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A VASCULAR FLORA OF THE SAN RAFAEL SWELL, UTAH¹

James G. Harris²

ABSTRACT.— The vegetation of the San Rafael Swell in southeastern Utah is examined based on personal field collections and previously collected herbarium specimens in the Brigham Young University Herbarium (BRY). An annotated checklist includes information on frequency of occurrence and habitat preference for each entity. Treated are 491 vascular plant taxa from 59 families.

The San Rafael Swell is the eroded remnant of a massive domal anticline, oval in shape, stretching along a northeasterly axis from Capitol Reef National Park in northern Wayne County to the foot of the Tavaputs Plateau in Carbon County. Folding of the earth's crust, which formed the domal anticline, and the subsequent erosion of the central dome left a huge area of concentric stone rings, each progressively younger from the innermost to the outermost. One of these rings, the Ferron Sandstone Member of the Mancos Shale Formation, encloses approximately 1.4 million acres of land and forms the boundary of this study. In some cases, where the Ferron Sandstone has been completely eroded from the structural confines of the swell, artificial boundaries have been followed (Fig. 1).

Throughout the field seasons of 1979 and 1980, I attempted to collect representatives of all vascular plant species growing in the San Rafael Swell. A voucher specimen from each collection has been placed in the Brigham Young University Herbarium (BRY). Included in the checklist are species not found by me, but collected by others and vouchered for by specimens in the Brigham Young University Herbarium. The checklist is not definitive; additional taxa will undoubtedly be discovered in the swell.

The following sources were used for identification and nomenclature: lower vascular plants and gymnosperms, Cronquist et al. (1972); dicotyledons, Neese and Welsh

(1981), Welsh (1978, 1980a, 1980b), Welsh and Atwood (1981), Welsh and Moore (1973), Welsh and Reveal (1977), Welsh et al. (1981); monocotyledons, Cronquist et al. (1977).

The checklist includes 478 vascular plant taxa found in the study area and an additional 13 taxa known to occur on lands immediately adjacent to the study area and to be expected in the San Rafael Swell. These 13 taxa are listed below:

Allionia incarnata L.
Cordylanthus wrightii Gray
Descurainia pinnata (Walter) Britt. var. *filipes* (Gray) Peck
Eriogonum smithii Reveal
Euphorbia micromera Boiss.
Haplopappus drummondii (T. & G.) Blake
Helianthus petiolaris Nutt.
Hymenopappus filifolius Hook. var. *lugens* (Greene) Jeps.
Lupinus pusillus Pursh var. *rubens* (Rydb.) Welsh
Phacelia demissa Gray var. *heterotricha* Howell
Physocarpus alternans (Jones) Howell
Sphaeralcea munroana (Dougl.) Spach
Sporobolus giganteus Nash

The flora of the San Rafael Swell is not particularly rich in numbers of species. This is due, at least in part, to the relatively narrow elevational range in the area. Although not rich in numbers of species, the flora is rather rich in numbers of unique and geographically restricted species. The following eight species are strictly endemic to the San Rafael Swell:

Astragalus rafaensis Jones
Cryptantha johnstonii Higgins
Cryptantha jonesiana (Payson) Payson
Erigeron maguirei Cronquist

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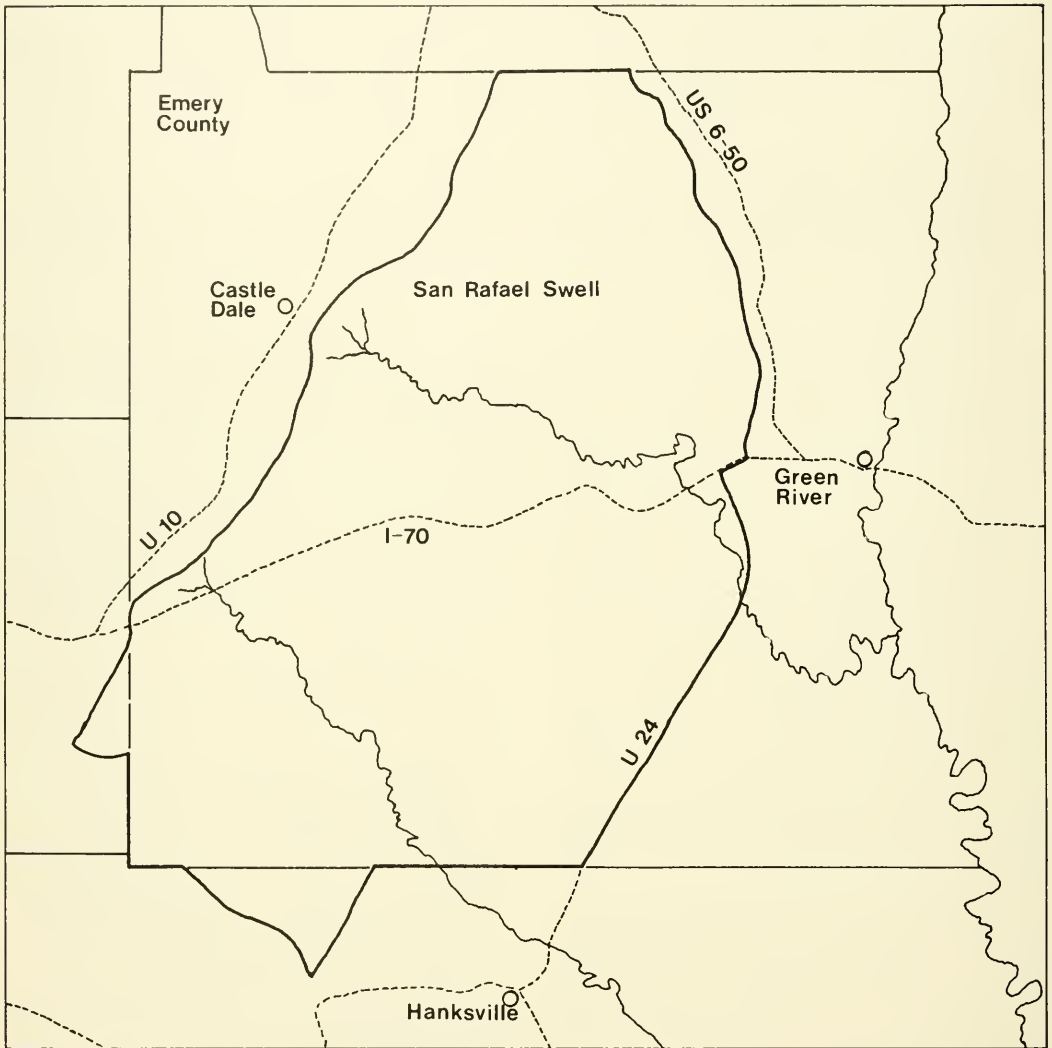


Fig. 1. Map of the San Rafael Swell study area.

