

Sego Lily

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The Flora of Rainbow Bridge National Monument



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Cover: Rainbow Bridge, the world's largest natural stone bridge, viewed from the south-east in Rainbow Bridge National Monument, Utah. Photo by W. Fertig, September 2010.

“This Rainbow Bridge was the one great natural phenomenon, the one grand spectacle, which Shefford had ever seen that did not at first give vague disappointment, a confounding of reality, a disenchantment of contrast with what the mind had conceived. But this thing was glorious. It silenced him, yet did not awe or stun. His body and brain, weary and dull from the toil of travel, received a singular and revivifying freshness. He had a strange, mystic perception of this rosy-hued stupendous arch of stone, as if in a former life it had been a goal he could not reach ... Here at last, apparently, was the rainbow of his boyish dreams and of his manhood: a rainbow magnified even beyond those dreams, no longer transparent and ethereal, but solidified, a thing of ages, sweeping up majestically from the red walls, its iris-hued arch against the blue sky.” - Zane Grey, The Rainbow Trail, 1915.

Flora of Rainbow Bridge National Monument

By Walter Fertig

To the Navajo, it was Nonnezoshe, “the stone arch”. Paiutes called it Barhoini - “the rainbow”. In all, five tribes from the Four Corners region considered it sacred. White explorers named it “Rainbow Bridge” for its colorful hues (though mostly in orange, tan, and white) and arching shape. Rainbow Bridge is the world’s largest natural stone bridge reaching 290 feet from top to bottom and spanning 275 feet across Bridge Canyon*. President William Howard Taft recognized the significance of the bridge in May 1910, decreeing it one of the nation’s first national monuments under the Antiquities Act.

Rainbow Bridge had only been “discovered” by the outside world less than a year earlier. Though likely known by Indians for centuries, word of the colossal stone rainbow first attracted the attention of early settlers in 1907. Over the next two years expeditions were mounted by University of Utah dean Byron Cummings and government surveyor William Douglass to discover the bridge rumored to lie somewhere in the poorly explored meandering canyons of the Colorado River west of Navajo Mountain in extreme southern San Juan County, Utah. The two rival parties eventually joined forces with local trader/explorer John Wetherill, Paiute guide Nasja Begay, and Ute guide Jim Mike to reach the bridge in August 1909.

For years, Rainbow Bridge was the most remote and probably least visited National Park Service unit in the contiguous United States. No paved roads or airstrips were located in the monument. Reaching the bridge entailed a four day trek on foot or horseback from base camps on the south or north sides of Navajo Mountain, or a three day boat trip from Lee’s Ferry to the mouth of Bridge Canyon on the Col-



Above: Western redbud (Cercis occidentalis var. orbiculata) produces pea-like blooms in April in Bridge Canyon below Rainbow Bridge. Overland trekkers seeking Rainbow Bridge from the south must cross the appropriately named Redbud Pass and Redbud Canyon. Photo by W. Fertig.

orado River and then a 7 mile hike up canyon. With the completion of Glen Canyon Dam in 1963, Rainbow Bridge became accessible by boat on Lake Powell, though it is still nearly a four hour round-trip from Wahweap Marina. Three hundred thousand tourists now visit the bridge each year according to the park service.

Rainbow Bridge is carved entirely within Jurassic-aged Navajo Sandstone sitting on a base of Triassic Kayenta Sandstone. Until 5.5 million years ago, the Colorado Plateau region was a relatively flat plain built up of thousands of feet of sediments. Regional uplift and a wetter climate facilitated extensive erosion by creeks draining Navajo Mountain. Over time, Bridge Creek carved a deep, meandering chasm that pinched off a narrow fin of sandstone. Eventually the creek began to pound at the base of the fin, ultimately creating a small hole in the Navajo Sandstone. Over time the hole expanded thanks to the erosive power of floods and freezing and thawing to ultimately create the massive bridge that stands today. It is thought that nature took 30,000

years to carve the bridge. Engineers predict that it should persist for many thousands of years to come until the massive abutments are eventually eroded to half their current size and will no longer be able to support the weight of the span.

At just 65 acres, Rainbow Bridge National Monument is the smallest national park unit in Utah. Not surprisingly, it also has one of the smallest floras. The low species richness is a consequence of the minimal elevational range (3700-4880 feet) and limited number of vegetation types (Utah juniper, blackbrush-saltbush scrub, hanging gardens, and rock ledges) present in the monument.

The first trained botanists to explore Rainbow Bridge were apparently Elzada Clover and Lois Jotter in 1939, as part of their baseline floristic studies of the canyons of the Colorado River (Clover and Jotter 1941). They noted 18 vascular plant species from the area. During the next four decades just 15 additional species were documented through the efforts of John T. Howell, Duane Atwood, Stan Welsh, and others. In 1985, Jim Holland and colleagues from Glen Canyon NRA made extensive collections at Rainbow Bridge and bumped the known flora to 164, where it stood for the next two decades.

I became interested in the flora of Rainbow Bridge in April 2006 when I first visited the monument with my wife Laura and some friends via the overland route. Although I kept a log of plants observed on the trek, I didn’t differentiate between species found in the monument and those from the adjacent Navajo reservation. When we returned in April 2008, Laura and I had Holland and Wood’s unpublished species list in hand and began checking off new taxa. In just a few hours we relocated 62 species cited by previous botanists and discovered 26 new species. One of our discoveries was the first report of the rare Texas stork’s-bill (*Erodium texanum*), a native [text continued on page 13]

* To put this in perspective, the bridge is nearly the height of the US Capitol.

Flora of Rainbow Bridge National Monument

The following checklist is based on herbarium records (primarily from the University of Nevada Las Vegas, Glen Canyon NRA, and Brigham Young University), published and unpublished literature, and recent field collections and observations by Walter and Laura Fertig and John Spence. Species are organized alphabetically by family and genus. Life forms include annual forbs (AF), annual graminoids (AG), ferns and fern-allies (fern), perennial forbs (PF), perennial graminoids (PG), shrubs (S), and trees (T). Range describes the distribution of each species in Utah and includes: local endemics (LE), regional endemic (RE), peripheral (P), sparsely distributed (S), and widespread (W). Status within Rainbow Bridge NM is either confirmed present (Pres) with an herbarium record, photograph, or recent observation; historical (Hist) - not observed since 1970; or reported (Rep) in the literature. Population Size ranges from common (com) to uncommon (unc) or rare. The source is the basis for a record in the Rainbow Bridge flora and may be an herbarium specimen, literature citation, or observation. The year documented is the earliest year in which a species was reported for the monument. Species taxonomy follows the 4th edition of *A Utah Flora* (Welsh et al., 2008).

