed that plants were occupying sites of mining disturbance. Off-highway vehicle use, present along ridge tops and foot slopes, has resulted in erosion of habitat. It is a very palatable plant and is heavily browsed by deer and rabbits (Fitts, pers. comm. 2005a, UTHP 2005). The recent discovery of oil in the Sevier Valley has added another potential impact to this plant's habitat. However, the plant is abundant to the extent that its distribution nearly defines the Arapien Shale exposure (Fitts, pers. comm. 2005a).

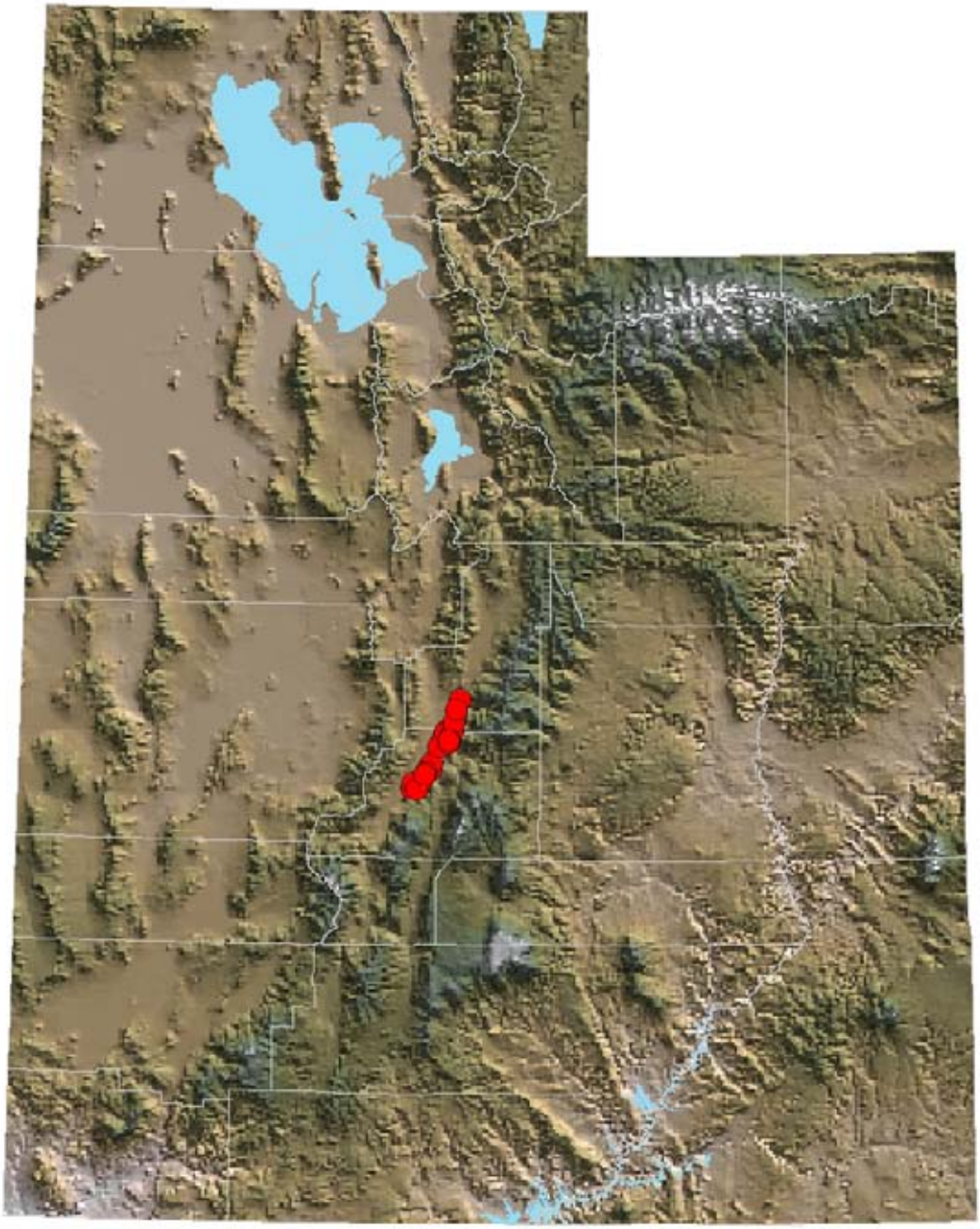

Figure 25. The distribution of Rainbow rabbitbrush (*Chrysothamnus nauseosus* subsp. *iridis*).

Wasatch Fitweed
Corydalis caseana subsp. *brachycarpa*

TAXONOMY AND NOMENCLATURE

FAMILY: Fumitory (Fumariaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Wasatch-Cache National Forest's forest plan (USDA, FS 2003) as a Recommended Sensitive species.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a north-central Utah endemic known from the Wasatch Mountains in the vicinity of the Wasatch Front, in Little Cottonwood, Big Cottonwood, Mill Creek, Lambs and American Fork canyons, and just over the divide into Willow Draw and Bear Canyon, Utah, Wasatch, Salt Lake, and Summit counties. It is disjunct to the north in North Ogden Canyon and along Wolf Creek on James Peak, Weber County. It is often locally abundant in a narrow band along flowing streams.

There is little information available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. There has never been a focused effort to survey for this plant throughout its range, however, in 2004 and 2005 new locations were documented, i.e., James Peak, Weber County, Willow Draw, Summit County and Big Cottonwood Canyon (Butler Fork and Mill D North), Salt Lake County. New data were acquired for at least two known sites in 2005, and, though unsuccessful, an effort was undertaken to relocate it in Lambs Canyon.

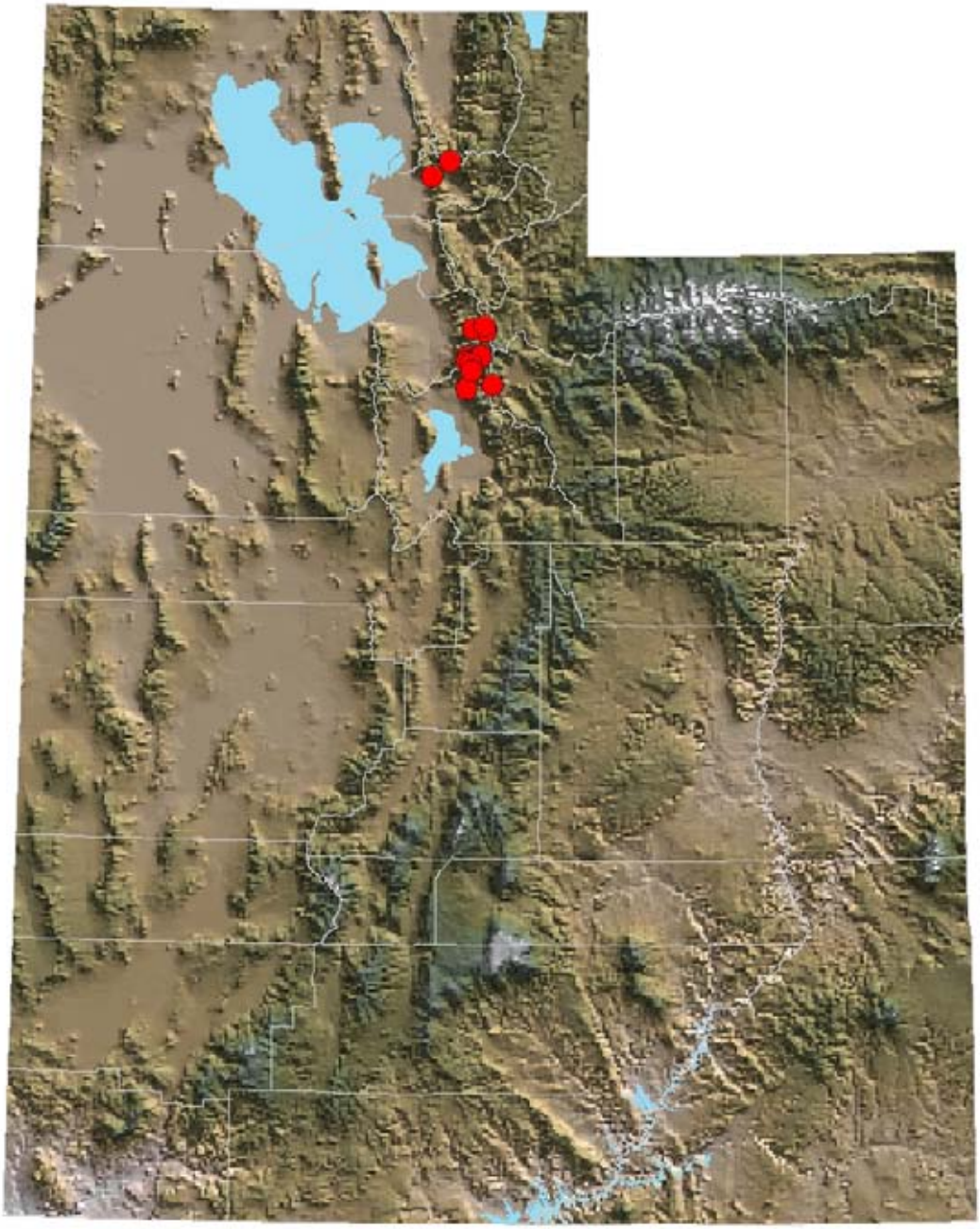

Figure 26. The distribution of Wasatch fitweed (*Corydalis caseana* subsp. *brachycarpa*).

Mound Cryptanth
Cryptantha compacta

TAXONOMY AND NOMENCLATURE

FAMILY: Borage (Boraginaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

Higgins (1993) reported, "*C. compacta* is an endemic species, located only in southwestern Millard County, Utah in Townships 24, 25S, and Ranges 17, 18 West… The total population of this taxon is estimated to be over 100,000, with all age classes represented.... It grows almost exclusively on Sevy Dolomite substrates." However, collections presently filed as this taxon in the Stanley L. Welsh Herbarium, i.e., collections that predate Higgins (1993), extend the distribution to the north onto Crystal Peak and into the House and Confusion ranges. It grows on calcareous gravels in salt desert and mixed desert shrub communities (Atwood 2002a).

Evenden (1999) and Atwood (2002a) both indicate that the 1999 field season efforts reconfirm Higgins' (1993) assertions of the extensive nature of this species' populations. They suggest that its presence on the Desert Experimental Range (DER), managed by RMRS Shrub Sciences Laboratory, Provo, has and will continue to provide protection for it. In addition, the DER has been designated as a Biosphere Reserve through UNESCO's Man and the Biosphere Program (Franklin 1996). Perhaps the management goals that this designation places upon it will assist in the conservation of this species.

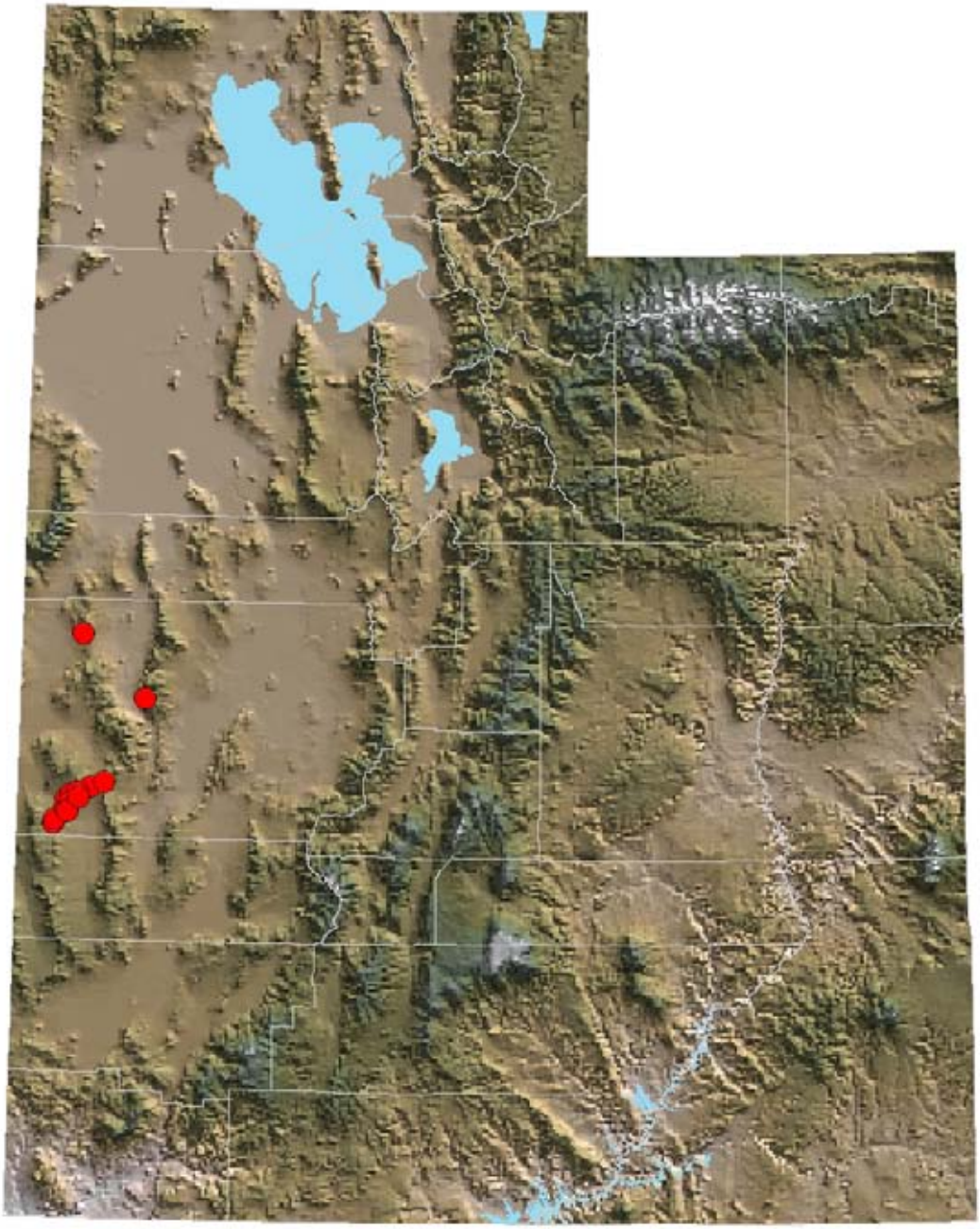

Figure 27. The distribution of mound cryptanth (*Cryptantha compacta*).

Creutzfeldt-Flower
Cryptantha creutzfeldtii

TAXONOMY AND NOMENCLATURE

FAMILY: Borage (Boraginaceae)

OTHER NAMES: This plant was named in honor of Frederick Creutzfeldt of the Gunnison Expedition of 1853- 1854, "the one person who gave more than anyone to the cause of plant collection in Utah—his life (Welsh 1982)."

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and is on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is an east-central Utah endemic known from widely scattered locations along the base of the Book Cliffs and Wasatch Plateau escarpments as they flank Castle Valley on its north and west edges, in Carbon, Emery and Sevier counties. It occurs on silty-clay soils of the Mancos Shale where the soil is occasionally covered by a veneer of fragments from the overlying Emery Sandstone. It grows in scattered piñon-juniper communities with an under-story of black sagebrush and/or *Atriplex* (Franklin 1992a).

Clark (1989) conducted a survey of BLM managed lands in which he surveyed for new occurrences but revisited only a portion of known BLM sites. Franklin (1992a) conducted a survey for the Manti-La Sal National Forest during which known sites were inventoried and expanded and new sites searched for. Complete and current data that document the status of this plant throughout its range, i.e., population size estimates, habitat condition or potential impacts, are not available. Two of this plant's populations are in residential areas of Price; another population is very near Orangeville. Though perhaps for the most part not of great concern, livestock grazing is present in much of its habitat. A concern more recent than both agency surveys is the increase of oil and gas exploration and development across the three counties of the plant's distribution (in part, Thompson, pers. comm. 2005a).

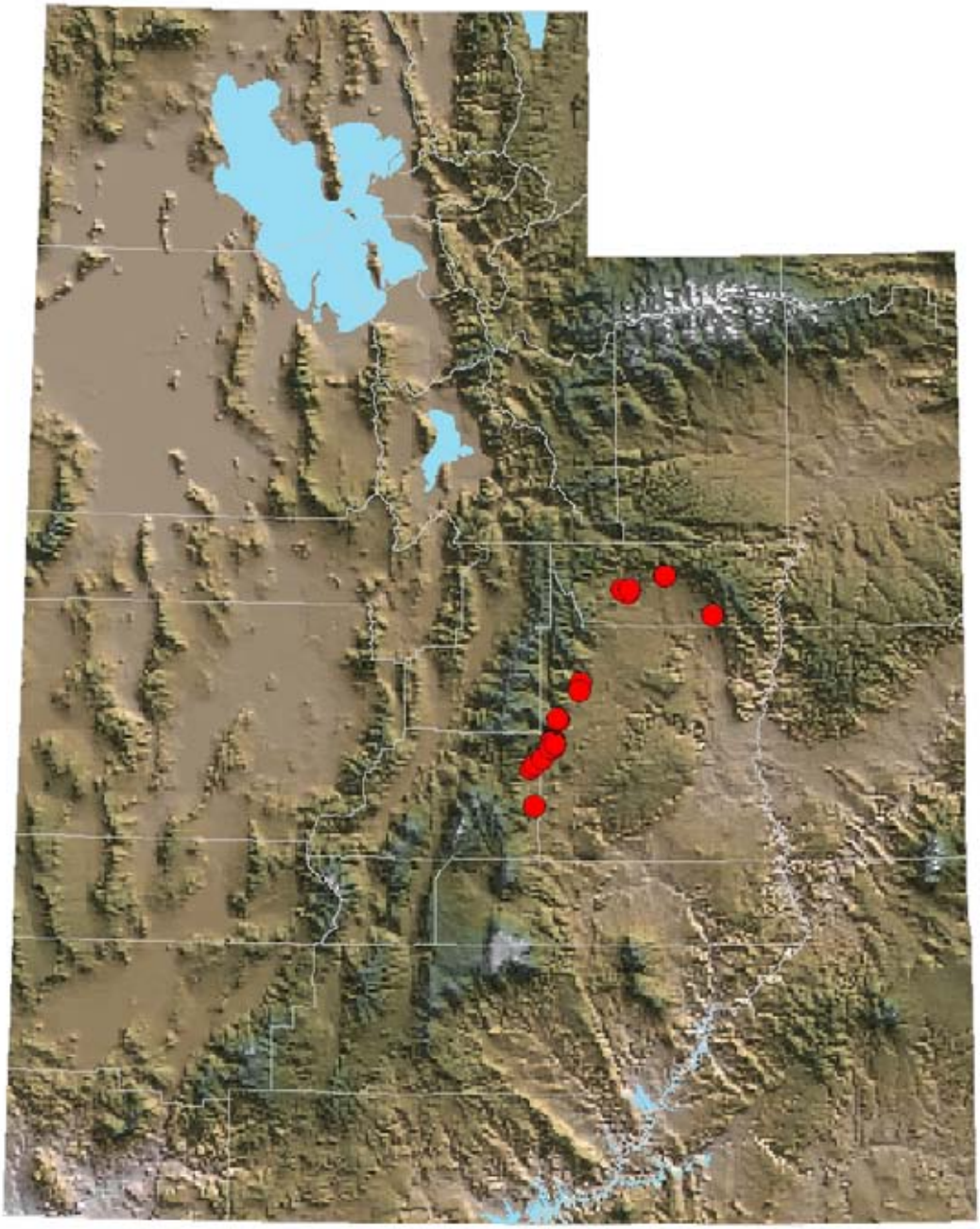

Figure 28. The distribution of Creutzfeldt-flower (*Cryptantha creutzfeldtii*).

Jones' Cycladenia
Cycladenia humilis var. *jonesii*

TAXONOMY AND NOMENCLATURE

FAMILY: Dogbane (Apocynaceae)

CONSERVATION STATUS DESIGNATIONS

On 5 May 1986, Jones' cycladenia was determined to be a threatened species under the Endangered Species Act of 1973, as amended (Vol. 51 Federal Register No. 86). As a federal threatened species, it is of concern to the USDI Bureau of Land Management, Price and Moab Field Offices and Grand Staircase-Escalante National Monument, and the USDI National Park Service, Glen Canyon National Recreation Area.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is restricted to the canyon-lands of the Colorado Plateau in Emery, Grand, Garfield and Kane counties, as well as in immediately adjacent Arizona, Coconino County. It is found in *Eriogonum-Ephedra*, mixed desert shrub, and scattered piñon-juniper communities, often on steep slopes in gypsiferous soils derived from the Summerville, Cutler, and Chinle formations; the soils are shallow, fine textured, and intermixed with rock fragments (Sipes et al. 1994, Spence 1994, Welsh et al. 2003).

Threats to this taxon include off-highway vehicle activity, livestock grazing, and the presence of mining claims and oil and gas leases on or immediately adjacent to known sites (Spence 1994, Sipes et al. 1994). Monitoring of populations on Glen Canyon National Recreation Area occurs on a regular basis, however, little information is available documenting the current status of most populations.

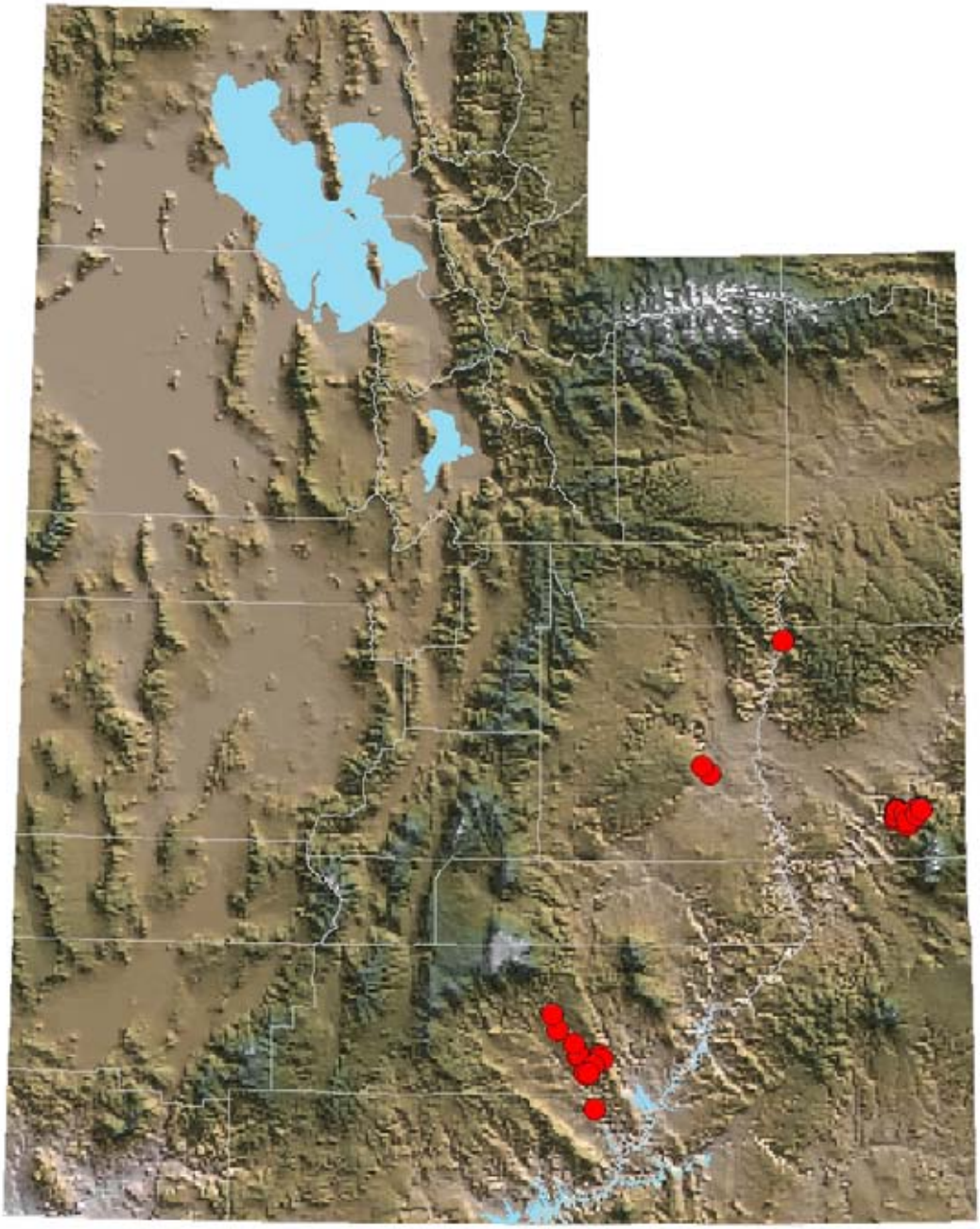

Figure 29. The distribution of Jones' cycladenia (*Cycladenia humilis* var. *jonesii*).

Wasatch Shooting Star
Dodecatheon dentatum var. *utahense*

TAXONOMY AND NOMENCLATURE

FAMILY: Primrose (Primulaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Wasatch-Cache National Forest's forest plan as a Recommended Sensitive species (USDA, FS 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species' known distribution is limited to Big Cottonwood Canyon in the central Wasatch Mountains, Salt Lake County, Utah. It is known from just five general locations in Mule Hollow, Mill B North Fork, Elbow Fork, and head of Mill B South Fork (UTHP 2005). Its habitat is in cracks of quartzite, on thinly layered soils over quartzite or in scree where water is seeping or flowing, and occasionally in the spray of waterfalls. It is found growing with moss, monkey flowers, miner's lettuce and saxifrage.

With exceptions, due to the isolation of this plant's known populations, there are few threats to it. However, at Moss Ledge Picnic Area and up the canyon to Moss Falls impacts have occurred for many years. Picnickers in their explorations and hikes up the narrow canyon to view the falls have trailed and climbed through this plant's habitat. Soils on which it perhaps grew have been compacted or eroded away. For reasons other than the presence of this plant, there has been recent discussion of closing the picnic area. If this were to be done, rehabilitation of the area might restore habitat for the plant. Monitoring of sites is ongoing, and a single new location was found in 2005 (Duncan, pers. comm. 2005a, UTHP 2005).

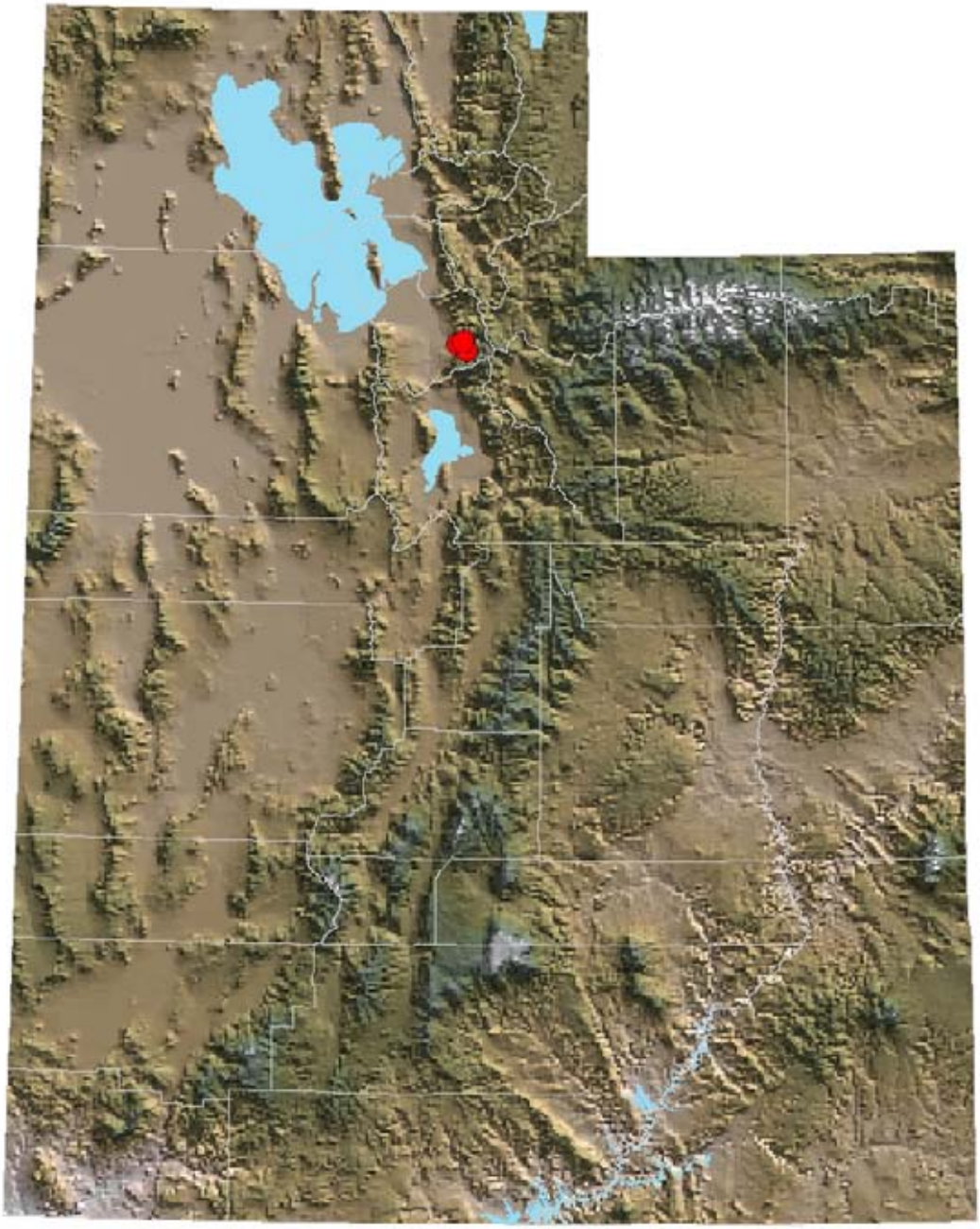

Figure 30. The distribution of Wasatch shooting-star (*Dodecatheon dentatum* var. *utahense*).

Wasatch Draba
Draba brachystylis

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: This taxon has long been considered to have a disjunct population in the Spring Mountains of southern Nevada (Rollins 1993, Welsh et al.). Holmgren et al. (2005) write of these plants, they "have shorter styles…than the Utah plants and may represent an unnamed species." Welsh et al. (2003) continue to include Nevada in its distribution.

CONSERVATION STATUS DESIGNATIONS

It is included on the Wasatch-Cache National Forest's forest plan as a Recommended Sensitive species (USDA, FS 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This "poorly known and rarely collected" taxon is known from only a few scattered locations in the northern and central Wasatch Mountains, south into the San Pitch Mountains, and the western Uinta Mountains; in Salt Lake, Utah, Juab and Duchesne counties. In addition, as previously mentioned, it is in the Spring Mountains of southern Nevada. It grows in moist places on rocky slopes and banks in aspen and white fir-Douglas fir communities (Holmgren et al. 2005, Rollins 1993, Welsh et al.2003).

No information is available documenting its status, i.e., population size estimates, habitat condition or potential impacts. Continuing development in the canyons of the central Wasatch Mountains is a source of potential impacts.

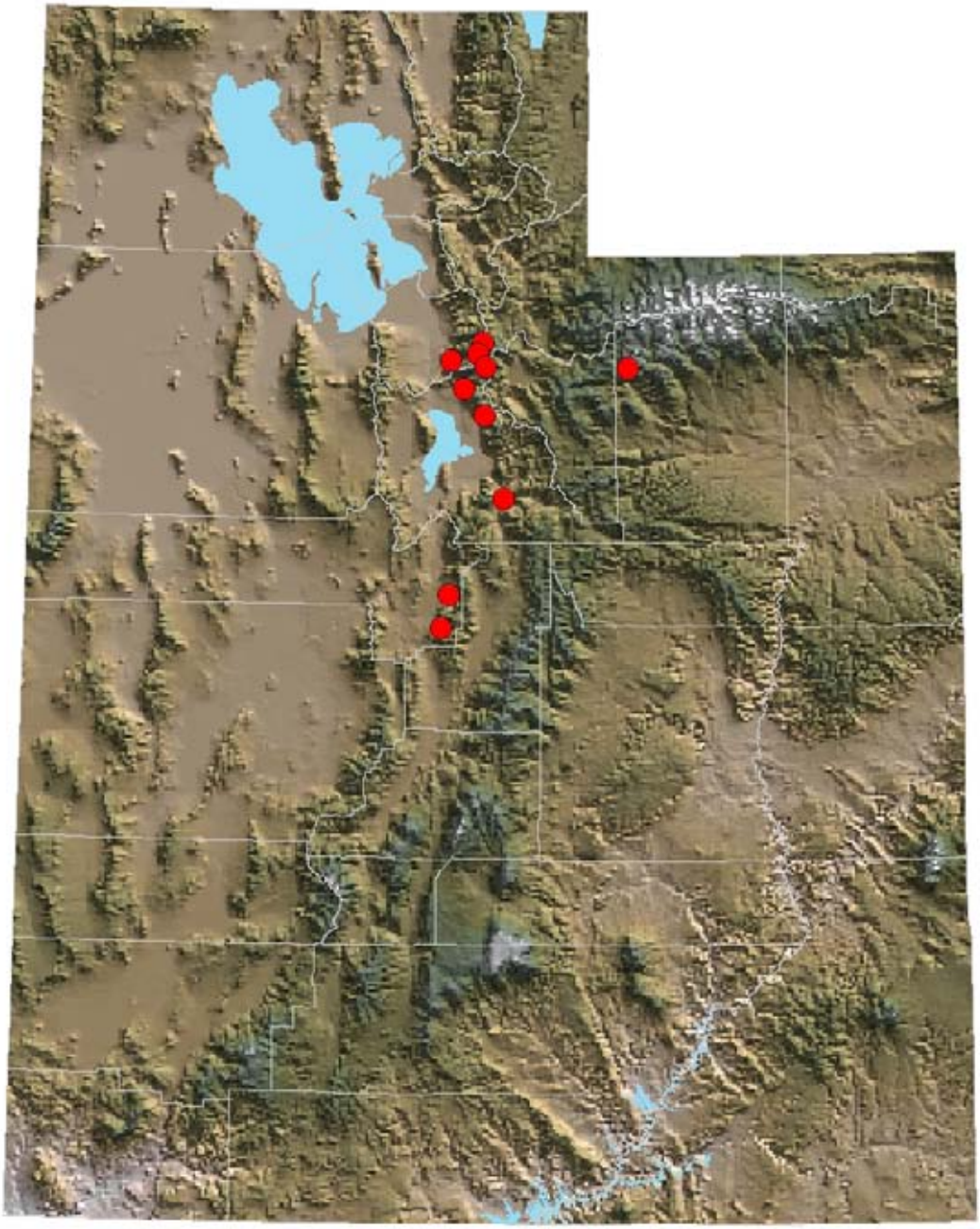

Figure 31. The distribution of Wasatch Draba (*Draba brachystylis*).

Burke's Draba
Draba burkei

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: This taxon continues to be recognizes by some authors (e.g., Welsh et al. 2003) as a variety of *Draba maguirei*. Recent DNA analyses show it to be more closely linked with *Draba globosa* than with *Draba maguirei* and to be amply distinct enough from *D. globosa* as to deserve recognition at species level (Windham and Beilstein 1998). It has been elevated to species level (Windham 2003).

CONSERVATION STATUS DESIGNATIONS

It is included on the Wasatch-Cache National Forest's forest plan as a Sensitive species (USDA, FS 2003). Before its placement in synonymy under *Draba maguirei* (Welsh et al. 1987), it had been a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 50 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a north-central Utah species endemic in Cache, Box Elder, Weber and Morgan counties. It is known from scattered locations in the Wellsville Mountains, northern Wasatch Range, and on James Peak. It is found from the lower montane zone to the open ridges and summits of the higher peaks. "[A]t lower elevations [it is] generally on protected, north-facing slopes in shade of Douglas-fir (Stone 1989)." It primarily inhabits small, exposed patches of shallow, rocky soils and crevices of rock outcrops of various lithologies, i.e., limestone, dolomite, quartzite, and schist (Stone 1989, Tait 2002).

Windham and Beilstein (1998) note that the high elevation, rocky nature of this plant's habitat is no longer sufficient to protect it; increased ease of accessibility has resulted in increased degradation. Recreational activities, such as excessive off-highway vehicle use, have impacted it and its habitat (Tait 2002). Padgett (pers. comm. 2005a) noted that most, if not all, off-highway vehicle impacts have resulted from unauthorized use outside designated travel routes. Construction of the 2002 Olympics men's downhill ski run at Snowbasin Ski Area resulted in a loss of approximately 200 individuals. In addition, at Snowbasin, a loss of approximately 800 plants occurred because of their unauthorized burial with excavation materials associated with the construction of communications towers. Tait (2002) expressed concerns about development associated with Powder Mountain Ski Resort and a nearby population of Burke's draba. Approximately 80 plants were removed from the downhill ski run at Snowbasin before construction; 50 surviving plants are maintained at the Denver Botanic Gardens. Seed viability and germination studies were completed, and seeds, collected from greenhouse-grown plants, were sent to the National Center for Genetic Resources Preservation, Fort Collins, Colorado (Denver Botanic Gardens 2003). Padgett (pers. comm. 2005a) is recommending the establishment of a botanical special interest area from Willard Peak to Ben Lomond Peak that would include populations of this plant.

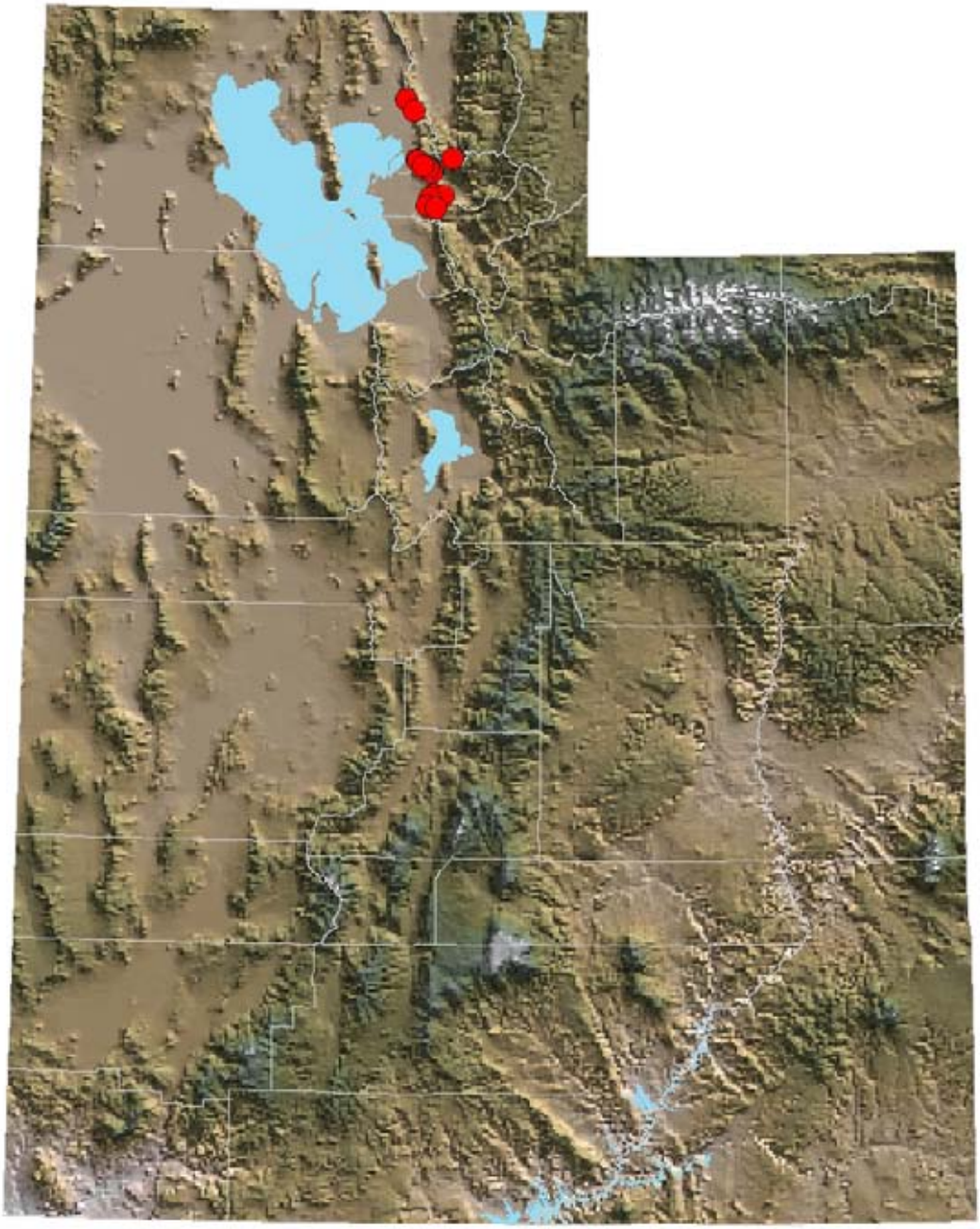

Figure 32. The distribution of Burke's Draba (*Draba burkei*).

Kass' Rockcress
Draba kassii

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: The common names "Deep Creek Range Draba " and "Kass' whitlow grass" are also available (e.g., Holmgren et al. 2005).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

Endemic to the Deep Creek Range, Tooele and Juab counties, this species occurs at scattered locations from "Reilly and Hardscrabble canyons, extending north into Chokecherry Canyon;" and to the south in Goshute and "Big Canyon, extending southeasterly to the lower portion of Middle Canyon." Southwest from here, at the head of Indian Canyon, it is near the summit of Ibapah Azimuth Peak (Stone 1998, UTHP 2005). It inhabits "piñon-juniper, white fir, and mountain brush communities, in crevices in granite" and quartzite (Welsh et al. 2003, Holmgren et al. 2005).

There have been no actual population counts, but, within the five major populations, size estimates are between 1,000 to 5,000 plants in an area of approximately 2,000 acres. The only potential impact appears to be hard rock mining, but it has not occurred in the past nor is it presently occurring (Hardy, pers. comm. 2005).

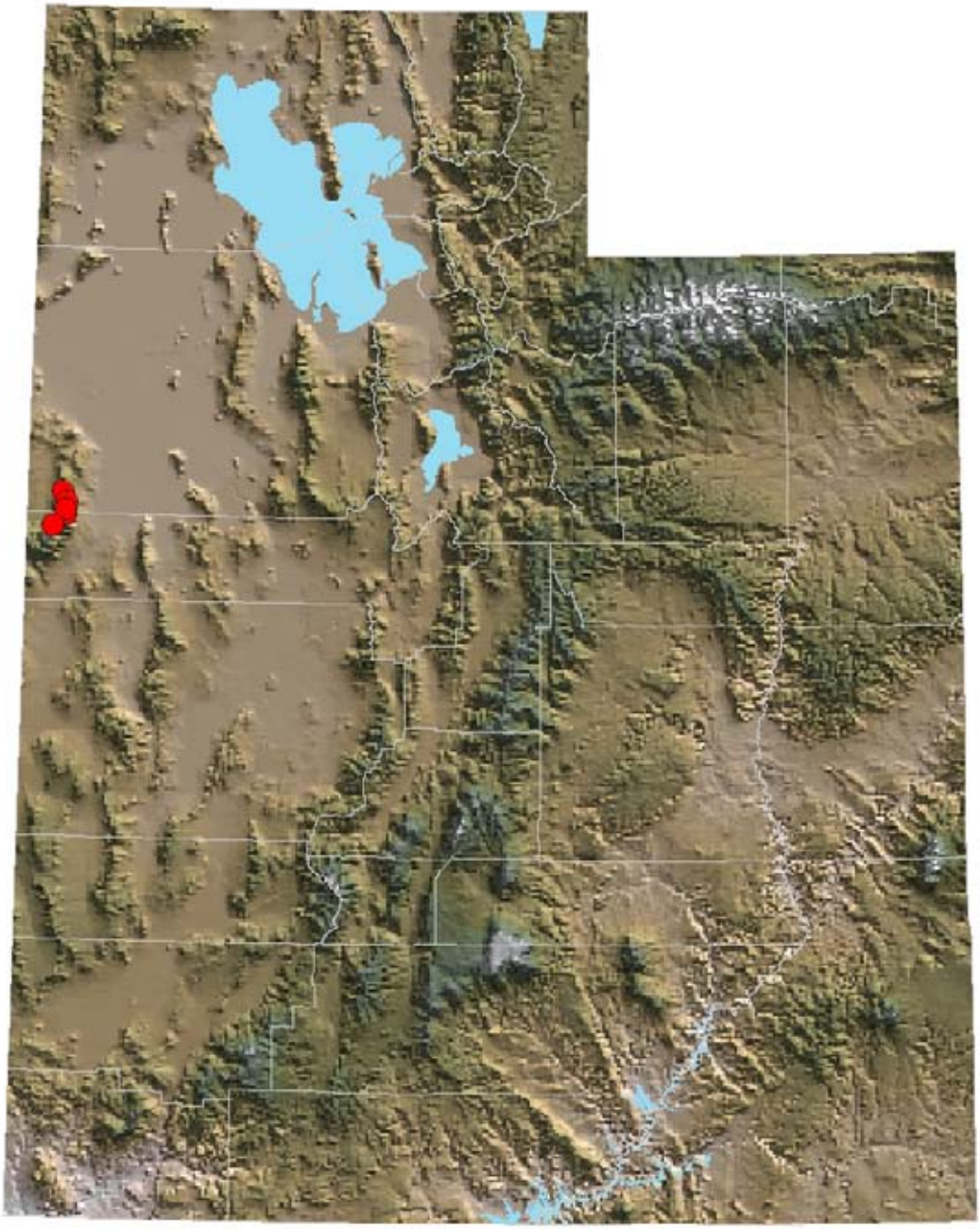

Figure 33. The distribution of Kass' rockcress (*Draba kassii*).

Belknap Peak Draba
Draba ramulosa

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Until recently (Welsh et al. 2003) this taxon was not recognized in "A Utah Flora" (Welsh et al. 1987 and 1993). The common names "Tushar Mountain draba" and "Tushar Mountain whitlow-grass" are also available (e.g., NRCS 2005, Holmgren 2005).

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a south-central Utah endemic known only on Mount Belknap and adjacent ridges in the Tushar Mountains, Piute and Beaver counties. It is found at high elevations on windblown, barren slopes and ridges in coarse gravel and talus of igneous origin (Welsh et al. 2003; UTHP 2005).

Limited information is available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. The mountain goat was introduced into the range, however, it has had limited impact on this species. Hiking and off-highway vehicle use are present within the plant's habitat (Tate, pers. comm. 2005).

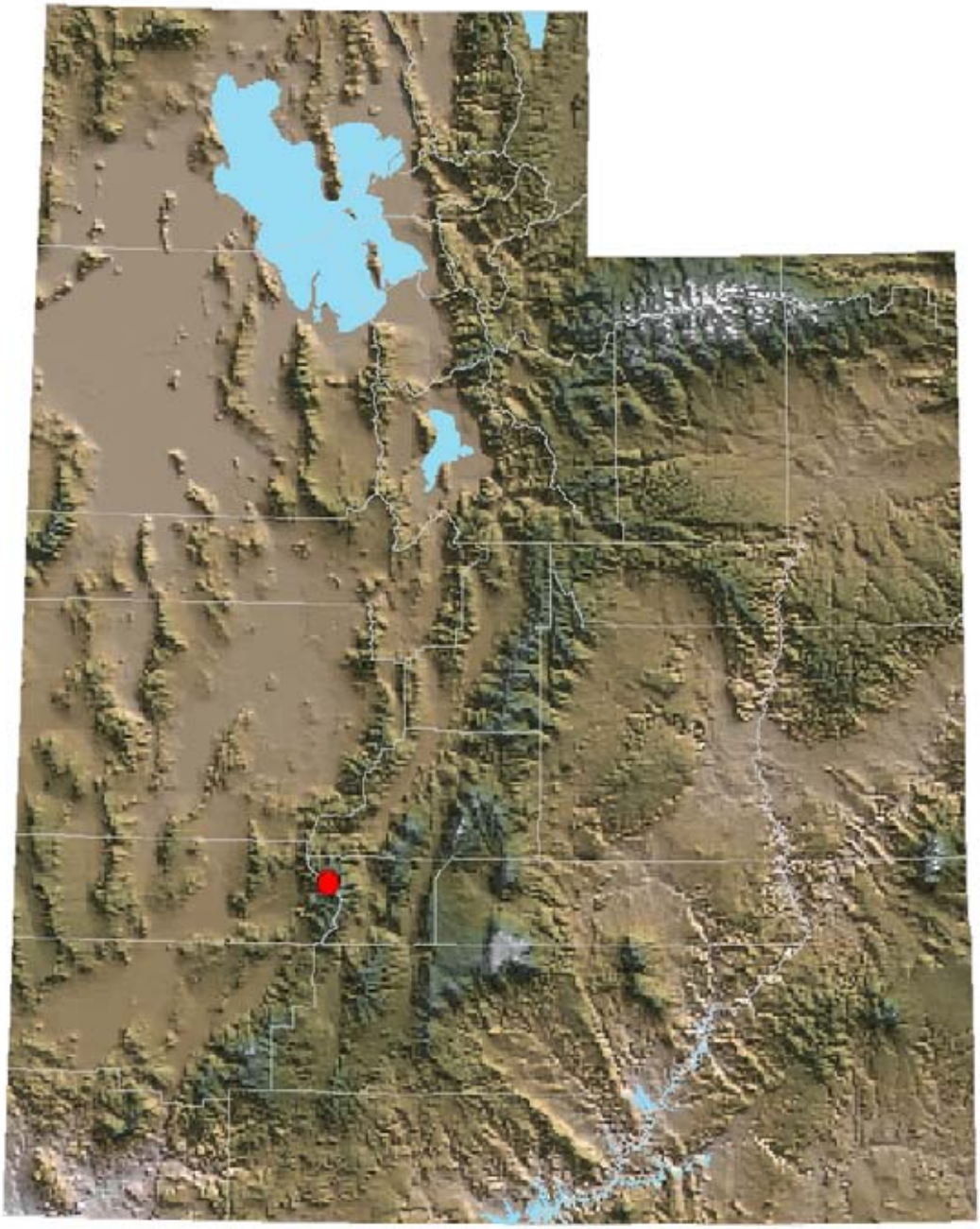

Figure 34. The distribution of Belknap Peak draba (*Draba ramulosa*).

Creeping Draba
Draba sobolifera

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: The common names "stolon draba" and "stolon whitlow-grass" are available (e.g., NRCS 2005, Holmgren et al. 2005).

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Tushar Mountain endemic known only at scattered locations from the slopes of Mount Baldy to Mount Belknap and south to Delano Peak, Piute and Beaver counties. It is found at high elevations in subalpine fir communities and on windblown, barren slopes and ridges in coarse gravel and talus of igneous origin (Welsh et al. 2003; UTHP 2005).

Limited information is available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. The mountain goat was introduced into the range, however, it has had limited impact on this species. Hiking and off-highway vehicle use are present within the plant's habitat (Tate, pers. comm. 2005).

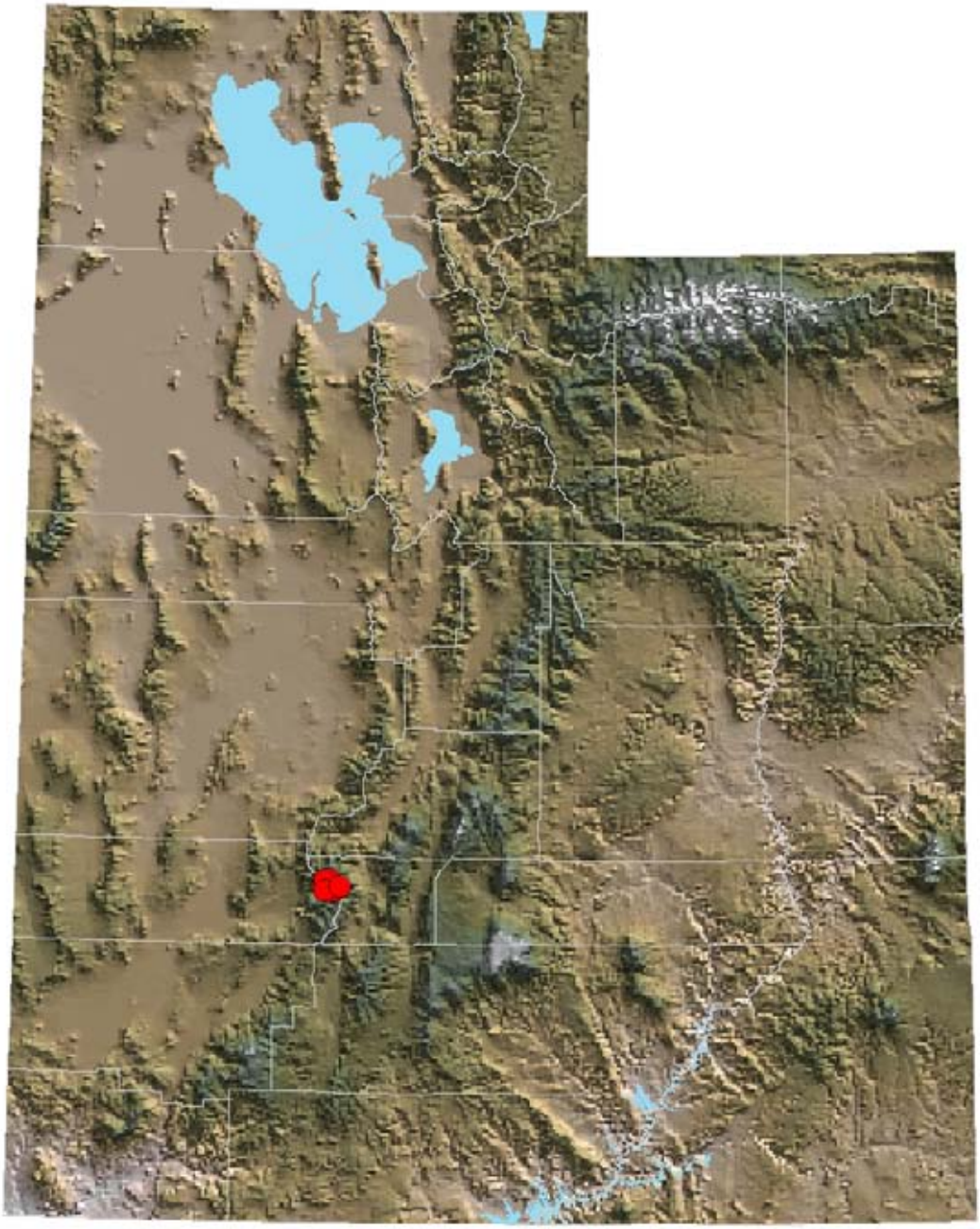

Figure 35. The distribution of creeping draba (*Draba sobolifera*).

Carrington's Daisy
Erigeron carringtoniae

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Nesom and Hevron (1995) considered this taxon to be a synonym of *Erigeron untermannii*. According to Stone (1998), "if the plants previously called *E. carringtoniae* and *E. untermannii* are indeed conspecific, then the correct name would be *E. carringtoniae* since it has 'page priority' acc. the Internatl. Code of Botanical Nomenclature." The common name "Jane Carrington's daisy" has been used (Stone 1998).

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to central Utah on the "margins of the high Wasatch Plateau in Emery, Sanpete, and Sevier counties." It inhabits the subalpine zone in a "mixed upland herb association" which is present across the ridge tops with scattered small stands of Engelmann spruce and subalpine fir. Substrates are barren scree slopes and, along adjacent plateau margins, level patches of shallow, calcareous soils overlain by angular limestone fragments or gravel (Stone 1993).

There are 10 known occurrences with only limited information available documenting their current status, i.e., estimated numbers of plants, habitat condition or potential impacts. Thompson (1991) indicates that off-road vehicle use, on-going road maintenance, and trampling by livestock are threats at some locations. Before conclusions can be made concerning trend and status of populations, Stone (1993) suggests the need for population mapping, abundance determinations and the identification of threats. It is also suggested that, before this taxon is placed in synonymy, a genetic study is needed that supports the conclusions made by Nesom and Hevron (1995).

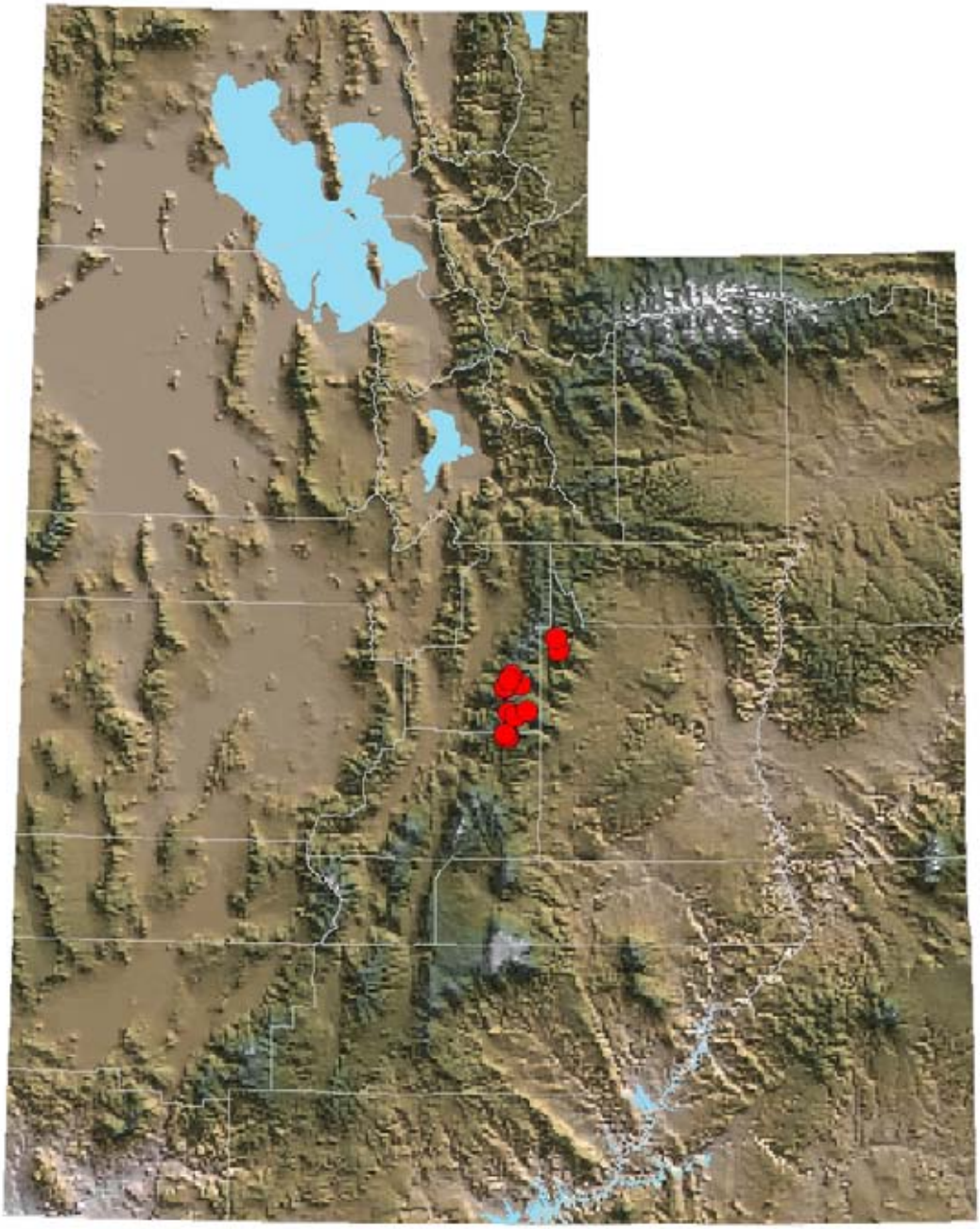

Figure 36. The distribution of Carrington's daisy (*Erigeron carringtoniae*).

Cronquist's Daisy
Erigeron cronquistii

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: The common name "Cronquist's fleabane" is in use (e.g., NRCS 2005).

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

Cronquist's daisy is endemic to the Bear River Range of north central Utah, Cache County. Its scattered distribution is limited to mid-Logan Canyon and the higher ridges to the north as far as Doubletop Mountain. It grows in crevices and on rock ledges of limestone and dolomite outcrops and in soils at the base of those outcrops. In inhabits mountain brush and Douglas fir to spruce-fir communities and is associated with *Petrophytum caespitosum*, *Heuchera rubescens*, *Boykenia jamesii* and *Musineon lineare* (Franklin 1990b).

There is a roughly estimated total population of approximately 1,500 to 14,000 individuals (Franklin 1990b). It occurs within both cattle and sheep allotments, but is not in areas actually grazed by livestock. A primary use activity in this plant's habitat is recreation, but, due to the difficulty of access, impacts are minimal (Franklin 1990b). Generally this plant is not in areas that have the potential for rock climbing activities, however, it remains a concern (Padgett, pers. comm. 2005a). The 2003 revised forest plan (USDA, FS 2003) established the Logan Canyon Botanical Area for the canyon's seven rare endemic plants; a portion of this plant's habitat occurs within it. The remaining habitat is in either the Mount Naomi Wilderness or in areas that have been assigned to an "undeveloped" Management Prescription, thus precluding them from any form of development and the resulting impacts (Padgett, pers. comm. 2005a).

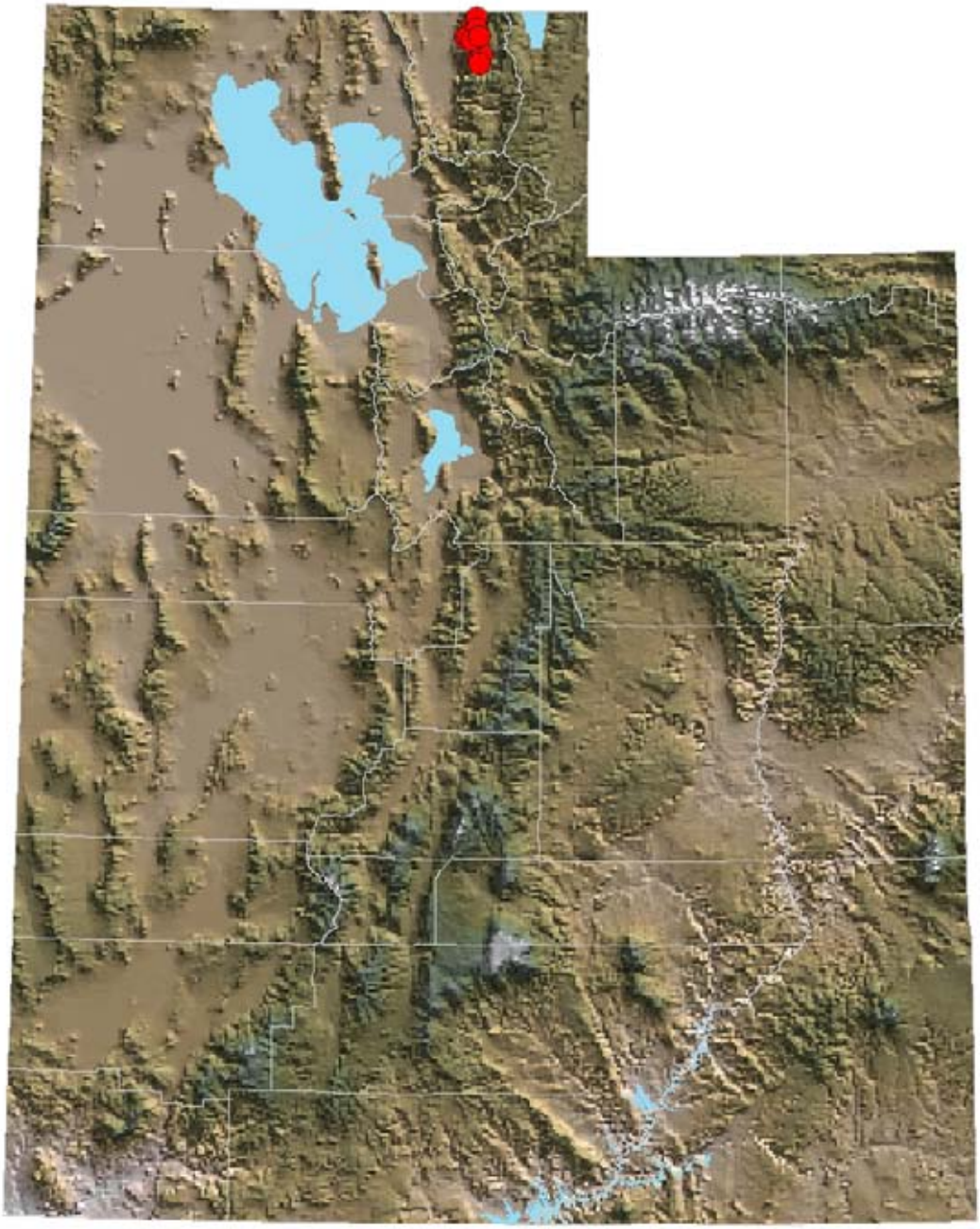

Figure 37. The distribution of Cronquist's daisy (*Erigeron cronquistii*).

Maguire's Daisy
Erigeron maguirei

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Van Buren (1993), through genetic studies, determined that variety *harrisonii* was synonymous with the typical variety. Welsh et al. (2003) continue to recognize *Erigeron maguirei* var. *harrisonii* as distinct.

CONSERVATION STATUS DESIGNATIONS

On 5 September 1985, the variety *maguirei* of this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 50 Federal Register No. 172). After acceptance by the U.S. Fish and Wildlife Service of the determination that variety *harrisonii* did not merit recognition, the full species, now without varieties, was reclassified as threatened (Vol. 61 Federal Register No. 119). A document identifying recovery goals (USFWS 1995a) has been produced as a guide to management and conservation efforts. As a federal threatened species, it is of concern to USDI Bureau of Land Management (BLM), Price Field Office, USDA Forest Service (USFS), Fishlake National Forest, and USDI National Park Service, Capitol Reef National Park (CRNP). CRNP, BLM, USFS and the U.S. Fish and Wildlife Service are currently preparing a status report, a conservation agreement and strategy, and a monitoring program for this taxon to meet criteria of the recovery plan (Clark, pers. comm. 2005).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a central Utah endemic known from the west edge of the San Rafael Swell and, after a break of approximately thirty miles, on the east slope of Thousand Lake Mountain and south along Waterpocket Fold, in Emery, Wayne and Garfield counties. It grows on the sand and detritus weathered from Navajo Sandstone and, rarely, the Kayenta Formation. It is found in slickrock crevices, on ledges, and in bottoms of washes (Cronquist 1994, UTHP 2005)

According to USFWS (1996), at the time of its reclassification, there have been impacts as the result "off-road vehicles and trampling by humans and livestock. Mineral and energy development are potential threats to the species." Also, concern for loss of genetic viability and the cumulative effect of natural disturbance due to its small and isolated populations is a threat to its continued existence. In a joint venture, the BLM, Fishlake National Forest (FNF), and CRNP conducted surveys from 1997 through 2002. This effort refined the range in CRNP, extended it onto FNF, and greatly increased the number of plants known (Clark, pers. comm. 2005).

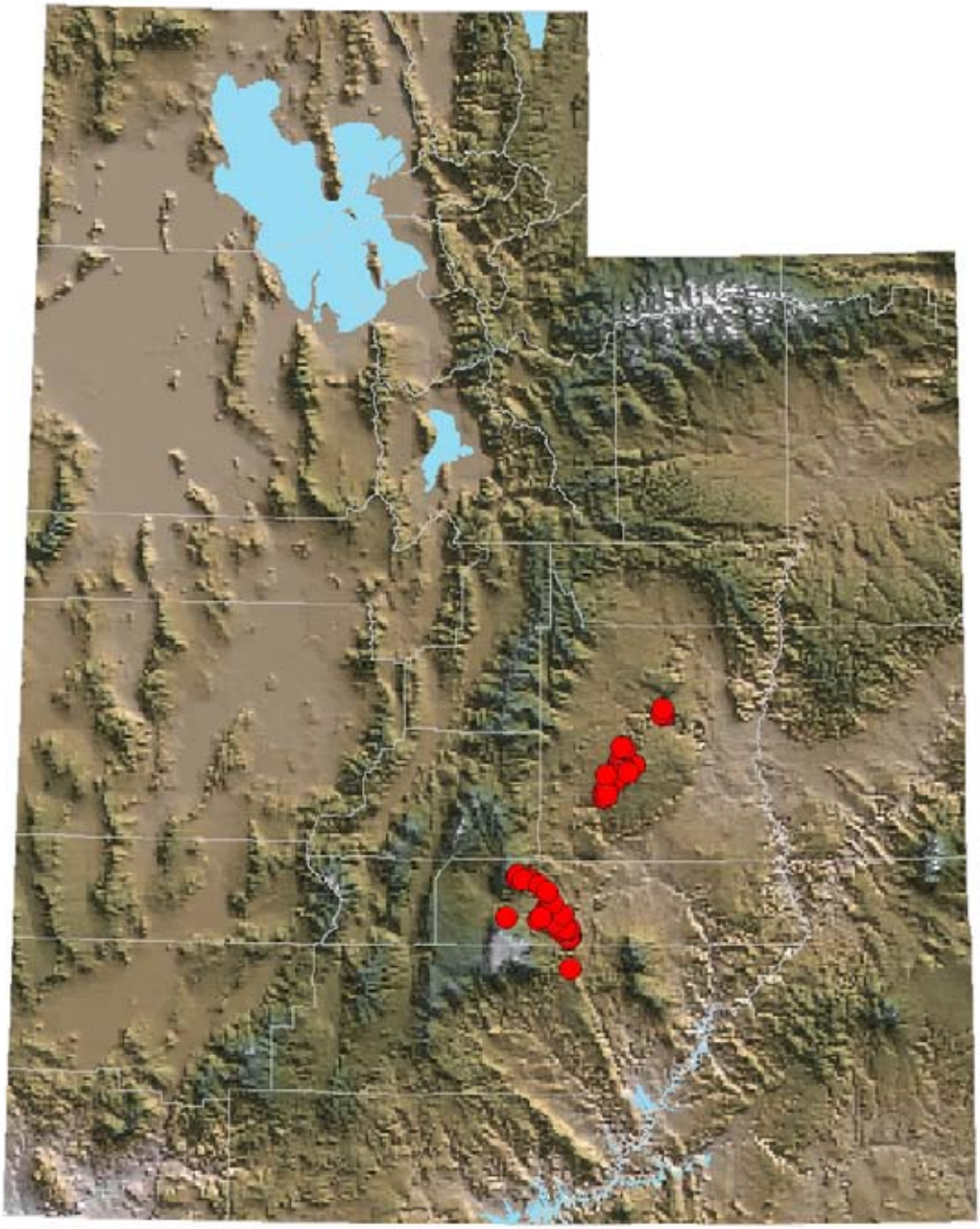

Figure 38. The distribution of Maguire's daisy (*Erigeron maguirei*).

La Sal Daisy
Erigeron mancus

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: The common name "depauperate fleabane" is used in the Plants National Database (NRCS 2005) and appears to have spread from there to other Internet sites.

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southeast Utah endemic where it is known from only the highest elevations of the La Sal Mountains, Grand and San Juan counties. It is most frequently an alpine species growing in "alpine forb and grass-sedge communities, [and] frequently [is found] in rockstrips", but, is occasionally associated with subalpine fir when the above mentioned communities "finger" down-slope into its adjacent habitat (Welsh et al. 2003)."

No information is available to indicate the status of populations. An old mining road reaches up from Miner's Basin into this plant's habitat, but that road is now closed (Thompson, pers. comm. 2005b). A portion of this plant's habitat is within the Mount Peale Research Natural Area. Increasing recreational activity is perhaps the only potential impact that merits monitoring.

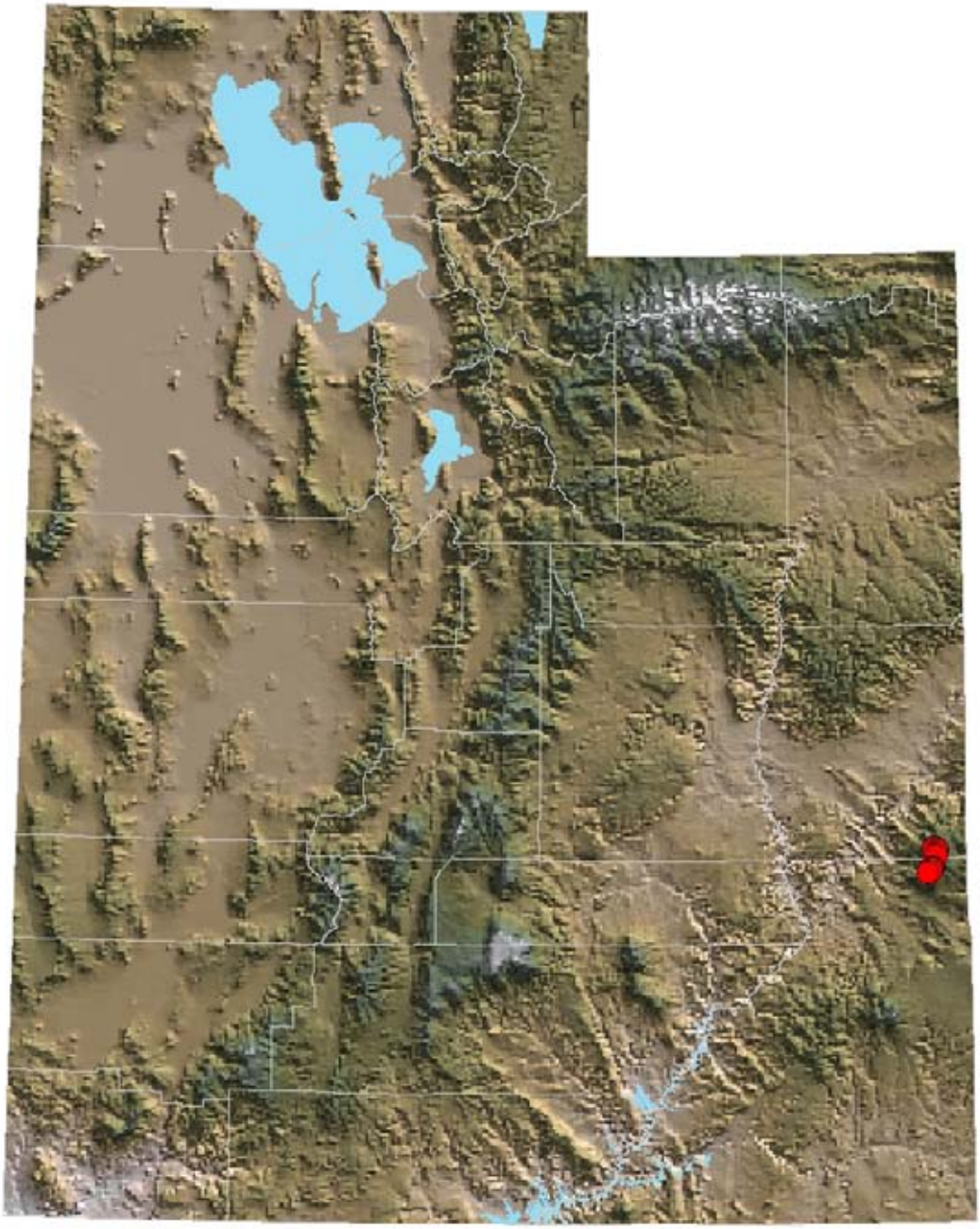

Figure 39. The distribution of La Sal daisy (*Erigeron mancus*).

Untermann's Daisy
Erigeron untermannii

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Nesom and Hevron (1995) considered the Wasatch Plateau endemic *Erigeron carringtoniae* to be a synonym of this taxon. According to Stone (1998), "if the plants previously called *E. carringtoniae* and *E. untermannii* are indeed conspecific, then the correct name would be *E. carringtoniae* since it has 'page priority' acc. the Internatl. Code of Botanical Nomenclature."

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a northeast Utah endemic along primary and secondary ridgelines in the rugged canyon-and-ridge topography of the Tavaputs Plateau, Duchesne County. It is found in piñon-juniper-alder leaf mountain mahogany communities on the light to buff colored Uinta Formation in soils that are fine textured and intermixed with flat, angular shale fragments (Franklin 1988b and 1989a).

When last surveyed, there were an estimated 55,000 plants (Franklin 1988b and 1989a). A monitoring study was set up in two easily accessible populations, i.e., on Cottonwood and Wild Horse ridges (Franklin 1989a). In 2005, the monitoring plots were reread (Goodrich 2005). There was an increase in numbers of plants present on Cottonwood Ridge and a decrease on Wildhorse Ridge. Though the Uinta Basin has again become an area of intense oil and gas exploration and development, it is not yet present in the habitat of this plant. Grazing is permitted within its known distribution, but cattle "are not spending time on these low [feed] producing ridges (Goodrich 2005)."

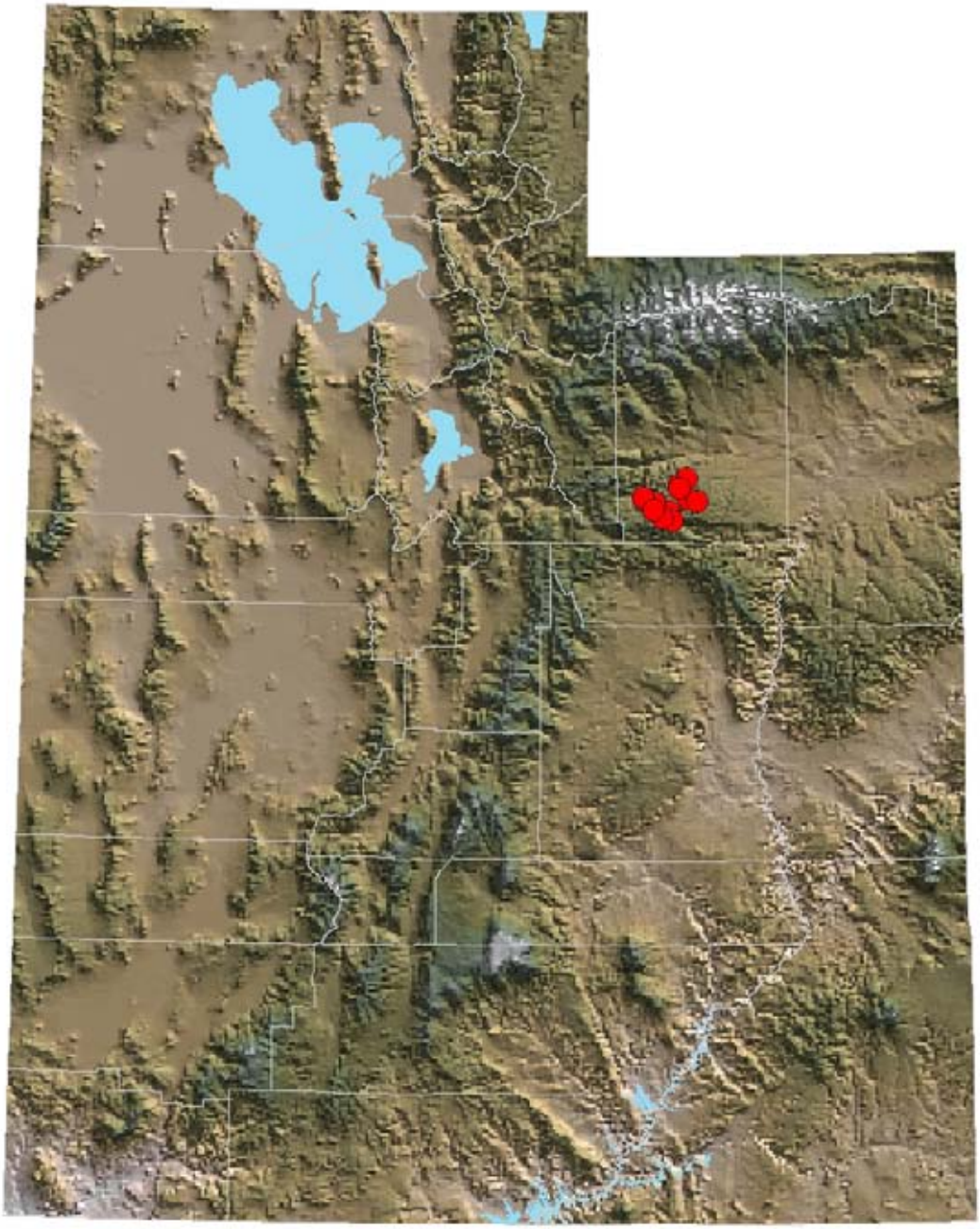

Figure 40. The distribution of Untermann's daisy (*Erigeron untermannii*).

Flat Tops Wild Buckwheat
Eriogonum corymbosum var. *smithii*

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: The taxon *smithii* continues to be recognized by some (e.g., FNA 2005) as a distinct species. The common name "Smith's wild buckwheat" is also used.

CONSERVATION STATUS DESIGNATIONS

This species is included on the BLM Sensitive Species Plant List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is native to Utah's San Rafael Desert, Emery and Wayne counties. The type collection is from the south base of Little Flat Top. From here it reaches to the northeast, almost to Dugout Spring; to the east, as far as the east end of Sweetwater Reef; to the south, with breaks, to Point of Rocks; and to the west, with major breaks, to Molly's Castle. At sites to the west, beyond Jeffery Well, morphological differences begin to appear that are not present in the main body of the population. In three single-plant outlier sites farther to the south of Point of Rocks, similar morphological anomalies appear. Its habitat is desert shrub communities on, primarily, Entrada Sandstone and stabilized sandy soils (Franklin 2003b).

Franklin (2003b), in attempting to define distribution by walking outer boundaries, does not always provide estimates of plant numbers for larger sites; when provided, they are in the thousands or many-thousands. Though the presence of roads of various qualities, catchment basins, cattle, and remnants of mineral exploration activities are noted, there appear to be few current management practices that are a threat to this plant. Recommendations were limited to the need for additional survey in certain areas of potential habitat and better estimates of plant numbers at certain of the larger sites. There is currently some oil and gas development within the plant's habitat, with the possibility that oil and gas development in the area will increase in the future (Maddux, pers. comm. 2005).

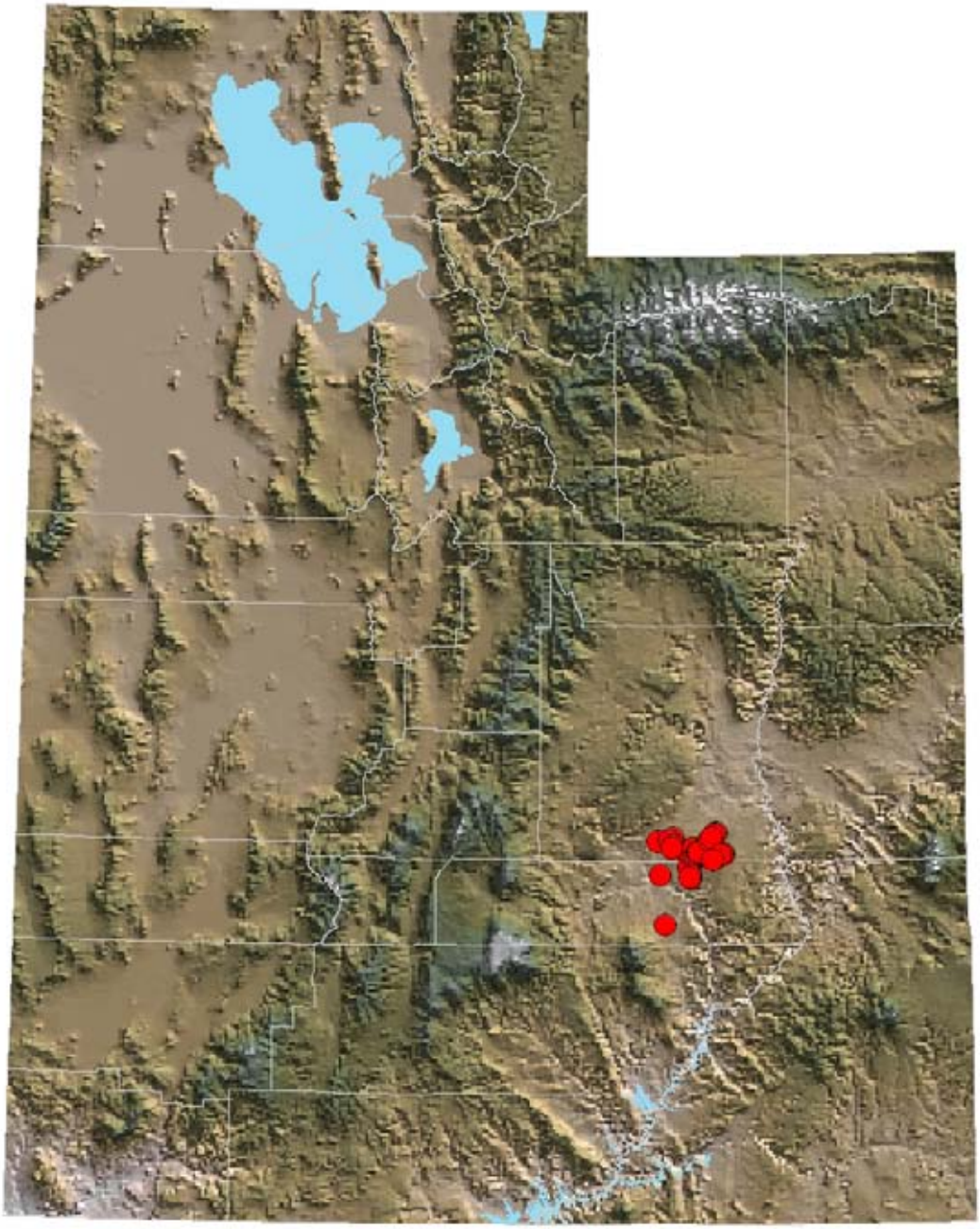

Figure 41. The distribution of Flat Tops wild buckwheat (*Eriogonum corymbosum* var. *smithii*).

Frisco Buckwheat
Eriogonum soredium

TAXONOMY AND NOMENCLATURE

FAMILY: Buckwheat (Polygonaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic in southeast Utah from the vicinity of Grampian Hill, at the south end of the San Francisco Mountains, north up their west side to as far as the Indian Queen Mine. The habitat is predominately privately owned. An additional location has been questionably documented, i.e., "Flats northeast of Lime Point, Wah Wah Mountains (Kass 1992a)." It has been observed by the author that a series of this day's-collections by the collectors of this specimen are one pass/range west of other-source documented locations. Their same-day *Sphaeralcea caespitosa* collection, another sensitive species, is recorded from Mormon Gap, from where it is not otherwise known, i.e., one pass/range west of Halfway Summit, from where it is known (Franklin 1996b). This same pattern fits their Lime Point collection of this taxon, i.e., Lime point is one pass/Range west of the San Francisco Mountains. Its habitat is piñon - juniper woodlands with associated shrubs and forbs, and it prefers open sunlight to shade (Kass 1992a).

Kass (1992a) speculates, after having extensively searched for similar potential habitat in adjacent ranges unsuccessfully, that due to the uniqueness of the geologic substrate "this taxon will not be found elsewhere." He estimated the total population size at 2,000 individuals with a total area of approximately 400 acres. Robinson (2004a) provided an estimate of as high as 1,000 plants, but indicated that she relocated only one population. Kass (1992a) notes that, at the time of his report, there was speculation of renewed gold and silver mining, and Robinson (2004a) indicates that mining of limestone rock is ongoing. She also made the observation that populations appear to be declining.

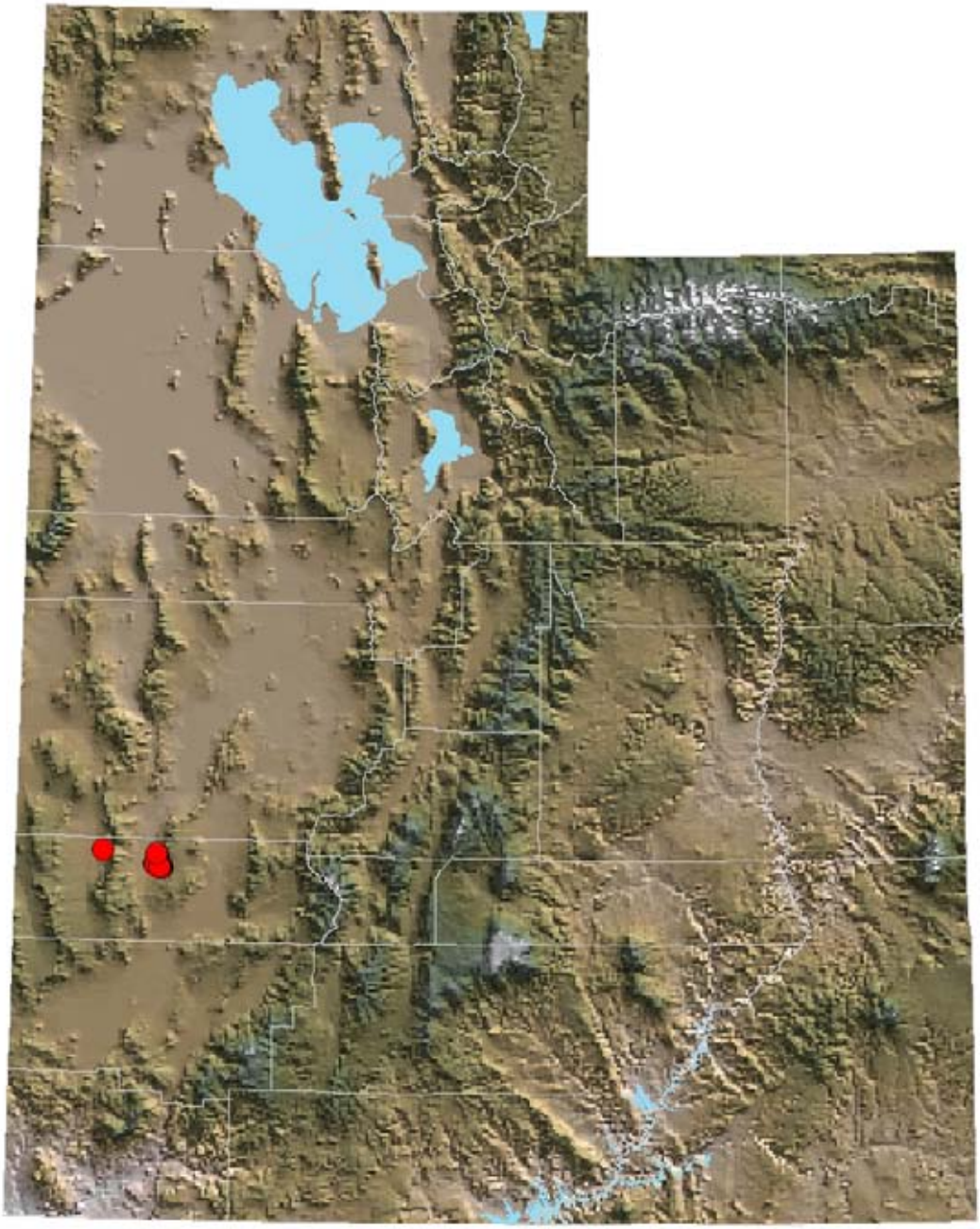

Figure 42. The distribution of Frisco buckwheat (*Eriogonum soredium*).

Rabbit Valley Gilia
Gilia caespitosa

TAXONOMY AND NOMENCLATURE

FAMILY: Phlox (Polemoniaceae)

OTHER NAMES: Recently the species *caespitosa* was transferred into the genus *Aliciella* (Porter 1998). The common name newly applied to it is "Wonderland Alice-flower" (e.g., USFS, et al. 1996).

CONSERVATION STATUS DESIGNATIONS

On 15 December 1980, this species was designated as category 1 candidate for listing under the Endangered Species Act of 1973 (Vol. 45 Federal Register No. 242). Following the 1996 discontinuation of category 1 and 2 candidates, it remained a candidate taxon, ready for proposal. Specific actions necessary for the attainment of long-term conservation goals are identified in a multi-agency conservation agreement (USFS et al. 1996). As a federal candidate species, it is of concern to USDI National Park Service, Capitol Reef National Park, USDI Bureau of Land Management, Richfield Field Office, and USDA Forest Service, Dixie and Fishlake National Forests.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a south-central Utah endemic, along the north end of Waterpocket Fold, on the slopes of Thousand Lake Mountain and in Rabbit Valley, Wayne County. It grows in open piñon-juniper woodlands, often mixed with mountain brush, sagebrush, or ponderosa pine. It is found associated with Navajo Sandstone (primarily), Kayenta and Wingate formations, growing in sand-filled crevices, sand pockets, on detrital slopes, and uncommonly along sandy wash bottoms (Porter and Heil 1994a).

Monitoring of this taxon is ongoing. The largest known populations are the Teasdale Occurrence, an estimated 2100 plants, and the Black Ridge Occurrence, estimated at over 2000 plants. Various threats have been documented, some of greater concern than others, i.e., off-road vehicle use, recreational use, road building and maintenance of utility corridors, trail building and maintenance, pesticide use, collection by rock garden enthusiasts and livestock use by both cattle and sheep (USFS et al. 1996).

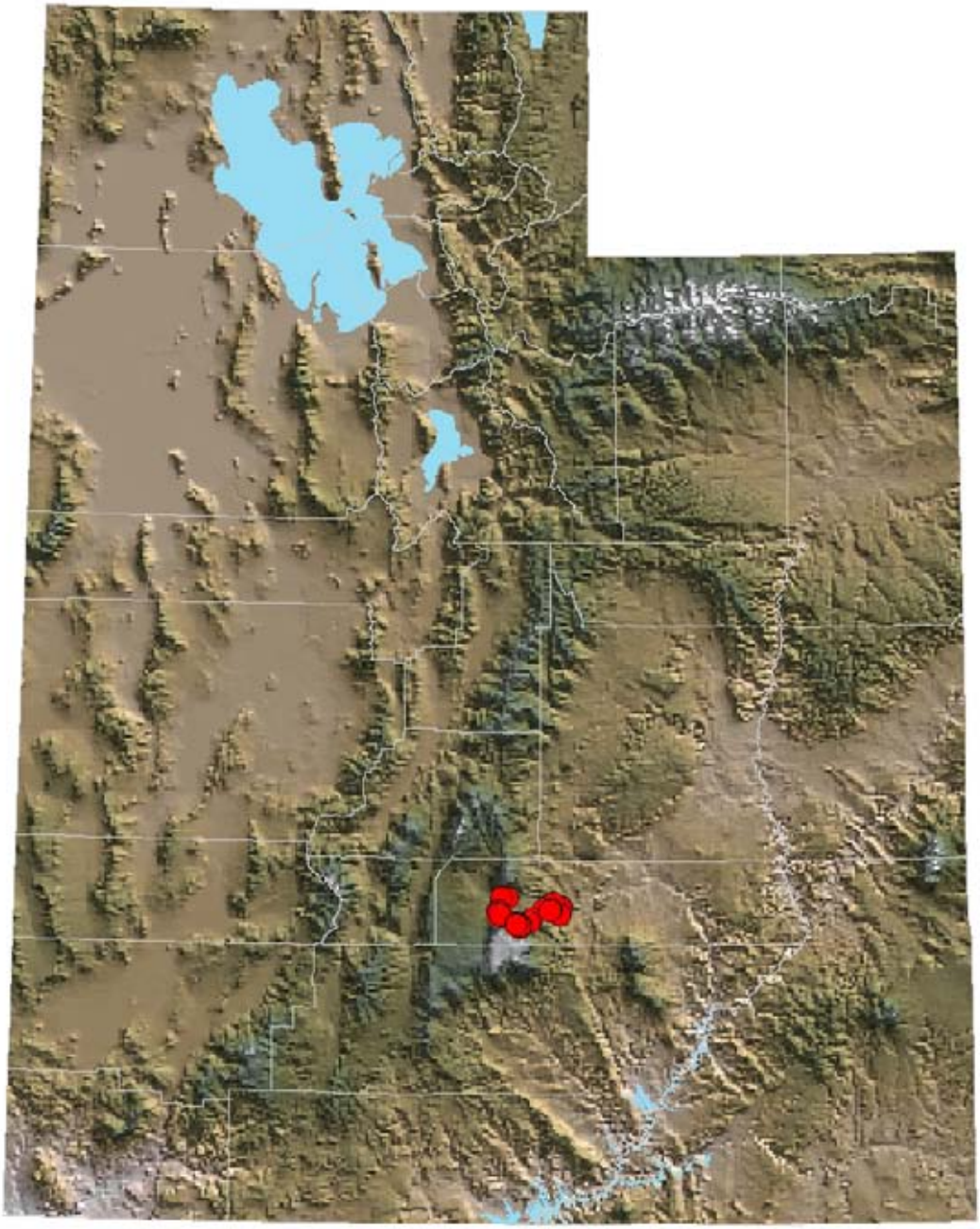

Figure 43. The distribution of Rabbit Valley gilia (*Gilia caespitosa*).

Mussentuchit Gila
Gilia tenuis

TAXONOMY AND NOMENCLATURE

FAMILY: Phlox (Polemoniaceae)

OTHER NAMES: Recently the species *tenuis* was transferred into the genus *Aliciella* (Porter 1998).

CONSERVATION STATUS DESIGNATIONS

Mussentuchit Gila is included on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188). On 19 May 2003, with the Southern Utah Wilderness Alliance as the lead, several conservation groups filed an emergency petition with U.S. Fish and Wildlife Service requesting immediate listing of this taxon (SUWA 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs at scattered locations on the western slope of the San Rafael Swell, western Emery County; at the base of the Limestone Cliffs, western Sevier County; and into the South Desert, immediately adjacent Wayne County (Porter and Heil 1994b). It grows in an unusual assemblage of open piñon-juniper woodland mixed with dwarf mountain mahogany and desert cushion plants, and, though not restricted to any specific geologic formation, it is found on light-colored, coarse-textured sandstone outcrops and detrital slopes (Porter and Heil 1994b).

Porter and Heil (1994) discuss present and potential threats, i.e., oil and gas exploration and development, off-road vehicle and recreational impacts, sand and gravel quarrying, road construction and maintenance, pesticide use and collection by rock garden enthusiasts. Noted elsewhere as potential threats on the increase in this plant's habitat are grazing and trampling by livestock, competition from noxious weeds and climate change (SUWA 2003).