Pediocactus despainii Welsh & Goodrich
Sclerocactus wrightii Benson
Sphaeralcea psoraloides Welsh
Thelypodopsis barnebyi Welsh & Atwood

An additional seven species are endemic to the San Rafael Swell and the adjacent lands in close proximity to the swell. They are listed as follows:

Astragalus pardalinus (Rydb.) Barneby
Astragalus woodruffii Jones
Hoffmanseggia repens (Eastw.) Cockerell
Hymenoxys depressa (T. & G.) Welsh & Reveal
Lomatium junceum Barneby & Holmgren
Psorothamnus polyadenius (Torr.) Rydb. var. *jonesii* Barneby
Townsendia aprica Welsh & Reveal

VEGETATIVE ZONES

The vegetation of the San Rafael Swell can be divided into five major zones: the Sand Desert Shrub Zone, the Salt Desert Shrub Zone, the Mixed Desert Shrub Zone, the Pinyon-Juniper Zone, and the Ponderosa Pine-Mountain Brush Zone. These zones are controlled principally by elevation, precipitation, and local edaphic factors. Although in some areas the zones are clear and well defined, in most areas they interfuse considerably and it becomes difficult to draw a sharp boundary line between them.

SAND DESERT SHRUB ZONE.— The San Rafael Desert, in the southeastern region of the San Rafael Swell, ranges from an elevation of about 4200 ft (1280 m) at the lowest point to about 5000 ft (1524 m) at the highest point. It is a sandy desert with moving dunes in some areas. Common shrubs in this zone include: *Artemisia filifolia*, *Ephedra torreyana*, *Yucca harrimaniae*, *Poliomintha incana*, *Tiquilia latior*, and *Coleogyne ramosissima*. *Abronia elliptica*, *Oenothera pallida*, *Hoffmanseggia repens*, and *Oryzopsis hymenoides* are characteristic herbaceous plants of this zone.

SALT DESERT SHRUB ZONE.— In the San Rafael Swell the Salt Desert Shrub Zone is widespread, occurring mainly on alkaline clay soils between 4500 and 5800 ft (1372–1766 m) in elevation. Communities in this zone are characteristically dominated by *Atriplex confertifolia* interspersed with any of the following subdominant species: *Hilaria jamesii*, *Oryzopsis hymenoides*, *Enceliopsis nudicaulis*, *Aristida purpurea*, *Eriogonum inflatum*, *Salsola iberica* or *Ceratoides lanata*.

Highly alkaline flood plains in this zone are often covered by nearly pure stands of *Sarcobatus vermiculatus*, which may at times be accompanied by thick clumps of *Tamarix ramosissima*.

Heavy clay soils of the Mancos Shale Formation are often dominated by *Atriplex cuneata* and *Atriplex corrugata*. During wet springs these areas may be blanketed by annual species such as *Cleome lutea*, *Lupinus pusillus*, *Malcolmia africana*, *Camissonia sca-poidea*, and *Camissonia eastwoodiae*.

MIXED DESERT SHRUB ZONE.— Deep, well-drained soils between 4500 and 5800 ft (1372–1766 m) in elevation are often dominated by one or several of the following shrubby species: *Artemisia tridentata*, *Artemisia bigelovii*, *Artemisia spinescens*, *Xanthocephalum sarothrae* or *Chrysothamnus viscidiflorus*. These may be intermingled with an understory of herbaceous plants including: *Hilaria jamesii*, *Stipa comata*, *Bouteloua gracilis*, *Astragalus* spp., *Sphaeralcea* spp., and *Leucelene ericoides*.

PINYON-JUNIPER ZONE.— *Pinus edulis* and *Juniperus osteosperma* are conspicuously dominant at elevations between 5800 and

7800 ft (1766–2377 m). Within this altitudinal range *Juniperus osteosperma* is dominant at the lower elevations and *Pinus edulis* is dominant at the higher elevations. Intermediate elevations yield a heterogeneous mixture of both species.

Dense stands have almost no understory, but more open or scattered stands will include almost all the species found in the Mixed Desert Shrub Zone.

PONDEROSA PINE-MOUNTAIN BRUSH ZONE.— The highest point in the San Rafael Swell is the San Rafael Knob at 7921 ft (2414 m) in elevation. The area surrounding the knob and the summit of Cedar Mountain represent the highest vegetative zone in the swell. *Pinus edulis* continues to remain dominant even at the highest elevations, but above 7500 ft (2286 m) plants characteristic of the Ponderosa Pine-Mountain Brush Zone become increasingly common. Some common species in this zone are: *Pinus ponderosa*, *Artemisia nova*, *Cowania mexicana*, *Mahonia fremontii*, *Populus tremuloides*, *Amelanchier utahensis*, *Cercocarpus montanus*, *Ribes leptanthum*, *Juniperus scopulorum*, *Hymenoxys richardsonii*, *Symphoricarpos longiflorus* and *Philadelphus microphyllus*.

In addition to these five major vegetative zones, smaller communities dependent on unique local habitats are scattered throughout the area. These include plants distributed along seeps and streams, along washes and roadsides where runoff collects, in hanging gardens, on rocky outcrops, and on disturbed sites.