Family	Species/Synonym	Common Name	Life form	Range	Status	Pop Size	Source	Year Doc.
Agavaceae	<i>Yucca harrimaniae</i> var. <i>harrimaniae</i>	Spanish bayonet	S	W	Pres	Unc	Fertig & Spence obs Sep 2010	2008
	<i>Yucca toftiae</i> (<i>Y. angustissima</i> var. <i>toftiae</i>)	Toft's yucca	S	LE	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
Anacardiaceae	<i>Rhus aromatica</i> var. <i>simplicifolia</i> (<i>R. trilobata</i> var. <i>simplicifolia</i>)	Squawbush	S	W	Pres	Unc	Clover & Jotter 4048 (MICH)	1939
	<i>Rhus aromatica</i> var. <i>trilobata</i> (<i>R. trilobata</i> var. <i>trilobata</i>)	Squawbush	S	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Toxicodendron rydbergii</i>	Western poison ivy	S	W	Pres	Com	Fertig et al. obs Jul 2008	2008
Apiaceae (Umbelliferae)	<i>Cymopterus acaulis</i> var. <i>fendleri</i> (<i>C. fendleri</i>)	Fendler's spring-parsley	PF	RE	Pres	Unc	Holland, Ott & Wood 2711 (UNLV)	1985
Apocynaceae	<i>Apocynum cannabinum</i>	Common dogbane	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Asclepiadaceae (Apocynaceae)	<i>Asclepias asperula</i> var. <i>asperula</i>	Spider milkweed	PF	W	Pres	Rare	Fertig & Fertig obs Apr 2008	2008
	<i>Asclepias latifolia</i>	Broadleaf milkweed	PF	W	Pres	Rare	Fertig & Spence obs Sep 2010	2010
	<i>Asclepias macrosperma</i>	Bigseed milkweed	PF	RE	Pres	Rare	Holland, Ott, & Wood 2667 (UNLV)	1985
Asteraceae (Compositae)	<i>Acourtia wrightii</i> (<i>Perezia wrightii</i>)	Wright's perezia	PF	P	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Artemisia bigelovii</i>	Bigelow's sagebrush	S	W	Pres	Unc	Fertig & Spence obs Sep 2008	2010
	<i>Artemisia ludoviciana</i> var. <i>albula</i>	Louisiana wormwood	PF	W	Pres	Com	Fertig et al. obs Jul 2008	1985
	<i>Artemisia ludoviciana</i> var. <i>mexicana</i>	Louisiana wormwood	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Aster ascendens</i> (<i>Symphotrichum ascendens</i>)	Pacific aster	PF	W	Pres	Com	Fertig & Spence 26251 (GLCA)	2010
	<i>Aster wasatchensis</i> var. <i>pulcher</i> (<i>Eucephalus pulcher</i> , <i>Herrickia glauca</i> var. <i>pulchra</i>)	Modest aster	PF	RE	Pres	Unc	Fertig & Spence obs Sep 2010	2010
	<i>Aster welshii</i> (<i>Symphotrichum welshii</i>)	Welsh's aster	PF	RE	Pres	Rare	Fertig et al. 24036 (GLCA)	2008
	<i>Baccharis salicifolia</i> (<i>B. glutinosa</i>)	Sticky seep-willow	S	W	Pres	Com	Fertig et al. 24040 (GLCA)	2008
	<i>Brickellia atractyloides</i>	Spiny brickellbush	S	W	Pres	Unc	Holland, Ott, & Wood 2726 (UNLV)	1985
	<i>Brickellia longifolia</i>	Longleaf brickellbush	S	W	Pres	Com	Fertig et al. obs July 2008	1985
	<i>Bricellia microphylla</i> var. <i>scabra</i>	Rough brickellbush	S	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Chaenactis macrantha</i>	Showy dusty-maiden	AF	W	Pres	Unc	Holland, Ott, & Wood 2712 (UNLV)	1985
	<i>Chaenactis stevioides</i>	Stevia dusty-maiden	AF	W	Pres	Unc	Holland, Ott, & Wood 2713 (UNLV)	1985
	<i>Chrysopsis villosa</i> var. <i>minor</i> (<i>Heterotheca villosa</i> var. <i>minor</i>)	Hispid golden-aster	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008