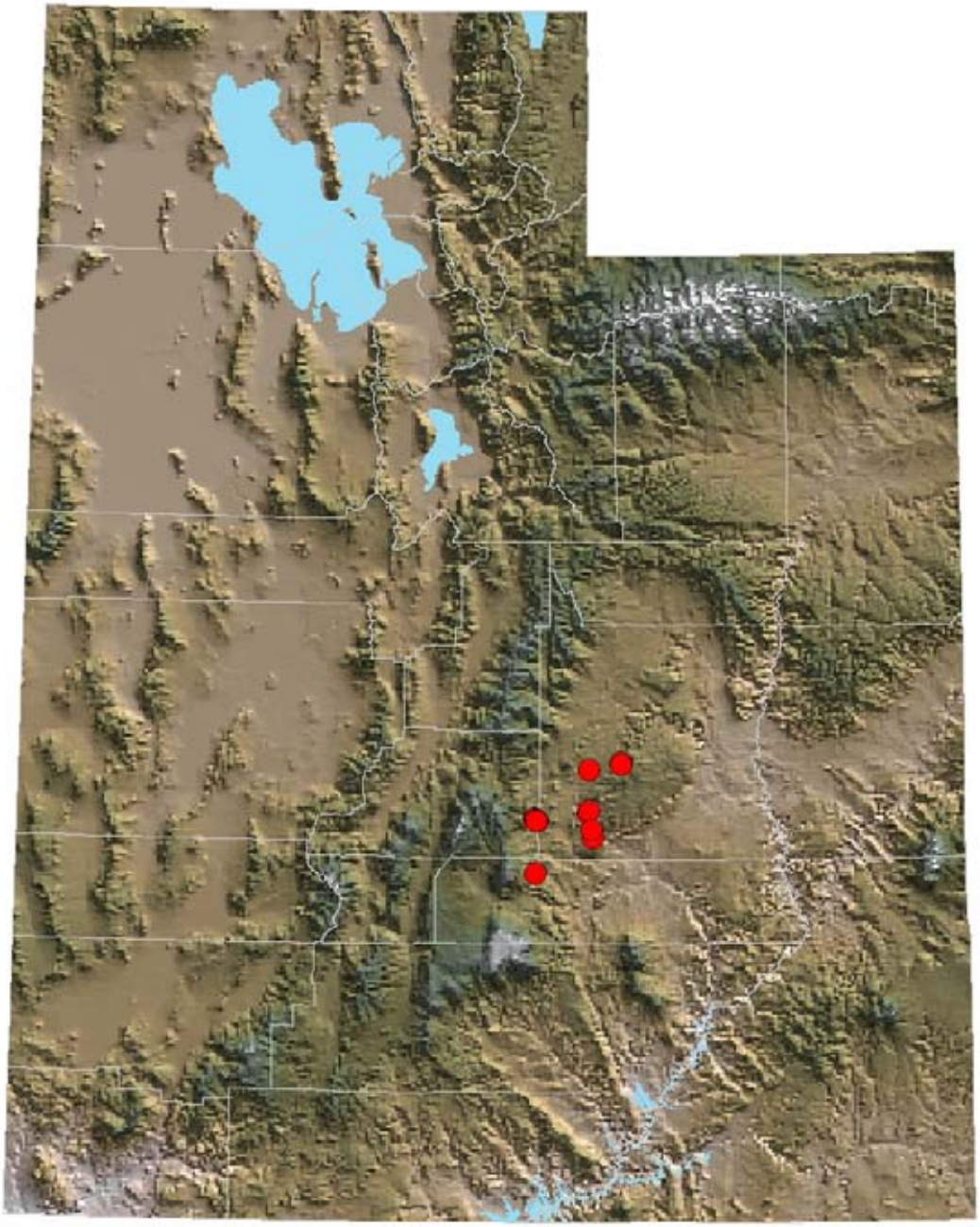

Figure 44. The distribution of Mussentuchit gilia (*Gilia tenuis*).

Shrubby Reed-Mustard
Glaucocarpum suffrutescens

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Some authors (e.g., Holmgren et al. 2005, Welsh et al. 2003) recognize the placement of this species in the genus *Schoenocrambe*. Other common names that have been applied to this species are "Graham's schoenocrambe", "toad-flax cress", "shrubby glaucocarpum" and "Uinta Basin waxfruit".

CONSERVATION STATUS DESIGNATIONS

On 6 October 1987, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 52 Federal Register No. 193). A document identifying recovery goals (USFWS 1994) has been produced as a guide to management and conservation efforts. As a federal endangered species, it is of concern to USDI Bureau of Land Management, Vernal Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a Uinta Basin endemic in Uintah and Duchesne counties. It is known from "Big and Little Pack Mountains; west…onto the slopes of Gray Knolls and Dog Knoll; and…west across the Green River, onto the north-slope-bench above Nine Mile Canyon, along the base of Bad Land Cliffs," Uintah and Duchesne counties. It grows "in mixed desert shrub and piñon-juniper communities" where it is "found along semi-barren, white-shale layers of the Evacuation Creek member of the Green River Formation[,]… where the [s]oils are…shallow and fine textured and usually overlain by shale fragments (Franklin 1995)."

The Uinta Basin has again become an area of intense oil and gas exploration and development. Recent preliminary flagging of well sites and access roads within this plant's habitat on Big Pack Mountain resulted in the need for a localized survey (Buys & Associates, Inc. 2005) to avoid direct impacts. With the current oil crisis, the development of both tar sands and oil shale are again of interest in the Uinta Basin. Franklin (1995) noted that a portion of this plant's habitat was within the U.S. Department of Energy's Naval Oil Shale Reserve No. 2. In 2000, the deed to the Reserve was transferred to the Ute Indian Tribe, not as Federal reservation land held in trust for the tribe, but as private land owned by the tribe. Other impacts noted were winter sheep grazing as a principal use within the plant's habitat, the presence of roadways, and the collection of building stone. England (pers. comm. 2005) has indicated that mining sites for building stone and this taxon's habitat are the same. Besides the previously mentioned survey, additional proactive surveys for this taxon have recently been conducted (Glisson, pers. comm. 2005).

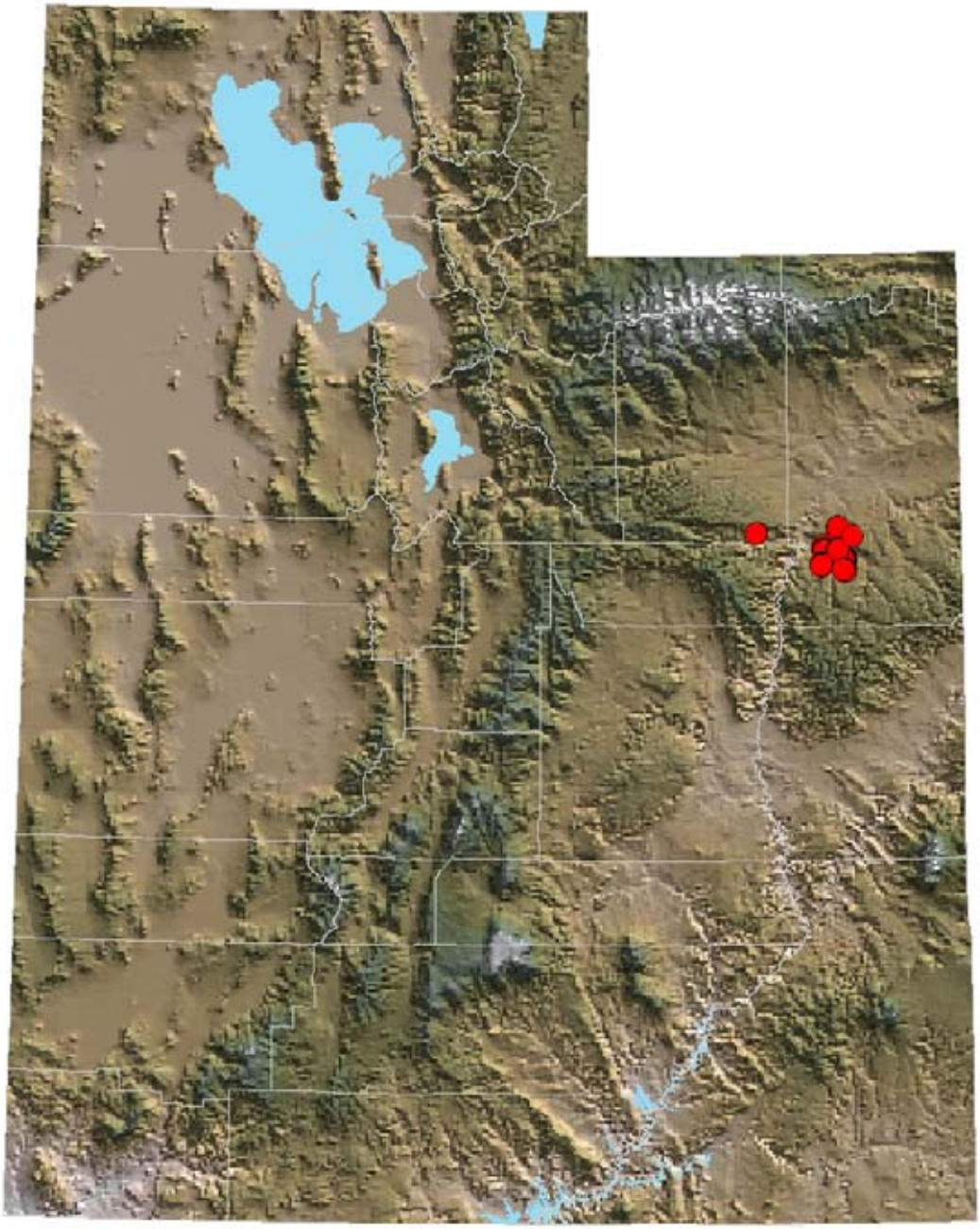

Figure 45. The distribution of shrubby reed-mustard (*Glaucocarpum suffrutescens*).

Rock Hymenoxys
Hymenoxys lapidicola

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Some authors (e.g., Cronquist et al. 1994) place this taxon in synonymy under *Hymenoxys torreyi*. The common name "rock-dwelling gold-flower" has also been used (Stone 1998).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 55 Federal Register No. 35). With the 1993 Notice of Review (Vol. 58 Federal Register No. 188), it became a category 3c candidate, i.e., one of those taxa "that are not subject to any identifiable threat", however, should concerns arise, "they may be reevaluated for possible inclusion in category 1 or 2."

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a narrow endemic on Cliff Ridge, or Blue Mountain, and south slope of Yampa Plateau in northeast Utah, Uintah County. It grows in piñon-juniper and ponderosa pine-manzanita communities (Welsh et al. 2003) where it is found "on precipitous to vertical sandstone slopes of the Weber Formation. More specifically, it grows in sandy soils on ledges or in crevices of that formation at open to protected sites (Franklin 1992b)."

Though grazing occurs on Blue Mountain, Franklin (1992b) discounted resulting impacts due to the steepness of the habitat. The one location where some degree of impact was likely occurring was at Point of Pines campground on the south rim of Blue Mountain. Plants were present within the campsite. No information is available documenting the status of this or other populations, i.e., any population size estimates, habitat condition or potential impacts.

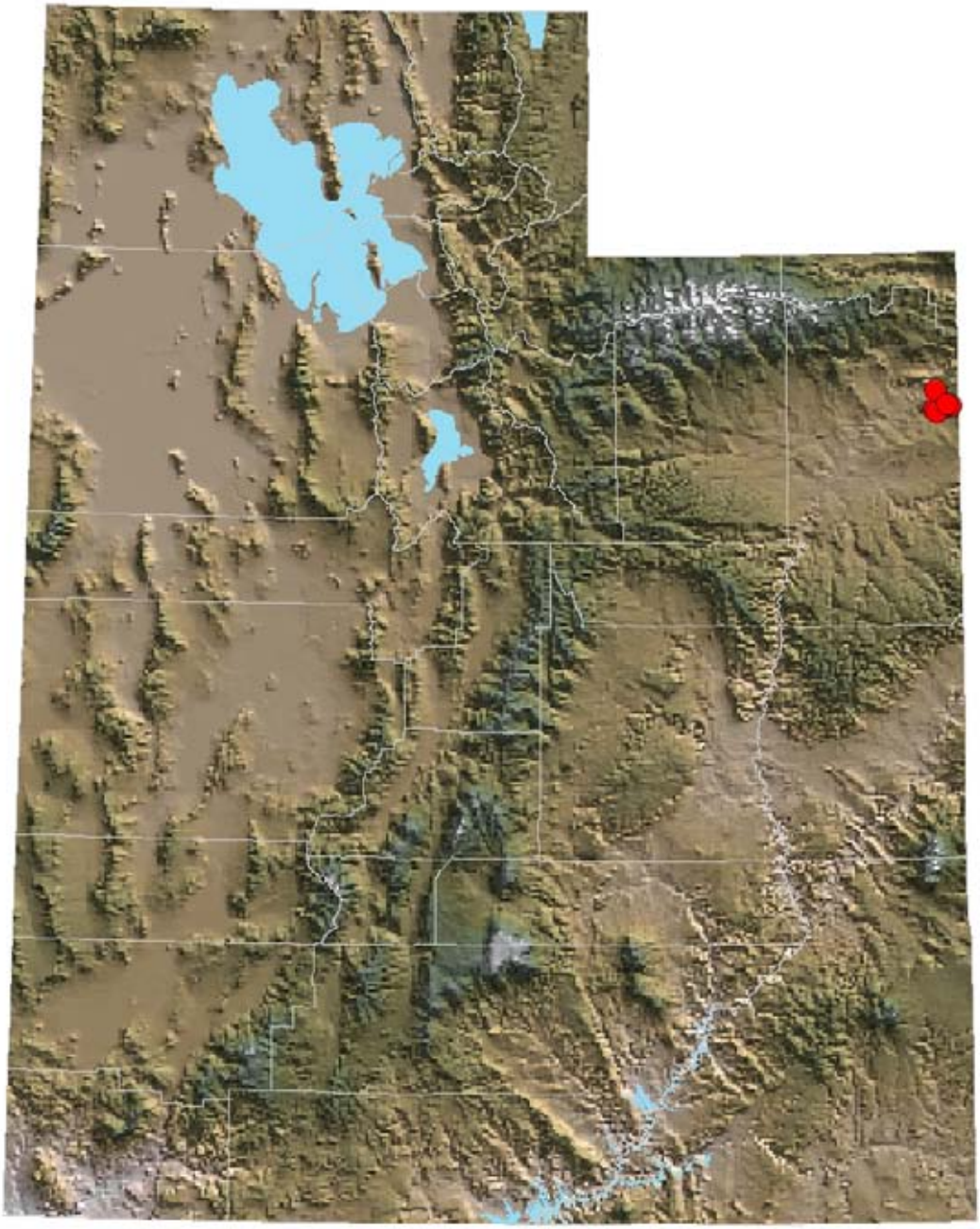

Figure 46. The distribution of rock hymenoxys (*Hymenoxys lapidicola*).

Tushar Gilia
Ipomopsis tridactyla

TAXONOMY AND NOMENCLATURE

FAMILY: Phlox (Polemoniaceae)

OTHER NAMES: Until recently (Welsh et al. 2003) the genus *Ipomopsis* was referred to as *Gilia* in "A Utah Flora" (Welsh et al. 1987 and 1993). As a subspecies, the name *Ipomopsis spicata* subsp. *tridactyla* is available (e.g., NatureServe 2005, NRCS 2005). The common name "Cedar Breaks gilia" is also used.

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southeast Utah endemic. It is known at high elevations in the Tushar Mountains, Piute County, and at Cedar Breaks and Brian Head, Iron County. Collection data indicate a varied habitat, i.e., wet meadows in spruce-fir to alpine meadows, stunted aspen krummholtz, and alpine tundra to gravelly, rocky flats and slopes.

No information is available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. Though in a National Monument such as Cedar Breaks it is expected that natural communities are managed and protected, the status of this taxon there is unknown. Due to the fact that Brian Head supports a ski slope and associated development, there is a greater concern for its status there. Mountain goats, hiking and off-highway vehicle use are present in the high elevations of the Tushar Mountains.

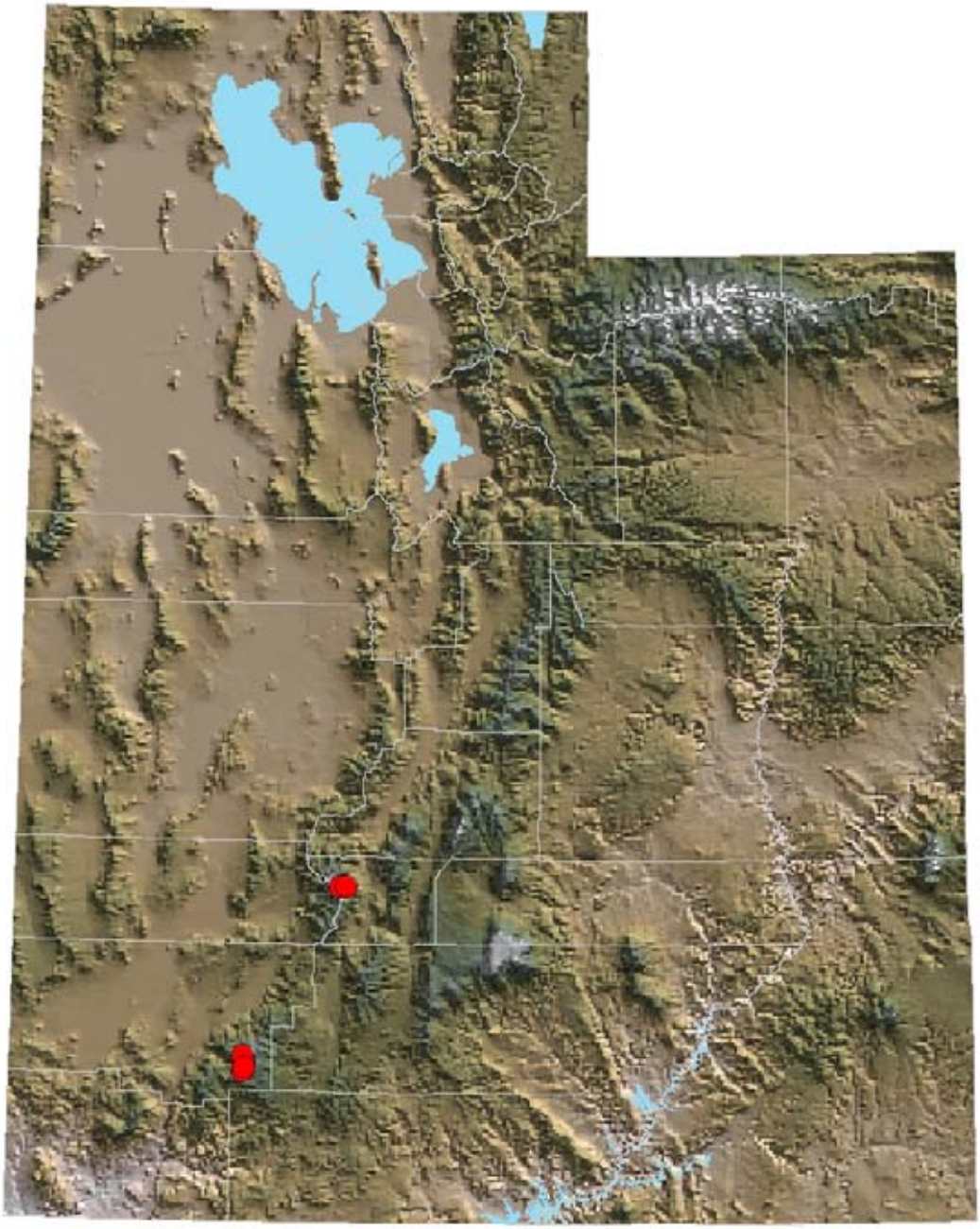

Figure 47. The distribution of Tushar gilia (*Ipomopsis tridactyla*).

Ostler's Ivesia
Ivesia shockleyi var. *ostleri*

TAXONOMY AND NOMENCLATURE

FAMILY: Rose (Rosaceae)

OTHER NAMES: The common name "Wah Wah ivesia" (e.g., Stone 1998) has been used.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic in southeast Utah on foothills in The Needles and the southern Wah Wah Mountains, Beaver County. It inhabits cracks and crevices of quartzite outcrops along ridges covered in piñon-juniper and ponderosa pine-piñon-mountain mahogany woodlands.

There is no information available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts.

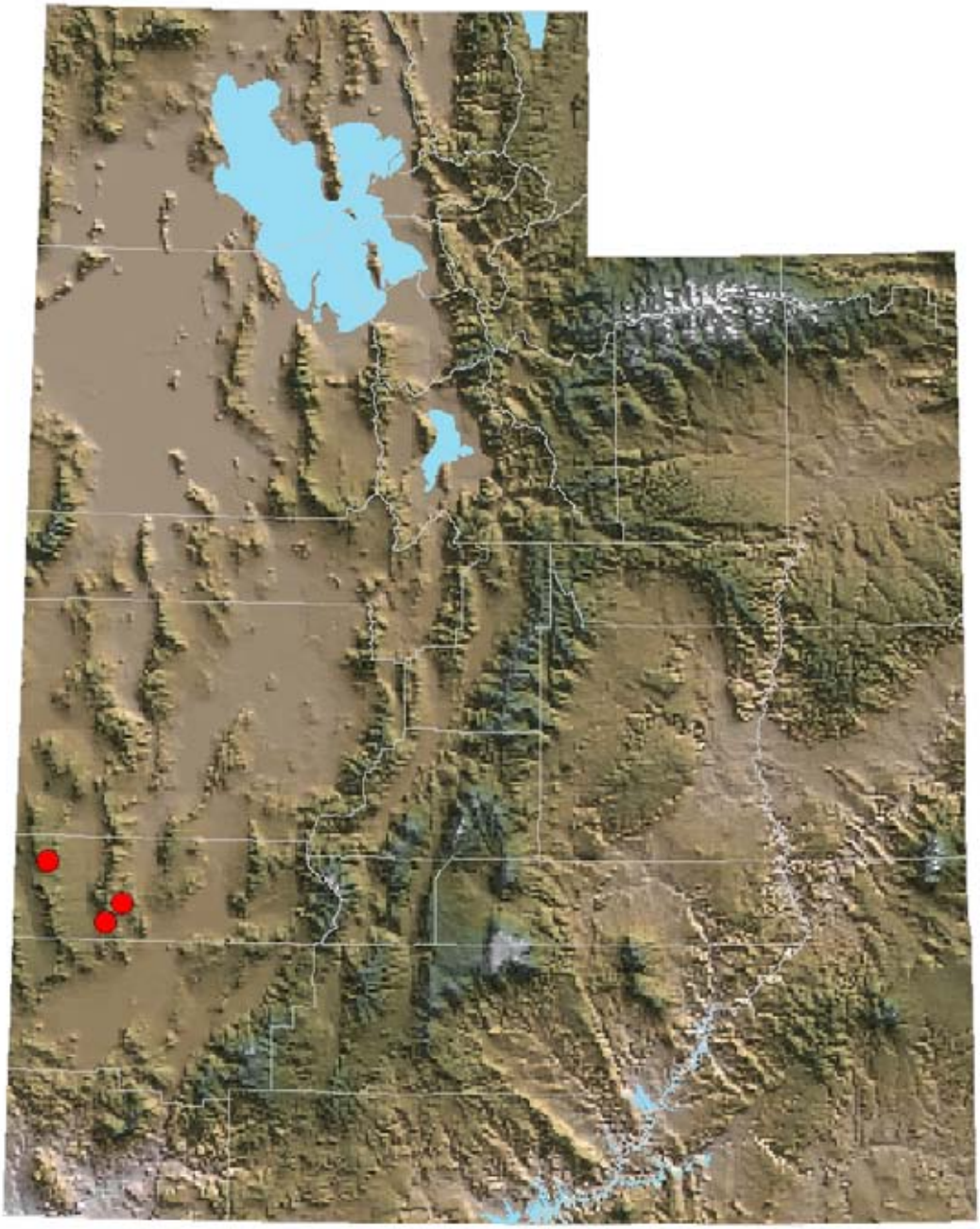

Figure 48. The distribution of Ostler's ivesia (*Ivesia shockleyi* var. *ostleri*).

Utah Ivesia
Ivesia utahensis

TAXONOMY AND NOMENCLATURE

FAMILY: Rose (Rosaceae)

OTHER NAMES: The common name "Utah mousetail" is in use (e.g., NRCS 2005).

CONSERVATION STATUS DESIGNATIONS

It is included in the Wasatch-Cache National Forest's forest plan (USDA, FS 2003) as a Recommended Sensitive species, and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Utah endemic known from very few but widely scattered locations. In the Wasatch Mountains, it is known from Ben Lomond peak, Weber County, and on the upper ridges around Little Cottonwood Canyon, Salt Lake, Utah and Wasatch counties. In the western Uintah Mountains, it is known on Bald Mountain, Duchesne and Summit counties, and on Ostler Peak and the ridgeline south of Mount Beulah, Summit County (Stone 1998, UTHP 2005). It grows in "[a]lpine tundra and krummholtz communities, often in talus (Welsh et al. 2003)."

No information is available documenting the status of the Ben Lomond population; however, mountain goats are a potential threat (Duncan, pers. comm. 2005b). An unsuccessful effort was made in 2005 to relocate it. If established, it will be included in an area that has been recommended as a botanical special interest area by the Wasatch-Cache National Forest Ecologist (Padgett, pers. comm. 2005a). Bald Mountain, off Mirror Lake Highway in the western Uinta Mountains, has a hiking trail to its top that bisects its population. Forest Service personnel have observed that the source of the several additional trails through the Bald Mountain habitat is the result of trailing by mountain goats (Duncan, pers. comm. 2005b). The status of other Uinta Mountains locations is undocumented. In the central Wasatch instances of trampling by hikers has been observed. Continuing recreational development in the canyons of the central Wasatch Mountains is a source of potential impacts (UTHP 2005). The most severe impact that is known to have occurred to this plant was to a population at Alta Ski Area that was bisected by a service road before forest service personnel recognized it as a rare Utah species; it has been protected since (Padgett, pers. comm. 2005a).

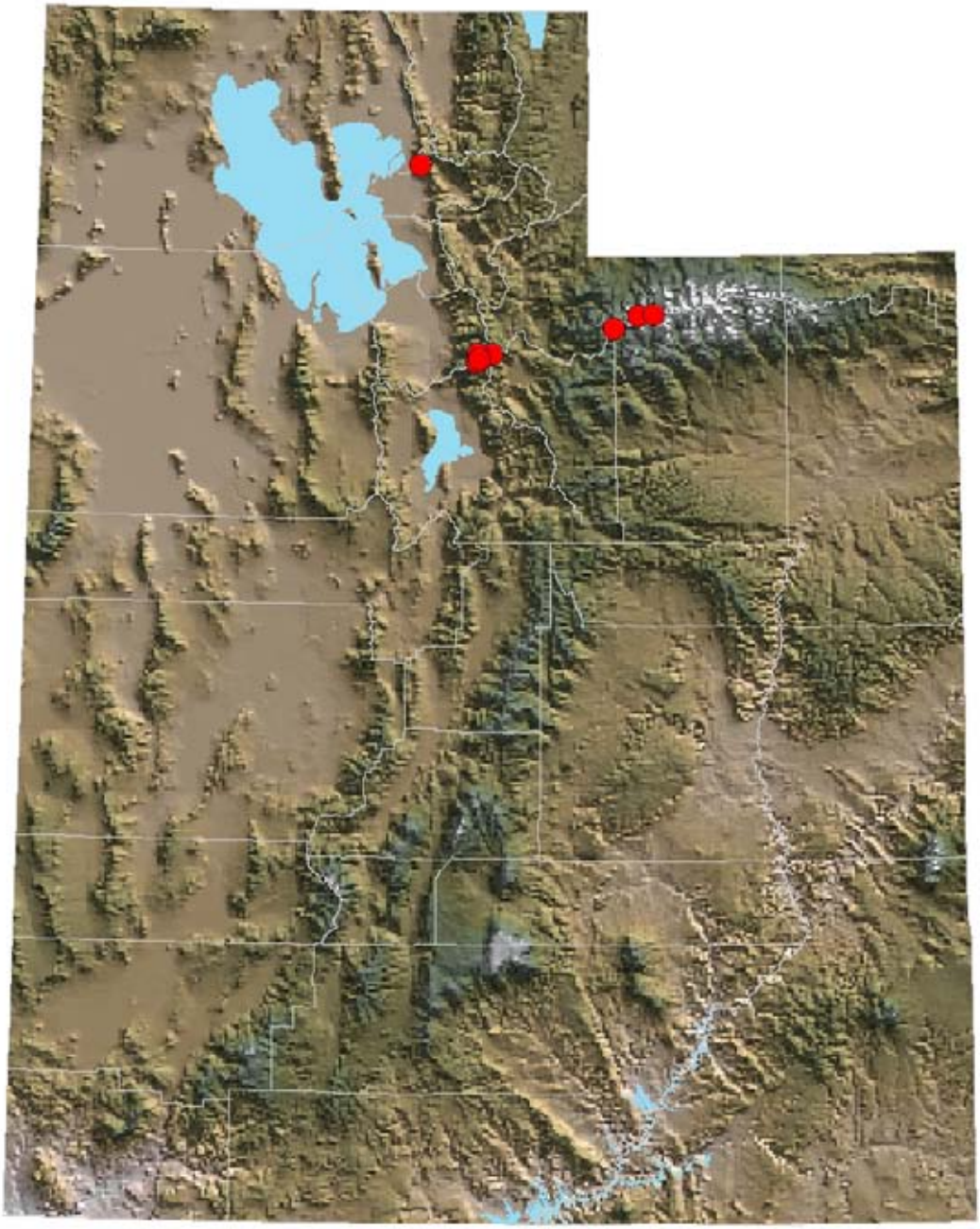

Figure 49. The distribution of Utah ivesia (*Ivesia utahensis*).

Barneby's Ridgecress
Lepidium barnebyanum

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: The common name "Barneby pepper grass" is used (e.g., NatureServe 2005).

CONSERVATION STATUS DESIGNATIONS

On 28 September 1990, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 55 Federal Register No. 189). A document identifying recovery goals (USFWS 1993a) has been produced as a guide to management and conservation efforts. It is not known to occur on federal lands.

DISTRIBUTION AND ABUNDANCE IN UTAH

This plant is a narrow endemic known only in the vicinity of Indian Canyon in the Uinta Basin, Duchesne County. It is found along semi-barren ridges in piñon-juniper woodlands where, on sparsely vegetated ground surfaces, it is associated with similar cushion shaped plants. The soils are derived from the white shale of the Uinta Formation; they are shallow, fine textured, and intermixed with rock fragments (USFWS 1990a, Welsh et al. 2003).

The most recent estimates on population size are from its listing document, i.e., an estimated total population at about 5000 plants over an area of less than 500 acres (USFWS 1990a). No information is available documenting the current status of populations, i.e., population size estimates, habitat condition or potential impacts. Oil and gas exploration and development have escalated in the Uinta Basin and may result in potential impacts to habitat.

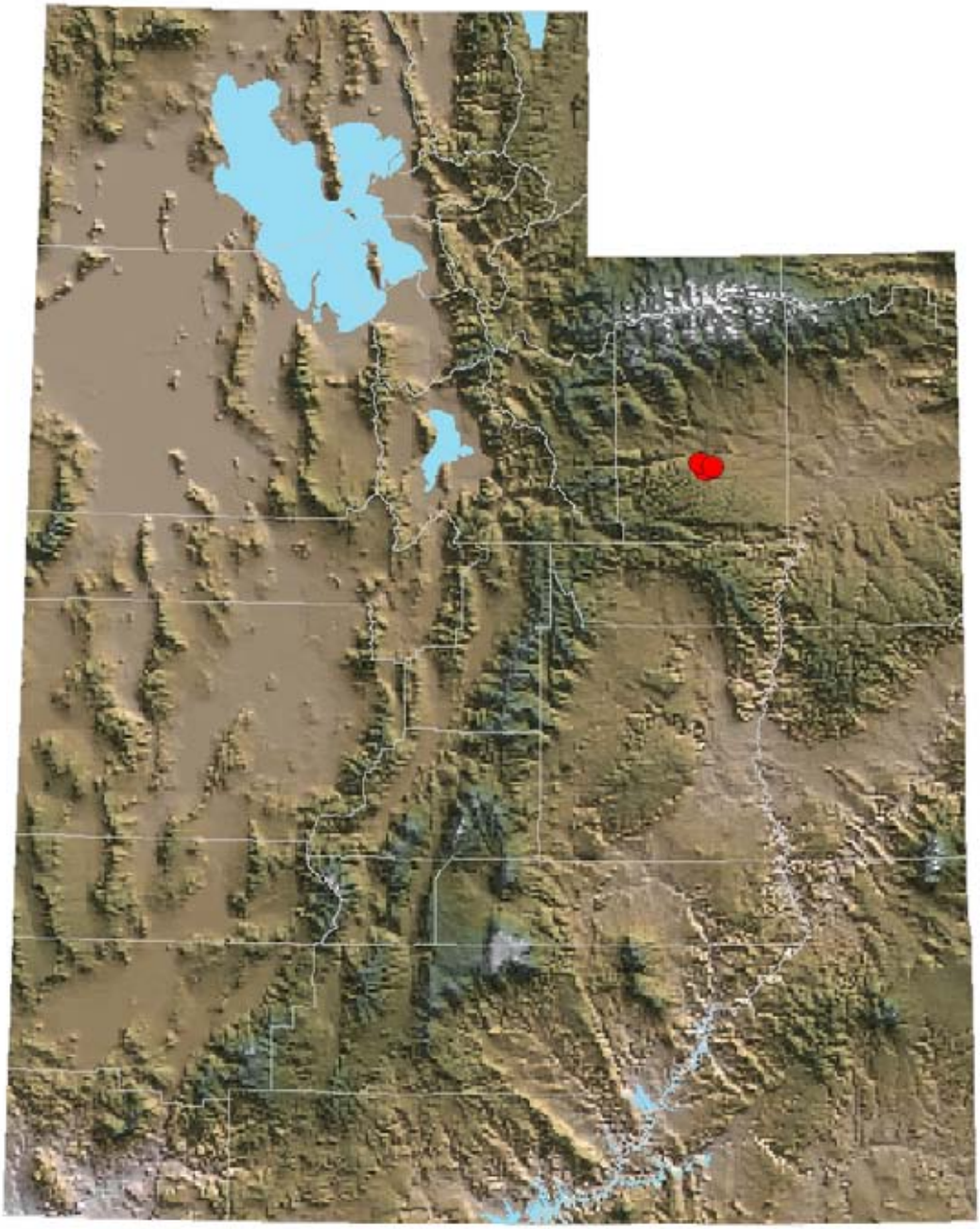

Figure 50. The distribution of Barneby's ridgecress (*Lepidium barnebyanum*).

Alpine Pepperplant
Lepidium montanum var. *alpinum*

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: The common name "Wasatch pepperwort" is also being used (e.g., Holmgren et. al. 2005).

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Utah endemic known primarily from the central Wasatch Range in Big and Little Cottonwood canyons, Salt Lake County. Based on historical collections, it is reported in the Oquirrh Mountains, Salt Lake or Tooele County (Rollins 1993; Holmgren et al. 2005), and "Near Midway", Wasatch County (NYBG 2005). At a location far removed from these, it has been reported in the Tushar Mountains of south-central Utah, Piute County (Holmgren et al. 2005). Based on available Wasatch Front data, it grows at upper elevations in cracks and in pockets on quartzite, limestone and shale cliffs; and can be associated with *Amelanchier* sp., *Symphoricarpos* sp., *Saxifraga* sp., *Orobanche uniflora*, *Sedum* sp., and *Aspidotis densa* (UTHP 2005).

Available information for the few known sites indicates that numbers are variable, i.e., as few as an estimated 1-10 plants to as high as 1,001-10,000 plants (UTHP 2005). Observed impacts to visited sites were limited to those resulting from access of the habitat by hikers and climbers. Potential impacts are those resulting from ski industry development.

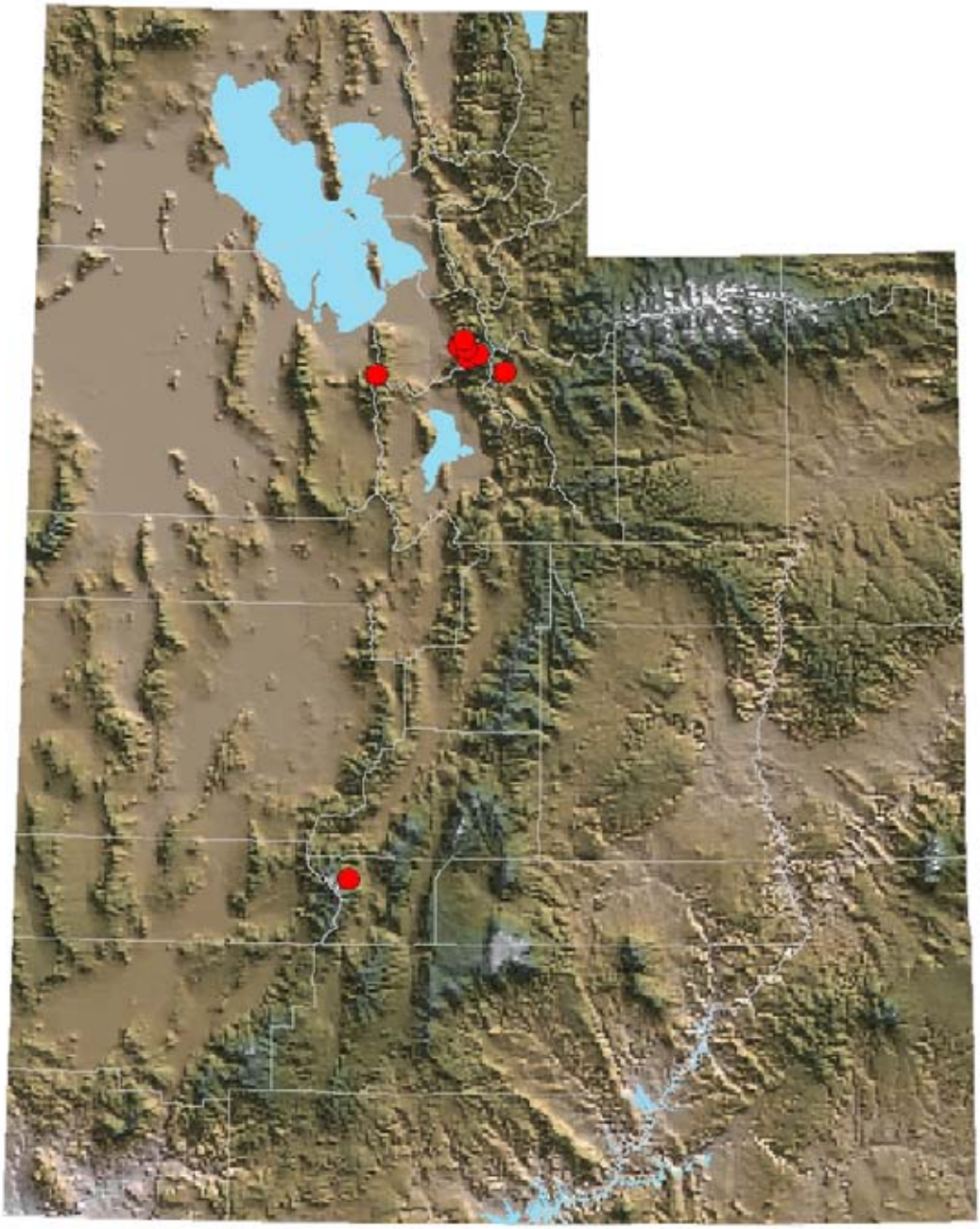

Figure 51. The distribution of alpine pepperplant (*Lepidium montanum* var. *alpinum*).

Ostler's Peppergrass
Lepidium ostleri

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to south and west slopes of the San Francisco Mountains, west-central Utah, Beaver County. It is known at the south end of the range on Grampian Hill, to the northwest in the vicinity of Loeber Gulch, and north, with an apparent break, on the west slope below Frisco Peak in the vicinity of Indian Queen Mine and south nearly to Copper Canyon (UTHP 2005). The habitat is predominately privately owned. It grows in piñon-juniper-sagebrush communities on outcrops chalk-white calcareous limestone in soil that is fine textured to gravelly (Atwood 2002b, Kass 1992b).

After having extensively searched for and not found similar potential habitat in adjacent ranges, Kass (1992b) speculates that it is not likely to be found beyond this range. Atwood (2002b) estimated the total population size at 20,000 individuals covering a total area of approximately 100 acres. Kass (1992b) indicates that past impacts to this plant's habitat have resulted from mining activities, and notes that, at the time of his report, there was speculation of renewed gold and silver mining. Evidence of recent seismic activity was observed in the habitat. Atwood (2002b) stresses the need for protecting its very limited habitat, and suggests that purchase by private conservation groups or the establishment of a botanical area might accomplish this. Additional survey and monitoring are recommended.

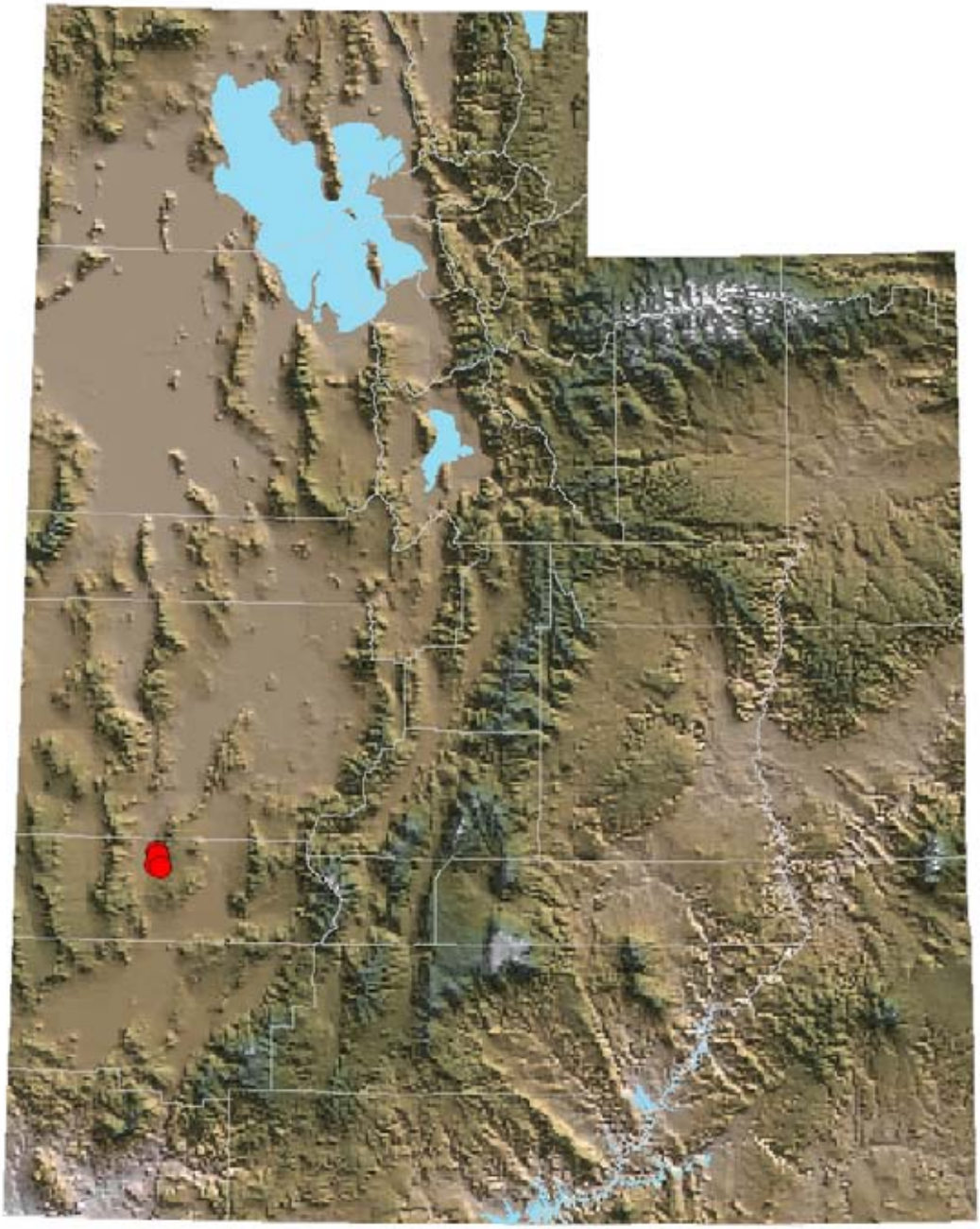

Figure 52. The distribution of Ostler's peppergrass (*Lepidium ostleri*).

Garrett's Bladderpod
Lesquerella garrettii

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Recently, species of the genus *Lesquerella* were transferred into *Physaria* (Al-Shehbaz and O' Kane 2002).

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to the central Wasatch Mountains where it is known at high elevation from Big Cottonwood Canyon south to Provo Peak. It grows on steep, sparsely to moderately vegetated sites, on talus slopes, weathered rock outcrops, and less frequently in boulder fields, where it is in rocky-gravelly soils or rock crevices (Tuhy 1991).

Tuhy (1991) noted that most occurrences "contain only a few tens of plants." His survey provides a total estimated population of 4250, but notes that this is very likely an underestimate. Observations of impacts such as rock climbing and off-trail hiking that resulted in trampling of soil and vegetation and in networks of trails through its habitat, were reported. He noted however, that these were localized impacts and, at the present, not a threat to the species as a whole. He suggests that potential future impacts are recreation, both commercial and private, and the presence of mountain goats. In a 1992 (Tuhy 1993) follow-up project, permanent monitoring sites were established in order to obtain populations trends and to determine better the effects of recreation and mountain goat use over time.

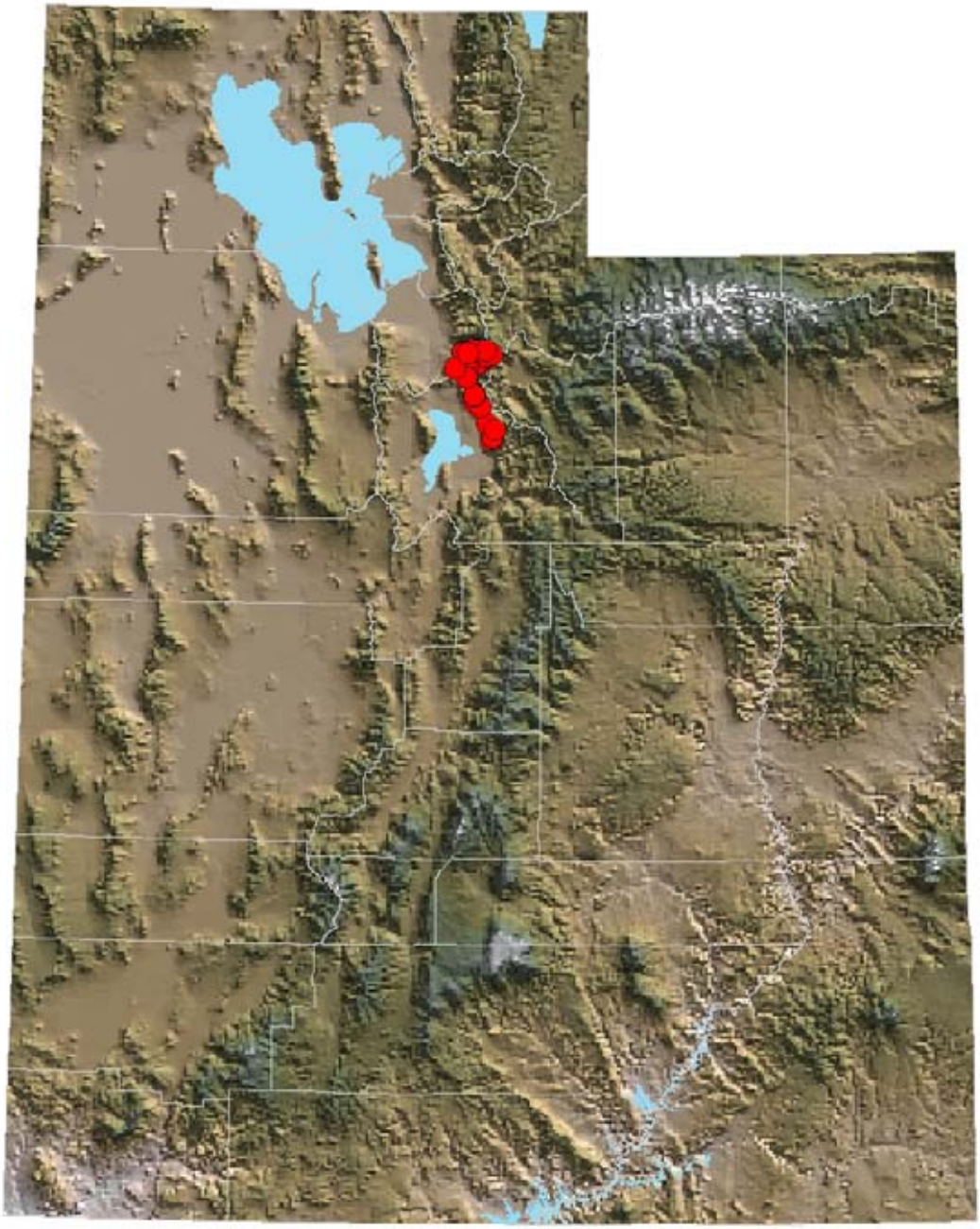

Figure 53. The distribution of Garrett's bladderpod (*Lesquerella garrettii*).

Kodachrome Bladderpod
Lesquerella tumulosa

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Recently, species of the genus *Lesquerella* were transferred into *Physaria* (Al-Shehbaz and O' Kane 2002). This taxon has been relegated to varietal status by some authors (e.g., Welsh et al. 2003), i.e., *Physaria rubicundula* var. *tumulosa*. Yet, others (e.g., NRCS 2005) follow Rollins (1993) who considers it a synonym of *Physaria rubicundula*. Its common name appears stable.

CONSERVATION STATUS DESIGNATIONS

On 6 October 1993, this species was designated as endangered under the Endangered Species Act of 1973 (Vol. 58 Federal Register No. 192). As a federal endangered species, it is of concern to USDI Bureau of Land Management, Grand Staircase-Escalante National Monument.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a south-central Utah endemic near Kodachrome Basin State Park, Kane County. It grows in scattered piñon-juniper community with *Purshia tridentata* and *Cryptantha flava* on "white, semibarren shale knolls (Franklin 1990, Welsh et al 2003)."

A 2002 survey estimates the total population of this species is approximately 16,500 plants (GSENM 2003). Franklin (1990c) noted the presence of cattle grazing in the plant's habitat, but off-highway vehicle activity was not observed. Van Buren and Harper (2000) began monitoring this species in 1997. They report that from within their monitoring plots, apparently, as a result of off-highway vehicle use, some of their tagged plants were found either dead or missing. After noting that the open "habitat of this taxon is attractive to users of such vehicles", they recommend, off-highway vehicle "use should be limited to areas outside of the known habitat." They do not mention impacts resulting from cattle grazing.

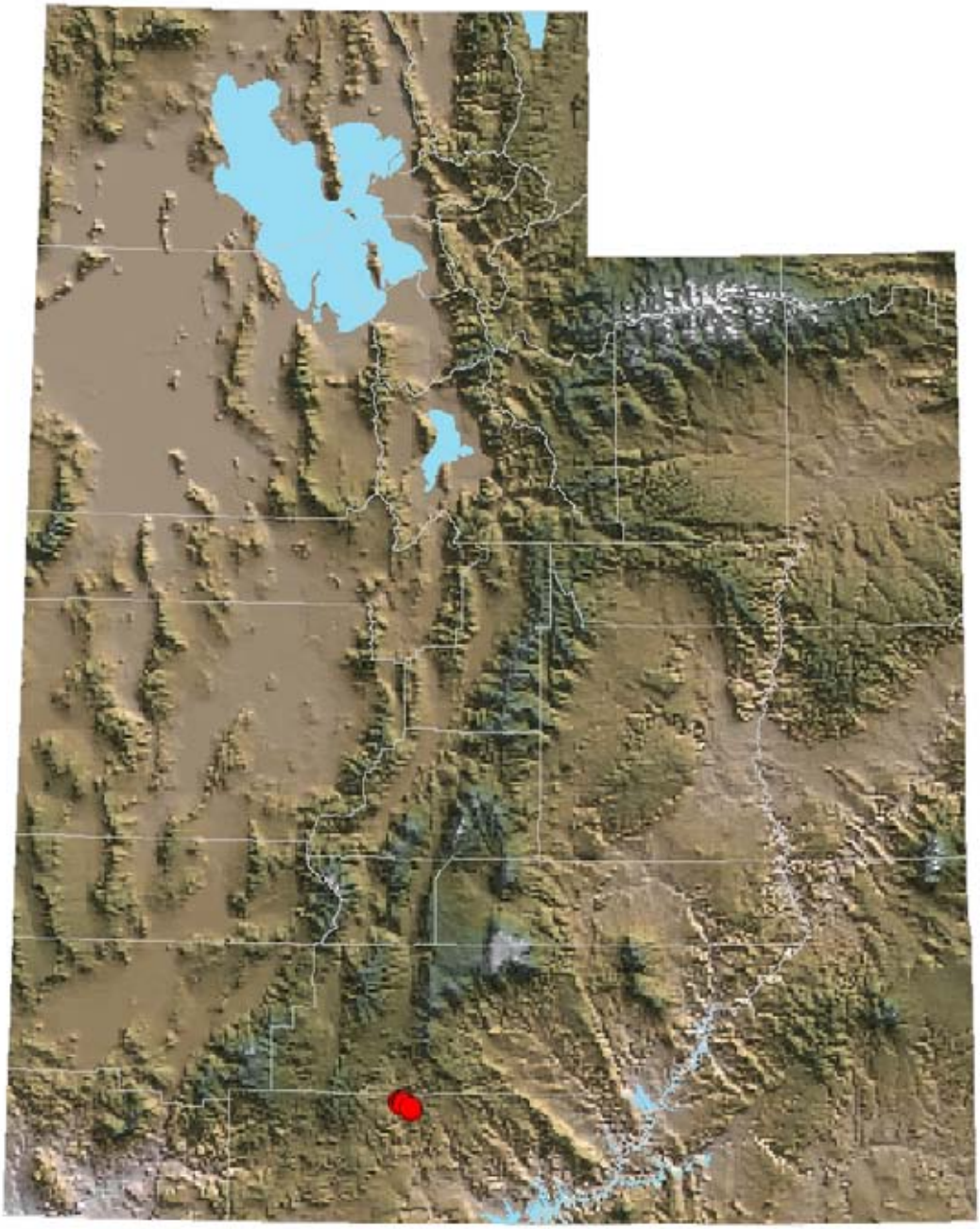

Figure 54. The distribution of Kodachrome bladderpod (*Lesquerella tumulosa*).

Arapien Stickleaf
Mentzelia argillosa

TAXONOMY AND NOMENCLATURE

FAMILY: Stickleaf (Loasaceae)

OTHER NAMES: Until recently this species has been regarded as having a disjunct distribution on the Roan Plateau area of Garfield Co., Colorado. However, that entity is now named *Mentzelia rhizomata* (Reveal 2002).

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies. It was formerly on the BLM Sensitive Plant List (Lamb 1996), and was a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a central Utah endemic that occurs in the Sevier River Valley, Sanpete and Sevier counties. It is known on steep, eroding, semi-barren slopes of the Arapien Shale Formation along the east side of the valley from Ninemile Reservoir, north of Mayfield, south to the vicinity of Rainbow Hills near Glenwood. It grows in piñon-juniper and mixed desert shrub communities with alder-leaf mountain mahogany, shadscale and *Ephedra* (Fitts, pers. comm. 2005a, Welsh et al. 2003).

A 2004 partial survey of the Arapien Shale, with Rainbow rabbitbrush as primary target, documented *Mentzelia* from Mayfield to Rainbow Hills. Over 4100 plants were observed. Stone (1998) indicated that it is "widespread, even locally common". Evidence of gypsum mining was observed over much of the habitat, and plants were never observed having occupied disturbed locations. Gypsum mining is ongoing, and it was observed that some inactive mines had up-to-date paperwork on the claim stakes. Off-road vehicle use is present and a potential source of impacts (Fitts, pers. comm. 2005a, UTHP 2005). The recent discovery of oil in the Sevier Valley has added another potential impact to this plant's habitat.

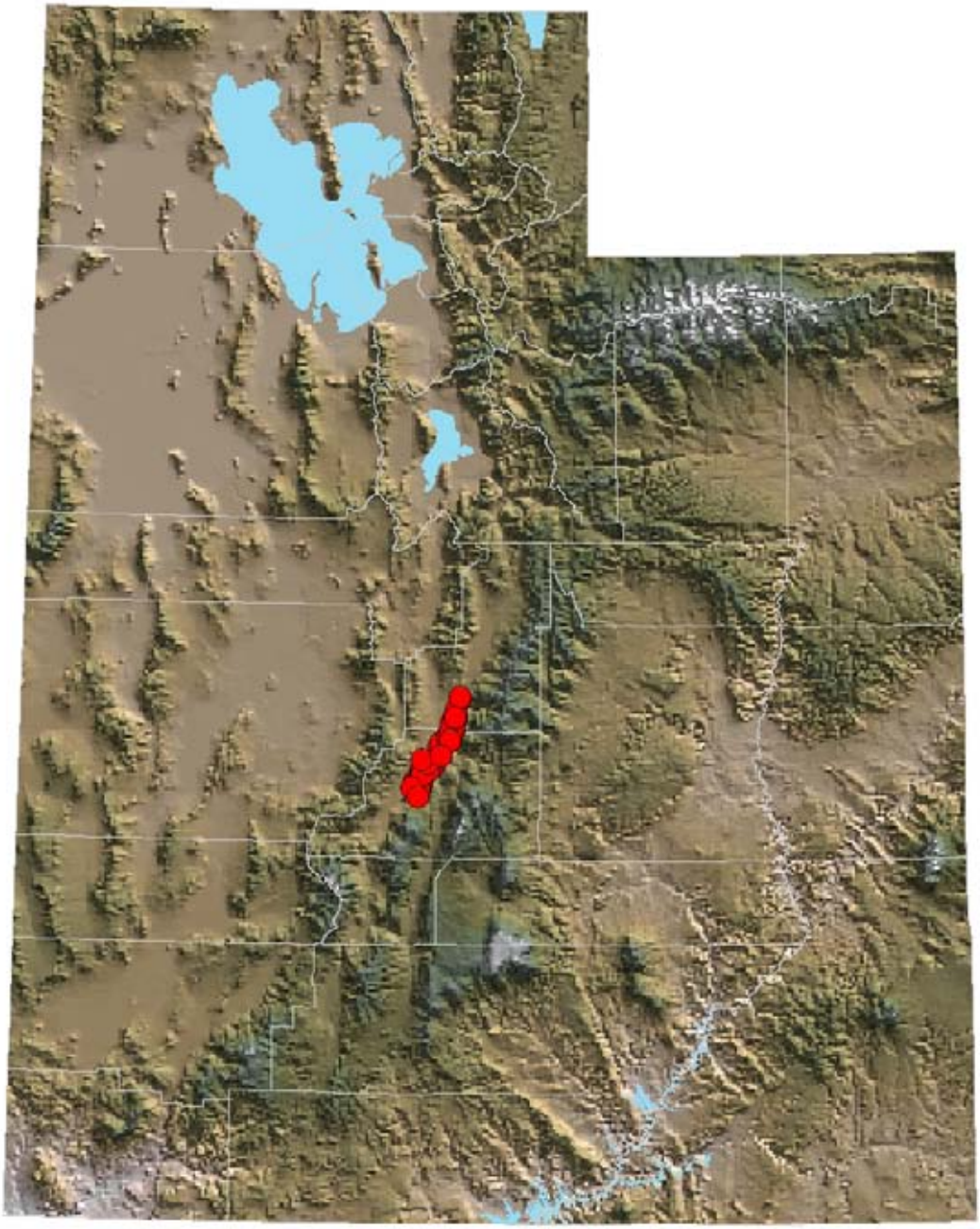

Figure 55. The distribution of Arapien stickleaf (*Mentzelia argillosa*).

Goodrich's Blazingstar
Mentzelia goodrichii

TAXONOMY AND NOMENCLATURE

FAMILY: Stickleaf (Loasaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and on the BLM's Sensitive Plant Species List (Fortner 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

Endemic to Utah in southern Duchesne County this taxon is known along Bad Land Cliffs above Argyle Canyon and west into Avintaquin Canyon. In is found growing on "[s]teep, white, marly calciferous shale outcrops of Green River Formation with scattered limber pine, pinyon pine, Douglas fir, mountain mahogany, and rabbitbrush (Welsh et al. 2003)."

No information is available documenting the status of populations, i.e., neither population size estimates, habitat condition or potential impacts. Extensive oil and gas exploration and development are on the increase locally and are perhaps a potential source of future impacts.

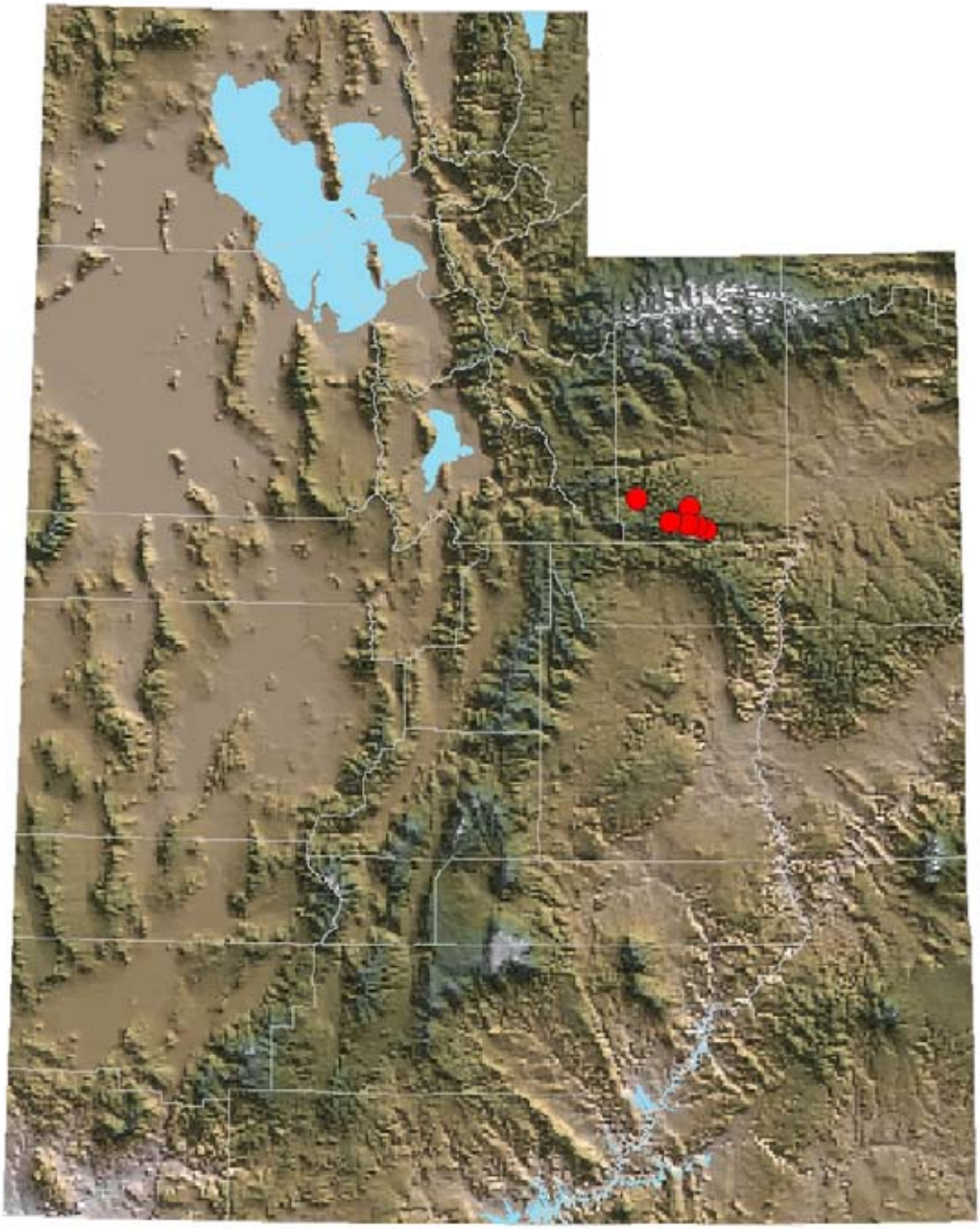

Figure 56. The distribution of Goodrich's blazingstar (*Mentzelia goodrichii*).

Shultz' Stickleaf
Mentzelia shultziorum

TAXONOMY AND NOMENCLATURE

FAMILY: Stickleaf (Loasaceae)

OTHER NAMES: The common name "Shultz blazing star" is also in use (e.g., NRCS 2005; Smith 1994).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a southeast Utah endemic in the vicinity of Professor Valley. It is known at scattered locations from Parriott Mesa to the west slope of Adobe Mesa and, after an apparently unoccupied break, in the twisting, narrow canyon of Onion Creek, Grand County. It grows in "a mixed desert shrub community having a sparse forb and grass understory", "on moderate to very steep slopes…[in soils of] either a silty clay loam or a silty loam (Smith 1994a)."

Smith (1994b) documented seven populations with a total estimate of plants at approximately 4500 individuals. It is noted that the BLM Grand Resource Area Management Plan, of the time, indicates that recreation and grazing are allowed uses in the area. Smith contends that due to the increase in "hiking, rock climbing and mountain biking in the immediate area", recreation may be a threat. There is no more current information documenting the status of populations.

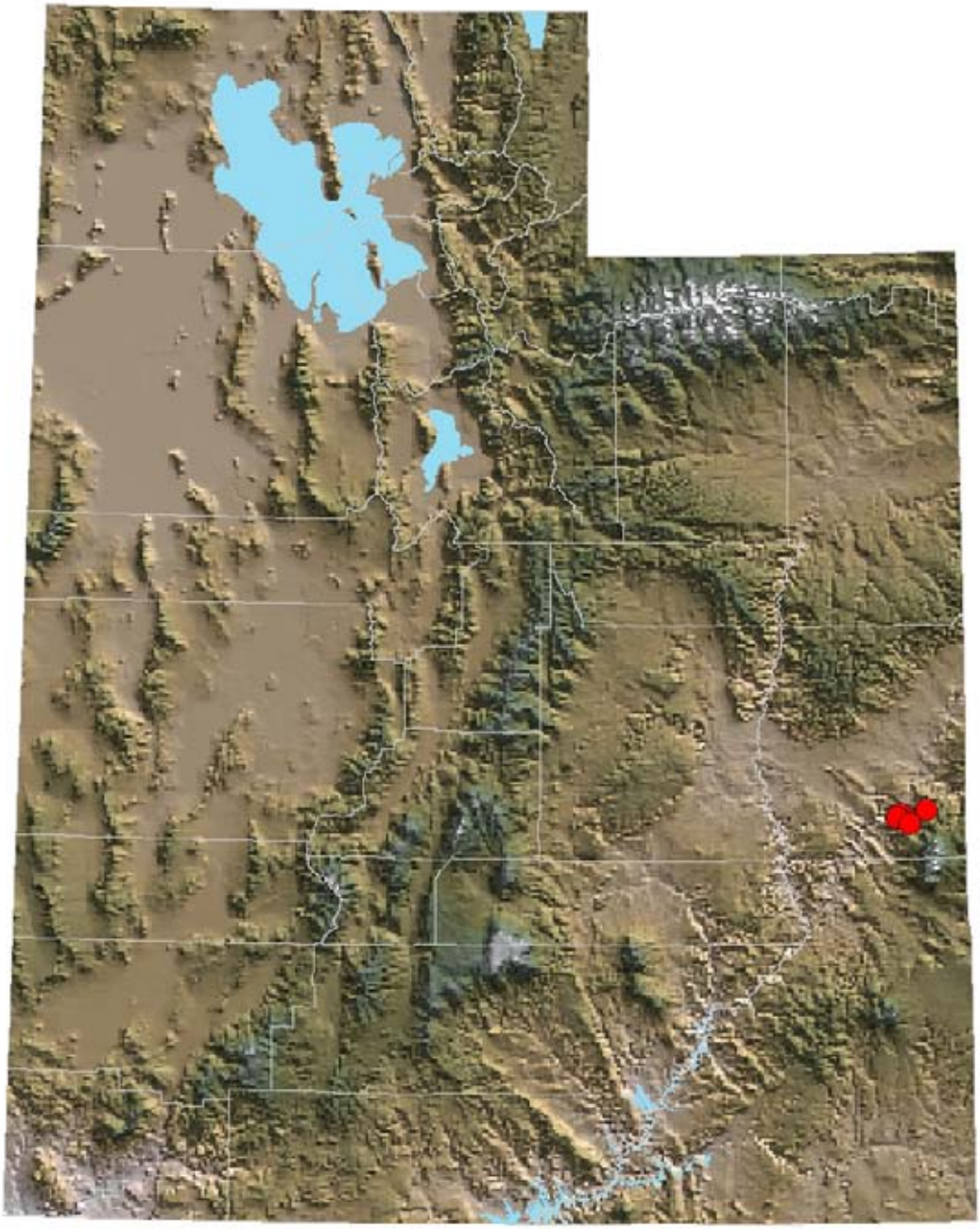

Figure 57. The distribution of Shultz' stickleaf (*Mentzelia shultziorum*).

San Rafael Cactus
Pediocactus despainii

TAXONOMY AND NOMENCLATURE

FAMILY: Cactus (Cactaceae)

OTHER NAMES: Other common names currently applied to this species are "Despain's footcactus" (e.g., Welsh et al. 2003) and "Despain pincushion cactus" (e.g., NRCS 2005).

CONSERVATION STATUS DESIGNATIONS

On 16 September 1967, this species was designated as endangered under the Endangered Species Act of 1973 (Vol. 52 Federal Register No. 179). In 1995, the FWS announced the availability of a draft recovery plan (Vol. 60 Federal Register No. 187); it has not been implemented. As a federal endangered species, it is of concern to USDI Bureau of Land Management, Price Field Office, and USDI National Park Service, Capitol Reef National Park.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a central Utah endemic, predominantly in Emery County but just over the line into Wayne County. It is known from the east base of Cedar Mountain, southwest to The Wedge and The Red Ledges and as far south as Cathedral Valley. Away from this broken band of distribution down the west side of the San Rafael Swell, it is found in its southern interior. It inhabits benches, hilltops, and gentle slopes in mixed desert shrub-grassland and piñon-juniper communities in fine textured soils rich in calcium that are derived from the Carmel, Sinbad Member of the Moenkopi and Brushy Basin Member of the Morrison formations (Clark 2005a, USFWS 1995b).

The draft recovery plan estimated the total number of individuals to be about 20,000 (USFWS 1995b). Survey for this taxon has been ongoing for several years. New sites have been found as recently as this year (Clark 2005a). It is an attractive plant and subject to collection. Its habitat has been impacted by off-road vehicle use and trampling by livestock. Gypsum deposits and potential oil and gas reserves underlie habitat; development and annual assessment work on claims adversely impact the plant and its habitat (USFWS 1995b).

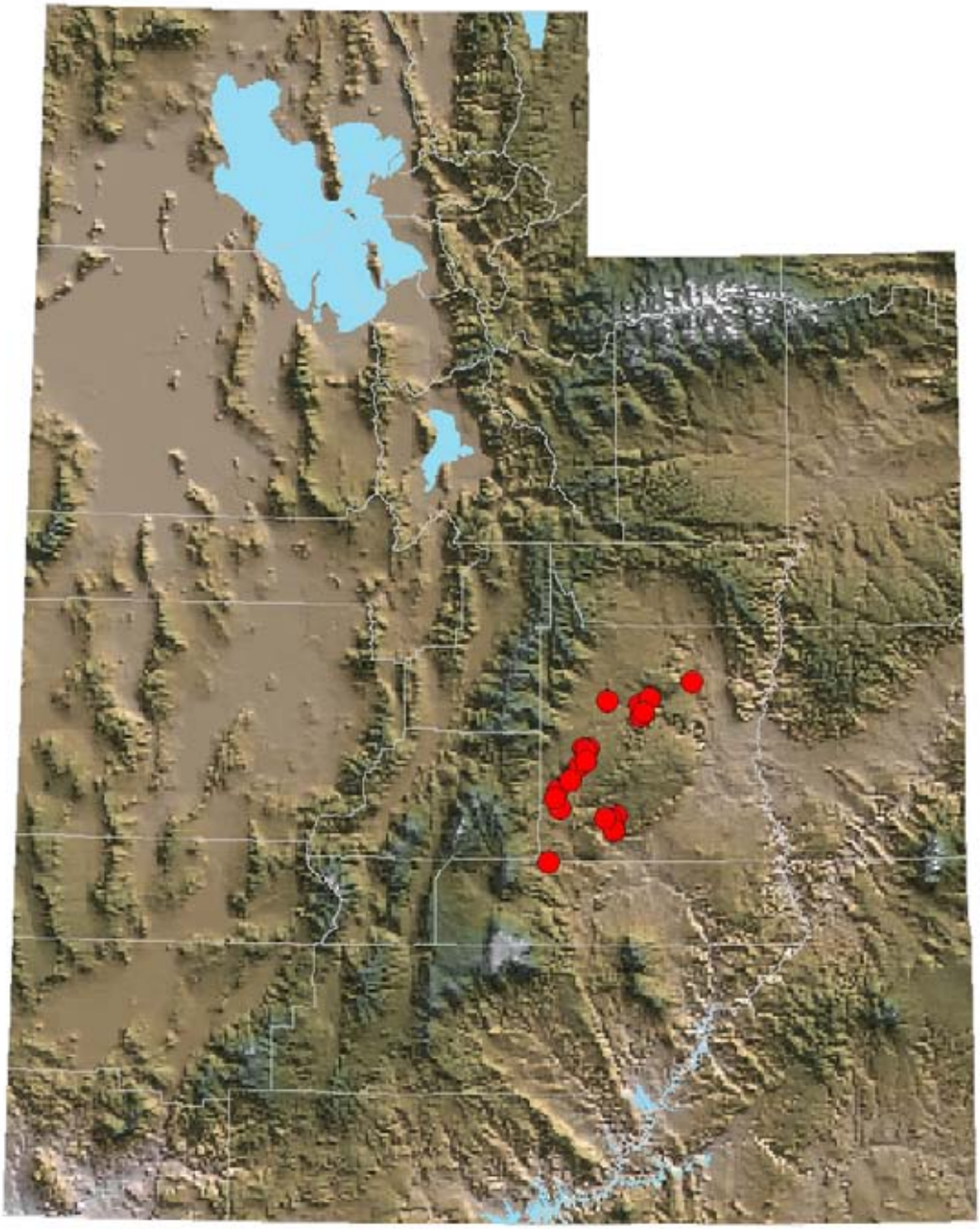

Figure 58. The distribution of San Rafael cactus (*Pediocactus despainii*).

Siler's Pincushion Cactus
Pediocactus sileri

TAXONOMY AND NOMENCLATURE

FAMILY: Cactus (Cactaceae)

OTHER NAMES: The common name "gypsum cactus" is also used (e.g., Welsh et al. 2003).

CONSERVATION STATUS DESIGNATIONS

On 26 October 1979, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 42 Federal Register No. 209). On 27 December 1993, it was downlisted as threatened (Vol. 58 Federal Register No. 246). A document identifying recovery goals (USFWS 1986) has been produced as a guide to management and conservation efforts. As a federal threatened species, it is of concern to USDI Bureau of Land Management, St. George Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs in southwest Utah at scattered locations along the Utah-Arizona state line, at the northern edge of its Mohave County-centered distribution. It is known from White Dome, Washington County, east to the base of the Shinarump Cliffs, Kane County. It is found in rolling hills, often with a badlands appearance, in warm desert shrub, sagebrush-grass, and, at its upper limits, piñon-juniper communities. The white, occasionally red, gypsiferous and calcareous sandy or clay soils are derived from the various members of the Moenkopi Formation, and on the nearly identical Kaibab Formation (Hughes 1987, Hreha and Meyer1994).

This species and its habitat are vulnerable to disturbance from off-road vehicle use, trampling by livestock, and possibly mining activities (USFWS 1986). And recently, through the U.S. Fish and Wildlife Service's Cooperative Endangered Species Conservation Fund Grants, a grant has been approved that will assist in the preservation of a portion of this plant's habitat at White Dome as a rare plant preserve (Frates, pers. comm. 2005).

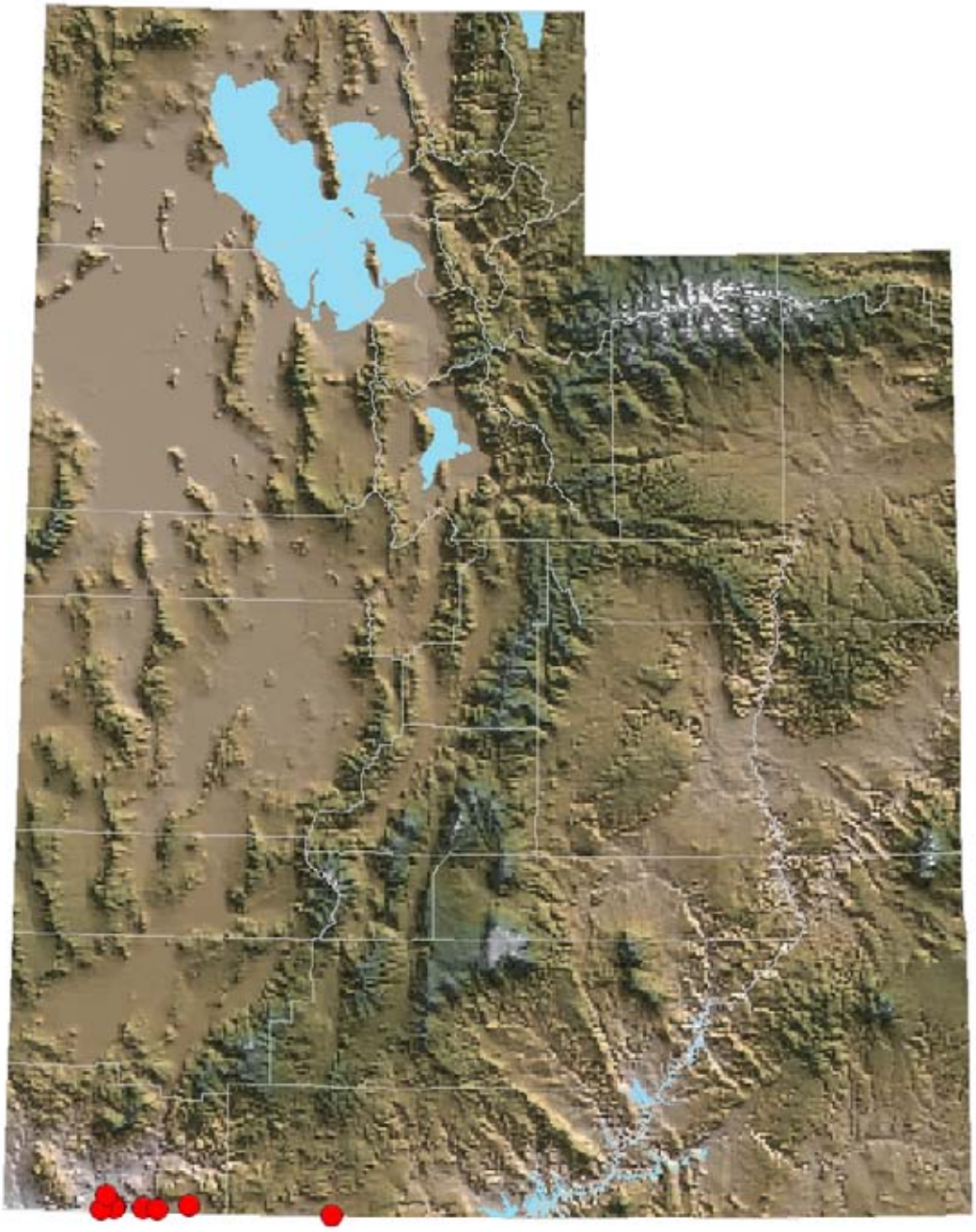

Figure 59. The distribution of Siler's pincushion cactus (*Pediocactus sileri*).

Winkler's Cactus
Pediocactus winkleri

TAXONOMY AND NOMENCLATURE

FAMILY: Cactus (Cactaceae)

OTHER NAMES: Other common names include, "Winkler's footcactus" (e.g., Welsh et al. 2003) and "Winkler's pincushion-cactus" (e.g., NatureServe 2005).

CONSERVATION STATUS DESIGNATIONS

On 20 August 1998, this species was designated as threatened under the Endangered Species Act of 1973 (Vol. 63 Federal Register No. 161). In 1995, the FWS announced the availability of a draft recovery plan (Vol. 60 Federal Register No. 187); it has not been implemented. As a federal threatened species, it is of concern to USDI Bureau of Land Management, Richfield and Price Field Offices, and USDI National Park Service, Capitol Reef National Park.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a central Utah endemic in Emery and Wayne counties. It is known from the vicinity of Ferron south to the northeast slopes of the San Rafael Swell, and again south to locations east of Waterpocket Fold as far as the vicinity of Notom. It inhabits benches, hilltops, and gentle slopes on barren, open sites in mixed desert shrub or piñon-juniper communities, in fine textured soils of the Dakota Formation and, primarily, the Brushy Basin Member of the Morrison Formation (Clark 2005a, USFWS 1995b).

The draft recovery plan estimated the total number of individuals to be about 5,000 (USFWS 1995b). Survey for this taxon has been ongoing for several years. New sites have been found as recently as this year (Clark 2005a). It is an attractive plant and subject to collection. Its habitat has been impacted by off-road vehicle use and trampling by livestock. Habitat is underlain by bentonite clay and limited uranium deposits; annual assessment work on claims adversely impacts the plant and its habitat (USFWS 1995b).

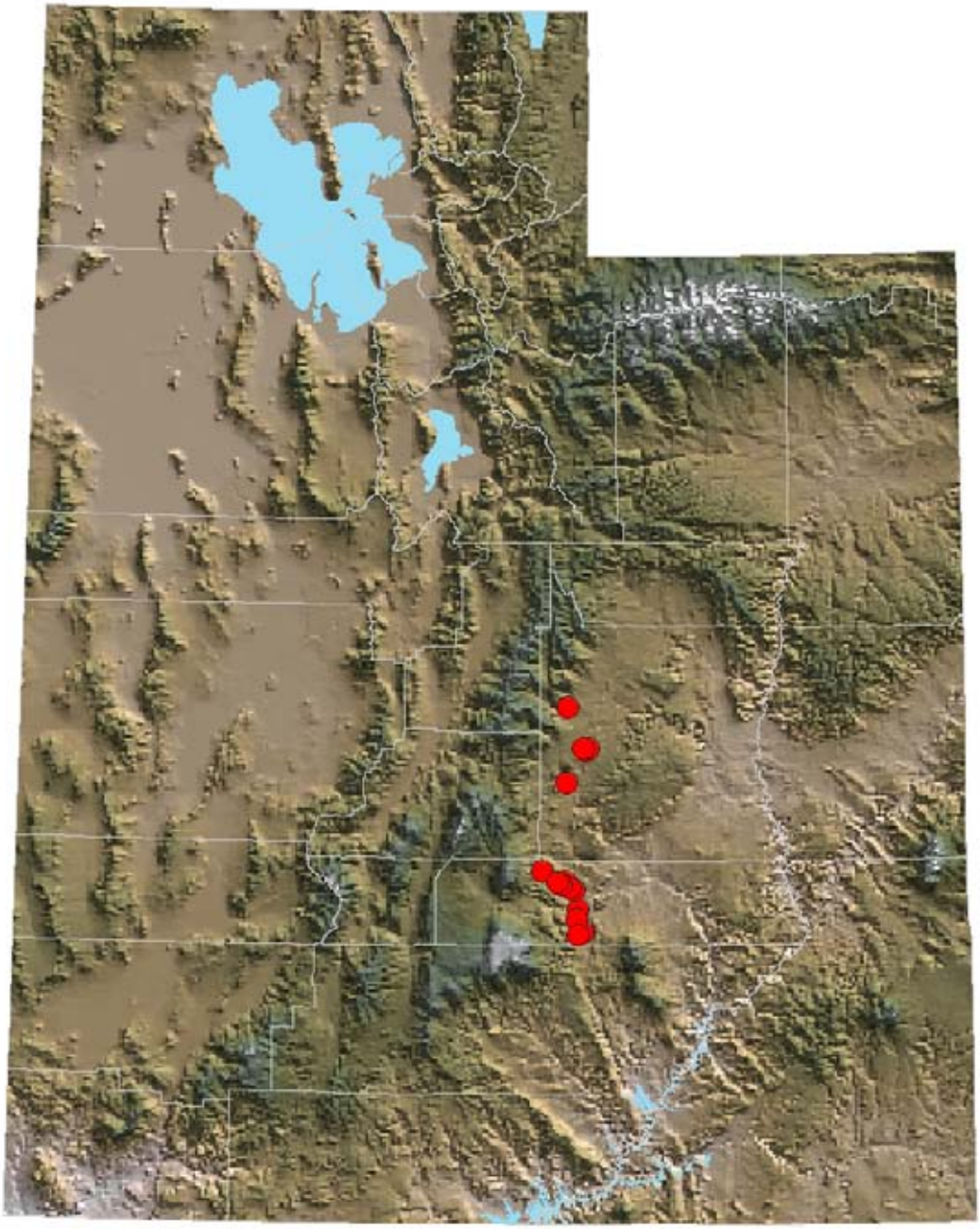

Figure 60. The distribution of Winkler's cactus (*Pediocactus winkleri*).

Tuhy's Breadroot
Pediomelum aromaticum var. *tuhyi*

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: Barneby (1989) places this taxon in synonymy under the variety *aromaticum*. The common name "Tuhy aromatic scurf pea" is also in use (e.g., NatureServe 2005).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to northern San Juan County, southeast Utah. It is known from only six widely scattered locations, some of which are South Sixshooter Peak, Rone Bailey Mesa, Needles Overlook and the vicinity of Wilson Arch. With one exception, it is found growing around mesa rims "on the Morrison Formation / Tidwell Member, the narrow band of reddish siltstone-like material that immediately caps the prominent cliffs of the Entrada / Slickrock Member (Tuhy, pers. comm. 1999)." The one exception is a mesa rim of the Kayenta Formation. It grows in shallow rocky soils in an open piñon-juniper woodland with cliff-rose and a sparse understory, occasionally, an understory of only this taxon (Tuhy, pers. comm. 1999).

Tuhy (pers. comm. 1999) indicates that population numbers at three of the sites visited are "certainly in the thousands and probably in the tens of thousand considering the likelihood that they are present in a ring around the edge of the whole mesa top." With the exception of Tuhy's (pers. comm. 1999) personal attempt to document locations in 1993, there has been no survey for this plant, and his visits were only a partial documentation. Tuhy (pers. comm. 1999) did not discuss actual or potential threats, but, with the exception of Needles Overlook, the isolated nature of known habitat precludes many.

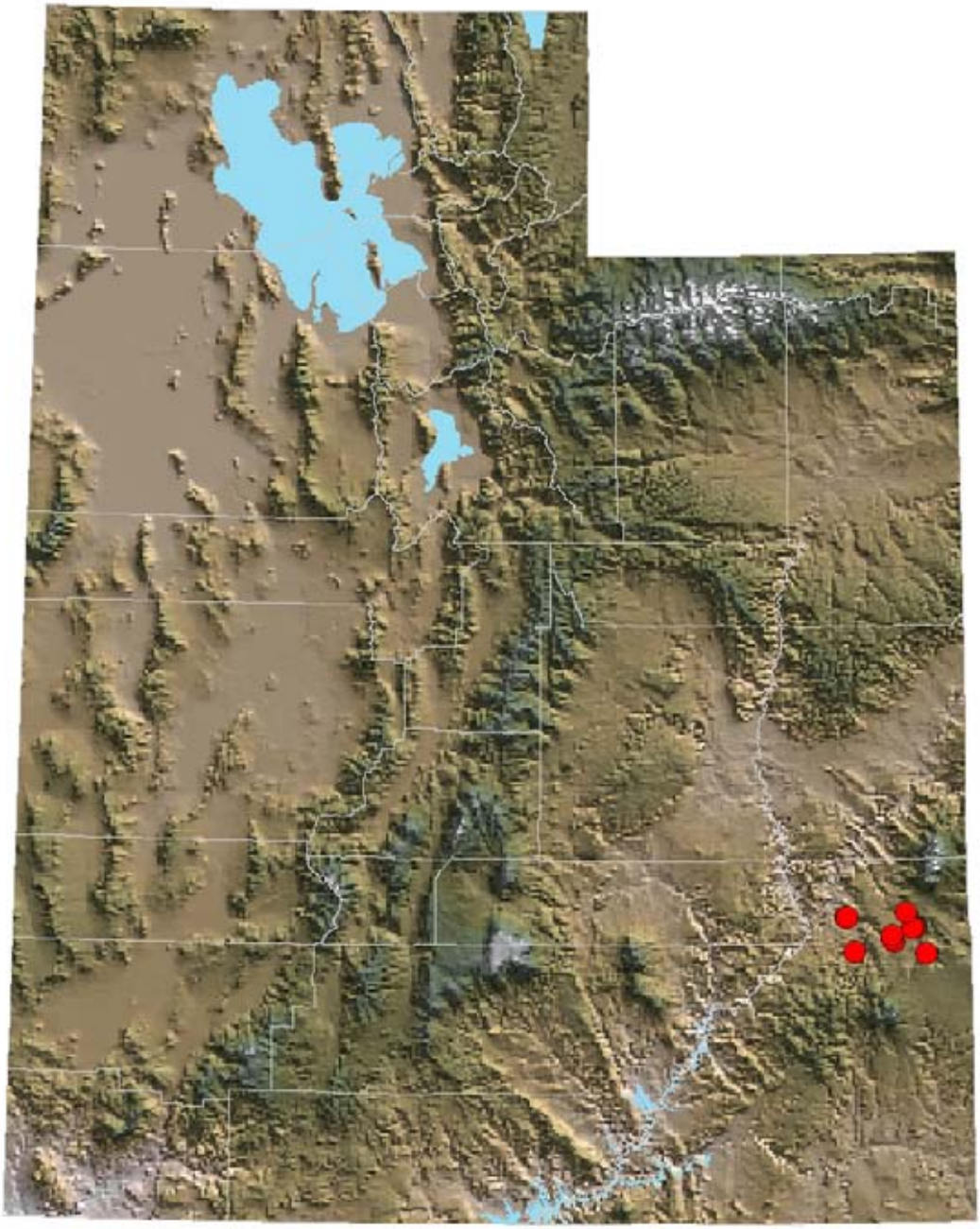

Figure 61. The distribution of Tuhy's breadroot (*Pediomelum aromaticum* var. *tuhyi*).

Kane Breadroot
Pediomelum epipsilum

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: Some authors (e.g., Barneby 1989) consider this taxon to be a variety. As a variety it is recognized under the name *Pediomelum megalanthum* var. *epipsilum*.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs in extreme southern Utah, Kane County, and in adjacent Coconino County, Arizona. In Kane County, it is known below the Vermilion Cliffs where it is found at scattered locations from Johnson Wash east to Kitchen Corral Wash. It inhabits piñon-juniper woodlands with cliff-rose and serviceberry and mixed sagebrush-*Eriogonum* communities on the barren gypsiferous soils of the Chinle and Moenkopi formations (Welsh 1978, Welsh et al. 2003).

At some locations, it nearly blankets the ground (Chapman 1995). Robinson (2003) estimated 1.025 million plants at the sites visited, and over ninety-nine percent of those were within a single Element Occurrence; not all known sites were included in her study. The five-year drought appeared to have no effect on the plant (Robinson 2003). It is not grazed by cattle (Chapman 1995), and it is suggested that its vigorous growth habit precludes concern about negative impacts resulting from occasional recreational and other use access (Robinson 2003).

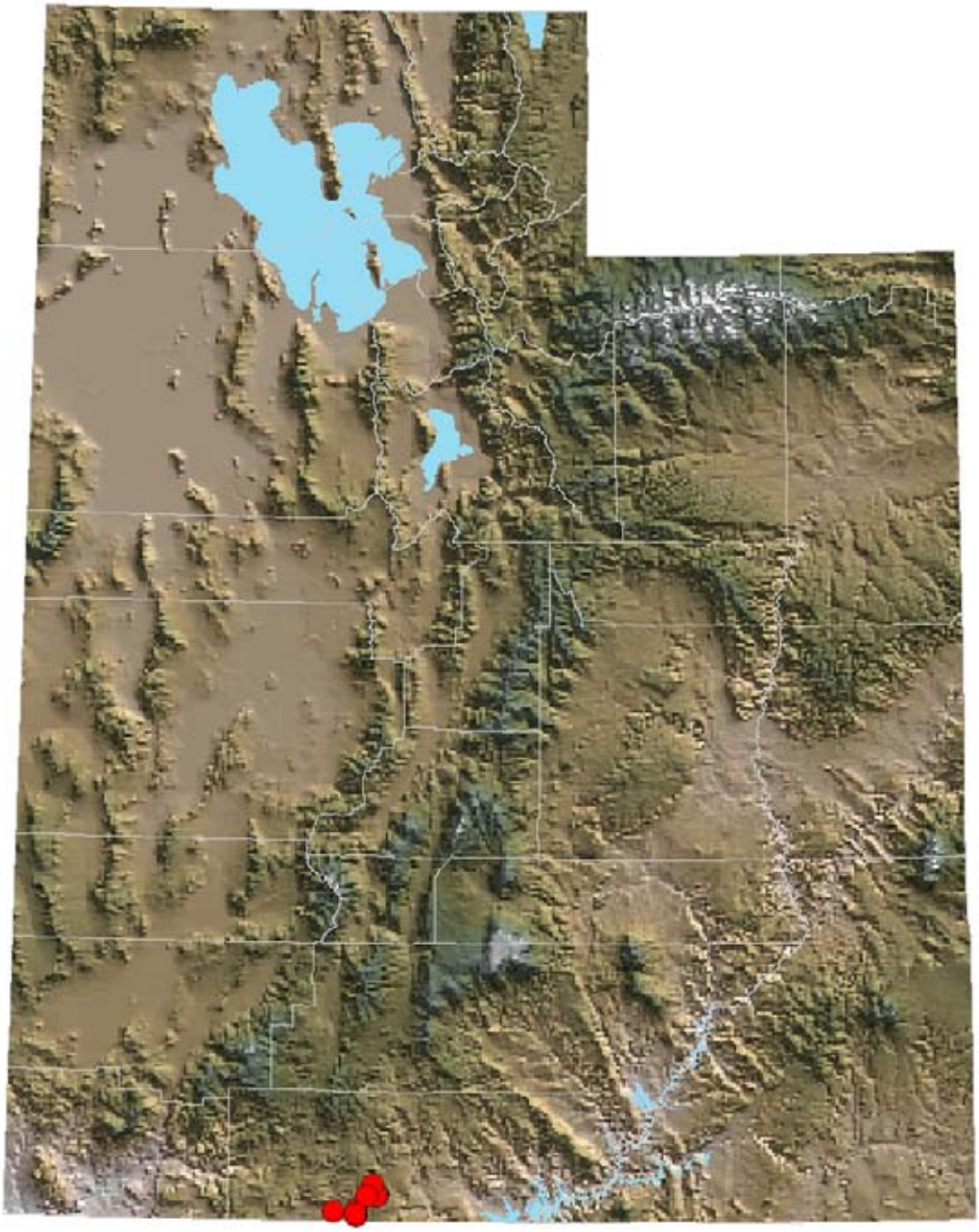

Figure 62. The distribution of Kane breadroot (*Pediomelum epipsilum*).

Firleaf Beardtongue
Penstemon abietinus

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is central Utah endemic, Sevier and Utah counties. It is know on the Fishlake Plateau east of Salina and from a single collection in Spanish Fork Canyon. It inhabits piñon-juniper-oak and sagebrush communities where, at least in Sevier County, it grows in loose, gravelly soils derived from limestone (Cronquist et al. 1985, Welsh et al. 2003).

There is no information available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. Livestock grazing, recreation and perhaps other multiple-use activities are occurring on forest-managed lands.

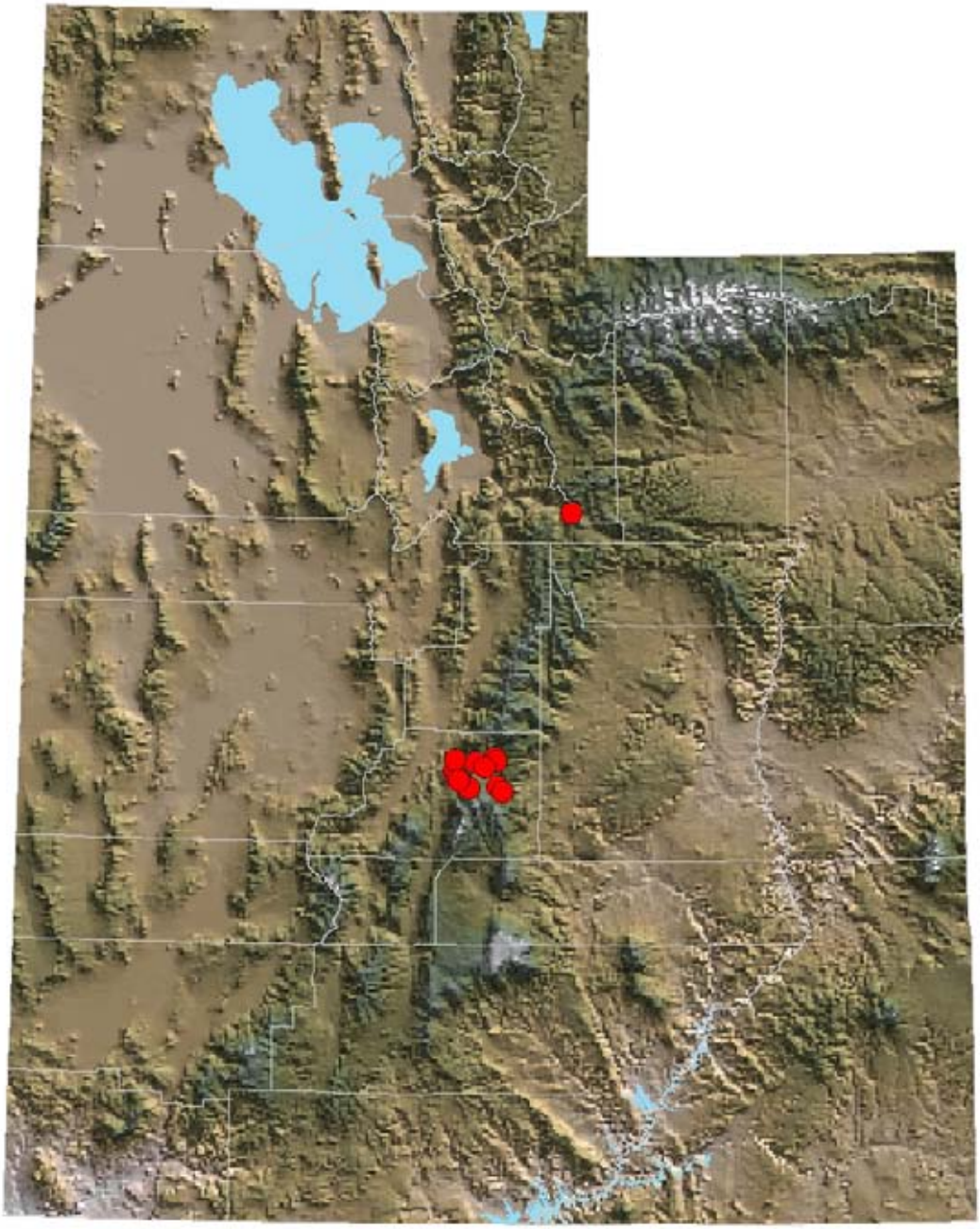

Figure 63. The distribution of firleaf beardtongue (*Penstemon abietinus*).

Duchesne Penstemon
Penstemon duchesnensis

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: Some authors (e.g., Cronquist et al. 1984) consider this taxon to be a variety. As a variety, it is recognized under the name *Penstemon dolius* var. *duchesnensis*.

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to the western Uinta Basin, Duchesne County. It is known from scattered locations along the corridor of the Duchesne River, from Duchesne east to Bridgeland and then from Duchesne west along the corridor of U.S. Route 40 to the north ridge of Blackburn Hollow (UTHP 2005). This later stretch, at least in part, is undoubtedly an artifact of collector inaccessibility. It is found on gravelly semi-barrens usually along a break in the landscape, i.e., a mesa rim, wash edge, on road cuts, etc., and in various open piñon-juniper, black sagebrush and grass communities (Welsh et. al. 2003)

Little information is available to indicate the status of most populations, private property inaccessibility being the major hindrance. A 2001 effort by the Utah Natural Heritage Program to revisit previously known sites resulted in the documentation of a population on Blue Bench with estimates in the thousands. However, all other relocated sites combined barely exceeded a counted / estimated 2000 plants. Over time, the greatest threat to the persistence of this plant will likely be loss of suitable habitat because of property development.