ANNOTATED CHECKLIST

Following each species entry in the checklist (with the exception of the 13 taxa from lands adjacent to the study area) a designation is given concerning the frequency of occurrence and habitat preference of the taxon. Plants of broad distribution that are not limited to a specific zone or community type are listed as widespread. The following abbreviations are used:

- C—common
- O—occasional
- U—uncommon
- R—rare
- SnD—Sand Desert Shrub Zone
- SD—Salt Desert Shrub Zone
- MD—Mixed Desert Shrub Zone
- PJ—Pinyon-Juniper Zone

PM—Ponderosa Pine-Mountain Brush Zone
 SS—Seeps and streams
 WR—Washes and roadsides
 HG—Hanging gardens
 RO—Rocky outcrops
 DS—Disturbed sites
 W—Widespread

ACERACEAE

Acer glabrum Torr. (R;PM)

ANACARDIACEAE

Rhus trilobata Nutt. var. *simplicifolia* (Greene) Barkl. (C;WR)

Rhus trilobata Nutt. var. *trilobata* (C;WR)

Toxicodendron rydbergii (Small) Greene (C;SS,HG)

APIACEAE

Cymopterus acaulis (Pursh) Raf. (O;SnD,SID)

Cymopterus bulbosus Nels. (C;W)

Cymopterus fendleri Gray (C;W)

Cymopterus purpurascens (Gray) Jones (O;SID)

Cymopterus purpureus Wats. (O;W)

Lomatium junceum Barneby & Holmgren (R;SID,MD,PJ)

Sium suave Walt. (R;WR)

APOCYNACEAE

Amsonia eastwoodiana Rydb. (C;SnD)

Amsonia jonesii Woodson (O;MD,PJ)

Apocynum cannabinum L. (C;SS,HG)

Cycladenia humilis Benth. var. *jonesii* (Eastw.) Welsh & Atwood (R;MD)

ASCLEPIADACEAE

Asclepias cryptoceras Wats. (C;W)

Asclepias labriformis Jones (C;WR,SD,MD)

Asclepias macrosperma Eastw. (C;SnD,MD)

Asclepias ruthiae Maguire & Woodson (O;W)

Asclepias speciosa Torr. (C;WR)

ASTERACEAE

Ambrosia acanthicarpa Hook. (O;SID,MD,PJ)

Ambrosia artemisiifolia L. (C;SID,MD,PJ)

Artemisia biennis Willd. (U;WR)

Artemisia bigelovii Gray (C;MD,PJ)

Artemisia campestris L. (U;SnD,MD)

Artemisia dracunculus L. (C;WR)

Artemisia filifolia Torr. (C;SnD)

Artemisia frigida Willd. (R;WR)

Artemisia ludoviciana Nutt. (O;WR)

Artemisia nova Nels. (C;PJ,PM)

Artemisia pygmaea Gray (O;SID,MD,PJ)

Artemisia spinescens Eaton (O;SID,MD)

Artemisia tridentata Nutt. (C;MD,PJ,WR)

Aster glaucodes Blake (U;PM)

Baccharis emoryi Gray (U;WR)

Brickellia longifolia Wats. (U;WR)

Brickellia microphylla (Nutt.) Gray (U;WR)

Brickellia oblongifolia var. *linifolia* (Eaton) Robins (O;PJ,WR)

Brickellia scabra (Gray) Nels. (R;HG,WR)

Chaenactis stevioides Hook. & Arn. (C;SID,MD)

Chamaechaenactis scaposa (Eastw.) Rydb. (O;PJ)

Chrysothamnus greenei (Gray) Greene (O;SID)

Chrysothamnus linifolius Greene (O;WR)

Chrysothamnus nauseosus (Pall.) Britt. var. *consimilis* (Greene) Hall (C;WR)

Chrysothamnus nauseosus (Pall.) Britt. var. *gnaphaloides* (Greene) Hall (U;WR)

Chrysothamnus nauseosus (Pall.) Britt. var. *junceus* (Greene) Hall (U;WR)

Chrysothamnus nauseosus (Pall.) Britt. var. *leiospermus* (Gray) Hall (R;WR)

Chrysothamnus pulchellus (Gray) Greene (U;WR)

Chrysothamnus viscidiflorus (Hook.) Nutt. var. *stenophyllus* (Gray) Hall (U;WR)

Chrysothamnus viscidiflorus (Hook.) Nutt. var. *viscidiflorus* (C;WR)

Cirsium pulchellum (Greene) Woot. & Standl. (U;WR)

Cirsium undulatum (Nutt.) Spreng. (C;WR)

Dicoria canescens Gray (U;SnD)

Encelia frutescens Gray (U;WR)

Enceliopsis nudicaulis (Gray) Nels. (C;SID,MD)

Enceliopsis nutans (Eastw.) Nels. (C;SID,MD)

Erigeron argentatus Greene (O;SID,MD,PJ)

Erigeron compactus Blake var. *consimilis* Cronquist (O;MD,PJ)

Erigeron divergens T. & G. (U;PJ)

Erigeron eatonii Gray (U;PJ,PM)

Erigeron maguirei Cronquist (R;WR)

Erigeron pulcherrimus Heller var. *pulcherrimus* (C;SID,MD,PJ)

Erigeron pumilus Nutt. ssp. *concinoides* Cronq. var. *condensatus* (Eaton) Cronq. (C;SID,MD,PJ)

Erigeron utahensis Gray (C;WR,RO)

Gaillardia pinnatifida Torr. (C;SID,MD)

Gaillardia spathulata Gray (C;SID,MD,PJ)

Grindelia squarrosa (Pursh) Dunal. (O;WR)

Haplopappus armerioides (Nutt.) Gray (C;MD,PJ,RO)

Haplopappus drummondii (T. & G.) Blake

Helianthella microcephala (Gray) Gray (C;PJ,PM)

Helianthus annuus L. (C;WR)

Helianthus anomalous Blake (C;SnD)

Helianthus petiolaris Nutt.