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Asteraceae (Compositae)	<i>Chrysopsis villosa</i> var. <i>villosa</i> (<i>Heterotheca villosa</i> var. <i>villosa</i>)	Hairy golden-aster	PF	S	Rep	Unk	Holland & Wood (1985)	1985
	<i>Chrysothamnus nauseosus</i> var. <i>junceus</i> (<i>Ericameria nauseosa</i> var. <i>juncea</i>)	Rush rabbitbrush	S	RE	Pres	Com	Fertig & Fertig obs Apr 2008	2008
	<i>Chrysothamnus nauseosus</i> var. <i>oreophilus</i> (<i>Ericameria nauseosa</i> var. <i>consimilis</i> , <i>E. nauseosa</i> var. <i>oreophila</i>)	Greenish rabbitbrush	S	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Cirsium neomexicanum</i> var. <i>neomexicanum</i>	New Mexico thistle	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Cirsium rydbergii</i>	Rydberg's thistle	PF	RE	Pres	Rare	Fertig et al. obs Jul 2008	1985
	<i>Conyza canadensis</i> var. <i>glabrata</i>	Canadian horseweed	AF	W	Pres	Com	Clover & Jotter (1941)	1939
	<i>Encelia frutescens</i> var. <i>resinosa</i>	Bush encelia	S	RE	Pres	Unc	Holland, Ott, & Wood 2653 (UNLV)	1985
	<i>Erigeron bellidiastrum</i>	Pretty daisy	AF	W	Pres	Rare	Fertig et al. 24038 (GLCA)	2008
	<i>Erigeron divergens</i> var. <i>divergens</i>	Spreading daisy	PF	W	Hist	Unk	Clover & Jotter 4093 (MICH)	1939
	<i>Erigeron lobatus</i>	Lobeleaf daisy	PF	RE	Pres	Rare	Holland, Ott, & Wood 2679 (BRY)	1985
	<i>Erigeron utahensis</i> var. <i>sparsifolius</i> (<i>E. sparsifolius</i>)	Slenderleaf daisy	PF	RE	Pres	Unc	Holland, Ott, & Wood 2664 (UNLV)	1985
	<i>Euthamia occidentalis</i> (<i>Solidago occidentalis</i>)	Western goldenrod	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Filago californica</i> (<i>Logfia californica</i>)	Fluffweed	AF	P	Rep	Unk	Holland & Wood (1985)	1985
	<i>Gaillardia pinnatifida</i>	Hopi blanketflower	PF	W	Pres	Unc	Holland, Ott, & Wood 2701 (UNLV)	1985
	<i>Glyptopleura marginata</i>	Crustweed	AF	W	Pres	Unc	Holland, Ott, & Wood 2707 (UNLV)	1985
	<i>Gnaphalium palustre</i>	Lowland cudweed	AF	W	Pres	Unc	Holland, Ott, & Wood 2685 (UNLV)	1985
	<i>Gnaphalium stramineum</i> (<i>G. chilense</i> , <i>Pseudognaphalium stramineum</i>)	Cottonbatting cudweed	AF	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Gutierrezia microcephala</i>	Thread snakeweed	S	W	Pres	Com	Fertig et al. obs Jul 2008	1985
	<i>Gutierrezia sarothrae</i>	Broom snakeweed	S	W	Pres	Com	Fertig & Fertig obs Apr 2008	2008
	<i>Hymenopappus filifolius</i> var. <i>cinereus</i>	Common hyalineherb	PF	W	Pres	Unc	Holland, Ott, & Wood 2672 (UNLV)	1985
	<i>Hymenoxys acaulis</i> var. <i>arizonica</i> (<i>Tetraneris acaulis</i>)	Stemless woollybase	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Hymenoxys acaulis</i> var. <i>ivesiana</i> (<i>Tetraneris ivesiana</i>)	Canyonlands woollybase	PF	W	Pres	Unc	Fertig & Spence obs Sep 2010	2010
	<i>Machaeranthera canescens</i> var. <i>aristata</i>	Hoary aster	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Malacothrix glabrata</i>	Filiform desert-dandelion	AF	W	Pres	Unc	Holland, Ott, & Wood 2709 (UNLV)	1985
	<i>Pluchea sericea</i> (<i>Tessaria sericea</i>)	Arrowweed	S	W	Pres	Unc	Fertig et al. obs Jul 2008 (UNLV)	2008
	<i>Prenanthes exigua</i> (<i>Lygodesmia exigua</i>)	Prenanthes	AF	W	Pres	Unc	Holland, Ott, & Wood 2705 (UNLV)	1985
	<i>Solidago canadensis</i> var. <i>salebrosa</i> (<i>S. altissima</i>)	Canadian goldenrod	PF	W	Pres	Unc	Atwood 3304 (BRY)	1939
	<i>Solidago velutina</i> (<i>S. sparsiflora</i>)	Three-nerve goldenrod	PF	W	Pres	Com	Fertig & Fertig obs Apr 2008	2008

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Asteraceae (Compositae)	<i>Sonchus asper</i>	Spiny-leaf sow-thistle	AF	I	Pres	Rare	Fertig et al. obs Jul 2008	1985
	<i>Stephanomeria pauciflora</i>	Brown-plume wire-lettuce	PF	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Stephanomeria tenuifolia</i> var. <i>tenuifolia</i>	Slender wire-lettuce	PF	W	Pres	Com	Fertig et al. obs Jul 2008	2008
	<i>Stylocline micropoides</i>	Desert nest-straw	AF	P	Pres	Rare	Holland, Ott, & Wood 2661 (UNLV)	1985
	<i>Thymophylla pentachaeta</i> var. <i>belenidium</i> (<i>Dyssodia pentachaeta</i>)	Scale glandweed	PF	W	Pres	Com	Welsh & Atwood 11652 (BRY)	1948
	<i>Townsendia annua</i>	Annual townsendia	AF	W	Pres	Unc	Holland, Ott, & Wood 2699 (UNLV)	1985
	<i>Townsendia incana</i>	Hoary townsendia	PF	W	Pres	Unc	Holland, Ott, & Wood 2670 (UNLV)	1985
	<i>Wyethia scabra</i> (<i>Scabrethia scabra</i>)	Rough mule's-ears	PF	W	Pres	Unc	Holland, Ott, & Wood 2671 (UNLV)	1985
	<i>Xylorhiza imberbis</i> (<i>X. tortifolia</i> var. <i>imberbis</i> , <i>Machaeranthera tortifolia</i> var. <i>imberbis</i>)	Hurtleaf woodyaster	PF	RE	Pres	Unc	Holland, Ott, & Wood 2668 (UNLV)	1985
Betulaceae	<i>Ostrya knowltonii</i>	Western hop-hornbeam	T	RE	Pres	Unc	Fertig & Spence 26254 (GLCA)	2010
Boraginaceae	<i>Cryptantha circumcissa</i>	Cushion cryptanth	AF	W	Pres	Unc	Holland, Ott, & Wood 2723 (UNLV)	1985
	<i>Cryptantha confertiflora</i>	Basin yellow cryptanth	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Cryptantha fendleri</i>	Sand dune cryptanth	AF	W	Hist	Unk	Clover & Jotter 4097 (MICH)	1939
	<i>Cryptantha flava</i>	Plateau yellow cryptanth	PF	W	Pres	Unc	Holland, Ott, & Wood 2673 (UNLV)	1985
	<i>Cryptantha gracilis</i>	Slender cryptanth	AF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Cryptantha nevadensis</i>	Nevada cryptanth	AF	P	Pres	Unc	Holland, Ott, & Wood 2676 (UNLV)	1985
	<i>Cryptantha pterocarya</i> - variety not determined	Wing-nut cryptanth	AF	W	Rep	Unc	Holland & Wood (1985)	1985
	<i>Cryptantha recurvata</i>	Recurved cryptanth	AF	W	Pres	Unc	Holland, Ott, & Wood 2675 (UNLV)	1985
	<i>Heliotropium convolvulaceum</i>	Bindweed heliotrope	AF	W	Hist	Unk	Cutler 2847 (NY)	1939
	<i>Lappula occidentalis</i> (<i>L. redowskii</i>) - variety not determined	Cupseed stickseed	AF	W	Pres	Unc	Holland, Ott, & Wood 2724 (UNLV)	1985
	<i>Plagiobothrys jonesii</i>	Jones' popcorn-flower	AF	RE	Pres	Unc	Holland, Ott, & Wood 2716 (UNLV)	1985
	<i>Tiquilia latior</i> (<i>Coldenia hispidissima</i>)	Matted tiqulia	PF	RE	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Brassicaceae (Cruciferae)	<i>Arabis perennans</i> var. <i>perennans</i> (<i>Boechea perennans</i>)	Perennial rockcress	PF	W	Pres	Unc	Holland, Ott, & Wood 2689 (UNLV)	1985
	<i>Arabis pulchra</i> (<i>Boechea pulchra</i> var. <i>pallens</i>)	Desert rockcress	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Descurainia pinnata</i> var. <i>osmiarum</i>	Western tansy-mustard	AF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Lepidium alyssoides</i> var. <i>eastwoodiae</i> (<i>L. montanum</i> var. <i>spathulatum</i>)	Eastwood's tall pepperwort	PF	RE	Pres	Com	Fertig & Fertig obs Apr 2008	2008
	<i>Lepidium lasiocarpum</i> var. <i>lasiocarpum</i>	Hairy-pod pepperwort	AF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Lepidium montanum</i> var. <i>jonesii</i>	Jones' pepperwort	PF	W	Pres	Unc	Fertig & Spence obs Sep 2010	1985
	<i>Physaria rectipes</i> (<i>Lesquerella rectipes</i>)	Colorado Plateau bladderpod	PF	RE	Pres	Unc	Holland, Ott, & Wood 2693 (UNLV)	1985
	<i>Rorippa sinuata</i>	Spreading yellowcress	PF	S	Pres	Rare	Holland, Ott, & Wood 2706 (UNLV)	1985