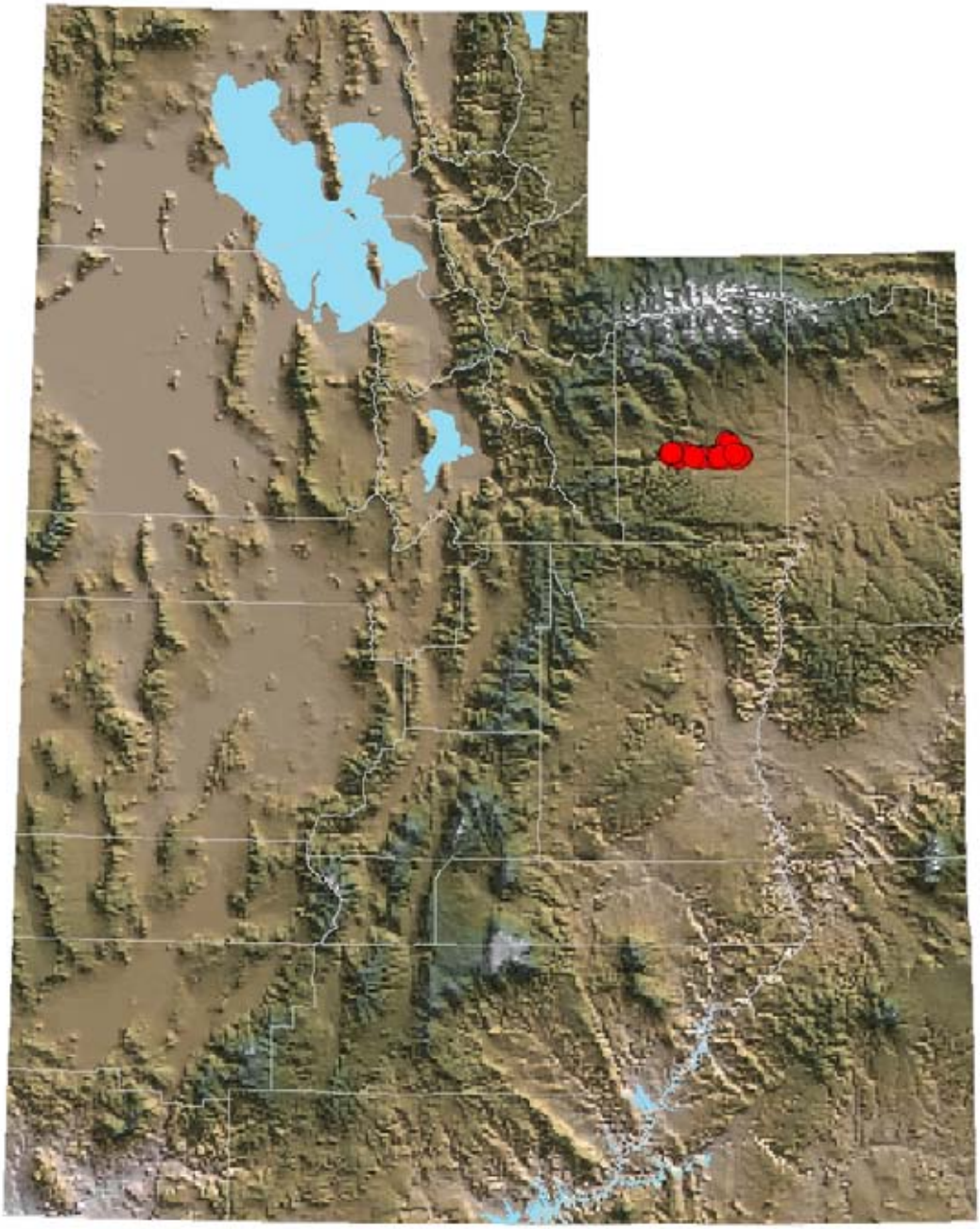

Figure 64. The distribution of Duchesne penstemon (*Penstemon duchesnensis*).

Flowers' Penstemon
Penstemon flowersii

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies. It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188), and was formerly on the BLM Sensitive Plant List (Lamb 1996).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to the west central Uinta Basin, Duchesne and Uintah counties. It is known from scattered locations along the corridor of the Duchesne River from Bridgeland to about 3 miles west of Randlett (UTHP 2005). Along that corridor, it appears to be associated with the "badland" breaks that define the benches remnant from the channeling of the river and its tributaries. In addition, it is on a few flatland locations that have not been converted to farmland or otherwise developed. There is a single Intermountain Herbarium collection, i.e., J. Redmond (s.n., no date), which breaks the typical distributional pattern with the simple directions, "North of Roosevelt". With the exception of being on Bureau of Reclamation land on the south slope of Windy Ridge, it is not known from federally managed lands.

There is no documentation of population size estimates and habitat condition throughout its limited range. Heil and Melton (1995a), not having surveyed on the Uintah and Ouray Indian Reservation, estimated a population of 15,000 to 20,000 plants on private lands alone. In addition, there can be large fluctuations in numbers from year to year, e.g., the flowering of 2001 was the best out of the previous nine years (Prevedel, pers. comm. 2001). Past losses of habitat through agricultural development, continued livestock grazing and recreational activity are the greatest threats to this plant's persistence (Heil and Melton 1995a). Private property inaccessibility is a hindrance to understanding this plant's status.

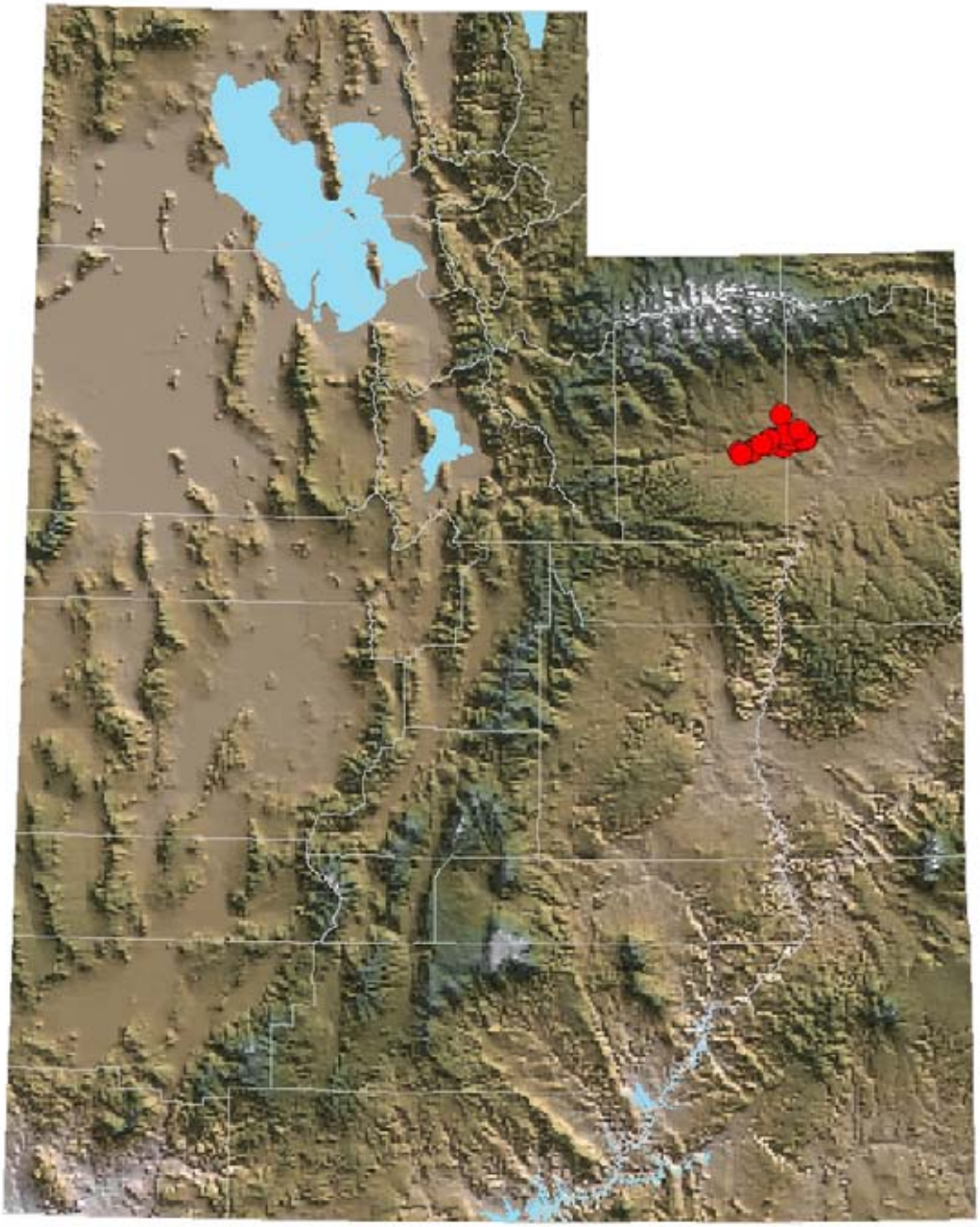

Figure 65. The distribution of Flowers' penstemon (*Penstemon flowersii*).

Ben's Beardtongue
Penstemon franklinii

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: The common name "Ben Franklin's beardtongue" and "Franklin's penstemon" are also being used (e.g., NatureServe 2005, Welsh et al. 2003).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

Endemic to central Iron County, this species occurs between the north end of Cedar Valley and the Bald Hills and is only slightly disjunct at a location to the west of Iron Spring (Franklin 1993, Tate 2001). It grows in a scattered black sagebrush-grass-forb community with purple three-awn, needle-and-thread grass, Indian ricegrass, blue grama, *Leptodactylon*, and Shockley's buckwheat. Soils are a gravelly, silty-sandy loam.

Tate (2001) noted that there was evidence of inflorescences being eaten by wildlife, but that livestock graze the area in winter and are not present during flowering and seed development. His survey efforts focused on determining the range of the species with the intent that follow-up projects would focus on numbers; resulting distributions are mapped as presence or absence by section. There are no estimates of population size, area covered, habitat condition or potential threats. Oil and gas exploration is planned in the vicinity of this plant's habitat.

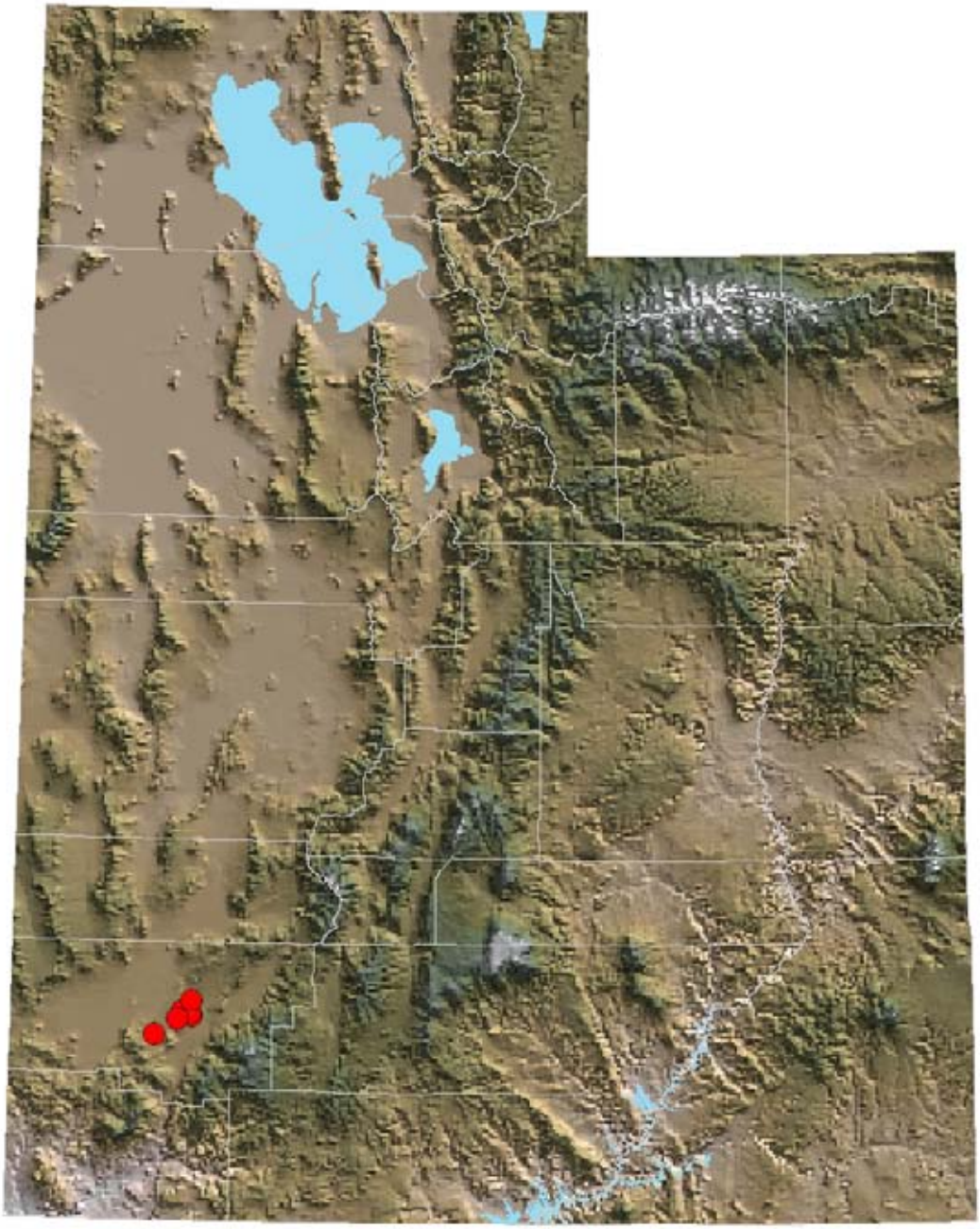

Figure 66. The distribution of Ben's beardtongue (*Penstemon franklinii*).

Goodrich's Penstemon
Penstemon goodrichii

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: The common name "Lapoint beardtongue" (e.g., NRCS 2005) is available.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to the Uinta Basin of northeast Utah, Duchesne and Uintah counties. It is primarily concentrated at locations in the hills northwest to east of the town of Lapoint. There are additional widely scattered locations to the west along the Cottonwood Creek drainage north of Roosevelt. It inhabits steep to moderately steep hills in salt desert shrub and piñon-juniper communities. The soils are clay-rich to silty or sandy clay weathered from the blue-gray and red sandy members of the Duchesne River Formation (Heil and Melton 1995b).

There is a roughly estimated total population of approximately 15,000 to 25,000 individuals (Heil and Melton 1995b). Heil and Melton (1995b) write that land use practices within the plant's habitat are primarily grazing, agriculture and recreation, and that there appear to be no resulting effects. According to Specht (pers. comm. 2005), though the plant's habitat is within cattle allotments, grazing does not occur on its steep habitat sites. Over the last several years BLM managed lands east of Lapoint have experienced an increase in cross-country and hill climbing use by motorcycles and four-wheelers. So far, however, disturbance has been confined to barren knolls and center ridgelines and has not resulted in the disturbance of nearby population sites (Specht, pers. comm. 2005). Concern is expressed, however, that the combined activities of grazing and recreation might result in the future threat of increased densities of invasive annuals. Additional survey on privately owned lands is recommended (Heil and Melton 1995b).

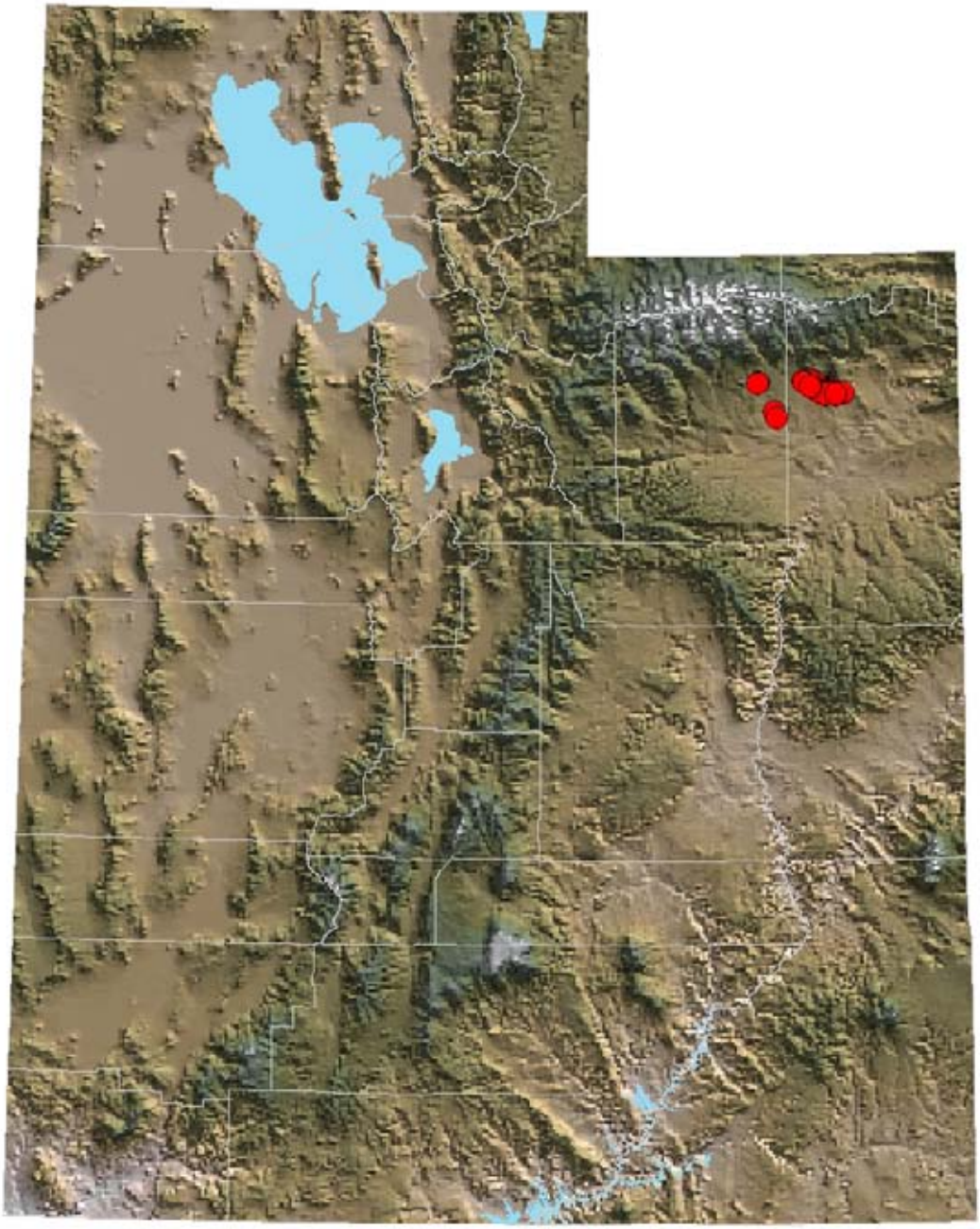

Figure 67. The distribution of Goodrich's penstemon (*Penstemon goodrichii*).

Graham's Beardtongue
Penstemon grahamii

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

CONSERVATION STATUS DESIGNATIONS

On 28 November 1983, this species was designated as a category 1 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 48 Federal Register No. 229). Following the 1996 discontinuation of category 1 and 2 candidates, it remained a candidate species, ready for proposal. Because of increased threats due to energy development, on 8 October 2002, with Center for Native Ecosystems taking the lead, a group of conservation organizations submitted a petition to the FWS for an emergency listing of Graham's beardtongue (CNE, et al. 2002). As a federal candidate species, it is of concern to USDI Bureau of Land Management, Vernal Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Uinta Basin endemic in Carbon, Duchesne and Uintah counties, and in immediately adjacent Rio Blanco County, Colorado. Its distribution is sporadic across the Basin where it grows "with shadscale, *Forsellesia*, *Elymus salinus*, and scattered pinyon-juniper." It is "present on white to tan, steep, barren, shale slopes and ridges of the…Green River Formation (Goodrich and Neese 1986)".

There is little new information available documenting the status of many populations, i.e., estimated numbers of plants, habitat condition or observed impacts. Oil and gas exploration-and-development have escalated across the Uinta Basin from Ninemile Canyon to Colorado and are the main threat to this species (Specht, pers. comm. 2005). The almost forgotten development of both tar sands and oil shale are again of interest in the Basin. Prior to its candidate status, these same concerns along with potential impact of sheep and cattle grazing were expressed (Shultz and Mutz 1979, Neese and Smith 1982). Red Butte Garden & Arboretum is doing population monitoring at two locations (Specht, pers. comm. 2005).

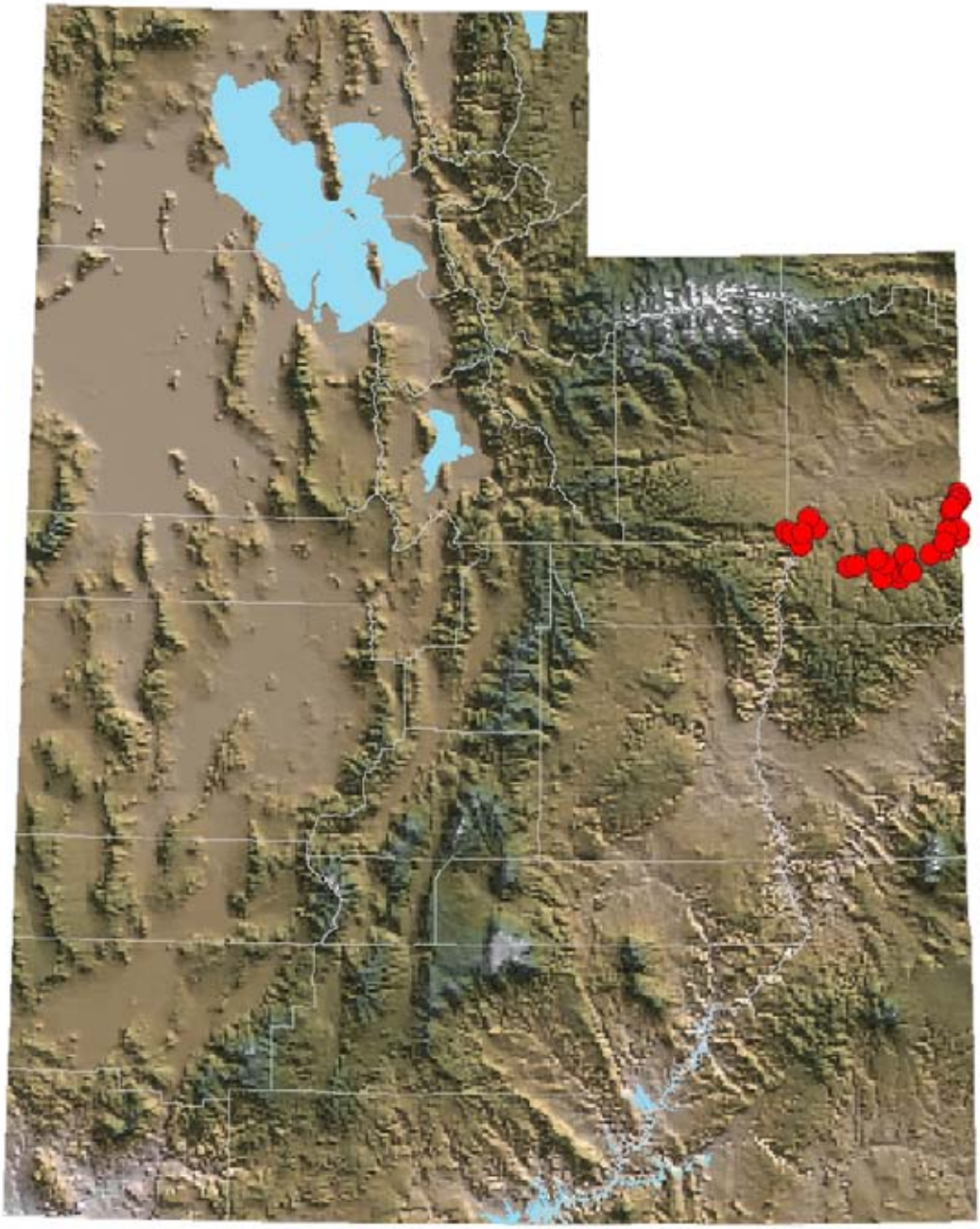

Figure 68. The distribution of Graham's beardtongue (*Penstemon grahamii*).

Idaho Penstemon
Penstemon idahoensis

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: The common name "Idaho beardtongue" (e.g., NRCS 2005) is also available.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs on Utah's edge of the Columbia Basin, in the Goose Creek drainage of extreme northwestern Box Elder County, and is shared with immediately adjacent Idaho. The bulk of its distribution is in southern Cassia County, Idaho. It grows mostly on steep slopes in sites dominated by *Juniperus osteosperma* and *Artemisia tridentata*; in fine textured and somewhat hard soils of the whitish to brownish tuffaceous sediments of the Tertiary Salt Lake formation (Baird, et al. 1991).

There are five distinct close-proximity sites in Utah with an estimated 3,300 individuals (Baird, et al. 1991). Baird, et al. (1991) indicate that its habitat is primarily managed as range land for cattle. At that time, "there [was] no indication that grazing practices [were] adversely affecting the distribution or vitality of the species." It was noted, however, that there was an absence of historical data and this conclusion was based on one year's observations. Baird, et al. (1991) noted, also, that the greatest potential man-related threat appeared to be from trampling by cattle, "either randomly or from proximity to established trails."

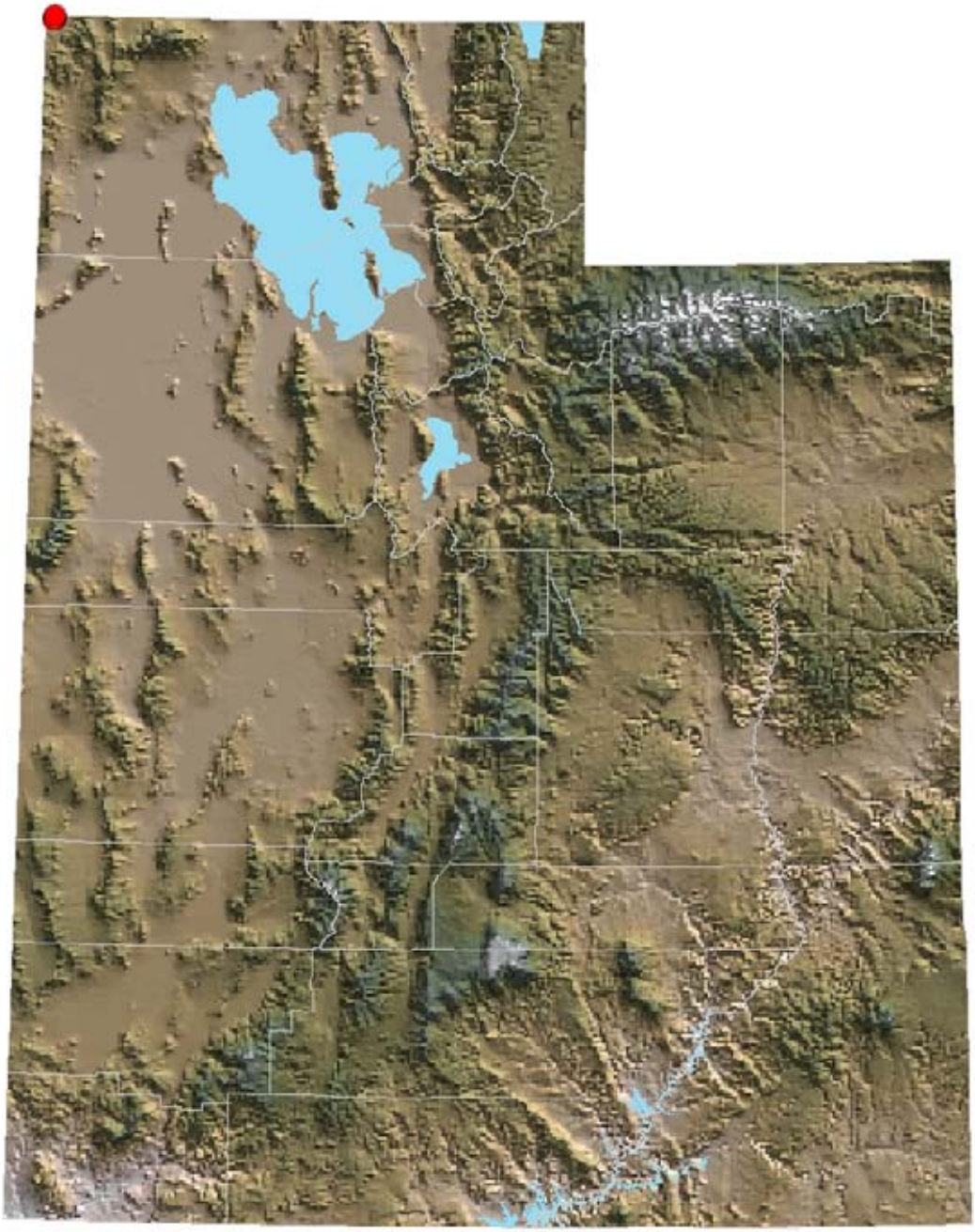

Figure 69. The distribution of Idaho penstemon (*Penstemon idahoensis*).

Navajo Penstemon
Penstemon navajoa

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: The common names "Navajo Mountain Penstemon" and "Navajo beardtongue" are also in use (Welsh et al. 2003, NatureServe 2005).

CONSERVATION STATUS DESIGNATIONS

It is listed as an "Endangered" species, on the Navajo Nation (NNDFW 2005), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic in extreme southeast Utah, San Juan County. It has long been known from only the upper elevations of Navajo Mountain on the Navajo Nation. Recent collections now place it at the head of Dark Canyon, on Chippean Ridge and in the Abajo Mountains; both areas are on the Manti-La Sal National Forest. It is found at high elevations in ponderosa pine-Douglas fir-alpine fir, ponderosa pine-Gambel's oak, grassland meadow-ponderosa pine, and, at one of the newer locations, aspen-Gambel's oak communities (UTHP 2005).

On Navajo Mountain, it is common above 7000 ft. Though there have been no systematic surveys to determine abundance, the Navajo Natural Heritage Program Botanist visits the population almost every year. It is considered secure and stable with no real threats. There is no logging or off-road vehicle traffic, and, though some horses are present they have not yet been observed eating *Penstemon*. Navajo Forestry is currently considering a prescribed burn to clear out underbrush; if done, a monitoring plot will be set up to determine effects (Roth, pers. comm. 2005c). There is no information on the status of the new Dark Canyon or Abajo Mountain locations, i.e., estimates of population size, habitat condition or potential threats.

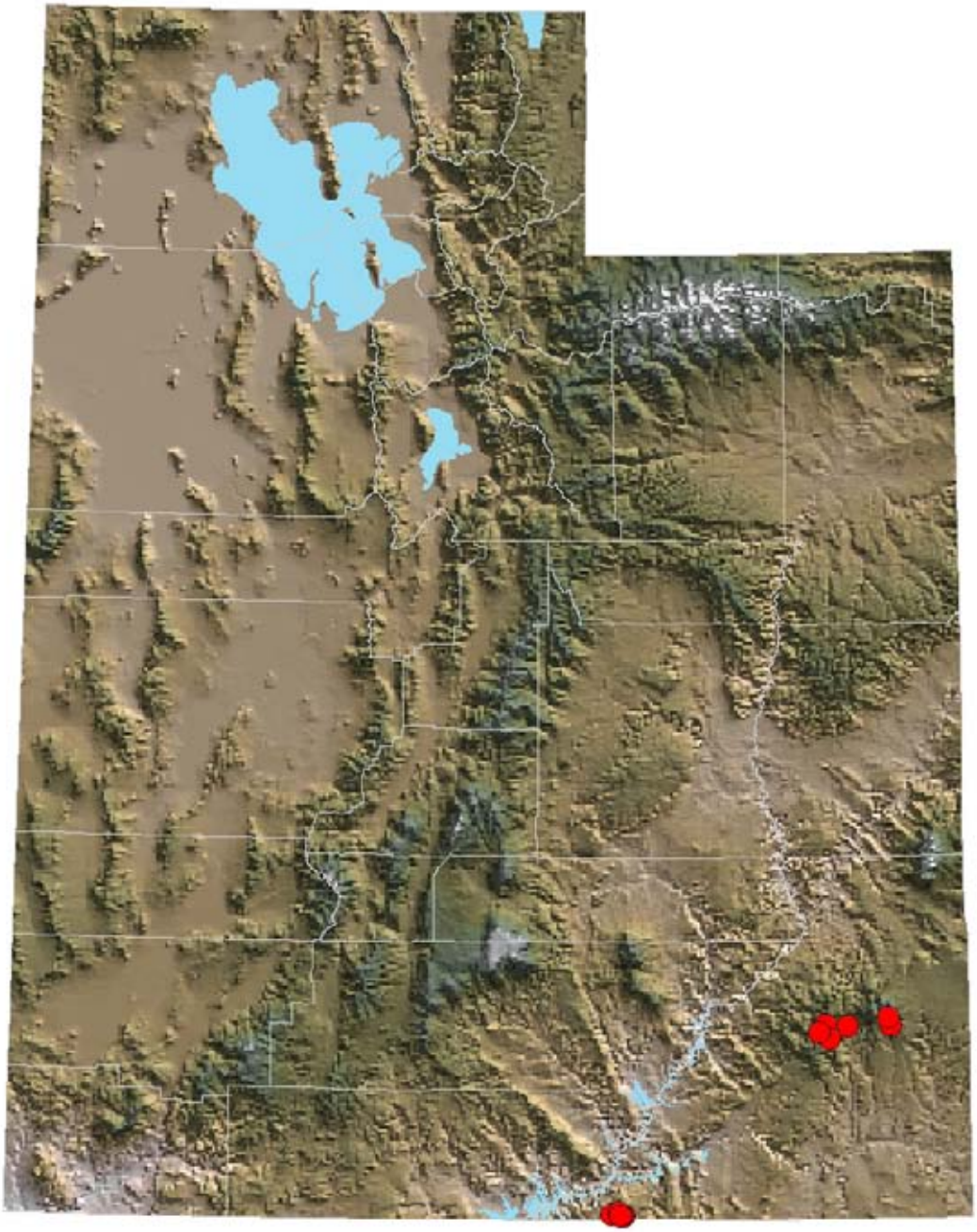

Figure 70. The distribution of Navajo penstemon (*Penstemon navajoa*).

Little Penstemon
Penstemon parvus

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: "little penstemon" was the common name used by Welsh et al. (1987). It later became "Aquarius penstemon" (Welsh et al. 1993 and 2003).

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs on the Aquarius Plateau from Griffin Top and Posy Lake, northeast to Dark Valley and northwest to Overland Draw; and on Fishlake Plateau from Frying Pan Flat north into Sheep Valley and at Hogan Pass. It grows in open sagebrush meadows on a substrate of loamy soil mixed with Tertiary volcanic gravel and scattered boulders (Franklin 1989).

After two years of recent survey, i.e., 2004 and 2005, the number of estimated individuals is more than 50,000. All sites visited by Franklin (1989) have been revisited and new locations discovered, perhaps the most significant extension being its presence at Hogan Pass. Though not all potential habitat sites on Monroe Peak were surveyed, those visited yielded negative results. It is suggested that with the results of the recent surveys, a revision of this plant's status might be warranted. Groebner (2005) also suggests that additional survey is needed on the Loa District beyond the UM Creek drainage.

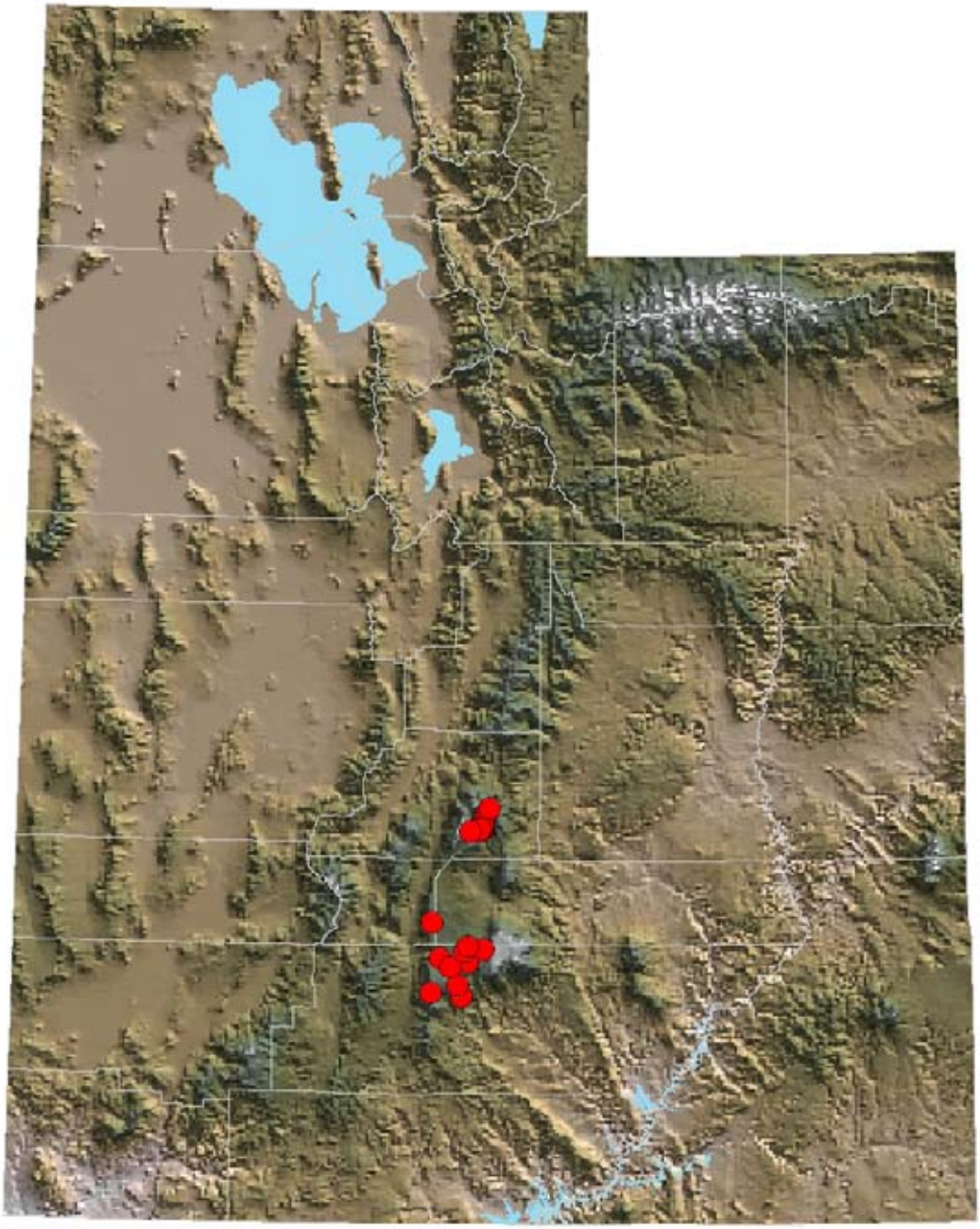

Figure 71. The distribution of little penstemon (*Penstemon parvus*).

Piñon Penstemon
Penstemon pinorum

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and is on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southwest Utah endemic known only in Washington and Iron counties. It occurs at scattered locations in the hills south-southwest of Newcastle, east of Old Irontown, in the Red Hills to the north and onto the southeast slopes of the Antelope Range. It grows most typically in the north-slope understory of piñon (*Pinus monophylla*) - juniper (*Juniperus osteosperma*) - mountain brush woodlands, but is found, too, scattered along drainages below these slopes. It is found, for the most part, in pinkish, sandy-gravelly soils of the Tertiary Claron Formation (Franklin 1994a).

There is an estimated total population of approximately 50,000 plants distributed among the three general locations at which this plant occurs (Franklin 1994a). The same author indicates that impacts to known habitat have resulted from various disturbances, i.e., chaining at one location resulted in the loss of habitat, greenwood fuel cutting has removed the woodland cover that is required, and, mining-related activities have resulted in the loss of habitat. Though portions of its habitat are open to grazing, there are no apparent impacts, and long-term effects, if any, are unknown (Kass 1995).

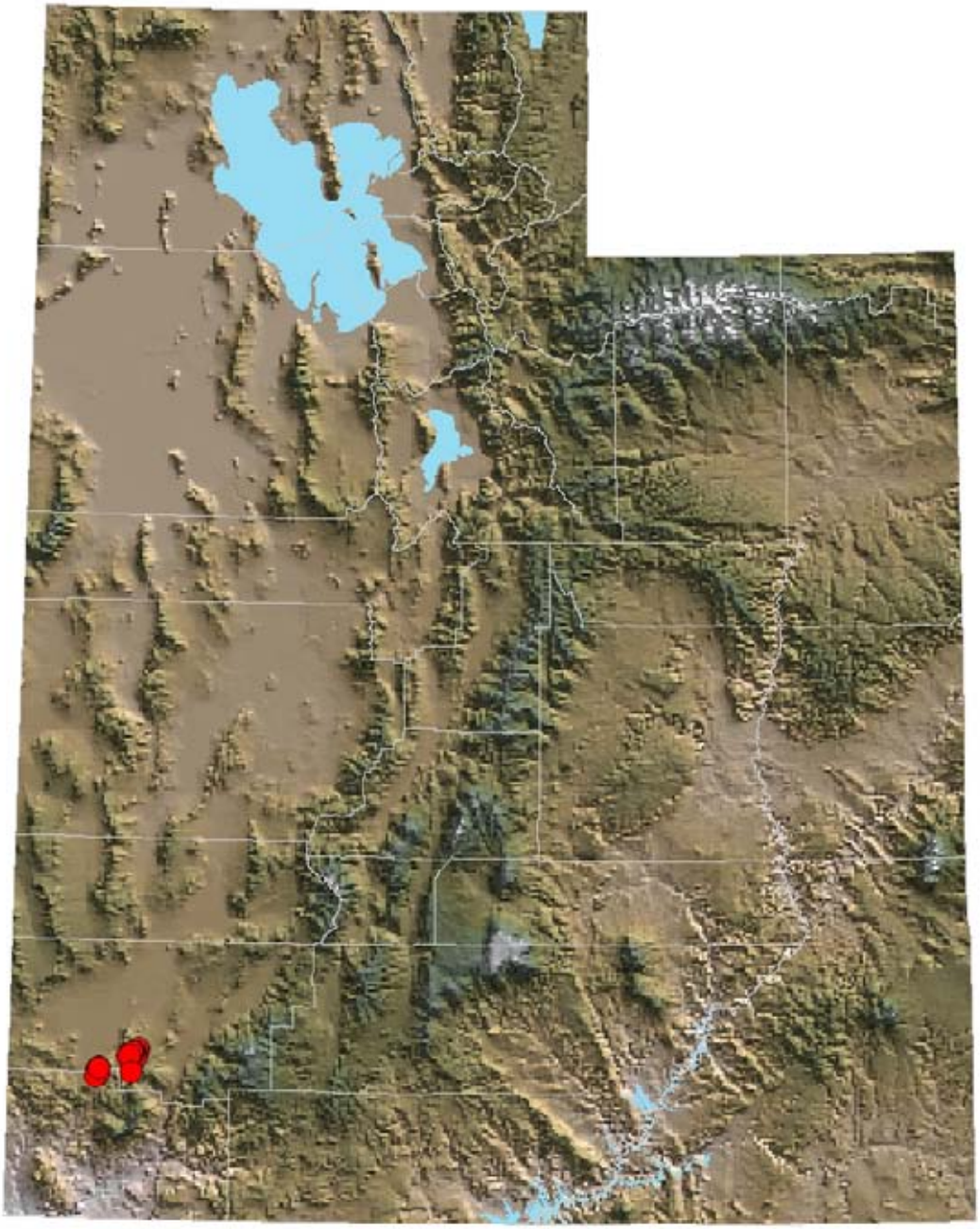

Figure 72. The distribution of piñon penstemon (*Penstemon pinorum*).

White River Beardtongue
Penstemon scariosus var. *albifluvis*

TAXONOMY AND NOMENCLATURE

FAMILY: Figwort (Scrophulariaceae)

OTHER NAMES: The common name "White River penstemon" is frequently used.

CONSERVATION STATUS DESIGNATIONS

On 28 November 1983, this species was designated as a category 1 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 48 Federal Register No. 229). Following the 1996 discontinuation of category 1 and 2 candidates, it remained a candidate species, ready for proposal. As a federal candidate species, it is of concern to USDI Bureau of Land Management, Vernal Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Uinta Basin endemic in Utah and Colorado. In Utah, it is known from eastern Uintah County, from the side canyons of the White River and south into the drainages of Evacuation Creek, southeast of Rainbow. Its habitat is semi-barren openings in piñon-juniper and mixed desert shrub communities, in shallow, fine textured soils and fragmented pieces of the Green River Formation (Franklin 1994). According to Welsh et al. (2003), "it passes into var. garrettii in the Hill Creek / Willow Creek area."

Franklin (1994) estimated the total population at approximately 23,000 plants distributed among 14 discrete occurrences and covering an area of approximately 200 acres. Winter sheep grazing was a principal use of its habitat at that time, drill sites were present and collection of building stone was ongoing. Oil and gas exploration activities were not mentioned as a source of potential impacts to this species. There is no current information documenting the status of most of these populations, but oil and gas exploration and development have escalated in the Uinta Basin. Pipelines have been proposed that will increase the corridors for transport through the Weaver Canyon area (Specht, pers. comm. 2005). The almost forgotten development of both tar sands and oil shale are again of interest in the Basin. Red Butte Garden & Arboretum is doing population monitoring at two locations.

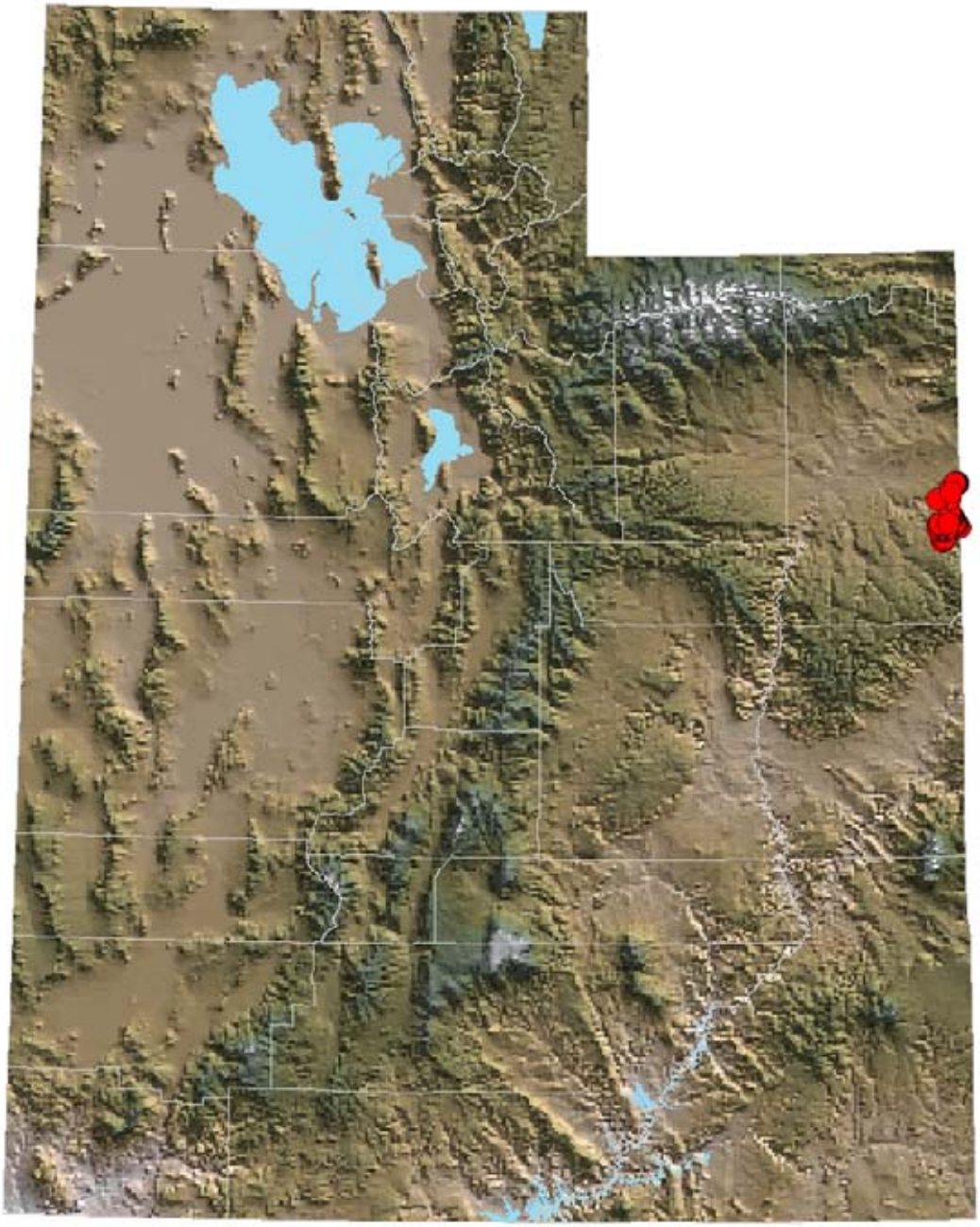

Figure 73. The distribution of White River beardtongue (*Penstemon scariosus* var. *albifluvis*).

Alcove Rock-daisy
Perityle specuicola

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a southeast Utah endemic known at widely scattered locations in Grand and San Juan counties. It is known along the Colorado River Canyon near Moab, from Pole Canyon on the north to Bootlegger Canyon on the south, and, within Glen Canyon National Recreation Area, in Clearwater, Cataract and Dark Canyons; and along the main canyon of the San Juan River (Franklin 1992c, UTHP 2005). It grows in alcove communities, in narrow, protected canyons, where it "receives minimal to no direct sunlight through the day, grows in crevices of walls, and noticeably prefers locally drier sites, avoiding seepage areas….[I]t appears to be habitat specific not substrate specific (Franklin 1992c)."

Where known populations are typically less than 50 plants, only one has numbers as high as an estimated 500. Impacts to habitat have been most apparent along the Colorado River corridor near Moab, i.e., trampling by hikers, campers and site-seers. Since the 1991 survey, due to continually increasing tourism, BLM management practices have changed along the river corridor (Franklin 1992c). The elimination of unestablished campsites has relieved pressure on at least two occurrences. No current information is available on the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts.

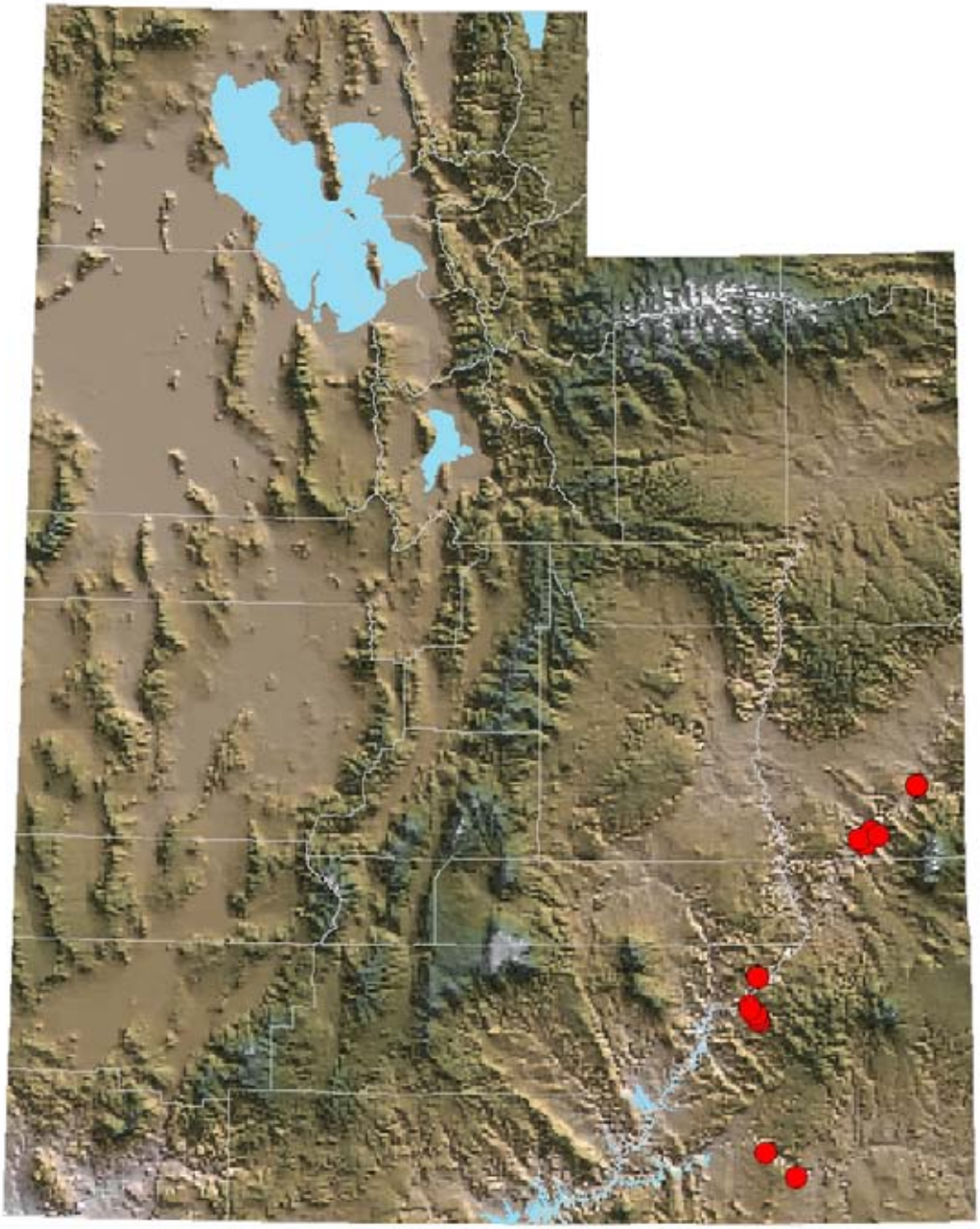

Figure 74. The distribution of alcove rock-daisy (*Perityle specuicola*).

Clay Phacelia
Phacelia argillacea

TAXONOMY AND NOMENCLATURE

FAMILY: Waterleaf (Hydrophyllaceae)

CONSERVATION STATUS DESIGNATIONS

On 28 September 1978, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 43 Federal Register No. 189). A document identifying recovery goals (USFWS 1982) has been produced as a guide to management and conservation efforts. It is not known to occur on federal lands.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to north-central Utah in Spanish Fork Canyon, Utah County. It is know from two extant locations, i.e., in the vicinity of Tucker and down-canyon near Mill Fork. The tucker site is a private preserve purchased and established specifically for this species by The Nature Conservancy. A historical location at a site southeast of Soldier Summit called Pleasant Valley Junction has never been relocated (Harper and Armstrong 1992). It grows on barren, precipitous hillsides in sparse piñon-juniper and mountain brush communities, in fine textured soil and fragmented shale derived from the Green River Formation (Callister and Van Pelt 1992, Harper and Armstrong 1992).

Construction activities have modified some of this plant's habitat, and grazing by native ungulates and the presence of exotic plant species in its habitat are both potential threats (Callister and Van Pelt. 1992). Harper and Armstrong (1992) completed a study for, in part, the purpose of locating apparently potential habitat and comparing the abiotic and biotic features of theses sites with occupied habitat. The results indicated that an introduction at these sites had the potential of being successful. Then, in 1996 and 1997, a study was conducted on Uinta National Forest in which, at three sites of unoccupied but apparently suitable habitat, seeds were planted in buried clay pots. Seeds germinated and grew both years, but no sustaining population resulted from the effort (Aanderud and Harper 1997, Jarvis 2003). In 2004, the U. S. Fish and Wildlife Service funded an interagency project to introduce both seedlings and seeds at up to 13 sites on Uinta National Forest. Seeds were collected at Tucker in 2004. To date, 60 greenhouse-germinations have occurred. These seedlings will be greenhouse-reared and used for the production of additional seed. These seeds will then be germinated and, in the fall of 2006, will be planted out. A repeat of this schedule will be followed in preparation for a fall 2007 planting (Van Keuren, pers. comm. 2005c).

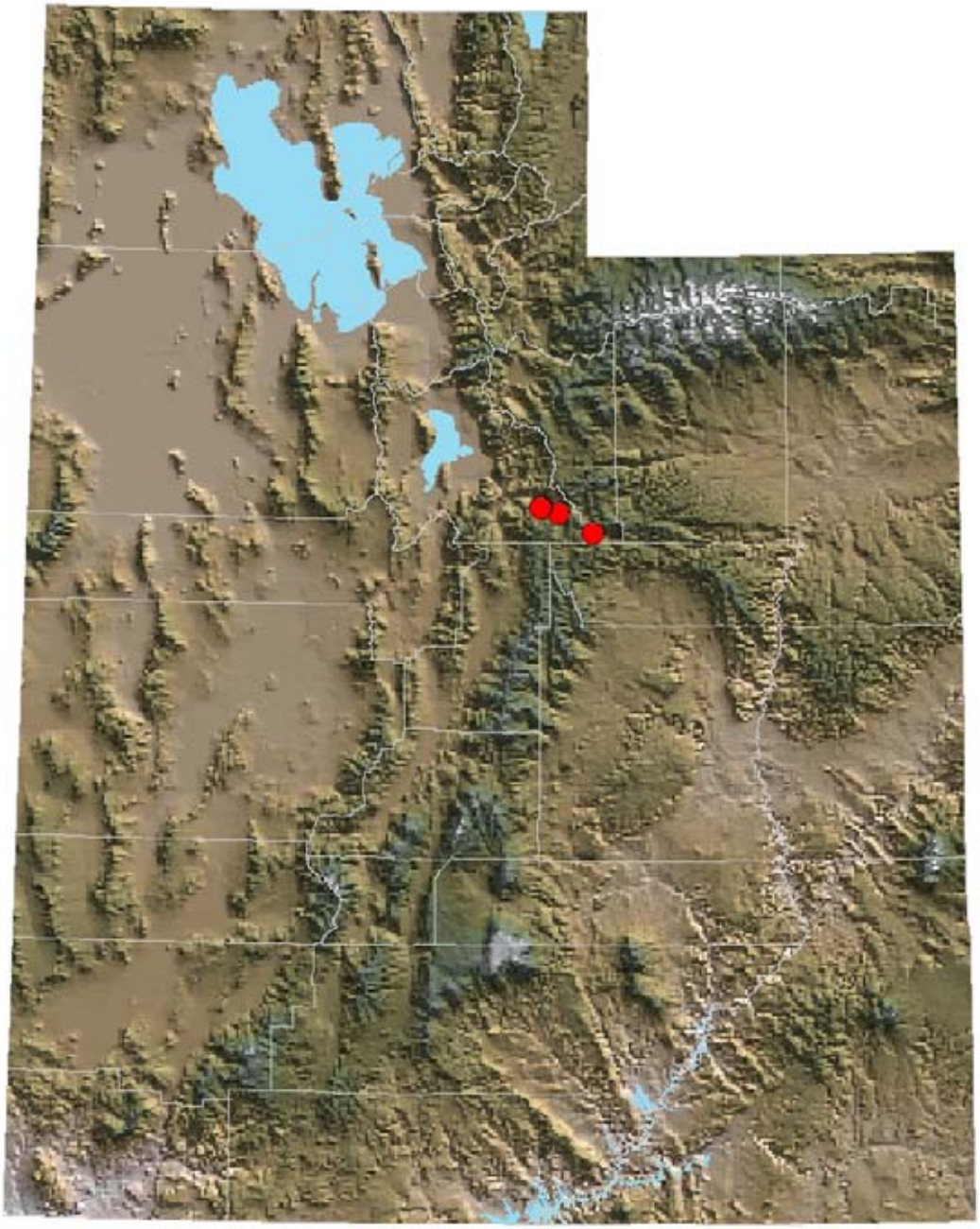

Figure 75. The distribution of clay phacelia (*Phacelia argillacea*).

Utah Phacelia
Phacelia utahensis

TAXONOMY AND NOMENCLATURE

FAMILY: Waterleaf (Hydrophyllaceae)

CONSERVATION STATUS DESIGNATIONS

This species is included on the BLM Sensitive Species Plant List (Fortner 2003), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a central Utah endemic that occurs in the Sevier River Valley, Sanpete and Sevier counties (Welsh et al. 2003). It is known on often-precipitous, barren slopes of the Arapien Shale Formation along the east side of the valley from Ninemile Reservoir, north of Mayfield, south to Rainbow Hills near Glenwood. There are also collections from the west side of the valley in hills southwest of the town of Richfield. Though collectors have identified these western hills as Arapien Shale, Hintze et al. (2003) shows that they are not. *Phacelia utahensis* is not endemic to the Arapien Shale. It grows in salt desert shrub and piñon-juniper-salt desert shrub communities with alder-leaf mountain mahogany, shadscale and Utah greasebush (Fitts, pers. comm. 2005a).

A 2004 partial survey of the Arapien Shale documented plants from Ninemile Reservoir to Rainbow Hills. Over 1300 plants were observed. Evidence of gypsum mining was observed over much of the habitat, and plants were never observed having occupied disturbed locations. Gypsum mining is ongoing, and it was observed that some inactive mines had up-to-date paperwork on the claim stakes. Grazing and off-highway vehicle use are present but due to the often steep habitat, not a concern at all locations (Fitts, pers. comm. 2005a, UTHP 2005). The recent discovery of oil in the Sevier Valley has added another potential impact to this plant's habitat.

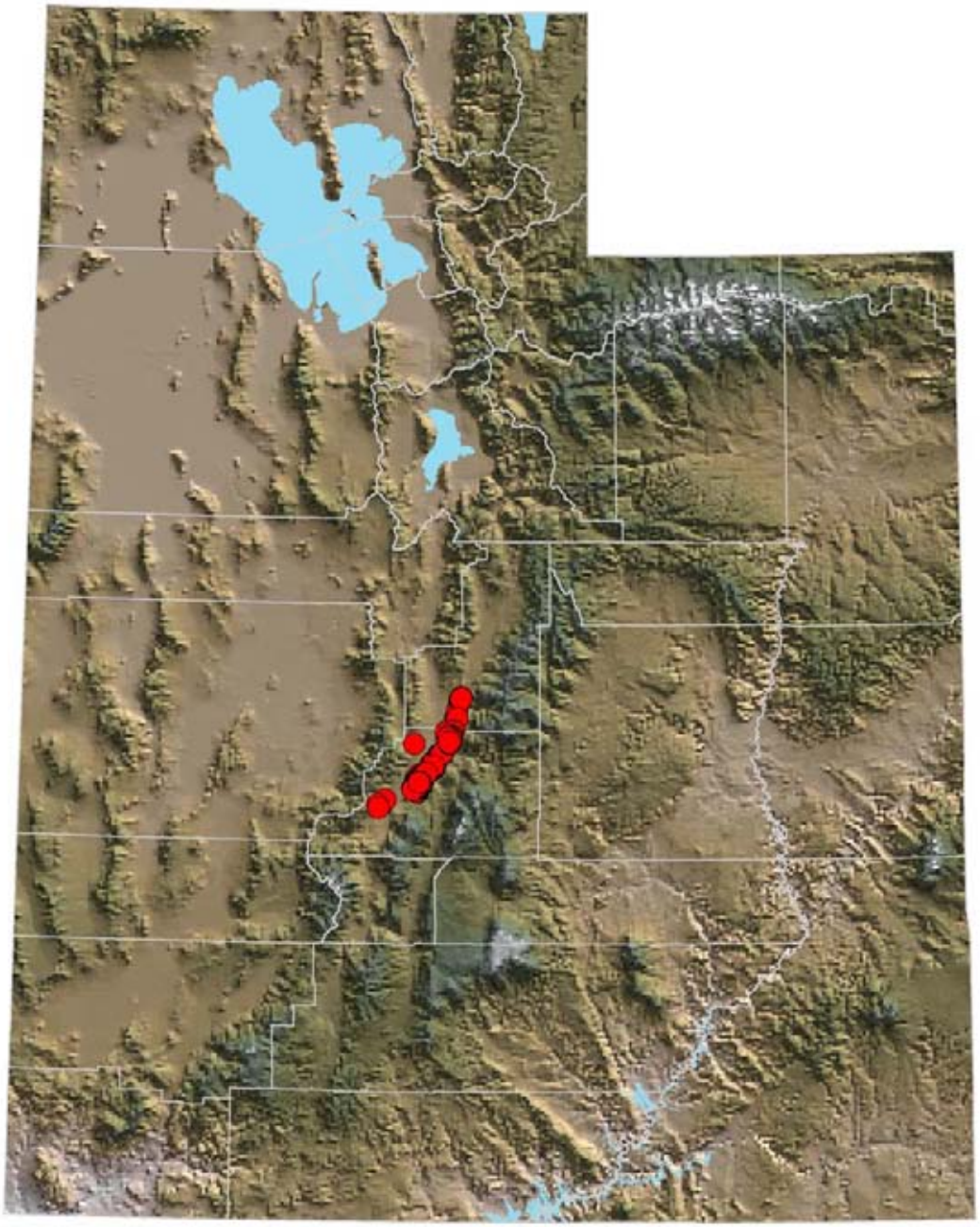

Figure 76. The distribution of Utah phacelia (*Phacelia utahensis*).

Duchesne River Twinpod
Physaria stylosa

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Some authors (e.g., Welsh et al. 2003) consider this taxon to be a variety of the species *acutifolia*, and others (e.g., Holmgren et al. 2005) place it in synonymy under that same species. The common names "little leaf twinpod" (e.g., Welsh et al. 2005) and "long-styled twinpod" (e.g., Stone 1998) are available.

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a north-central Utah endemic, Duchesne County. It is known on Duchesne Ridge above Corral Hollow, West Fork Duchesne River and from nearby along the west ridge above Mill Hollow. It inhabits open, precipitous slopes with forbs and scattered sagebrush. Engelmann spruce and dense sagebrush top the slopes and scattered aspen are at their base. Soils are light colored, shallow, fine textured to sandy and are mixed with pebbles and cobbles. They are derived from the Oligocene-Eocene Keetley Volcanics (UTHP 2005).

The results of a 2002 survey provide a total estimated population of 3500 plants. Recreation, grazing and logging all occur in the vicinity, but there appear to be no immediate threats to this plant or its habitat from these activities (Fitts, pers. comm. 2005b, UTHP 2005).

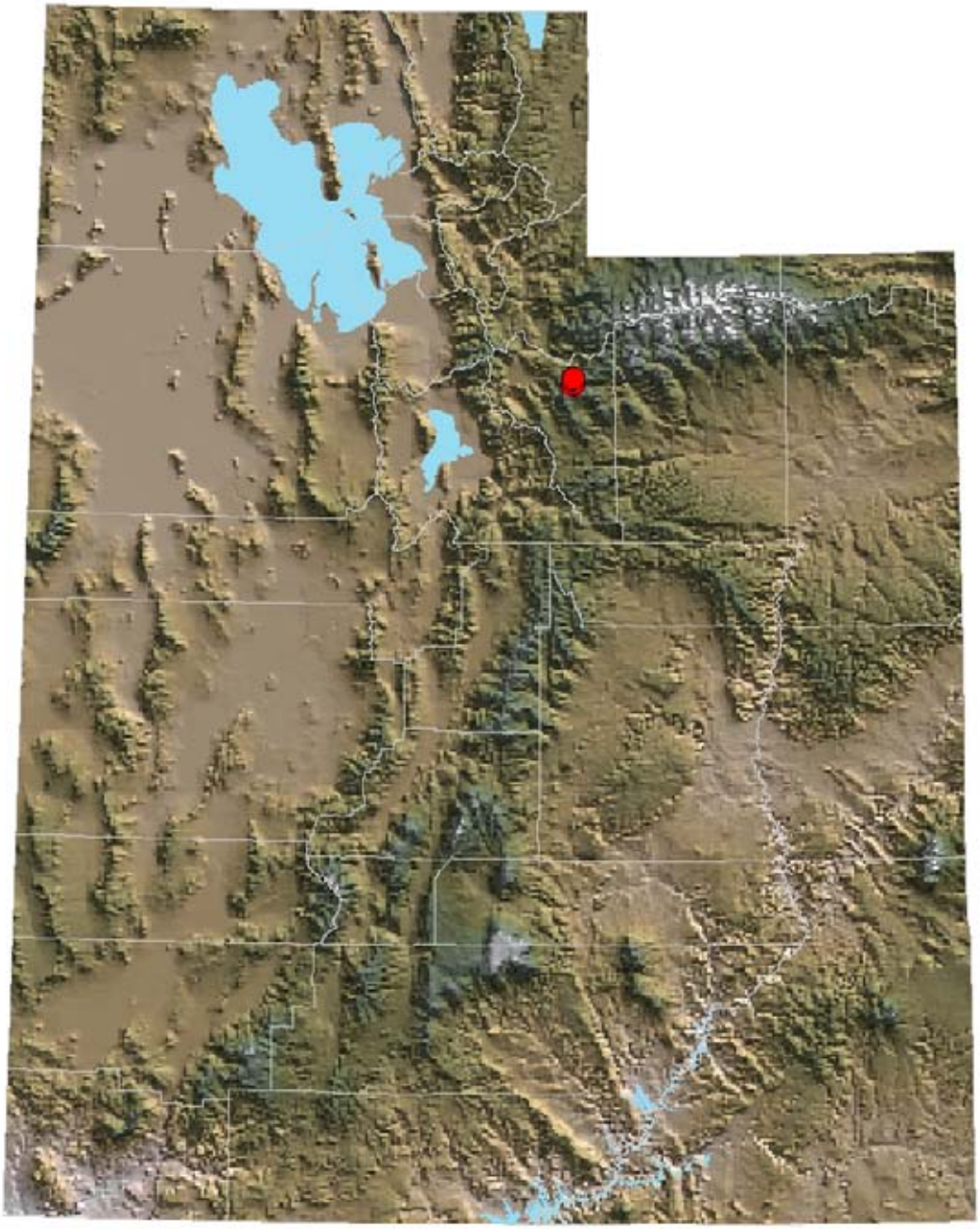

Figure 77. The distribution of Duchesne River twinpod (*Physaria stylosa*).

Angell's Cinquefoil
Potentilla angelliae

TAXONOMY AND NOMENCLATURE

FAMILY: Rose (Rosaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to the top of Boulder Mountain, Garfield County, and, as currently known, is isolated to perhaps less that a quarter of that. It grows "in open, sparsely vegetated, rocky subalpine meadows" with an elevational range of 10,700 to11,177 feet where it is associated with other low forbs and grasses (Groebner 2002; Clark 2002).

Surveys for this taxon have occurred regularly for several years. Surveyors have documented various disturbances that are degrading the plant's habitat, i.e., trampling and trailing resulting from sheep and cattle grazing; vehicular traffic, i.e., ATV and other; and visitor use, i.e., general, hikers and roads through habitat (Groebner 2002). In an attempt to discover its presence beyond Boulder Mountain, potential habitat on Thousand Lakes Mountain was surveyed; no plants were found (Groebner, et al. 2004a).

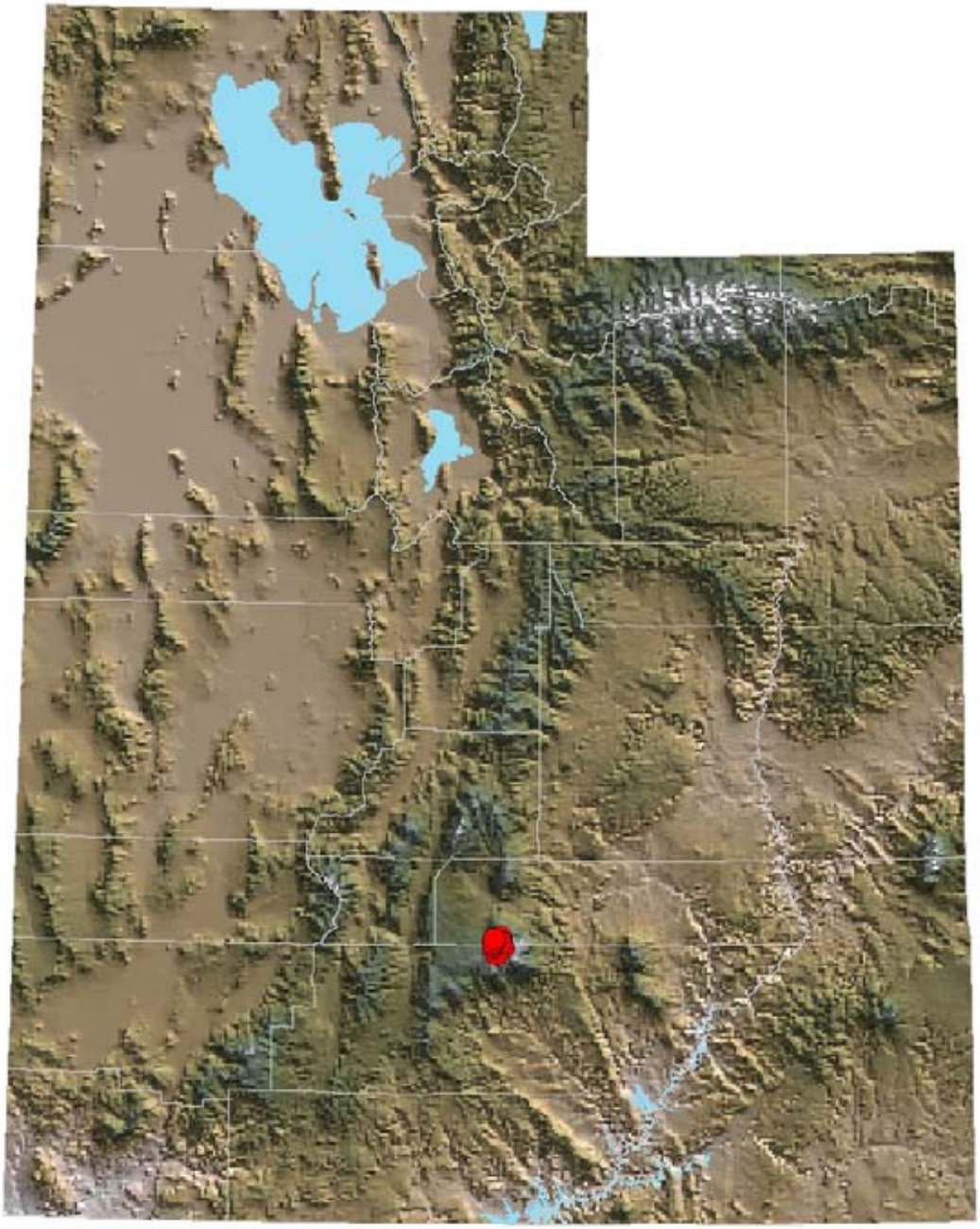

Figure 78. The distribution of Angell's cinquefoil (*Potentilla angelliae*).

Cottam's Cinquefoil
Potentilla cottamii

TAXONOMY AND NOMENCLATURE

FAMILY: Rose (Rosaceae)

OTHER NAMES: The common name "Cottam's Potentilla" is also used.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and is on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs in four of the highest mountain ranges around ancient Lake Bonneville, i.e., Raft River and Stansbury mountains and Deep Creek and Pilot ranges. Beyond Utah, it is known only in Nevada's portion of the Pilot Range. In general, it is restricted to high elevations in cracks, crevices and on ledges of cliff faces with a north aspect or shade. However, in the Stansbury Mountains is on a sheer, shadeless cliff face with an east aspect, and in the Deep Creek Range it is on a "west-facing", but partially shaded slope (Franklin 1993b; Dixon and Mancuso 2005; Holland 1999; UTHP 2005).

Its habitat in general is isolated and difficult to access. Utah's Pilot Range location is unknown and in question. The Deep Creek Range and Stansbury Mountain locations are extremely difficult to access and isolated from most human activities (UTHP 2005). In the more easily accessed Raft River Mountains, cattle-related disturbance has altered the community composition across the top of the range. However, these changes have not resulted in impacts to the plant's habitat. Though cattle are nearby, its precipitous habitat is inaccessible to them (Dixon and Mancuso 2005).

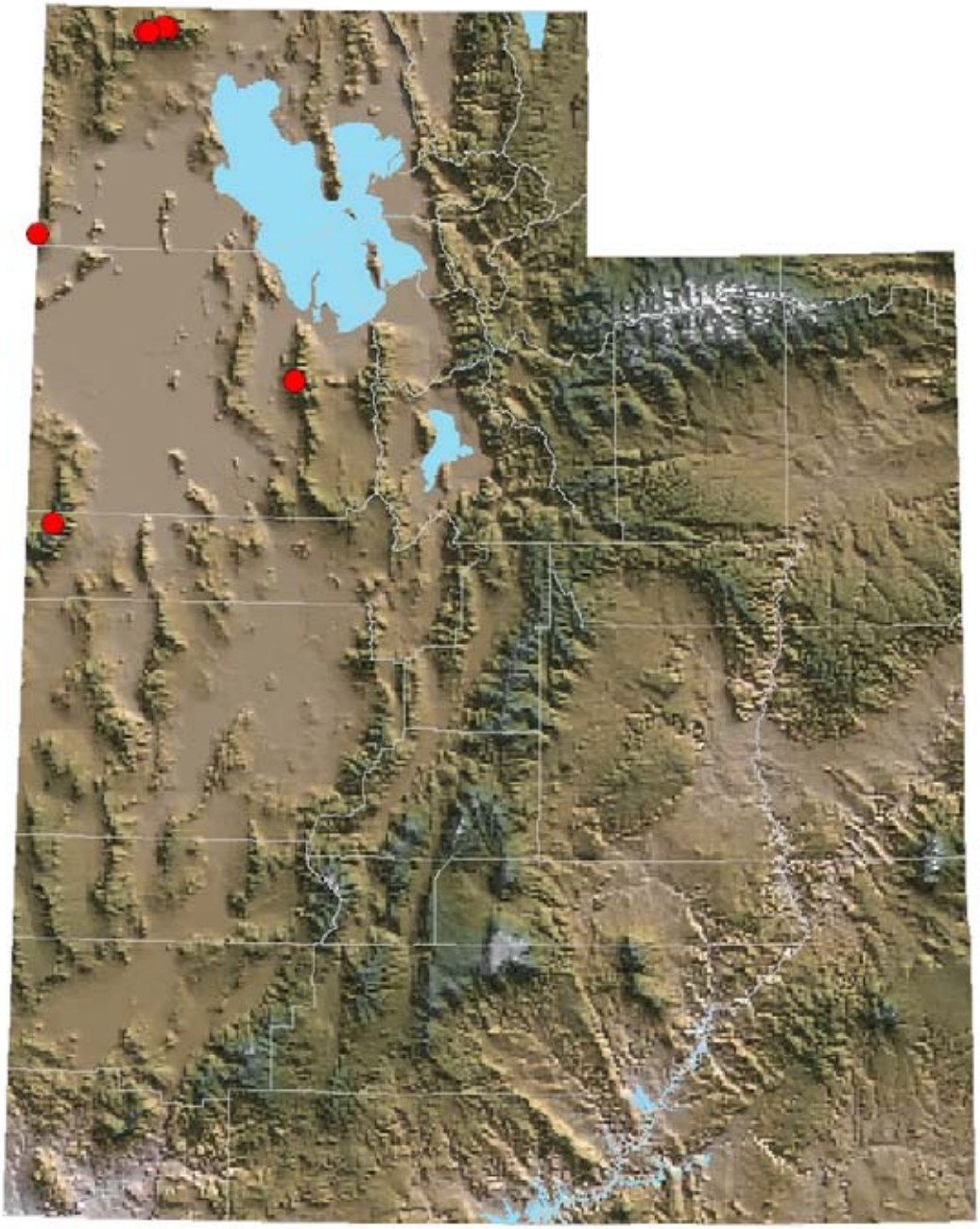

Figure 79. The distribution of Cottam's cinquefoil (*Potentilla cottamii*).

House Range Primrose
Primula domensis

TAXONOMY AND NOMENCLATURE

FAMILY: Primrose (Primulaceae)

OTHER NAMES: Richards (1993) and Holmgren and Kelso (2001) have provided alternative treatments respectively as a subspecies of and a variety of *Primula cusickiana*.

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 55 Federal Register No. 35).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to the House Range of west-central Utah, Millard County, where, as currently known, it is restricted to upper elevations at the heads of Sawtooth and Contact canyons. It grows on "shaded, limestone cliff-faces in the mountain shrub zone (Kass 1991)."

An early study estimated the total population size at 5000 individuals (Kass 1991). A more recent study provides estimates of 173 to 1,150 individuals. However, because the two sets of data are not known to be from the same precise sites, the later study expresses concerns about its use for drawing conclusions about population trends. Sites need to be more precisely documented and additional data gathered. Plants appeared healthy and recruitment was observed; six years of drought apparently have not affected the populations. Though recreation is a potential threat, inaccessibility of the habit makes it a minor concern. Historically, mining has occurred in the area, but it is not an ongoing activity (Robinson 2005).

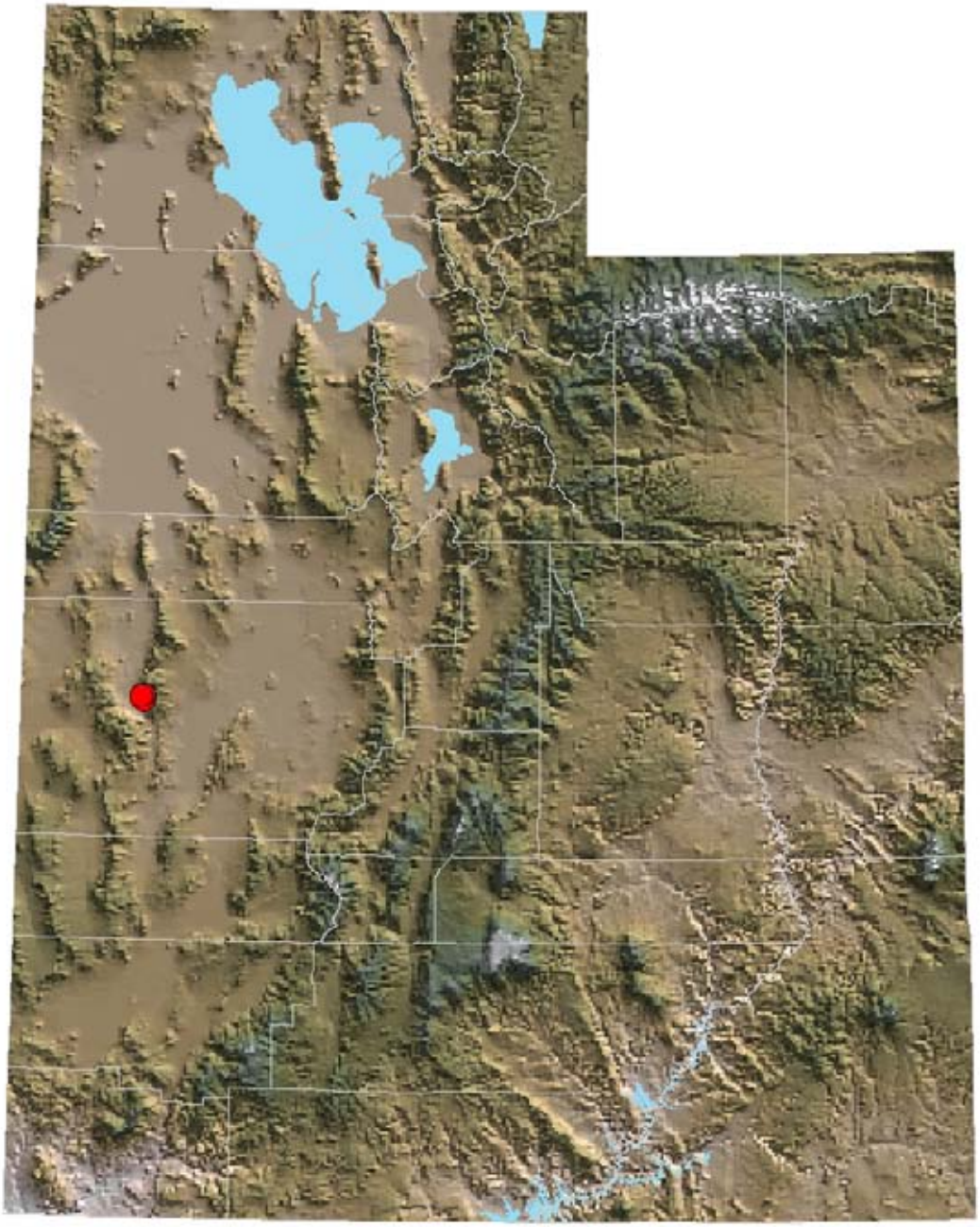

Figure 80. The distribution of House Range primrose (*Primula domensis*).

Maguire's Primrose
Primula maguirei

TAXONOMY AND NOMENCLATURE

FAMILY: Primrose (Primulaceae)

OTHER NAMES: Richards (1993) and Holmgren and Kelso (2001) have provided alternative treatments respectively as a subspecies of and a variety of *Primula cusickiana*.

CONSERVATION STATUS DESIGNATIONS

On 21 August 1985, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 50 Federal Register No. 162). A document identifying recovery goals (USFWS 1990b) has been produced as a guide to management and conservation efforts. As a federal endangered species, it is of concern to USDA Forest Service, Wasatch-Cache National Forest.

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to the lower elevations of Logan Canyon in the Bear River Range of north-central Utah, Cache County. It is found in "crevices and on ledges of north facing or well shaded south facing cliffs and boulders of the Laketown and Fish Haven Dolomites (Franklin 1990d)."

Highway expansion and recreational activities, i.e., rock climbing and hiking, have been suggested as potential impacts to this plant's habitat (Franklin 1990d). In the recent Logan Canyon road-widening projects, this plant's populations were considered in the planning process and all were avoided; of particular note was the extra care that was needed in avoiding impacts to the Woods Camp population. Although a pre-1992 draft management plan for climbing and rappelling was written, it has never been implemented. In addition, in 2004, a new climbing book was published that includes many new Logan Canyon climbing routes. Climbing remains a threat to this plant. In 2003, the Forest established the Logan Canyon Botanical Area for the canyon's seven rare endemic plants, *Primula* being one of the rarest; all of its known populations are included (Padgett, pers. comm. 2005b).

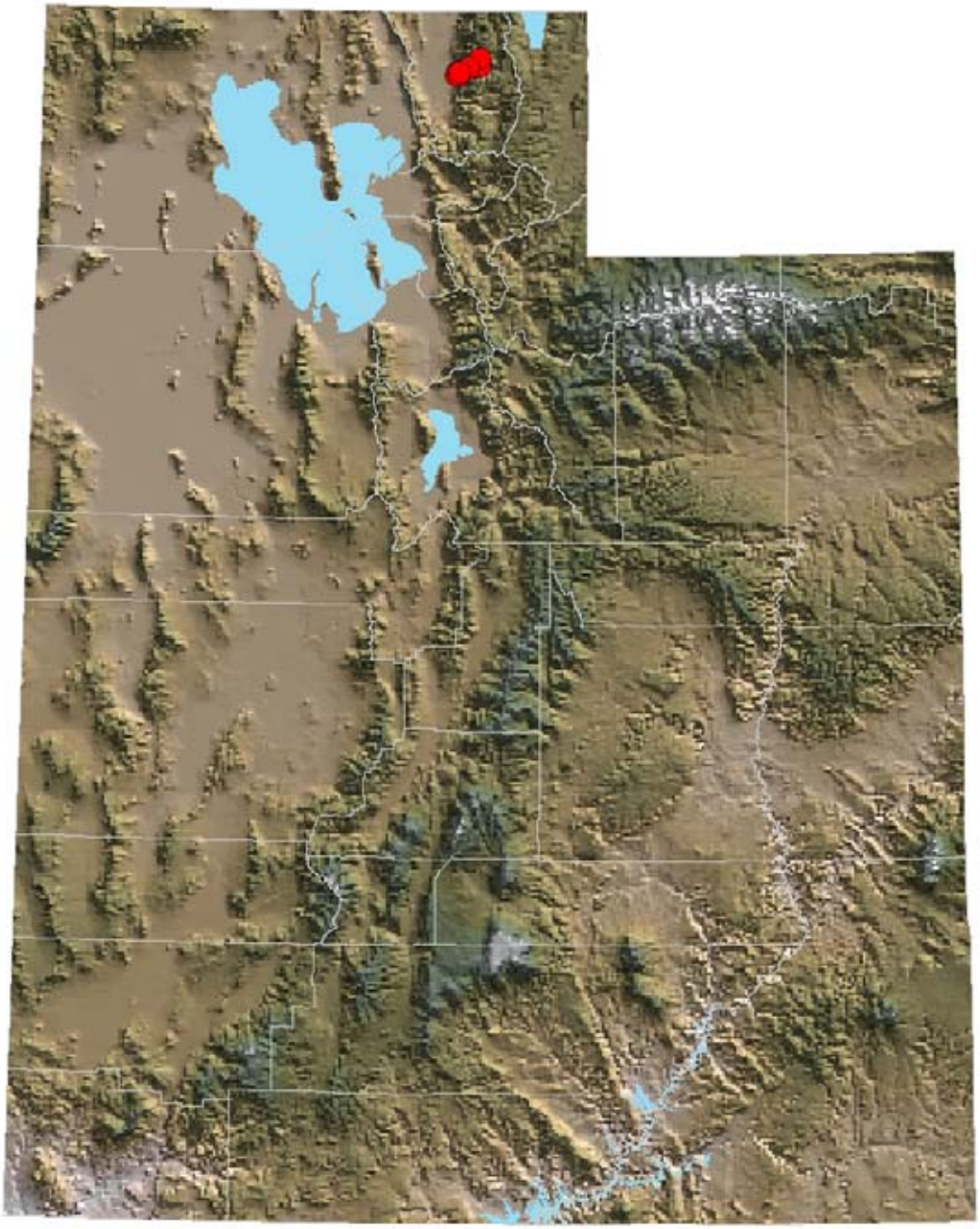

Figure 81. The distribution of Maguire's primrose (*Primula maguirei*).

Jones' Indigo-bush
Psorothamnus nummularius

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: This species was formerly referred to as *Psorothamnus polydenius* var. *jonesii* (e.g., Welsh et al. 1993). The common name "Jones dotted Dalea" has been used (Heil and Melton 1994).

CONSERVATION STATUS DESIGNATIONS

This species is included in the BLM Sensitive Species Plant List (BLM 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This east-central Utah endemic occurs near the town of Green River, from scattered locations within the mouth of Gray Canyon in Emery Co., and, with a single known location on the Grand Co. side of the river, south as far as Fivemile Wash. It is disjunct from here at two locations in the vicinity of Mexican Mountain in the San Rafael Swell. It is present in salt desert shrub communities on terrace, pedimental and alluvial gravels; the underlying geologic formation varies (Franklin 1988; Heil and Melton 1994).

Heil and Melton (1994) estimate that the numbers of individuals of this plant range from 13,000 to 40,000. Current management / ownership is BLM, i.e., Price and Moab Field Offices, private and School and Institutional Trust Lands (SITLA). In the San Rafael Swell all known habitat is within the Mexican Mountain Wilderness Study Area. Near Green River, a significant portion of this plant's habitat is either private or SITLA. The loss of habitat to development would be a significant impact to the species. Heil and Melton (1994) mention that the presence of this plant halted a gravel-mining project near Green River and suggest that this is a persisting concern.

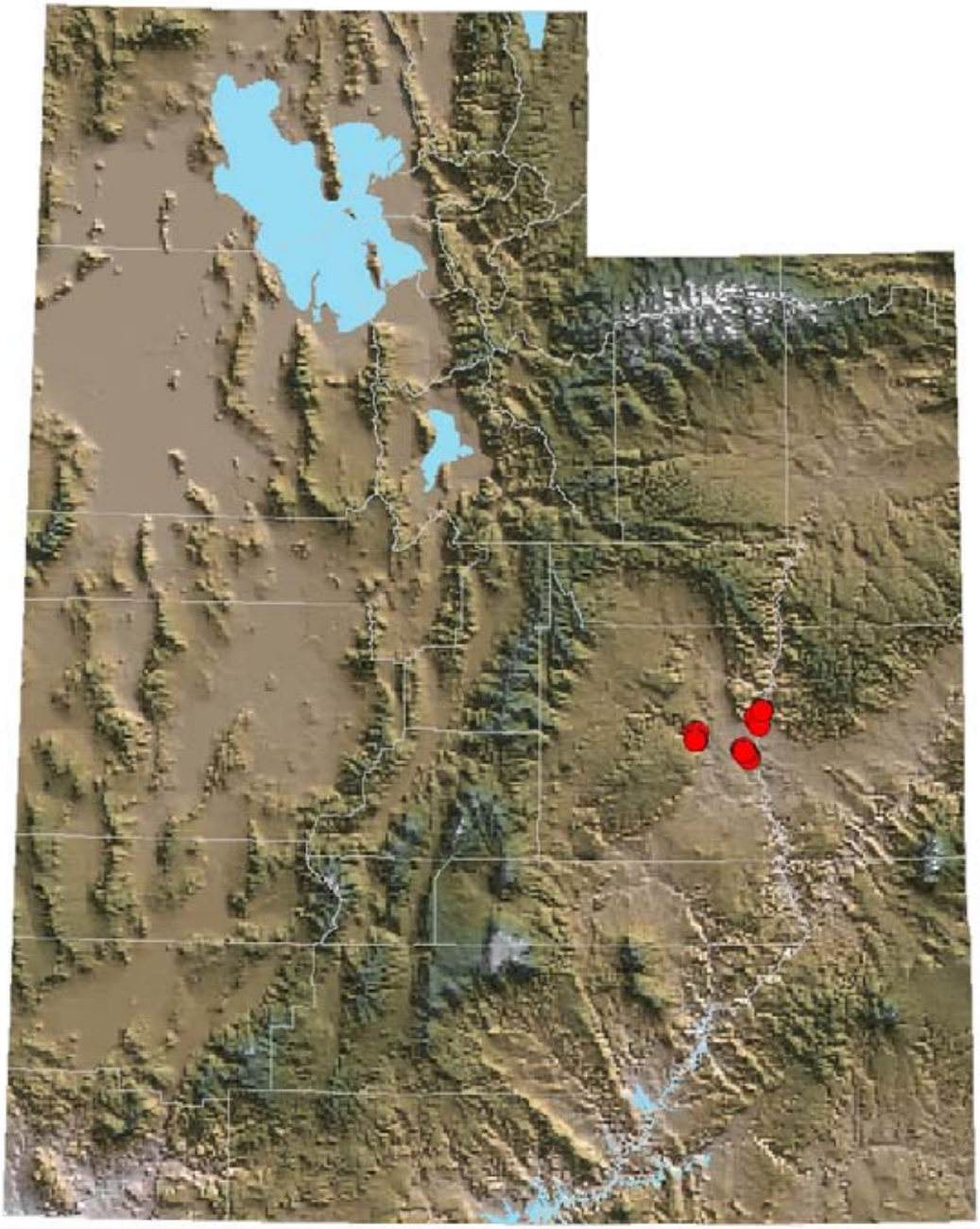

Figure 82. The distribution of Jones' indigo-bush (*Psorothamnus nummularius*).

Autumn Buttercup
Ranunculus aestivalis

TAXONOMY AND NOMENCLATURE

FAMILY: Buttercup (Ranunculaceae)

OTHER NAMES: This taxon continues to be treated by some authors as a variety of the species' *acriformis* (e.g., FNA 1997) and *acris* (e.g., Welsh et al. 2003). The common name "fall buttercup" has also been used (e.g., Welsh et al. 2003).

CONSERVATION STATUS DESIGNATIONS

On 21 July 1989, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 54 Federal Register No. 139). A document identifying recovery goals (USFWS 1991) has been produced as a guide to management and conservation efforts. It is not known to occur on federal lands.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to the Sevier River Valley of south-central Utah, Garfield County. It is known from two extant populations near Bear Valley Junction, i.e., a private ranch and a private preserve purchased and established specifically for this species by The Nature Conservancy. It grows, "in an ecotonal area between dry Greasewood / saltgrass and wet sedge marsh vegetation. The dominant species…include *Juncus arcticus*, *Glaux maritima*, *Haplopappus lanceolatus*, and *Plantago eriopoda*." The preserve site is a gently sloping alluvial terrace where the water table is high; soils are saturated early in the season, gradually drying, but remaining moist a short distance below the surface (Spence 1991).

The preserve site is monitored on a yearly basis; the population, though small, persists. Through the recent implementation of an annual, controlled ecological burn, an attempt is being made to reestablish a more natural pre-settlement landscape that will improve the buttercup's chances for survival. And, funding was recently approved, through the US Fish & Wildlife Service's Private Stewardship Grants Program, for re-introduction onto this site of plants grown in captivity (Whitham, pers. comm. 2005). The private ranch site, when discovered in 1991, had an estimated population of 200+ plants. Cattle were present in the same field, but plants were robust and did not appear to have been grazed (UTHP 2005). There is no current information available documenting its status, i.e., population size estimates, habitat condition or potential impacts.

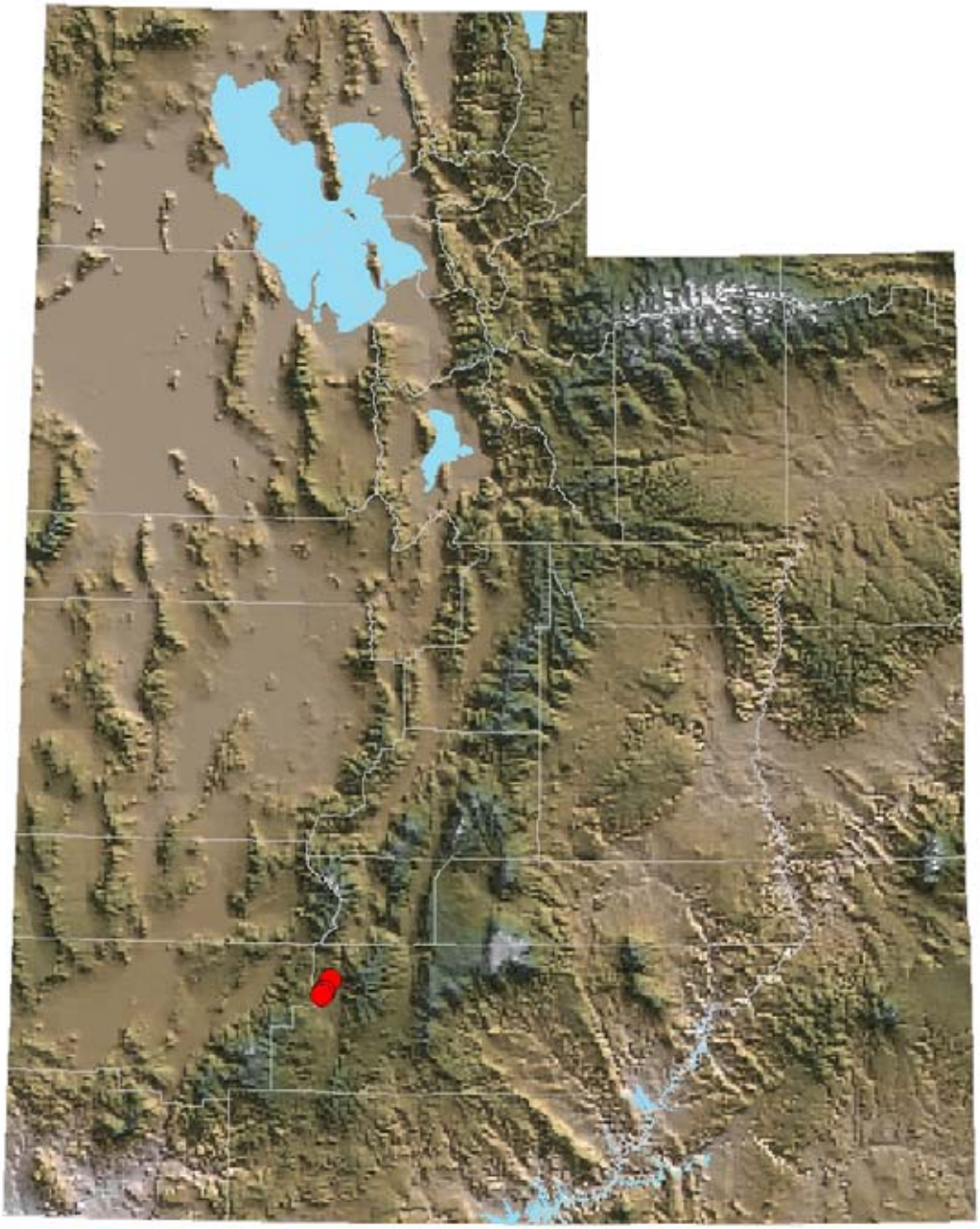

Figure 83. The distribution of Autumn buttercup (*Ranunculus aestivalis*).