Heterotheca villosa (Pursh) Shinnars (C;SID,MD,PJ)

Hymenopappus filifolius Hook. var. *lugens* (Greene) Jeps.

Hymenopappus filifolius Hook. var. *megacephalus* Turner (C;SID,MD)

Hymenopappus filifolius Hook. var. *pauciflorus* (Johnst.) Turner (O;SID)

Hymenoxys acaulis (Pursh) Parker var. *arizonica* (Greene) Parker (C;MD,PJ)

Hymenoxys depressa (T. & G.) Welsh & Reveal (O;RO)

Hymenoxys richardsonii (Hook.) Cockerell (C;PJ,PM)

Iva axillaris Pursh (O;SS,WR)

Iva xanthifolia Nutt. (O;WR)

Lyceum ericoides (Torr.) Greene (C;W)

Lygodesmia arizonica Tomb (C;SID,MD,WR)

Lygodesmia grandiflora (Nutt.) T. & G. (C;SID)

Lygodesmia juncea (Pursh) D. Don (R;SnD)

Machaeranthera canescens (Pursh) Gray (R;SnD)

Machaeranthera grindelioides (Nutt.) Shinnars (C;W)

Machaeranthera linearis Greene (U;WR)

Machaeranthera tanacetifolia (H.B.K.) Nees (C;WR)

Malacothrix sonchoides (Nutt.) T. & G. (C;SID,MD)

Oxytena acerosa Nutt. (C;SS,WR)

Parthenium ligulatum (Jones) Barneby (U;SID,MD,PJ)

Petradoria pumila (Nutt.) Greene (C;PJ,WR,RO)

Platyschkueria integrifolia (Gray) Rydb. var. *oblongifolia* (Gray) Ellison (C;WR)

Prenanthes exigua (Gray) Rydb. (C;WR,RO)

Senecio multicaпитatus Greenm. (U;PJ,PM,WR)

- Senecio multilobatus* T. & G. (O;PJ,WR) +
Stephanomeria exigua Nutt. (O;WR)
Stephanomeria runcinata Nutt. (R;WR)
Stephanomeria spinosa (Nutt.) Tomb (U;WR)
Stephanomeria tenuifolia (Torr.) Hall (C;WR,RO)
Taraxacum officinale Weber (C;SS)
Tetradymia canescens DC. (O;PJ,PM)
Tetradymia glabrata Gray (C;MD,PJ)
Tetradymia spinosa Hook. & Arn. (O;WR)
Thelesperma subnudum Gray (C;W)
Townsendia annua Beaman (U;MD)
Townsendia aprica Welsh & Reveal (U;SID,MD,PJ)
Townsendia incana Nutt. (C;SID,MD,PJ)
Tragopogon dubius Scop. (C;W)
Vanclveea stylosa (Eastw.) Greene (C;SnD)
Wyethia scabra Hook. (C;WR)
Xanthium strumarium L. (O;SS)
Xanthocephalum microcephalum (DC.) Shinners (R;PJ)
Xanthocephalum sarothrae (Pursh) Shinners (C;SID,MD,PJ)
Xylorhiza venusta (Jones) Heller (C;RO)
- BERBERIDACEAE**
- Mahonia fremontii* (Torr.) Fedde (C;MD,PJ)
- BETULACEAE**
- Betula occidentalis* Hook. (R;SS)
- BORAGINACEAE**
- Cryptantha cinerea* Greene (R;PJ,PM)
Cryptantha confertifolia (Greene) Payson (R;SnD)
Cryptantha crassispala (T. & G.) Greene var. *elachantha* Johnst. (C;W)
Cryptantha flava (Nels.) Payson (C;W)
Cryptantha flavoculata (Nels.) Payson (C;PJ)
Cryptantha fulvocanescens (Wats.) Payson var. *echinoides* (Jones) Higgins (O;SID)
Cryptantha fulvocanescens (Wats.) Payson var. *fulvocanescens* (C;MD,PJ)
Cryptantha gracilis Osterh. (U;PJ)
Cryptantha humilis (Gray) Payson var. *nana* (Eastw.) Higgins (O;PJ)
Cryptantha jamesii (Torr.) Payson var. *disticha* (Eastw.) Payson (U;MD,WR)
Cryptantha jamesii (Torr.) Payson var. *setosa* (Jones) Johnst. (C;PJ)
Cryptantha johnstonii Higgins (U;SID)
Cryptantha jonesiana (Payson) Payson (U;SID)
Cryptantha mensana (Jones) Payson (O;SID)
Cryptantha paradoxa (Nels.) Payson (O;PJ)
Cryptantha recurvata Coville (O;MD,PJ,WR)
Cryptantha rollinsii Johnst. (O;MD,PJ,WR)
Cryptantha tenuis (Eastw.) Payson (O;WR)
Cryptantha wetherillii (Eastw.) Payson (O;SID)
Heliotropium convulvulaceum (Nutt.) Gray (U;SnD)
Lappula occidentalis (Wats.) Greene var. *cupulata* (Gray) Higgins (R;MD,PJ)
Lappula occidentalis (Wats.) Greene var. *occidentalis* (C;W)
Lithospermum incisum Lehm. (C;PJ)
Tiquilia latior (Johnst.) Richardson (O;SID,MD)
- BRASSICACEAE**
- Arabis demissa* Greene var. *lanugida* Rollins (R;PJ,PM)
Arabis perennans Wats. (O;PJ)
Arabis pulchra Jones var. *pallens* Jones (O;PJ)
Arabis selbyi Rydb. (C;PJ)
Caulanthus crassicaulis (Torr.) Wats. (C;PJ)
Chorispora tenella (Pall.) DC. (U;DS)
Descurainia pinnata (Walt.) Britt. var. *filipes* (Gray) Peck
Descurainia pinnata (Walt.) Britt. var. *intermedia* (Rydb.) Hitchc. (U;MD)
Descurainia pinnata (Walt.) Britt. var. *osmarium* (Cockerell) Shinners (C;W)
Descurainia sophia (L.) Webb. (O;WR)
Dithyrea wislizenii Engelm. in Wisliz. (O;SnD)
Lepidium densiflorum Schrad. var. *pubicarpum* (Nels.) Thell. (R;PJ)
Lepidium densiflorum Schrad. var. *ramosum* (Nels.) Thell. (O;MD,PJ)
Lepidium montanum Nutt. var. *jonesii* (Rydb.) Hitchc. (C;W)
Lesquerella alpina (Nutt.) Wats. var. *alpina* (O;PJ,PM)
Lesquerella intermedia (Wats.) Heller (O;PJ,PM)
Lesquerella kingii Wats. (R;PJ)
Lesquerella rectipes Wood. & Standl. (C;W)
Lesquerella subumbellata Rollins (U;PJ,PM)
Malcolmia africana (L.) R. Br. in Ait. (C;SID,DS)
Physaria acutifolia Rydb. (C;PJ)
Physaria chambersii Rollins (U;PJ)
Schoenocrambe linifolia (Nutt.) Greene (O;PJ,PM)
Sisymbrium altissimum L. (C;PJ,PM)
Stanleya pinnata (Pursh) Britt. (C;SID)
Stanleya viridiflora Nutt. in T. & G. (U;MD,PJ)
Streptanthella longirostris (Wats.) Rydb. (C;W)
Streptanthus cordatus Nutt. ex T. & G. (C;PJ)
Thelypodopsis barnebyi Welsh & Atwood (R;MD)
Thelypodopsis divaricata (Rollins) Welsh & Reveal (C;SID,MD,PJ)
- CACTACEAE**
- Coryphantha vivipara* (Nutt.) Britt. & Rose (O;PJ)
Echinocereus triglochidiatus Engelm. var. *melanacanthus* (Engelm.) Benson (C;SID,MD,PJ)
Opuntia basilaris Engelm. & Bigel. (O;SnD,MD,PJ)
Opuntia erinacea Engelm. (O;SnD)
Opuntia polyacantha Haw. (C;W)
Pediocactus despainii Welsh & Goodrich (R;PJ)
Pediocactus simpsonii (Engelm.) Britt. & Rose (R;PJ)
Sclerocactus parviflorus Clover & Jotter var. *intermedius* (Peebles) Woodruff & Benson (C;W)
Sclerocactus wrightiae Benson (U;SID,MD,PJ)
- CAPPARIDACEAE**
- Cleome lutea* Hook. (C;SID)
Cleome serrulata Pursh (O;PJ)
Cleomella palmerana Jones (O;PJ)
- CAPRIFOLIACEAE**
- Sambucus coerulea* Raf. (U;PJ,PM)
Symphoricarpos longiflorus Gray (O;PJ,PM)
- CARYOPHYLLACEAE**
- Arenaria eastwoodiae* Rydb. (C;PJ)
Arenaria fendleri Gray (C;SID)
Arenaria hookeri Nutt. var. *desertorum* Maguire (R;PJ)
Paronychia sessiliflora Nutt. (O;PJ,WR)
- CELASTRACEAE**
- Forsellesia meionandra* (Koehne) Heller (O;PJ,RO)
- CHENOPODIACEAE**
- Allenrolfea occidentalis* (Wats.) Kuntze (O;SID)
Atriplex argentea Nutt. (U;SID)
Atriplex canescens (Pursh) Nutt. (C;SID,MD)
Atriplex confertifolia (Torr. & Frem.) Wats. (C;SID)
Atriplex corrugata Wats. (C;SID)