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Brassicaceae (Cruciferae)	<i>Streptanthella longirostris</i>	Long-beak fiddle-mustard	AF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Cactaceae	<i>Echinocereus engelmannii</i>	Engelmann's hedgehog cactus	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Echinocereus triglochidiatus</i> (<i>E. mojavensis</i>)	Claretcup	PF	W	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Opuntia erinacea</i> var. <i>erinacea</i>	Common prickly-pear	PF	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Opuntia erinacea</i> var. <i>utahensis</i>	Utah pricklypear	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Sclerocactus whipplei</i> var. <i>roseus</i> (<i>S. parviflorus</i>)	Small-flower fishhook cactus	PF	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
Campanulaceae	<i>Lobelia cardinalis</i> ssp. <i>graminea</i>	Cardinal-flower	PF	P	Pres	Rare	Atwood & Allen 3301 (BRY)	1971
Caryophyllaceae	<i>Silene antirrhina</i>	Sleepy catchfly	AF	W	Pres	Rare	Fertig et al. obs Jul 2008	1985
Chenopodiaceae (Amaranthaceae)	<i>Atriplex canescens</i> var. <i>canescens</i>	Four-wing saltbush	S	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Atriplex saccaria</i> var. <i>saccaria</i>	Stalked orache	AF	RE	Pres	Unc	Holland, Ott, & Wood 2718 (UNLV)	1985
	<i>Grayia spinosa</i>	Spiny hopsage	S	W	Pres	Unc	Holland, Ott, & Wood 2682 (UNLV)	1985
	<i>Monolepis nuttalliana</i>	Nuttall's povertyweed	AF	W	Pres	Unc	Holland, Ott, & Wood 2710 (UNLV)	1985
	<i>Salsola tragus</i> (<i>S. kali</i> , <i>S. tragus</i> , <i>S. pestifer</i>)	Russian-thistle	AF	I	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Commelinaceae	<i>Tradescantia occidentalis</i>	Western spiderwort	PF	W	Pres	Unc	Holland, Ott, & Wood 2656 (UNLV)	1985
Cupressaceae	<i>Juniperus osteosperma</i> (<i>Sabina osteosperma</i>)	Utah juniper	T	W	Pres	Unc	Clover & Jotter (1941)	1939
Cyperaceae	<i>Carex hassei</i> (included in <i>C. aurea</i> by some authors)	Salt sedge	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Scirpus pungens</i> var. <i>longispicatus</i> (<i>Schoenoplectus pungens</i>)	Three-square bulrush	PG	W	Pres	Rare	Fertig et al. obs Jul 2008	2008
Elaeagnaceae	<i>Shepherdia rotundifolia</i>	Roundleaf buffaloberry	S	RE	Pres	Unc	Clover & Jotter (1941)	1939
Ephedraceae	<i>Ephedra torreyana</i>	Torrey's mormontea	S	W	Pres	Unc	Howell 24651 (ARIZ)	1948
	<i>Ephedra viridis</i> var. <i>viridis</i>	Green mormontea	S	W	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Ephedra viridis</i> var. <i>viscida</i> (<i>E. cutleri</i>)	Cutler's mormontea	S	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
Equisetaceae	<i>Equisetum hyemale</i> var. <i>affine</i>	Tall scouring-rush	Fern	W	Pres	Unc	Welsh & Atwood 11660 (BRY)	1972
	<i>Equisetum x ferrisii</i> (hybrid between <i>E. hyemale</i> x <i>E. laevigatum</i>)	Ferris's horsetail	Fern	W	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Equisetum laevigatum</i>	Smooth scouring-rush	Fern	W	Pres	Unc	Fertig & Spence obs Sep 2010	1985
Euphorbiaceae	<i>Chamaesyce fendleri</i> (<i>Euphorbia fendleri</i>)	Fendler's spurge	PF	W	Rep	Unk	Holland & Wood (1985)	1985
Fabaceae (Leguminosae)	<i>Astragalus amphioxys</i> var. <i>amphioxys</i>	Crescent milkvetch	PF	W	Pres	Unc	Holland, Ott, & Wood 2658 (UNLV)	1985
	<i>Astragalus amphioxys</i> var. <i>vespertinus</i>	Sheldon's milkvetch	PF	RE	Pres	Com	Fertig & Fertig obs Apr 2008	2008
	<i>Astragalus lentiginosus</i> var. <i>palans</i>	Stragglng milkvetch	PF	W	Pres	Unc	Holland, Ott, & Wood 2684 (UNLV)	1985
	<i>Astragalus nuttallianus</i> var. <i>micranthiformis</i>	Small-flowered milkvetch	AF	RE	Pres	Unc	Holland, Ott, & Wood 2714 (UNLV)	1985
	<i>Astragalus sabulorum</i>	Gravel milkvetch	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Astragalus zionis</i> var. <i>zionis</i>	Zion milkvetch	PF	RE	Pres	Unc	Fertig & Fertig obs Apr 2008	2008