Clay Reed-Mustard
Schoenocrambe argillacea

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: The common names "clay Schoenocrambe" and "Uinta Basin plainsmustard" are also in use (Welsh et al. 2003 and NRCS 2005, respectively).

CONSERVATION STATUS DESIGNATIONS

On 14 January 1992, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 57 Federal Register No. 9). A document identifying recovery goals (USFWS 1994) has been produced as a guide to management and conservation efforts. As a federal endangered species, it is of concern to USDI Bureau of Land Management, Vernal Field Office.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to the Uinta Basin of northeast Utah, Uintah County. It is known along the east slopes of Big Pack Mountain and in Broome Canyon to the east; along the west slopes of Wild Horse Bench, from the vicinity of Kings Canyon and south nearly to The Wrinkles; and along the slopes of the canyons above Ray's Bottom, on the west side of the Green River (Franklin 1992d). It grows in salt desert shrub communities were it is most commonly associated with *Eriogonum corymbosum*, *Ephedra torreyana*, *Atriplex confertifolia*, *Atriplex gardneri* var. *cuneata*, *Elymus salinus*, *Tetradymia nuttallii*, and *Amelanchier utahensis*, on north tending precipitous slopes in substrates consisting of at-the-surface bedrock, scree, and fine-textured soils (Franklin 1992d).

Forthcoming information from a 2005 preliminary survey of known and potential habitat will assist in the update of the status of this plant's populations, i.e., estimated numbers of plants, habitat condition or observed impacts (Glisson, pers. comm. 2005; Specht, pers. comm. 2005). The Uinta Basin has again become an area of intense oil and gas exploration that, according to Specht (pers. comm. 2005), will be moving into the habitat areas of this species. Development in the vicinity of Pack Mountain will be down slope of its habitat and have no direct affect, however, known habitat along the Green River and on the East side of Willow Creek will be down slope of the development and will potentially be threatened from above by sedimentation and increased erosion (Specht, pers. comm. 2005).

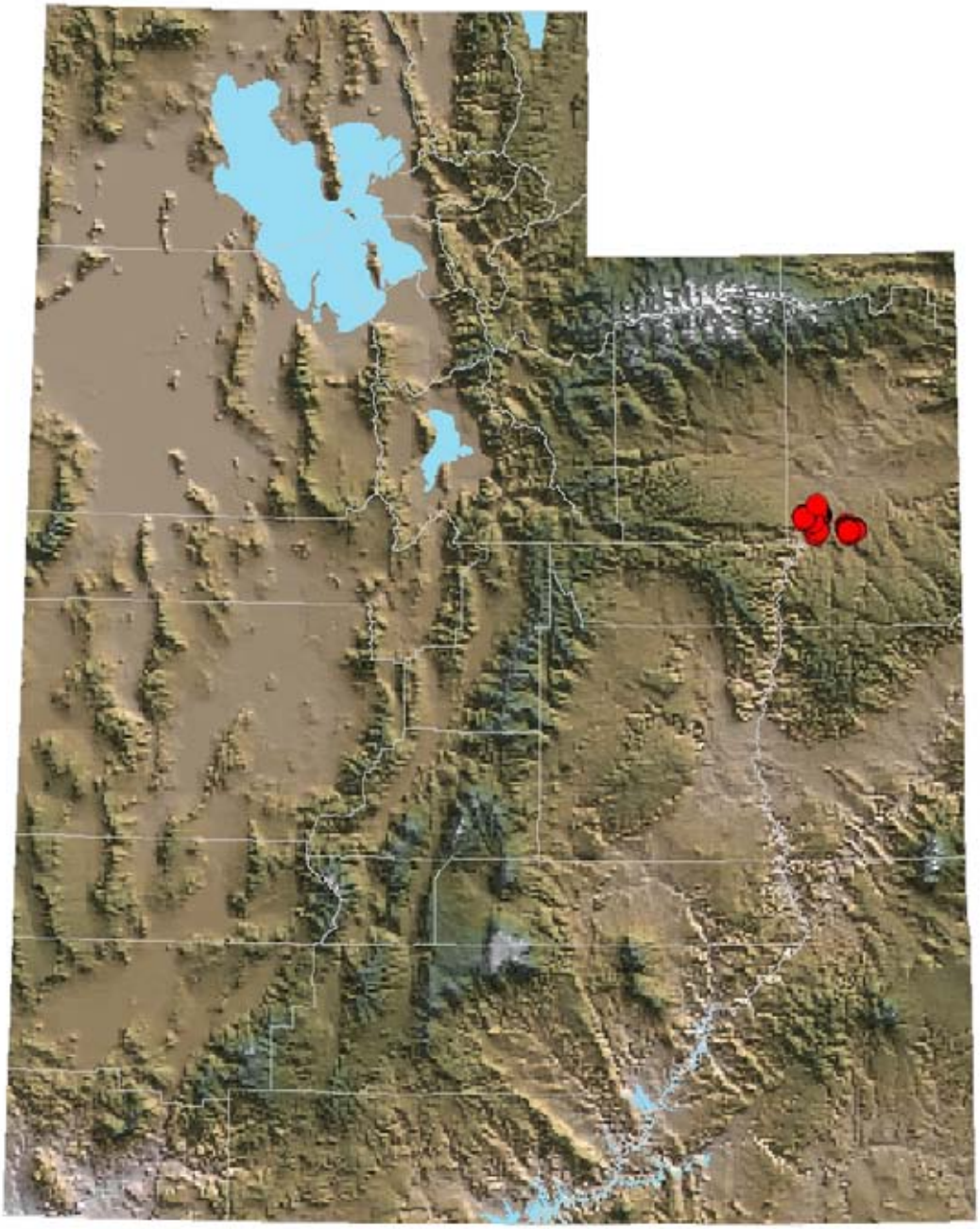

Figure 84. The distribution of clay reed-mustard (*Schoenocrambe argillacea*).

Barneby's Reed-Mustard
Schoenocrambe barnebyi

TAXONOMY AND NOMENCLATURE

FAMILY: Mustard (Cruciferae, Brassicaceae)

OTHER NAMES: Other common names that have been applied to the species are "Barneby's Schoenocrambe", "Barneby plainsmustard" and "Sye's Butte plainsmustard".

CONSERVATION STATUS DESIGNATIONS

On 14 January 1992, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 57 Federal Register No. 9). A document identifying recovery goals has been produced as a guide to management and conservation efforts (USFWS 1994). As a federal endangered species, it is of concern to USDI Bureau of Land Management, Price Office, and USDI National Park Service, Capitol Reef National Park.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic to south-central Utah where it is known from Keesle Country, in the San Rafael Swell, and in Capitol Reef National Park, Emery and Wayne counties. It grows where vegetation is sparse on steep north to northeast facing slopes of the Moenkopi Formation, and, rarely, on soils eroded from it that now overlie the Chinle Formation and on the Carmel Formation (Clark 2005b, Ecosphere 1992).

USFWS (1994) estimated the total population at 2000 plants. Recent estimates indicate that there are now "about 3,000 plants known of this species." Due to terrain that is difficult to navigate and in some cases inaccessible, Clark (2005b) indicates that numbers available from 2005 surveys on Capitol Reef National Park do not represent absolute totals. Additional potential habitat remains unsurveyed on both the Park and on BLM land. Ecosphere (1992) notes that gypsum and uranium mining have occurred in the San Rafael Swell, and that abandoned uranium mines are near this plant's habitat. It is suggested that these mining activities are "possible threat[s] in the distant future." Clark (2005b) does not discuss threats to the plant and its habitat.

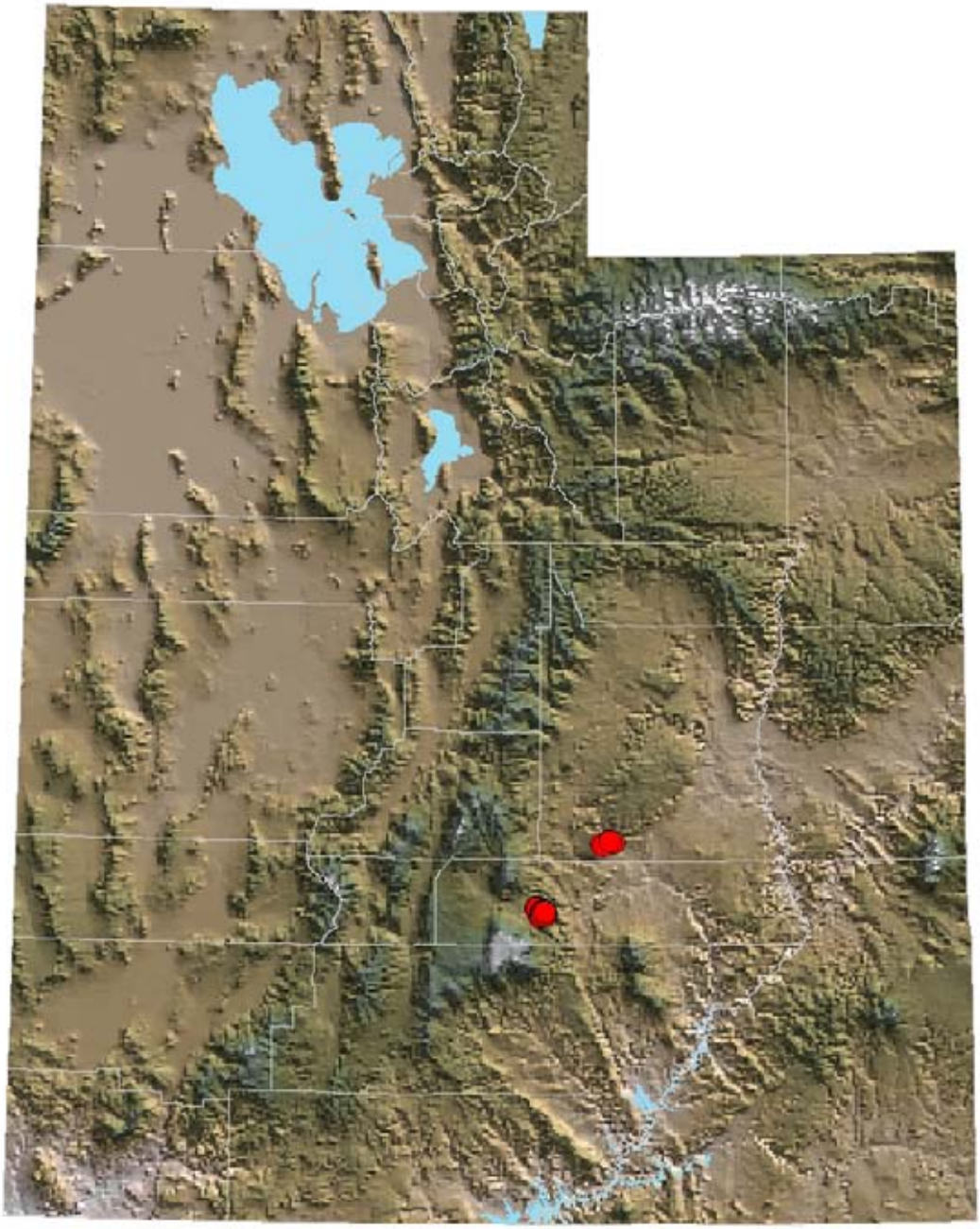

Figure 85. The distribution of Barneby's reed-mustard (*Schoenocrambe barnebyi*).

Pariette Cactus
Sclerocactus brevispinus

TAXONOMY AND NOMENCLATURE

FAMILY: Cactus (Cactaceae)

OTHER NAMES: This taxon was originally named as *Sclerocactus wetlandicus* var. *ilseae* (Hochstätter 1993). At least one source (i.e., Welsh et al. 2003) places this taxon, as variety *ilseae*, within *Sclerocactus whipplei*. Other common names applied to the taxon are "Pariette fishhook cactus", "shortspine fishhook cactus", and "Pariette Bench hookless cactus".

CONSERVATION STATUS DESIGNATIONS

On 28 February 1996, this species was designated as a candidate for possible listing as an endangered or threatened species under the Endangered Species Act of 1973, as amended (Vol. 61 Federal Register No. 40). Then, in 1997 (Vol. 62 Federal Register No. 182) the designation was "corrected" with the following discussion, "*Sclerocactus brevispinus* (Pariette cactus), was mistakenly included in Table 1 in the 1996 candidate notice of review….Because *S. brevispinus* was a part of *S. glaucus* when the latter species was listed as threatened, those plants now referred to as *S. brevispinus* are…considered to be listed as threatened….To address the recent change in taxonomy, a proposed rule to add *S. brevispinus* to the List of Endangered and Threatened Plants will be published in the Federal Register at a later time." This proposed rule has not been published; as a result, on 18 April 2005 the Center for Native Ecosystems and the Utah Native Plant Society submitted a petition to list *S. brevispinus*. Because Pariette cactus is considered a federal threatened species under the umbrella of *S. glaucus*, it is of concern to USDI Bureau of Land Management, Vernal Field Office. It is included on the BLM Sensitive Species Plant List (Fortner 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is a Uinta Basin endemic in northeast Utah, Duchesne County. It is known from "a series of small scattered populations…near Myton (Heil and Porter (1994)." Its east-west tending habitat is 10 miles long and little more that 3 miles wide with an estimated acreage of 7,548 (CNE 2005). It inhabits "stoney, gravelly, low hilly terrain, growing with desert grasses or low vegetation (Hochstätter 1993)"; the soils on which it grows are derived from the Uinta Formation (Specht, pers. comm. 2005).

A mid-1980's population estimate of plant numbers is approximately 3,700 (CNE 2005)." Oil and gas exploration and development have escalated in the Uinta Basin and into this plant's habitat. New information is needed to document the status of this plant.

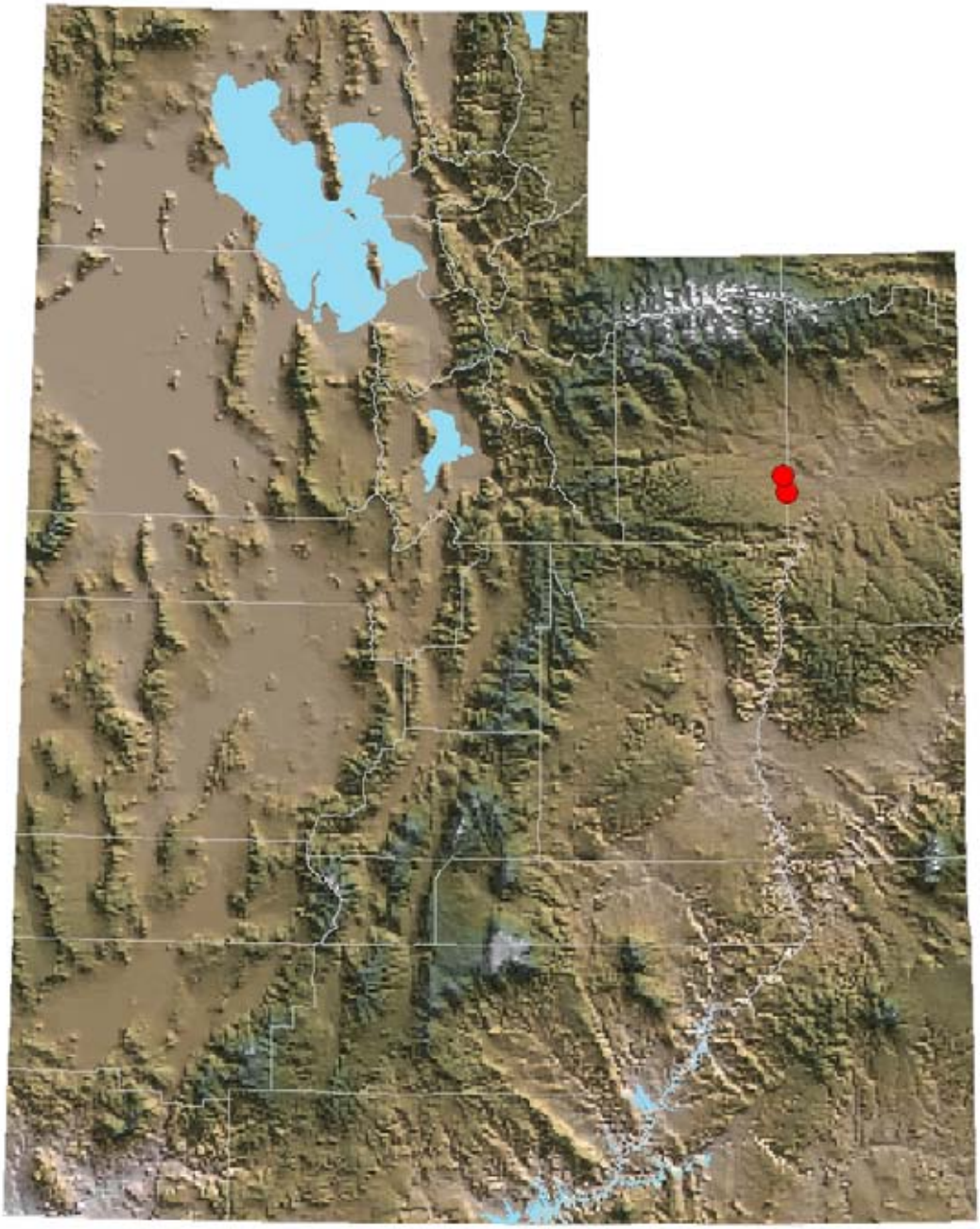

Figure 86. The distribution of Pariette cactus (*Sclerocactus brevispinus*).

Uinta Basin Hookless Cactus
Sclerocactus wetlandicus

TAXONOMY AND NOMENCLATURE

FAMILY: Cactus (Cactaceae)

OTHER NAMES: This taxon was named in 1989 (Hochstätter 1989). Heil and Porter (in, FNA 2003) in their treatment of the genus *Sclerocactus* recognize it, thereby limiting the distribution of *S. glaucus* to Colorado. This taxon is referred to as *S. whipplei* var. *glaucus* by some authors (e.g., Welsh et al. 2003); with this name, it retains the Utah-Colorado distribution. Another common name applied to the taxon is "Pariette hookless cactus" (e.g., FNA 2003).

CONSERVATION STATUS DESIGNATIONS

On 11 October 1979, as part of *Sclerocactus glaucus*, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 44 Federal Register No. 198). A document identifying recovery goals (USFWS 1990c) has been produced as a guide to management and conservation efforts. As a federal threatened species, it is of concern to USDI Bureau of Land Management, Vernal and Price Field Offices.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a Uinta Basin endemic in northeast Utah, Duchesne and Uintah counties. It inhabits salt desert shrub communities and piñon-juniper woodlands on river benches, valley slopes, and rolling hills. The soils are xeric, fine textured and overlain with cobbles and pebbles, and they are weathered from the Uinta and Green River formations; it is not know from the Duchesne River formation (Heil and Porter 1993, Specht, pers. comm. 2005).

This species and its habitat are vulnerable to disturbance from domestic livestock grazing, oil and gas exploration and development, building stone collecting and off-road vehicle use and recreation (Heil and Porter 1993). Oil and gas exploration and development have recently escalated in the Uinta Basin and the almost forgotten development of both tar sands and oil shale are again of interest in the Basin. There is no current data documenting the status of populations, i.e., estimated numbers of plants, habitat condition or observed impacts.

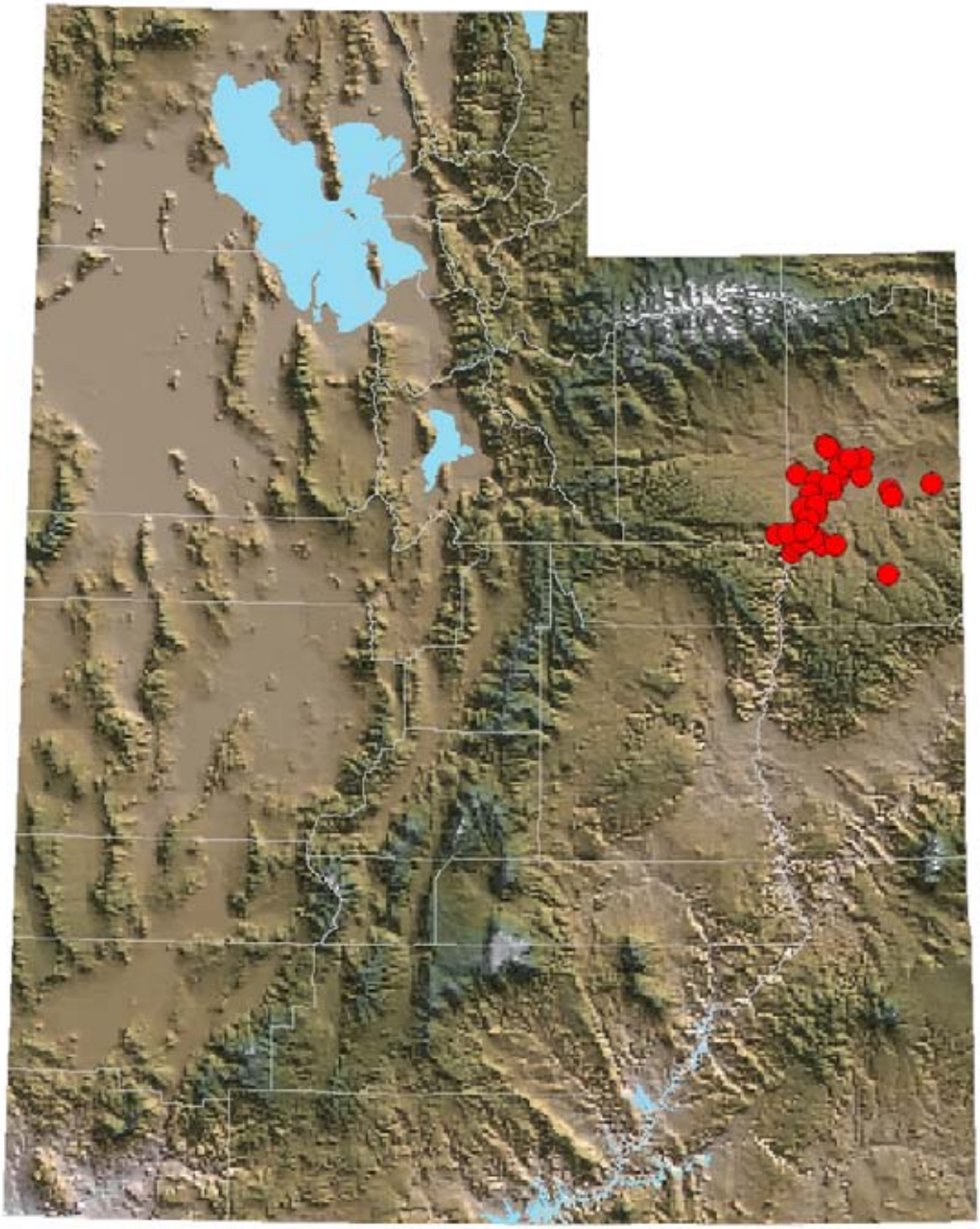

Figure 87. The distribution of Uinta Basin hookless cactus (*Sclerocactus wetlandicus*).

Wright's Fishhook Cactus
Sclerocactus wrightiae

TAXONOMY AND NOMENCLATURE

FAMILY: Cactus (Cactaceae)

OTHER NAMES: The common name "Wright's fishhook cactus" is shared with *Mammillaria wrightii* var. *wrightii*, a non-Utah taxon. Apparently, in order to prevent confusion, a new option is provided in Flora of North America (FNA 2003), i.e. "Wright's cactus". Other authors (e.g., Welsh et. al. 2003) shorten it to "Wright's fishhook.

CONSERVATION STATUS DESIGNATIONS

On 11 October 1979, this species was designated as endangered under the Endangered Species Act of 1973, as amended (Vol. 44 Federal Register No. 198). A document identifying recovery goals (USFWS 1985b) has been produced as a guide to management and conservation efforts. In February of 1997, the FWS received a petition to remove Wright's cactus from the list of endangered and threatened species. On 3 August 2005, they published the determination that insufficient data had been provided to support its removal from the list; it remains an endangered species (Vol. 70 Federal Register No. 148). As a federal endangered species, it is of concern to USDI Bureau of Land Management, Price and Richfield Field Offices.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a central Utah endemic occurring "in the low elevation desert trough around the south end of the San Rafael Swell" in Emery, Sevier and Wayne counties. Its inner boundary wraps tightly south down the Swell's west base from The Red Benches to Moroni Slopes and up the east base to just north of Goblin Valley State Park. Again, from The Red Benches, the outer boundary reaches southwest to the base of the Limestone Cliffs in the Last Chance Desert and south along the Waterpocket Fold as far as Notom and then east across the Blue Valley Benches toward Hanksville (USFWS 1985b). It inhabits salt desert shrub and widely scattered piñon-juniper communities in soils that range from clays to sandy silts to fine sands derived from numerous geologic formations, and is typically in areas with well developed biological soil crusts (Neese Investigations 1987, Groebner 2004).

Disturbances noted in recent surveys have resulted from off-highway vehicle use, grazing, and close proximity to existing roads, an active gypsum mine and to mining claims that require annual assessment work. Several sites are also described as "drought stricken area" (Groebner 2004). Neese Investigations (1987) indicate that at the time of their study, approximately eighteen years before Groebner's study (2004), this species and its habitat were vulnerable to these same disturbances.

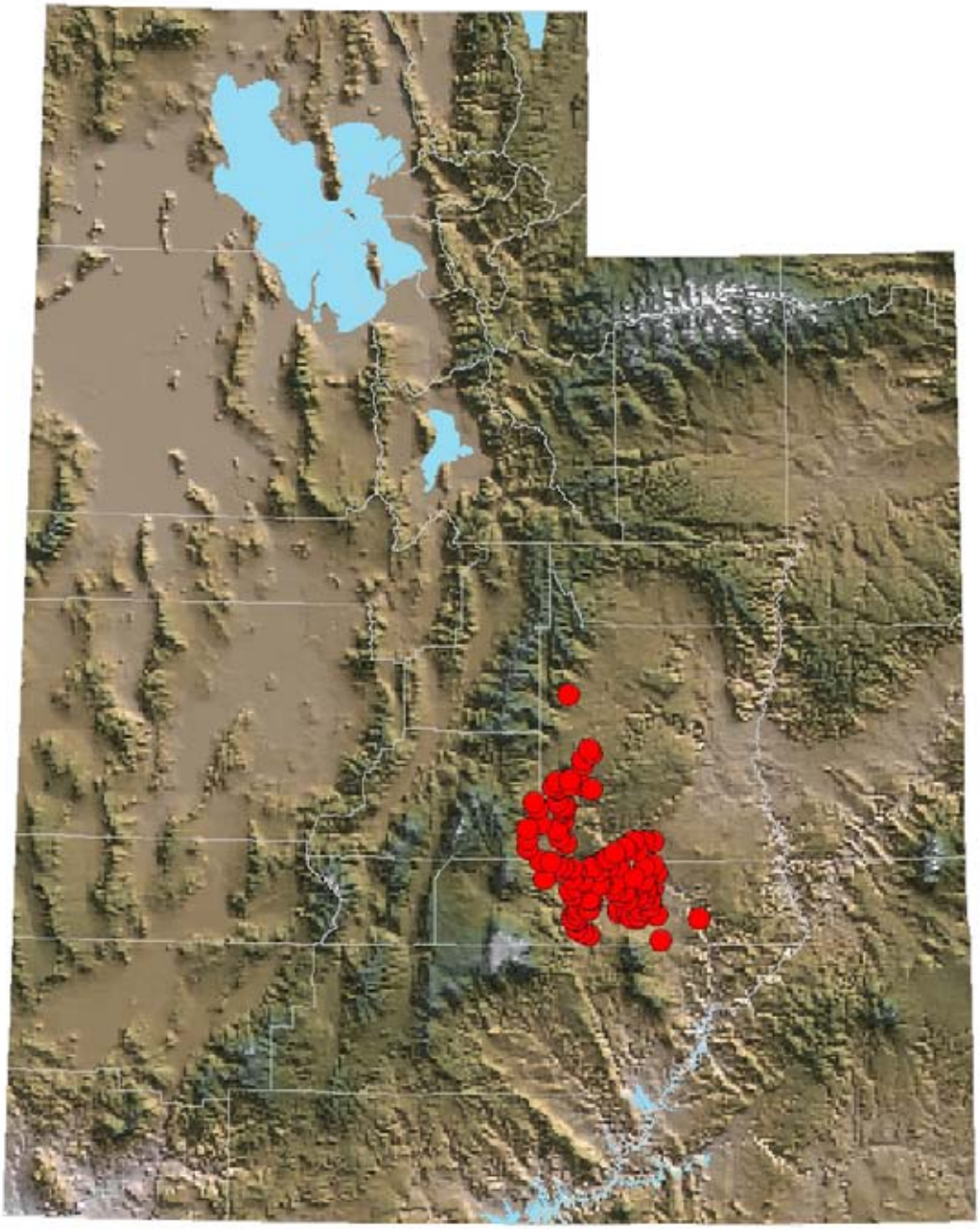

Figure 88. The distribution of Wright's fishhook cactus (*Sclerocactus wrightiae*).

La Sal Mountains' Groundsel
Senecio fremontii var. *inexpectatus*

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: The common names "dwarf mountain ragwort" (e.g., NRCS 2005) and "La Sal Mountains' butterweed" (e.g., Stone 1998) are also available.

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southeast Utah endemic in the La Sal Mountains, Grand and San Juan counties. It inhabits "[a]lpine ridgecrests, talus slopes, and subalpine meadows (Welsh et al. 2003)."

No information is available to indicate the status of populations. A portion of this plant's habitat is within the Mount Peale Research Natural Area. Increasing recreational activity is perhaps the only potential impact that merits monitoring.

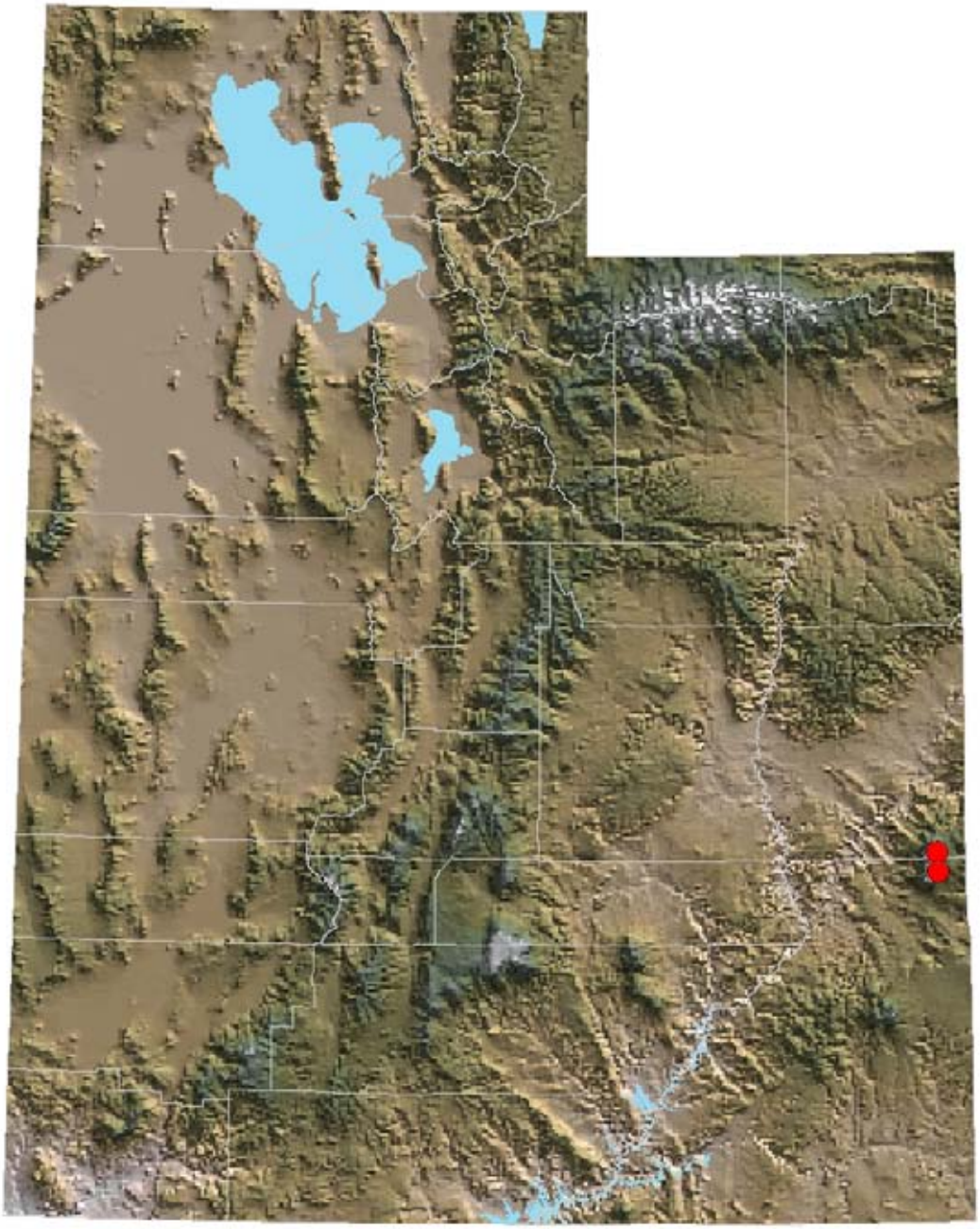

Figure 89. The distribution of La Sal Mountains' groundsel (*Senecio fremontii* var. *inexpectatus*).

Gierisch's Globemallow
Sphaeralcea gierischii

TAXONOMY AND NOMENCLATURE

FAMILY: Mallow (Malvaceae)

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species occurs along the Arizona-Utah state line in southwest Utah, Washington County. It is known from Utah's Little Round Valley and south across Black Knolls in Arizona; its north-south distribution of just over 8 miles. It grows in a warm desert shrub community with *Lycium andersonii*, *Chrysothamnus* sp., *Hymenoclea salsola*, and *Hilaria jamesii*, where it is found on low terraces with either a "cover of black, slaty-limey rock" or by "gypsiferous biological soil crusts (Fertig, pers. comm. 2005)."

Total population size was estimated at over 200 plants. Overall, threats are presently low; the presence of all terrain vehicle use, the minor presence of livestock tracks, and some weed species were observed. It was noted that the site was not especially protected from potential disturbance (Fertig, pers. comm. 2005).

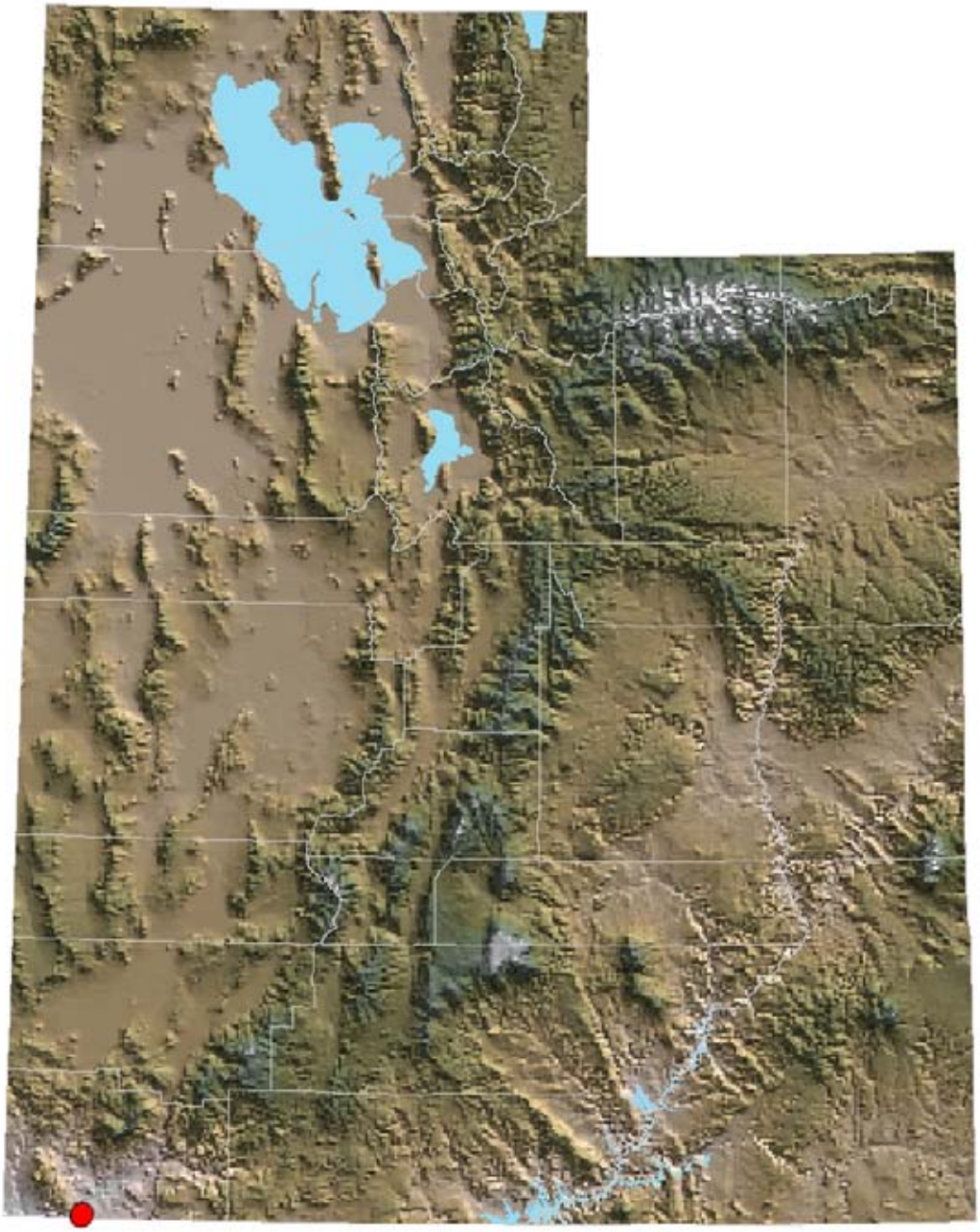

Figure 90. The distribution of Gierisch's globemallow (*Sphaeralcea gierischii*).

Psoralea Globemallow
Sphaeralcea psoraloides

TAXONOMY AND NOMENCLATURE

FAMILY: Mallow (Malvaceae)

OTHER NAMES: The common name "scurfpea globemallow" has recently been used Jones and Neese (2004).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is endemic in central Utah on the eastern and southeastern foot slopes of the San Rafael Swell, Emery and Wayne counties. There it is found on various saline and gypsiferous substrates in salt desert and mixed desert shrub communities (Atwood 2003, Jones and Neese 2004, Stone 1998).

Atwood (2003), after compiling existing information, suggests that due to the number of existing populations the species in not in jeopardy, that critical habitat designation is not needed and that most populations are stable. However, it is recommended that field checks take place to determine the status of each known site. Even more recently, separate efforts by Jones and Neese (2004) and Robinson (2004b) have acquired field data on the status of some populations. Before these two surveys, no organized effort to obtain an understanding of this taxon in the field had occurred since Neese (1987); even then, scurfpea globemallow was a secondary target. Robinson (2004b) visited 16 previously known sites and 8 new sites with an estimated number of plants, at the high end, approaching 70,000. At locations visited, varied threats were documented, i.e., recent ATV use, grazing, recreation, exotic weed encroachment, mining and urbanization. Robinson (2004b) concluded that, with the presence of varied age classes and the observation that new recruitment was occurring, the population as a whole appeared to be stable. Research, to understand better the plant's natural history, and additional survey were recommended. Jones and Neese (2004) revisited eight previously known sites and discovered two new sites. At the 10 sites visited, the estimated number of plants was between 6,500 and 15,000, and the presence of cattle and off-highway vehicle use at those sites was mentioned. Recommendations included field survey for several sites at which extensive additional habitat was observed, and, due to the observation of hybridization at several sites, genetic research and hybridization studies.

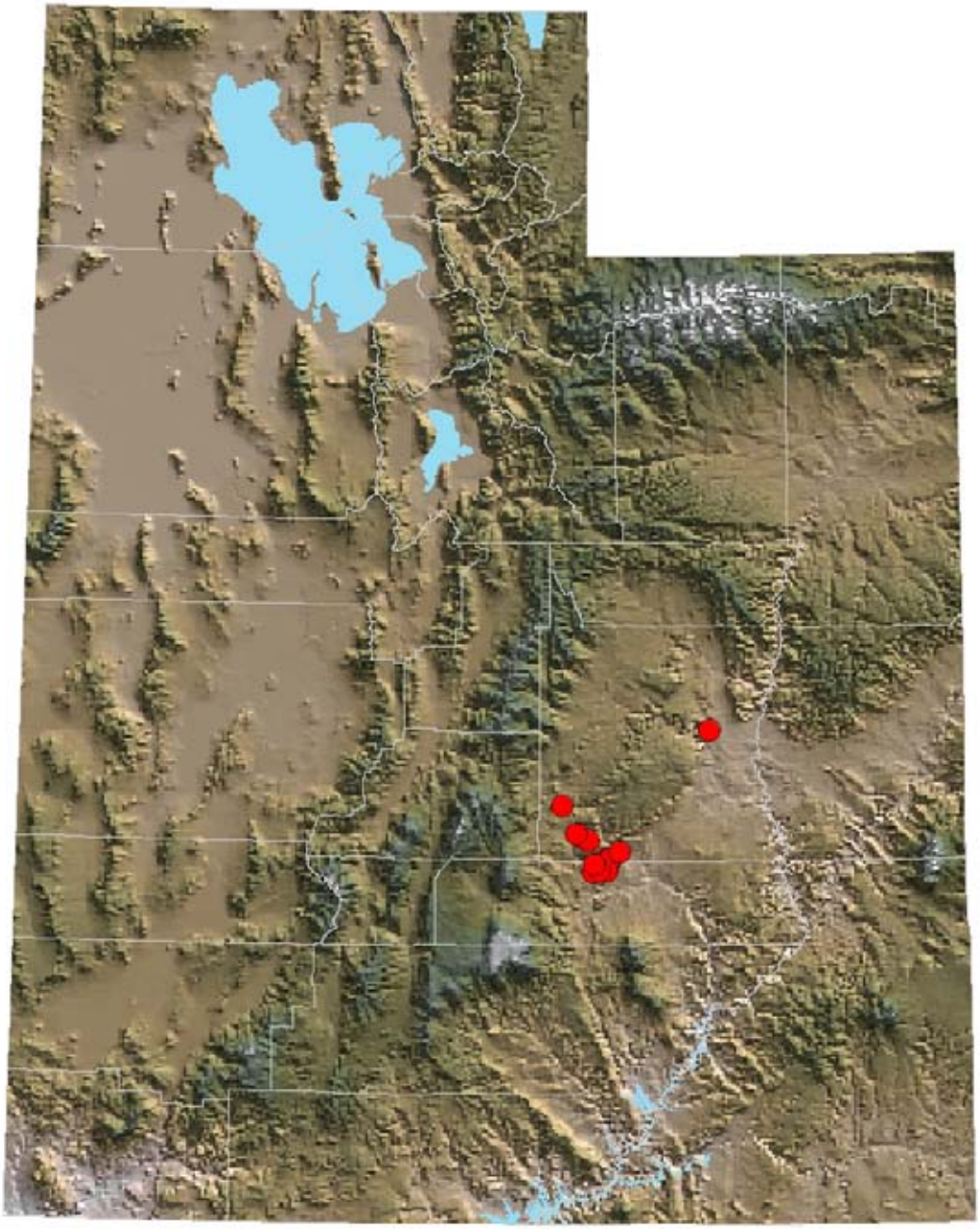

Figure 91. The distribution of psoralea globemallow (*Sphaeralcea psoraloides*).

Ute Ladies' Tresses
Spiranthes diluvialis

TAXONOMY AND NOMENCLATURE

FAMILY: Orchid (Orchidaceae)

OTHER NAMES: Some authors (e.g., Welsh et al. 1993) refer to this taxon as a variety of the species *romanzoffiana*, and give it the common name "flood ladies'-tresses".

CONSERVATION STATUS DESIGNATIONS

On 17 January 1992, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 57 Federal Register No. 12). In 1995, the FWS announced the availability of a draft recovery plan (Vol. 60 Federal Register No. 187); it has not yet been implemented. As a federal threatened species, it is of concern to USDI Bureau of Land Management, Vernal Field Office and Grand Staircase National Monument, USDA Forest Service, Uinta National Forest, and USDI National Park Service, Capitol Reef National Park and Dinosaur National Monument. A petition to delist Ute ladies' tresses was received by the FWS in May of 1996.

DISTRIBUTION AND ABUNDANCE IN UTAH

Historically this taxon was known in Utah from the Salt Lake Valley and Ogden. Currently known locations are concentrated in, but not limited to, the northern half of the state, i.e., in the Uinta Basin and along the Green River, Daggett, Duchesne and Uintah counties; through Utah Valley and along Diamond Fork and Spanish Fork, Utah County; at Willow Spring, Juab County; on the Freemont River, Wayne County; and along Deer Creek, Garfield County. Habitat is moist to wet meadows, stabilized streamsides to active floodplains, and manmade sites such as abandoned borrow and peat mining pits (UTHP 2005).

The size of Utah populations is incompletely known, with only a few sites such as Diamond Fork (Black 2004) and Deer Creek (Hughes 2004) being monitored on a regular basis. Fertig et al. (2005) summarized existing and potential threats that apply to this taxon in Utah and throughout its range. Among others, discussed are loss of habitat resulting from urban development, the flooding and de-watering of habitat resulting from dam control and stream channel rerouting, and competition from introduced weed species.

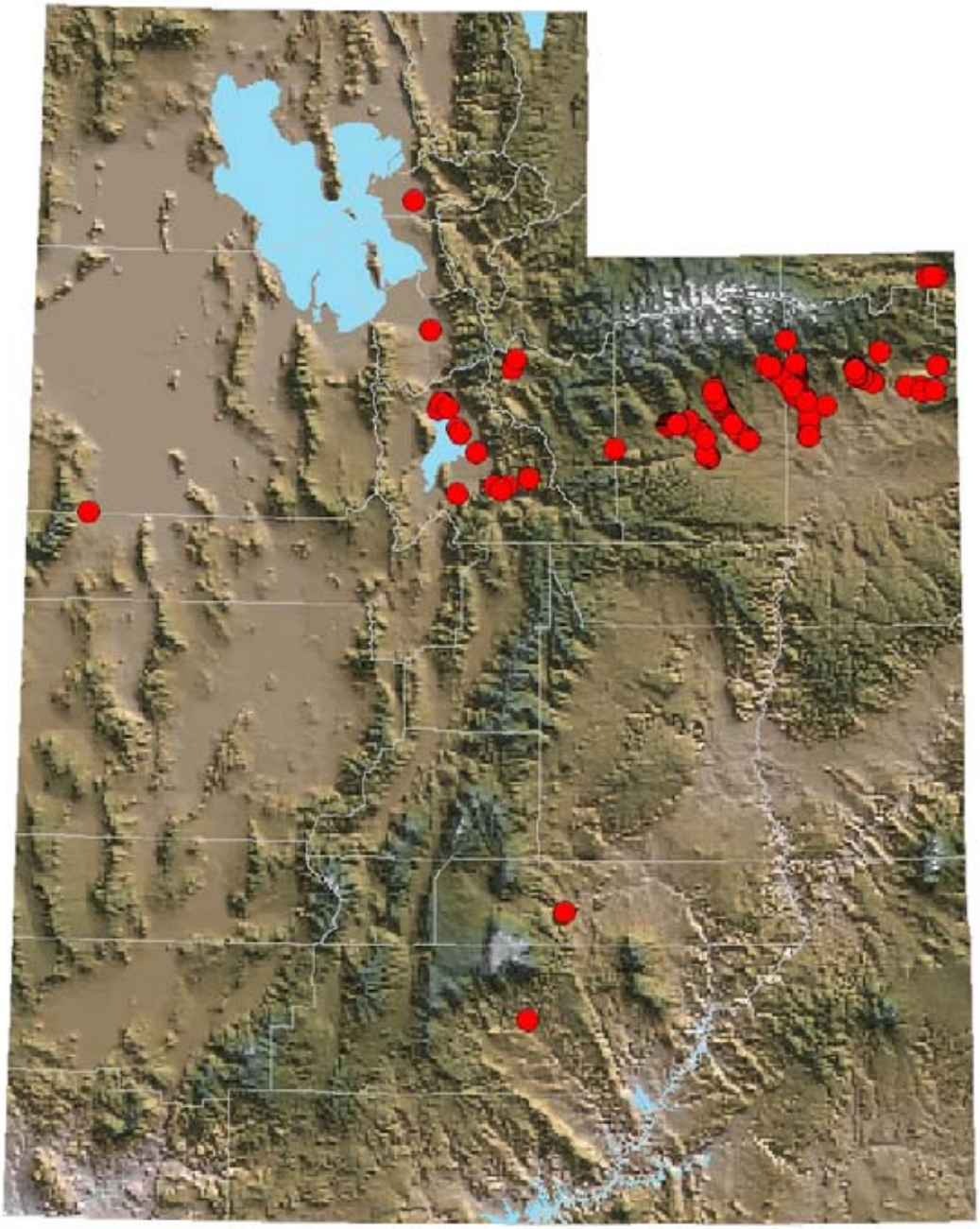

Figure 92. The distribution of Ute ladies' tresses (*Spiranthes diluvialis*).

Sunnyside Green-gentian
Swertia gypsicola

TAXONOMY AND NOMENCLATURE

FAMILY: Gentian (Gentianaceae)

OTHER NAMES: Some authors (e.g., Cronquist, et al. 1984) place the taxon *gypsicola* in the genus *Frasera*. The common name "White River Swertia" has also been used (e.g., Welsh et al. 2003).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

Known first from locations in Nevada, this species was collected in Utah in 1983 by Dr. Arthur Cronquist at a location, "some 17 km north of Garrison." Twenty-one years later, it was collected again in Utah (collection, S.L. Welsh and N.D. Atwood 28902), "some 17 km north of Garrison." It has since been revisited and its boundaries, at least in part, defined. It grows in a desert shrub habitat with *Atriplex confertifolia*, *Chrysothamnus* sp., *Sporobolus airoides*, scattered *Sarcobatus vermiculatus* and *Thelypodium integrifolium*, and *Halogeton glomeratus*, in a playa bottom of dry, cracked fine textured soil with a scattered gravel overlay.

A principal well maintained road and, to its south, an irrigation-water diversion ditch transect the habitat, and there is cultivated land nearby. Water that sometimes flows across the habitat comes from the direction of irrigated land to the south; species present because of the water, e.g. *Juncus*, are not found outside its influence to the north. Where water is present and perhaps at times standing, plants are very robust. There is additional potential habitat that needs to be surveyed.

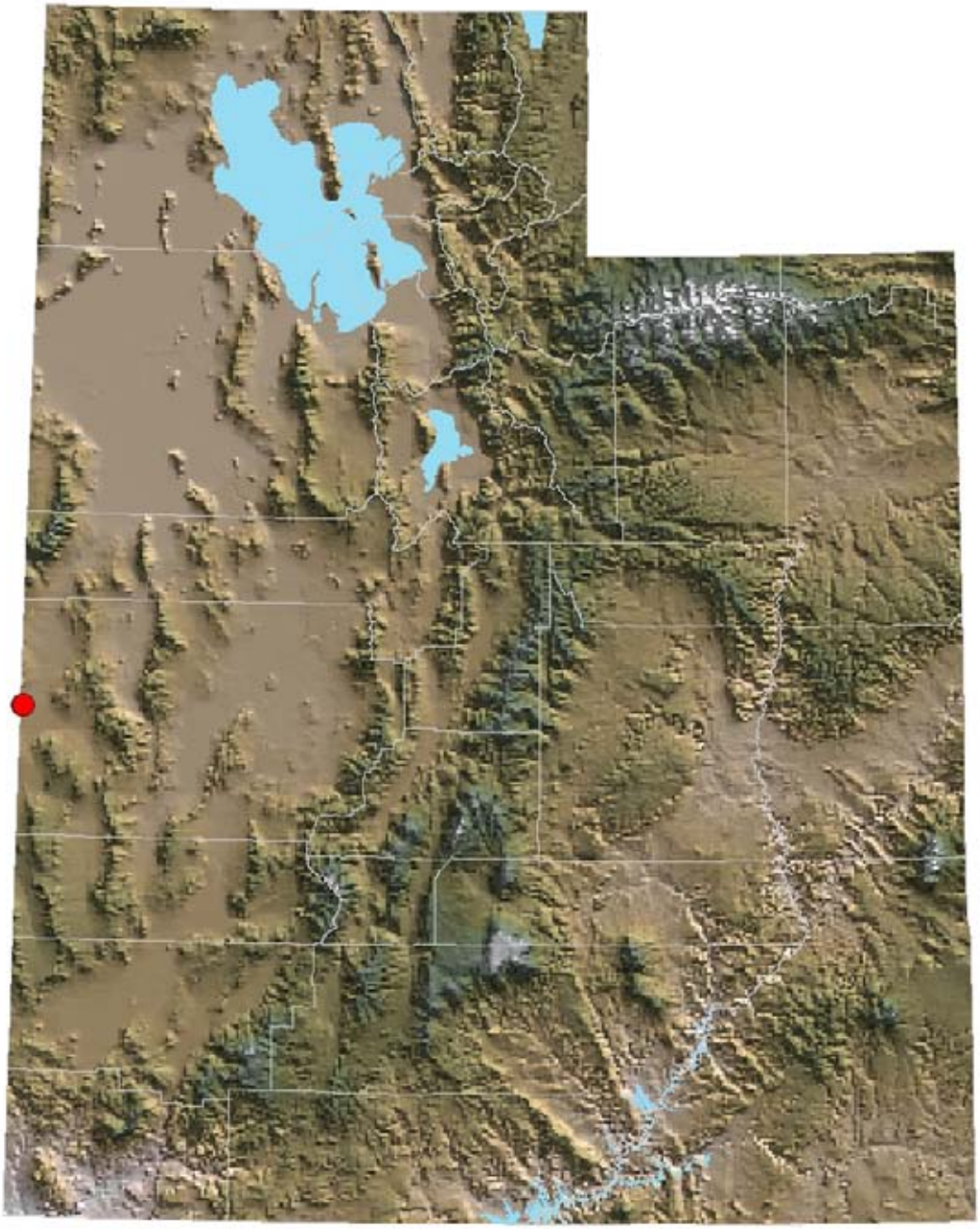

Figure 93. The distribution of Sunnyside green-gentian (*Swertia gypsicola*).

Thompson's Talinum
Talinum thompsonii

TAXONOMY AND NOMENCLATURE

FAMILY: Purslane (Portulacaceae)

OTHER NAMES: This species was named in honor of Robert "Bob" M. Thompson, "a long-time collector and botanical enthusiast" who has now worked for the Manti-La Sal National Forest for 52 years. Before its recognition as new to science, this taxon was briefly referred to as *Talinum validulum*, a taxon otherwise known from northern Arizona (Atwood and Welsh 1985; Smith 1991). Smith (1994b) reports that after having seen specimens of *T. thompsonii* an expert in the genus *Talinum* determined that the Utah specimens were *T. validulum*. Welsh et al. (2003) continue to recognize *T. thompsonii*. The common name "Cedar Mtn. flame-flower" has been used (Stone 1998).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003), and was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is an east-central Utah endemic known only to occur on the top of Cedar Mountain, Emery County. It is found most commonly in open area in piñon–juniper woodlands where the soils are shallow and very gravelly and the vegetation is sparse and composed primarily of forbs and grasses (Smith 1994b).

There are fourteen known populations with a northwest to southeast distribution of approximately 13 miles and a width that is less than half that. Total population estimates are 6400 plants, however, because of yet unsurveyed habitat, this number is probably low. Potential man-caused threats are "recreational disturbance, road construction, and newly built radio towers (Smith 1994b)." Smith (1994b) recommends additional survey and notes having been informed of potential habitat on Manti-La Sal National Forest. Atwood (2002) reiterates Smith's (1994b) concerns and recommendations.

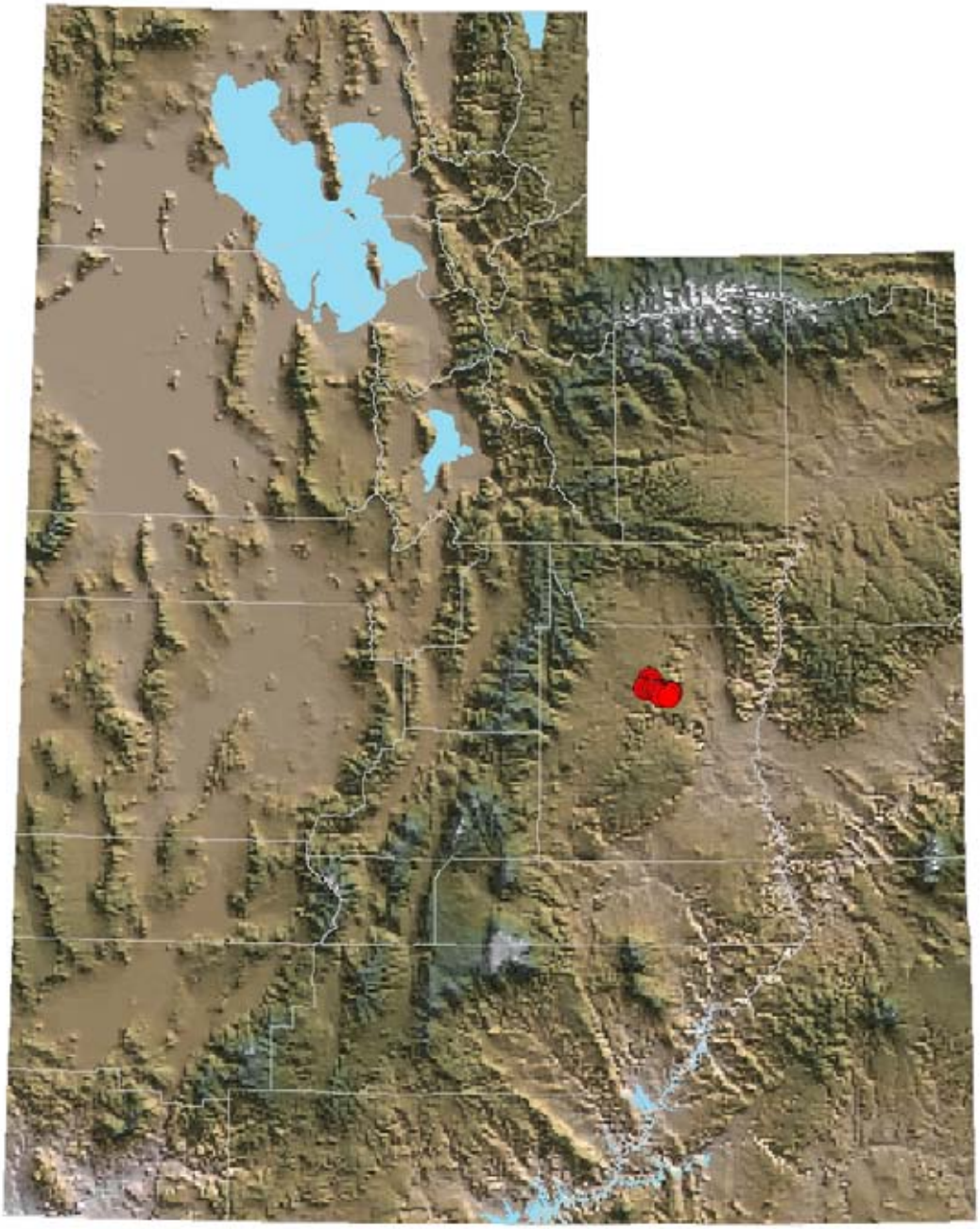

Figure 94. The distribution of Thompson's talinum (*Talinum thompsonii*).

Alpine Greenthread
Thelesperma subnudum var. *alpinum*

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Hansen, et al. (2002) raised this taxon to species level and gave it a new name, i.e., *Thelesperma windhamii*. Some authors (e.g., Cronquist et al. 1994) consider it a synonym of *Thelesperma pubescens*.

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This taxon is endemic to south-central Utah, Wayne County. It is known from the northeast and southwest slopes of Thousand Lake Mountain and south into Rabbit Valley, to Teasdale and Fish Creek Cove. It is found in piñon-juniper-mountain mahogany, scattered bristlecone pine, and ponderosa pine communities. It grows in sandy-soil pockets, cracks of slickrock and on ledges and clay flats of the Carmel Formation and Navajo Sandstone (UTHP 2005).

The isolated locations at which this plant occurs apparently insulate it from serious impacts. Cattle grazing, recreational horse and hiker use have been documented as occurring in its vicinity (UTHP 2005).

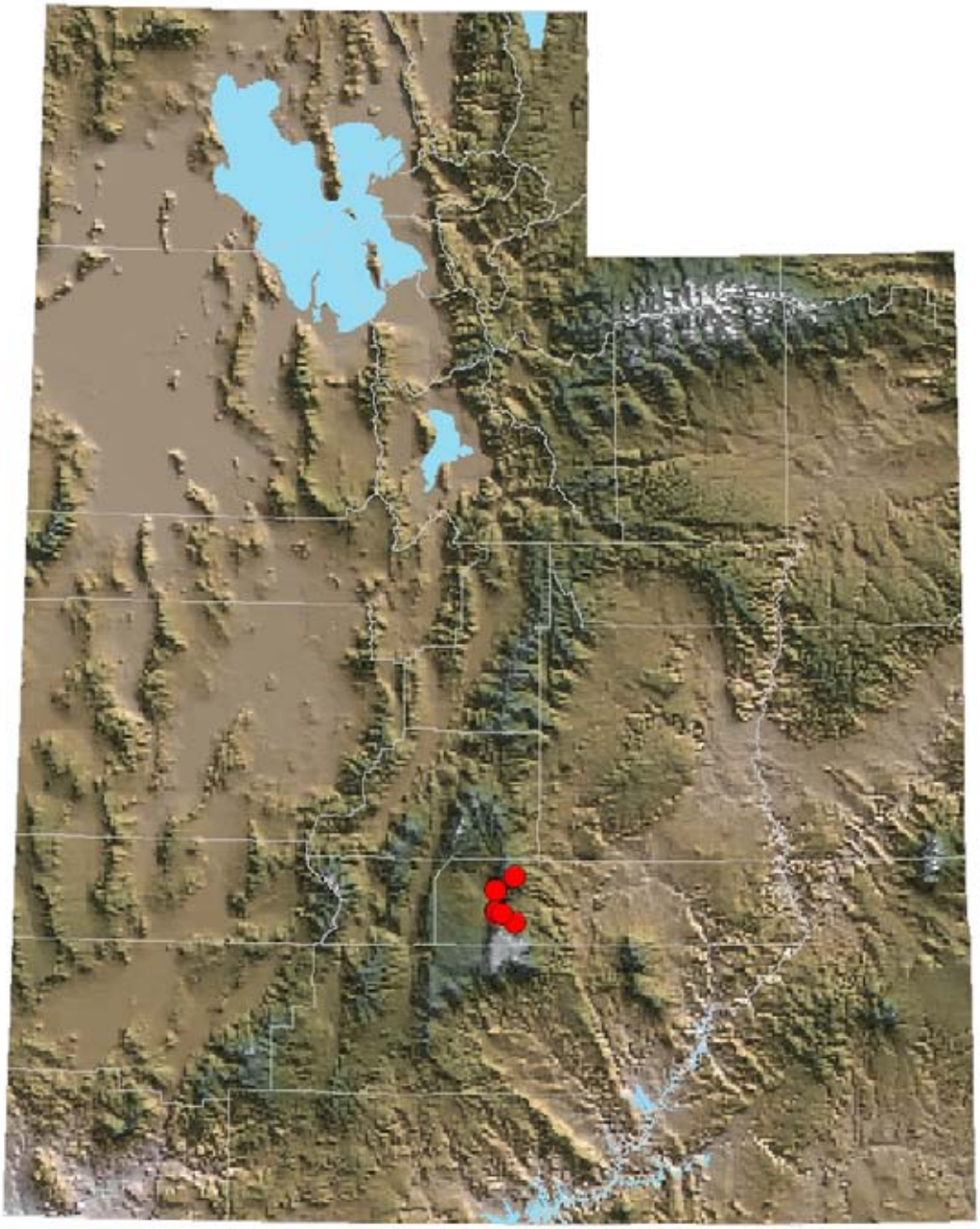

Figure 95. The distribution of alpine greenthread (*Thelesperma subnudum* var. *alpinum*).

Last Chance Townsendia
Townsendia aprica

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Cronquist et al. (1994) places *Townsendia jonesii* var. *lutea* in synonymy under this taxon. This discussion does not include it.

CONSERVATION STATUS DESIGNATIONS

On 21 August 1985, this species was designated as threatened under the Endangered Species Act of 1973, as amended (Vol. 50 Federal Register No. 102). A document identifying recovery goals (USFWS 1993b) has been produced as a guide to management and conservation efforts. As a federal threatened species, it is of concern to USDI Bureau of Land Management, Price and Richfield Field Offices, USDA Forest Service, Fishlake National Forest, and USDI National Park Service, Capitol Reef National Park.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a central Utah endemic in Sevier, Emery and Wayne counties. It occurs from the base of the Wasatch escarpment near Emery south to the vicinity of Fremont Junction and continuing south onto the east slopes of Thousand Lake and Miners mountains. East of this band, it is known at a few sites on the west slopes of the San Rafael Swell. It inhabits salt desert shrub and piñon-juniper communities, in clay, clay-silt, or gravelly clay soils derived from the Mancos, Curtis, Entrada, Morrison, Moenkopi, Dakota, Carmel and Summerville formations; these soils are often densely covered with biological soil crusts (Armstrong and Thorne 1991, Clark 2005c).

Survey for this taxon has been ongoing for several years. At sites visited during the 2005 survey, impacts from camping, random off-highway traffic, domestic livestock use and mining claims activity, were observed. A monitoring study was begun this year, i.e., the technique to be used was decided on, a pilot plot was established and data gathered. Involved agencies yet need to decide what information about the species will be of most value to them before a more encompassing plan is designed and implemented. A graduate school project to obtain a genetic profile of the taxon and then to determine the closeness of its relationship to other *Townsendia* species was recently completed (Clark 2005c).

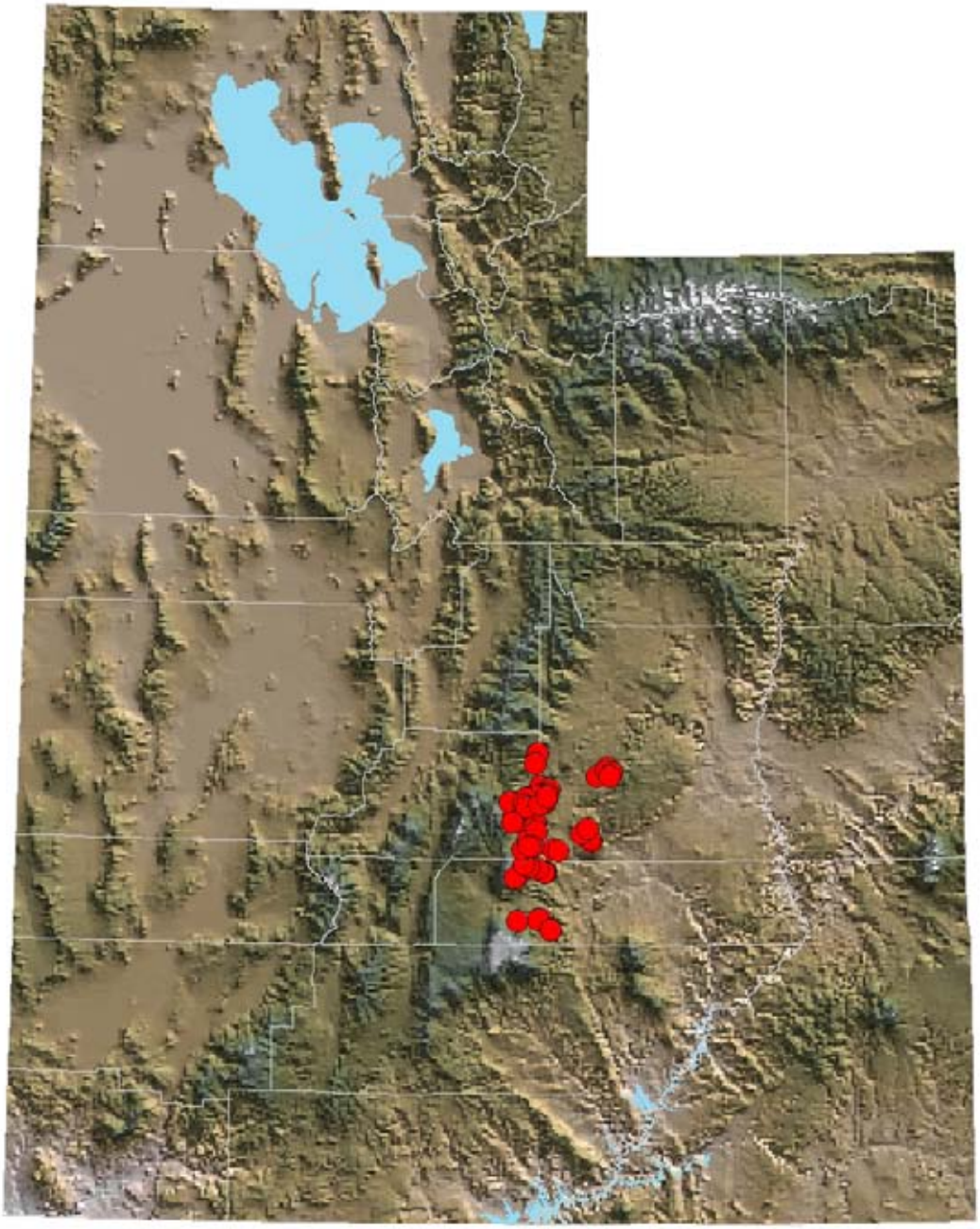

Figure 96. The distribution of Last Chance townsendia (*Townsendia aprica*).

Frisco Clover
Trifolium friscanum

TAXONOMY AND NOMENCLATURE

FAMILY: Legume (Leguminosae, Fabaceae)

OTHER NAMES: The name *Trifolium andersonii* var. *friscanum* is available (e.g., Barneby 1989).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003). It was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southeast Utah endemic, Millard and Beaver counties. It is known in the Tunnel Spring and San Francisco mountains and on Blue Mountain. It grows on volcanic gravels and calcareous substrates in piñon-juniper woodlands (Welsh et al. 2003, Evenden 1999).

Recent survey has resulted in the discovery of two new populations for this taxon, i.e., on the northwest side of the Tunnel Spring Mountains and on Blue Mountain. Though two of the recently visited sites have current population estimates, Atwood (2002d) indicates that the status of remaining sites is not well documented. Atwood (2002d) states that, "this is one of the most threatened of the rare plants in the West Desert." The plant's populations in the San Francisco Mountains are on "un-mined patented mining claims"; the Wah Wah Mountains population is adjacent to an active quarry; and the newly discovered Tunnel Spring Mountains population has been fragmented by a newly built grazing allotment fence (Atwood 2002d). Atwood (2002d) suggests seeking a conservation easement for the San Francisco Mountains populations, and recommends the instigation of a study to obtain an understanding of the plant's biology, ongoing visits in order to more regularly evaluate status, and additional survey of potential habitat.

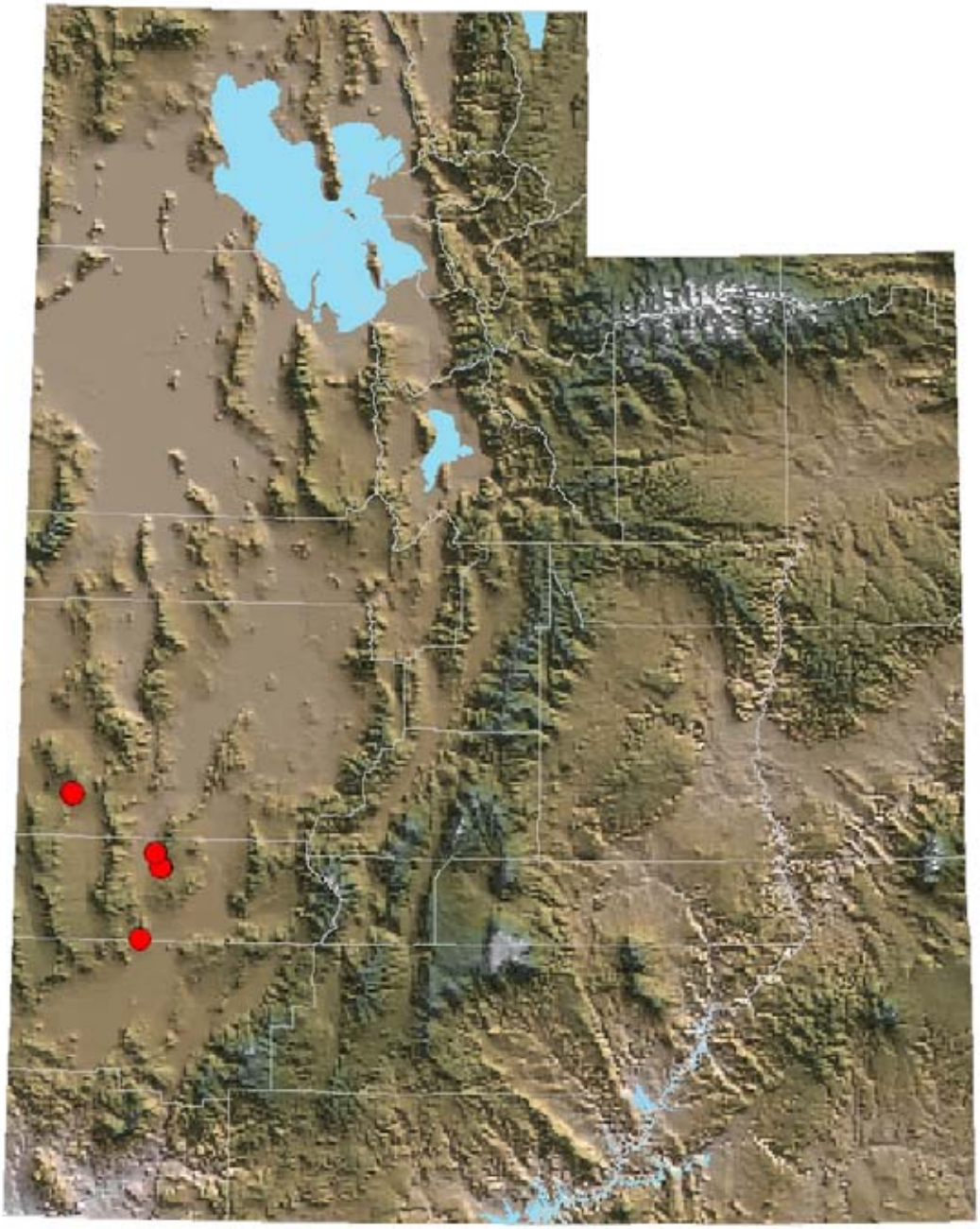

Figure 97. The distribution of Frisco clover (*Trifolium friscanum*).

Tropic Goldeneye
Viguiera soliceps

TAXONOMY AND NOMENCLATURE

FAMILY: Sunflower (Compositae, Asteraceae)

OTHER NAMES: Some authors (e.g., Cronquist et al. 1994) recognize the placement of this species in the genus *Heliomeris*. The common name "Barneby's goldeneye" has also been used (Stone 1998).

CONSERVATION STATUS DESIGNATIONS

It is included on the BLM's Sensitive Plant Species List (Fortner 2003).

DISTRIBUTION AND ABUNDANCE IN UTAH

This plant is a southern Utah endemic known from The Cockscomb east to Sit Down Bench, Kane County. It grows in mat saltbush communities on the "gumbo-clay" soils of only the Tropic Shale Formation (Welsh et al. 2003, Cronquist et. al. 1994).

There is limited information available documenting the status of populations, i.e., estimated numbers of plants, habitat condition or potential impacts. However, its habitat is almost entirely within the Grand-Staircase National Monument and Glen Canyon National Recreation Area.

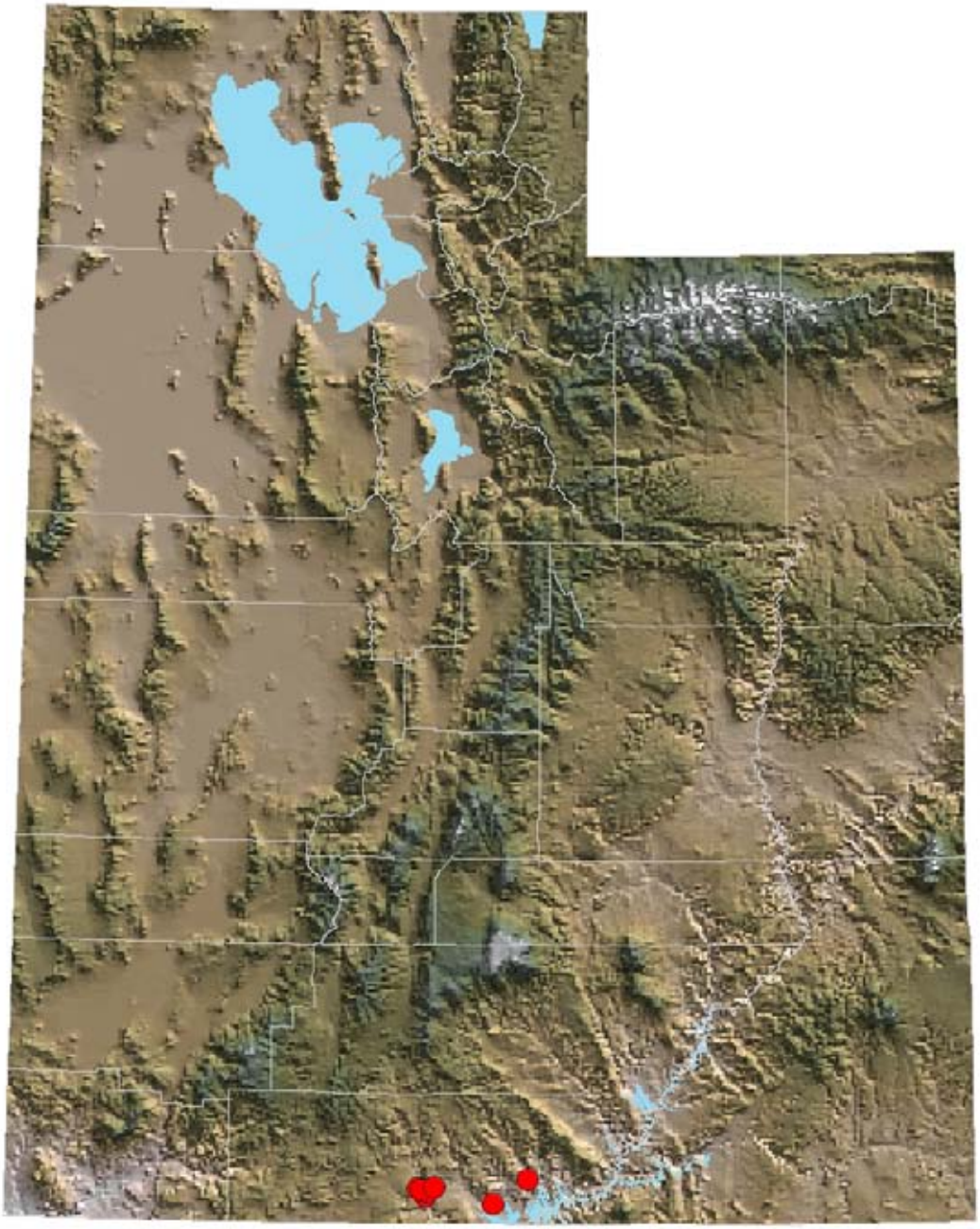

Figure 98. The distribution of Tropic goldeneye (*Viguiera soliceps*).

Clausen's Violet
Viola clauseniana

TAXONOMY AND NOMENCLATURE

FAMILY: Violet (Violaceae)

OTHER NAMES: Until recently (e.g., Welsh et al. 2003) this taxon has been synonymized under *Viola nephrophylla* (e.g., Russell and Crosswhite 1963, Welsh et al 1989). It is apparently distinct from all other violets in North America (Stone 1998).

CONSERVATION STATUS DESIGNATIONS

No conservation status is currently assigned by management agencies.

DISTRIBUTION AND ABUNDANCE IN UTAH

This species is a southwest Utah endemic known only from Zion and Kolob canyons in Zion National Park, Washington County. It is apparently locally common in hanging garden communities where it is associated with *Adiantum capillus-veneris*, *Mimulus cardinalis* and *Aquilegia* (Welsh et al. 2003, Stone 1998).

There is no recent information documenting the status of populations, i.e., population size estimates, habitat condition or potential impacts. Welsh et al. (2003) however do comment that it "is locally common in alcoves and grottos along the bottom of Zion and Kolob canyons."

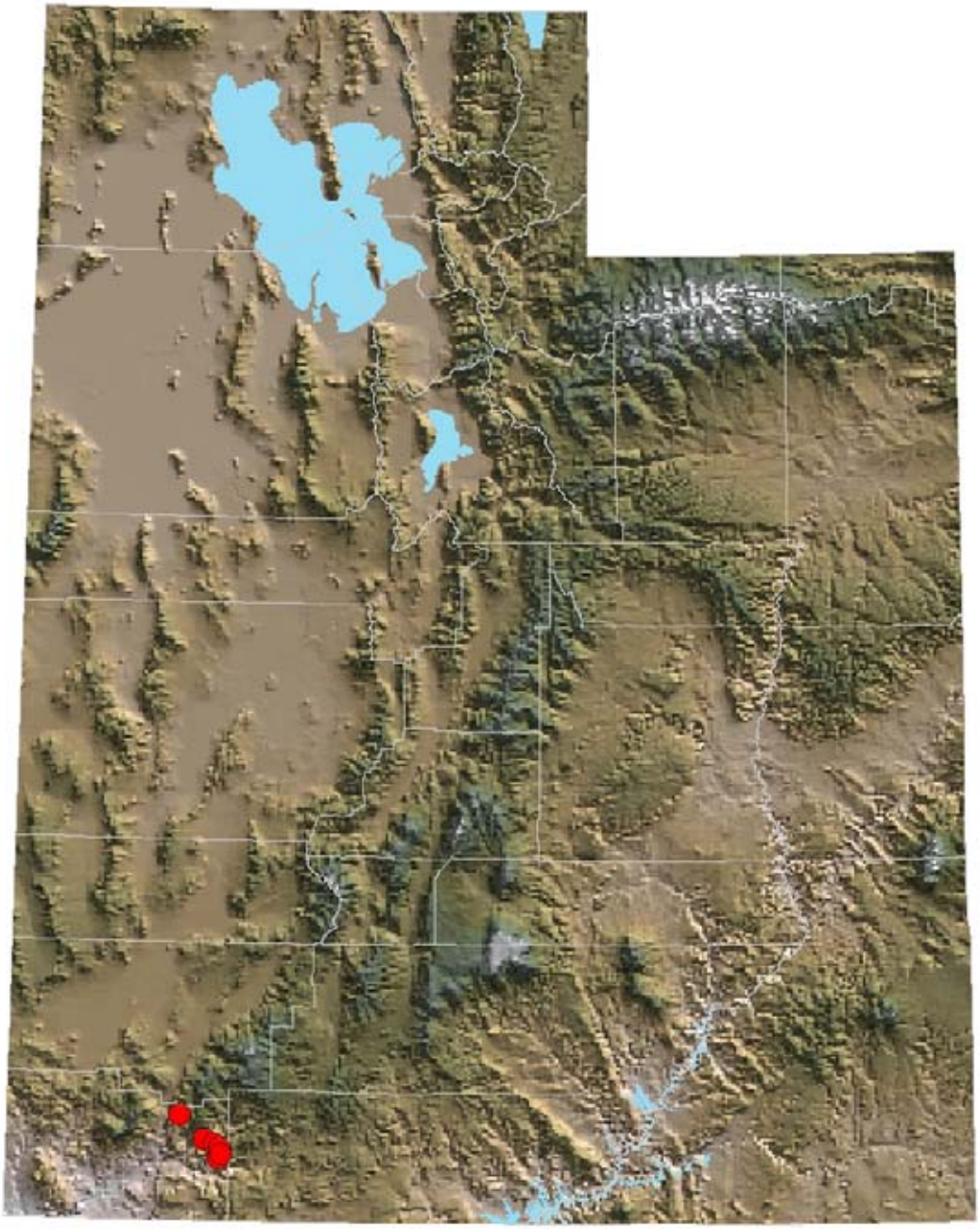

Figure 99. The distribution of Clausen's violet (*Viola clauseniana*).

Frank Smith's Violet
Viola frank-smithii

TAXONOMY AND NOMENCLATURE

FAMILY: Violet (Violaceae)

CONSERVATION STATUS DESIGNATIONS

It is included on the Forest Service Region 4 Sensitive Plant List (Joslin 1994, Technical edits 2004), and it was formerly a category 2 candidate for listing under the Endangered Species Act of 1973, as amended (Vol. 58 Federal Register No. 188).

DISTRIBUTION AND ABUNDANCE IN UTAH

Frank Smith's violet is endemic to north central Utah, Cache County. Its distribution is limited to scattered locations in Logan Canyon and its tributaries. It is a rock-dwelling plant found on cool, northerly exposed near-vertical rock faces of calcareous origin. Usually present are open to dense stands of Douglas fir and maple providing additional shade (Stone 1994b).

There are 11 known occurrences with a population estimate of approximately 10,000 plants (Stone 1994b). Stone (1994b) examined twenty-one established climbing routes and, though the habitat was determined to be too dry at most locations, potential or actual impacts were identified in several areas. Although a pre-1992 draft management plan for climbing and rappelling was written by the Wasatch-Cache National Forest, it has never been implemented. In addition, in 2004, a new climbing book was published that includes many new Logan Canyon climbing routes. Climbing remains a threat to this plant. In 2003, the Forest established the Logan Canyon Botanical Area for the canyon's seven rare endemic plants; all but one of the known populations are included (Padgett, pers. comm. 2005b).

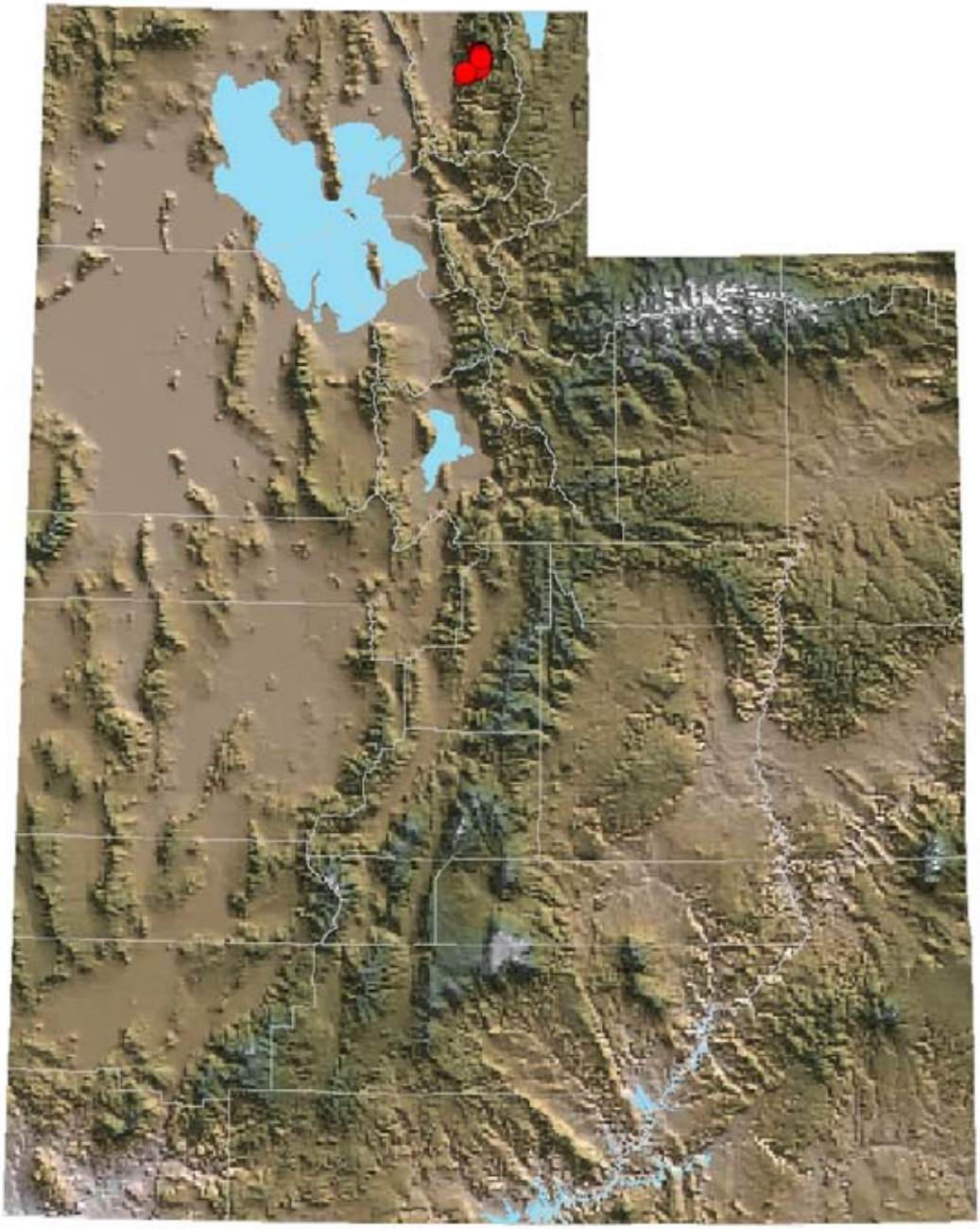

Figure 100. The distribution of Frank Smith's violet (*Viola frank-smithii*).

Distribution Maps for Additional Species of Conservation Concern

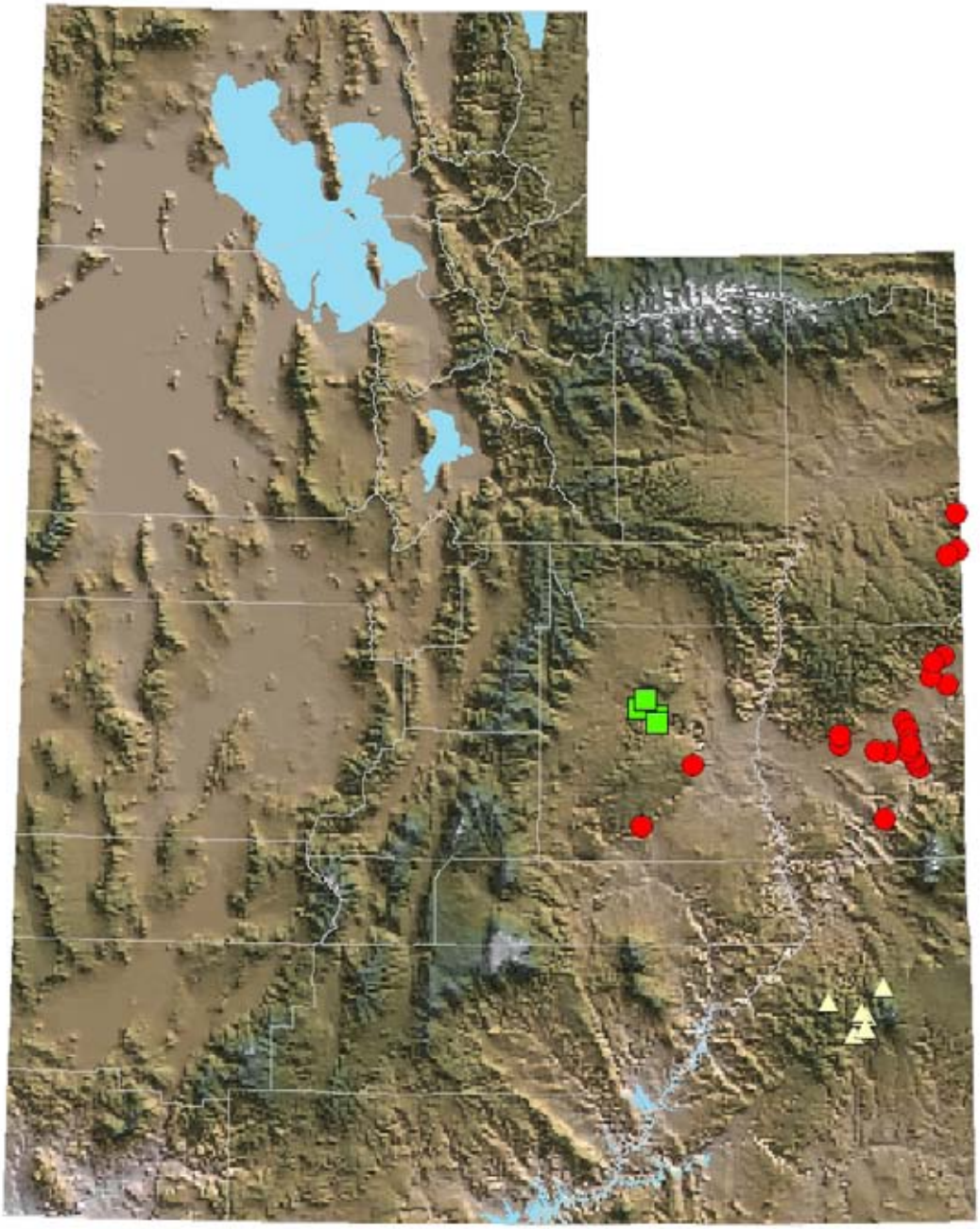

Figure 101. The distribution of clay-verbena (*Abronia argillosa*) ●, Harris' sand-verbena (*Abronia nana* var. *harrisii*) ■, and Chatterley's onion (*Allium geyeri* var. *chatterleyi*) △ .

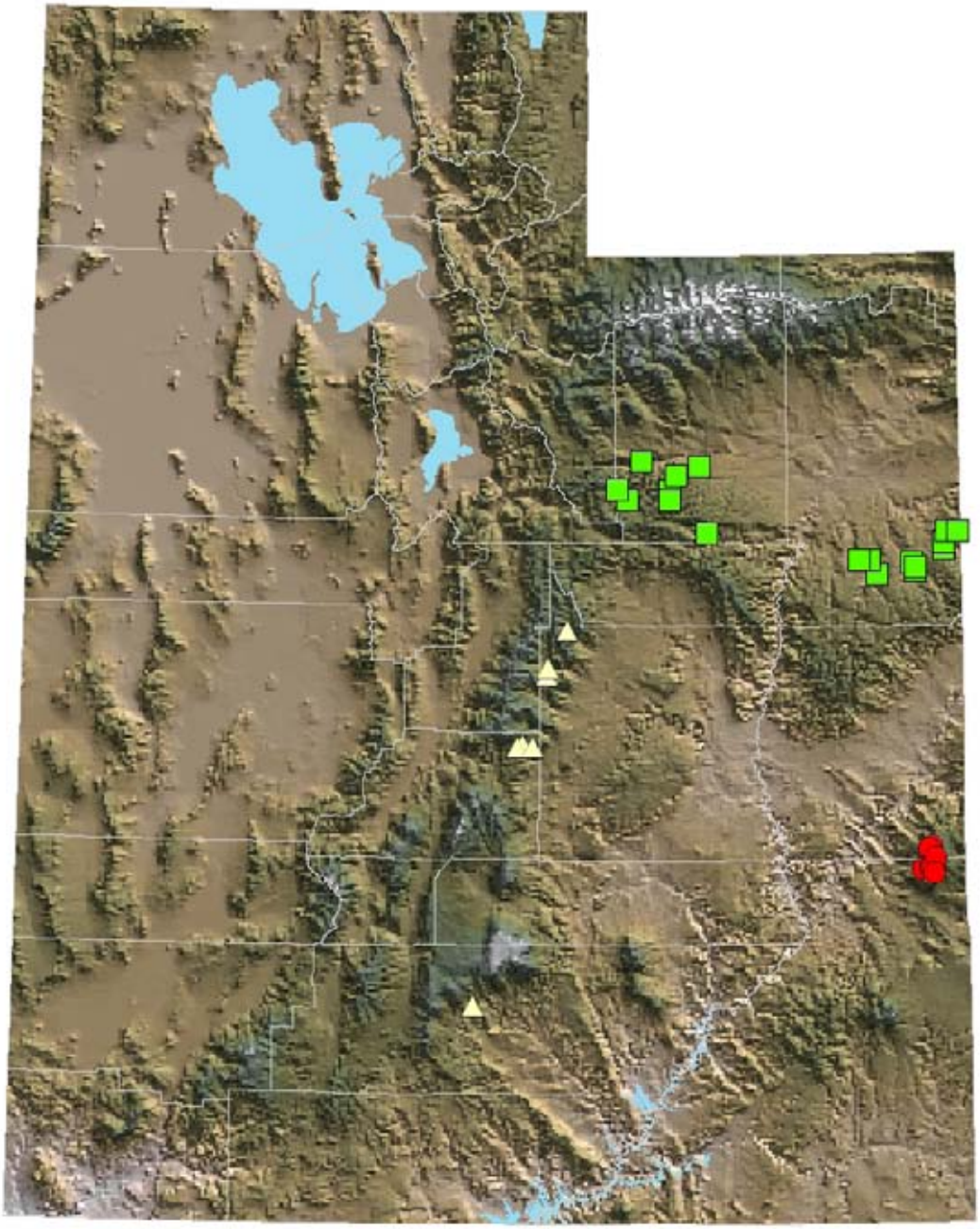

Figure 102. The distribution of sweet-flower rock-jasmine (*Androsace chamaejasme* var. *carinata*) ●, Barneby's columbine (*Aquilegia barnebyi*) ■, and Link Trail columbine (*Aquilegia flavescens* var. *rubicunda*) △ .