- Atriplex cuneata* Nels. (C;SID)
Atriplex graciliflora Jones (U;SID)
Atriplex powellii Wats. (C;SID)
Atriplex saccaria Wats. (U;MD)
Bassia hysopifolia Pallas (U;WR)
Ceratoides lanata (Pursh) Howell (C;SID)
Chenopodium fremontii Wats. (C;W)
Chenopodium glaucum L. (O;SID)
Chenopodium pratericola Rydb. (C;SS)
Grayia brandegei Gray (U;MD)
Halogeton glomeratus (Bieb.) Meyer (C;DS)
Kochia iranica Bornm. (C;WR)
Kochia americana Wats. (R;SID,WR)
Monolepis nuttalliana (Schult.) Greene (O;WR)
Salsola iberica Sennen & Pau (C;W)
Sarcobatus vermiculatus (Hook.) Torr. (C;SID,SS,WR)
Suaeda torreyana Wats. (C;SS,WR)
- CONVOLVULACEAE
- Convolvulus arvensis* L. (C;WR)
Cuscuta cuspidata Engelm. (C;MD)
- CUPRESSACEAE
- Juniperus osteosperma* (Torr.) Little (C;PJ,PM)
Juniperus scopulorum Sarg. (U;PM)
- CYPERACEAE
- Carex filifolia* Nutt. (C;SS)
Carex parryana Dewey (R;SS)
Eleocharis palustris (L.) Roemer & Schult. (O;SS)
Eleocharis rostellata (Torr.) Torr. (U;SS)
Scirpus maritimus L. (O;SS)
Scirpus pungens Vahl. (C;SS)
Scirpus validus Vahl. (O;SS)
- ELAEAGNACEAE
- Shepherdia rotundifolia* Parry (U;PJ)
Shepherdia argentea (Pursh) Nutt. (U;WR)
- EPHEDRACEAE
- Ephedra torreyana* Wats. (C;W)
Ephedra viridis Coville (C;W)
- EQUISETACEAE
- Equisetum laevigatum* A. Br. (C;SS)
- EUPHORBACEAE
- Euphorbia albomarginata* T. & G. (U;PJ)
Euphorbia fendleri T. & G. (C;SID,MD,PJ)
Euphorbia micromera Boiss.
Euphorbia nephradenia Barneby (R;SID,WR)
Euphorbia palmeri Engelm. (R;SID)
Euphorbia parryi Engelm. (C;SnD)
Euphorbia robusta (Engelm.) Small (O;PJ,PM)
Euphorbia serpyllifolia Pers. (C;PJ,PM)
- FABACEAE
- Astragalus amphioxys* Gray var. *amphioxys* (C;SID,MD,PJ)
Astragalus amphioxys Gray var. *vespertinus* (Sheld.) Jones (C;W)
Astragalus argophyllus Nutt. var. *martinii* Jones (U;PJ,PM)
Astragalus asclepiadoides Jones (C;SID)
Astragalus brandegei Porter (U;SID,MD,PJ)
Astragalus calycosus Torr. (O;SID,MD,PJ)
Astragalus ceramicus Sheldon (U;WR)
Astragalus coltonii Jones var. *coltonii* (C;SID,MD,PJ)
Astragalus convallarius Greene var. *convallarius* (U;PJ,PM)
Astragalus cymboides Jones (C;SID,MD,PJ)
Astragalus desperatus Jones var. *desperatus* (C;SnD,MD,PJ)
- Astragalus desperatus* Jones var. *petrophilus* Jones (C;MD,SnD,PJ)
Astragalus episcopus Wats. (C;MD,PJ)
Astragalus flavus Nutt. var. *argillosus* (Jones) Barneby (C;SID)
Astragalus flavus Nutt. var. *flavus* (C;SID,MD,PJ)
Astragalus flexuosus (Hook.) Don. var. *diehlii* (Jones) Barneby (O;SID,MD,PJ)
Astragalus geyeri Gray (O;MD)
Astragalus kentrophyta Gray var. *coloradoensis* Jones (U;WR,RO)
Astragalus kentrophyta Gray var. *elatus* Wats. (R;SID)
Astragalus lentiginosus Dougl. var. *araneosus* (Sheld.) Barneby (C;MD,PJ)
Astragalus lentiginosus Dougl. var. *palans* (Jones) Jones (C;MD,PJ)
Astragalus lonchocarpus Torr. (C;SID,MD,PJ)
Astragalus moencoppensis Jones (C;SID,MD,PJ)
Astragalus mollissimus Torr. var. *thompsonae* (Wats.) Barneby (C;W)
Astragalus musiniensis Jones (C;SID,MD,PJ)
Astragalus pardalinus (Rydb.) Barneby (O;SnD,MD,PJ)
Astragalus praelongus Sheld. var. *ellisiae* (Rydb.) Barneby (C;SID)
Astragalus praelongus Sheld. var. *praelongus* (U;SID)
Astragalus preussii Gray var. *preussii* (C;SID,MD,PJ)
Astragalus rafaelsenis Jones (O;SID)
Astragalus sabulonum Gray (O;PJ,PM)
Astragalus spatulatus Sheld. (O;PJ,PM)
Astragalus subcinereus Gray var. *basalticus* Welsh (R;PJ)
Astragalus tenellus Pursh (O;MD,PJ)
Astragalus wingatanus Wats. (R;SID,MD,PJ)
Astragalus woodruffii Jones (U;SnD,MD)
Dalea flavescens (Wats.) Welsh (O;SnD,MD,PJ)
Dalea oligophylla (Torr.) Shinnars (O;WR,RO)
Glycyrrhiza lepidota Pursh (C;WR,SS)
Hedysarum boreale Nutt. (C;MD,PJ,PM)
Hoffmanseggia repens (Eastw.) Cockerell (C;SnD)
Lathyrus brachycalyx Rydb. var. *eucosmus* (Butters & St. John) Welsh (U;WR)
Lupinus argenteus Pursh var. *argenteus* (R;WR)
Lupinus argenteus Pursh var. *tenellus* Dougl. (U;MD)
Lupinus brevicaulis Wats. (U;SID,MD)
Lupinus pusillus Pursh var. *pusillus* (C;SID,MD,PJ)
Lupinus pusillus Pursh var. *rubens* (Rydb.) Welsh
Medicago sativa L. (C;WR)
Melilotus alba Medicus (O;SS,WR)
Melilotus officinalis (L.) Lam. (O;SS,WR)
Oxytropis lambertii Pursh var. *bigelovii* Gray (R;PJ,PM)
Oxytropis sericea Nutt. (O;MD,PJ)
Psoralea lanceolata Pursh var. *lanceolata* (U;MD,PJ)
Psoralea lanceolata Pursh var. *stenophylla* (Rydb.) Toft & Welsh (O;WR)
Psorothamnus polyadenius (Torr.) Rydb. var. *jonesii* Barneby (R;SID,MD)
Psorothamnus thompsonae (Vail) Welsh & Atwood (R;MD)
Robinia pseudoacacia L. (R;WR)
Sophora stenophylla Gray (O;MD)
- FUMARIACEAE
- Corydalis aurea* Willd. (R;PJ)