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Family	Species/Synonym	Common Name	Life form	Range	Status	Pop Size	Source	Year Doc.
Fabaceae (Leguminosae)	<i>Cercis occidentalis</i> var. <i>orbiculata</i> (<i>C. orbiculata</i>)	Western redbud	S	W	Pres	Unc	Atwood 3298 (BRY)	1939
	<i>Dalea occidentalis</i> (<i>D. oligophylla</i> , <i>D. candida</i> var. <i>oligophylla</i>)	White prairie-clover	PF	W	Pres	Unc	Fertig et al. 24037 (GLCA)	2008
	<i>Lupinus pusillus</i> —variety not determined	Dwarf lupine	AF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Psoraleidium lanceolatum</i> var. <i>stenophyllum</i>	Slenderleaf scurfpea	PF	RE	Pres	Unc	Holland, Ott, & Wood 2691 (UNLV)	1985
Fagaceae	<i>Quercus gambelii</i> var. <i>gambelii</i>	Gambel's oak	T	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Quercus x pauciloba</i> (hybrid between <i>Q. gambelii</i> x <i>Q. turbinella</i>)	Few-lobe oak	S	W	Pres	Unc	Fertig & Spence 26252 (GLCA)	2008
Gentianaceae	<i>Centaurium calycosum</i>	Buckley's centaury	AF	P	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Swertia utahensis</i> (<i>Fraseria paniculata</i>)	Utah swertia	PF	RE	Pres	Rare	Fertig & Spence obs Sep 2010	1985
Geraniaceae	<i>Erodium cicutarium</i>	Stork's-bill	AF	I	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Erodium texanum</i>	Texas stork's-bill	AF	P	Pres	Rare	Fertig & Fertig obs Apr 2008	2008
Hydrophyllaceae (Boraginaceae)	<i>Phacelia ivesiana</i>	Ives' phacelia	AF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Juncaceae	<i>Juncus arcticus</i> (<i>J. balticus</i>)	Baltic rush	PG	W	Pres	Unc	Welsh & Atwood 11662 (BRY)	1972
	<i>Juncus ensifolius</i> var. <i>brunnescens</i>	Brownish rush	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Juncus longistylis</i>	Longstyle rush	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Juncus tenuis</i>	Poverty rush	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Juncus torreyi</i>	Torrey's rush	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	1939
Liliaceae (Alliaceae)	<i>Allium macropetalum</i>	San Juan onion	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Allium nevadense</i>	Nevada onion	PF	W	Pres	Unc	Holland, Ott, & Wood 2657 (UNLV)	1985
Liliaceae (Alliaceae, Themidaceae)	<i>Androstephium breviflorum</i>	Pink funnel-lily	PF	W	Rep	Unk	Holland & Wood (1985)	1985
Liliaceae (Calochortaceae)	<i>Calochortus flexuosus</i>	Sinuuous mariposa	PF	W	Pres	Com	Holland, Ott, & Wood 2698 (UNLV)	1985
	<i>Calochortus nuttallii</i>	Sego-lily	PF	W	Pres	Unc	Holland, Ott, & Wood 2662 (UNLV)	1985
Liliaceae (Anthericaceae)	<i>Eremocrinum albomarginatum</i>	Sand lily	PF	RE	Rep	Unk	Holland & Wood (1985)	1985
Loasaceae	<i>Mentzelia albicaulis</i>	White-stem blazingstar	AF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Mentzelia multiflora</i>	Desert stickleaf	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Mentzelia pterosperma</i>	Wing-seed stickleaf	PF	W	Pres	Unc	Holland, Ott, & Wood 2715 (UNLV)	1985
Malvaceae	<i>Sphaeralcea coccinea</i>	Scarlet globe-mallow	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Sphaeralcea moorei</i>	Moore's globe-mallow	PF	RE	Pres	Com	Fertig & Fertig obs Apr 2008	2008
	<i>Sphaeralcea rusbyi</i>	Rusby's globe-mallow	PF	RE	Pres	Rare	Fertig et al. obs Jul 2008	2008
Nyctaginaceae	<i>Abronia fragrans</i> (ours probably var. <i>elliptica</i> though often included in var. <i>fragrans</i>)	Fragrant sand-verbena	PF	W	Pres	Com	Holland, Ott, & Wood 2677 (UNLV)	1985
	<i>Mirabilis multiflora</i>	Showy four-o'clock	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Tripterocalyx carneus</i> var. <i>wootonii</i>	Wooton's sand-verbena	AF	RE	Pres	Unc	Fertig & Fertig obs Apr 2008	2008

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Family	Species/Synonym	Common Name	Life form	Range	Status	Pop Size	Source	Year Doc.
Oleaceae	<i>Fraxinus anomala</i>	Singleleaf ash	S	W	Pres	Unc	Holland, Ott, & Wood 2669 (UNLV)	1985
Onagraceae	<i>Camissonia walkeri</i>	Walker's camissonia	AF	W	Pres	Unc	Holland, Ott, & Wood 2717 (UNLV)	1985
	<i>Oenothera caespitosa</i> var. <i>crinita</i>	Paria evening-primrose	PF	W	Pres	Unc	Holland, Ott, & Wood 2700 (UNLV)	1985
	<i>Oenothera coronopifolia</i>	Hairy-throat evening-primrose	PF	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Oenothera longissima</i>	Bridges evening-primrose	PF	RE	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Oenothera pallida</i> var. <i>pallida</i>	Pale evening-primrose	PF	W	Pres	Unc	Fertig & Spence obs Sep 2010	2010
Orchidaceae	<i>Epipactis gigantea</i>	Giant helleborine	PF	W	Pres	Unc	Clover & Jotter 4033a (MICH)	1939
Pinaceae	<i>Pinus edulis</i>	Two-needle pinyon	T	W	Rep	Unk	Holland & Wood (1985)	1985
Plantaginaceae	<i>Plantago patagonica</i>	Woolly plantain	AF	W	Pres	Unc	Holland, Ott, & Wood 2680 (UNLV)	1985
Poaceae (Gramineae)	<i>Andropogon gerardii</i> var. <i>gerardii</i>	Big bluestem	PG	W	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Aristida purpurea</i> (includes vars. <i>fendleriana</i> , <i>purpurea</i> , & reports of <i>nealleyi</i>)	Purple three-awn	PG	W	Pres	Com	Welsh & Atwood 11654 (BRY)	1972
	<i>Bothriochloa barbinodis</i>	Cane bluestem	PG	W	Pres	Com	Fertig et al. 24033 (GLCA)	2008
	<i>Bouteloua curtipendula</i>	Sideoats grama	PG	W	Pres	Unc	Fertig & Spence obs Sep 2010	1939
	<i>Bromus diandrus</i> (<i>B. rigidus</i> , <i>Anisantha dian-dra</i>)	Ripgut brome	AG	I	Pres	Rare	Welsh & Atwood 11655 (BRY)	1972
	<i>Bromus japonicus</i> (<i>B. arvensis</i> , <i>B. commutatus</i>)	Japanese chess	AG	I	Pres	Rare	Fertig et al. 24039 (GLCA)	2008
	<i>Bromus rubens</i>	Red brome	AG	I	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Bromus tectorum</i> (<i>Anisantha tectorum</i>)	Cheatgrass	AG	I	Pres	Com	Welsh & Atwood 11651 (BRY)	1972
	<i>Calamagrostis scopulorum</i>	Jones' reedgrass	PG	W	Pres	Unc	Atwood & Allen 3300 (BRY)	1971
	<i>Cenchrus longispinus</i>	Field sandbur	AG	W	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Cynodon dactylon</i>	Bermuda grass	PG	I	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Distichlis spicata</i>	Desert saltgrass	PG	W	Rep	Unk	Holland & Wood (1985)	1985
	<i>Elymus canadensis</i>	Canada wildrye	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Elymus elymoides</i> (<i>Sitanion hystrix</i>)	Squirreltail	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Erioneuron pulchellum</i> (<i>Dasychloa pulchella</i>)	Fluffgrass	PG	W	Pres	Unc	Holland, Ott, & Wood 2722 (UNLV)	1985
	<i>Festuca octoflora</i> (<i>Vulpia octoflora</i>)	Six-weeks fescue	AG	W	Pres	Unc	Fertig & Spence obs Sep 2010	1985
	<i>Hilaria jamesii</i> (<i>Pleuraphis jamesii</i>)	Galleta	PG	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Imperata brevifolia</i>	Satintail	PG	P	Extirp	Unk	Darrow s.n. (MNA) - apparently inundated by Lake Powell	1945
	<i>Muhlenbergia minutissima</i>	Annual muhly	AG	S	Rep	Unk	Holland & Wood (1985)	1985
	<i>Muhlenbergia thurberi</i> (includes <i>M. curtifolia</i>)	Thurber's muhly	PG	W	Pres	Unc	Fertig & Spence 26256 (GLCA)	2010
	<i>Panicum acuminatum</i> (<i>Dichantheium acuminatum</i>)	Bundle panicgrass	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Panicum virgatum</i>	Switchgrass	PG	W	Pres	Com	Fertig et al. obs Jul 2008	2008