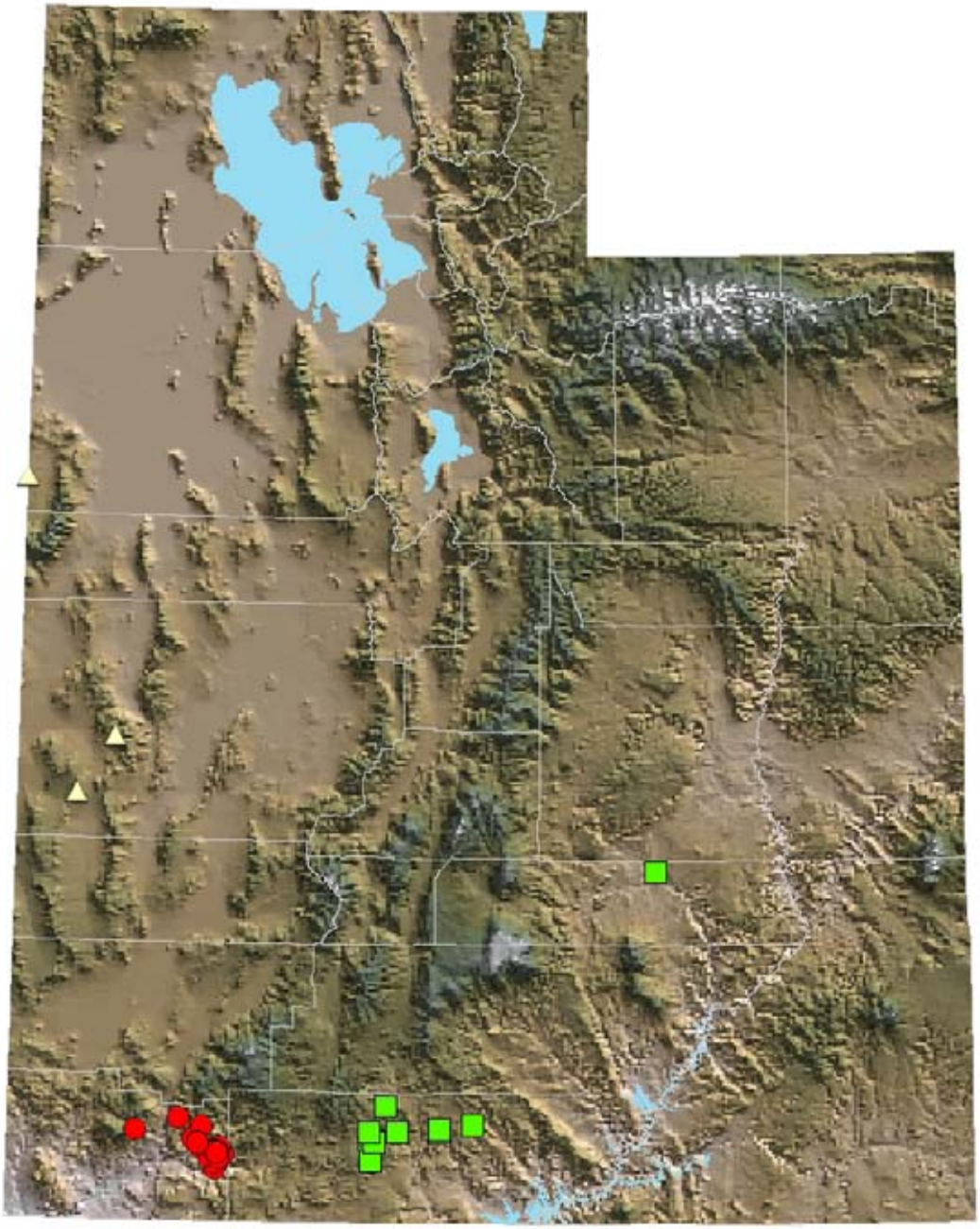

Figure 103. The distribution of Foster's columbine (*Aquilegia formosa* var. *fosteri*) ●, Lori's columbine (*Aquilegia loriae*) ■, and Beckwith's rockcress (*Arabis beckwithii*) △.

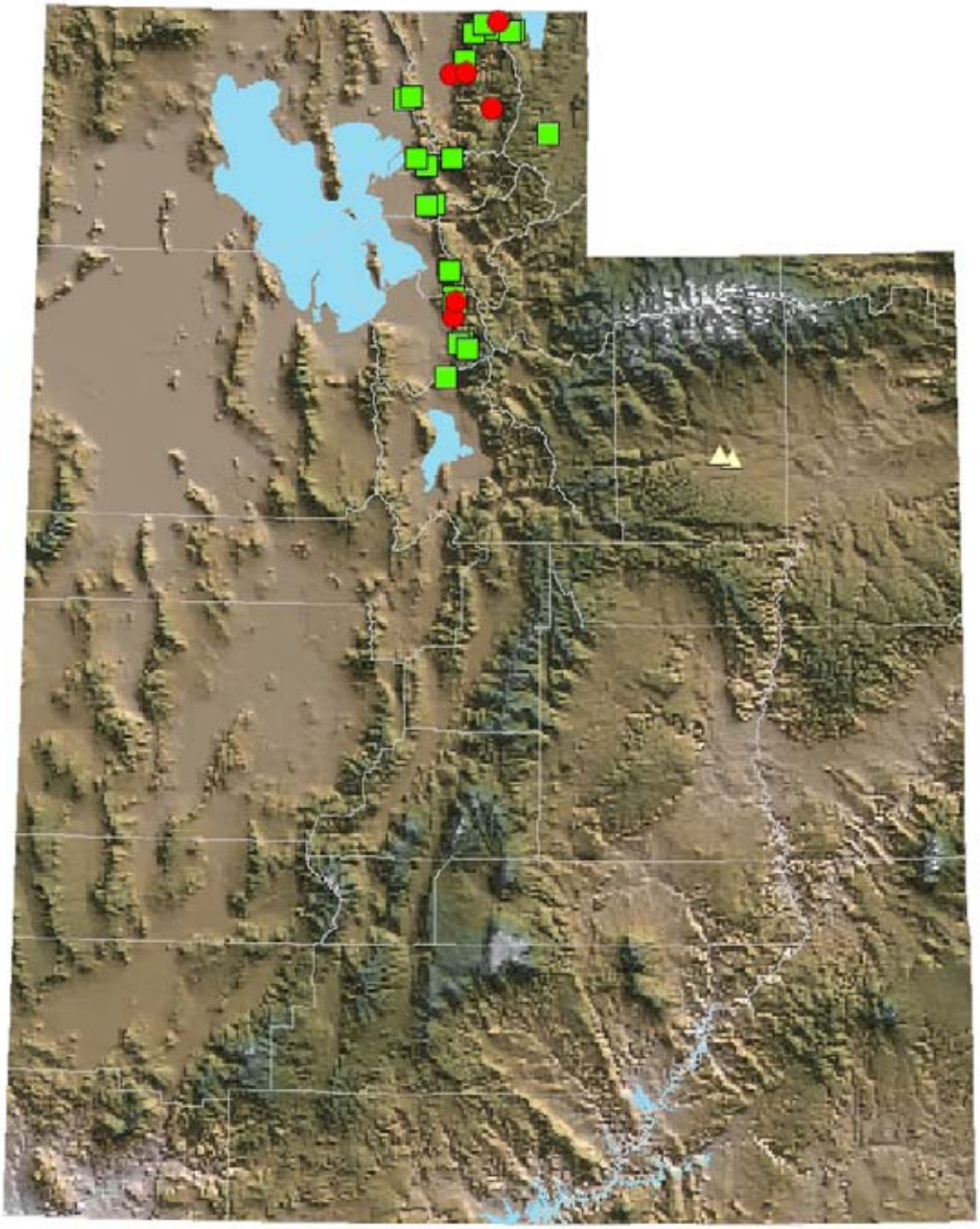

Figure 104. The distribution of Hopkins' tower-mustard (*Arabis glabra* var. *furcatipilis*) ●, Wasatch rockcress (*Arabis lasiocarpa*) ■, and Duchesne rockcress (*Arabis pulchra* var. *duchesnensis*) △ .

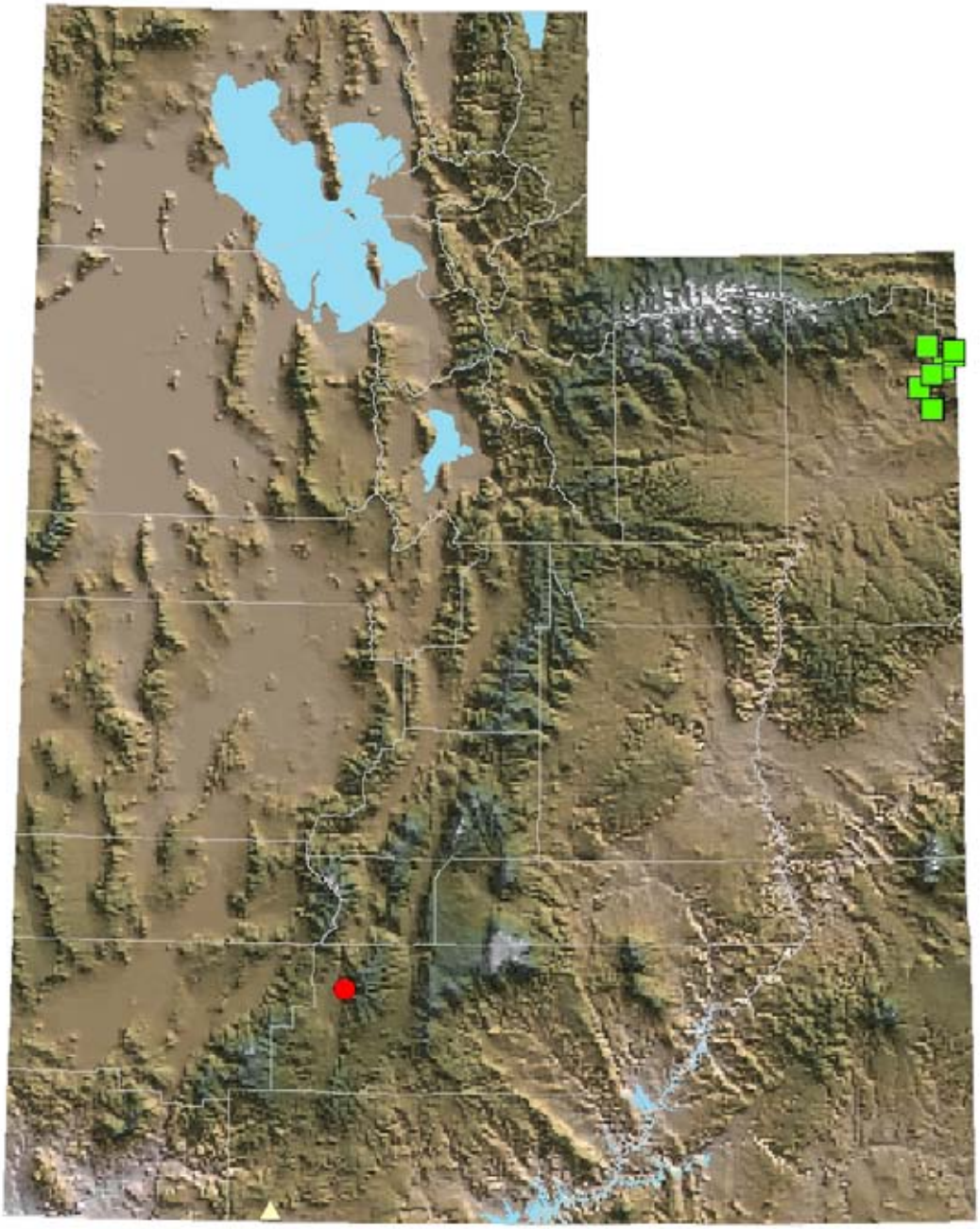

Figure 105. The distribution of schist rockcrest (*Arabis schistacea*) ●, park rock cress (*Arabis vivariensis*) ■, and American spikenard (*Aralia racemosa*) △.

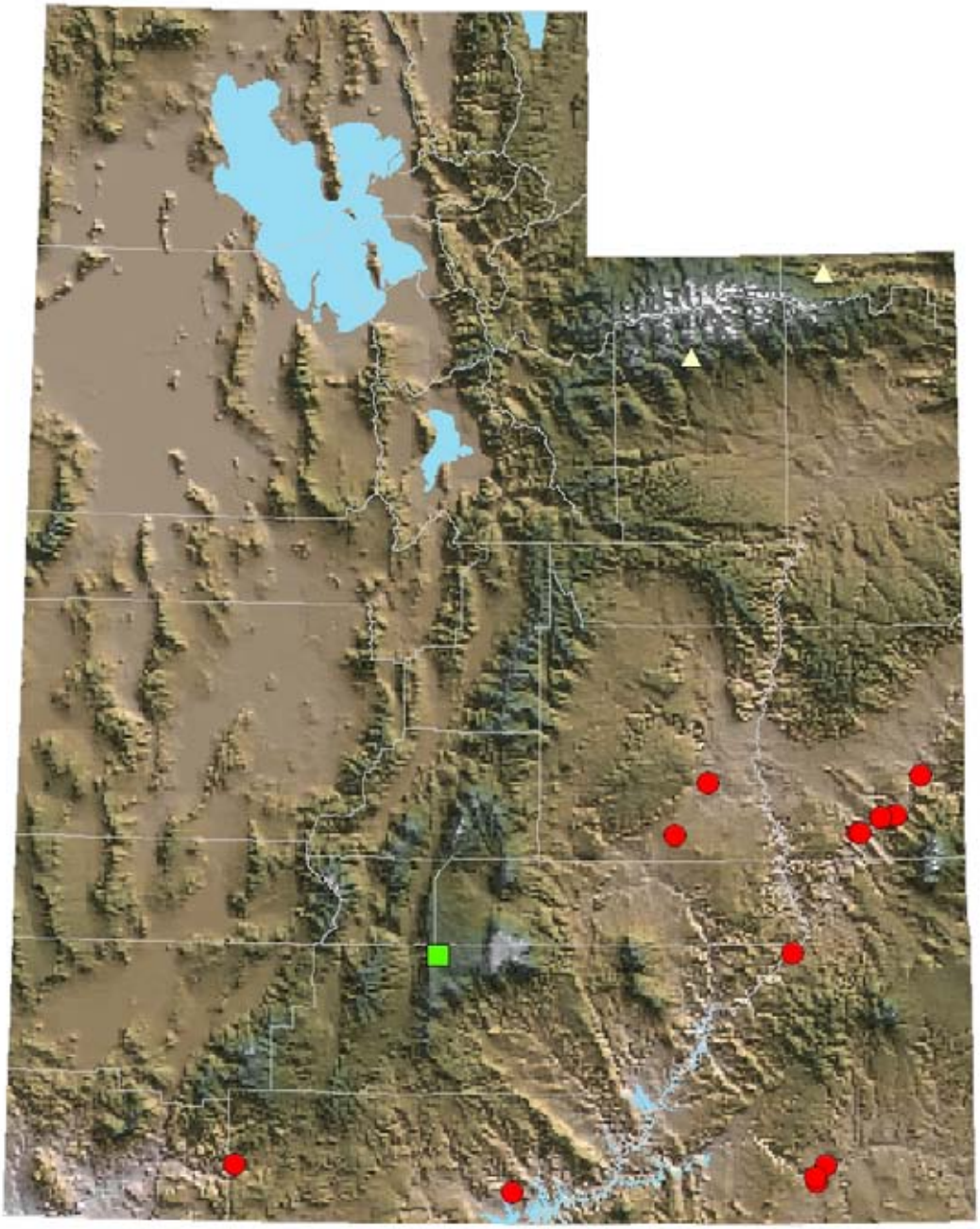

Figure 106. The distribution of San Rafael prickly-poppy (*Argemone corymbosa* subsp. *arenicola*) ●, mystery wormwood (*Artemisia biennis* var. *diffusa*) ■ , and petiolate wormwood (*Artemisia campestris* var. *petiolata*) △ .

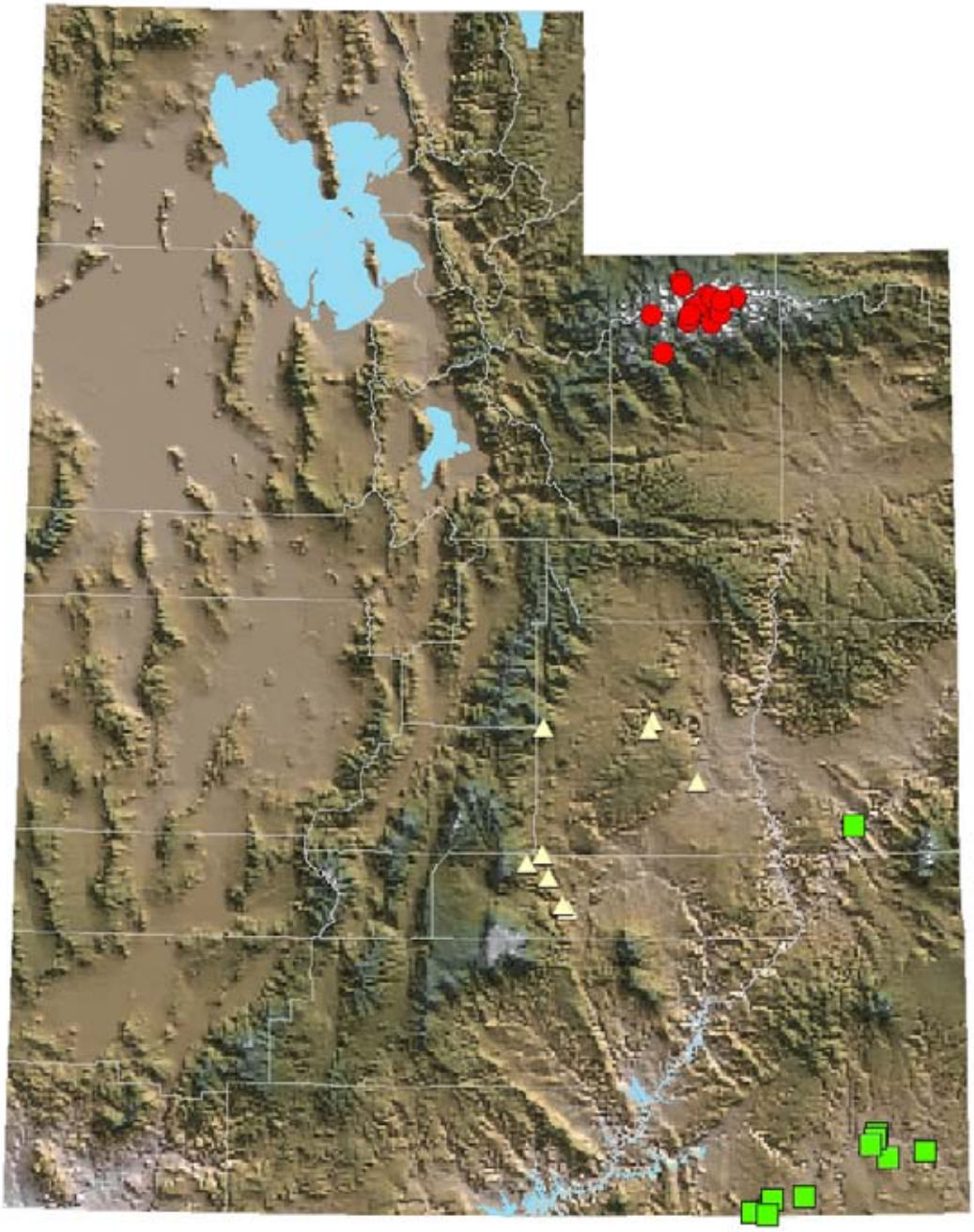

Figure 107. The distribution of spruce wormwood (*Artemisia norvegica* var. *piceetorum*) ●, Cutler's milkweed (*Asclepias cutleri*) ■, and Ruth's milkweed (*Asclepias ruthiae*) △ .

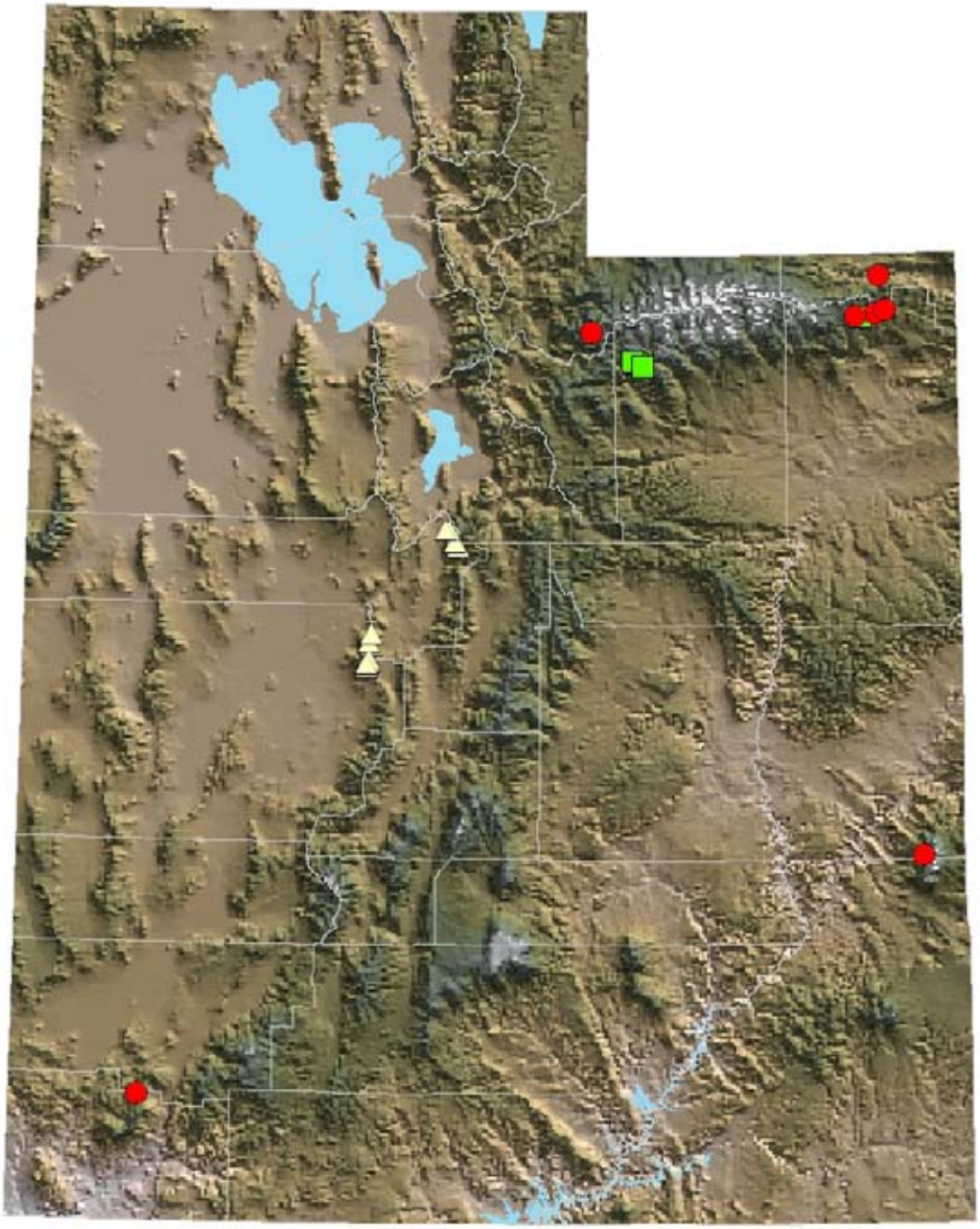

Figure 108. The distribution of grass-fern (*Asplenium septentrionale*) ●, green spleenwort (*Asplenium viride*) ■, and Barneby's rockaster (*Aster kingii* var. *barnebyana*) △ .

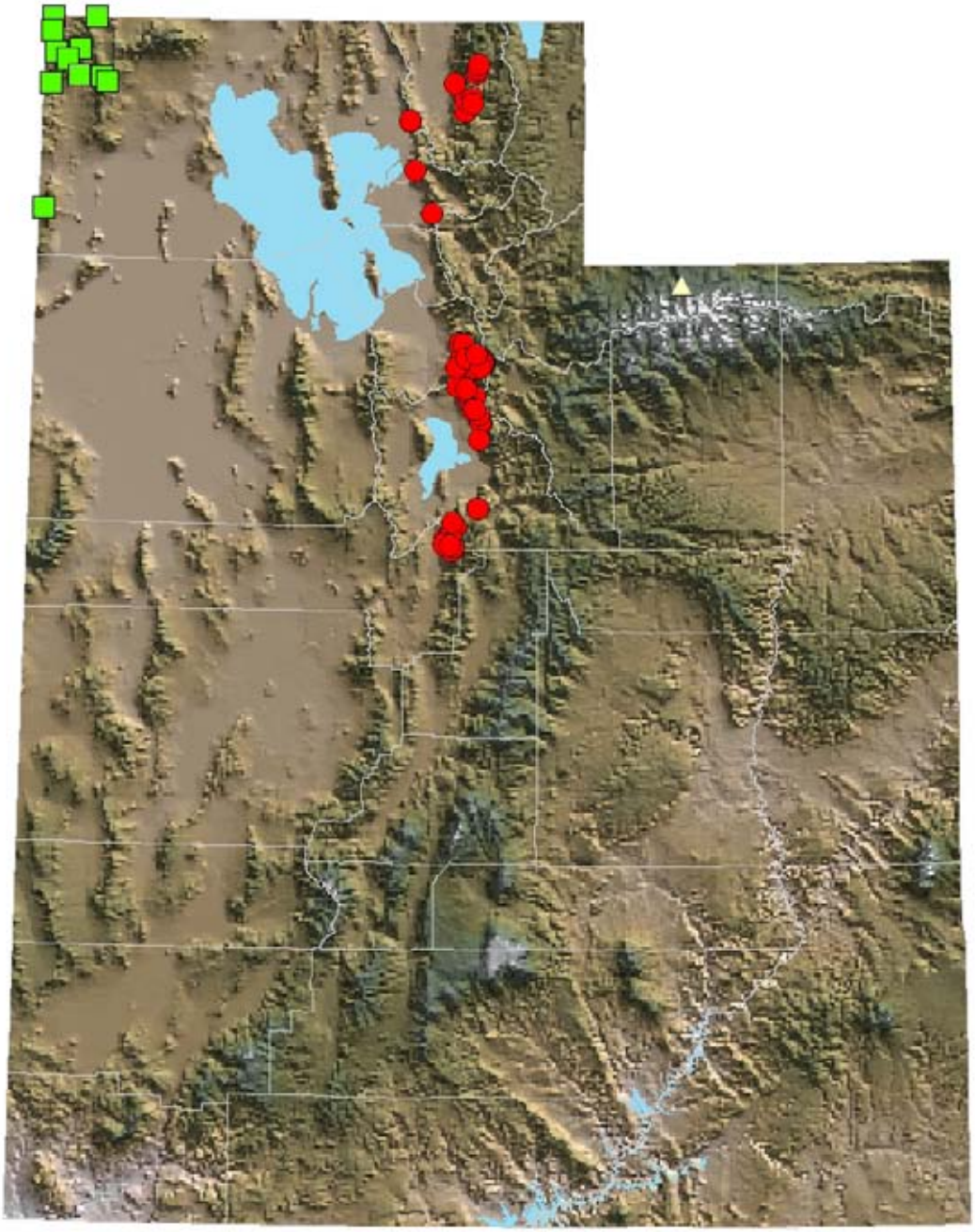

Figure 109. The distribution of King's aster (*Aster kingii* var. *kingii*) ●, lava aster (*Aster scopulorum*) ■ , and Siberian aster (*Aster sibiricus* var. *meritus*) △ .

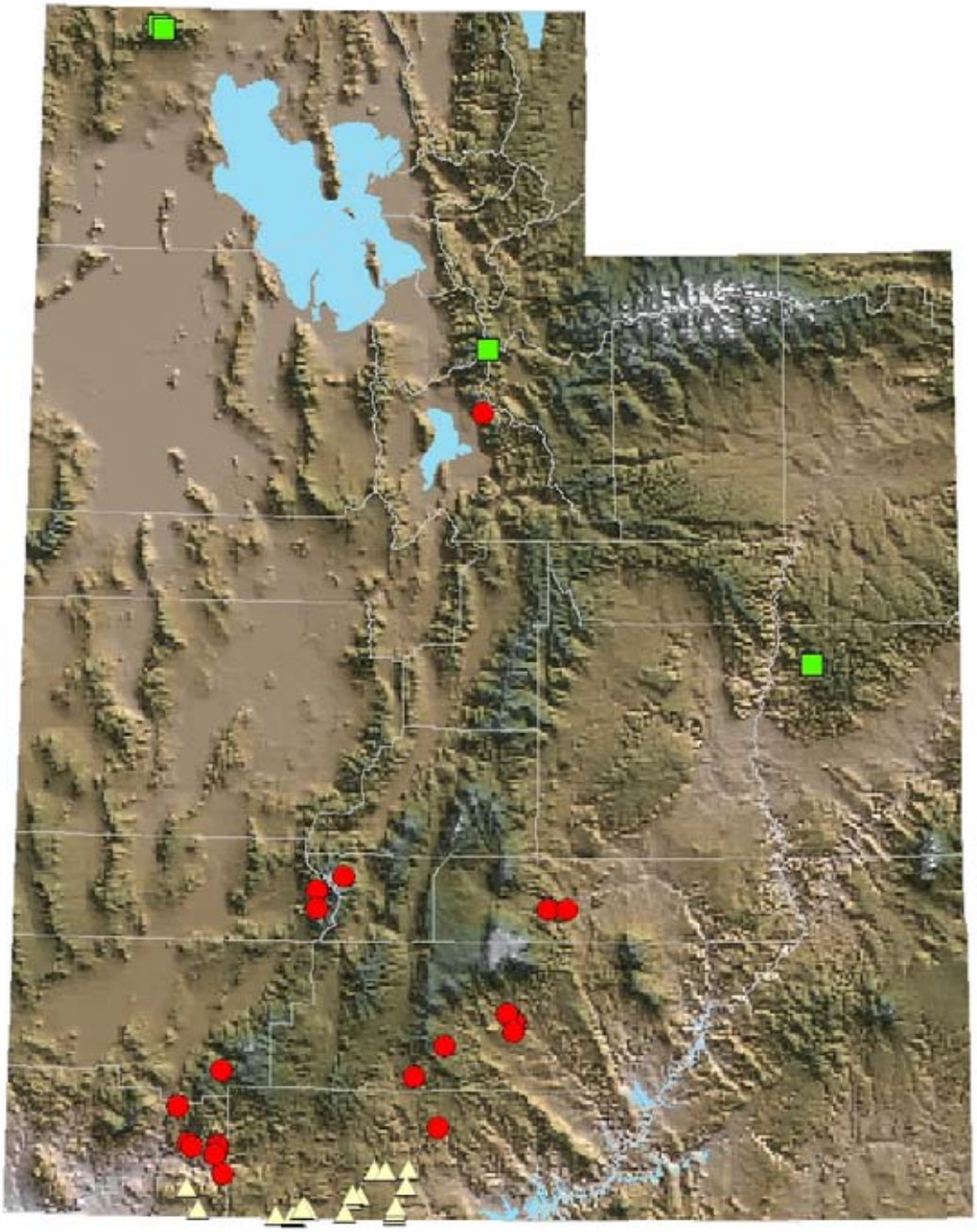

Figure 110. The distribution of Welsh's aster (*Aster welshii*) ●, alpine milkvetch (*Astragalus alpinus*) ■, and gumbo milkvetch (*Astragalus ampullarius*) △ .

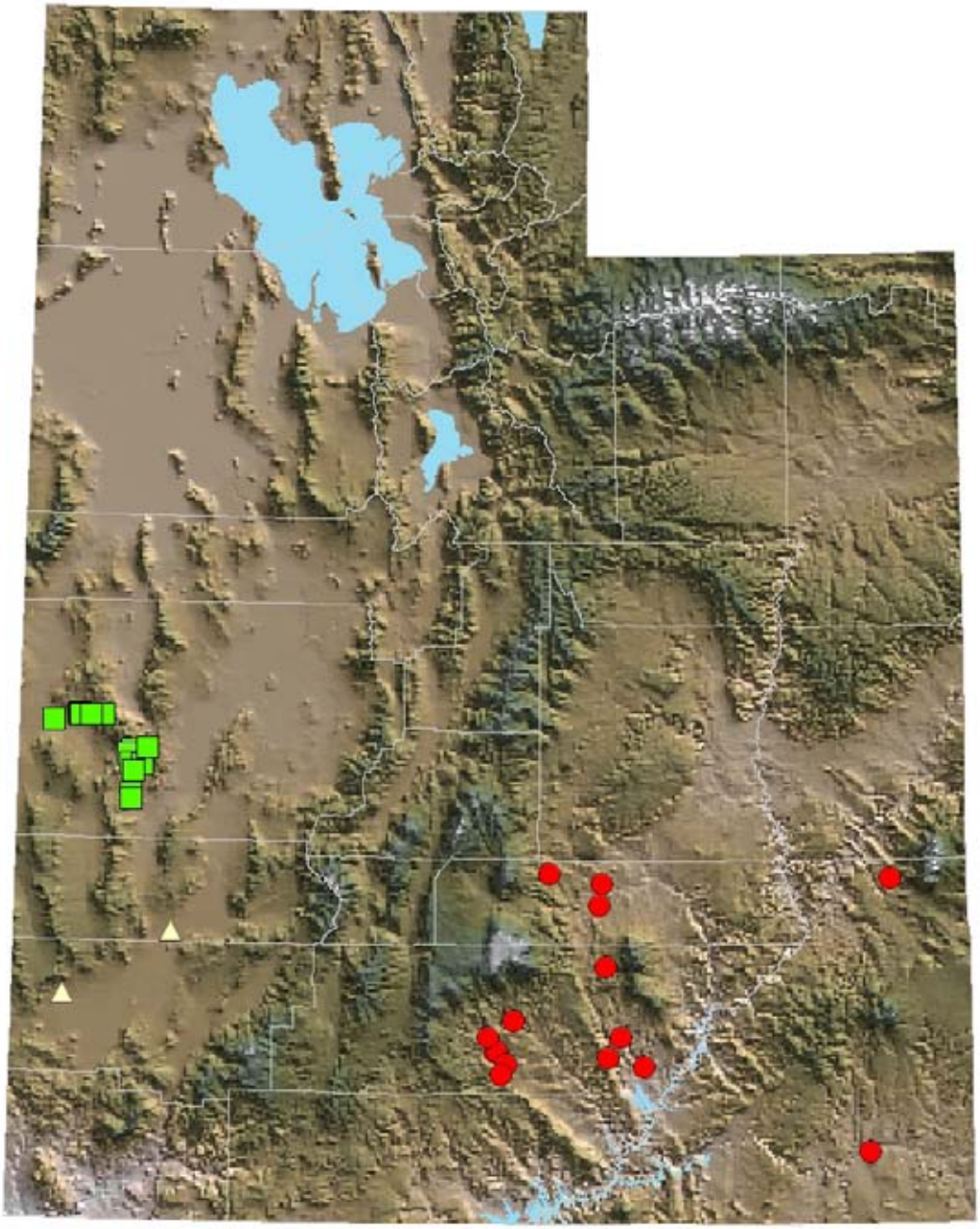

Figure 111. The distribution of Barneby's milkvetch (*Astragalus barnebyi*) ●, Callaway milkvetch (*Astragalus callithrix*) ■, and ground-crescent milkvetch (*Astragalus chamaemeniscus*) △ .

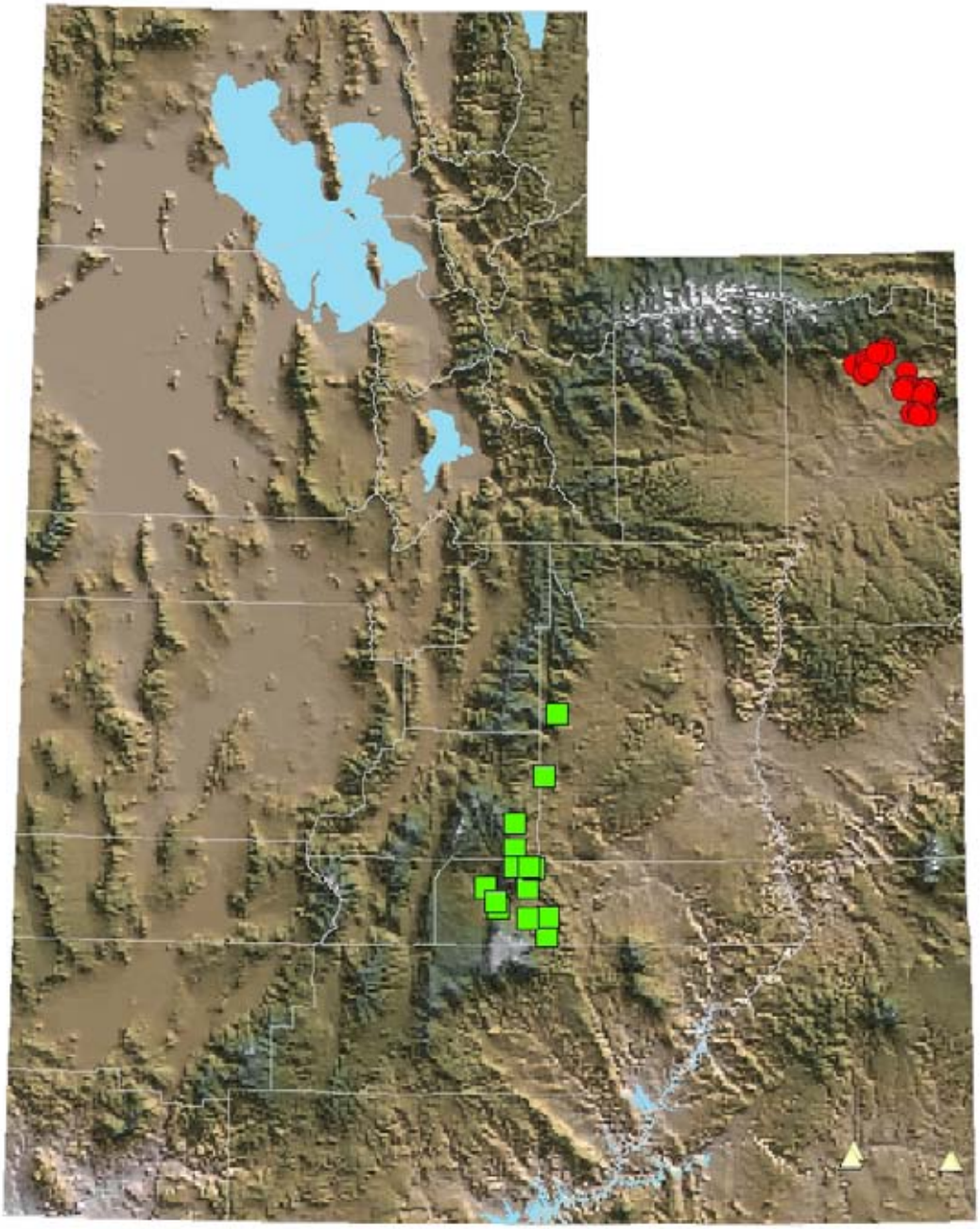

Figure 112. The distribution of grass milkvetch (*Astragalus chloodes*) ●, Bicknell milkvetch (*Astragalus consobrinus*) ■, and Cronquist's milkvetch (*Astragalus cronquistii*) △ .

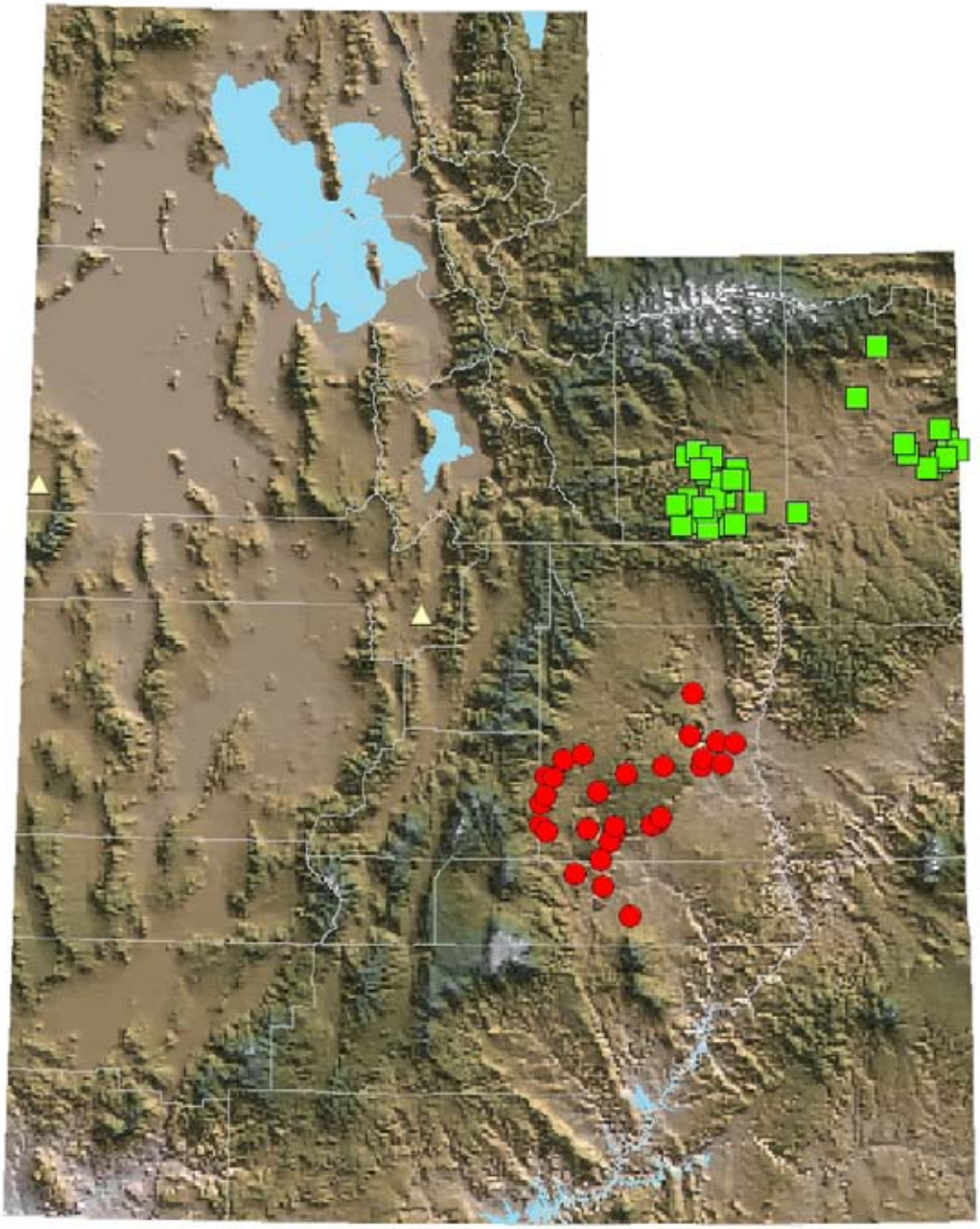

Figure 113. The distribution of rockloving milkvetch (*Astragalus desperatus* var. *petrophilus*) ●, debris milkvetch (*Astragalus detritalis*) ■, and mesic milkvetch (*Astragalus diversifolius*) △ .

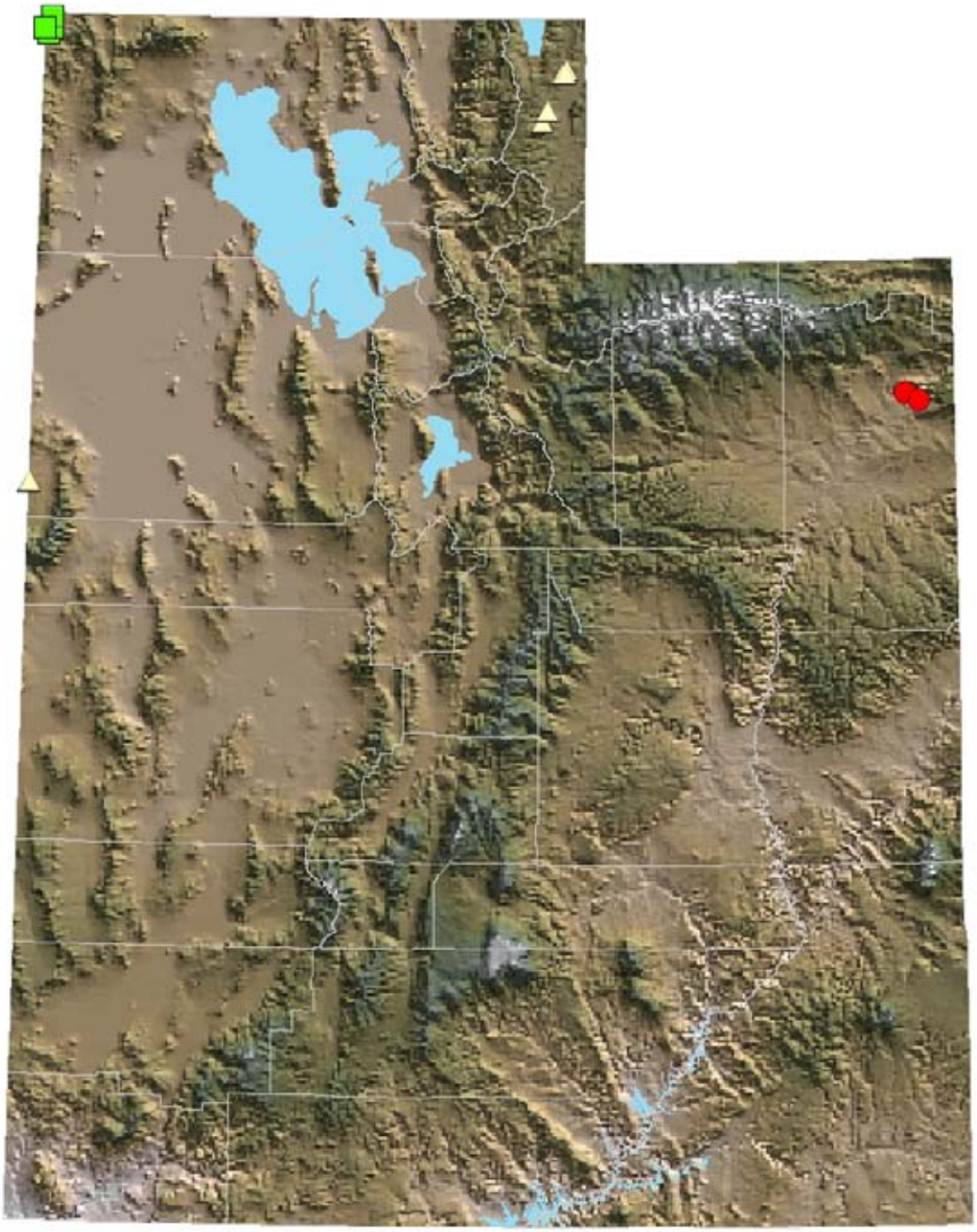

Figure 114. The distribution of Duchesne milkvetch (*Astragalus duchesnensis*) ●, basalt milkvetch (*Astragalus filipes*) ■, and plains orophaca (*Astragalus gilviflorus*) △ .

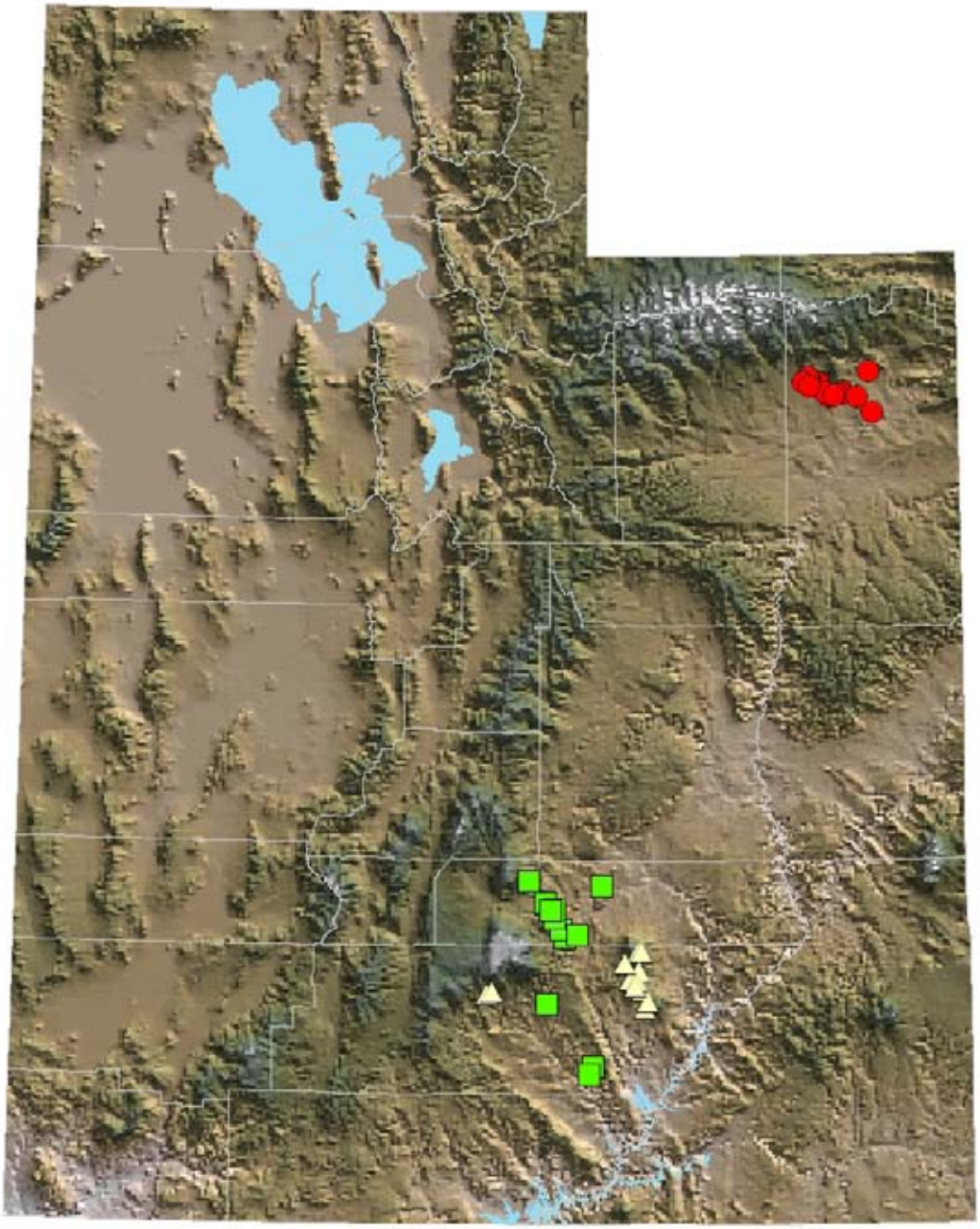

Figure 115. The distribution of Hamilton's milkvetch (*Astragalus hamiltonii*) ●, Harrison's milkvetch (*Astragalus harrisonii*) ■, and Dana's milkvetch (*Astragalus henrimontanensis*) △ .

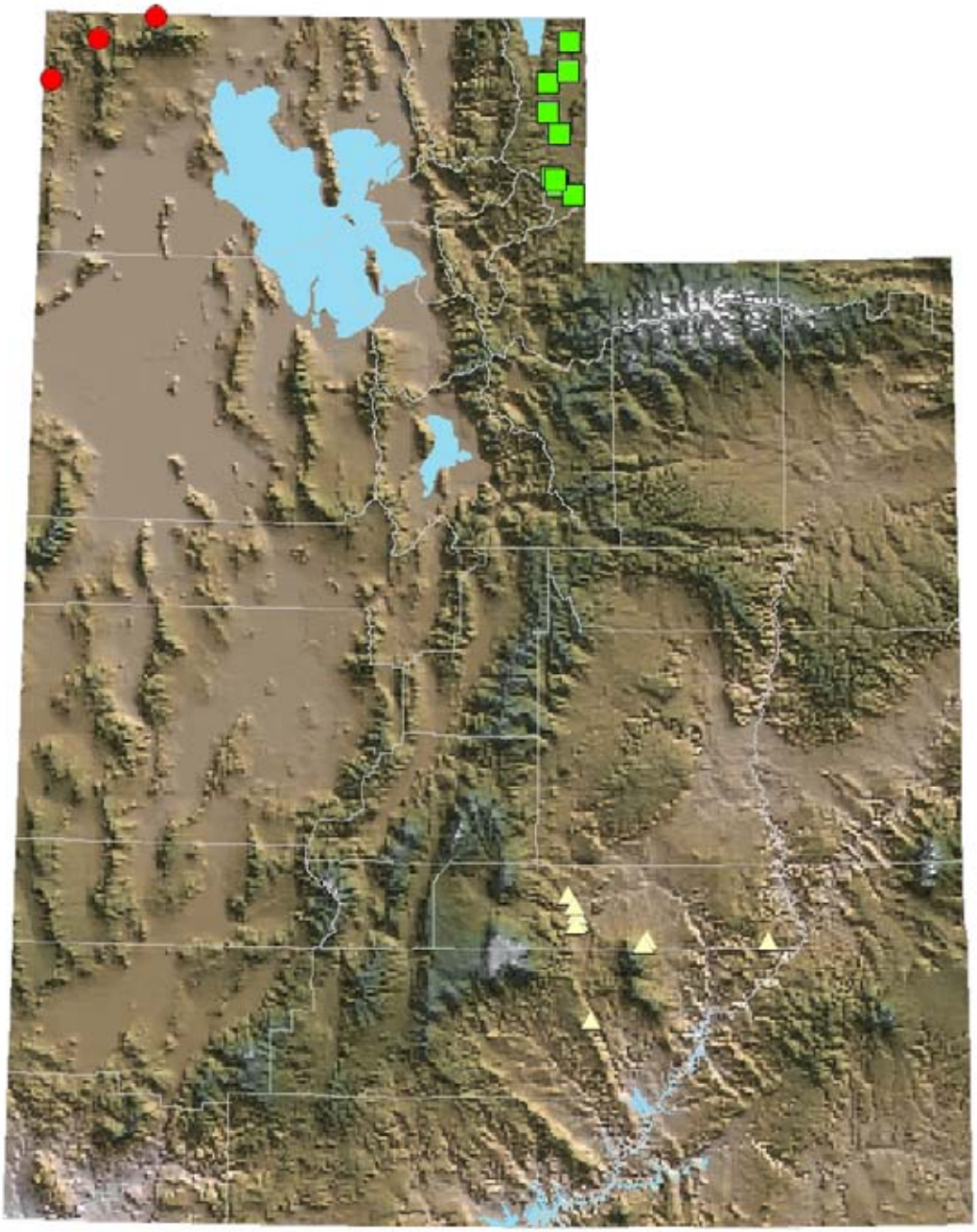

Figure 116. The distribution of Humboldt River milkvetch (*Astragalus iodanthus* var. *iodanthus*) ●, starveling milkvetch (*Astragalus jejunus* var. *jejunus*) ■, and intrusive milkvetch (*Astragalus laccoliticus*) △ .

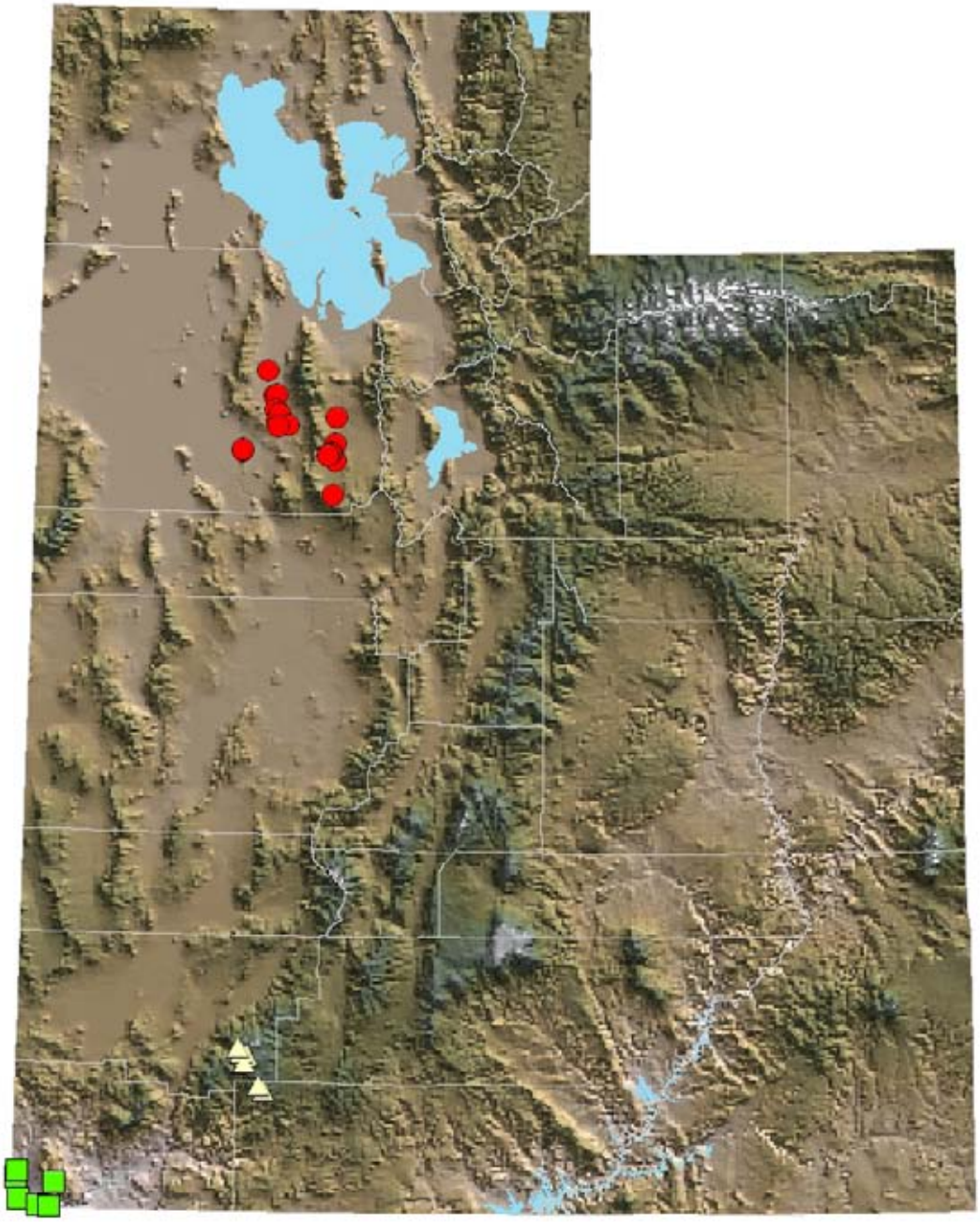

Figure 117. The distribution of Pohl's milkvetch (*Astragalus lentiginosus* var. *pohlii*) ●, straw milkvetch (*Astragalus lentiginosus* var. *stramineus*) ■, and Navajo Lake milkvetch (*Astragalus limnocharis* var. *limnocharis*) △ .

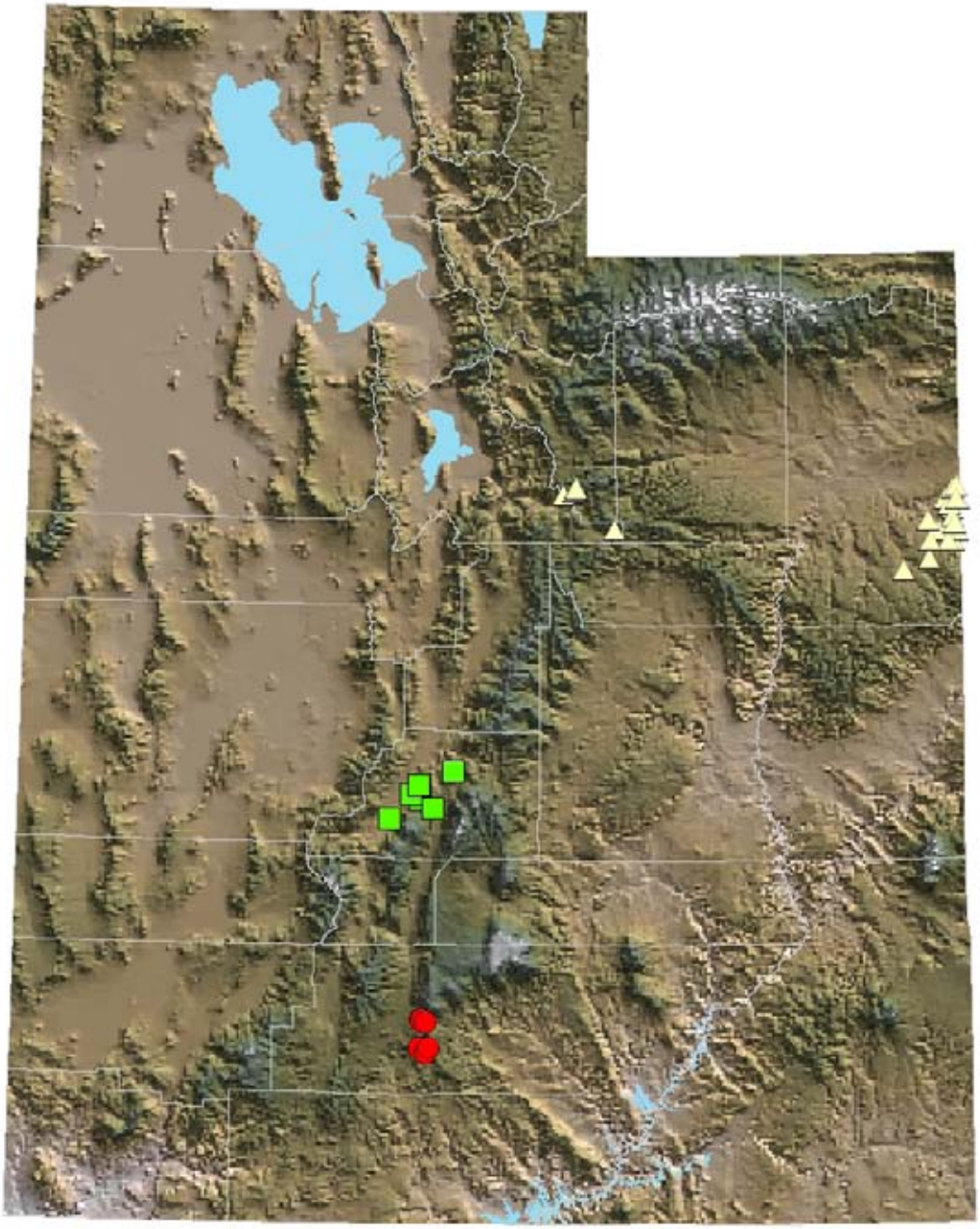

Figure 118. The distribution of Table Cliff milkvetch (*Astragalus limnocharis* var. *tabulaeus*) ●, Glenwood milkvetch (*Astragalus loanus*) ■, and Dragon milkvetch (*Astragalus lutosus*) △ .

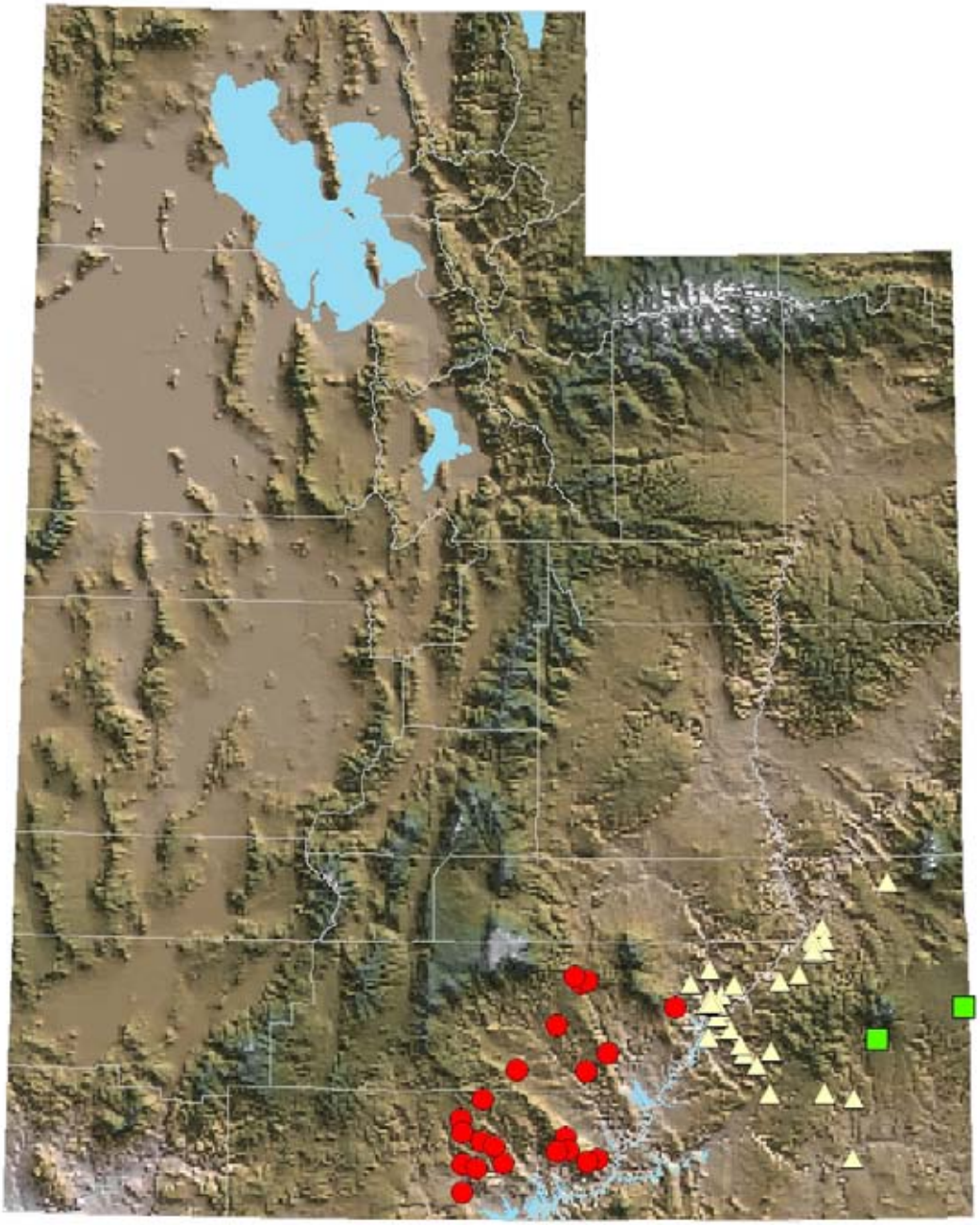

Figure 119. The distribution of Kaiparowits milkvetch (*Astragalus malacoides*) ●, Missourii milkvetch (*Astragalus missouriensis* var. *amphibolus*) ■, and Monument milkvetch (*Astragalus monumentalis*) △.

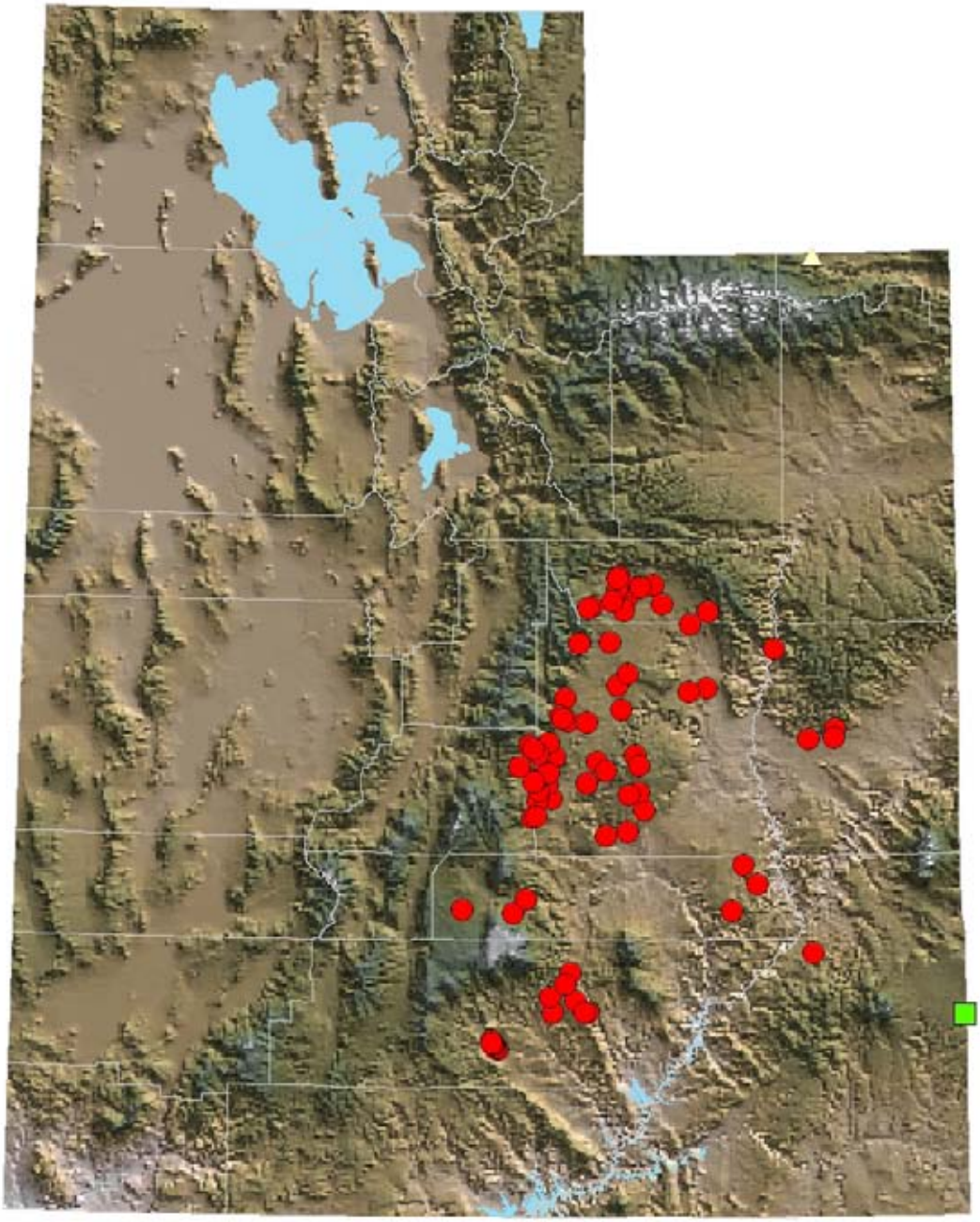

Figure 120. The distribution of Ferron milkvetch (*Astragalus musiniensis*) ●, Naturita milkvetch (*Astragalus naturitensis*) ■, and Nelson's milkvetch (*Astragalus nelsonianus*) △ .

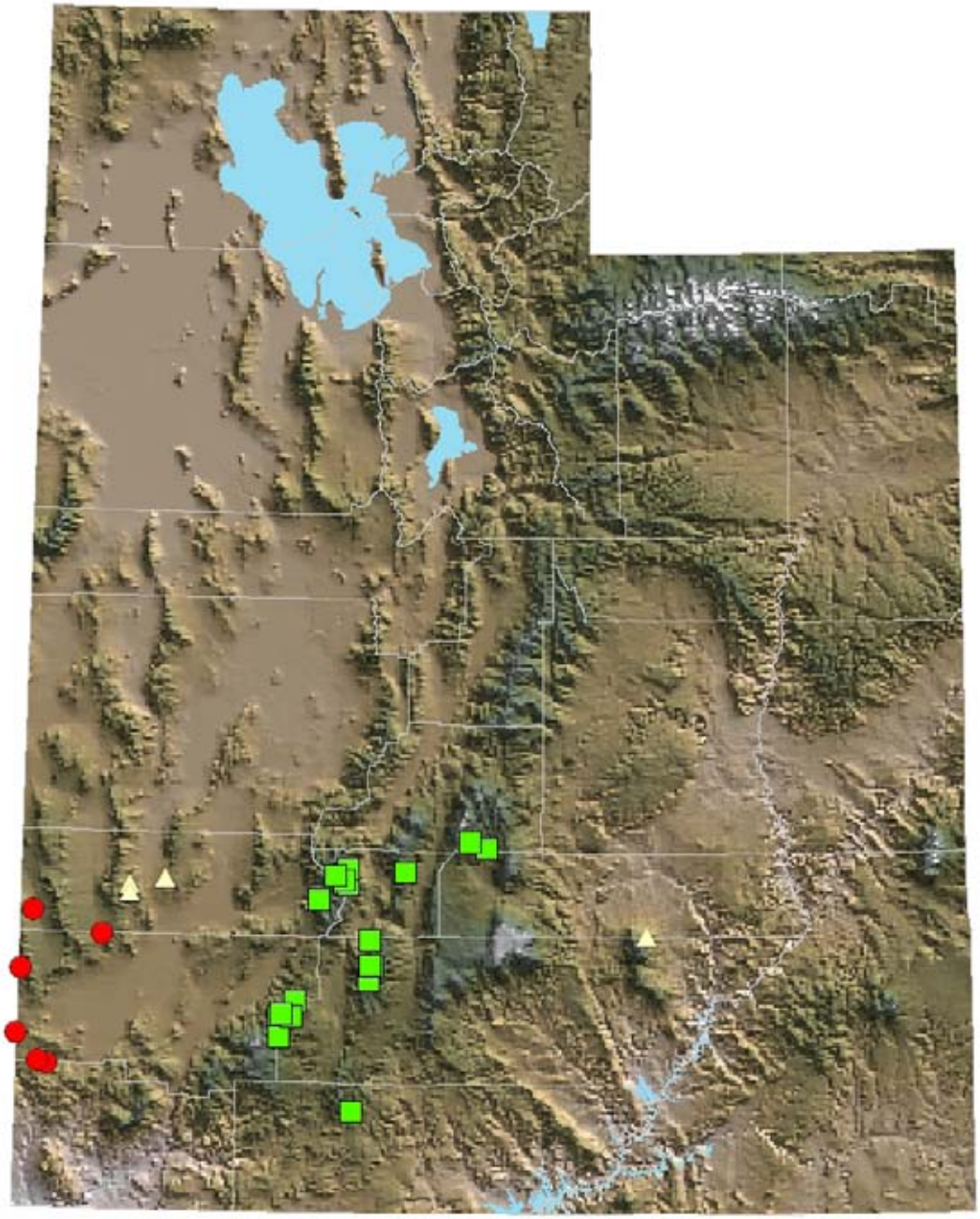

Figure 121. The distribution of pink egg milkvetch (*Astragalus oophorus* var. *lonchocalyx*) ●, Rydberg milkvetch (*Astragalus perianus*) ■, and piñon milkvetch (*Astragalus pinonis*) △ .

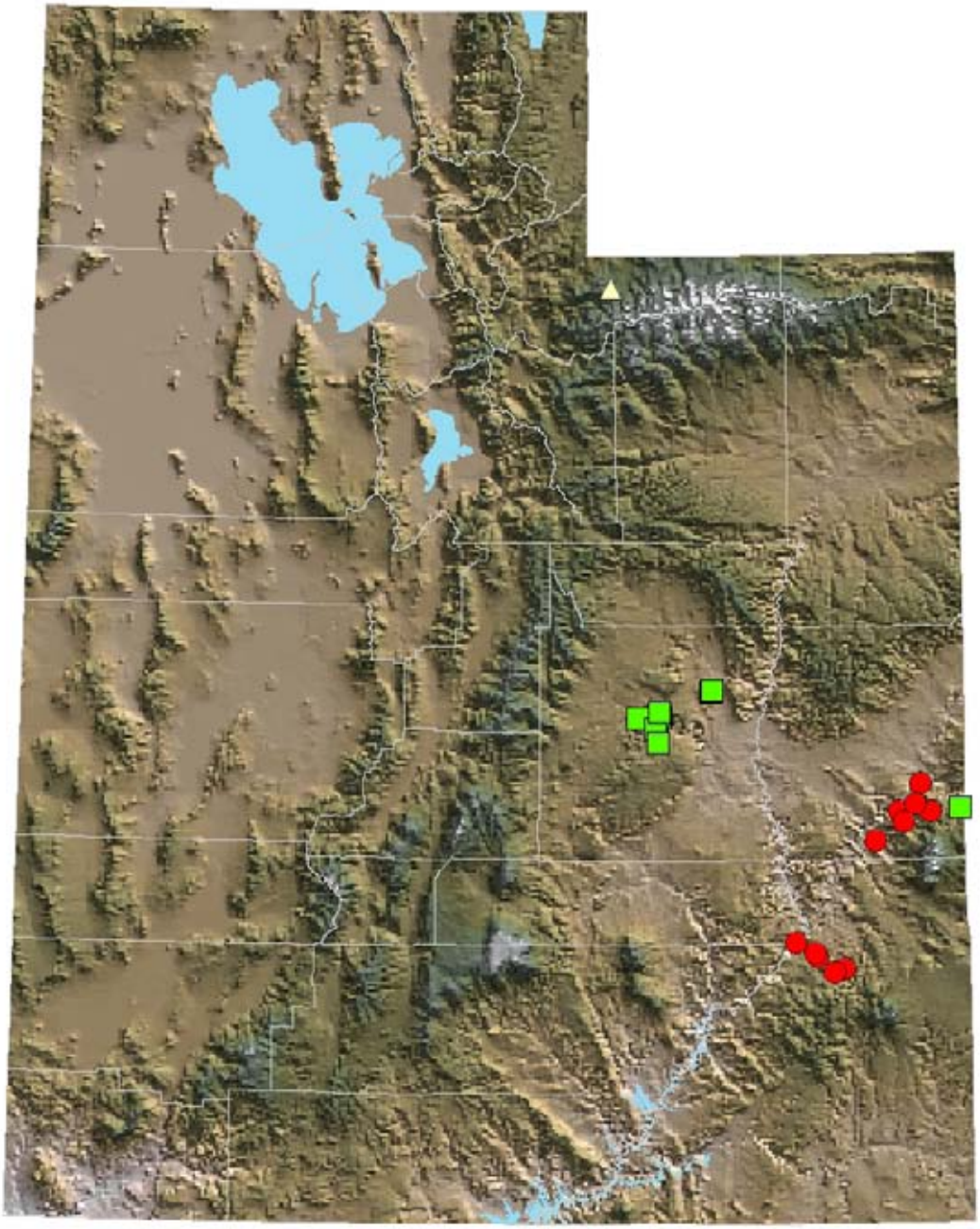

Figure 122. The distribution of Fisher milkvetch (*Astragalus piscator*) ●, San Rafael milkvetch (*Astragalus rafaelensis*) ■, and Robbin's milkvetch (*Astragalus robbinsii* var. *minor*) △ .

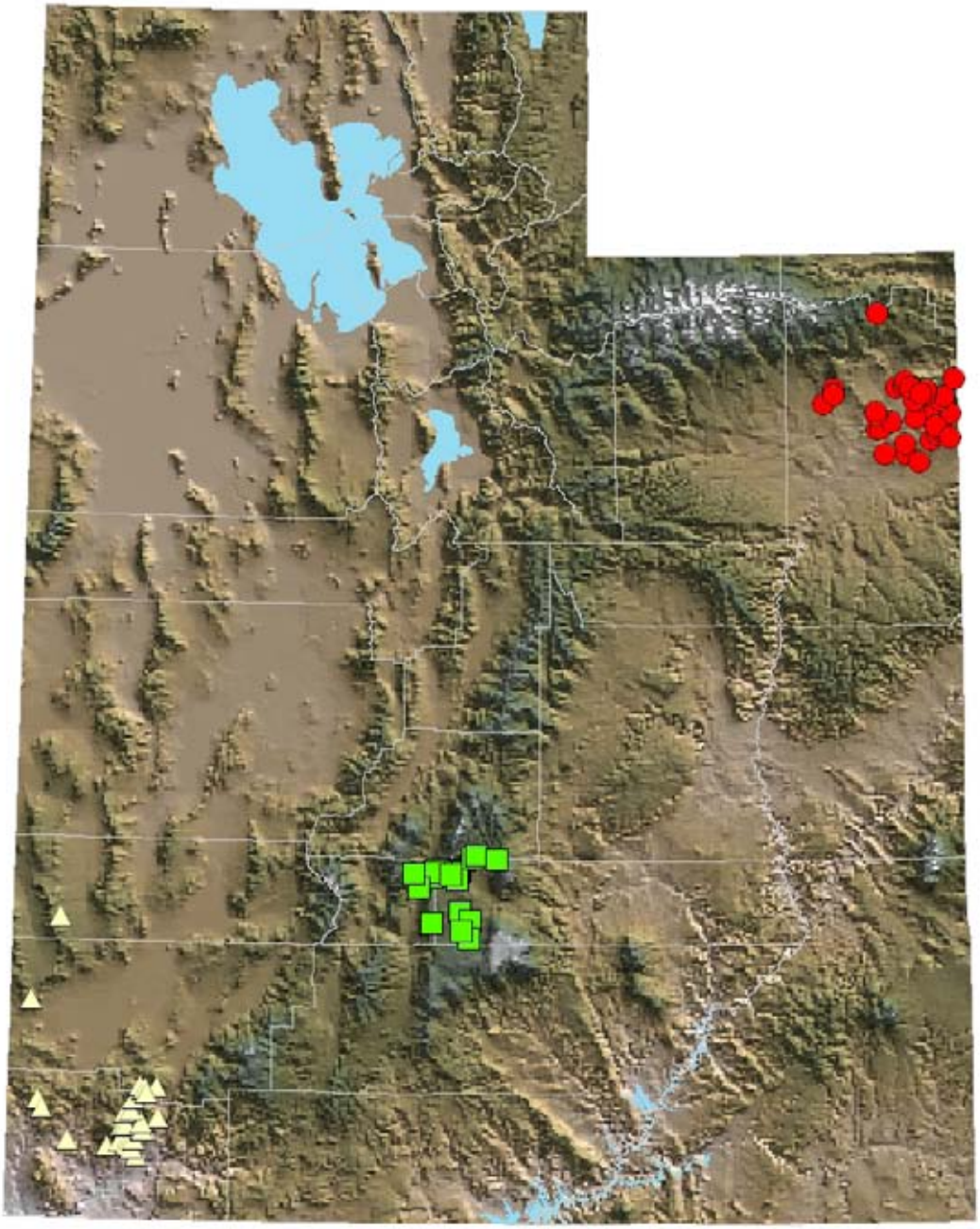

Figure 123. The distribution of Dinosaur milkvetch (*Astragalus saurinus*) ●, Plateau milkvetch (*Astragalus serpens*) ■ , and Silver Reef milkvetch (*Astragalus straturensis*) △ .

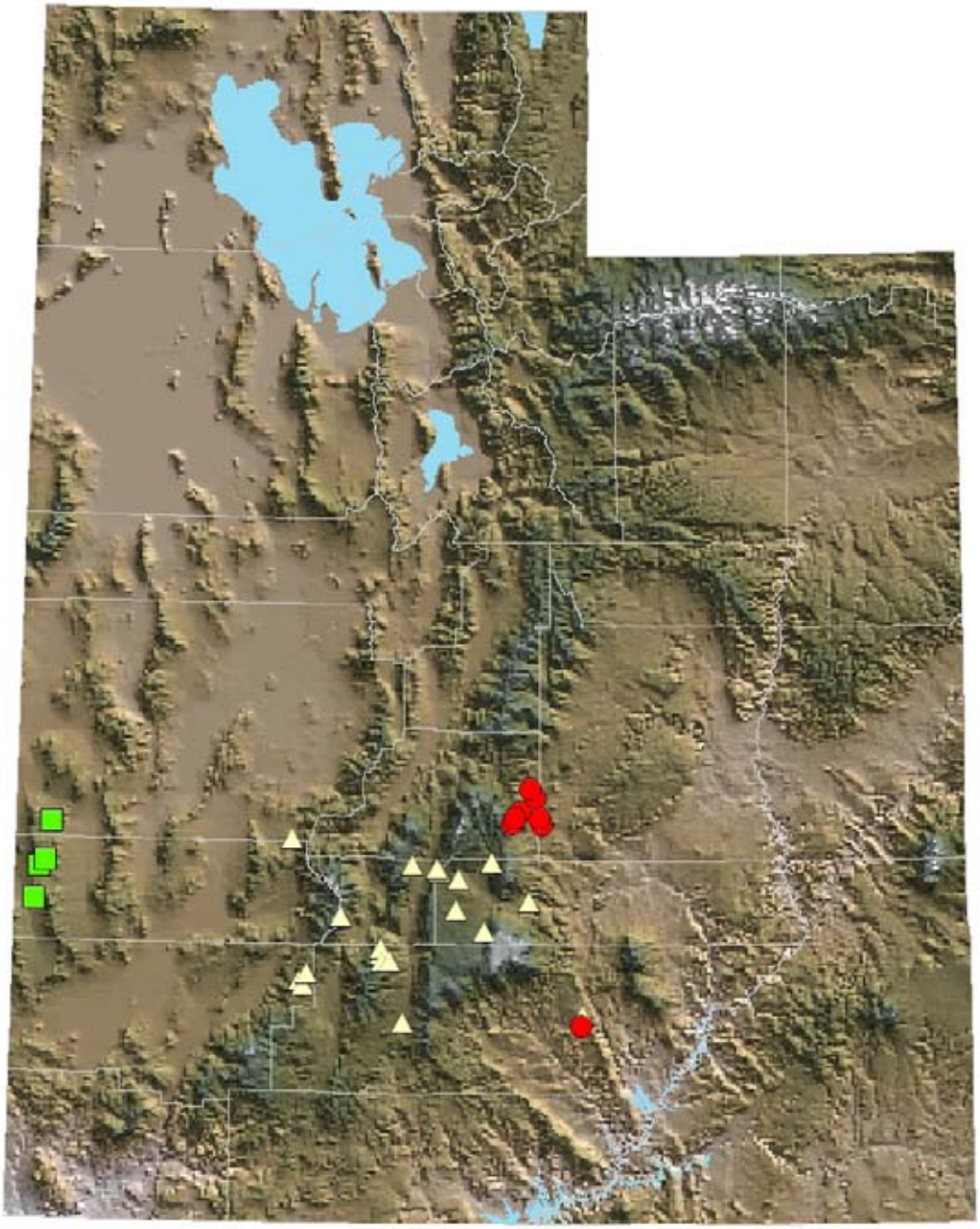

Figure 124. The distribution of silvery basalt milkvetch (*Astragalus subcinereus* var. *basalticus*) ●, four-wing milkvetch (*Astragalus tetrapterus*) ■, and Welsh's milkvetch (*Astragalus welshii*) △ .

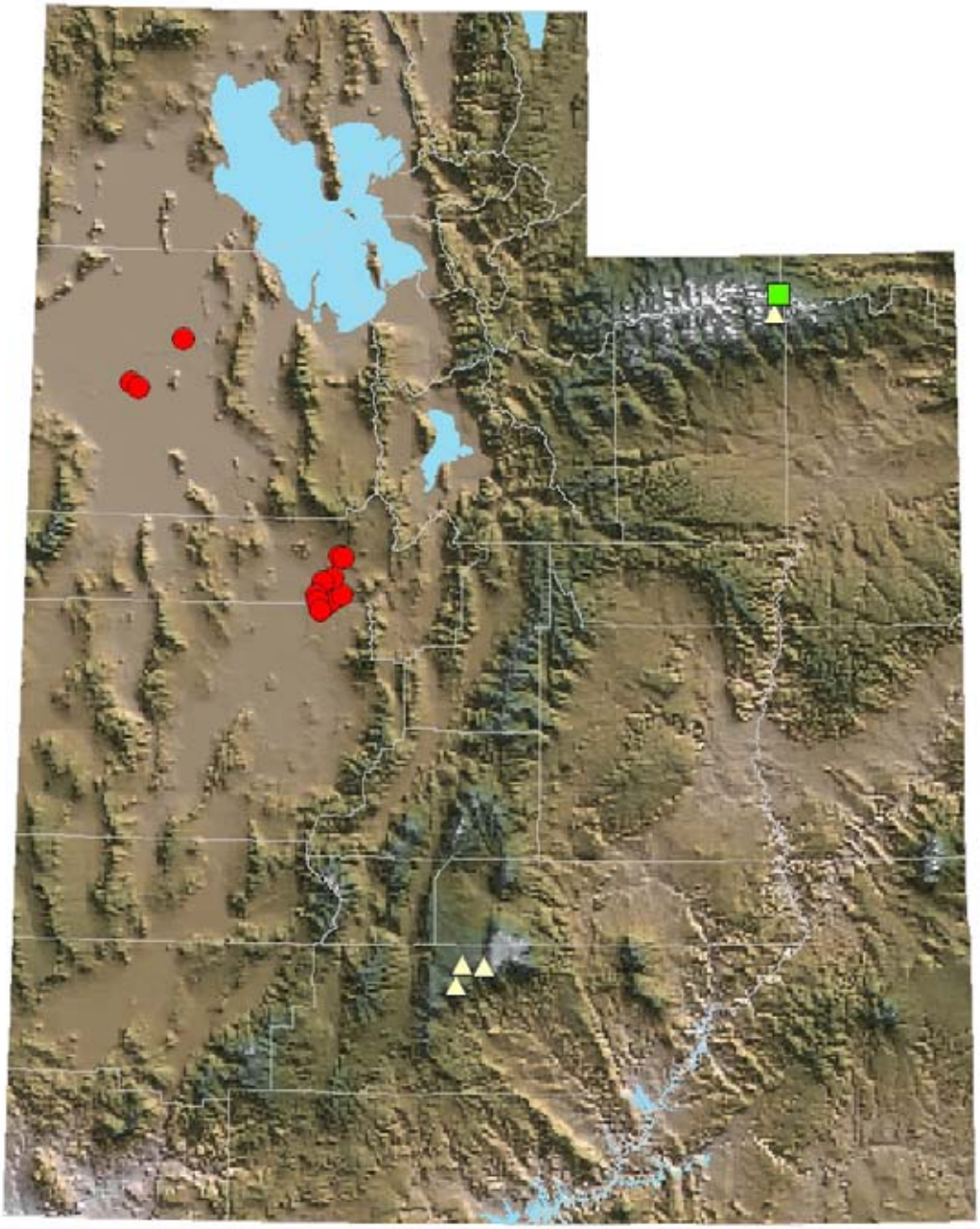

Figure 125. The distribution of giant four-wing saltbush (*Atriplex canescens* var. *gigantea*) ●, reflected moonwort (*Botrychium echo*) ■, and peculiar moonwort (*Botrychium paradoxum*) △ .

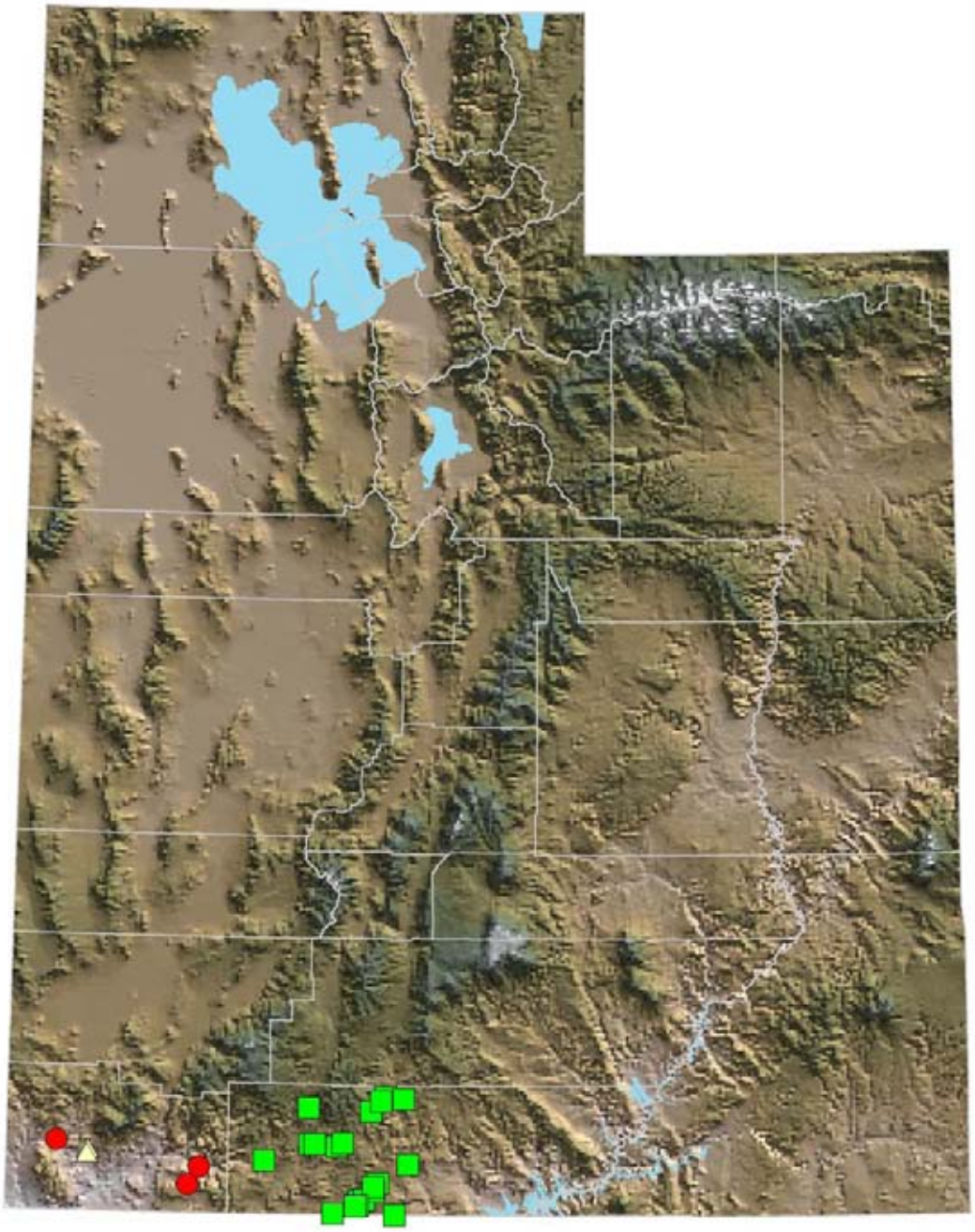

Figure 126. The distribution of Baird's camissonia (*Camissonia bairdii*) ●, meager camissonia (*Camissonia exilis*) ■, and Diamond Valley suncup (*Camissonia gouldii*) △ .

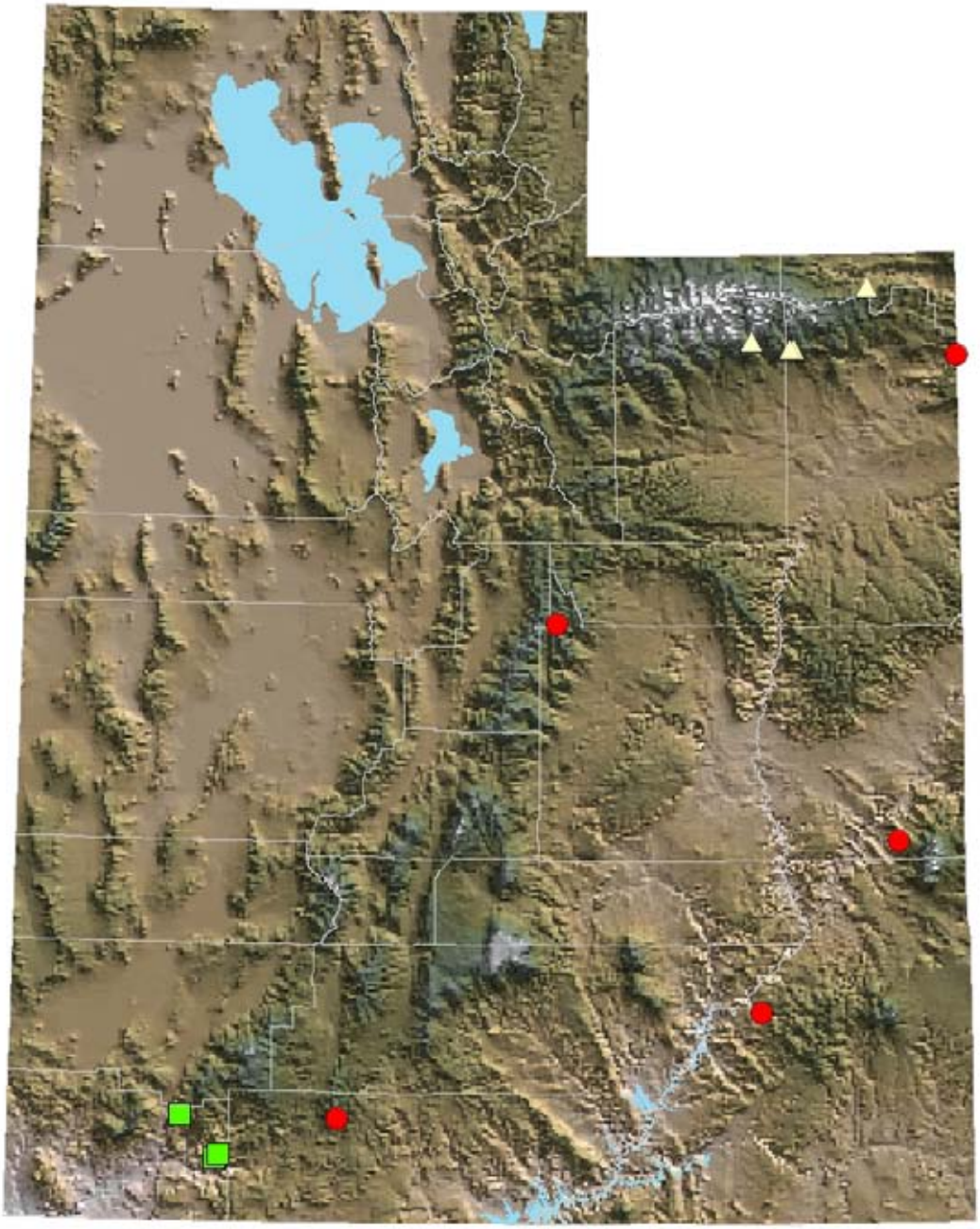

Figure 127. The distribution of Canyonlands' sedge (*Carex curatorum*) ●, Hays' sedge (*Carex haysii*) ■, and bristly-stalk sedge (*Carex leptalea*) △.