GENTIANACEAE

- Swertia albomarginata* (Wats.) Kuntze (R;PM)
Swertia utahensis (Jones) St. John (C;SnD,MD)

HYDROPHYLLACEAE

- Phacelia constancei* Atwood (R;SID)
Phacelia corrugata Nels. (C;W)
Phacelia demissa Gray var. *demissa* (O;SID,PJ)
Phacelia demissa Gray var. *heterotricha* Howell
Phacelia indecora Howell (R;SID)
Phacelia ivesiana Torr. (C;SID,MD,PJ)
Phacelia rafaelsensis Atwood (C;MD,PJ)

JUNCACEAE

- Juncus arcticus* Willd. (C;SS)
Juncus balticus Willd. (C;SS)
Juncus nodosus L. (U;SS)
Juncus torreyi Coville (O;SS)

JUNCAGINACEAE

- Triglochin maritima* L. (U;SS)

LAMIACEAE

- Poliomntha incana* (Torr.) Gray (C;SnD)

LILIACEAE

- Allium geyeri* Wats. (C;PJ,PM)
Allium macropetalum Rydb. (U;SID)
Allium textile Nels. & Macbr. (C;SnD)
Androstephium breviflorum Wats. (C;SID,MD,PJ)
Asparagus officinalis L. (O;WR,SS)
Calochortus nuttallii T. & G. (C;SID,MD)
Eremocrinum albomarginatum (Jones) Jones (C;SnD)
Smilacina stellata (L.) Desf. (C;HG)
Yucca harrimaniae Trel. (C;SnD,MD,PJ)