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Poaceae (Gramineae)	<i>Phragmites australis</i>	Common reed	PG	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Poa annua</i>	Annual bluegrass	AG	I	Rep	Unk	Holland & Wood (1985)	1985
	<i>Poa fendleriana</i>	Muttongrass	PG	W	Pres	Com	Fertig et al. obs Jul 2008	1985
	<i>Poa pratensis</i>	Kentucky bluegrass	PG	I	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Polypogon monspeliensis</i>	Rabbitfoot-grass	AG	I	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Polypogon semiverticillatus</i> (<i>Agrostis semiverticillatus</i>)	Water polypogon	PG	I	Hist	Unk	Clover & Jotter 4033 (MICH)	1939
	<i>Schismus barbatus</i>	Mediterranean grass	AG	I	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Schizachyrium scoparium</i> (<i>Andropogon scoparius</i>)	Little bluestem	PG	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Sorghastrum nutans</i>	Indian grass	PG	W	Pres	Rare	Fertig et al. obs Jul 2008	2008
	<i>Sporobolus cryptandrus</i>	Sand dropseed	PG	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Sporobolus flexuosus</i>	Mesa dropseed	PG	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Stipa comata</i> (<i>Hesperostipa comata</i>)	Needle-and-thread	PG	W	Pres	Unc	Holland, Ott, & Wood 2666 (UNLV)	1985
	<i>Stipa hymenoides</i> (<i>Oryzopsis hymenoides</i> , <i>Achnatherum hymenoides</i>)	Indian ricegrass	PG	W	Pres	Com	Fertig & Fertig obs Apr 2008	2008
	<i>Stipa speciosa</i> (<i>Jarava speciosa</i> , <i>Achnatherum speciosum</i>)	Desert needlegrass	PG	W	Pres	Unc	Welsh & Atwood 11653 (BRY)	1972
Polemoniaceae	<i>Gilia hutchinsifolia</i>	Broadlobe gilia	AF	W	Pres	Unc	Holland, Ott, & Wood 2704 (UNLV)	1985
	<i>Gilia inconspicua</i> var. <i>sinuata</i>	Shy gilia	AF	W	Pres	Com	Holland, Ott, & Wood 2719 (UNLV)	1985
	<i>Gilia leptomeria</i> var. <i>leptomeria</i> (<i>Aliciella leptomeria</i>)	Common gilia	AF	W	Pres	Unc	Holland, Ott, & Wood 2674 (UNLV)	1985
	<i>Ipomopsis aggregata</i> var. <i>aggregata</i> (<i>Gilia aggregata</i>)	Scarlet gilia	PF	W	Pres	Unc	Welsh & Atwood 11663 (BRY)	1972
	<i>Ipomopsis gunnisonii</i> (<i>Gilia gunnisonii</i>)	Gunnison's gilia	AF	W	Pres	Unc	Holland, Ott, & Wood 2659 (UNLV)	1985
	<i>Ipomopsis polycladon</i> (<i>Gilia polycladon</i>)	Spreading gilia	AF	W	Pres	Rare	Fertig & Fertig obs Apr 2008	2008
Polygonaceae	<i>Eriogonum corymbosum</i> var. <i>corymbosum</i>	Crisp-leaf wild buckwheat	S	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Eriogonum corymbosum</i> var. <i>orbiculatum</i>	Rimrock wild buckwheat	S	RE	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Eriogonum flexum</i> (<i>Stenogonum flexum</i>)	Bent wild buckwheat	AF	RE	Pres	Unc	Holland, Ott, & Wood 2702 (UNLV)	1985
	<i>Eriogonum inflatum</i> var. <i>inflatum</i>	Desert trumpet	PF	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Eriogonum palmerianum</i>	Palmer's wild buckwheat	AF	W	Pres	Unc	Holland, Ott, & Wood 2697 (UNLV)	1985
	<i>Eriogonum wetherillii</i>	Wetherill's wild buckwheat	AF	RE	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Rumex hymenosepalus</i>	Canaigre dock	PF	W	Rep	Unk	Holland & Wood (1985)	1985
Polypodiaceae (Adiantaceae)	<i>Adiantum capillus-veneris</i>	Southern maidenhair fern	Fern	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1939
Primulaceae	<i>Primula specuicola</i>	Cave primrose	PF	RE	Pres	Rare	Holland, Ott, & Wood 2683 (UNLV)	1985
Ranunculaceae	<i>Anemone tuberosa</i>	Desert anemone	PF	W	Pres	Unc	Atwood 3561 (BRY)	1971
	<i>Aquilegia micrantha</i>	Alcove columbine	PF	RE	Pres	Rare	Holland, Ott, & Wood 2678 (UNLV)	1939
	<i>Clematis ligusticifolia</i>	White virgin's-bower	PF	W	Pres	Unc	Fertig et al. obs Jul 2008	1985