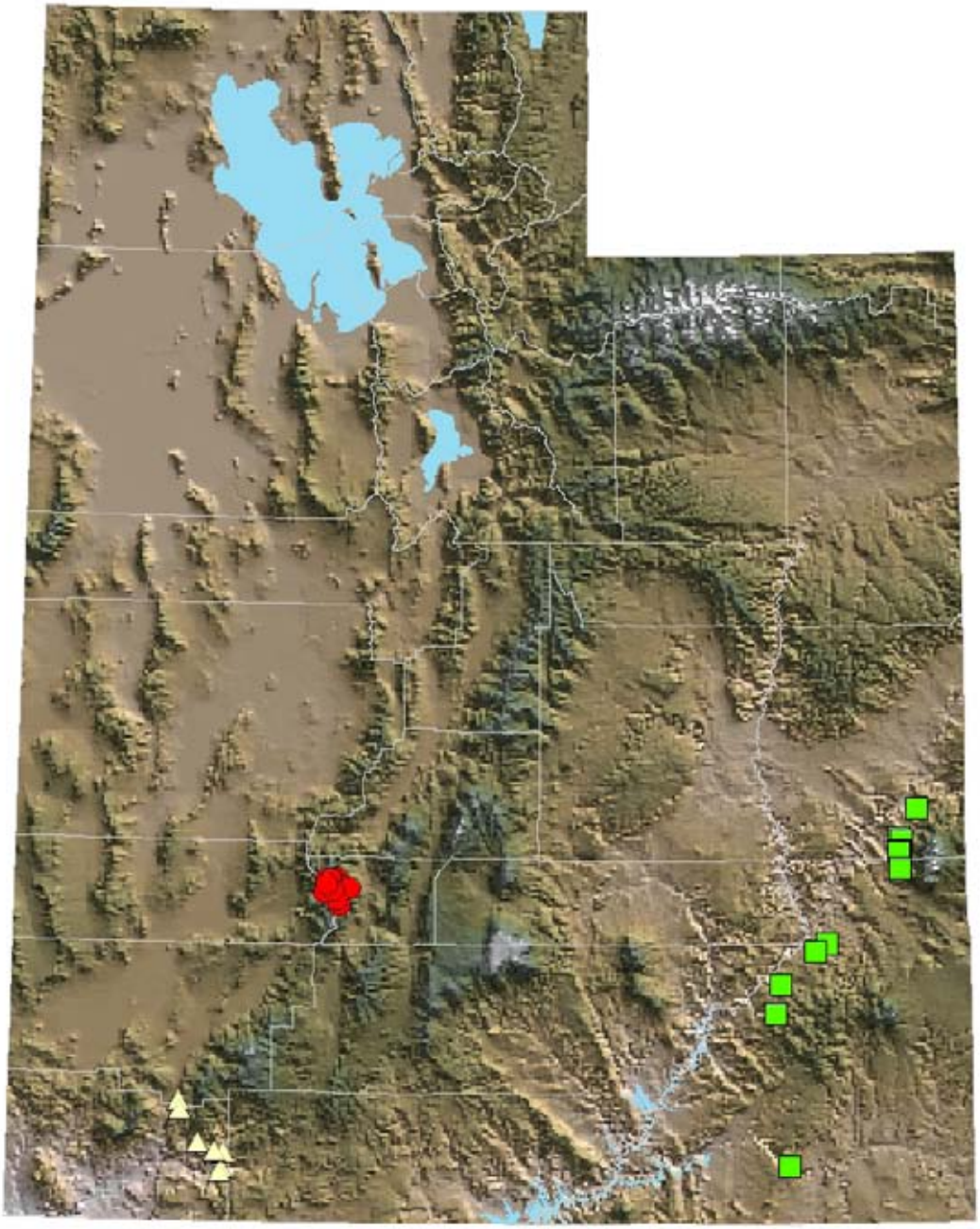

Figure 128. The distribution of Tushar paintbrush (*Castilleja parvula*) ●, Franklin's ceanothus (*Ceanothus greggii* var. *franklinii*) ■, and Menzies' wintergreen (*Chimaphila menziesii*) △ .

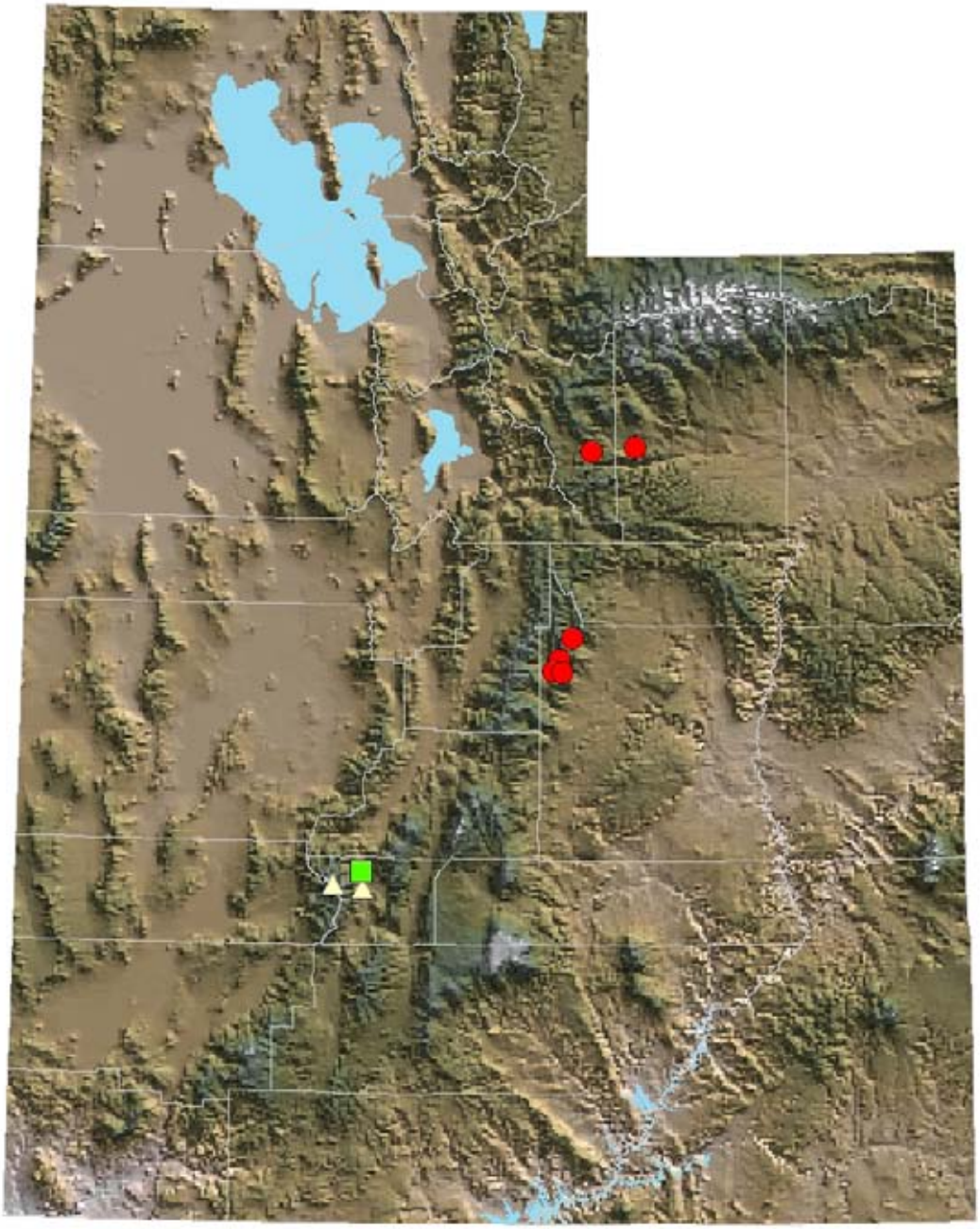

Figure 129. The distribution of Huntington rabbitbrush (*Chrysothamnus nauseosus* subsp. *psilocarpus*) ●, Marysvale rubber rabbitbrush (*Chrysothamnus nauseosus* var. *glareosus*) ■, and Harrison's thistle (*Cirsium eatonii* var. *harrisonii*) △ .

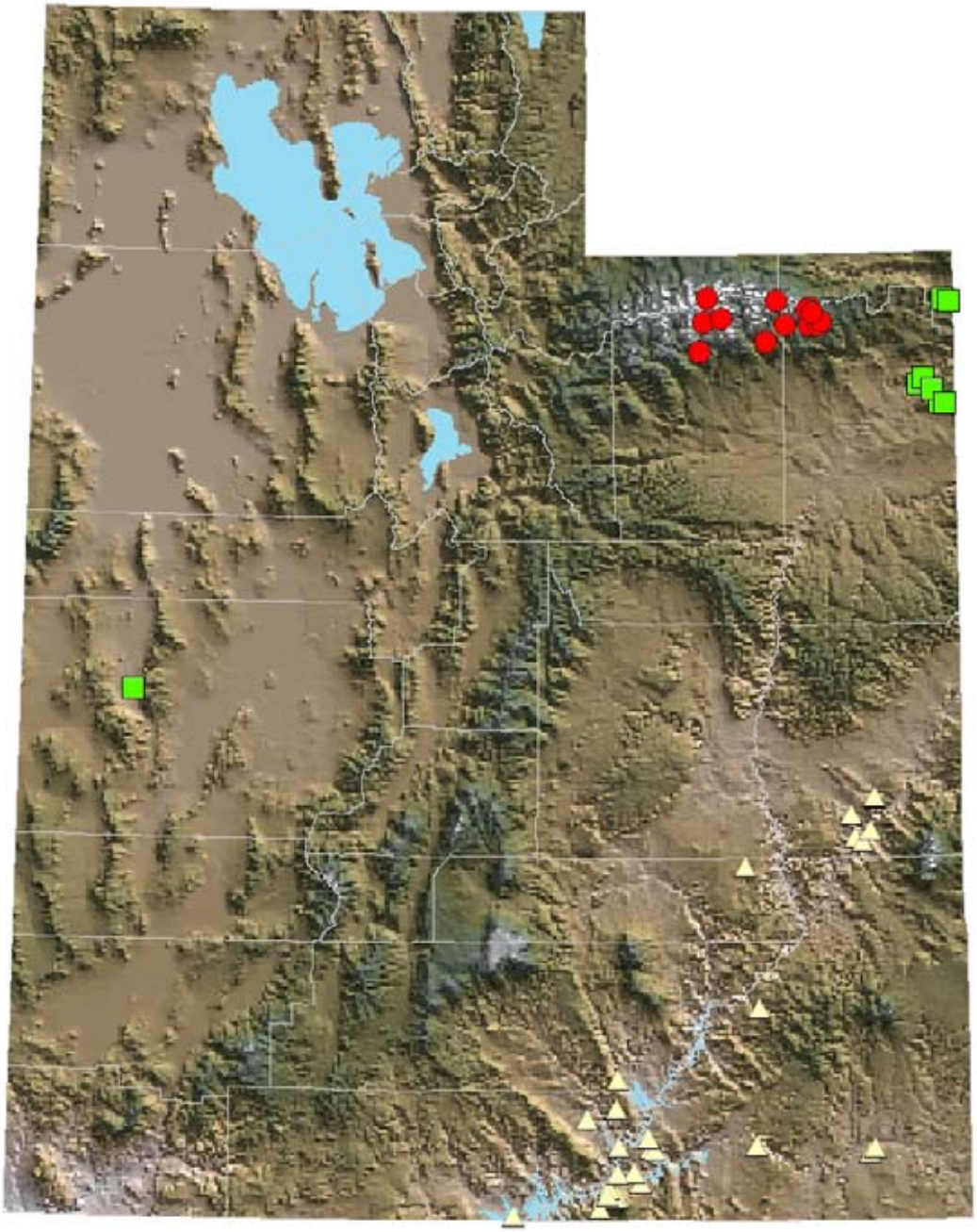

Figure 130. The distribution of Murdock's thistle (*Cirsium murdockii*) ●, Ownbey's thistle (*Cirsium ownbeyi*) ■, and Rydberg's thistle (*Cirsium rydbergii*) △ .

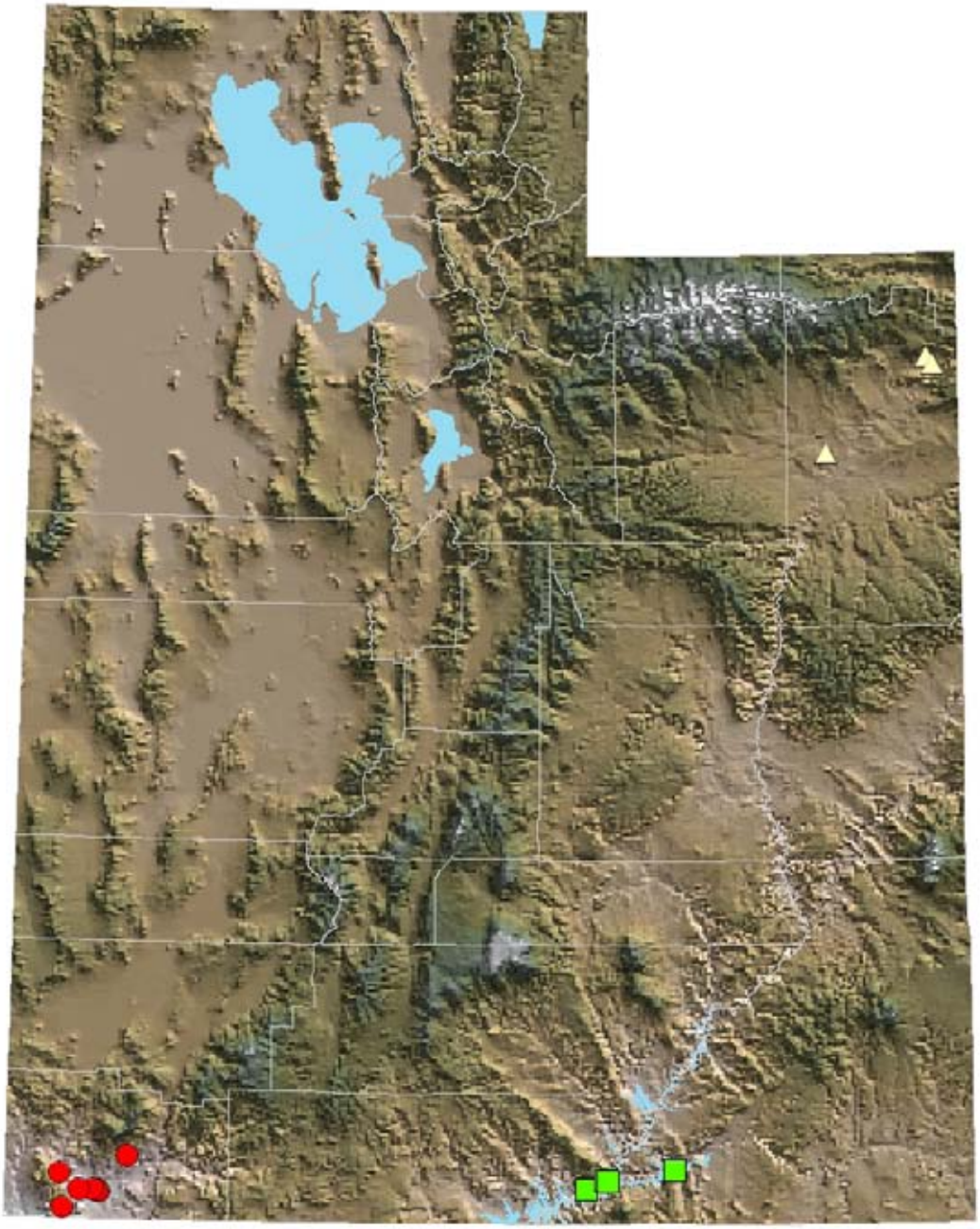

Figure 131. The distribution of Virgin thistle (*Cirsium virginense*) ●, California sawgrass (*Cladium californicum*) ■, and Goodrich's cleomella (*Cleomella palmeriana* var. *goodrichii*) △ .

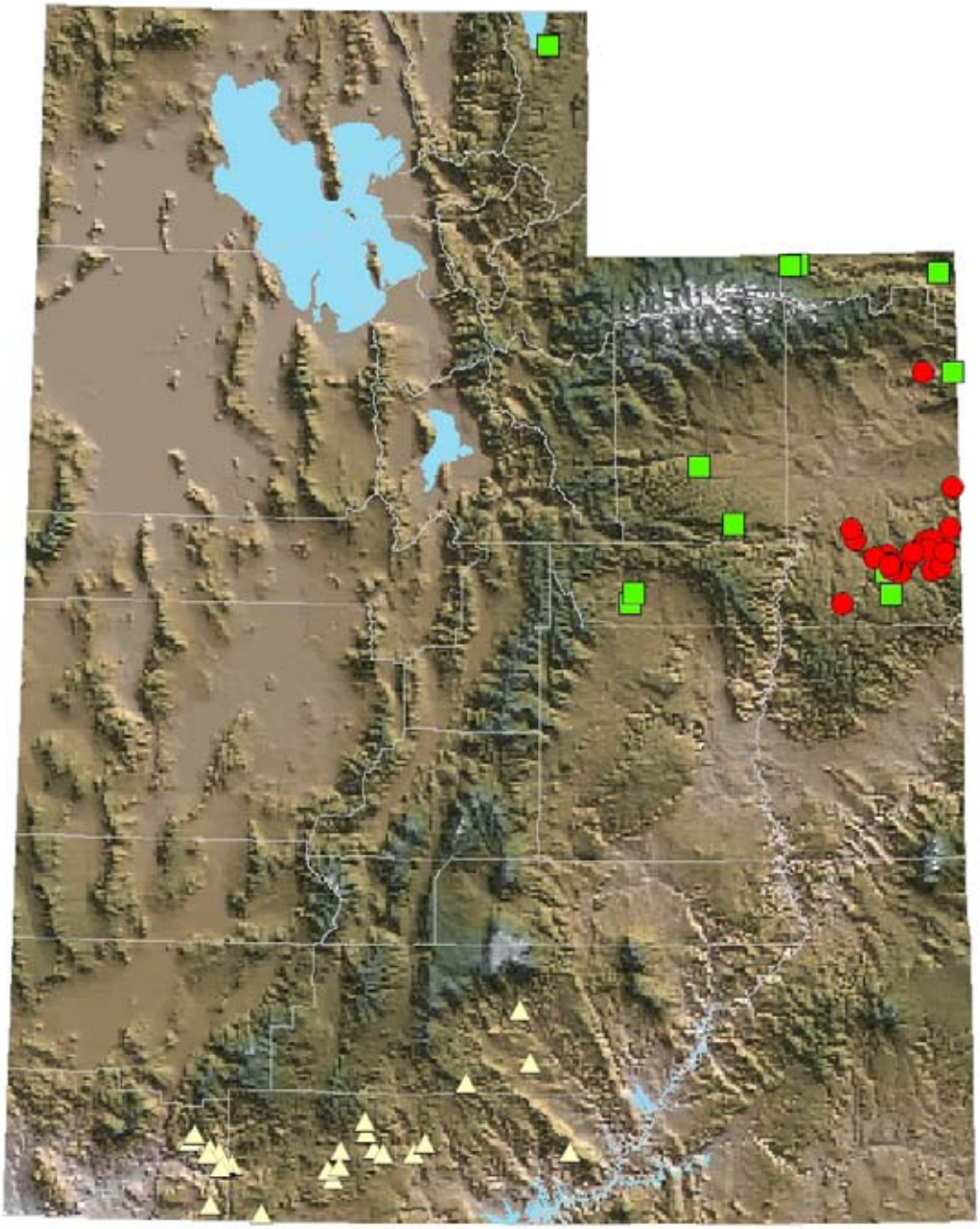

Figure 132. The distribution of Barneby's catseye (*Cryptantha barnebyi*) ●, caespitose cat's-eye (*Cryptantha caespitosa*) ■, and sand cryptanth (*Cryptantha cinerea* var. *arenicola*) △ .

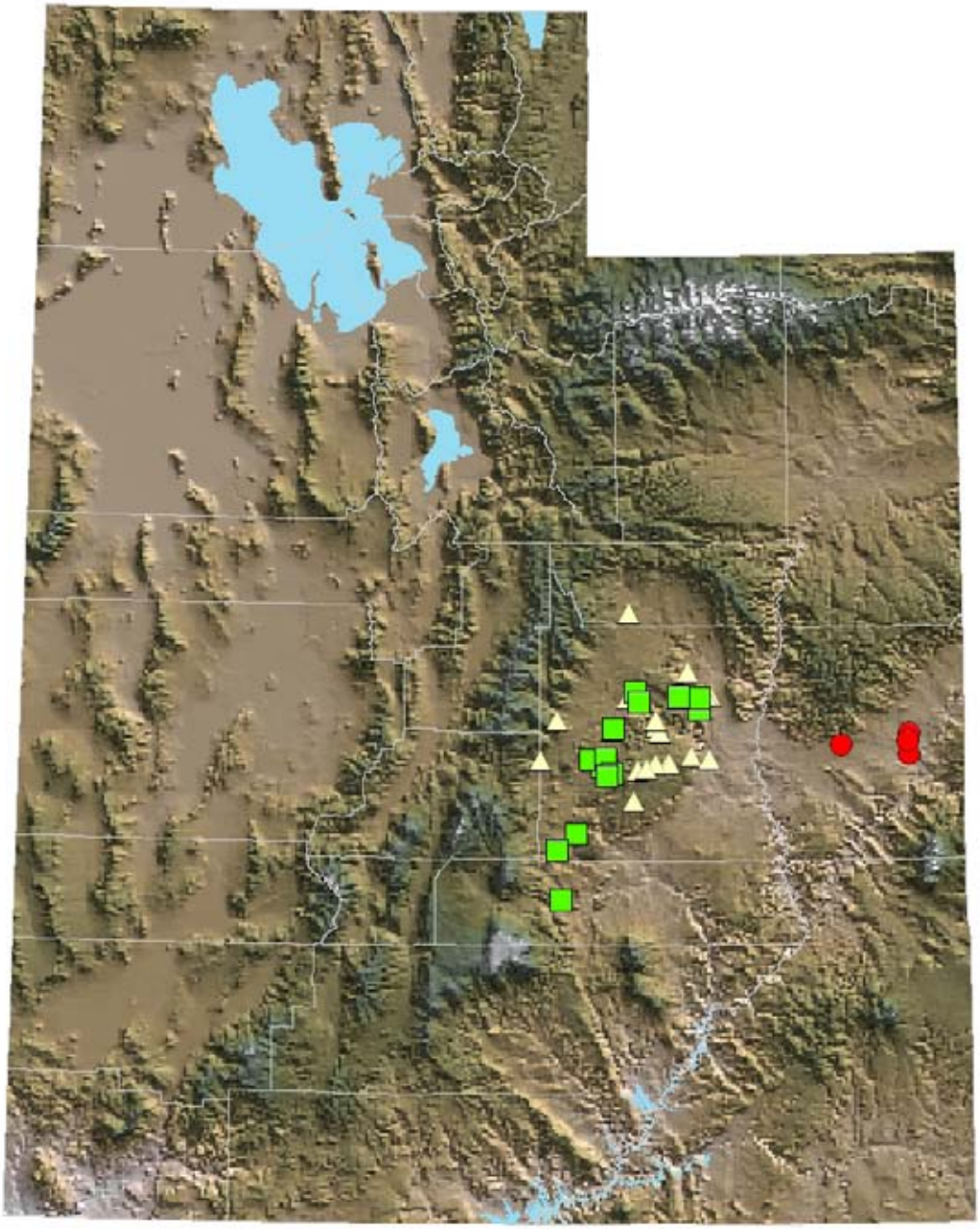

Figure 133. The distribution of tall catseye (*Cryptantha elata*) ●, Johnston's catseye (*Cryptantha johnstonii*) ■, and Jones' catseye (*Cryptantha jonesiana*) △ .

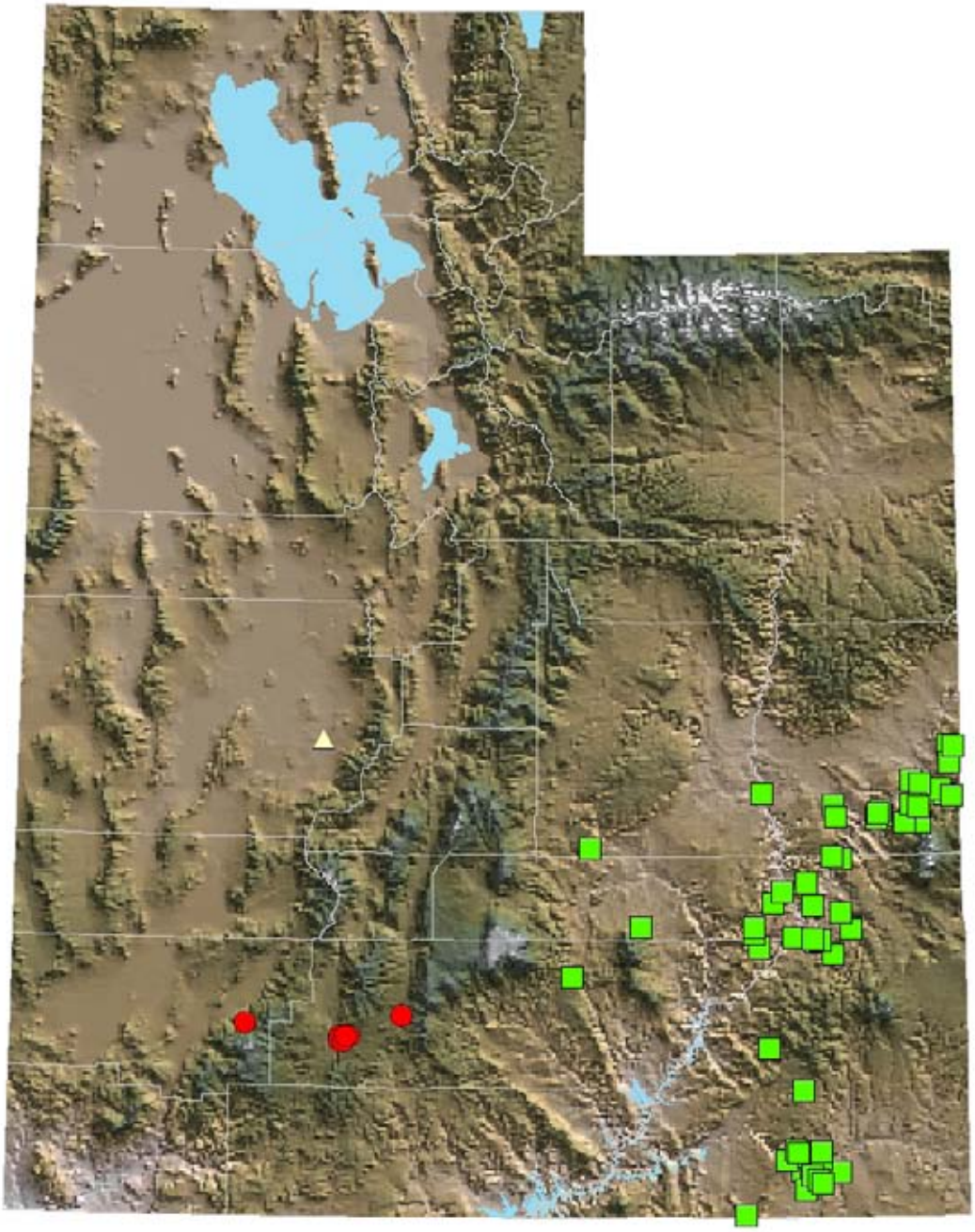

Figure 134. The distribution of yellow-white catseye (*Cryptantha ochroleuca*) ●, Osterhout's cat's-eye (*Cryptantha osterhoutii*) ■, and Warner's dodder (*Cuscuta warneri*) △ .

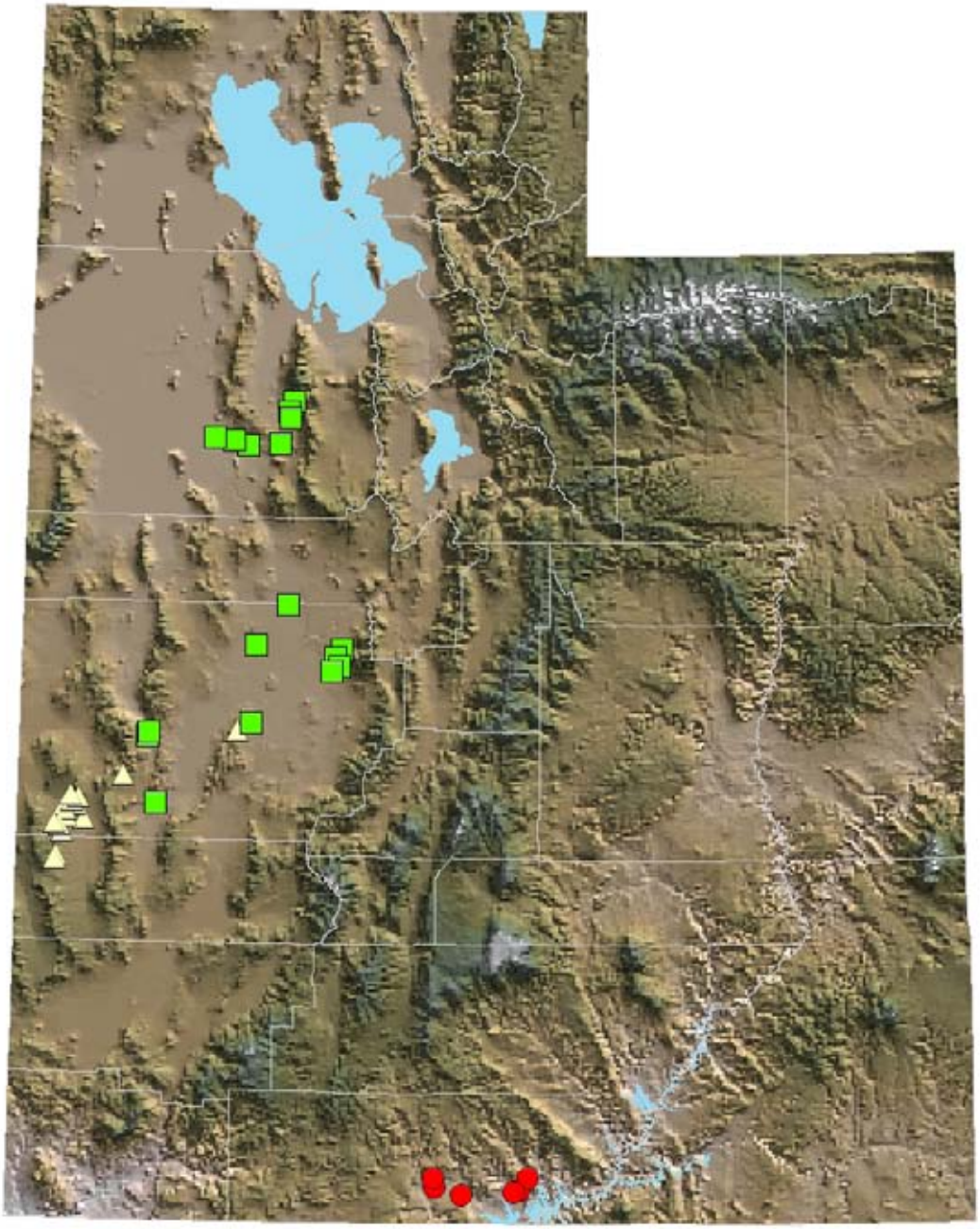

Figure 135. The distribution of Higgins' biscuitroot (*Cymopterus acaulis* var. *higginsii*) ●, small spring-parsley (*Cymopterus acaulis* var. *parvus*) ■, and Intermountain wavewing (*Cymopterus basalticus*) △ .

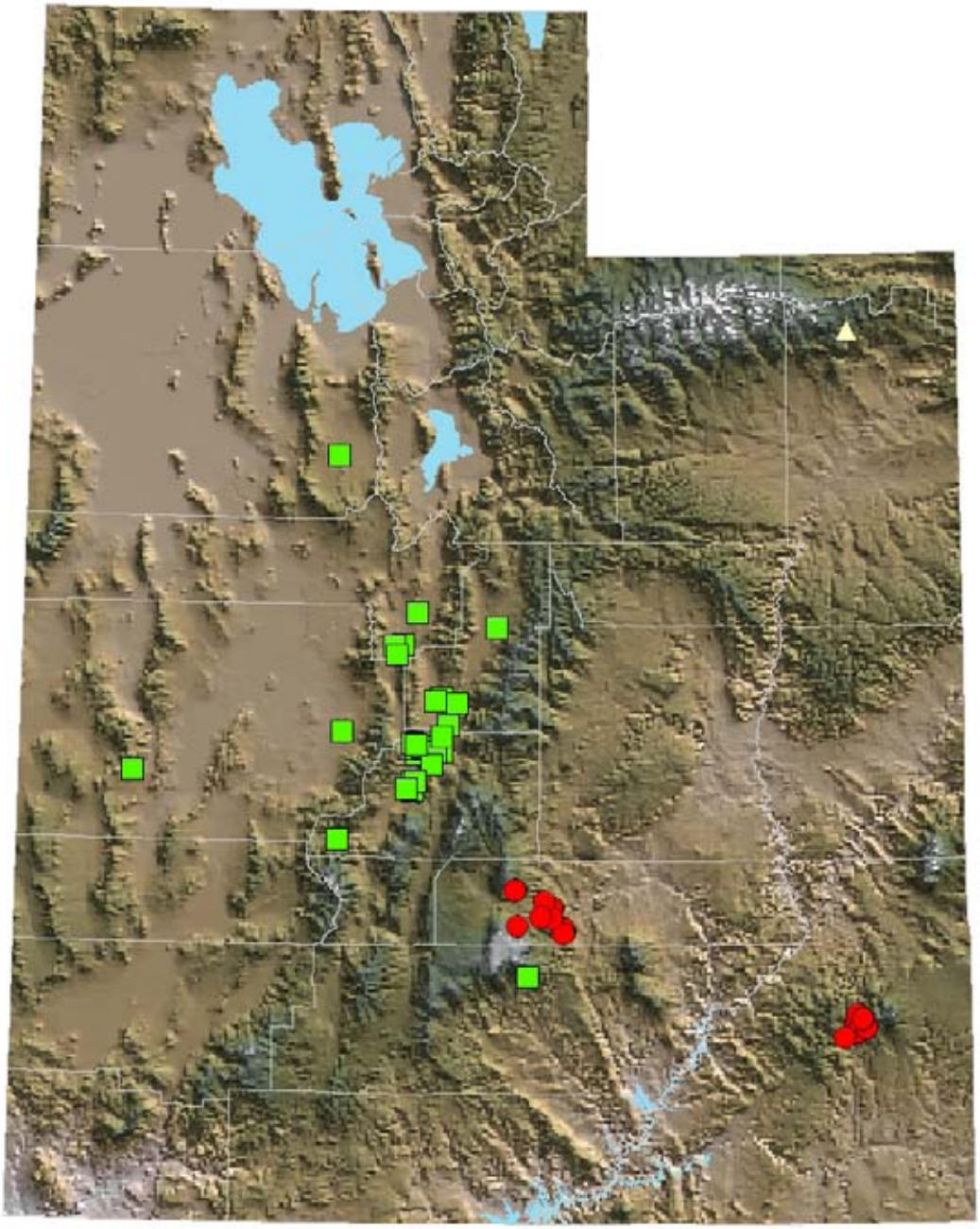

Figure 136. The distribution of pinnate spring-parsley (*Cymopterus beckii*) ●, Coulter's biscuitroot (*Cymopterus coulteri*) ■, and Evert's waferparsnip (*Cymopterus evertii*) △ .

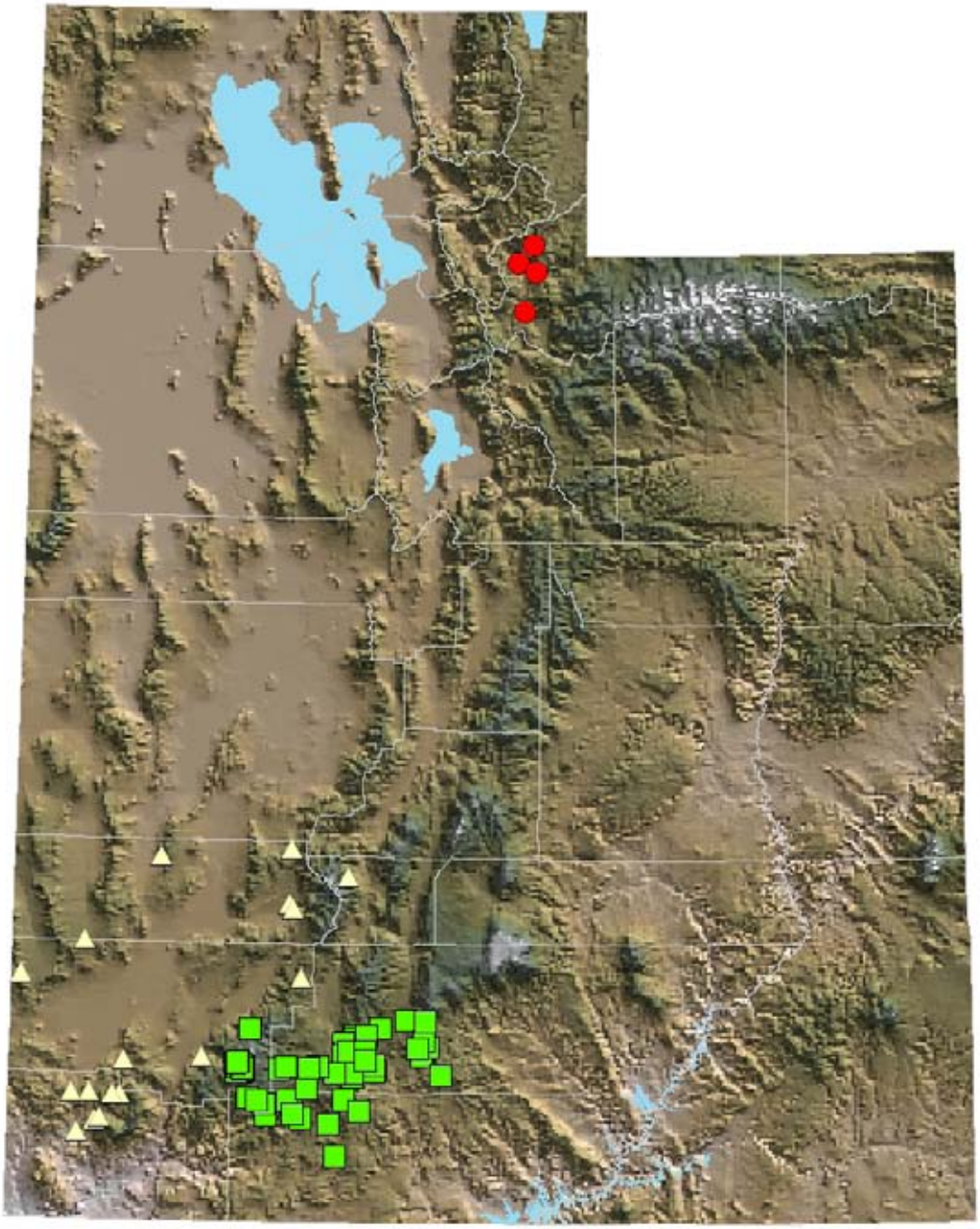

Figure 137. The distribution of Echo spring parsley (*Cymopterus lapidosus*) ●, Cedar Breaks biscuitroot (*Cymopterus minimus*) ■, and Jones' wavewing (*Cymopterus purpureus* var. *jonesii*) △ .

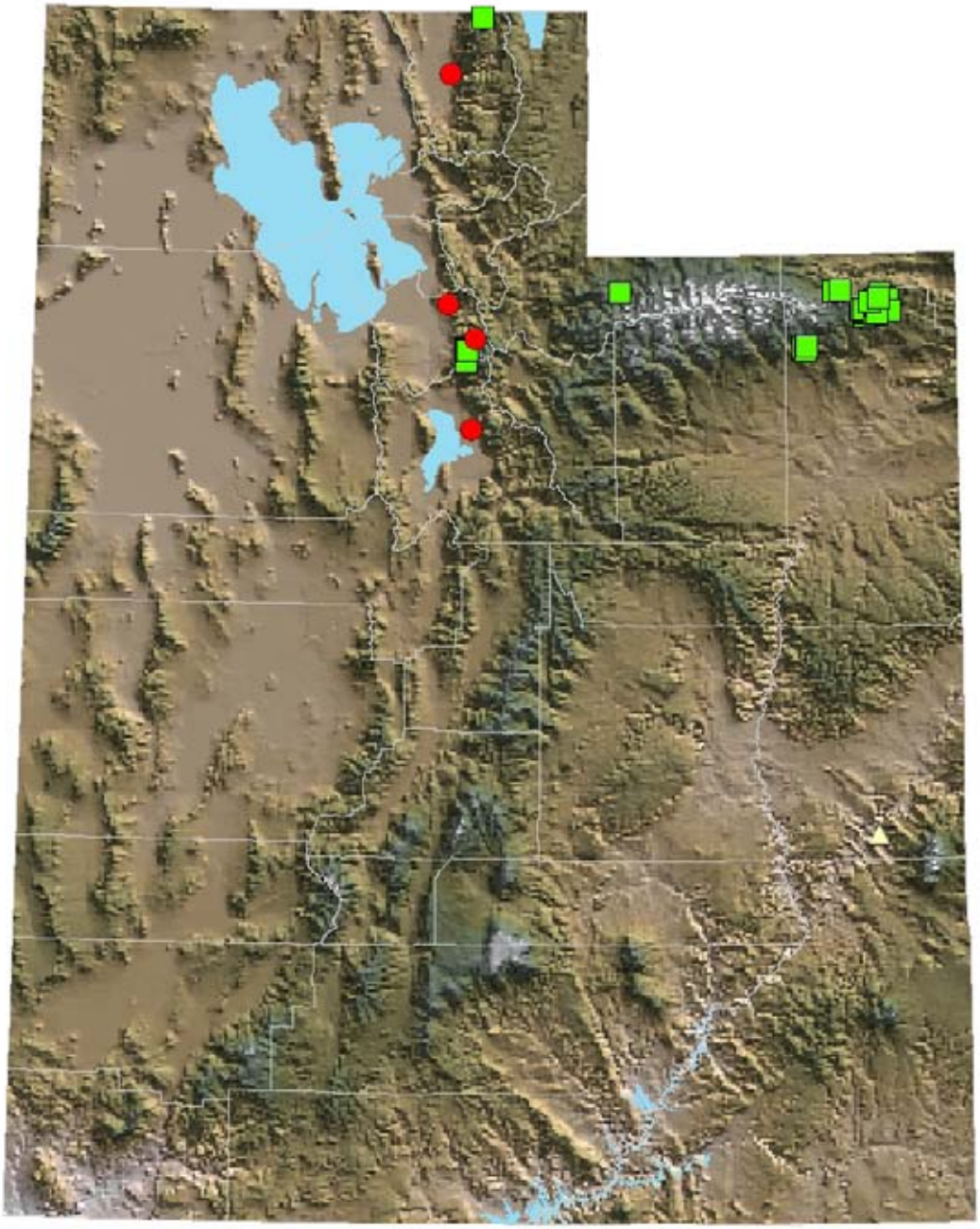

Figure 138. The distribution of small yellow lady's-slipper (*Cypripedium calceolus* subsp. *parviflorum*) ●, clustered lady's-slipper (*Cypripedium fasciculatum*) ■, and Utah bladder fern (*Cystopteris utahensis*) △.

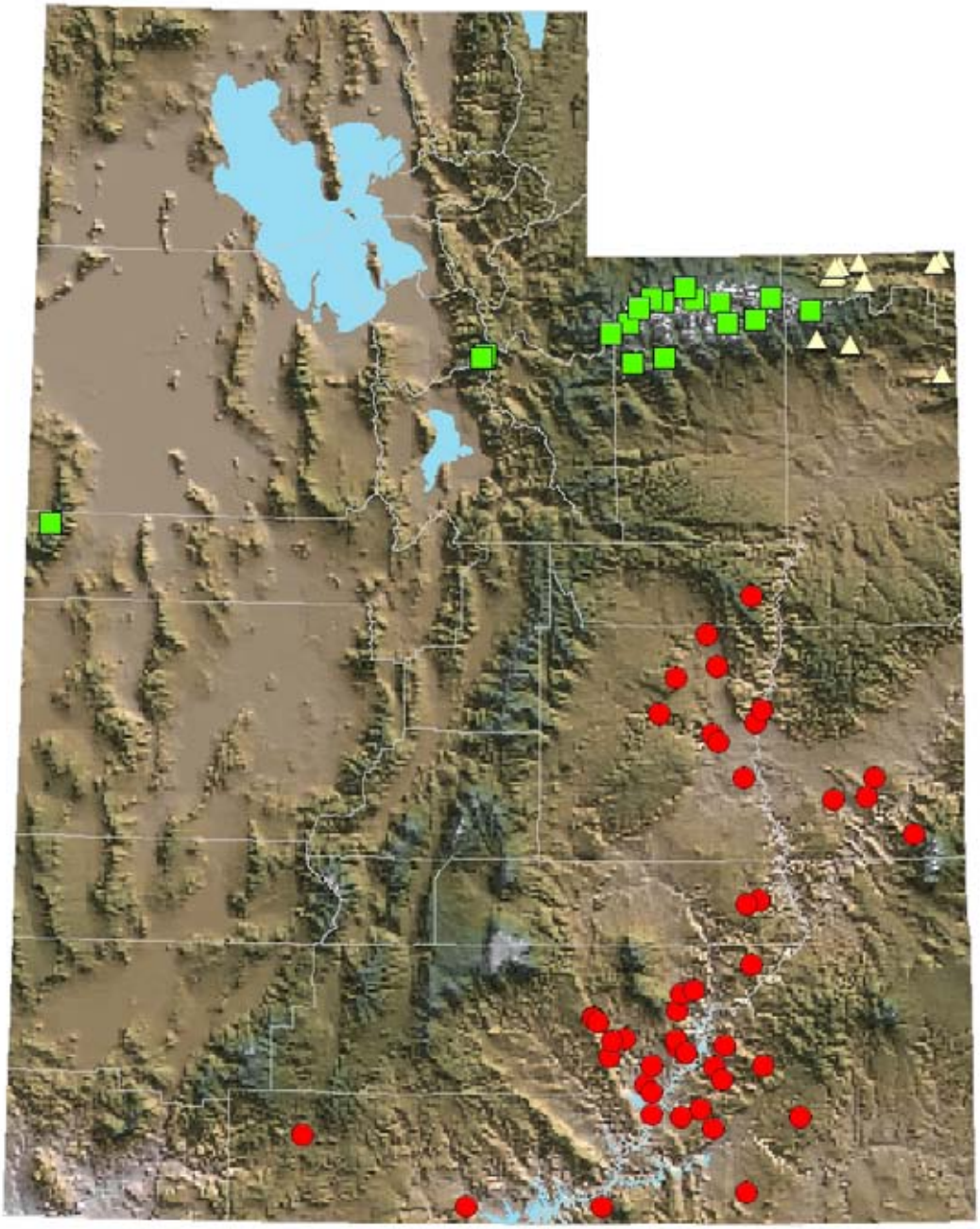

Figure 139. The distribution of Hole-in-the-Rock prairie clover (*Dalea flavescens* var. *epica*) ●, rockcress draba (*Draba globosa*) ■, and juniper whitlow-grass (*Draba juniperina*) △ .

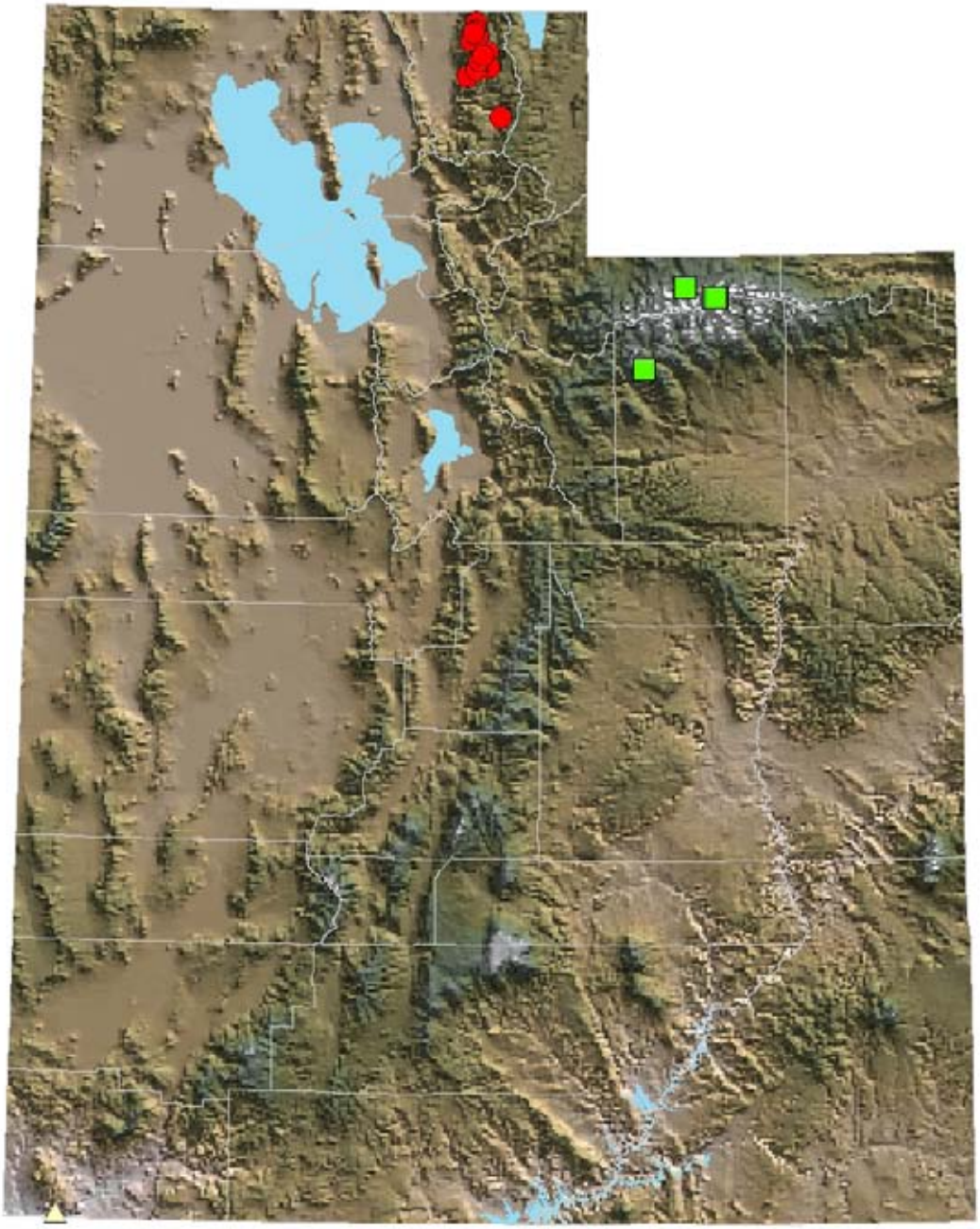

Figure 140. The distribution of Maguire's whitlow-grass (*Draba maguirei*) ●, tundra draba (*Draba ventosa*) ■, and live-forever (*Dudleya pulverulenta* var. *arizonica*) △ .

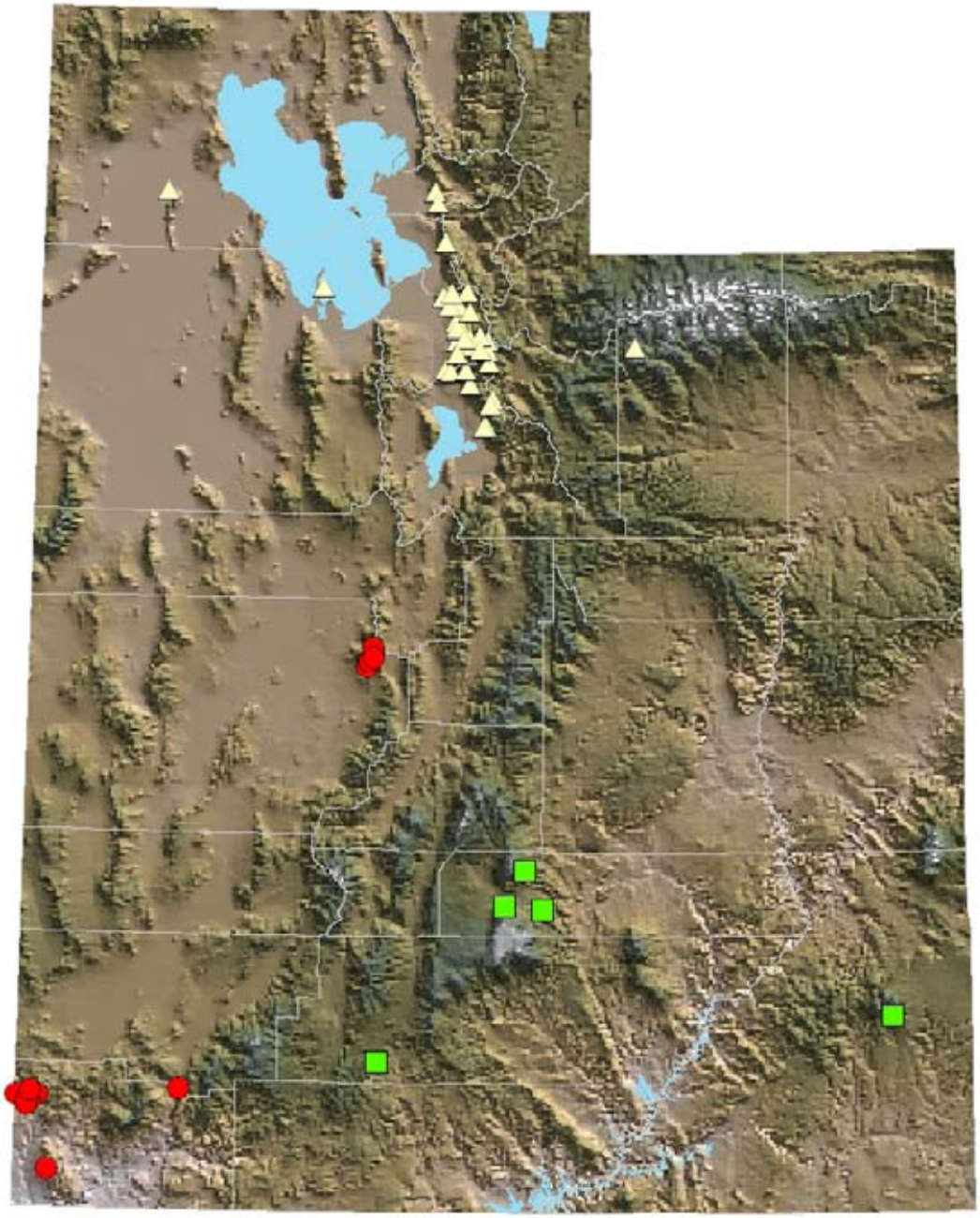

Figure 141. The distribution of Nevada willowherb (*Epilobium nevadense*) ●, Abajo daisy (*Erigeron abajoensis*) ■, and Wasatch daisy (*Erigeron arenarioides*) △ .

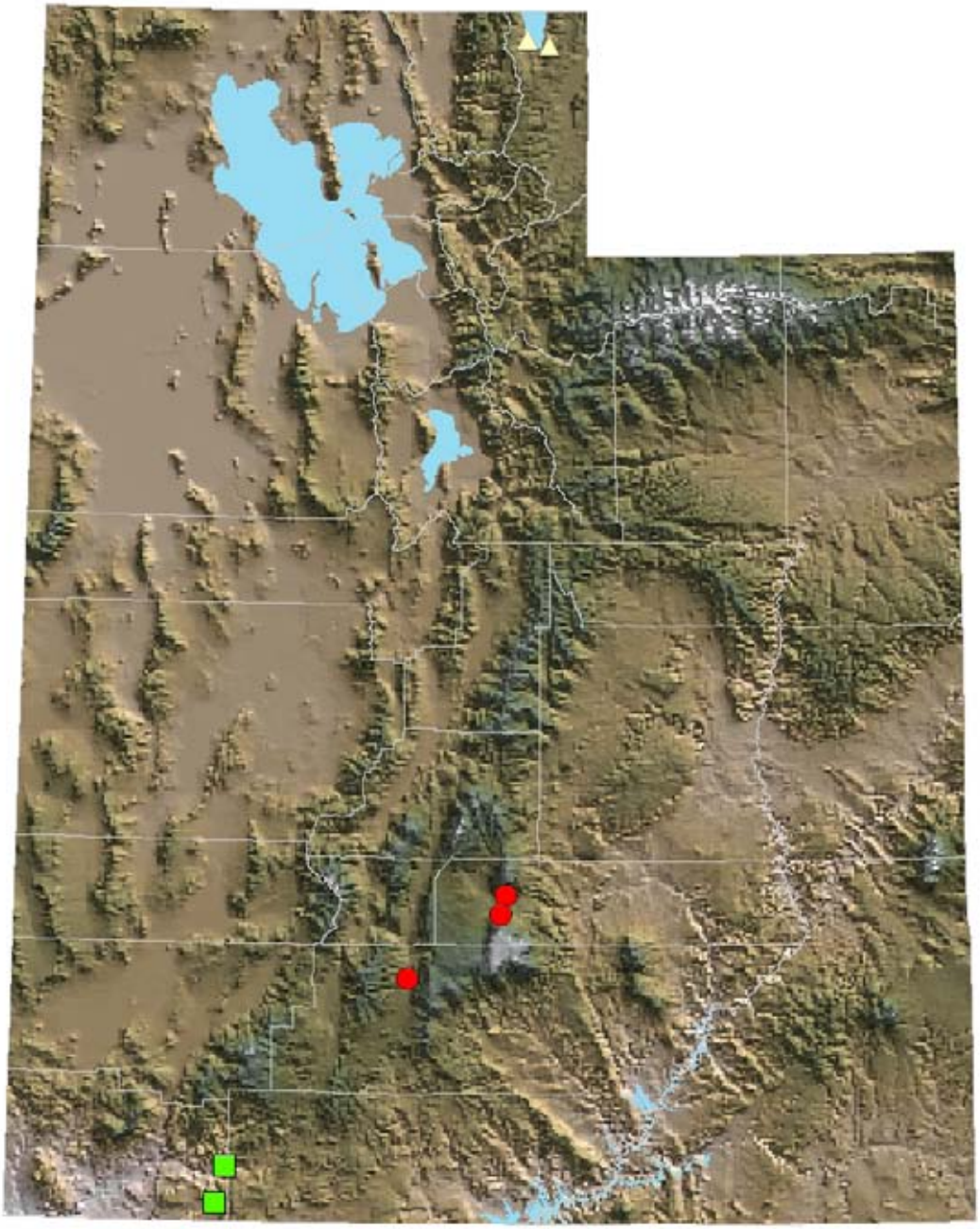

Figure 142. The distribution of Awapa daisy (*Erigeron awapensis*) ●, Canaan daisy (*Erigeron canaani*) ■ , and mountain daisy (*Erigeron corymbosus*) △ .

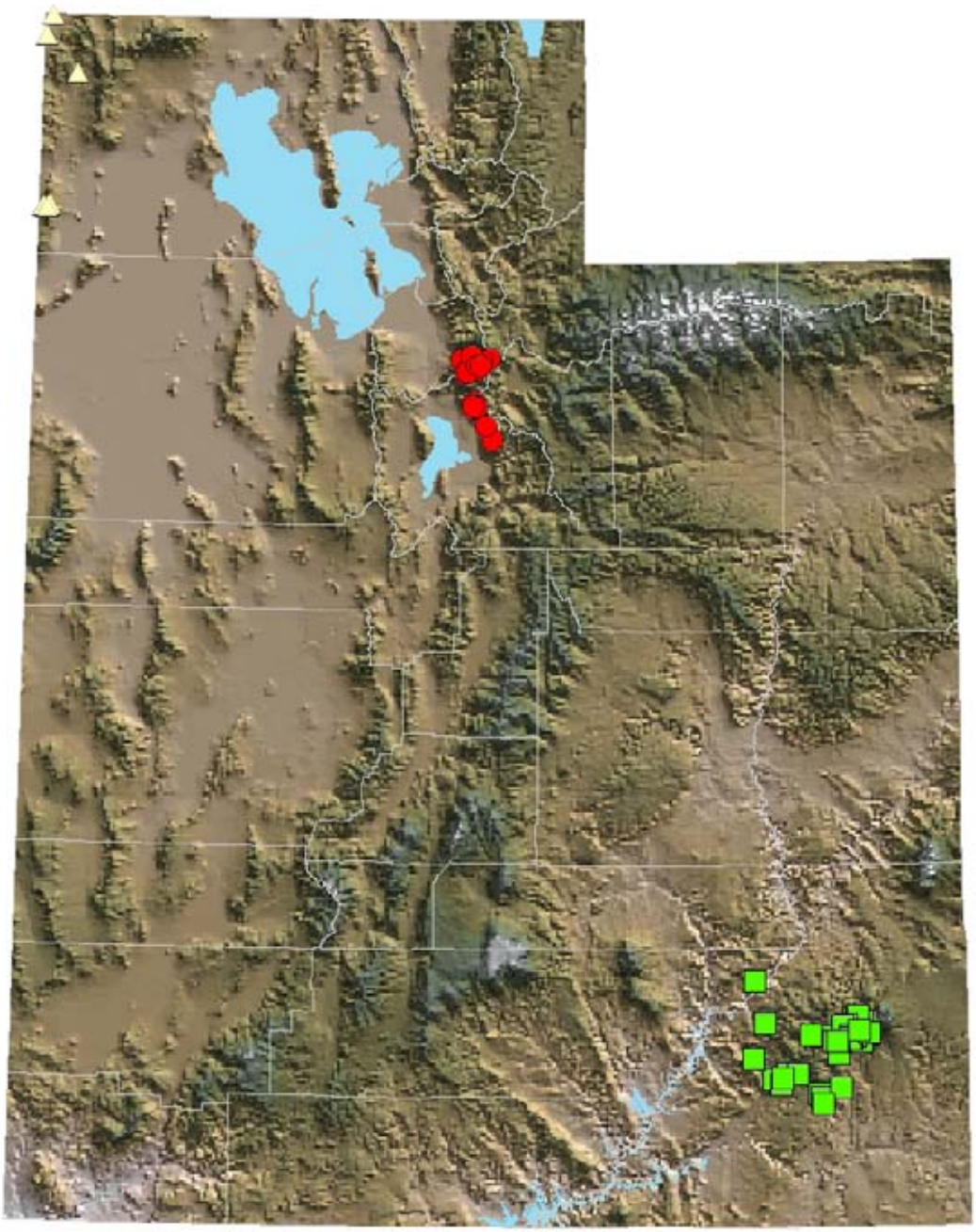

Figure 143. The distribution of Garrett's fleabane (*Erigeron garrettii*) ●, Kachina daisy (*Erigeron kachinensis*) ■, and yellow daisy (*Erigeron linearis*) △ .

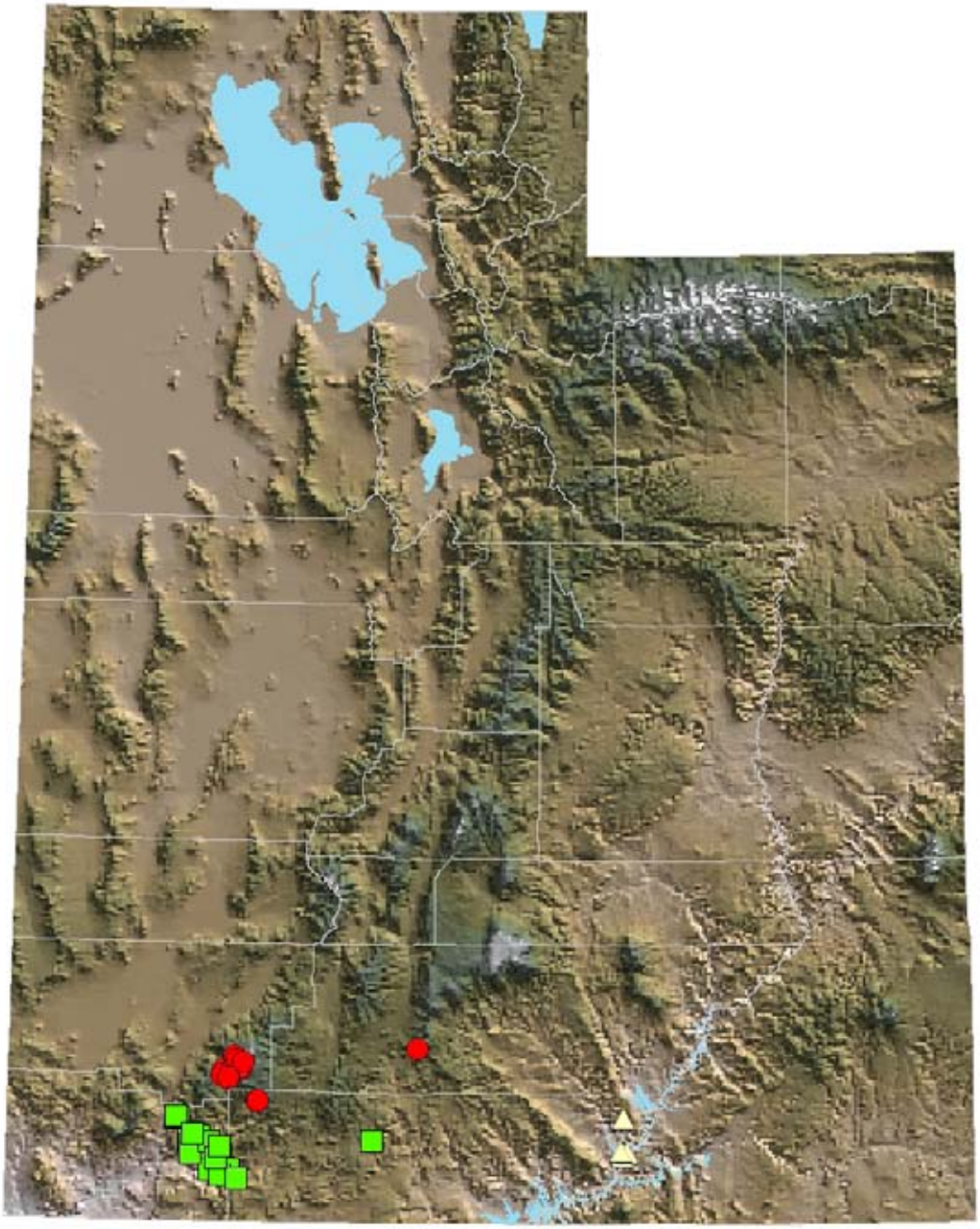

Figure 144. The distribution of professor daisy (*Erigeron proselyticus*) ●, Zion daisy (*Erigeron sionis*) ■, and alcove daisy (*Erigeron zothecinus*) △.

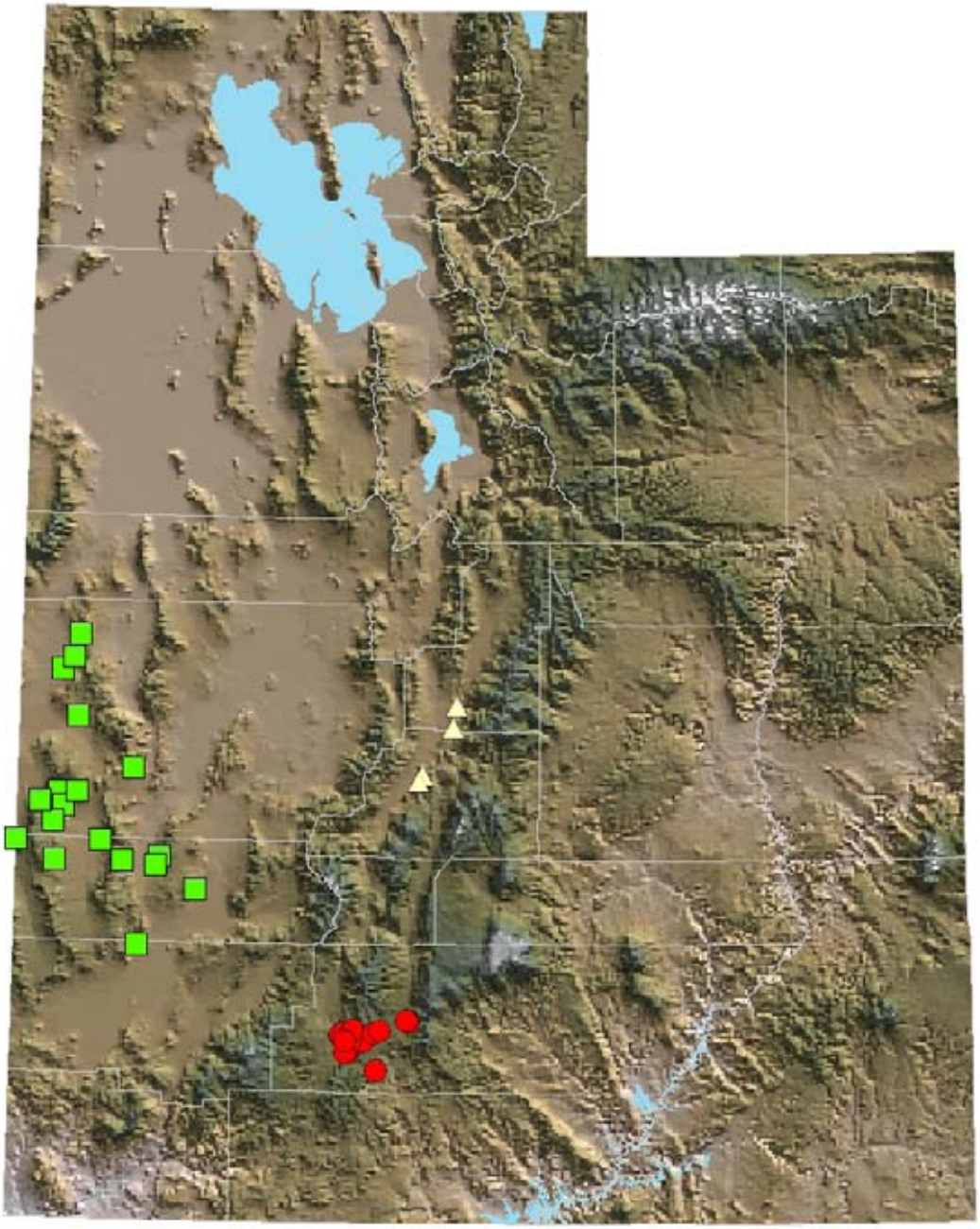

Figure 145. The distribution of Widtsoe wild buckwheat (*Eriogonum aretioides*) ●, hermit wild buckwheat (*Eriogonum batemanii* var. *eremicum*) ■, and Elsinore buckwheat (*Eriogonum batemanii* var. *ostlundii*) △ .

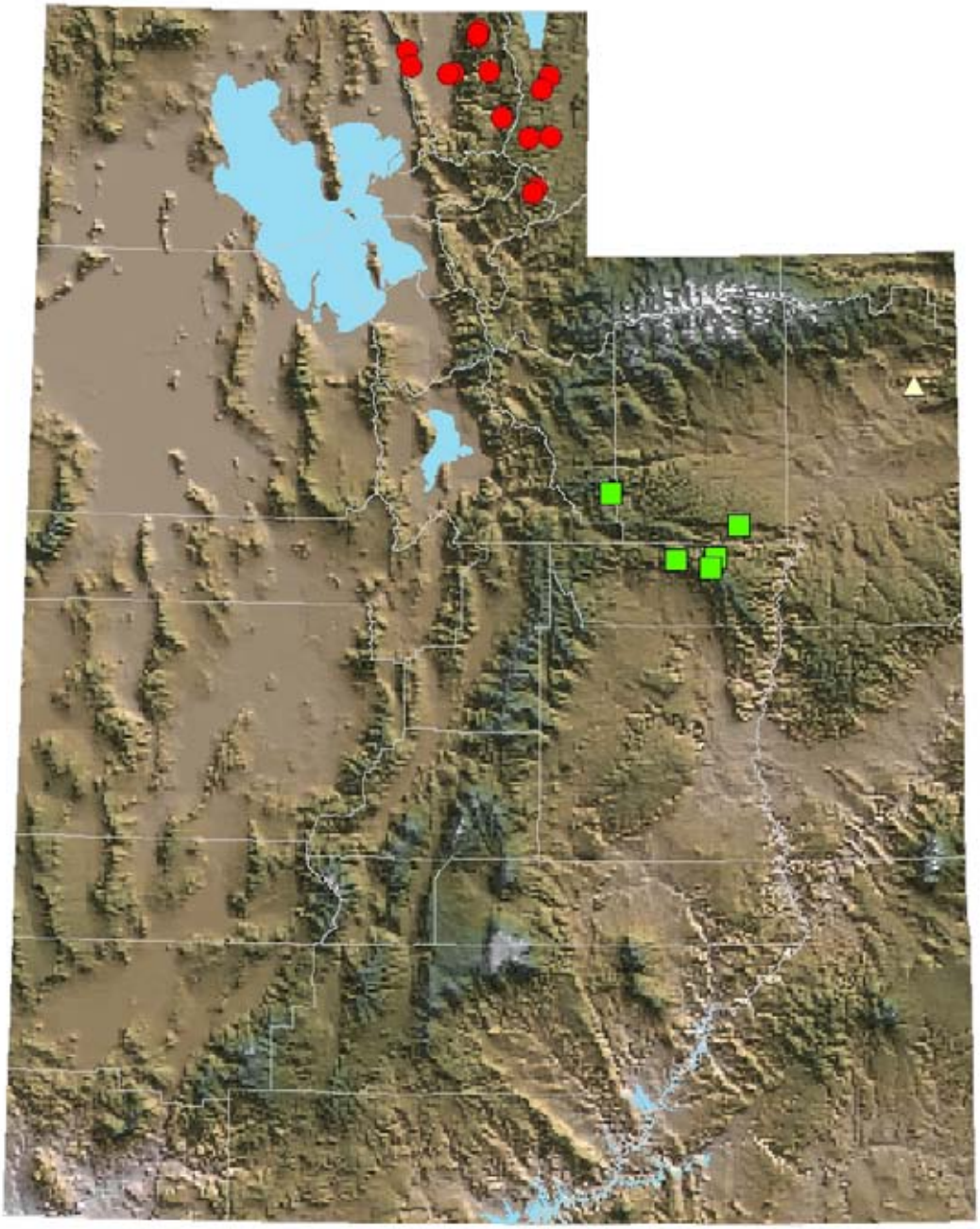

Figure 146. The distribution of Logan wild buckwheat (*Eriogonum brevicaule* var. *loganum*) ●, Mt. Bartles buckwheat (*Eriogonum brevicaule* var. *promiscuum*) ■, and Duchesne buckwheat (*Eriogonum brevicaule* var. *viridulum*) △ .

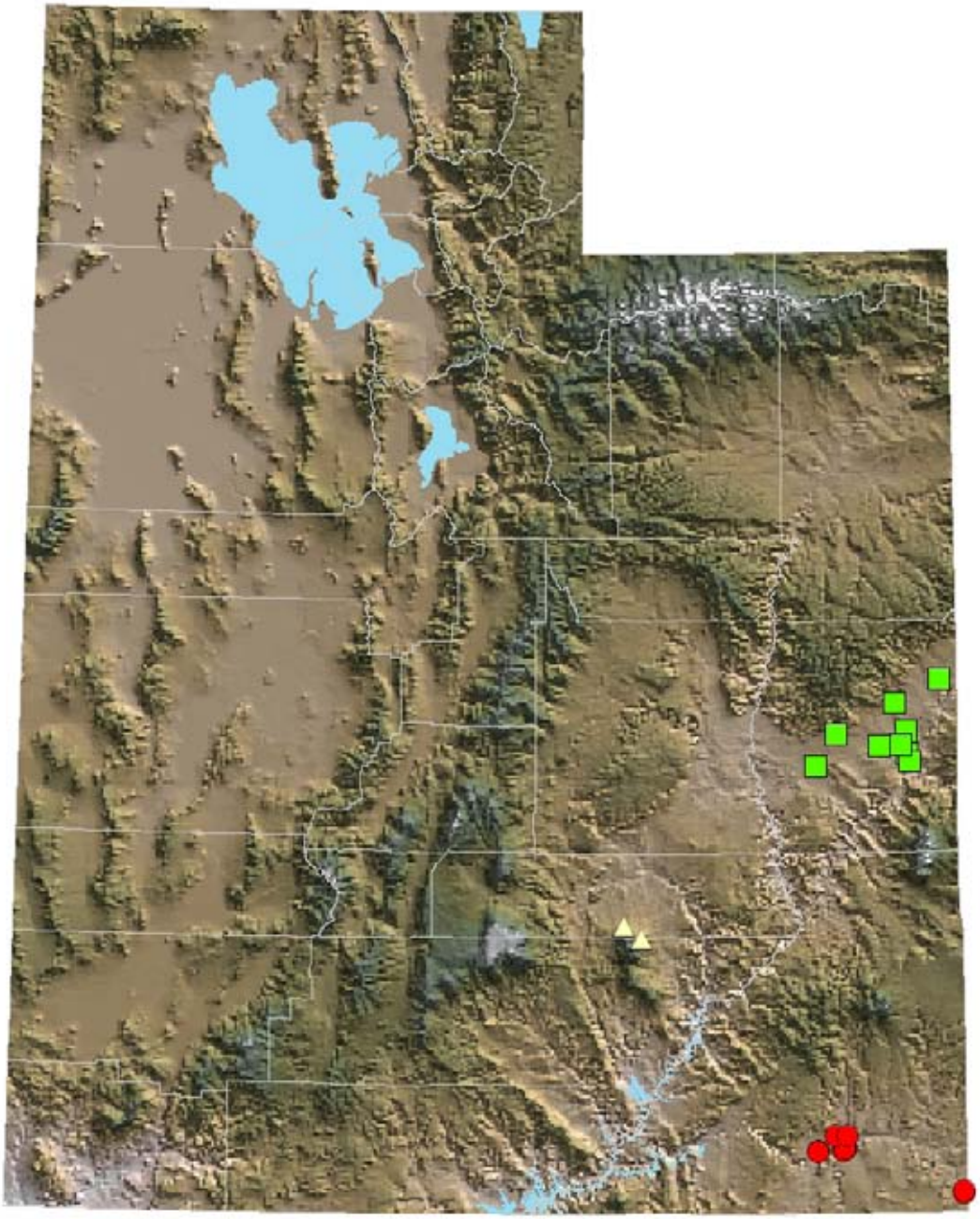

Figure 147. The distribution of Comb Wash wild buckwheat (*Eriogonum clavellatum*) ●, twisted wild buckwheat (*Eriogonum contortum*) ■, and Cronquist wild buckwheat (*Eriogonum corymbosum* var. *cronquistii*) △ .

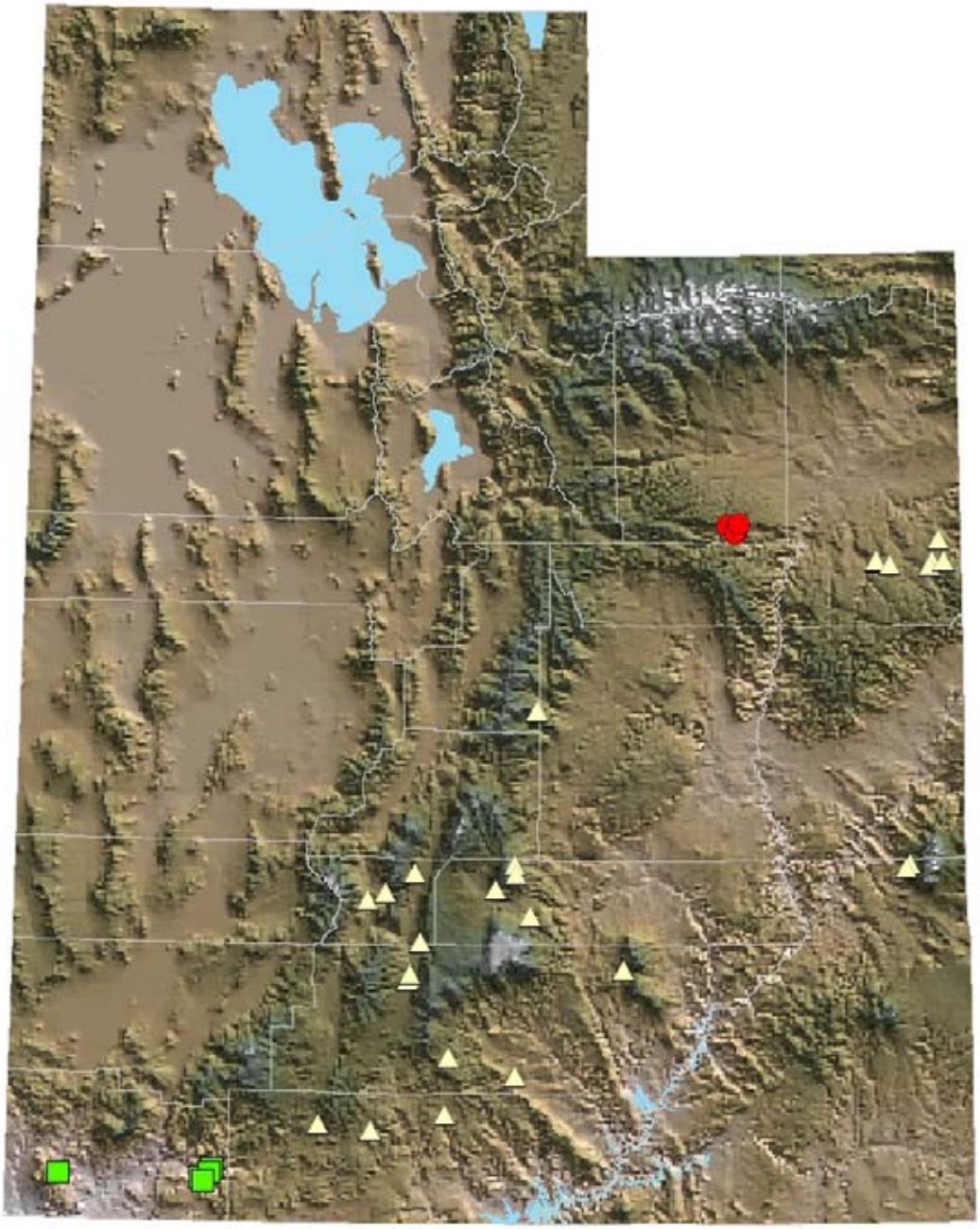

Figure 148. The distribution of Gate Canyon buckwheat (*Eriogonum corymbosum* var. *hylophilum*) ●, Matthew's wild buckwheat (*Eriogonum corymbosum* var. *matthewsiae*) ■, and Reveal's wild buckwheat (*Eriogonum corymbosum* var. *revealianum*) △ .

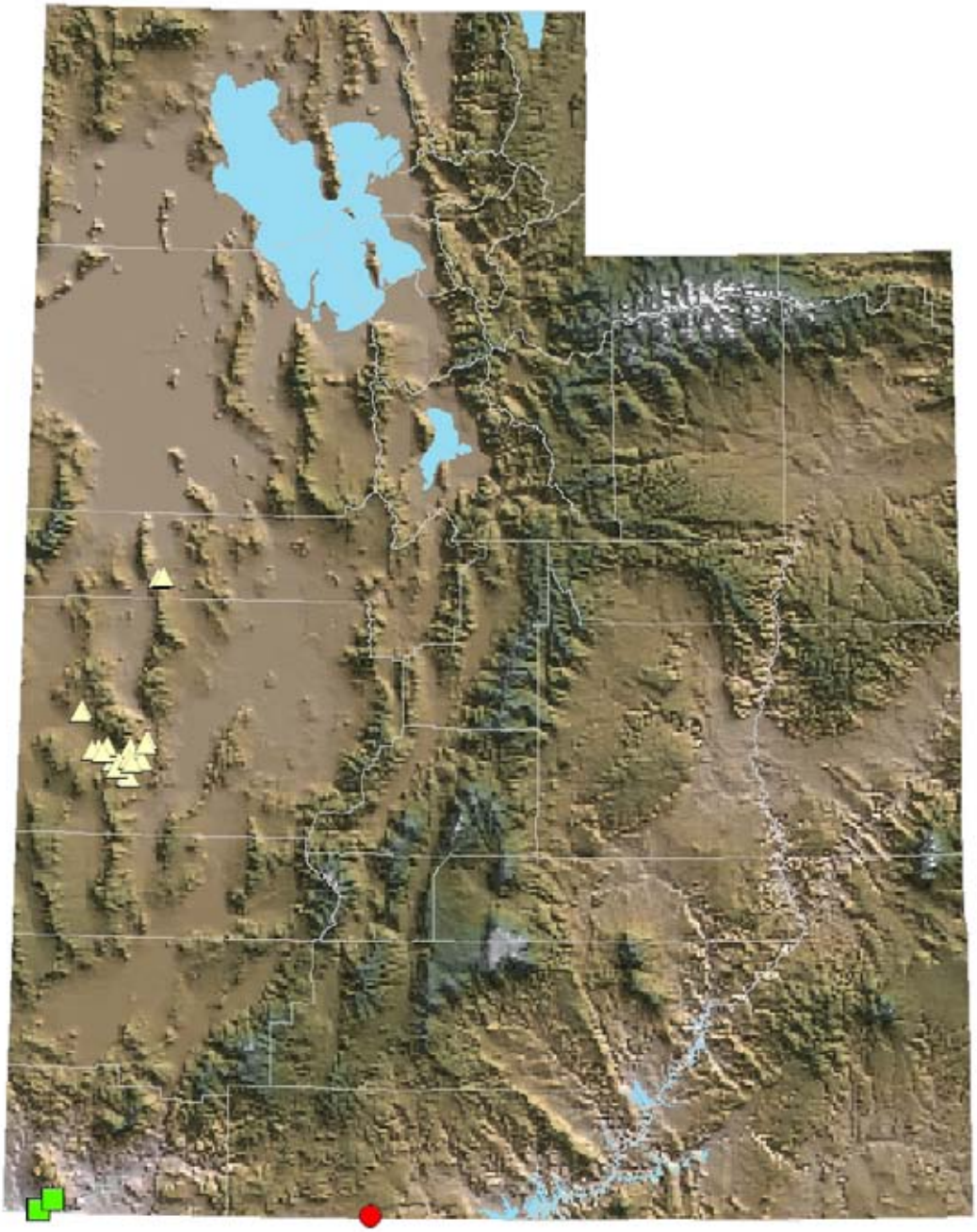

Figure 149. The distribution of Darrow's buckwheat (*Eriogonum darrovii*) ●, Tabeau Peak buckwheat (*Eriogonum heermannii* var. *subspinosum*) ■ , and Ibex buckwheat (*Eriogonum nummulare* var. *ammophilum*) △ .

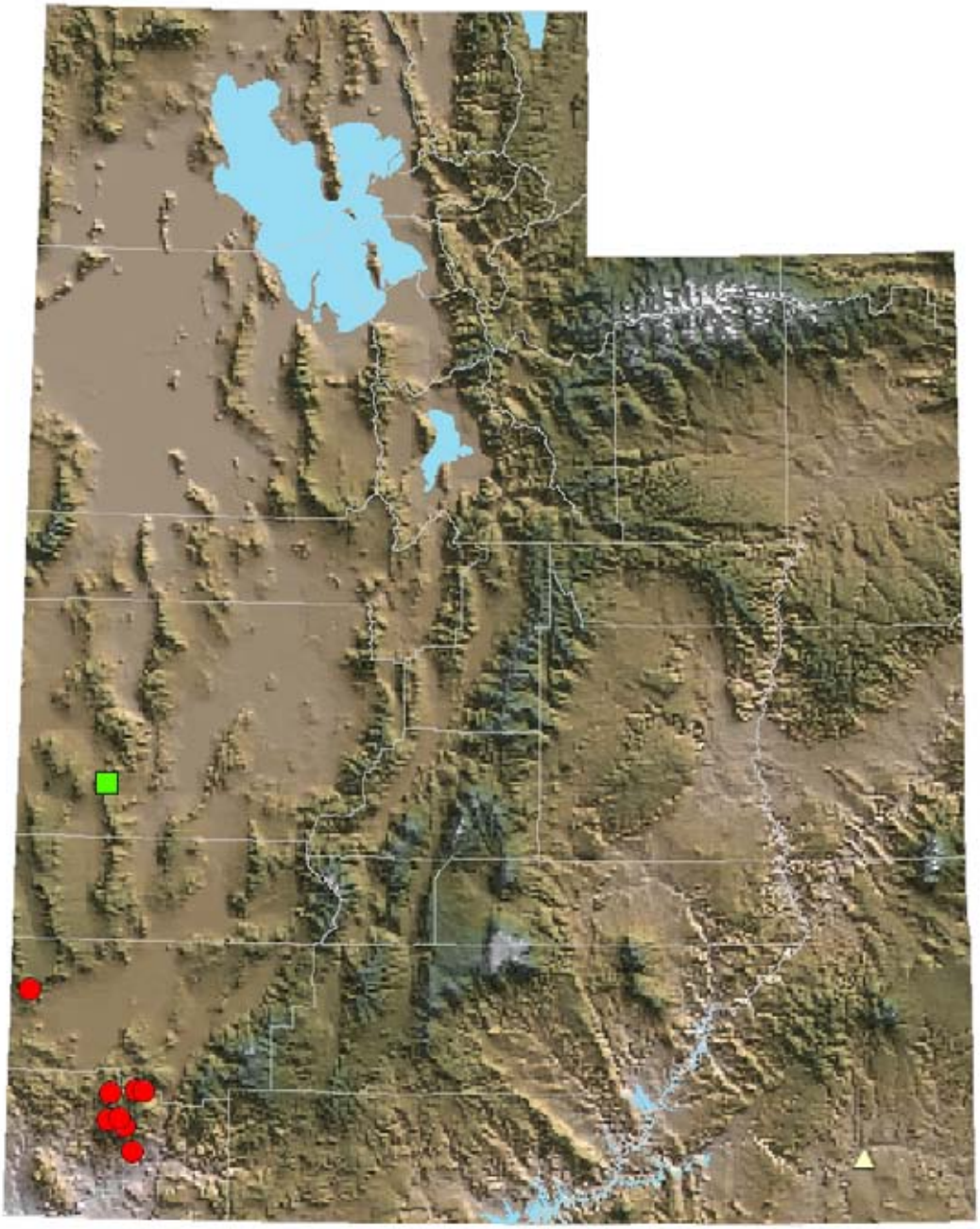

Figure 150. The distribution of wirestem wild-buckwheat (*Eriogonum pharnaceoides* var. *cervinum*) ●, scarlet buckwheat (*Eriogonum phoeniceum*) ■, and Bluff buckwheat (*Eriogonum racemosum* var. *nobile*) △ .

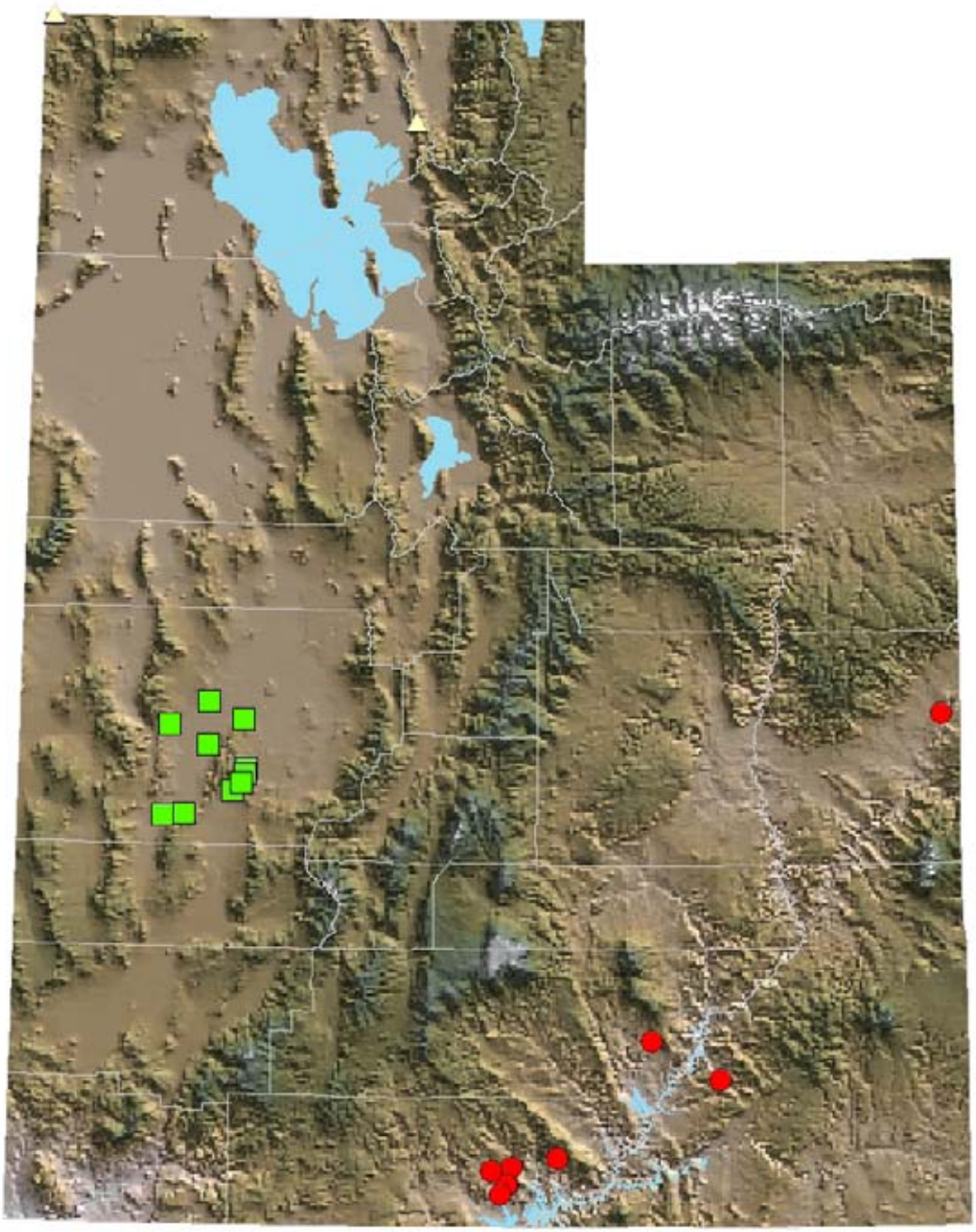

Figure 151. The distribution of Westwater buckwheat (*Eriogonum scabrellum*) ●, son's wild buckwheat (*Eriogonum spathulatum* var. *natum*) ■, and wooly eriophyllum (*Eriophyllum lanatum* var. *integrifolium*) △ .

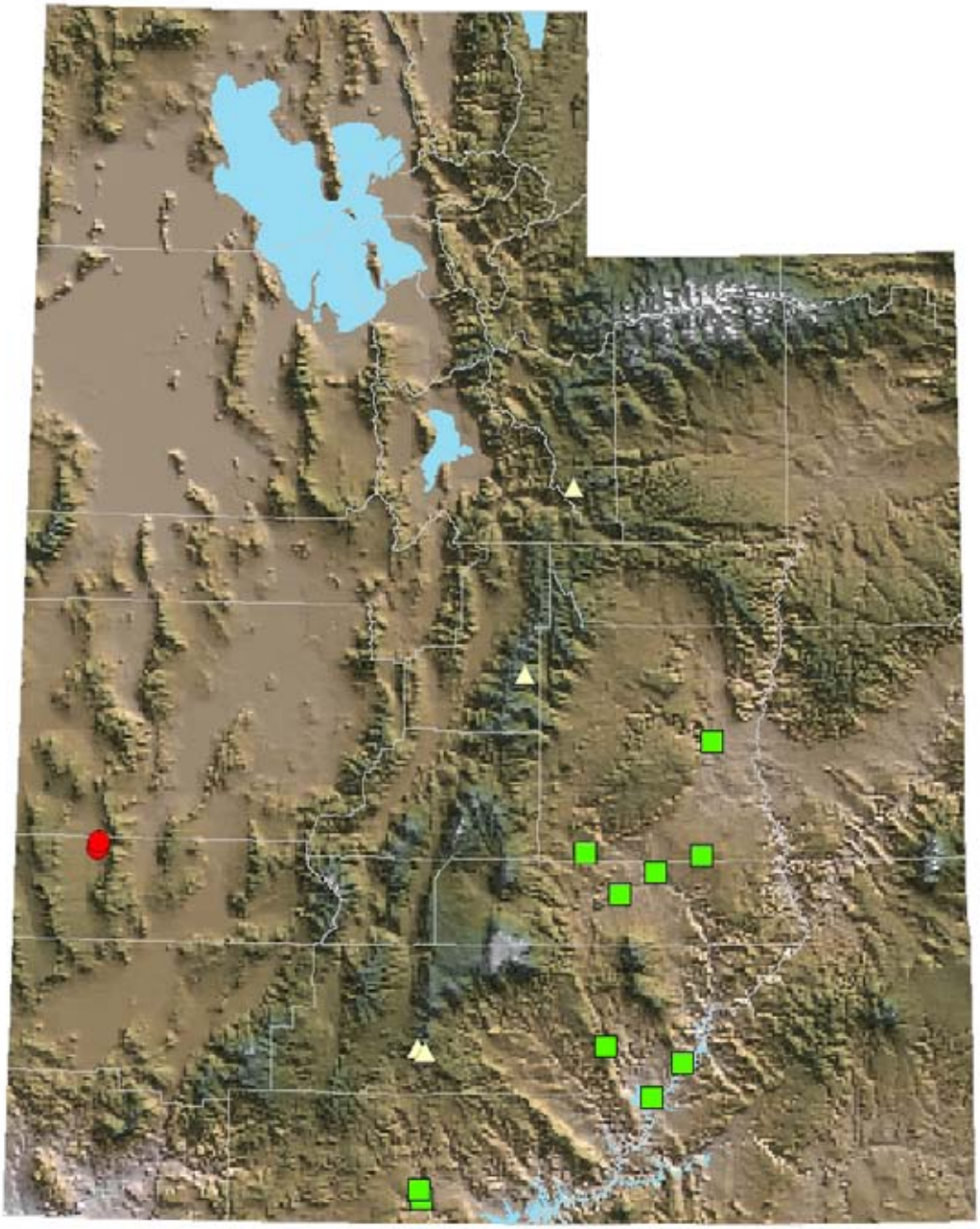

Figure 152. The distribution of square-seeded spurge (*Euphorbia exstipulata*) ●, Paria spurge (*Euphorbia nephradenia*) ■, and Utah fescue (*Festuca dasyclada*) △ .

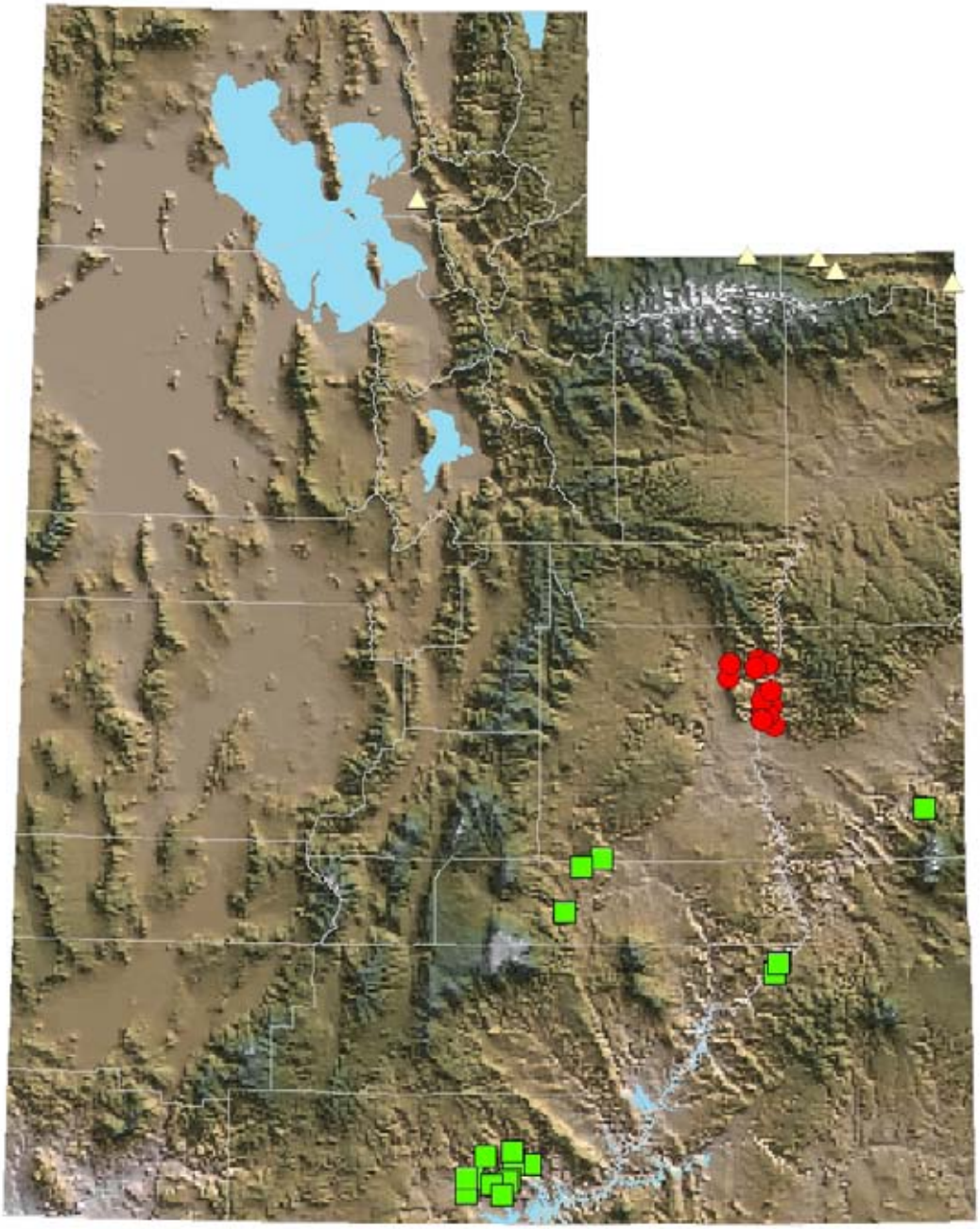

Figure 153. The distribution of yellow blanketflower (*Gaillardia flava*) ●, Cataract gilia (*Gilia imperialis*) ■, and spiked standing-cypress (*Gilia* [*Ipomopsis*] *spicata*) △ .