LINACEAE

- Linum aristatum* Engelm. (U;WR)
Linum perenne L. (C;WR)
Linum puberulum (Engelm.) Heller (O;SID)
Linum subterres Winkler (O;WR,PJ)

LOASACEAE

- Mentzelia albicaulis* Dougl. (C;SID,MD,PJ)
Mentzelia humilis (Gray) Darl. (U;WR)
Mentzelia multiflora (Nutt.) Gray (C;SnD)
Mentzelia pterosperma Eastw. (U;WR)
Mentzelia pumila (Nutt.) T. & G. (O;WR)

MALVACEAE

- Sphaeralcea coccinea* (Nutt.) Rydb. (C;W)
Sphaeralcea grossularifolia (Hook. & Arn.) Rydb. (O;SnD,MD)
Sphaeralcea leptophylla (Gray) Rydb. (R;WR)
Sphaeralcea munroana (Dougl.) Spach
Sphaeralcea parvifolia Nels. (C;W)
Sphaeralcea psoraloides Welsh (R;SID,MD)

NYCTAGINACEAE

- Abronia elliptica* Nels. (C;SnD,MD,WR)
Abronia nana Wats. (U;SID,PJ)
Allionia incarnata L.
Oxybaphus linearis (Pursh) Robins. (C;W)
Tripterocalyx micranthus (Torr.) Hook. (O;SnD)

OLEACEAE

- Fraxinus anomala* Torr. in Wats. (C;WR)

ONAGRACEAE

- Calylophus lavandulaefolia* (T. & G.) Raven (O;PJ,RO)
Camissonia eastwoodiae (Munz) Raven (C;SnD,SID)
Camissonia scapoidea (T. & G.) Raven (C;SnD,SID)
Camissonia walkeri (Nels.) Raven (U;SID,MD)
Oenothera brachycarpa (Gray) Britt. (U;MD,PJ,WR)
Oenothera caespitosa Nutt. (C;SnD,MD,WR)
Oenothera pallida Lindl. ssp. *pallida* (C;SnD,MD,WR)

- Oenothera pallida* Lindl. ssp. *trichocalyx* (Nutt.) Muuz & Klein (C;SID,MD)

ORCHIDACEAE

- Epipactis gigantea* Dougl. ex Hook. (C;HG,SS)

OROBANCHACEAE

- Orobanche fasciculata* Nutt. (O;W)

PAPAVERACEAE

- Argemone corymbosa* Greene (C;SnD)
Argemone munita Dur. & Hilg. (C;SnD)

PINACEAE

- Pinus edulis* Engelm. (C;PJ,PM)
Pinus ponderosa Lawson (C;PM)
Pseudotsuga menziesii (Mirb.) Franc. (C;PM)

PLANTAGINACEAE

- Plantago patagonica* Jacq. (C;SID,MD)

POACEAE

- Agropyron caninum* (L.) Beauv. (U;MD,RO)
Agropyron cristatum (L.) Gaertn. (C;MD,PJ)
Agropyron spicatum (Pursh) Scribn. & Smith (U;PJ)
Agropyron trachycaulum (Link) Malte (U;WR)
Andropogon hallii Hackel (R;WR)
Aristida purpurea Nutt. (C;W)
Bouteloua curtispindula (Michx.) Gray (R;MD)
Bouteloua gracilis (H.B.K.) Lag. ex Steud. (C;SID,MD,PJ)
Bromus japonicus Thunb. (R;PJ)
Bromus tectorum L. (C;WR,DS)
Calamagrostis scopulorum Jones (U;WR)
Dichanthelium lanuginosum (Elliott) Gould (U;SS)
Distichlis spicata (L.) Greene var. *stricta* (Torr.) Scribn. (C;SID,WR)

- Elymus canadensis* L. (U;WR)

- Elymus cinereus* Scribn. & Merr. (O;MD,PJ)

- Elymus junceus* Fischer (R;SID,MD)

- Elymus salina* Jones (C;PJ)

- Erioneuron pilosum* (Buckley) Nash (C;MD,RO,WR)

- Erioneuron pulchellum* (H.B.K.) Tateoka (R;PJ)

- Festuca pratensis* Huds. (U;SS)

- Hilaria jamesii* (Torr.) Benth. (C;W)

- Hordeum jubatum* L. (C;WR)

- Muhlenbergia asperifolia* (Nees & Mey.) Parodi (O;WR)

- Muhlenbergia pungens* Thurber (C;SnD)

- Munroa squarrosa* (Nutt.) Torr. (O;PJ)

- Oryzopsis hymenoides* (Roem. & Schult.) Ricker (C;W)

- Oryzopsis micrantha* (Trin. & Rupr.) Thurber (U;PJ)

- Panicum virgatum* L. (O;SS,WR)

- Phragmites australis* (Car.) Trin. ex Steud. (C;SS)

- Poa fendleriana* (Steud.) Vasey (O;PJ,PM)

- Poa pratensis* L. (U;SS,WR)

- Poa sandbergii* Vasey (U;PJ)

- Polypogon monspeliensis* (L.) Desf. (U;SS,WR)

- Schedonnardus paniculatus* (Nutt.) Trel. (R;SID)

- Schizachyrium scoparium* (Michx.) Nash (O;PJ,WR)

- Sitanion hystrix* (Nutt.) Smith (C;W)

- Spartina gracilis* Trin. (U;SS)

- Sporobolus airoides* (Torr.) Torr. (C;SID,MD)

- Sporobolus contractus* Hitchc. (O;MD,PJ,WR)

- Sporobolus cryptandrus* (Torr.) Gray (C;SID,MD,PJ)

- Sporobolus flexuosus* (Thurb.) Rydb. (U;SnD,WR)

- Sporobolus giganteus* Nash

- Stipa arida* Jones (U;WR)

- Stipa comata* Trin. & Rupr. (C;MD,PJ)