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Family	Species/Synonym	Common Name	Life form	Range	Status	Pop Size	Source	Year Doc.
Ranunculaceae	<i>Delphinium scaposum</i> var. <i>scaposum</i> (<i>D. andersonii</i> var. <i>scaposum</i>)	Pale larkspur	PF	W	Pres	Unc	Holland, Ott, & Wood 2688 (UNLV)	1985
Rhamnaceae	<i>Rhamnus betulifolia</i> (<i>Frangula betulifolia</i>)	Birchleaf buckthorn	S	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Rosaceae	<i>Amelanchier utahensis</i>	Utah serviceberry	S	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
	<i>Coleogyne ramosissima</i>	Blackbrush	S	W	Pres	Com	Hollan, Ott, & Wood 2654 (UNLV)	1985
	<i>Petrophyton caespitosum</i>	Rock spiraea	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Purshia mexicana</i> var. <i>stansburyana</i> (<i>P. stansburiana</i>)	Cliff-rose	S	W	Pres	Com	Fertig & Fertig obs Apr 2008	1985
Rubiaceae	<i>Galium multiflorum</i> var. <i>multiflorum</i>	Shrubby bedstraw	PF	W	Pres	Rare	Holland, Ott, & Wood 2690 (UNLV)	1985
Salicaceae	<i>Populus fremontii</i> var. <i>fremontii</i> (<i>P. deltoides</i> var. <i>fremontii</i>)	Fremont cottonwood	T	W	Pres	Unc	Fertig et al. obs Jul 2008	1985
	<i>Salix exigua</i> var. <i>stenophylla</i>	Coyote willow	S	W	Pres	Com	Holland, Ott, & Wood 2692 (UNLV)	1985
	<i>Salix gooddingii</i>	Goodding's black willow	T	W	Rep	Unk	Holland & Wood (1985)	1985
Santalaceae	<i>Comandra umbellata</i> var. <i>pallida</i>	Bastard toadflax	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
Scrophulariaceae (Orobanchaceae)	<i>Castilleja chromosa</i> (<i>C. angustifolia</i> var. <i>dubia</i> , <i>C. applegatei</i> ssp. <i>martini</i>)	Desert paintbrush	PF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Castilleja exilis</i> (<i>C. minor</i>)	Annual paintbrush	AF	W	Pres	Unc	Fertig & Spence obs Sep 2010	2010
	<i>Castilleja linariifolia</i>	Wyoming paintbrush	PF	W	Pres	Unc	Clover & Jotter 4046 (MICH)	1939
Scrophulariaceae (Phrymaceae)	<i>Mimulus eastwoodiae</i>	Eastwood's monkey-flower	PF	RE	Pres	Rare	Atwood & Allen 3303 (BRY)	1971
Scrophulariaceae (Plantaginaceae)	<i>Penstemon ambiguus</i> var. <i>laevissimus</i>	Bush penstemon	PF	W	Pres	Unc	Clover & Jotter 4034 (MICH)	1939
	<i>Penstemon eatonii</i> var. <i>undosus</i>	Eaton's firecracker penstemon	PF	W	Pres	Unc	Holland, Ott, & Wood 2686 (UNLV)	1985
	<i>Penstemon utahensis</i>	Utah penstemon	PF	W	Rep	Unk	Holland & Wood (1985)	1985
Solanaceae	<i>Datura wrightii</i>	Angel's trumpet	AF	W	Pres	Unc	Fertig & Fertig obs Apr 2008	1985
	<i>Lycium andersonii</i>	Anderson's wolfberry	S	W	Pres	Unc	Fertig & Fertig obs Apr 2008	2008
	<i>Nicotiana attenuata</i>	Coyote tobacco	AF	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
	<i>Nicotiana trigonophylla</i>	Desert tobacco	AF	W	Pres	Unc	Fertig & Spence obs Sep 2010	1985
Tamaricaceae	<i>Tamarix chinensis</i> (<i>T. pentandra</i> , <i>T. ramosissima</i>)	Five-stamen tamarisk	S	I	Pres	Unc	Fertig & Fertig obs Apr 2008	1939
Typhaceae	<i>Typha domingensis</i>	Southern cattail	PG	W	Pres	Unc	Fertig et al. obs Jul 2008	2008
Ulmaceae (Celtidaceae)	<i>Celtis reticulata</i> (<i>C. laevigata</i> var. <i>reticulata</i>)	Netleaf hackberry	T	W	Pres	Unc	Fertig et al. obs Jul 2008	985
Urticaceae	<i>Parietaria pennsylvanica</i> var. <i>hespera</i>	Pellitory	AF	P	Pres	Unc	Holland, Ott, & Wood 2681 (UNLV)	1985
Vitaceae	<i>Pathenocissus vitacea</i>	Virginia creeper	S	I	Pres	Unc	Welsh & Atwood s.n. (BRY)	1972

Questionable records: Two species reported for Rainbow Bridge by Holland et al. are not included in this list and considered questionable. *Yucca glauca* is a Great Plains species that is not otherwise known (or expected) from Utah. This report is probably based on a misidentified collection of *Yucca toftiae* or *Y. harrimaniae*. *Sphaeralcea janeae* is known mainly from the White Rim area and vicinity of Canyonlands National Park. The Rainbow Bridge report is probably based on *S. moorei* or *S. rusbyi*.



Above: *Erodium texanum* (left) growing next to its more common, weedy cousin, *E. cicutarium* at Rainbow Bridge NM. Photo by W. Fertig, 12 April 2008.

known from fewer than a dozen sites in San Juan and Washington counties in Utah.

Laura and I revisited Rainbow Bridge in July 2008 to document summer-blooming species. This time we traveled by boat in the company of NPS botanist John Spence, graduate student Emily Palmquist, and University of Michigan sedge expert Tony Reznicek. Our team found 35 new species, bringing the total flora to 224. Among our more noteworthy finds were first records of Welsh's aster (*Aster welshii*), Arrowweed (*Pluchea sericea*), and Indiangrass (*Sorghastrum nutans*).

In September 2010, John Spence and I made one last visit to Rainbow Bridge to document the under-collected fall flora. In particular, I was interested in visiting a side drainage across from the bridge that had caught my eye on earlier visits but required a bit of a scramble to access. With just an hour to spare before our return on the park service boat, John and I clambered over the loose sandy terrace to reach a shady alcove and perennial spring. Our hard work was rewarded with the discovery of a small hanging garden with dangling clumps of rock spirea (*Petrophyton caespitosum*), wide-leaved Rydberg's thistle (*Cirsium rydbergii*), orange-flowered Eastwood's monkeyflower (*Mimulus eastwoodiae*), cave primrose (*Primula specuicola*), and the aptly named cardinal-flower (*Lobelia cardinalis*). To our surprise, we also found a small grove of Western hop-hornbeam (*Ostrya knowltonii*), a rare shrub not previously recorded from Rainbow Bridge. In all we added 10 new species to the monu-

ment's flora, bringing the total number of confirmed and reported species to 234.