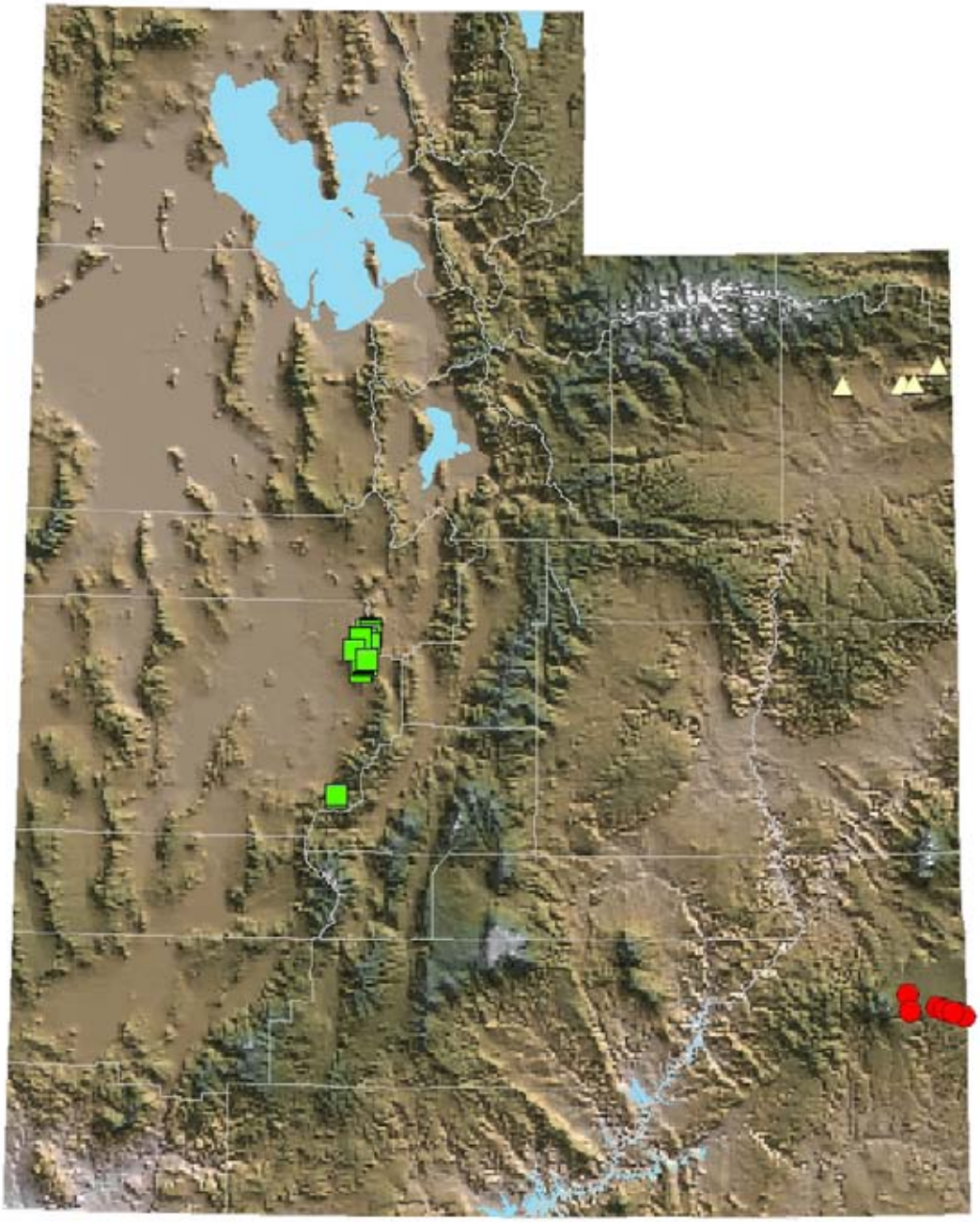

Figure 154. The distribution of cut-leaf gumweed (*Grindelia laciniata*) ●, goldenrod snakeweed (*Gutierrezia petradoria*) ■, and orchard snakeweed (*Gutierrezia pomariensis*) △ .

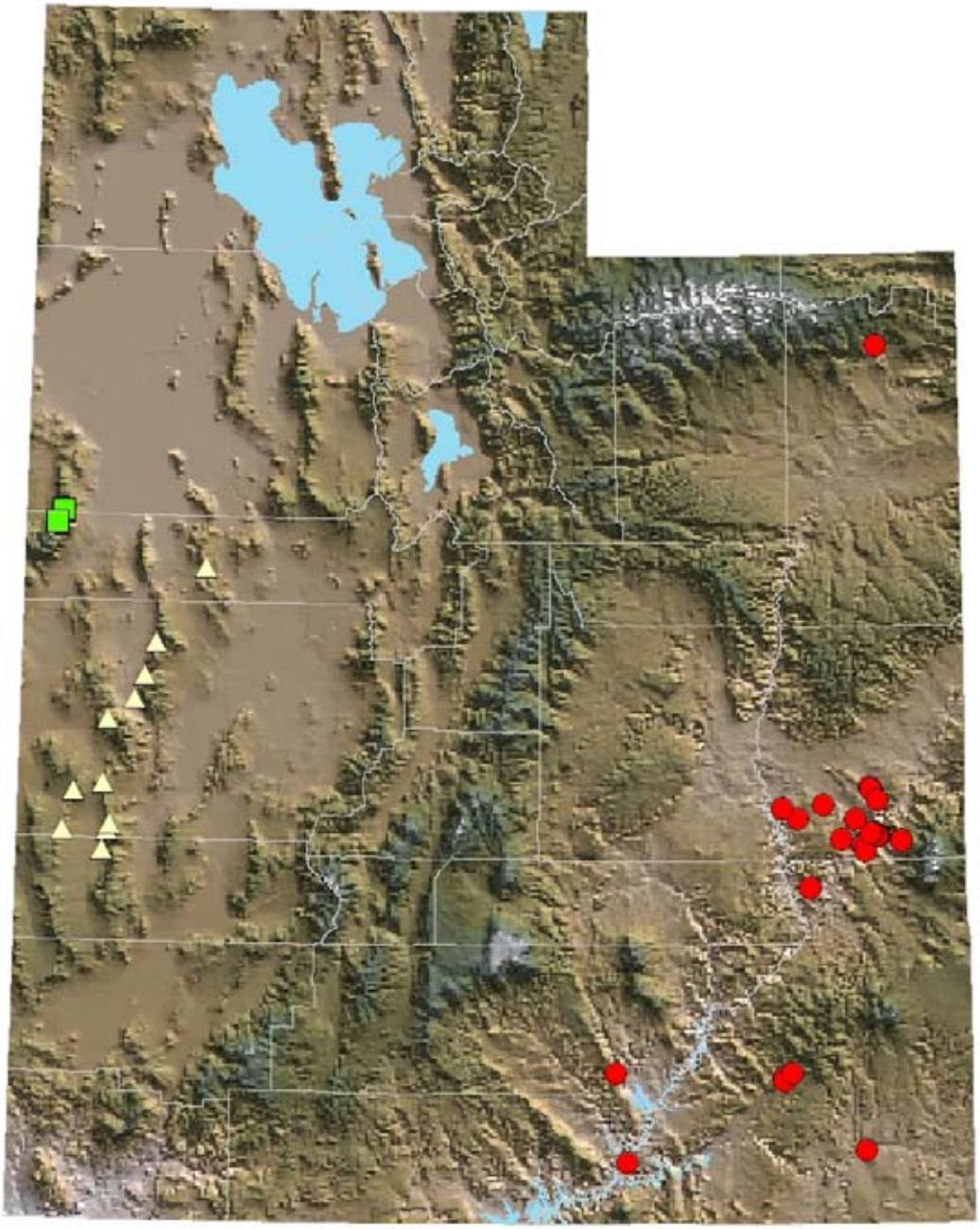

Figure 155. The distribution of alcove bog-orchid (*Habenaria zothecina*) ●, Deep Creek stickseed (*Hackelia ibapensis*) ■, and antelope goldenbush (*Haplopappus cervinus*) △ .

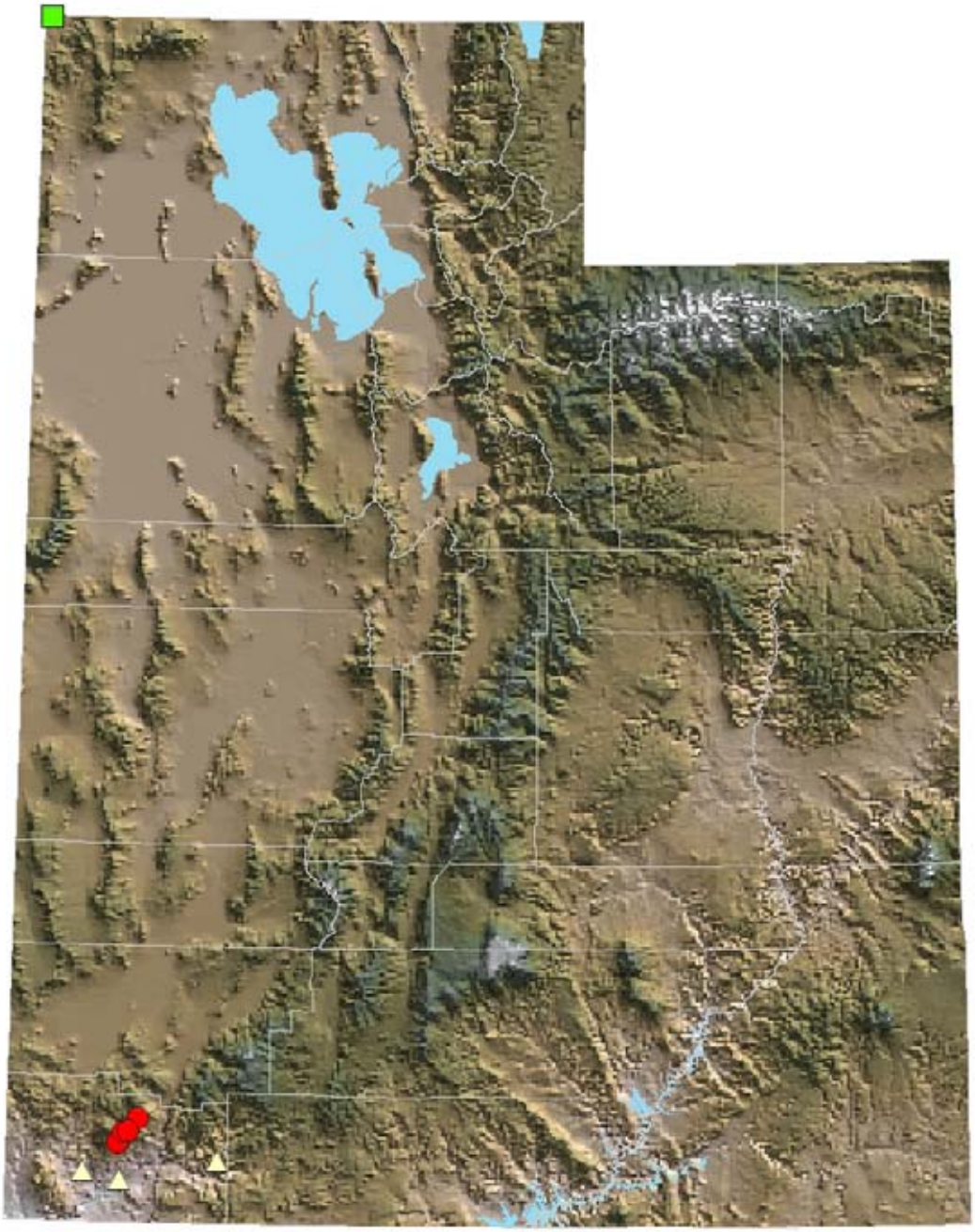

Figure 156. The distribution of Pine Valley goldenbush (*Haplopappus crispus*) ●, sticky goldenweed (*Haplopappus hirtus*) ■, and canyon goldenweed (*Haplopappus leverichii*) △.

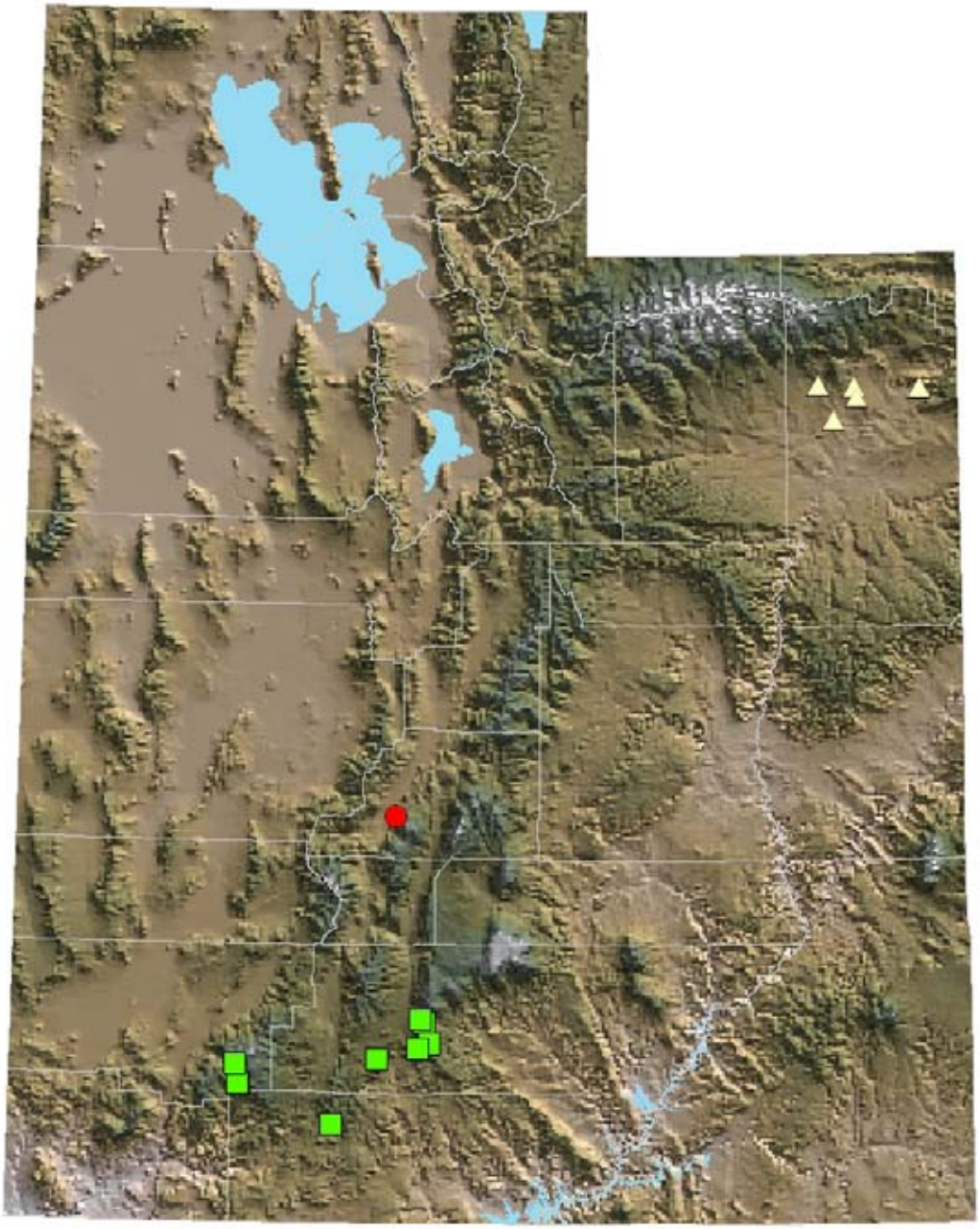

Figure 157. The distribution of Greenwood's goldenaster (*Haplopappus lignumviridis*) ●, Cedar Breaks goldenbush (*Haplopappus zionis*) ■, and Rollin's sweetvetch (*Hedysarum boreale* var. *gremiale*) △ .

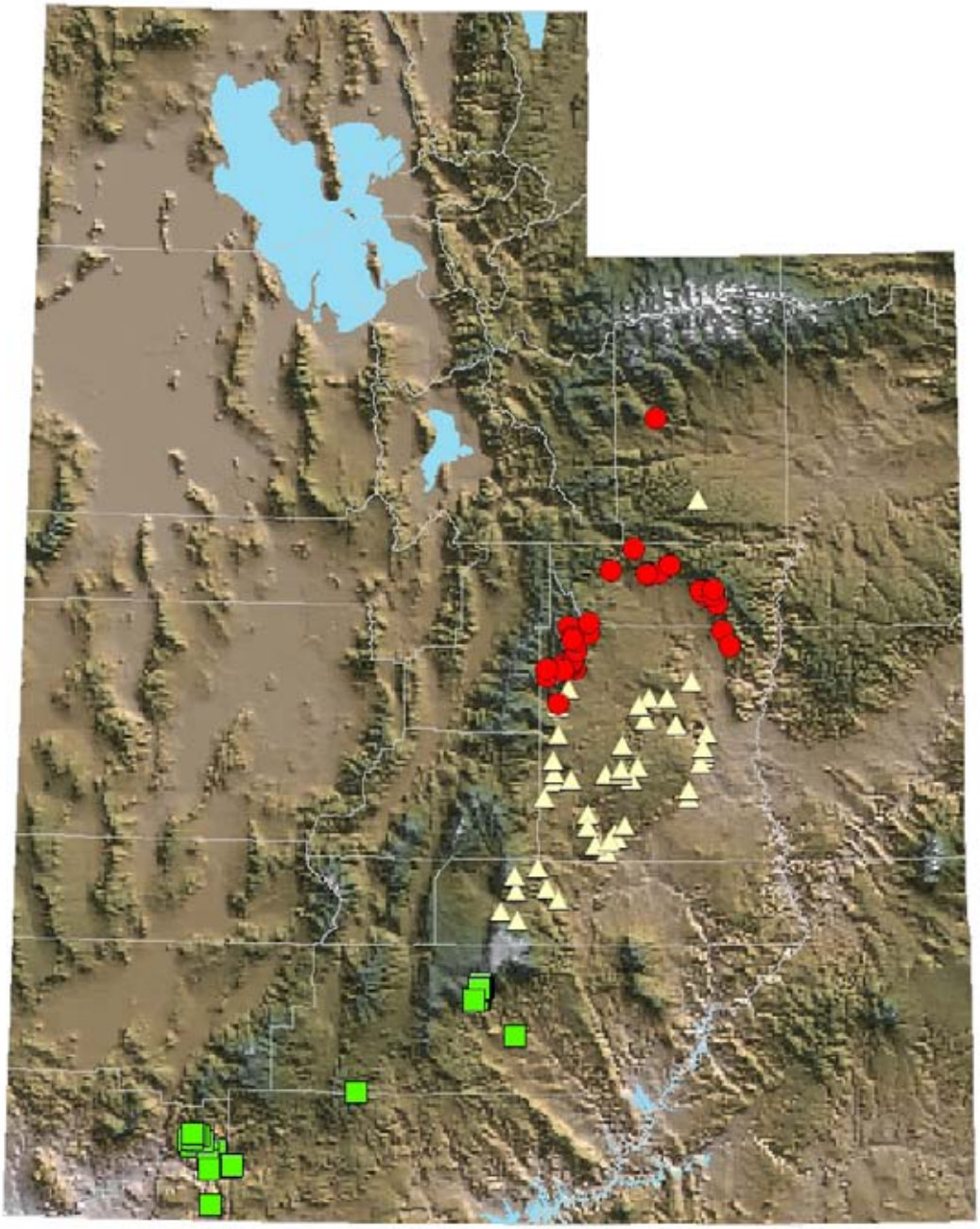

Figure 158. The distribution of canyon sweetvetch (*Hedysarum occidentale* var. *canone*) ●, Jones' golden-aster (*Heterotheca jonesii*) ■, and low woollybase (*Hymenoxys acaulis* var. *nana*) △ .

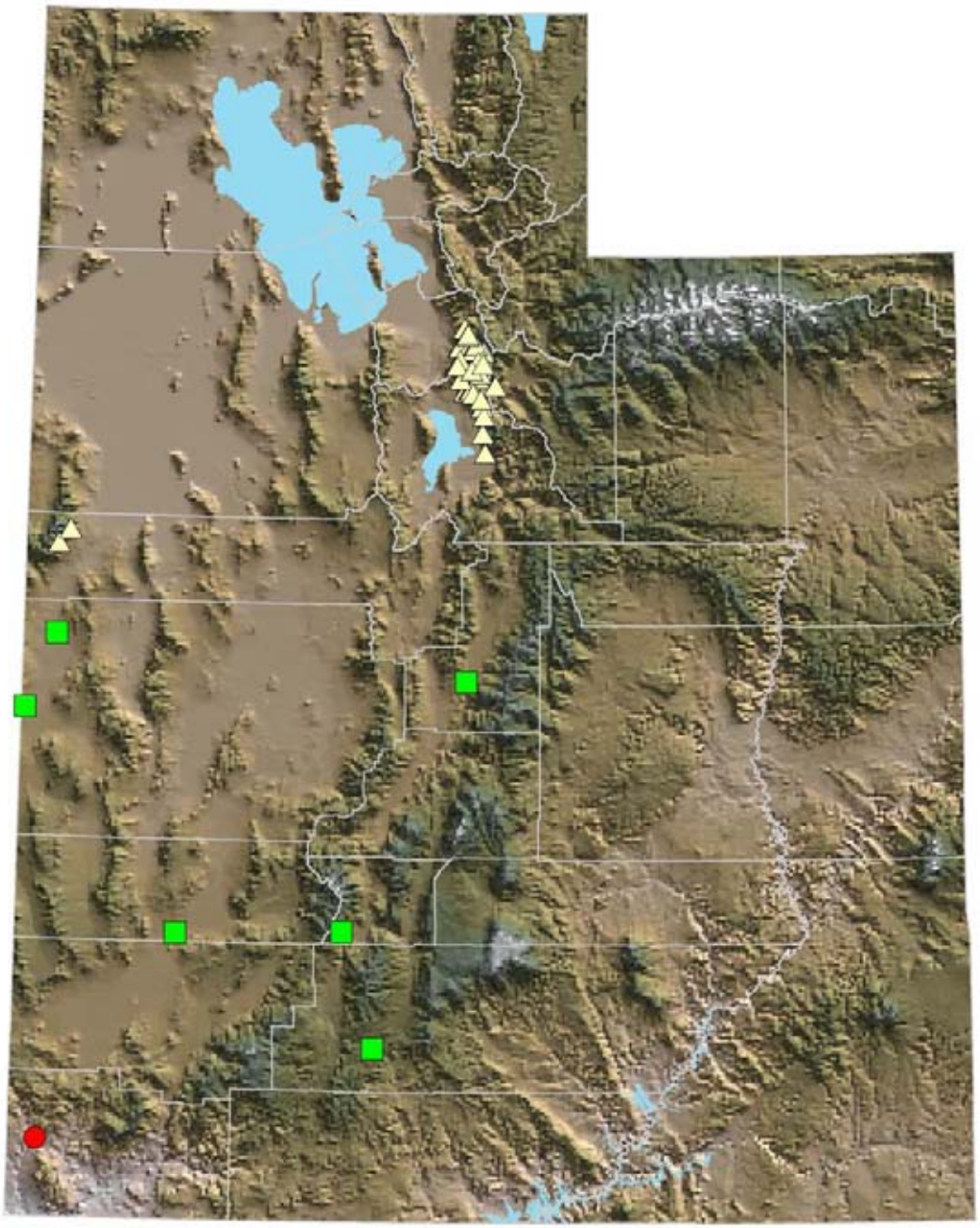

Figure 159. The distribution of Howell's quillwort (*Isoetes howellii*) ●, King's ivesia (*Ivesia kingii*) ■, and Wasatch jamesia (*Jamesia americana* var. *macrocalyx*) △ .

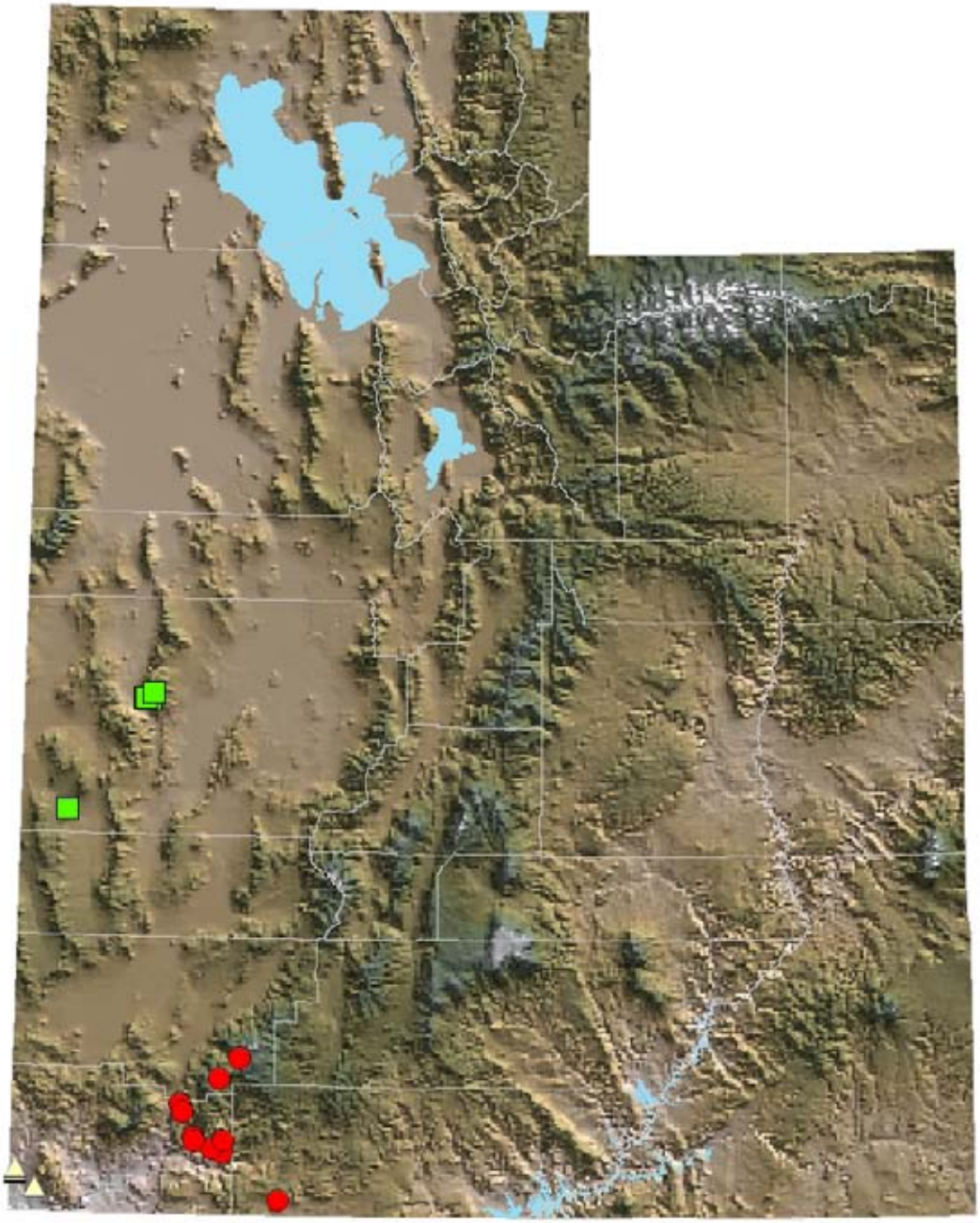

Figure 160. The distribution of Zion jamesia (*Jamesia americana* var. *zionis*) ●, Basin jamesia (*Jamesia tetrapetala*) ■, and long-leaf rush (*Juncus macrophyllus*) △ .

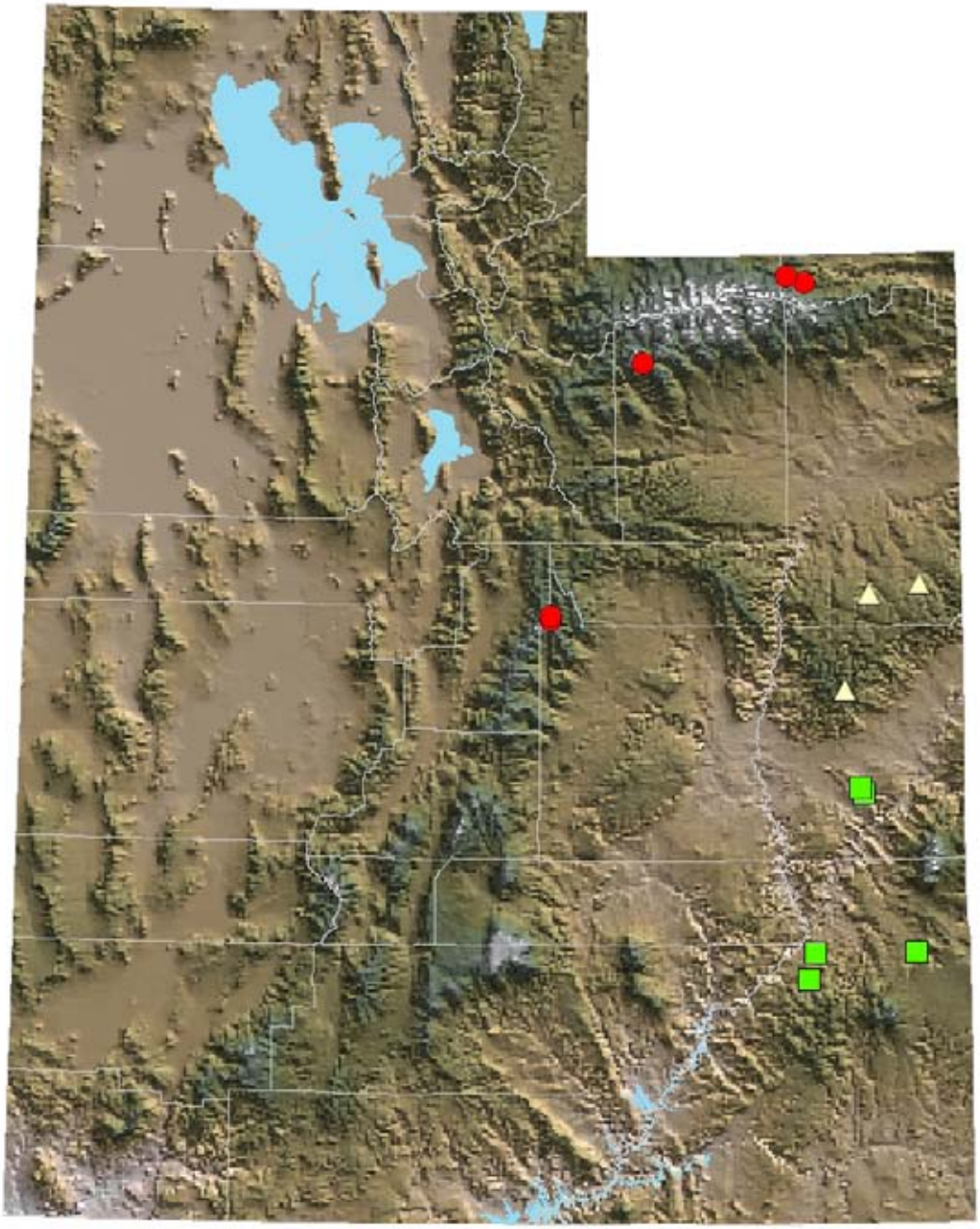

Figure 161. The distribution of compound kobresia (*Kobresia simpliciuscula*) ●, Ruin Park winter-fat (*Krascheninnikovia lanata* var. *ruinina*) ■, and false boneset (*Kuhnia* [*Brickellia*] *eupatorioides* var. *chlorolepis*) △ .

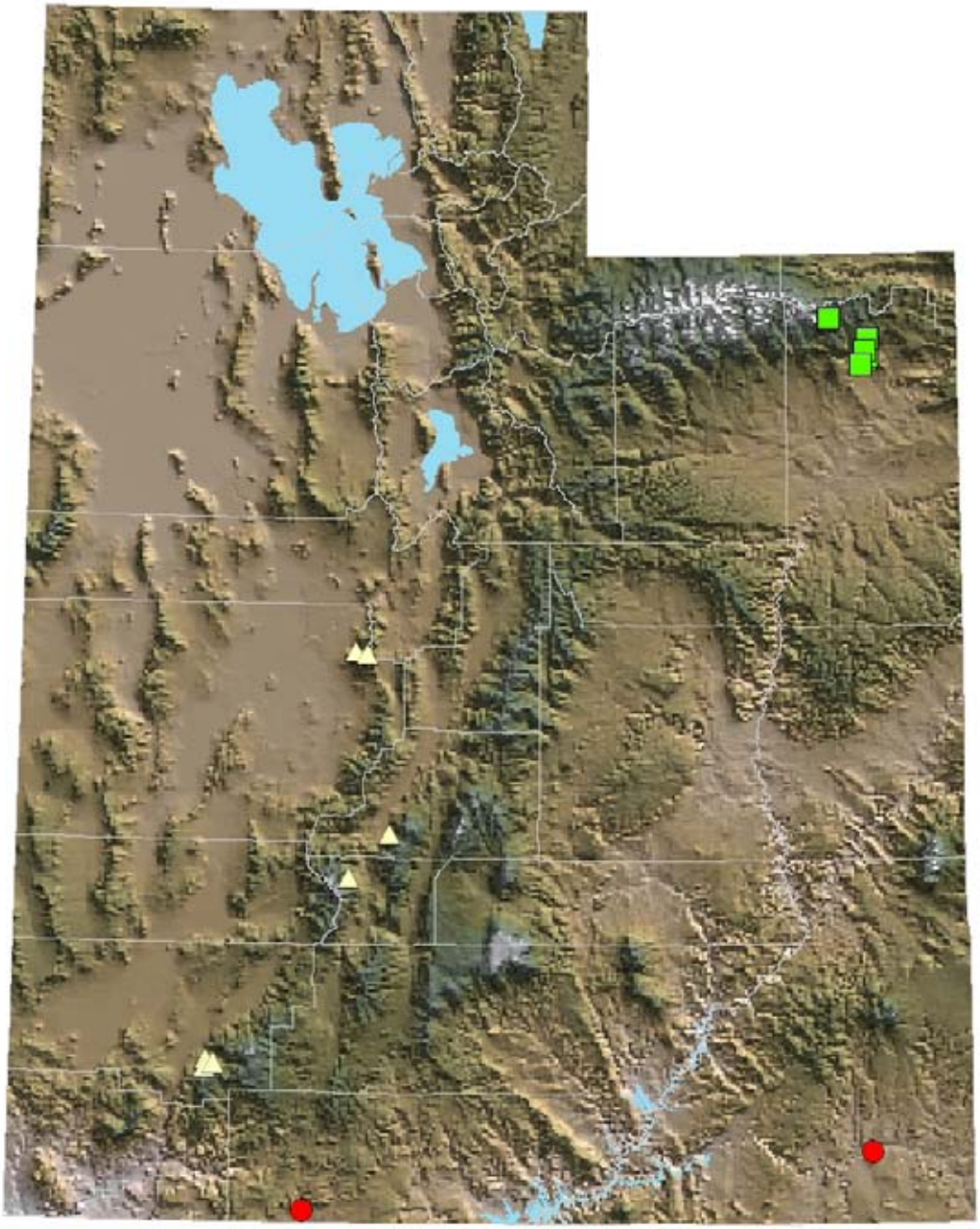

Figure 162. The distribution of Lee's Ferry peppergrass (*Lepidium alyssoides* var. *junceum*) ●, Huber's pepperplant (*Lepidium huberi*) ■, and varied peppergrass (*Lepidium integrifolium* var. *heterophyllum*) △ .

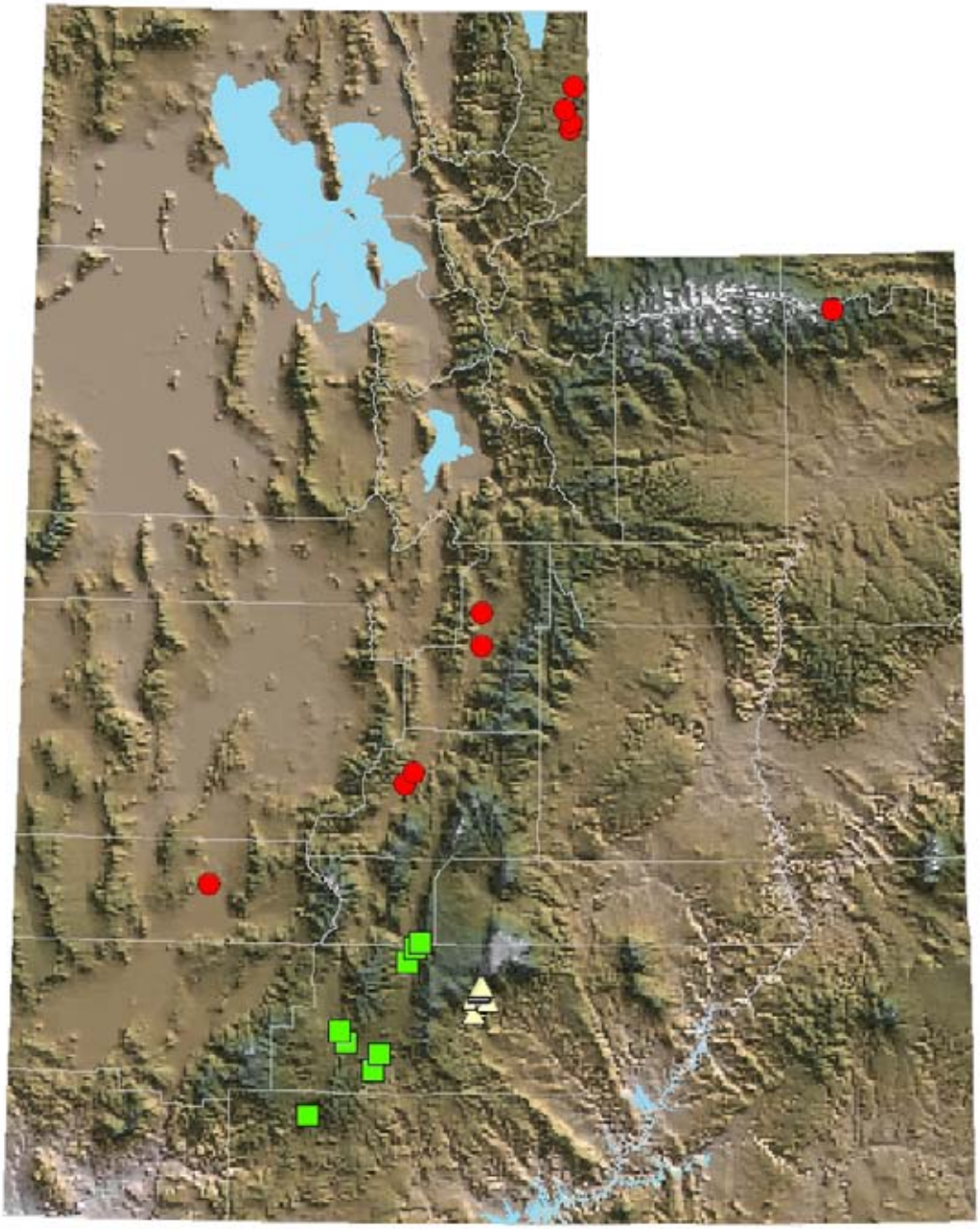

Figure 163. The distribution of meadow pepper-wortplant (*Lepidium integrifolium* var. *integrifolium*) ●, Claron pepperplant (*Lepidium montanum* var. *claronense*) ■ , and Neese's pepperplant (*Lepidium montanum* var. *neeseae*) △ .

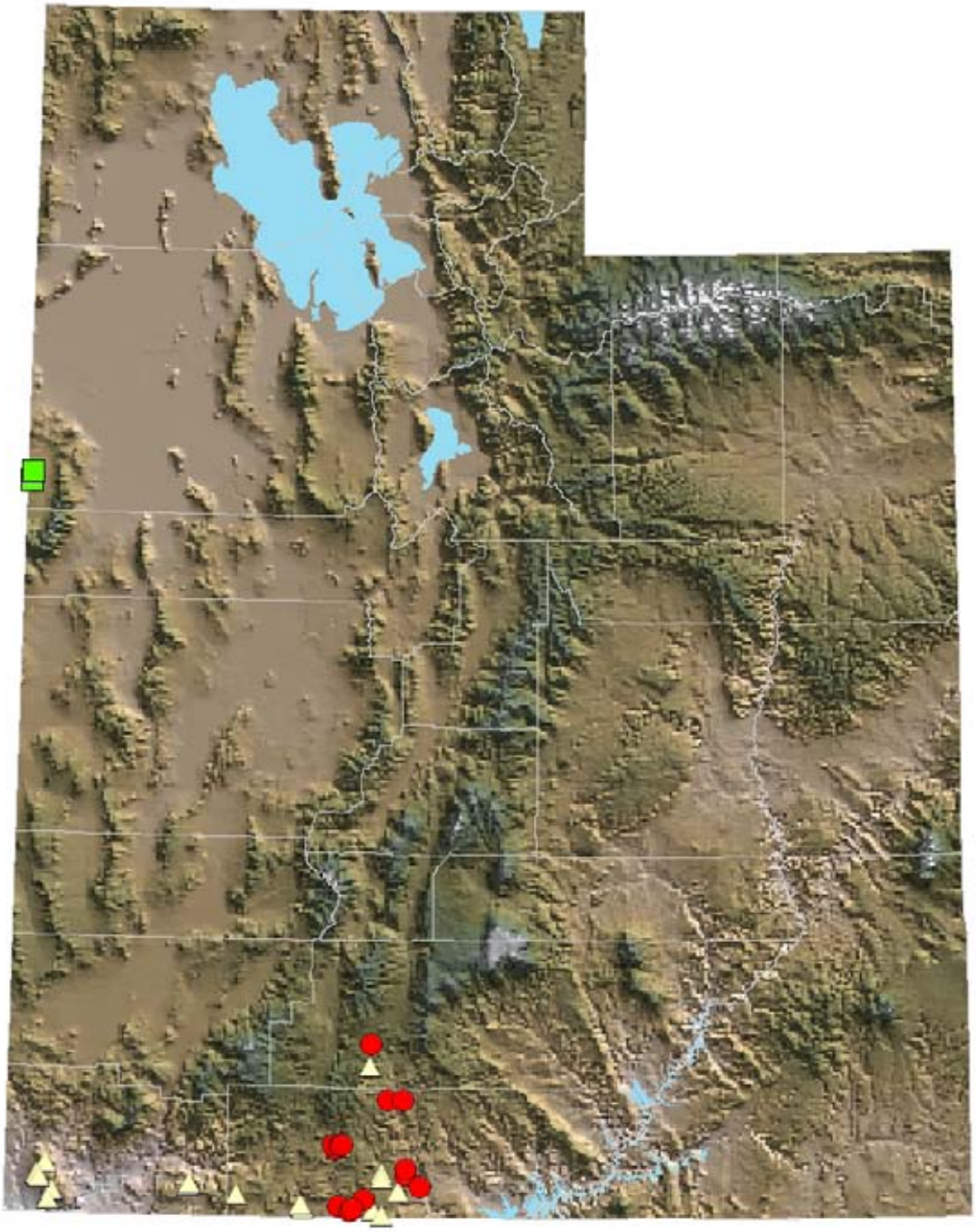

Figure 164. The distribution of Stella's pepperplant (*Lepidium montanum* var. *stellae*) ●, southwestern peppergrass (*Lepidium nanum*) ■, and Arizona bladderpod (*Lesquerella arizonica*) △ .

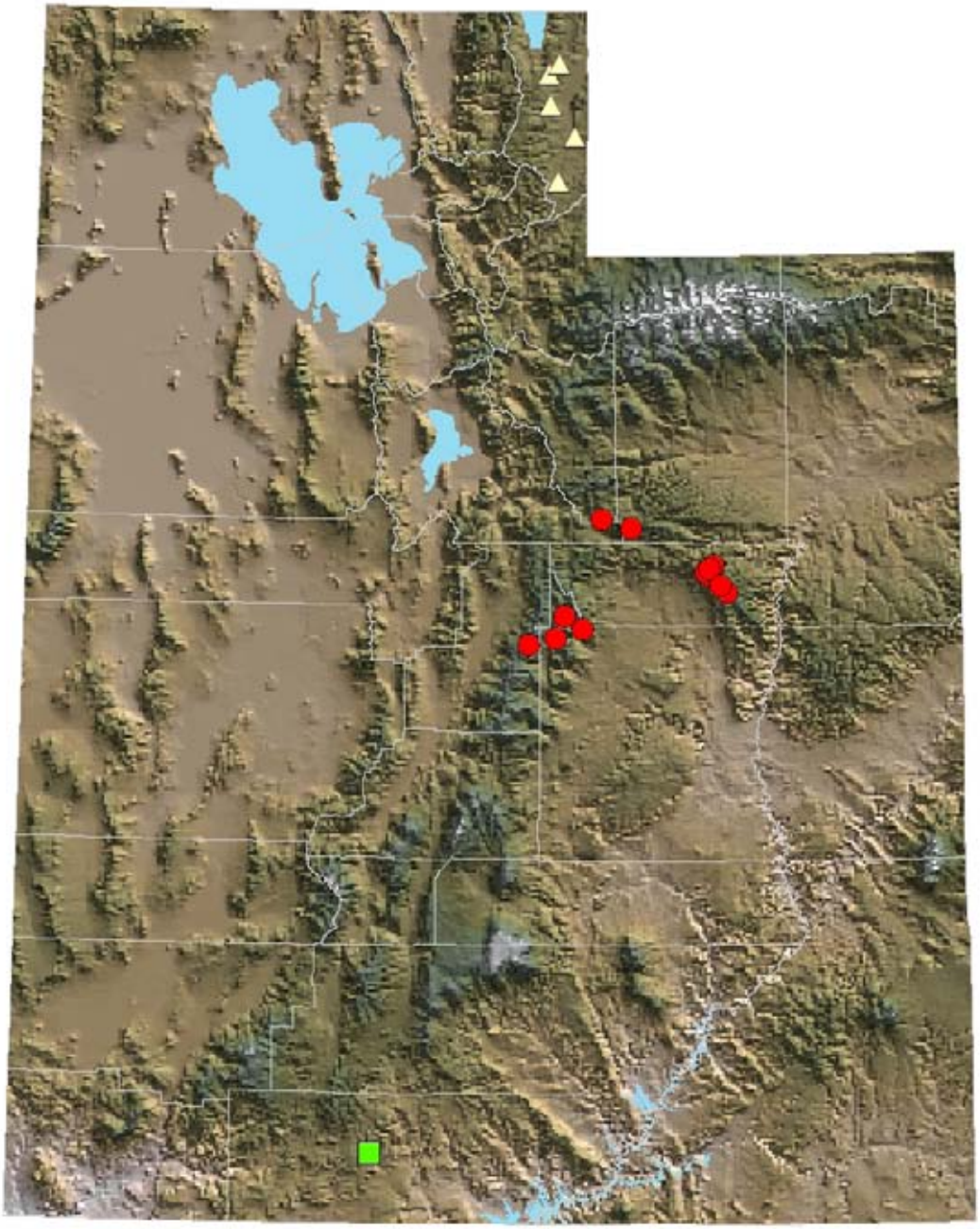

Figure 165. The distribution of Range Creek bladderpod (*Lesquerella hemiphysaria* var. *lucens*) ●, Navajo bladderpod (*Lesquerella navajoensis*) ■, and Rich bladderpod (*Lesquerella prostrata*) △ .

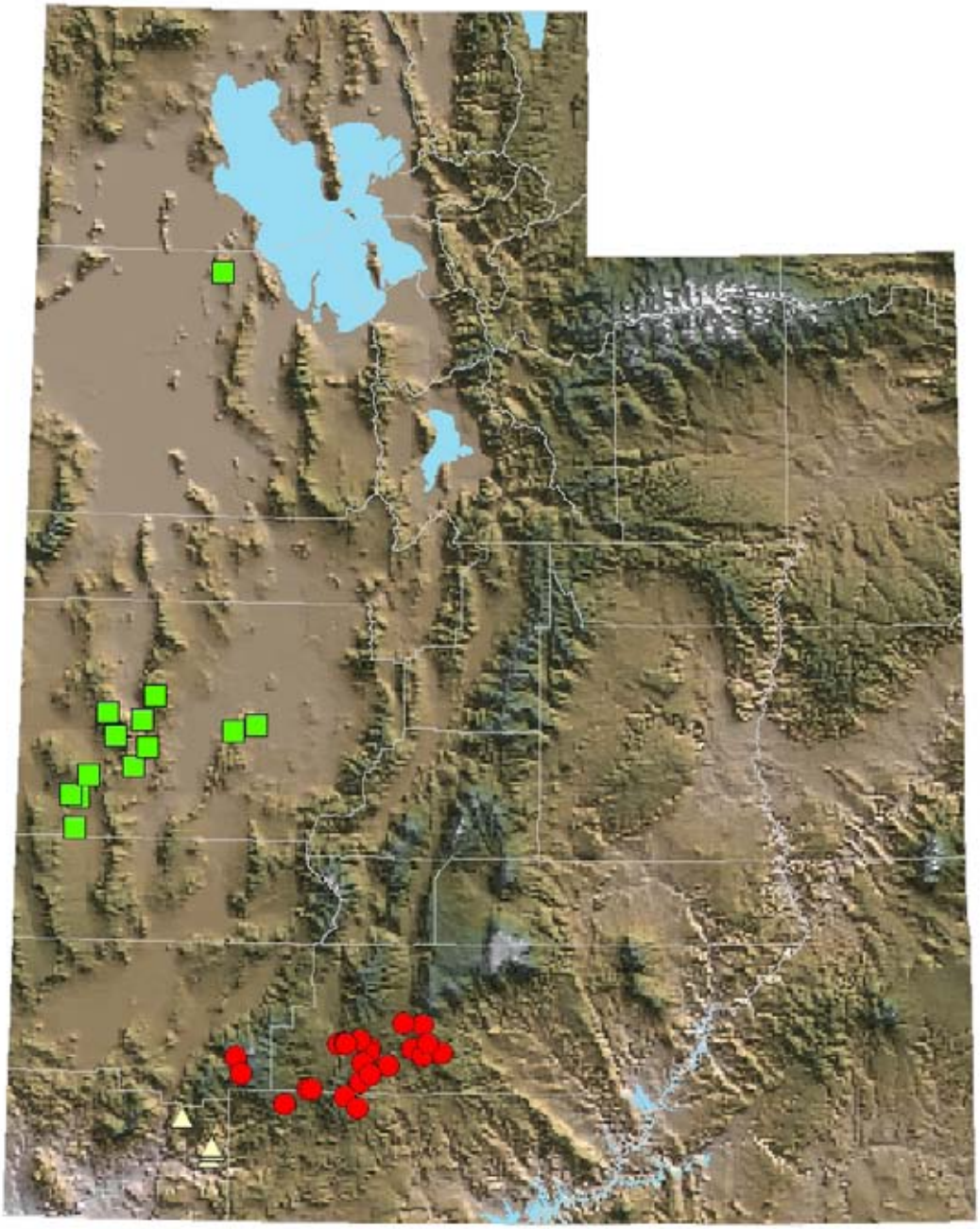

Figure 166. The distribution of Bryce bladderpod (*Lesquerella rubicundula*) ●, Challis wildrye (*Leymus salinus* subsp. *salmonis*) ■, and Clark's lomatium (*Lomatium graveolens* var. *clarkii*) △ .

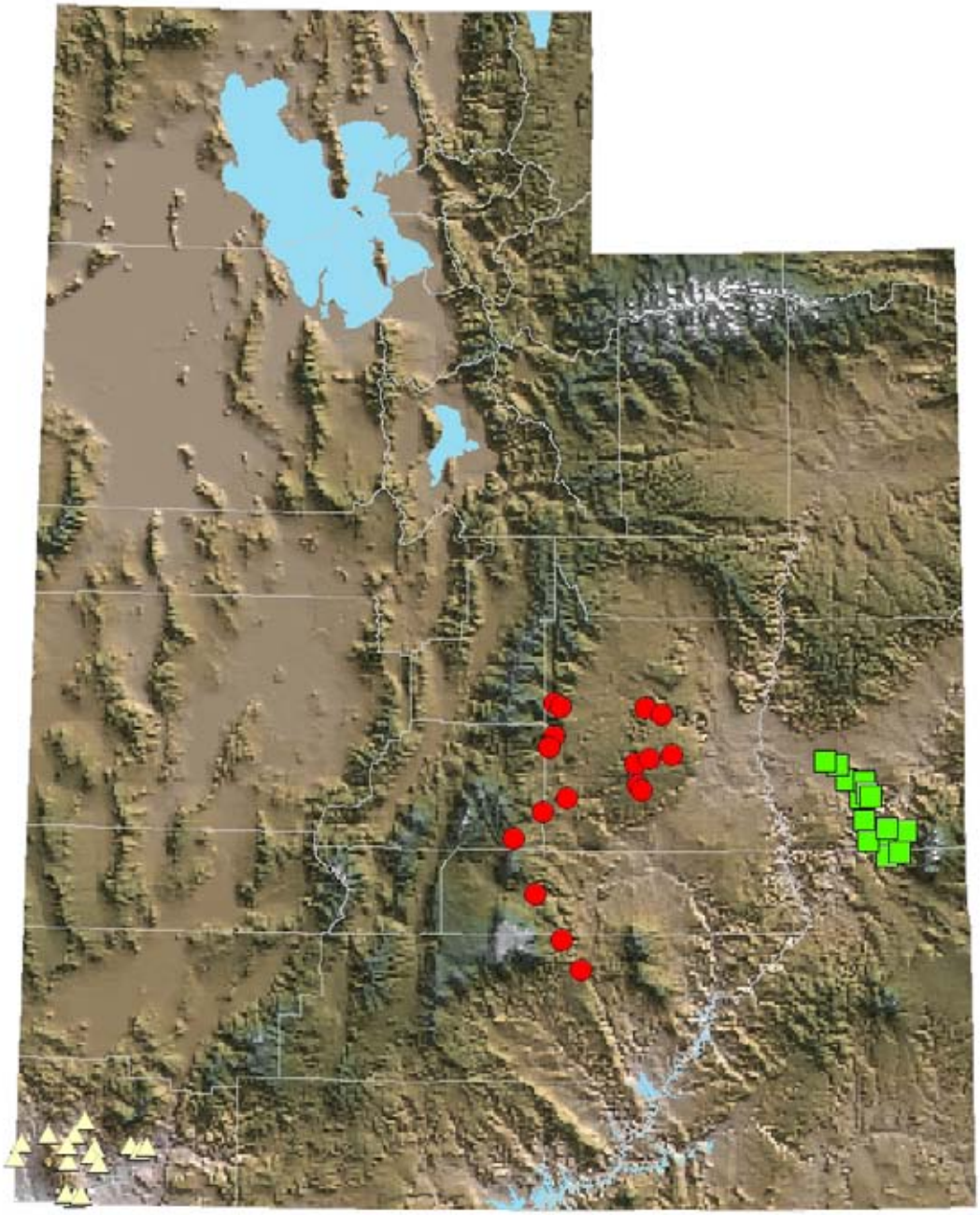

Figure 167. The distribution of rush desert-parsley (*Lomatium junceum*) ●, Canyonlands' lomatium (*Lomatium latilobum*) ■, and Virgin lomatium (*Lomatium scabrum* var. *tripinnatum*) △ .

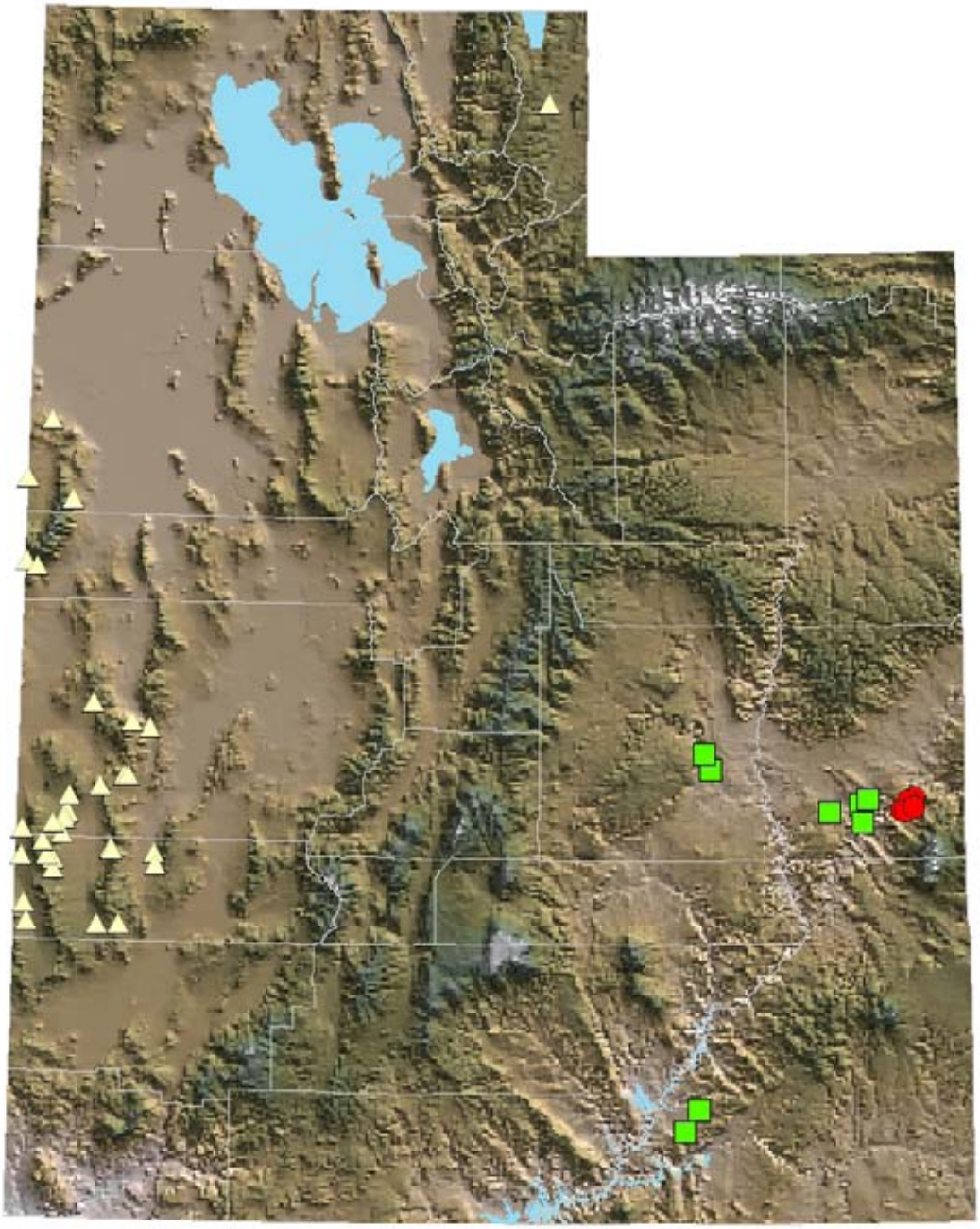

Figure 168. The distribution of Dolores River skeleton-plant (*Lygodesmia doloresensis*) ●, Entrada skeletonplant (*Lygodesmia entrada*) ■, and rayless tansy aster (*Machaeranthera grindelioides* var. *depressa*) △ .

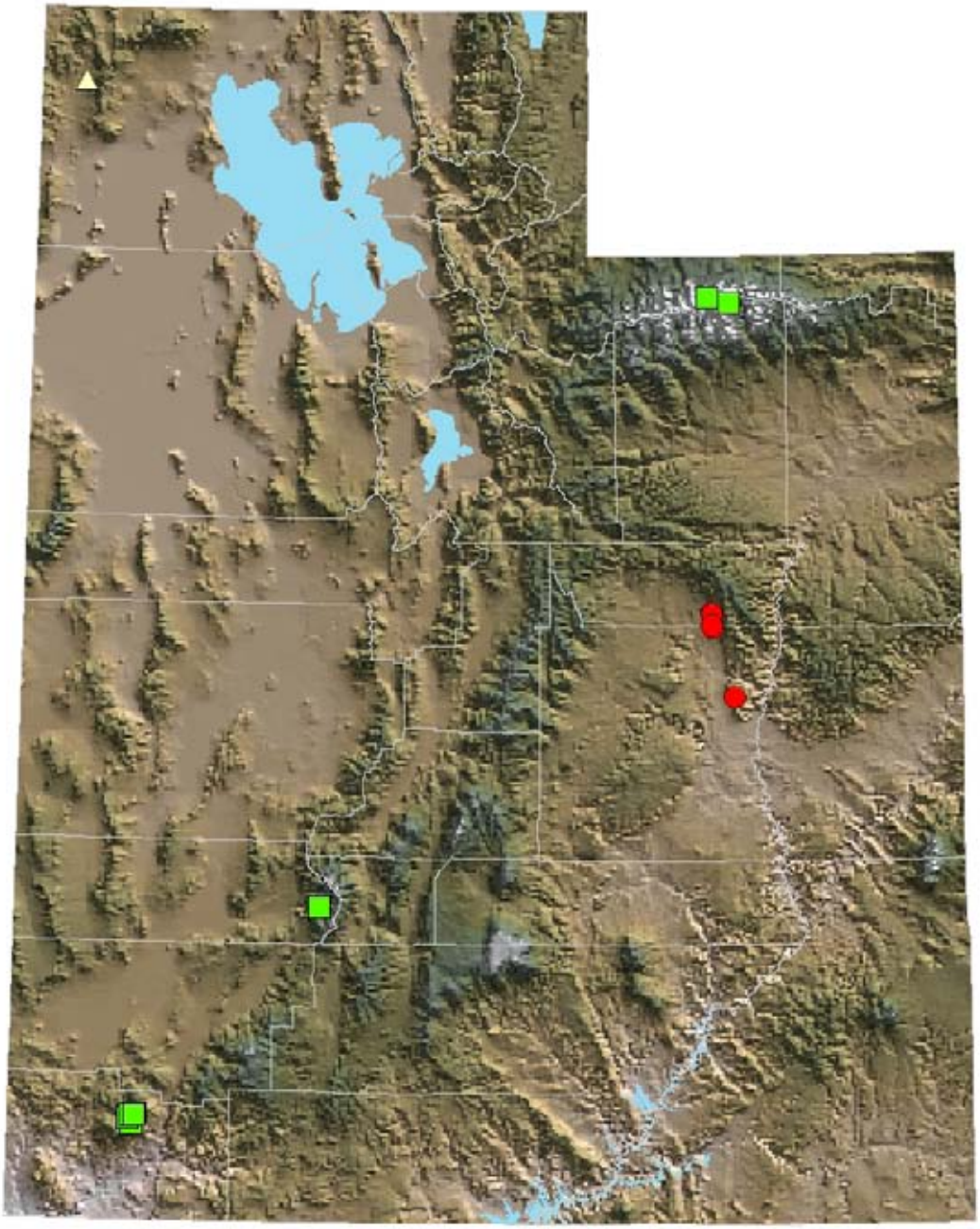

Figure 169. The distribution of Horse Canyon stickleaf (*Mentzelia multicaulis* var. *librina*) ●, primrose monkey-flower (*Mimulus primuloides*) ■, and fountain miner's-lettuce (*Montia fontana* subsp. *fontana*) △ .

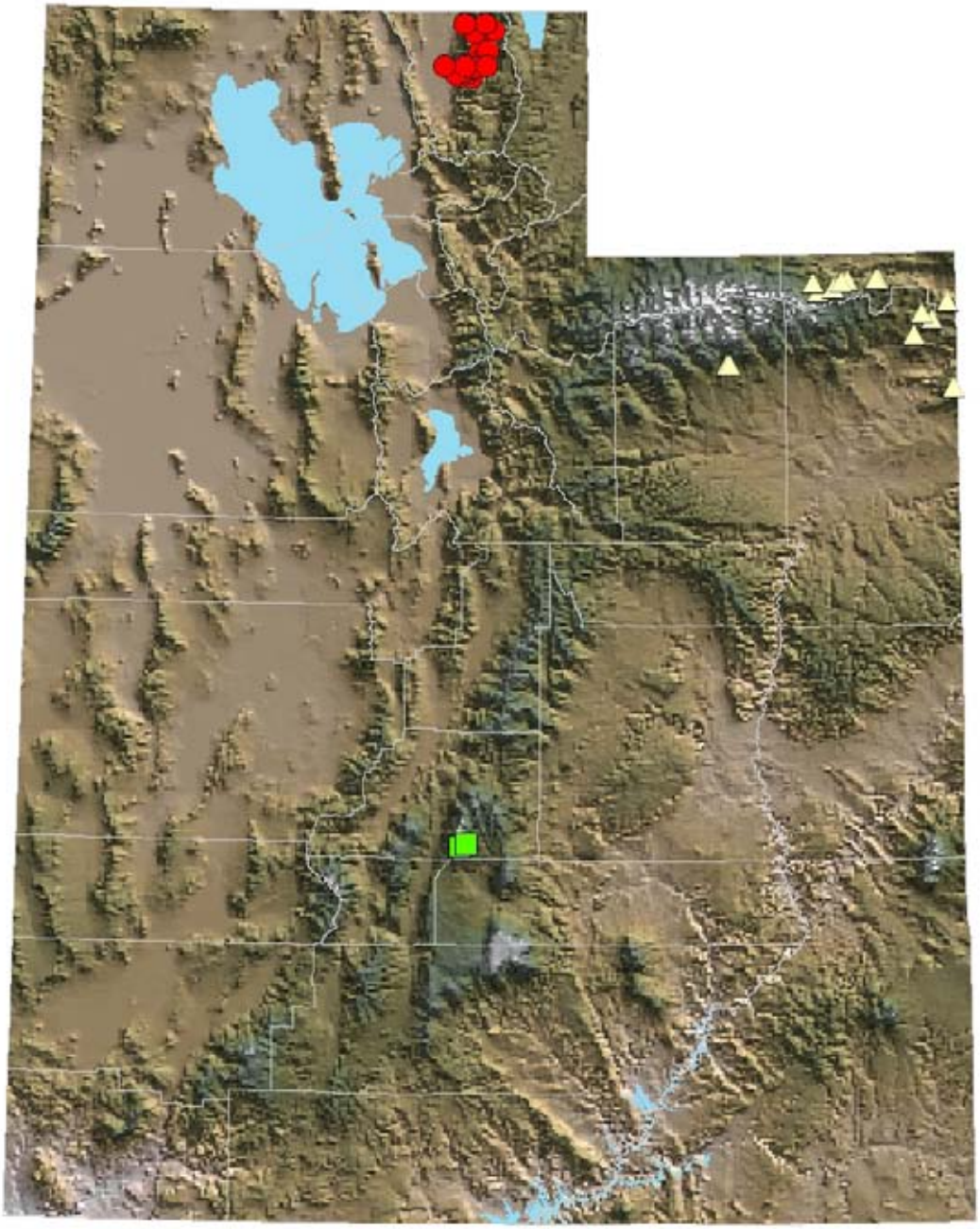

Figure 170. The distribution of Rydberg's musineon (*Musineon lineare*) ●, Fish Lake naiad (*Najas caespitosa*) ■, and narrow-leaf evening primrose (*Oenothera flava* var. *acutissima*) △ .

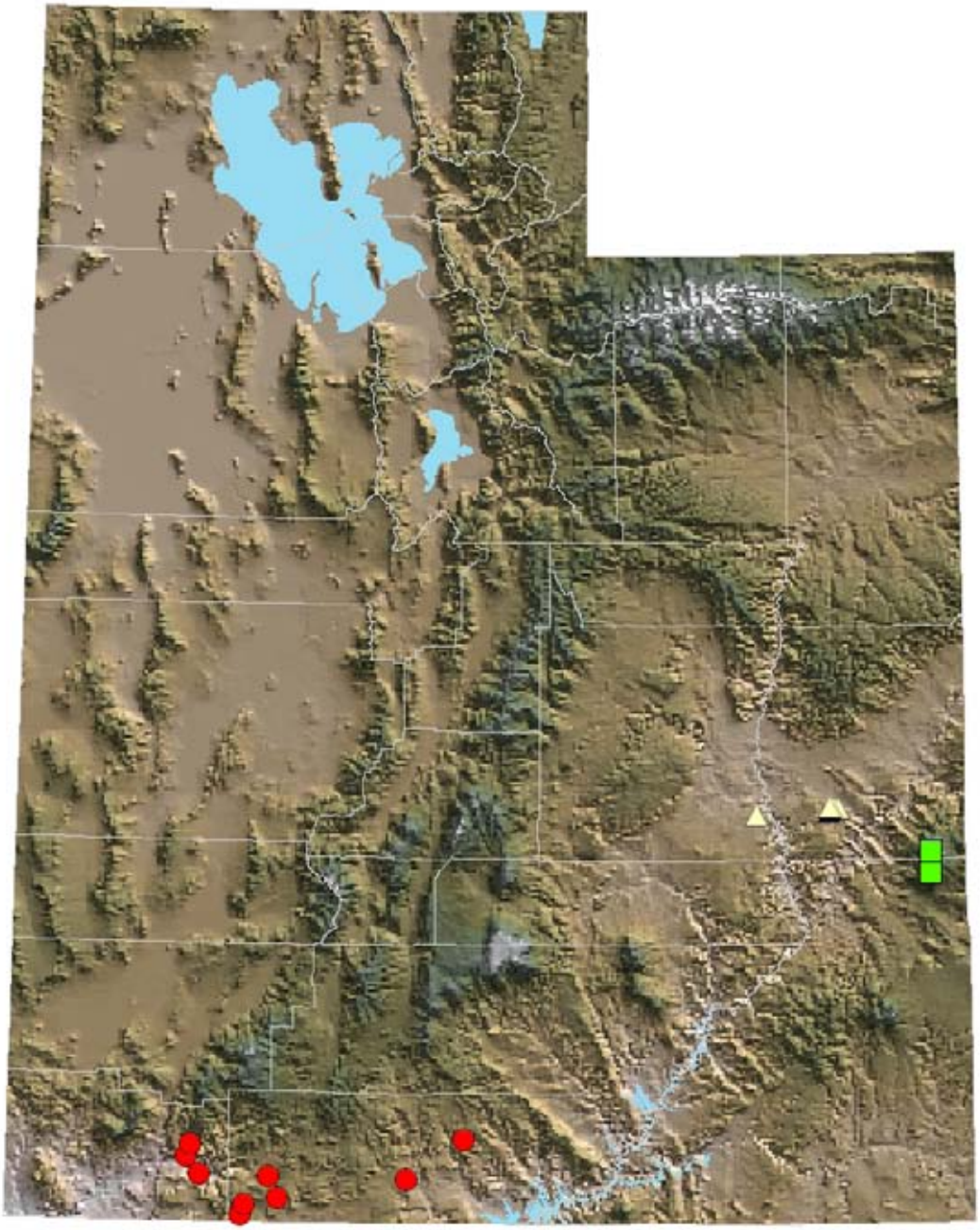

Figure 171. The distribution of Pipe Springs' cactus (*Opuntia aurea*) ●, Baker's oreoxis (*Oreoxis bakeri*) ■, and Trotter's oreoxis (*Oreoxis trotteri*) △ .

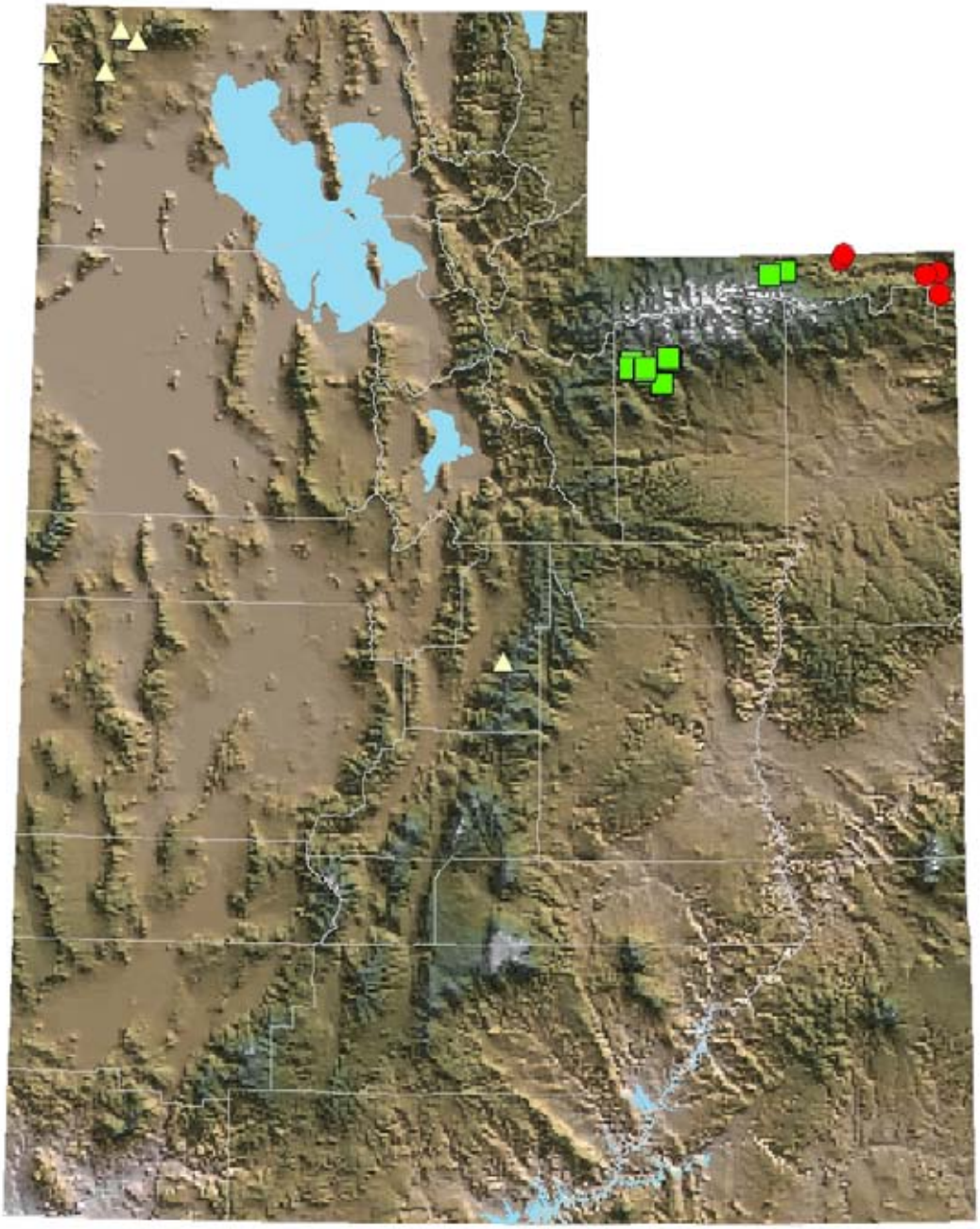

Figure 172. The distribution of Maybell loco (*Oxytropis besseyi* var. *obnapiformis*) ●, alpine locoweed (*Oxytropis deflexa* var. *pulcherrima*) ■, and western peony (*Paeonia brownii*) △ .

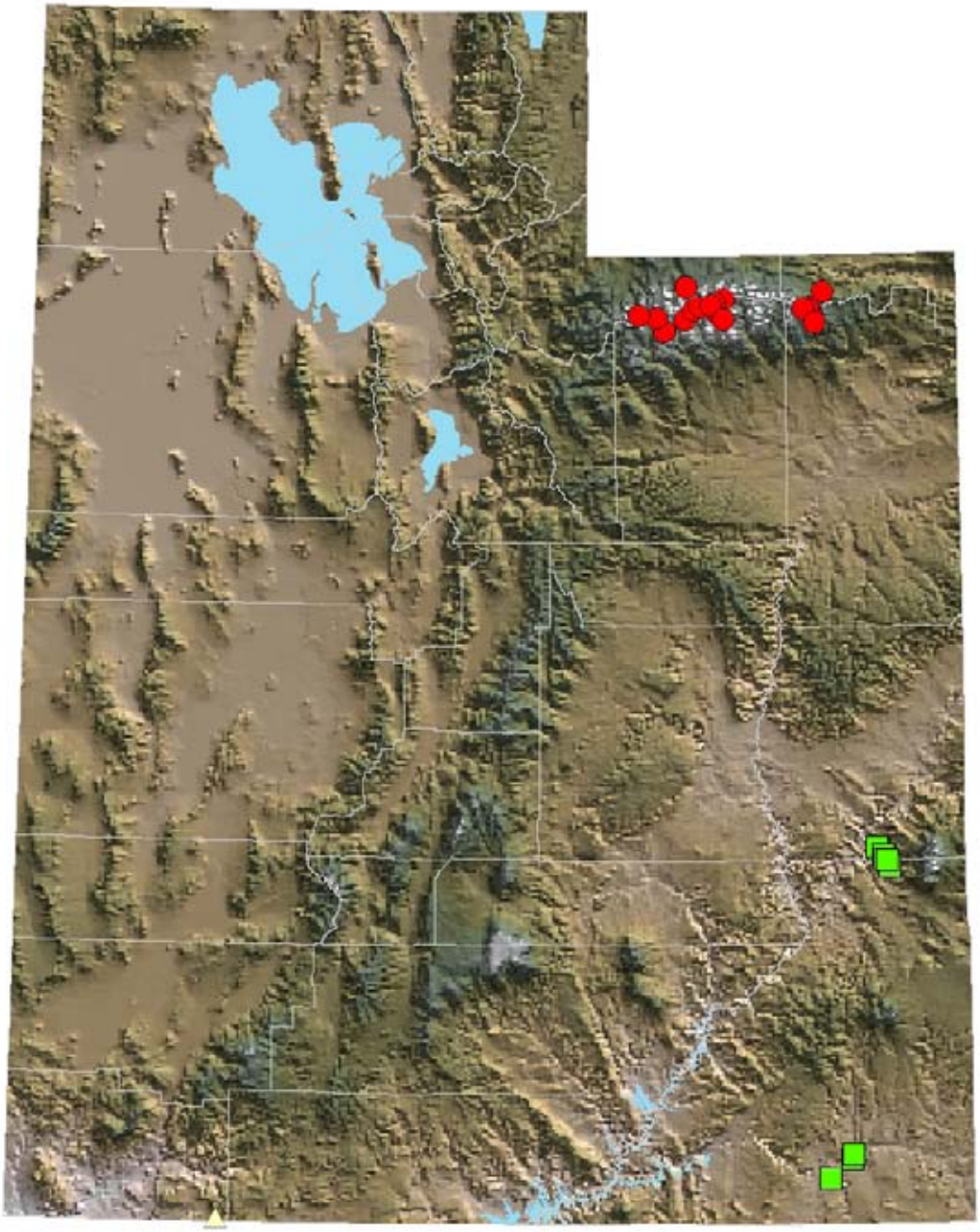

Figure 173. The distribution of naked-stemmed wallflower (*Parrya rydbergii*) ●, narrowleaf dunebroom (*Parryella filifolia*) ■, and Barneby's aromatic scurf-pea (*Pediomelum aromaticum* var. *barnebyi*) △.

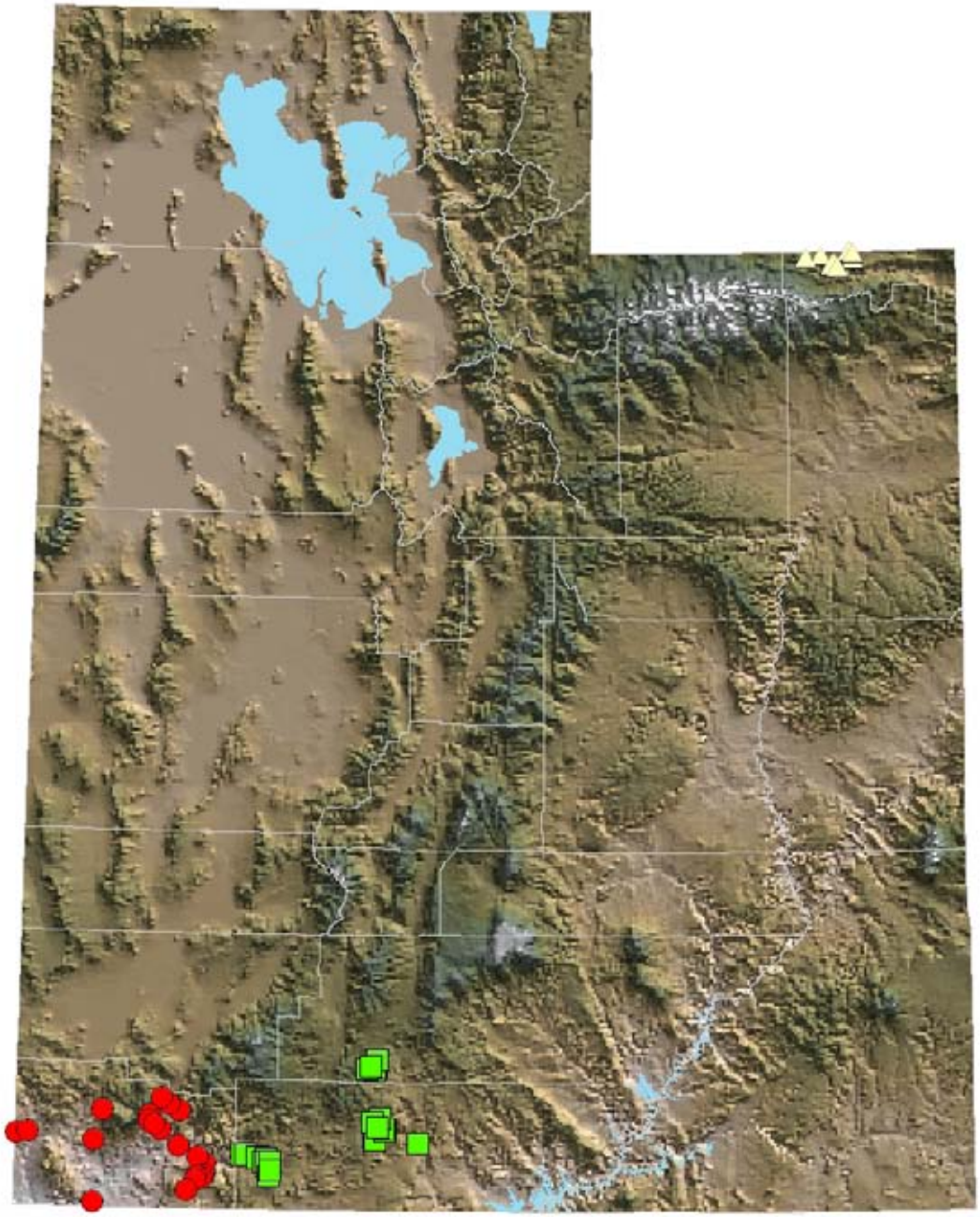

Figure 174. The distribution of skunk Indian breadroot (*Pediomelum mephiticum*) ●, Paria breadroot (*Pediomelum pariense*) ■, and stemless beardtongue (*Penstemon acaulis* var. *acaulis*) △ .

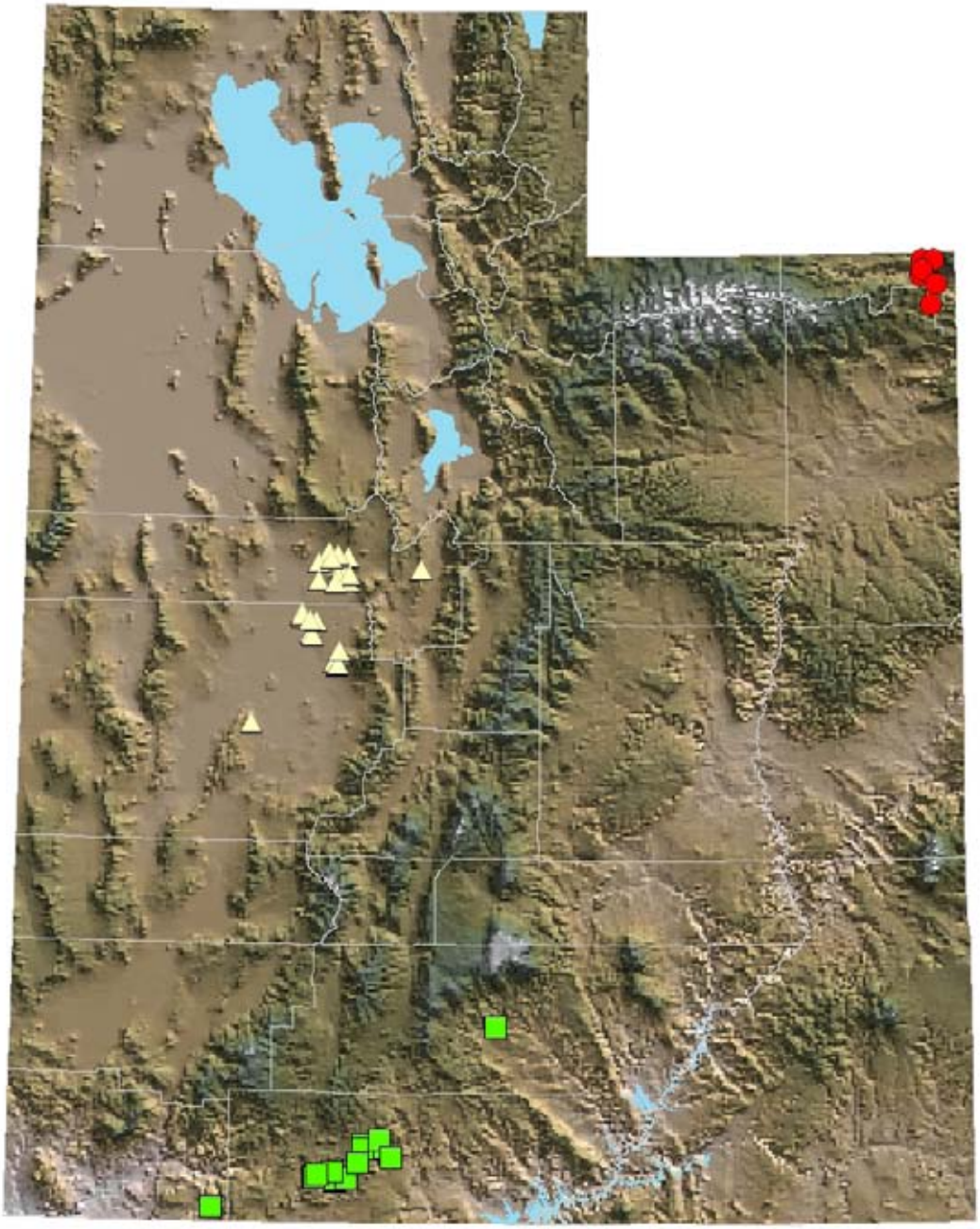

Figure 175. The distribution of Penland's beardtongue (*Penstemon acaulis* var. *yampaensis*) ●, Canaan Mountain beardtongue (*Penstemon ammophilus*) ■, and sweet penstemon (*Penstemon angustifolius* var. *dulcis*) △ .

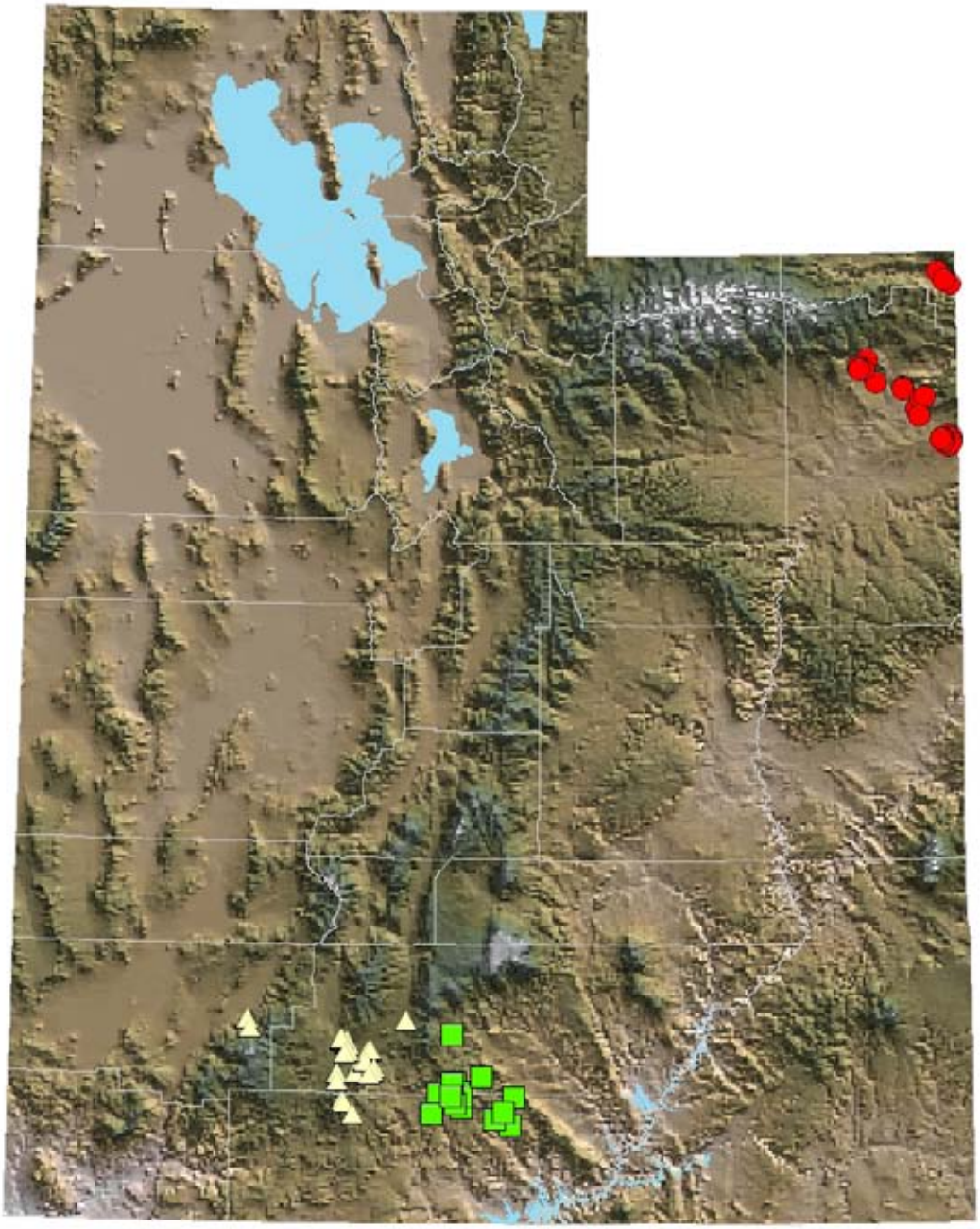

Figure 176. The distribution of Vernal narrow-leaf penstemon (*Penstemon angustifolius* var. *vernalensis*) ●, Atwood's beardtongue (*Penstemon atwoodii*) ■ , and Red Canyon beardtongue (*Penstemon bracteatus*) △ .

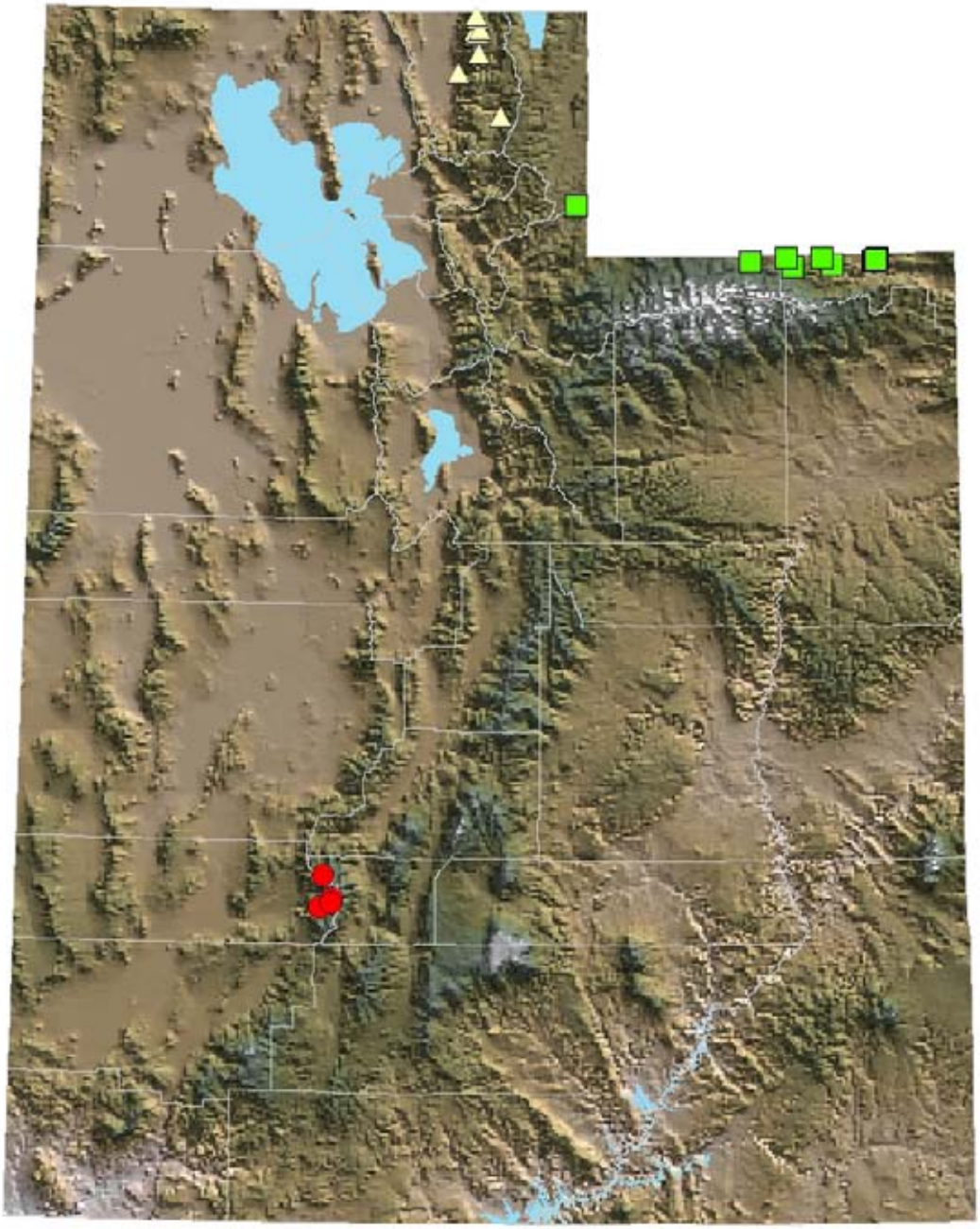

Figure 177. The distribution of Tushar Range beardtongue (*Penstemon caespitosus* subsp. *suffruticosus*) ●, Cleburn's beardtongue (*Penstemon cleburnei*) ■, and Bear River Range beardtongue (*Penstemon compactus*) △.

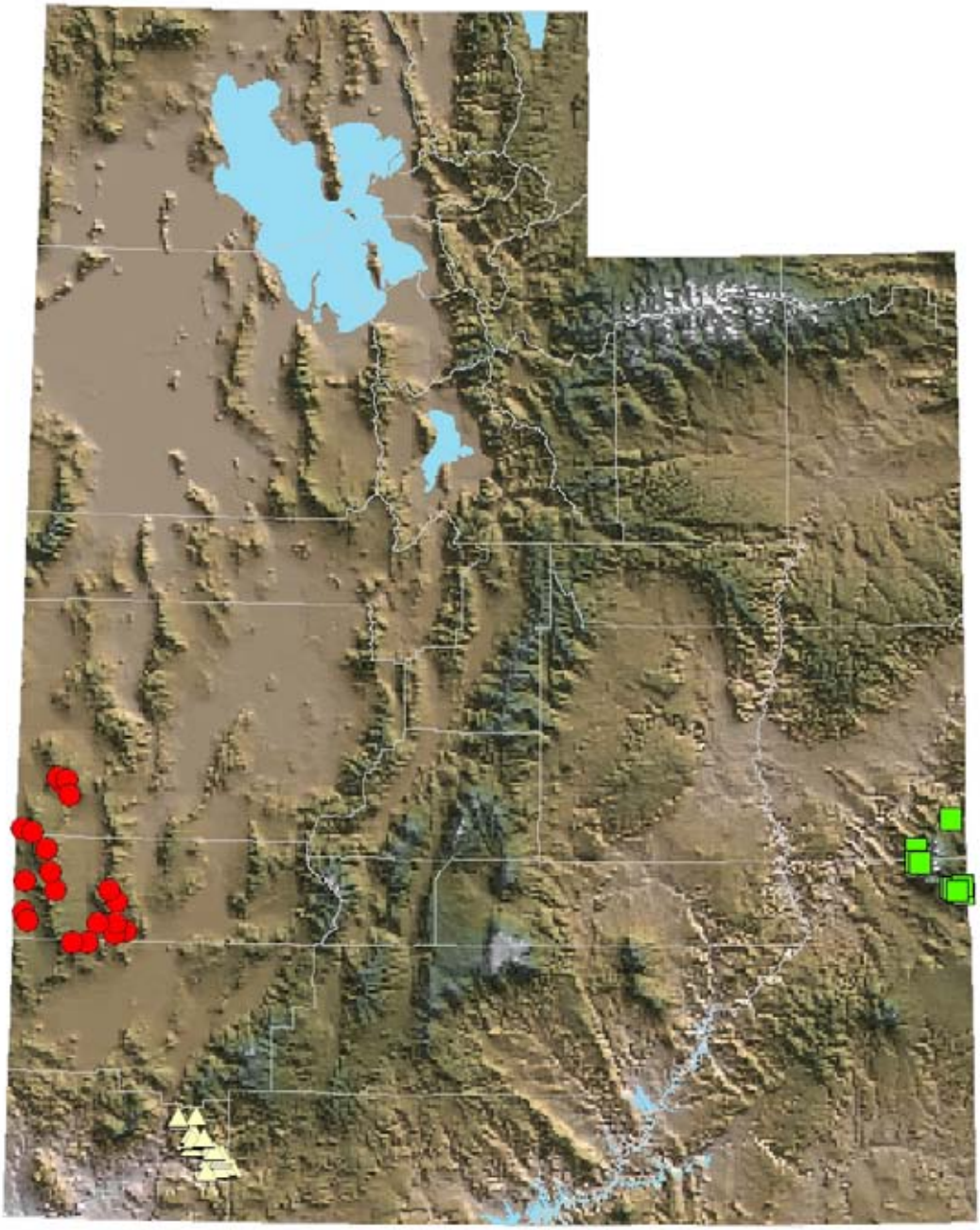

Figure 178. The distribution of Tunnel Spring beardtongue (*Penstemon concinnus*) ●, La Sal penstemon (*Penstemon crandallii* subsp. *atratus*) ■, and lowly beardtongue (*Penstemon humilis* var. *obtusifolius*) △ .