The table below gives the statistical breakdown of the flora of Rainbow Bridge National Monument. Nearly 39% of all plant species in the monument are perennial forbs. Another 27% of all species are annuals. Trees and shrubs make up about 18% of all taxa. Almost 73% of the species in the monument are common and widespread across much of Utah or the west, while just 36 are restricted to the Colorado Plateau.

Only 15 introduced species have been documented at Rainbow Bridge or just 6.4% of the flora. This number is extremely low compared to other park units and half the statewide average. The relative lack of weeds is probably due to the monument's remoteness and absence of roads. The most common exotic species are cheatgrass (*Bromus tectorum*) and stork's-bill (*Erodium cicutarium*). Salt cedar (*Tamarix chinensis*) was once more common, but has decreased significantly due to recent removal efforts by NPS.

Toff's yucca (*Yucca toftiae*) is arguably the rarest species from Rainbow Bridge. This striking yucca with extremely tall flowering stalks is a local endemic of hanging gardens and canyons along the Colorado River and tributaries upstream of Glen Canyon Dam in Utah. The species has only been recognized since 1975, but is shown in an historical photograph from the 1920s taken in Redbud Canyon south of Rainbow Bridge (Bernheimer 1923)! The state's only known occurrence of lobeleaf daisy (*Erigeron lobatus*) is found at Rainbow Bridge, though this species is more widespread to the south in Arizona. One other notable rare species is satgrass (*Imperata brevifolia*) which was collected in the area by Darrow in 1945 but has not been relocated since the filling of Glen Canyon Reservoir. At least five other species from Rainbow Bridge are considered historical and have not been seen since before 1970.

Of the fourteen national parks and monuments managed by the National Park Service and BLM in Utah, Rainbow Bridge is currently 13th in total number of species, exceeding only Golden Spike National

Statistical Summary of the Flora of Rainbow Bridge National Monument	Present, Extirpated or Historical	Reported	Total
Taxonomic Diversity			
Total # of Taxa (including vars. and subspecies)	212	22	234
# of Families	51	2	53
Life Form Diversity			
# of Tree Taxa	5	2	7
# of Shrub Taxa	35	0	35
# of Perennial Forb Taxa	79	12	91
# of Annual Forb Taxa	48	5	53
# of Perennial Graminoid Taxa	33	1	34
# of Annual Graminoid Taxa	8	2	10
# of Fern Taxa	4	0	4
Biogeographic Diversity			
# of Introduced Taxa	14	1	15
# of Native Taxa	198	21	219
# of Locally Endemic Taxa	1	0	1
# of Regionally Endemic Taxa	34	1	35
# of Disjunct Taxa	0	0	0
# of Peripheral Taxa	8	1	9
# of Sparse Taxa	1	2	3
# of Widespread Taxa	154	17	171

Revolutionary New Plant Taxonomy

By Dave Culp

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Following in the footsteps of the Angiosperm Phylogeny Group (see "Farewell to the Aceraceae: Changes in the Angiosperm Family Tree" in the September Sejo Lily), an even more novel approach to taxonomy has been developed.

With all due apologies to Arthur Cronquist, the current method of plant classification used in most modern herbaria is cumbersome at best. After working in the Rocky Mountain Herbarium I have developed a simplified method of plant classification to be known as the Culp Method of Filing Plant Corpses.

The main problem with Art's system lies in the families: there are too many of them. The Culp Method of Filing Plant Corpses utilizes only seven families.

In keeping with Art's tradition, we start with primitive plants. The first family is the Mossiaceae. Plants in the Mossiaceae family are characterized by being short, slimy, and generally gross. Members of this family are also readily identifiable by using the Animal Method: If it looks like something the cat drag in, and the dog was afraid to drag it back out, its in the Mossiaceae.

Our second family is the Ferniaceae. There is only one criterion for membership in this family: If it hangs in a fern bar it's a Ferniaceae. Ferniaceae is probably one of the most fun families to study because of its habitat.

Moving up the evolutionary ladder, we come to the Grassiaceae. These plants are very easily identified. If it has long, very thin leaves, tries to cover as much ground as possible, and survives after being run over by machines with whirling blades and the name "Toro" painted on them, it belongs in the Grassiaceae.

The next family is the largest. It is the Floweriaceae. This family includes any plant that exists to produce a flower. By flower, we mean a showy plant part that, when presented to your spouse, will probably win you forgiveness for an all night session at the fern bar.

The larger plants of the world fall into one of two families. These families are the Bushiaceae and the Treeiaceae. Both of these families have members that grow tall. Members of the Bushiaceae, however, have branches very low to the ground and are often found around foundations of buildings. Plants of the Treeiaceae don't have low branches and generally live further away from buildings.

Our final family is the most painful and dangerous to study. It is the Cockleburriaceae. Members of this family can be placed into one of two subfamilies: Dog Hair Cloggus or Bicycle Tire Eatus. Members of the Cockleburriaceae are identified by their spines, thorns, and other lethal projections. If you pick up a plant and say "ouch" it's probably a member of the Cockleburriaceae. Placement into the two subfamilies is easy: throw it at your dog. If it gets stuck in its hair, it's a Dog Hair Cloggus. The next test involves a bicycle. If it causes a flat tire after being run over by the bicycle, it goes into the Bicycle Tire Eatus subfamily.

Use of the Culp Method of Filing Plant Corpses will help most herbaria overcome their difficulties in filing specimens. It should also create lots of debate and frantic research among plant taxonomists. This will create hordes of jobs, stimulate the economy, help establish a new world order, and bring peace to the world. At the very least, it will make working in an herbarium a whole lot easier.

Editor's Note: The author formerly worked at the Rocky Mountain Herbarium at the University of Wyoming. He was fired after refiling the entire collection using the Culp Method.



Above: Glen Canyon NRA botanist John Spence posing with the prickly Rydberg's thistle or *Cirsium rydbergii* (Spence is on the left). Rydberg's thistle is an uncommon, native, hanging garden species recognized by its enormous leaves and often drooping inflorescence. Photo by W. Fertig, September 2010.

Historic Site (Fertig 2009). However, with our new discoveries in 2010, Rainbow Bridge is now only one species behind Timpanogos Cave National Monument for a share of 12th place!

John Spence applied a first-order jackknife analysis to collection data from Rainbow Bridge from 1939-2010 and estimates that the total vascular flora of the monument ranges from 242-272 species. Clearly additional floristic work is still needed, and I'll be more than happy to make my way back to Rainbow Bridge to find the missing species!

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