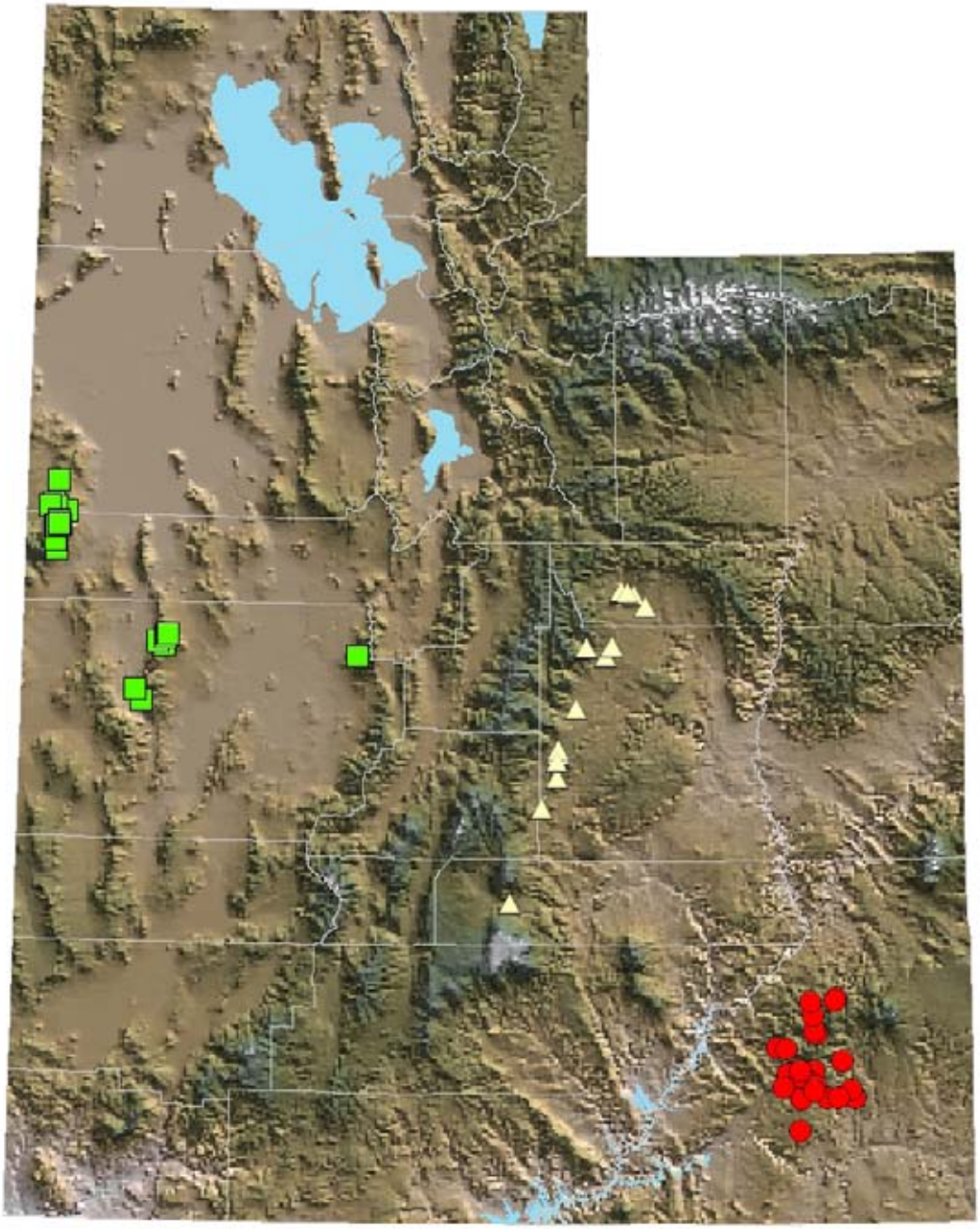

Figure 179. The distribution of whiteflower penstemon (*Penstemon lentus* var. *albiflorus*) ●, dad's penstemon (*Penstemon leonardii* var. *patricus*) ■, and Marcus Jones' penstemon (*Penstemon marcusii*) △ .

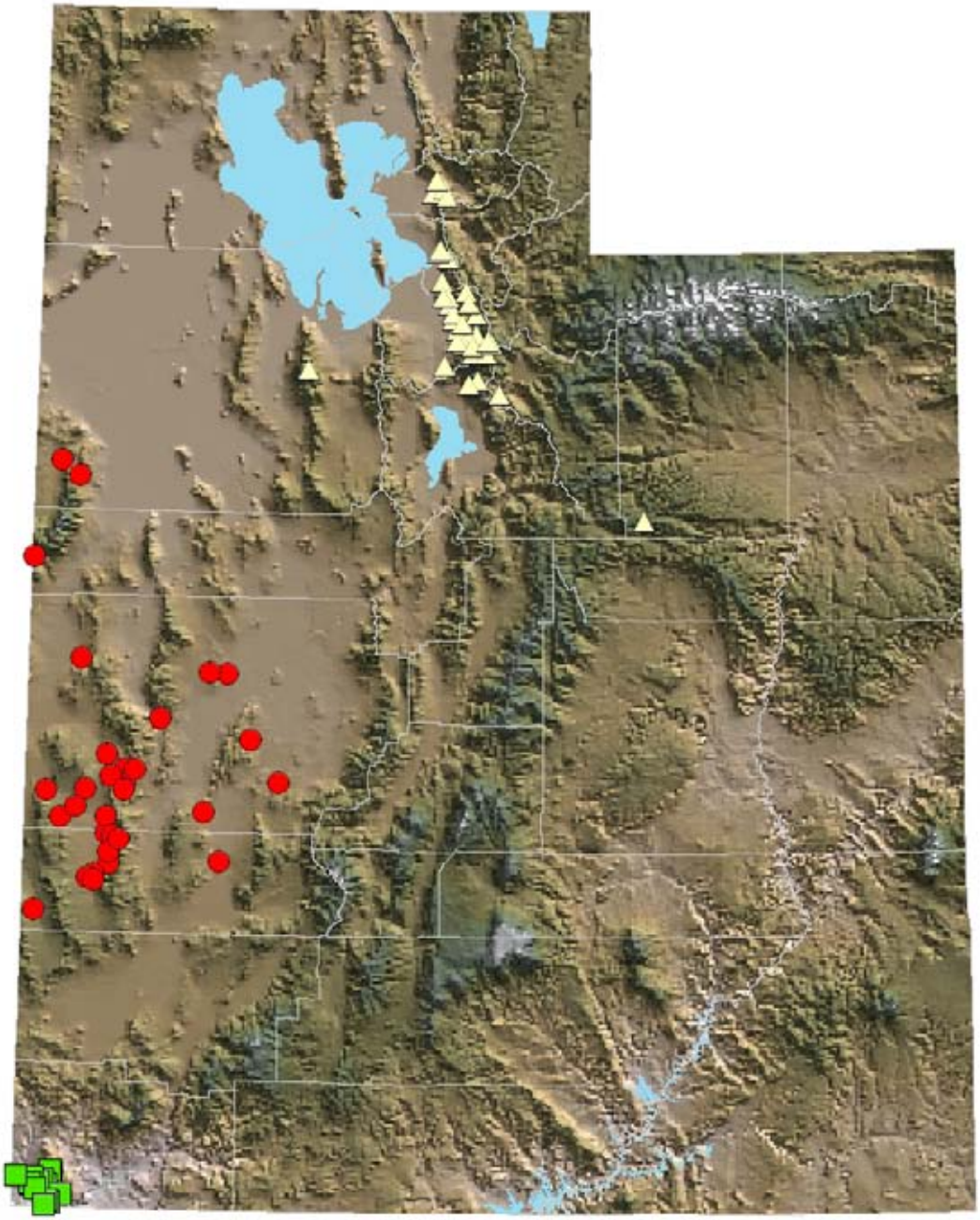

Figure 180. The distribution of low beardtongue (*Penstemon nanus*) ●, limestone beardtongue (*Penstemon petiolatus*) ■, and broadleaf penstemon (*Penstemon platyphyllus*) △ .

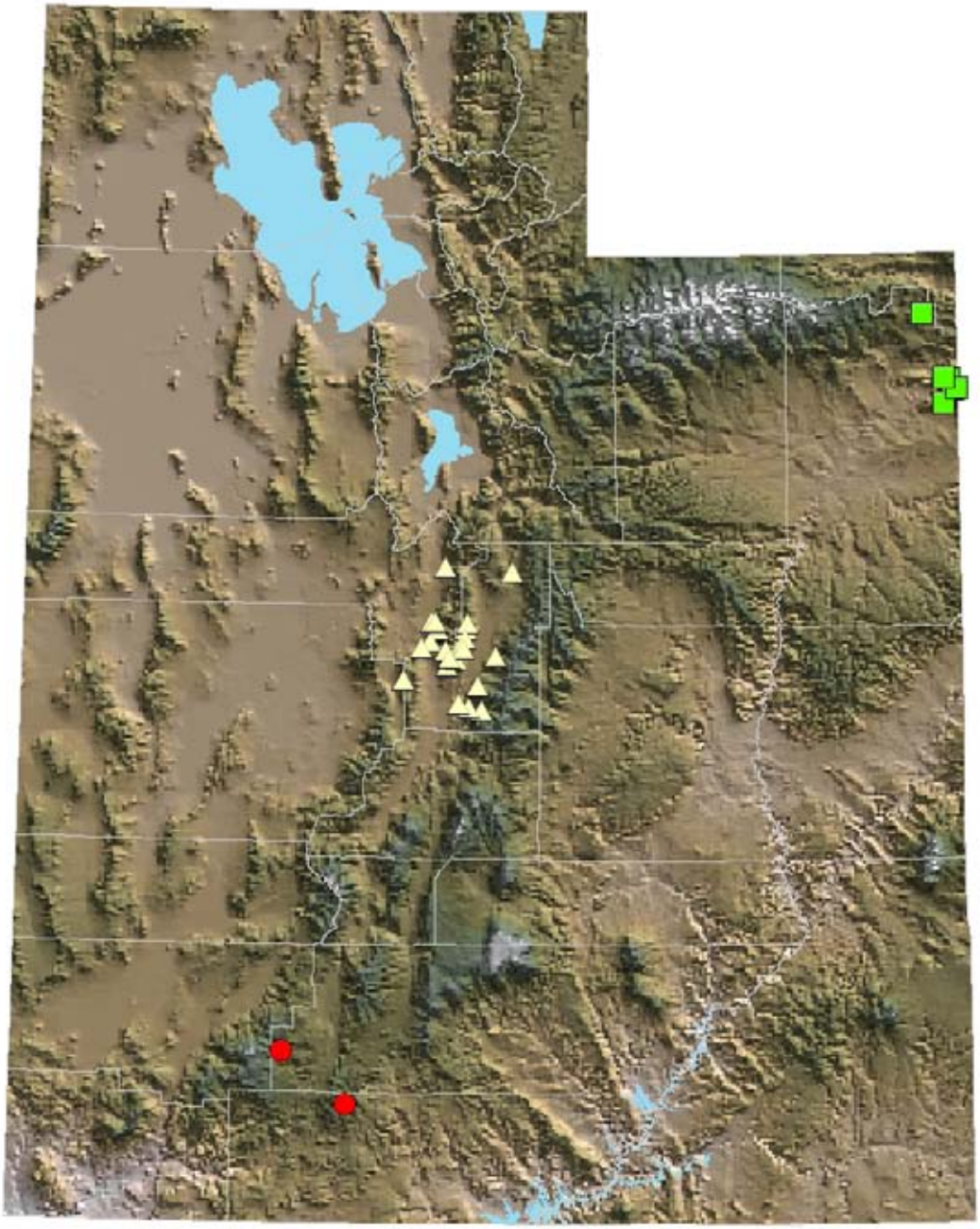

Figure 181. The distribution of Kaibab beardtongue (*Penstemon pseudoputus*) ●, Blue Mountain beardtongue (*Penstemon scariosus* var. *cyanomontanus*) ■, and Tidestrom's beardtongue (*Penstemon tidestromii*) △ .

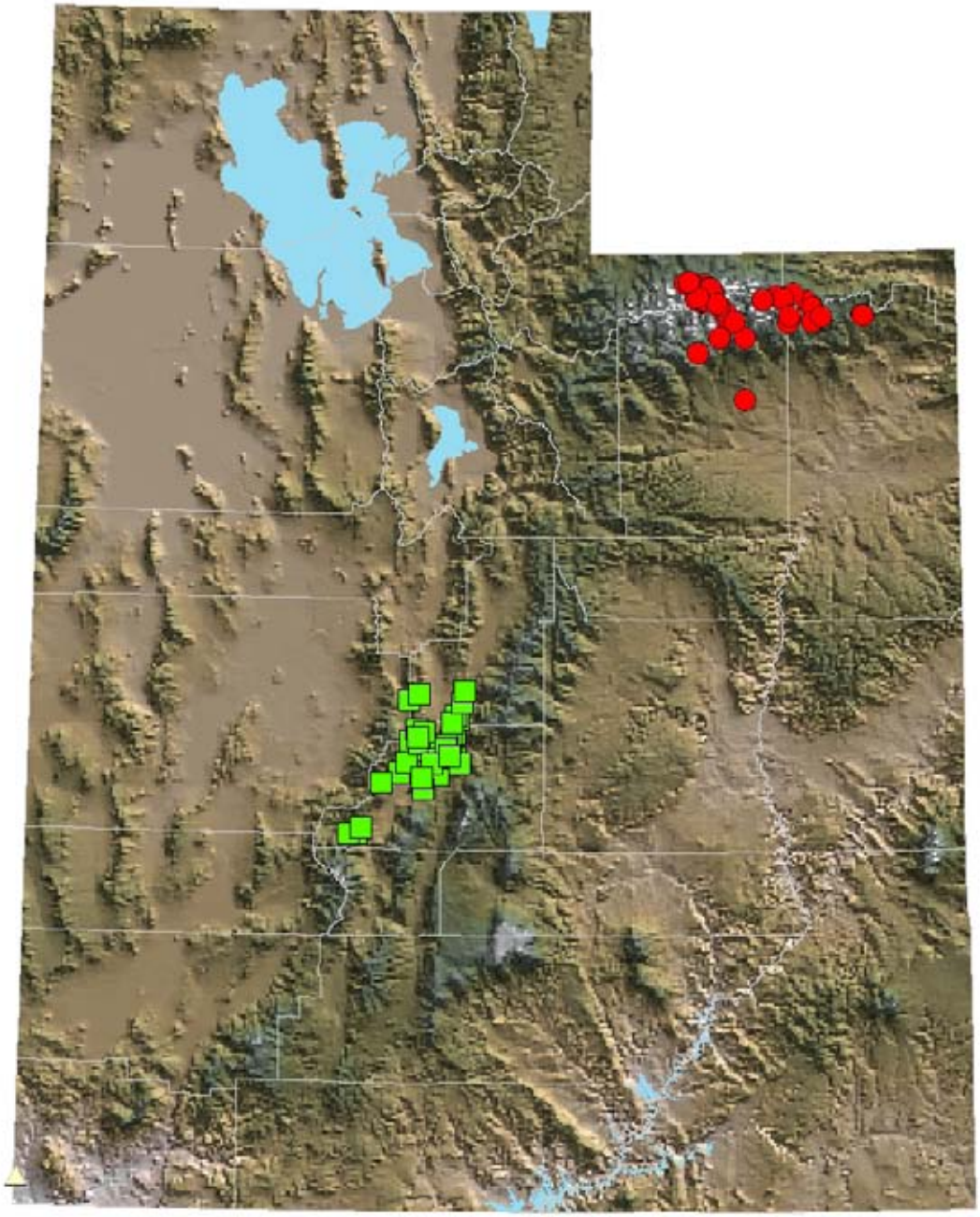

Figure 182. The distribution of Uintah beardtongue (*Penstemon uintahensis*) ●, Ward's beardtongue (*Penstemon wardii*) ■, and seaside petunia (*Petunia parviflora*) △ .

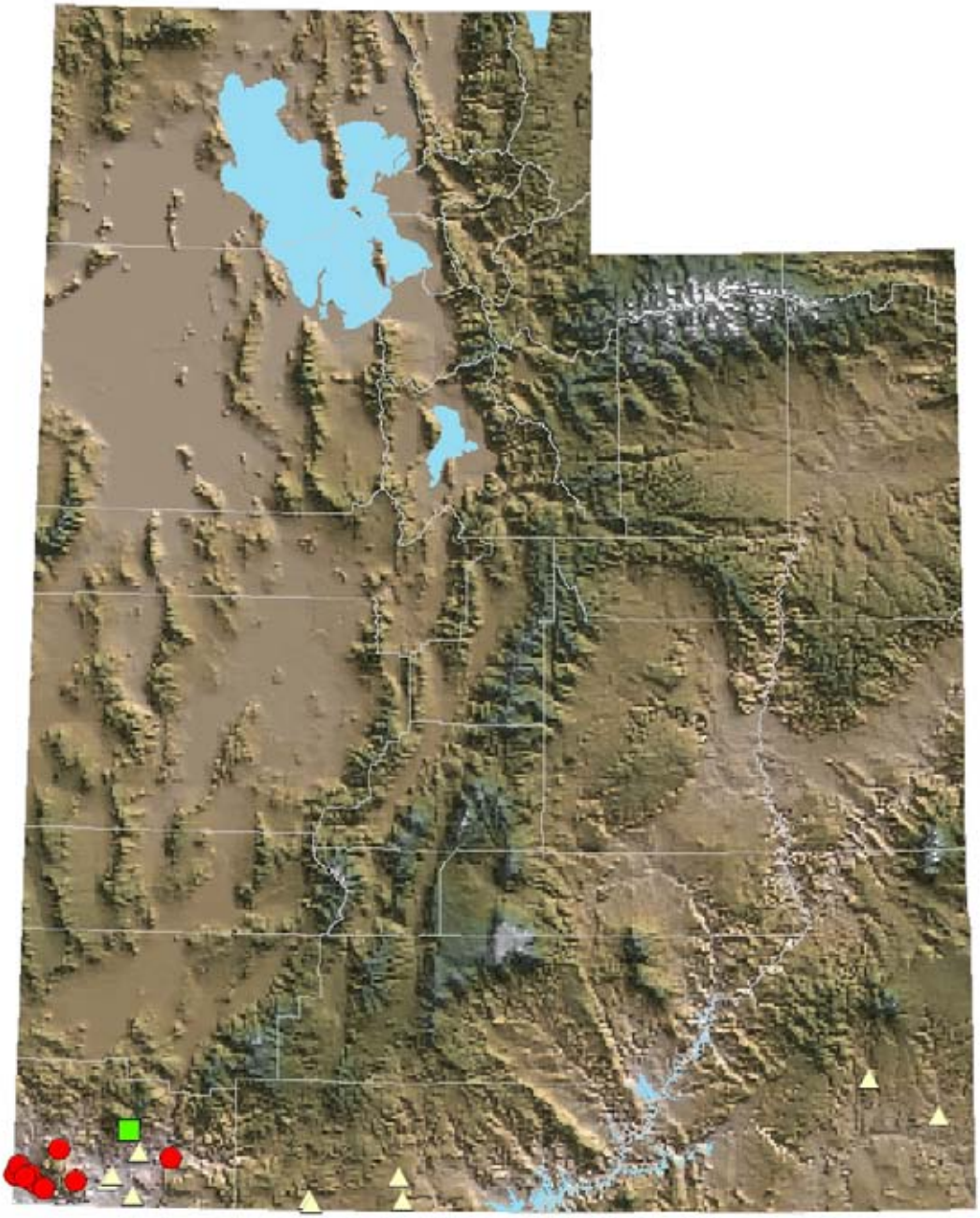

Figure 183. The distribution of Aven Nelson's phacelia (*Phacelia anelsonii*) ●, southern mountain scorpion-weed (*Phacelia austromontana*) ■, and Chinle phacelia (*Phacelia cephalotes*) △ .

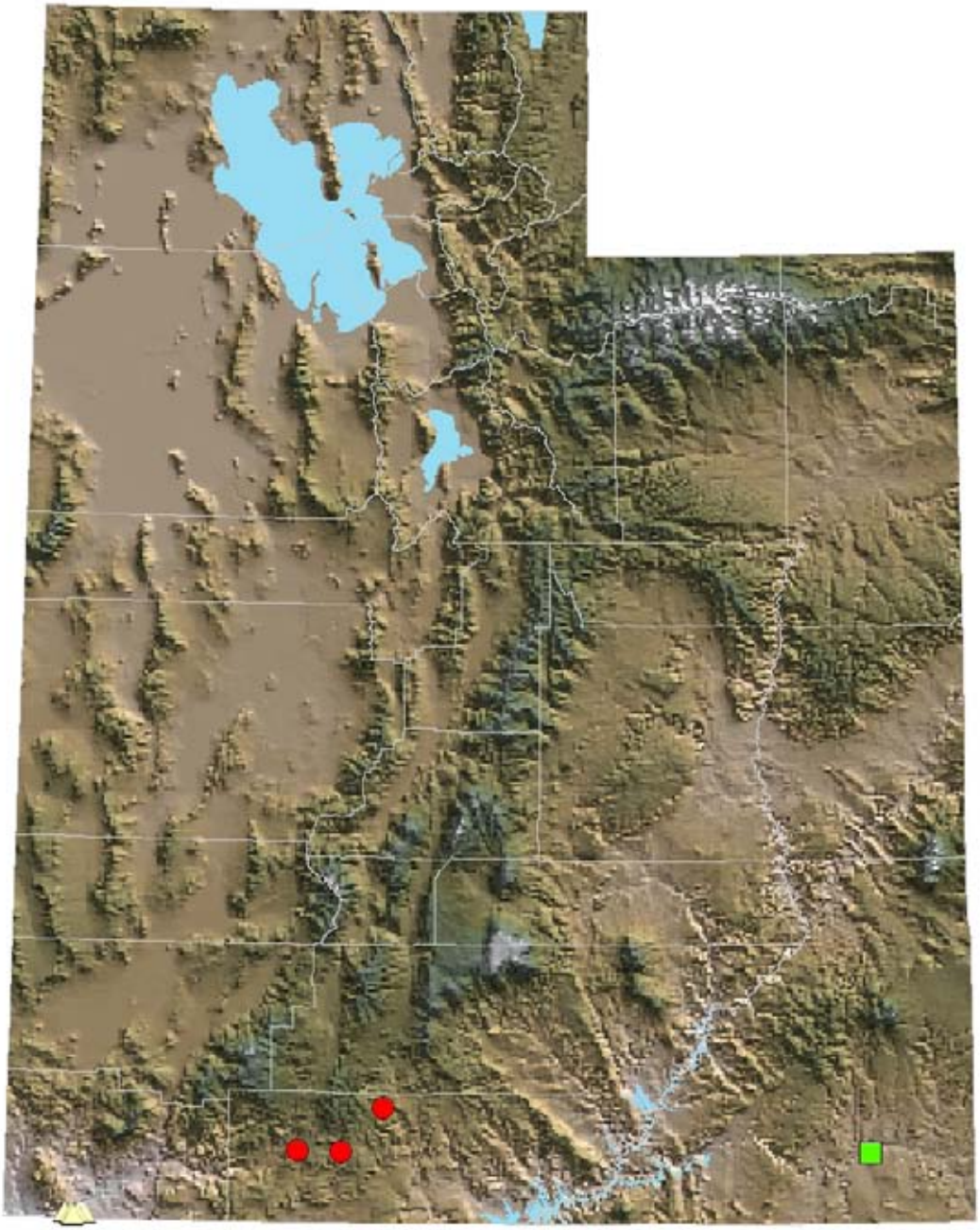

Figure 184. The distribution of Cronquist's phacelia (*Phacelia cronquistiana*) ●, drab phacelia (*Phacelia indecora*) ■, and nodding-flower scorpion-weed (*Phacelia perityloides* var. *laxiflora*) △ .

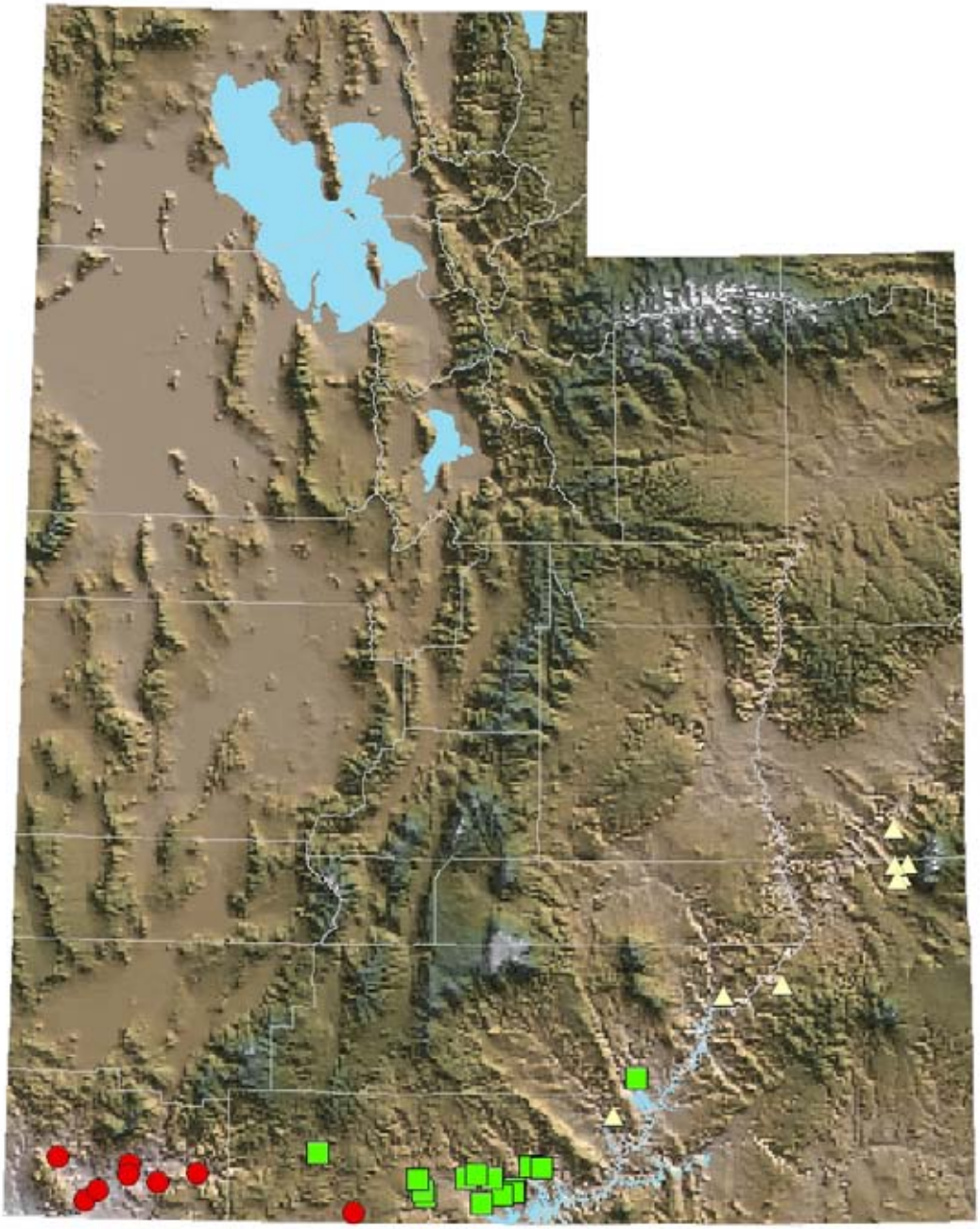

Figure 185. The distribution of pretty Phacelia (*Phacelia pulchella* var. *pulchella*) ●, Tompkin's phacelia (*Phacelia sabulonum*) ■, and yellowish phlox (*Phlox* [*austromontana* var.] *lutescens*) △ .

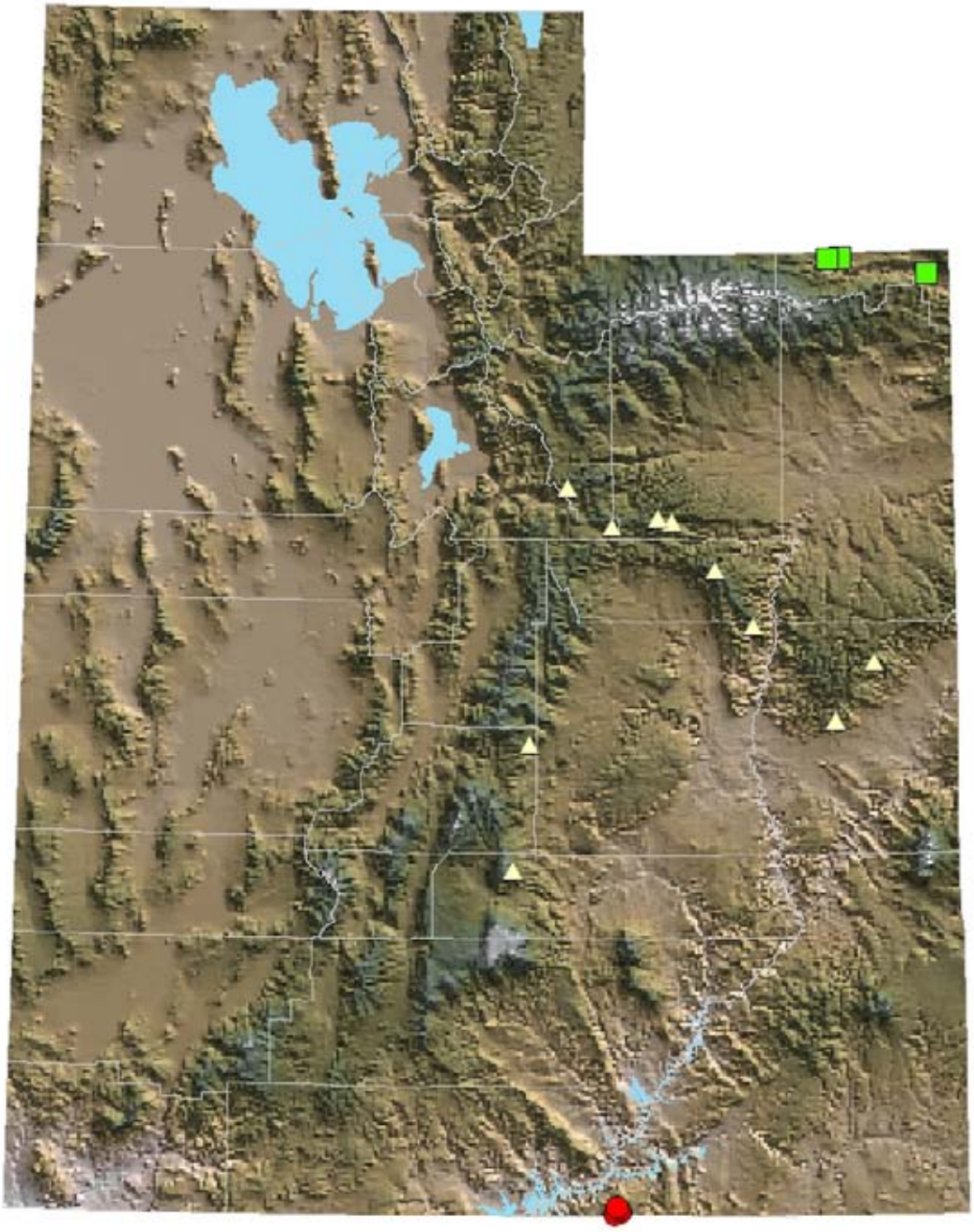

Figure 186. The distribution of Navajo Mountain phlox (*Phlox cluteana*) ●, opal phlox (*Phlox opalensis*) ■, and Book Cliffs twinpod (*Physaria acutifolia* var. *purpurea*) △ .

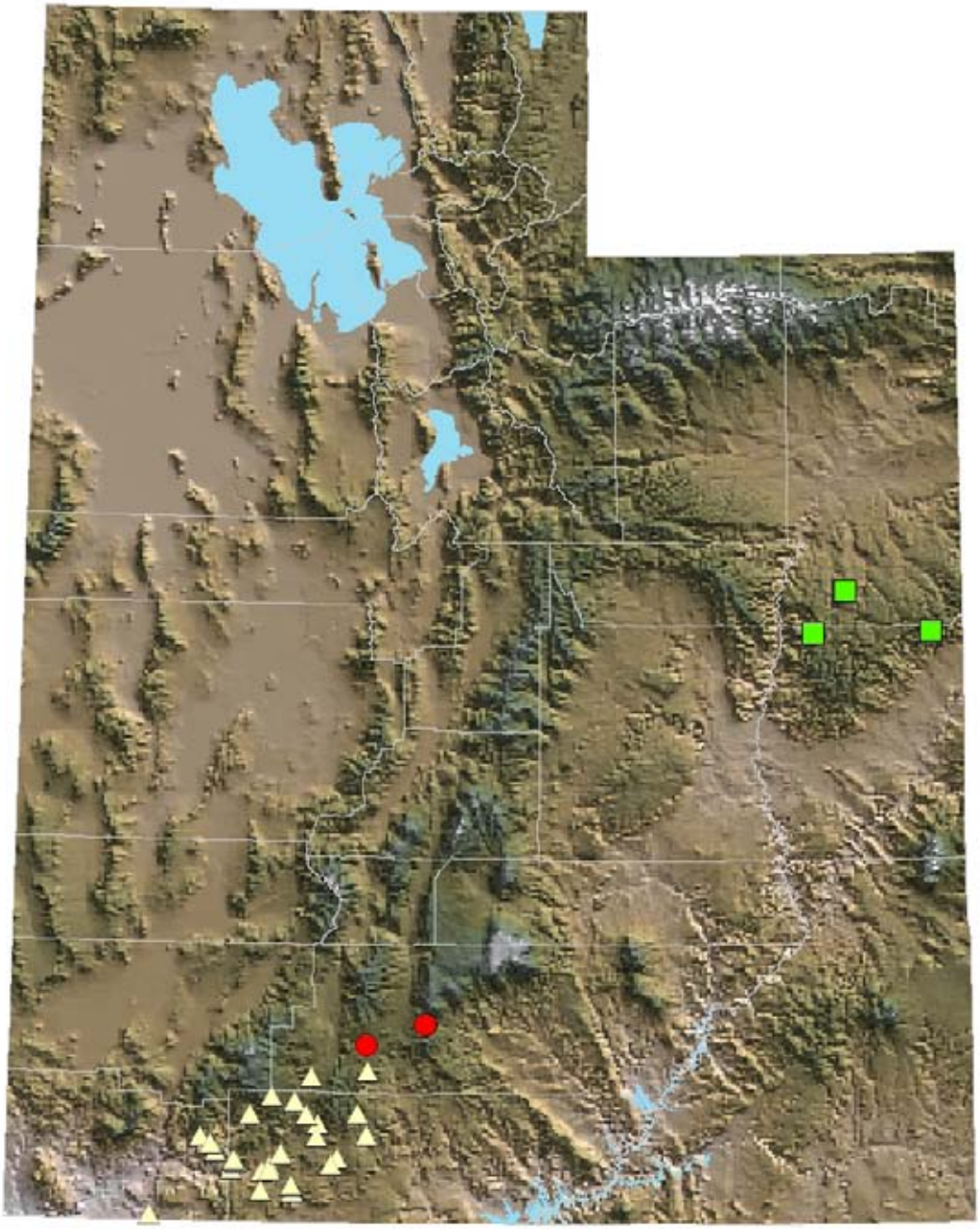

Figure 187. The distribution of Claron twinpod (*Physaria chambersii* var. *sobolifera*) ●, Graham's twinpod (*Physaria grahamii*) ■, and Mt. Carmel twinpod (*Physaria lepidota* var. *lepidota*) △ .

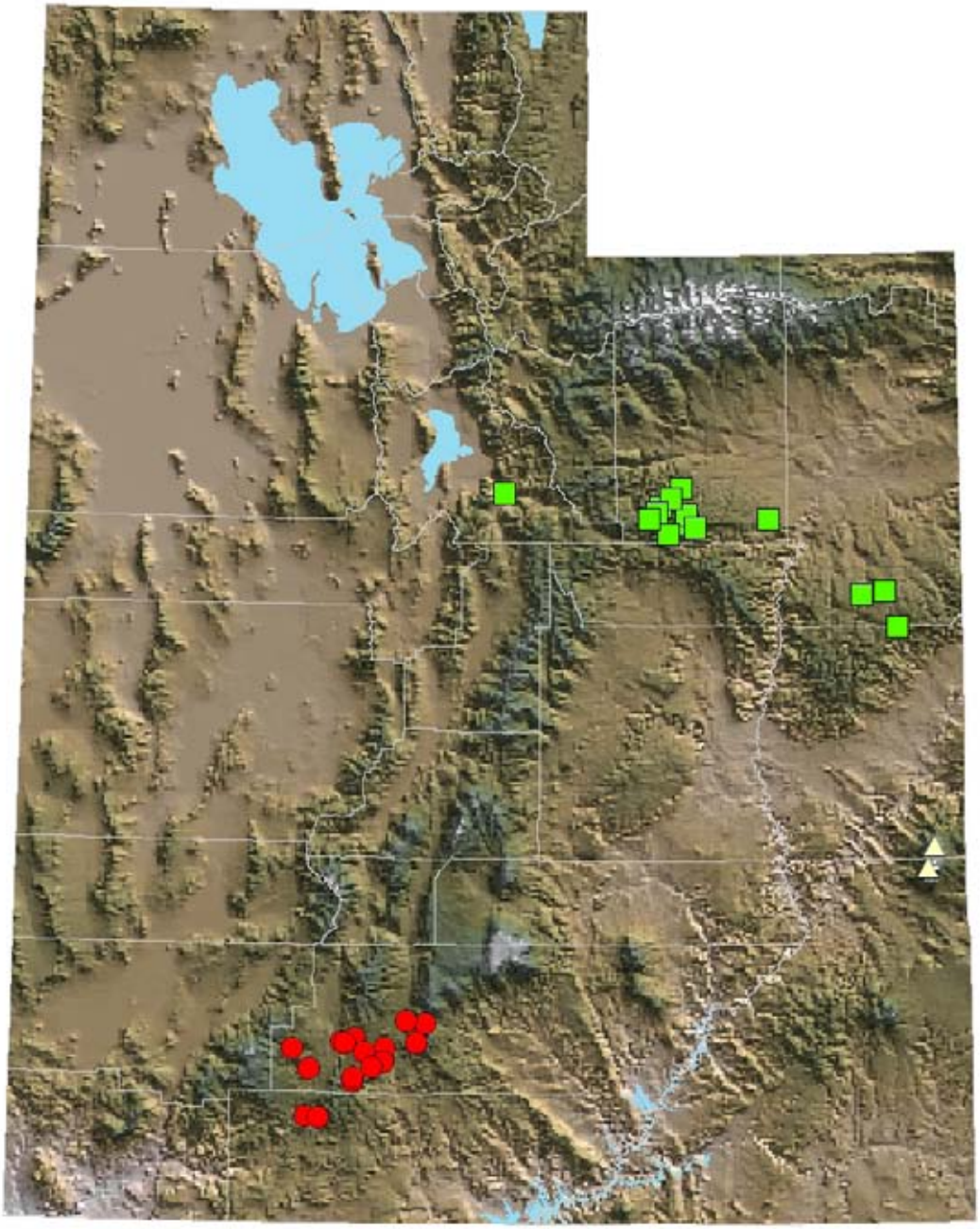

Figure 188. The distribution of Red Canyon twinpod (*Physaria lepidota* var. *membranacea*) ●, repand twinpod (*Physaria repanda*) ■, and Eastwood's podistera (*Podistera eastwoodiae*) △ .

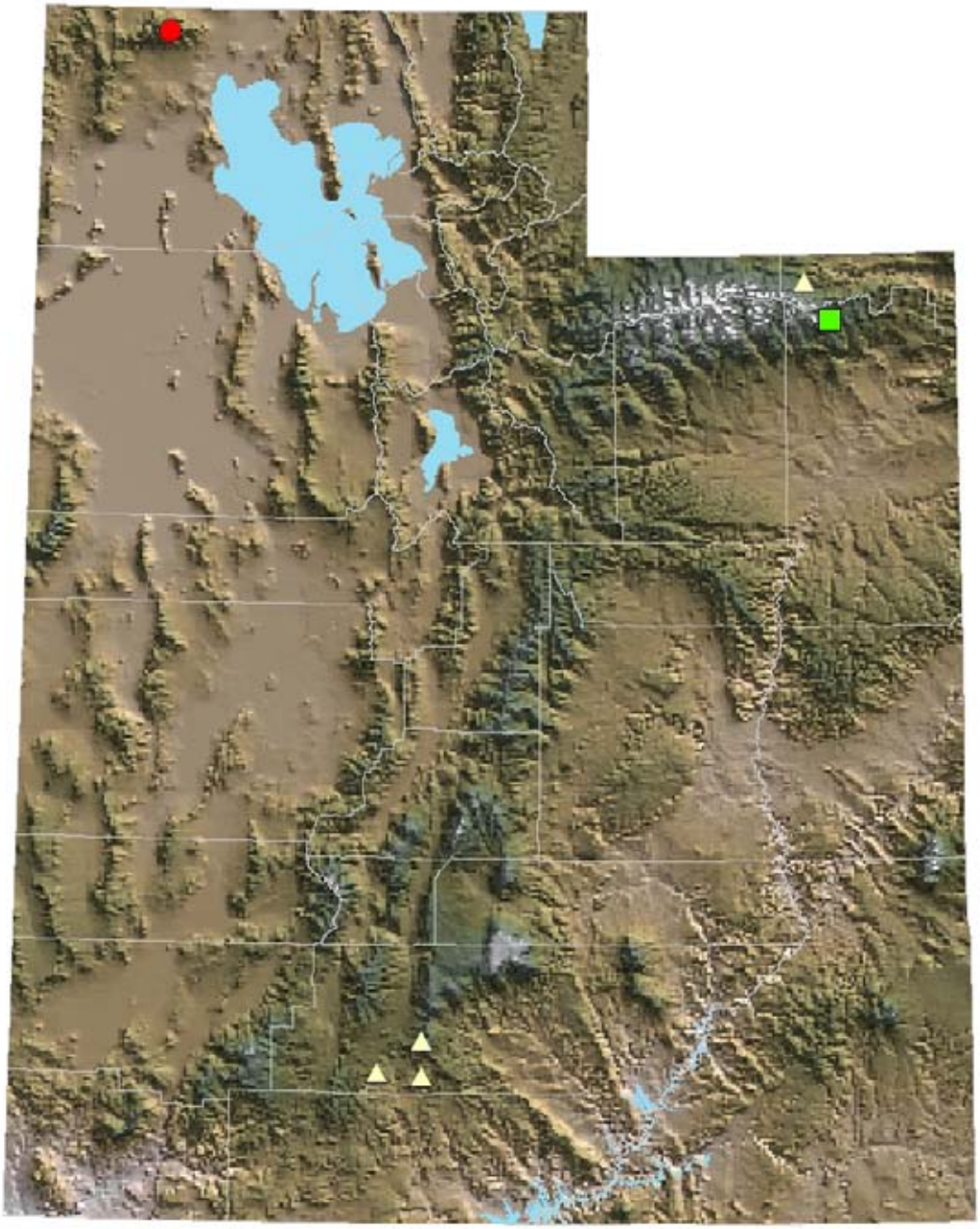

Figure 189. The distribution of Kruckberg's holly-fern (*Polystichum kruckebergii*) ●, marsh cinquifoil (*Potentilla palustris*) ■, and silvery primrose (*Primula incana*) △.

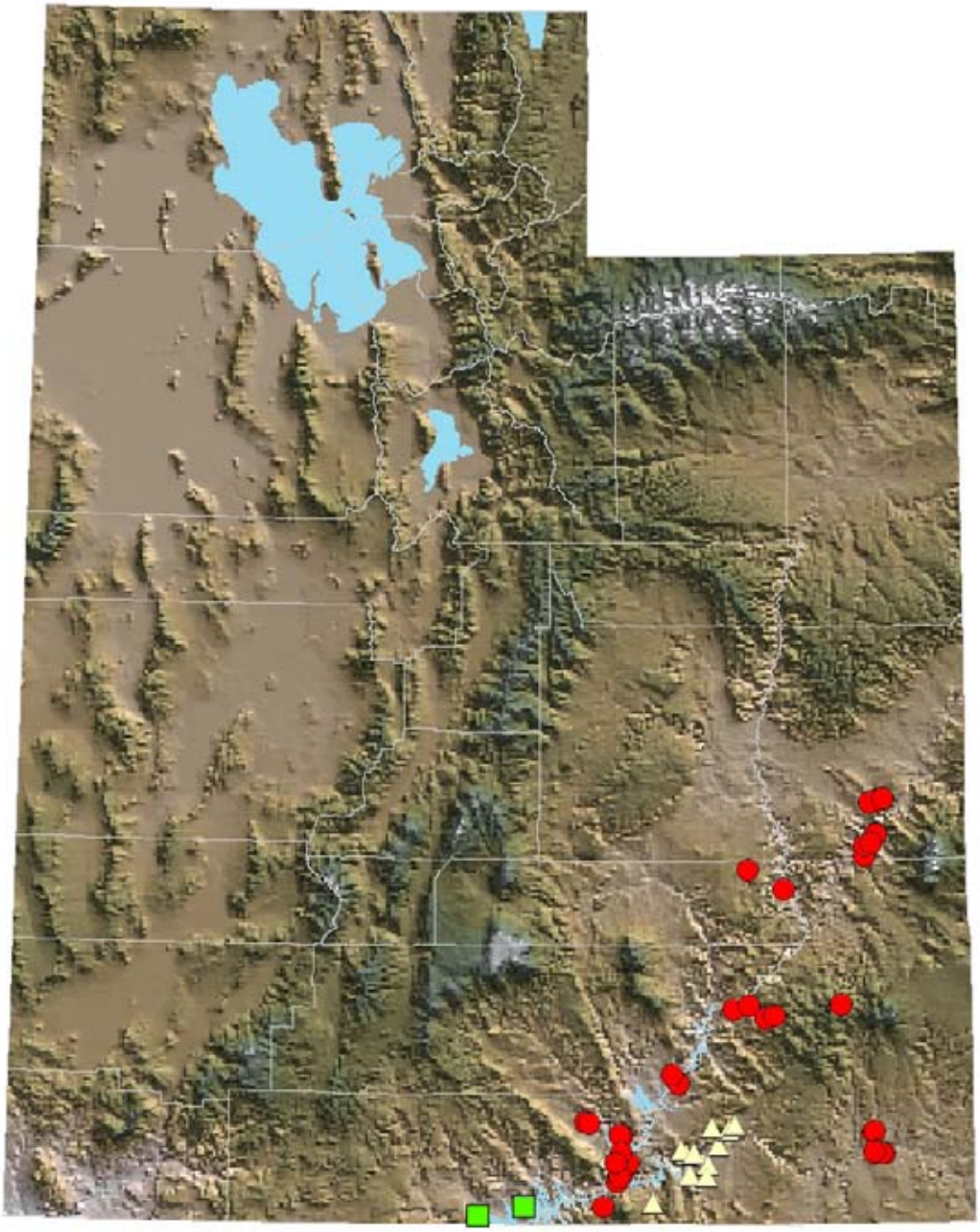

Figure 190. The distribution of cave primrose (*Primula specuicola*) ●, House Rock Valley indigo bush (*Psorothamnus arborescens* var. *pubescens*) ■, and Whiting's indigo bush (*Psorothamnus thompsoniae* var. *whitingii*) △ .

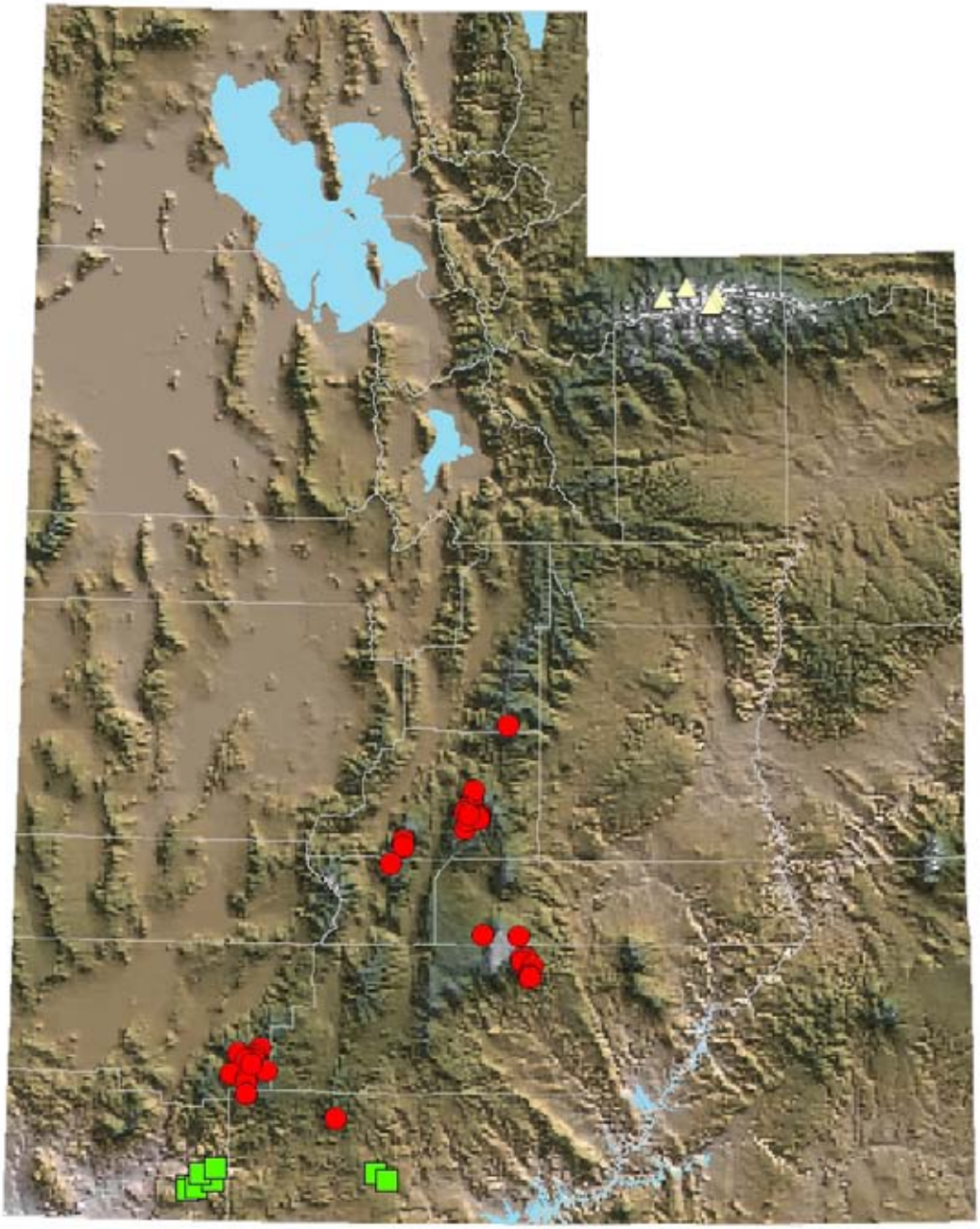

Figure 191. The distribution of Arizona willow (*Salix arizonica*) ●, Chinle chia (*Salvia columbariae* var. *argillacea*) ■, and golden saxifrage (*Saxifraga chrysantha*) △ .

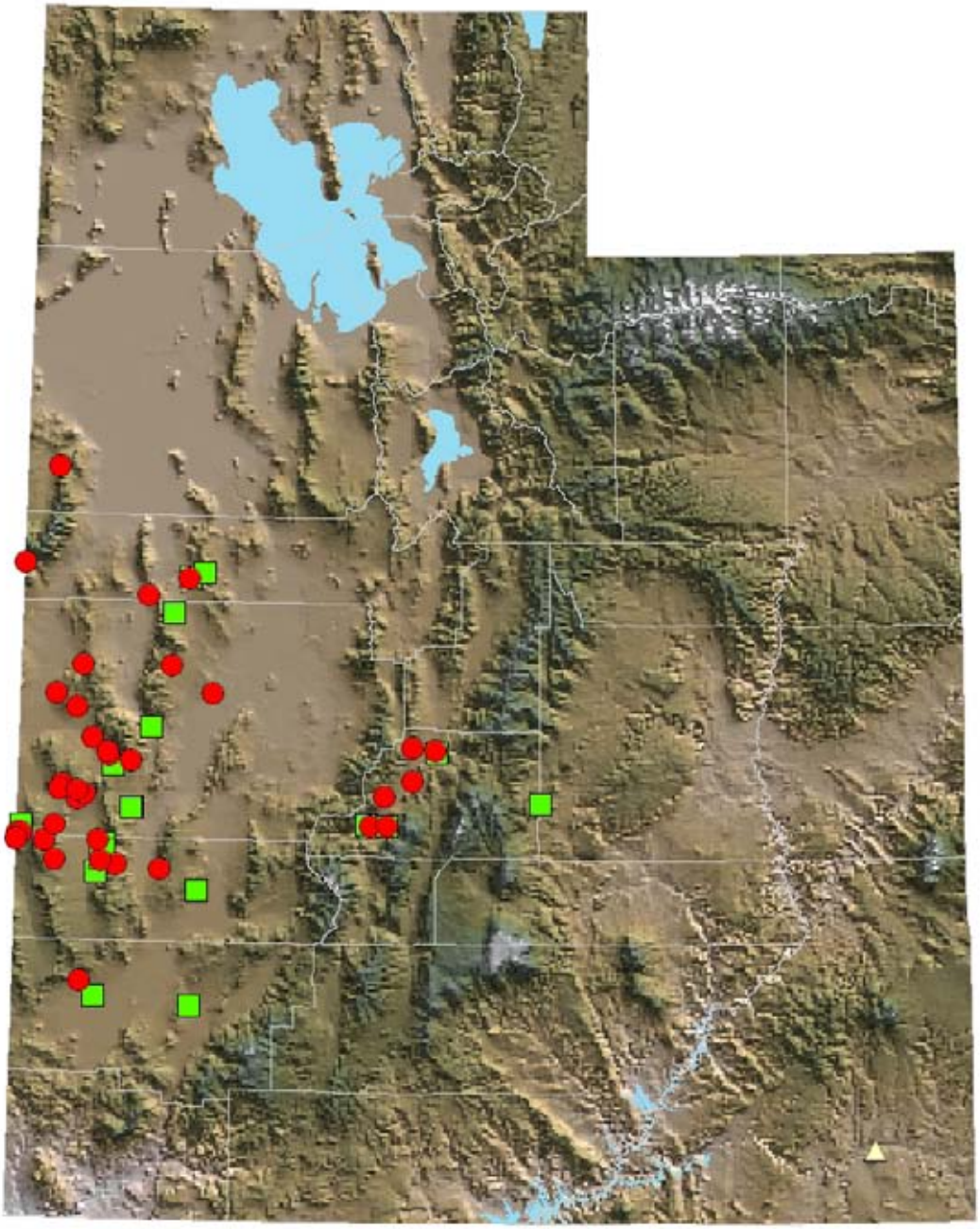

Figure 192. The distribution of Great Basin fishhook cactus (*Sclerocactus pubispinus*) ●, desert valley fishhook cactus (*Sclerocactus spinosior*) ■, and Whipple's fishhook cactus (*Sclerocactus whipplei*) △ .

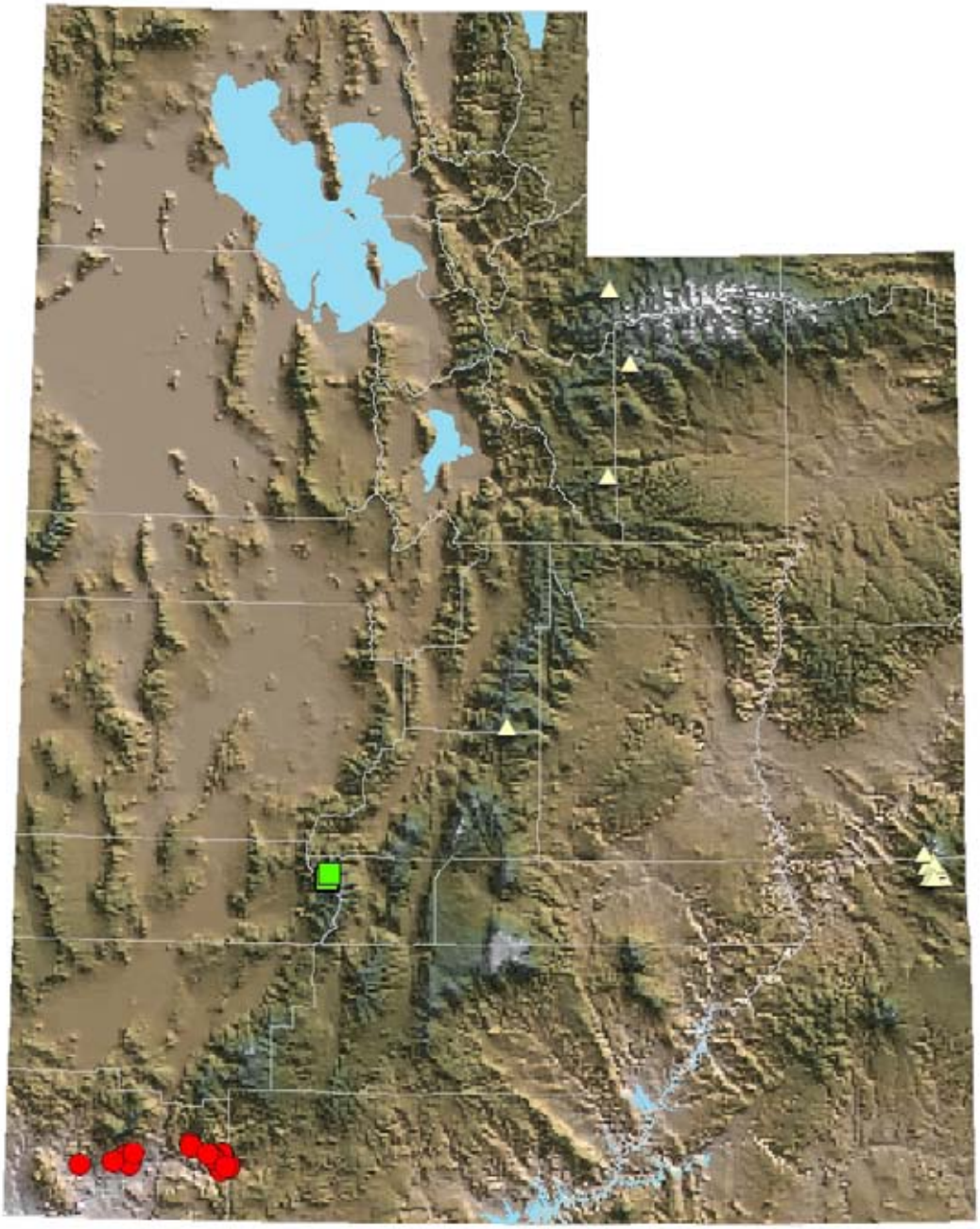

Figure 193. The distribution of Utah spike-moss (*Selaginella utahensis*) ●, Beaver Mountain groundsel (*Senecio castoreus*) ■, and different groundsel (*Senecio dimorphophyllus* var. *intermedius*) △ .

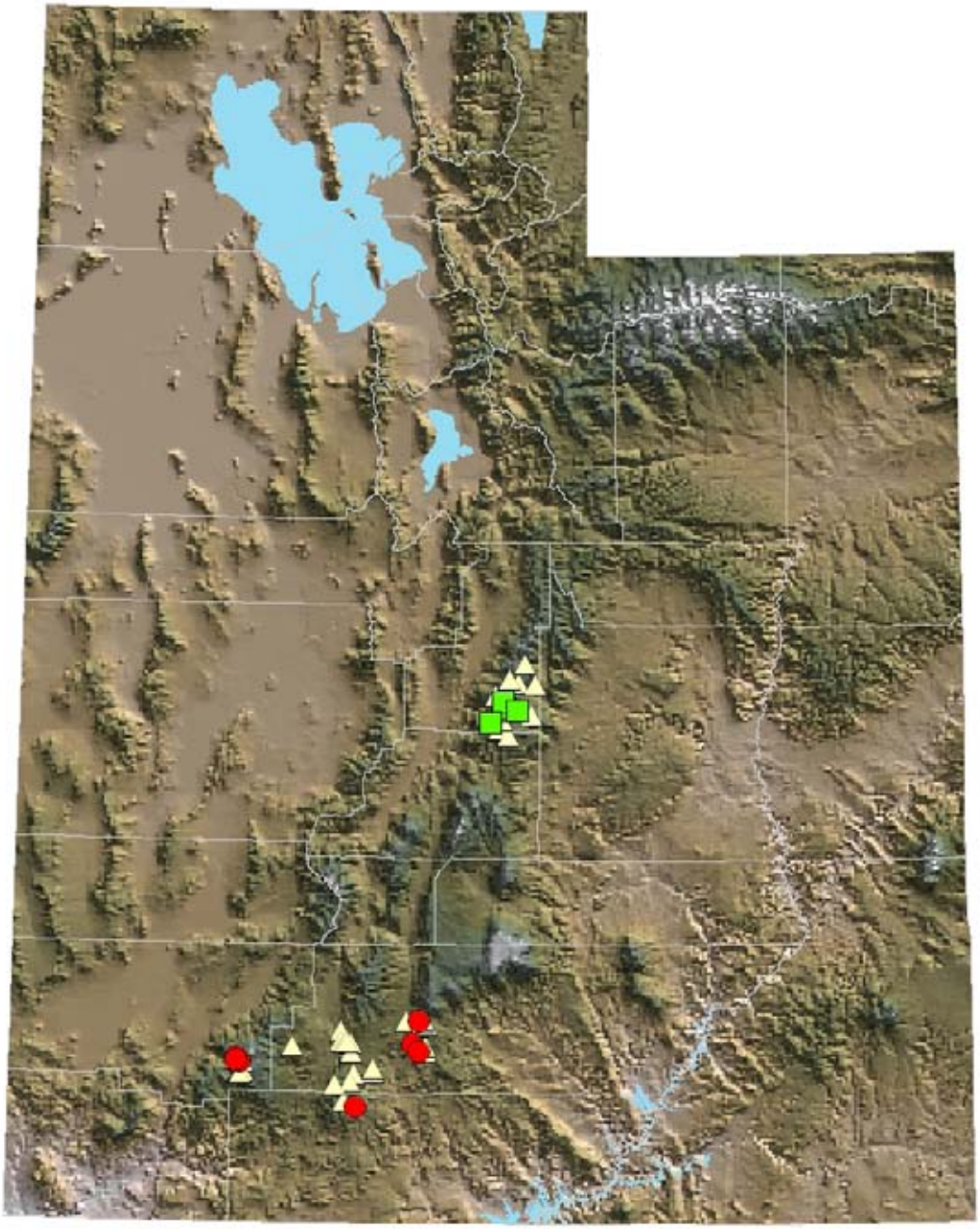

Figure 194. The distribution of Podunk groundsel (*Senecio malmstenii*) ●, Musinea groundsel (*Senecio musiniensis*) ■, and Peterson's catchfly (*Silene petersonii*) △ .

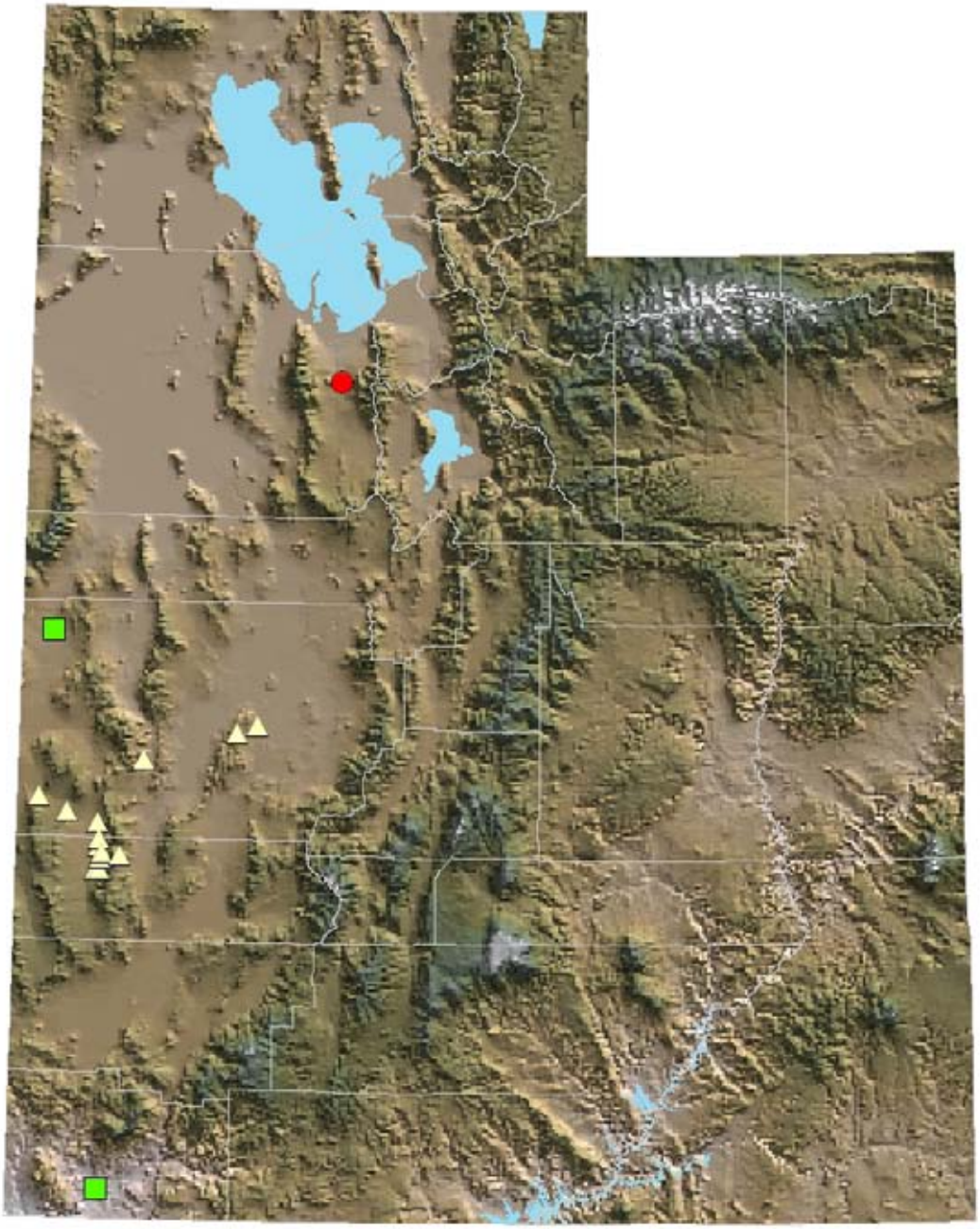

Figure 195. The distribution of purple-eyed grass (*Sisyrinchium douglasii* var. *inflatum*) ●, Nevada goldenrod (*Solidago spectabilis*) ■, and Jones' globe-mallow (*Sphaeralcea caespitosa*) △ .

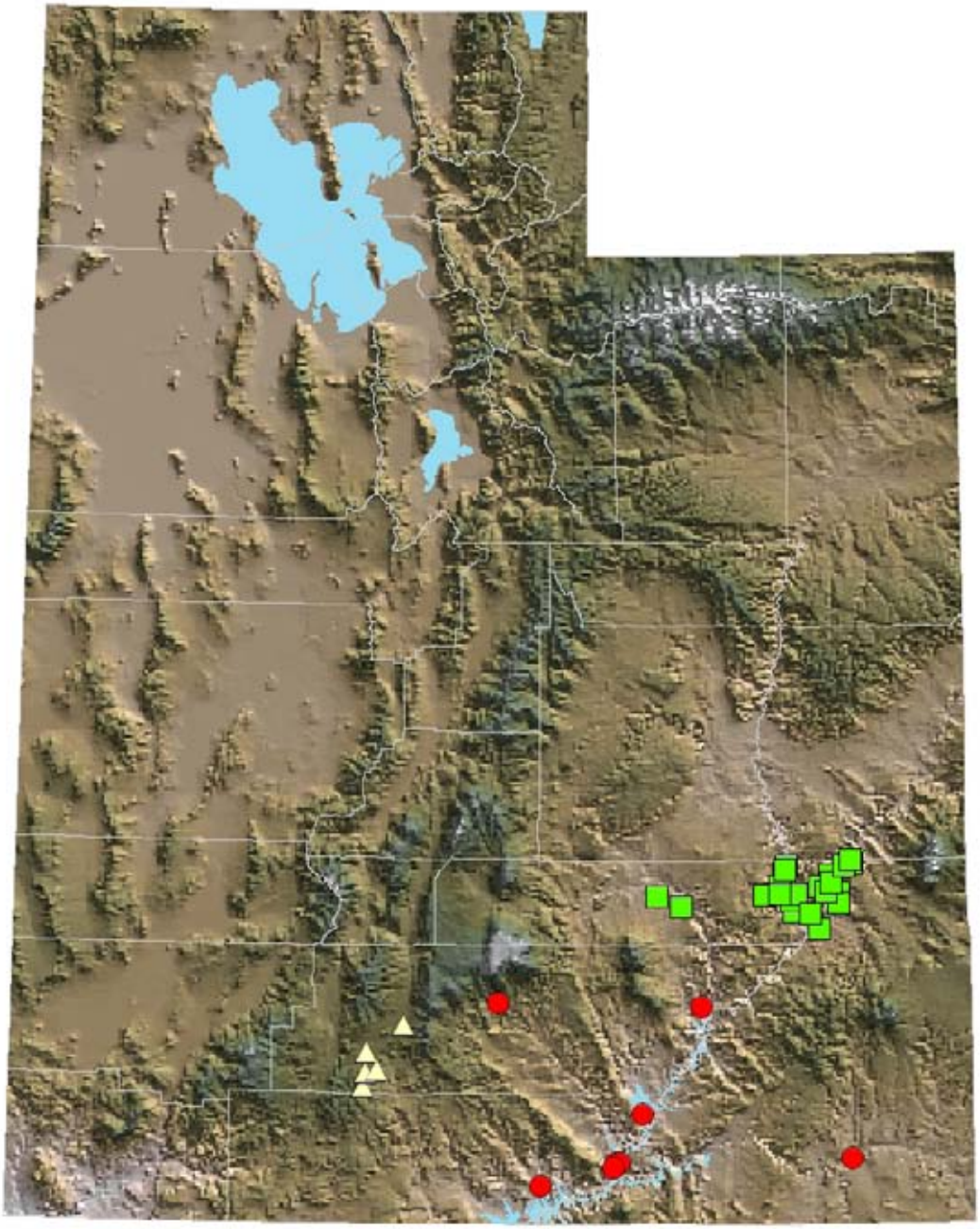

Figure 196. The distribution of Moore's globemallow (*Sphaeralcea grossulariifolia* var. *moorei*) ●, Jane's globemallow (*Sphaeralcea janeae*) ■, and rock-tansy (*Sphaeromeria capitata*) △ .

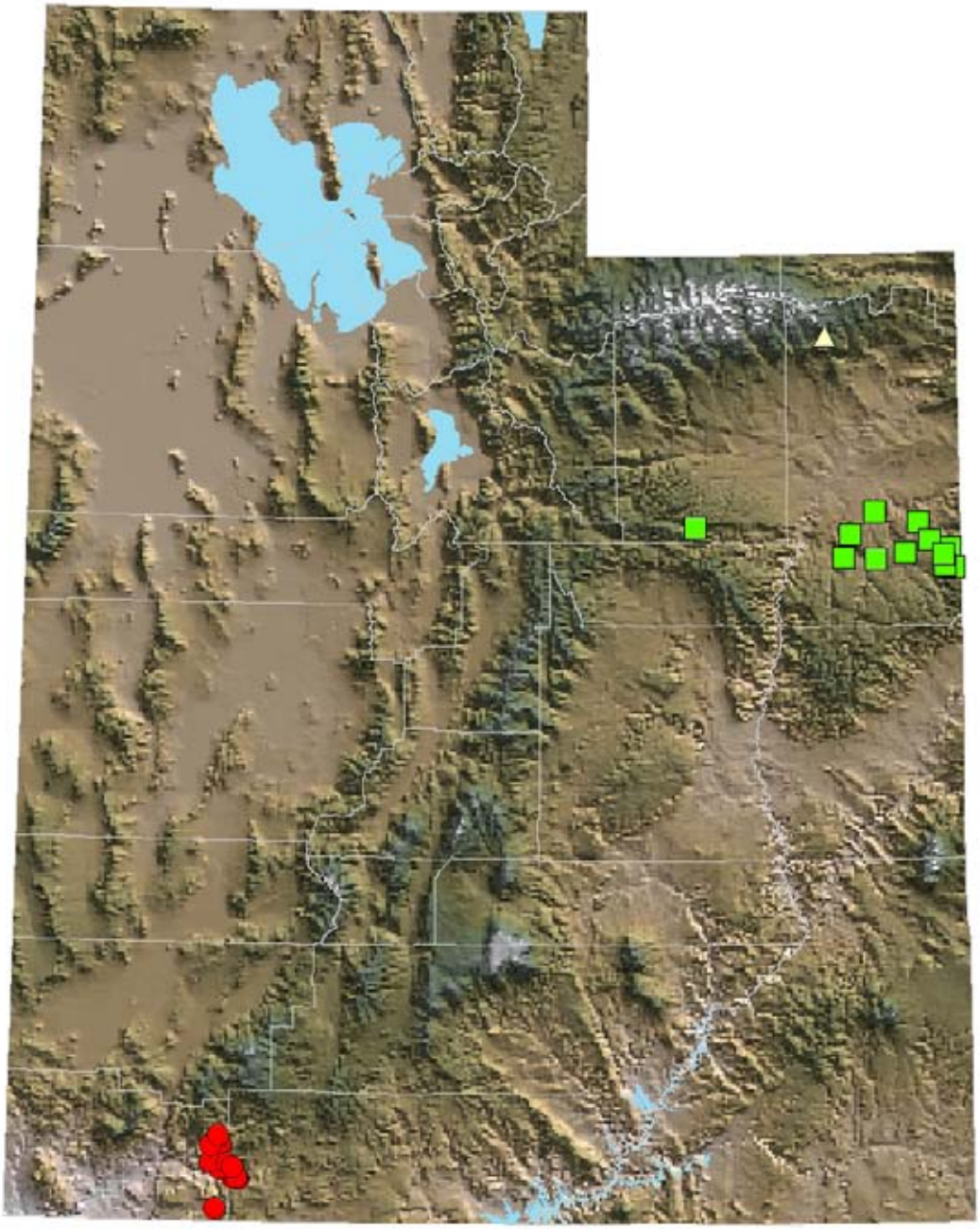

Figure 197. The distribution of Zion tansy (*Sphaeromeria ruthiae*) ●, grass goldenweed (*Stenotus armerioides* var. *gramineus*) ■, and narrow-leaved skeletonplant (*Stephanomeria tenuifolia* var. *uintaensis*) △ .

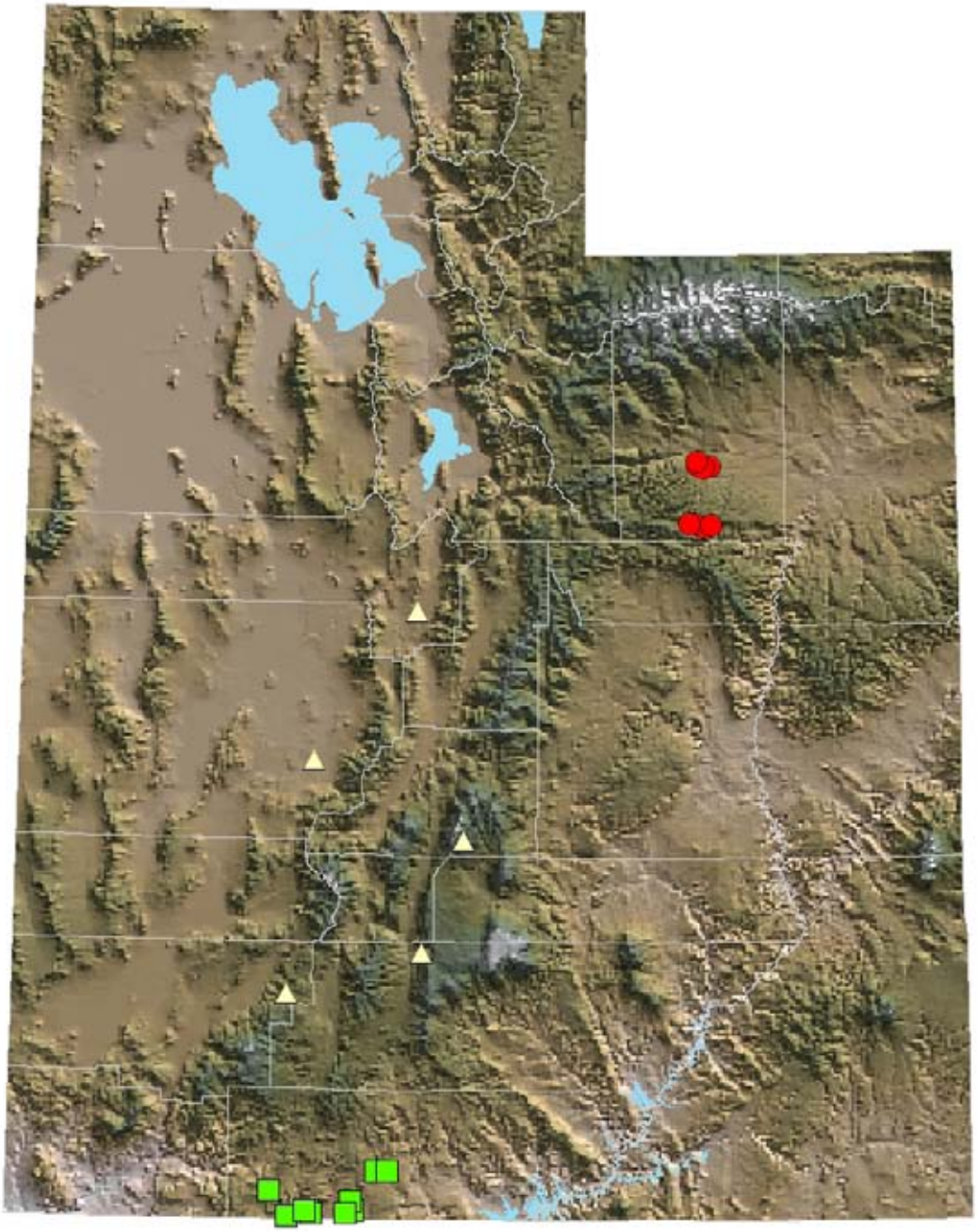

Figure 198. The distribution of Green River greenthread (*Thelesperma caespitosum*) ●, Kanab thelypody (*Thelypodiopsis ambigua* var. *erecta*) ■, and slender thelypody (*Thelypodiopsis sagittata* var. *ovalifolia*) △ .

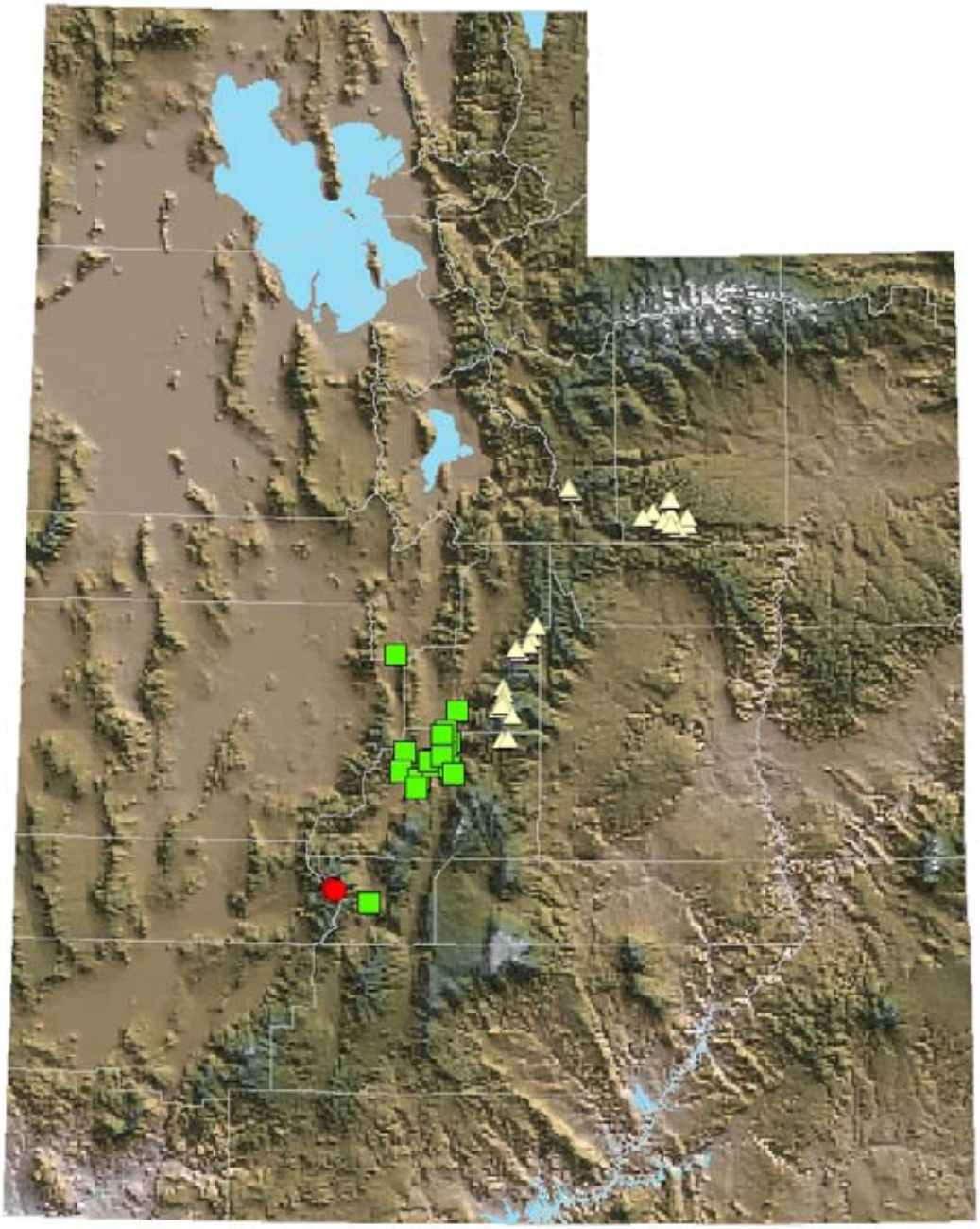

Figure 199. The distribution of cushion Townsend-daisy (*Townsendia condensata*) ●, Sigurd Easter daisy (*Townsendia jonesii* var. *lutea*) ■, and skyline townsendia (*Townsendia montana* var. *caelilinensis*) △ .

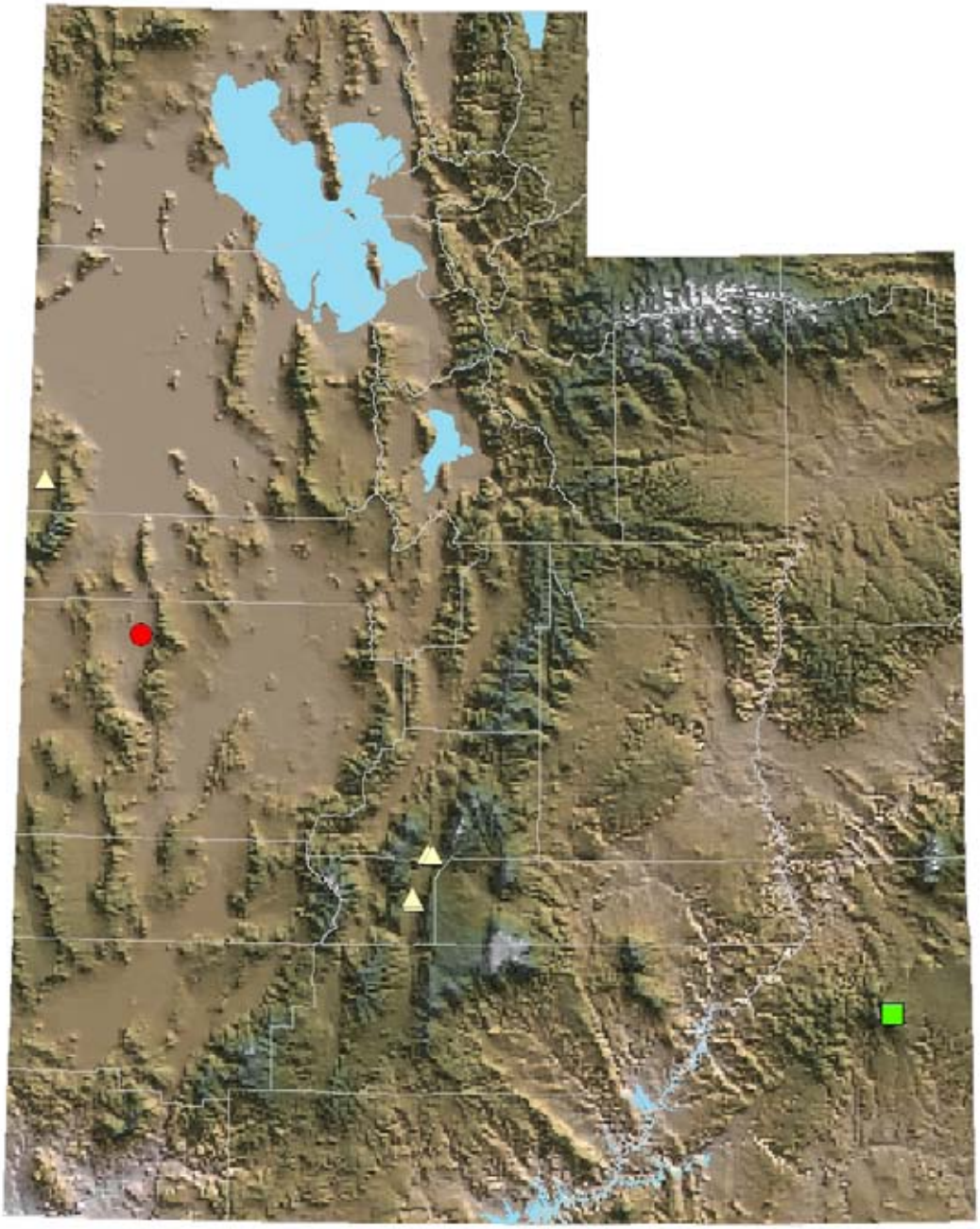

Figure 200. The distribution of tufted Townsend-daisy (*Townsendia scapigera*) ●, Carolina tassel-rue (*Trautvetteria caroliniensis*) ■, and wooly clover (*Trifolium eriocephalum* subsp. *villiferum*) △ .

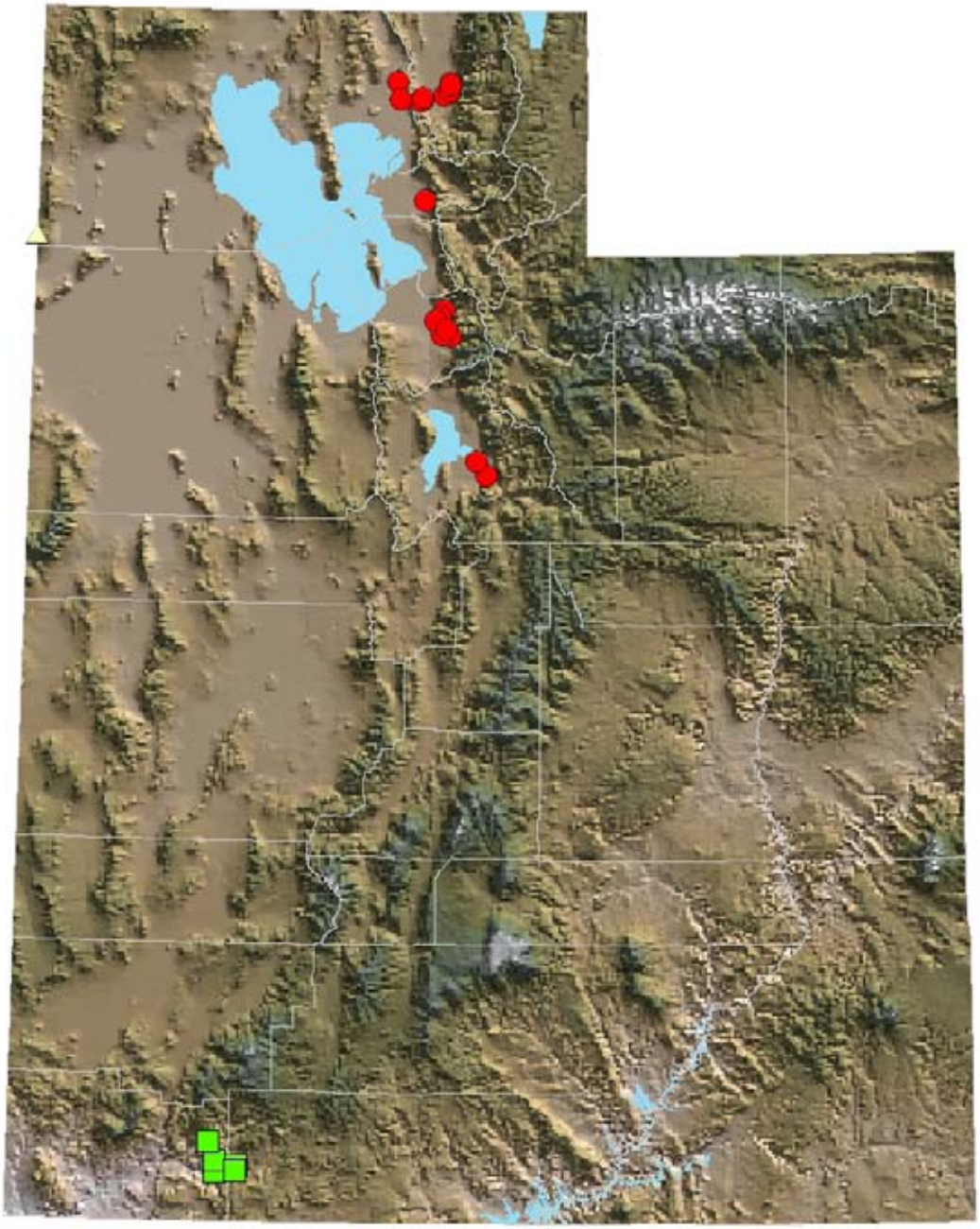

Figure 201. The distribution of Beckwith's violet (*Viola beckwithii*) ●, limestone violet (*Viola charlestonensis*) ■, and rock violet (*Viola lithion*) △.

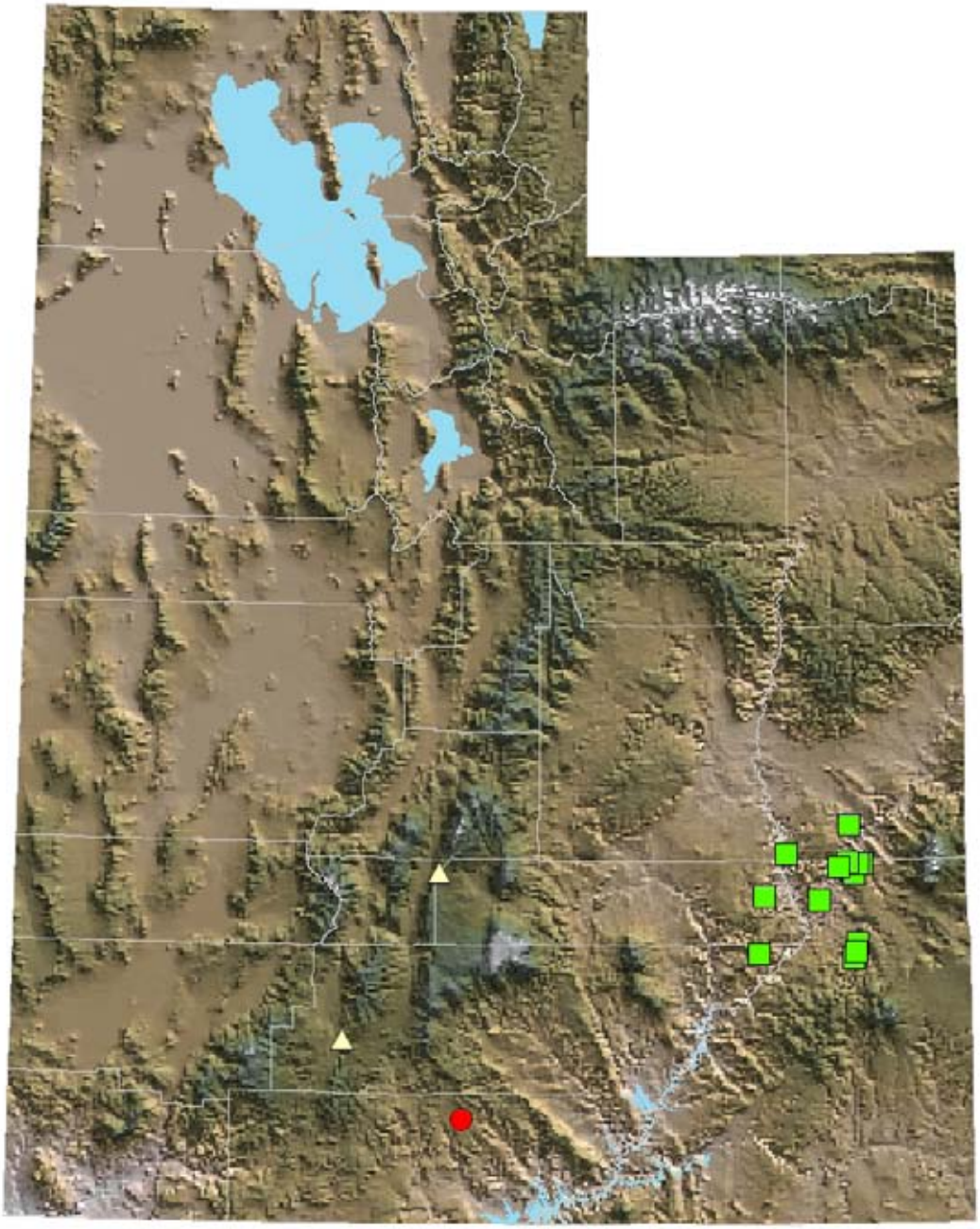

Figure 202. The distribution of Cronquist's woodyaster (*Xylorhiza cronquistii*) ●, Moab woodyaster (*Xylorhiza glabriuscula* var. *linearifolia*) ■, and out-of-the-way yucca (*Yucca angustissima* var. *avia*) △ .

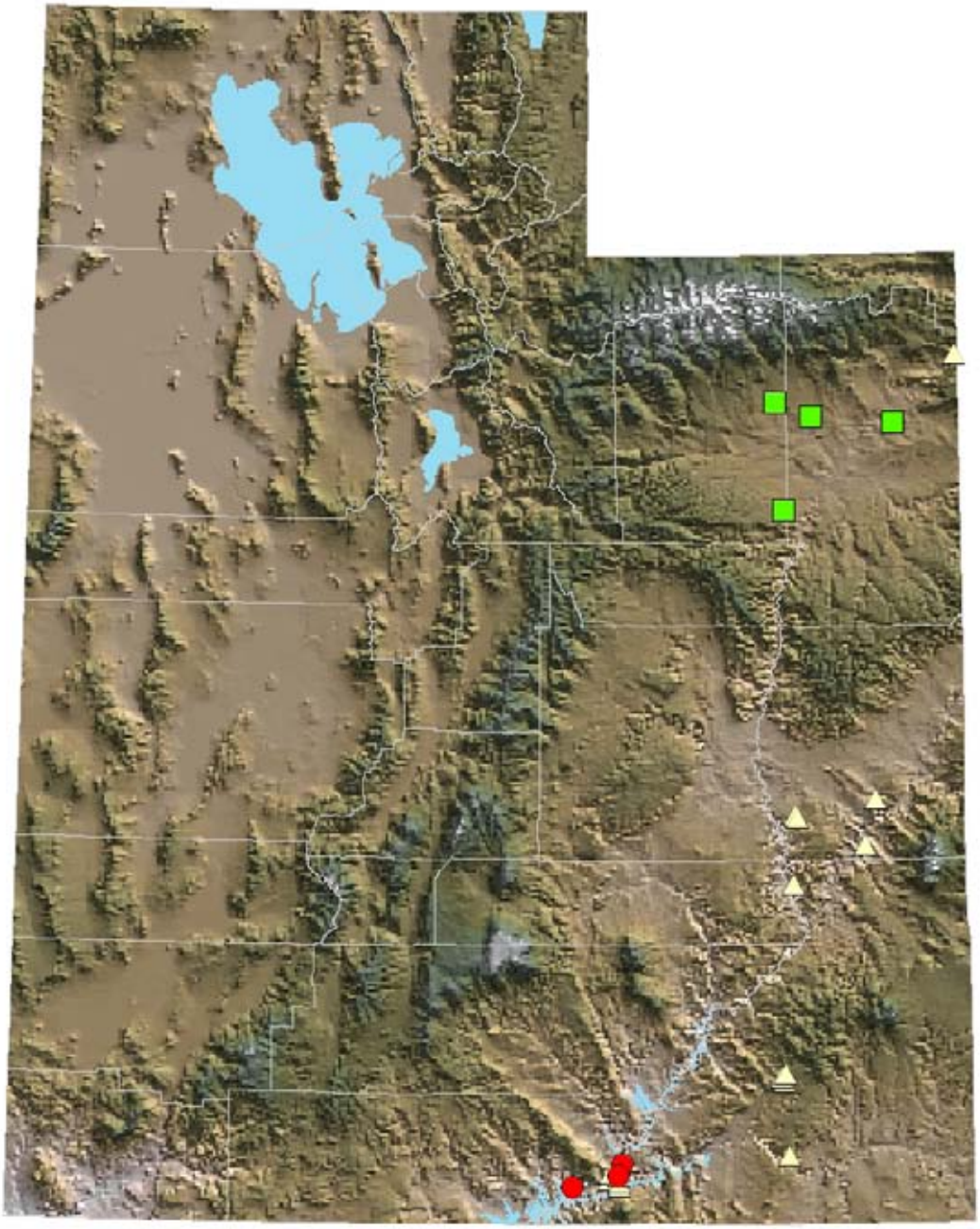

Figure 203. The distribution of Toft's yucca (*Yucca angustissima* var. *toftiae*) ●, sterile yucca (*Yucca harrimaniae* var. *sterilis*) ■, and sheathed deathcamus (*Zigadenus vaginatus*) △ .

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Appendix

Species accounts contain references to Utah counties. Below is a map of Utah showing its 29 counties.

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