- Stipa columbiana* Macoun. (U;PJ)

- Stipa speciosa* Trin. & Rupr. (U;PJ)
Vulpia octoflora (Walt.) Rydb. (O;PJ,WR)
- POLEMONIACEAE**
Cilia aggregata (Pursh) Spreng. (C;W)
Cilia congesta Hook. (O;SID)
Cilia gunnisonii T. & G. (C;MD,WR)
Cilia inconspicua (Smith) Sweet (C;PJ)
Cilia latifolia Wats. (R;RO,WR)
Cilia leptomeria Gray (C;SnD,MD,PJ)
Cilia polycladon Torr. in Emory (O;SID)
Cilia pumila Nutt. (O;SID)
Cilia roseata Rydb. (C;WR,RO)
Cilia stenothyrsa Gray (O;PJ)
Leptodactylon caespitosum Nutt. (U;WR)
Leptodactylon pungens (Torr.) Nutt. (O;MD,WR,RO)
Leptodactylon watsonii (Gray) Rydb. (U;WR,RO)
Phlox austromontana Cov. (O;PJ)
Phlox hoodii Rich. (C;MD,PJ)
Phlox longifolia Nutt. (O;SID,MD)
- POLYGALACEAE**
Polygala acanthoclada Gray (R;MD)
Polygala subspinosa Wats. (C;SID,PJ,RO)
- POLYGONACEAE**
Eriogonum alatum Torr. in Sitgr. (C;PJ)
Eriogonum batemanii Jones (C;PJ)
Eriogonum bicolor Jones (C;MD,PJ)
Eriogonum cernuum Nutt. (C;SID)
Eriogonum corymbosum Benth. var. *corymbosum* (C;SID,MD)
Eriogonum fasciculatum Benth. var. *polifolium* (Benth. in DC.) T. & G. (R;MD)
Eriogonum flexum Jones (R;SID)
Eriogonum gordonii Benth. (U;SID,MD)
Eriogonum hookeri Wats. (O;MD,PJ)
Eriogonum inflatum Torr. & Frem. var. *fusiforme* (Small) Reveal (O;SID,MD,PJ)
Eriogonum inflatum Torr. & Frem. var. *inflatum* (C;SID,MD)
Eriogonum jamesii Benth. var. *flavescens* Wats. (C;MD,PJ,WR)
Eriogonum leptocladon T. & G. var. *leptocladon* (C;SID)
Eriogonum microthecum Nutt. var. *foliosum* (T. & G.) Reveal (O;SID)
Eriogonum ovalifolium Nutt. var. *ovalifolium* (C;W,RO)
Eriogonum salsuginosum (Nutt.) Hook. (O;MD,PJ)
Eriogonum shockleyi Wats. var. *longilobum* (Jones) Reveal (C;SID,MD)
Eriogonum smithii Reveal
Eriogonum tumulosum (Barneby) Reveal (U;PJ)
Eriogonum wetherillii Eastw. (O;W)
Polygonum aviculare L. (O;WR,DS)
- POLYPODIACEAE**
Adiantum capillus-veneris L. (U;HG)
Cheilanthes feei Moore (O;HG)
Pellaea glabella Mett. ex Kuhn (R;HG)
- PORULACEAE**
Portulaca oleracea L. (R;PJ,PM)
Talinum validulum Greene (O;PJ)
- RANUNCULACEAE**
Aquilegia micrantha Eastw. (C;HG)
Clematis ligusticifolia Nutt. (C;WR)
Delphinium nuttallianum Pritz. ex Walp. (O;W)
Delphinium scaposum Greene (O;PJ)
- Ranunculus cymbalaria* Pursh (U;SS)
Ranunculus testiculatus Crantz (O;DS)
- ROSACEAE**
Amelanchier utahensis Koehne (C;WR,SS)
Cercocarpus intricatus Wats. (C;PJ,RO)
Cercocarpus montanus Raf. (C;PJ,PM,WR)
Coleogyne ramosissima Torr. (C;SnD)
Cowania mexicana D. Don (C;PJ)
Fallugia paradoxa (D. Don) Endl. (O;WR)
Physocarpus alternans (Jones) Howell
Physocarpus monogynus (Torr.) Cou. (U;PJ)
Purshia tridentata (Pursh) DC. (O;WR)
Rosa woodsii Lindl. (R;PM)
- RUBIACEAE**
Galium multiflorum Kellogg (O;WR)
- SALICACEAE**
Populus x acuminata Rydb. (U;WR,SS)
Populus angustifolia James ex Torr. (O;WR)
Populus fremontii Wats. (C;WR,SS)
Populus tremuloides Michx. (O;PM)
Salix exigua Nutt. (C;SS)
- SANTALACEAE**
Comandra umbellata (L.) Nutt. var. *pallida* (DC.) Jones (C;W,WR)
- SAXIFRAGACEAE**
Philadelphus microphyllus Gray (C;PJ,PM)
Ribes cereum Dougl. (R;PJ,PM)
Ribes leptanthum Gray (O;PM)
- SCROPHULARIACEAE**
Castilleja chromosa Nels. (O;W)
Castilleja linariaefolia Benth. (O;SS)
Castilleja scabrida Eastw. (C;W)
Cordylanthus kingii Wats. (O;PJ)
Cordylanthus wrightii Gray
Mimulus rubellus Gray (R;PM)
Penstemon carnosus Pennell (C;PJ)
Penstemon cyanocaulis Payson (U;WR)
Penstemon eatonii Gray (O;PJ,PM)
Penstemon lentus Pennell (U;WR)
Penstemon utahensis Eastw. (C;PJ)
- SELAGINELLACEAE**
Selaginella nutica Eaton ex Underw. (U;HG)
- TAMARICACEAE**
Tamarix ramosissima Ledeb. (C;SS,WR)
- TYPHACEAE**
Typha latifolia L. (C;SS)
- ULMACEAE**
Celtis reticulata Torr. (U;WR)
Ulmus pumila L. (R;WR)

LITERATURE CITED

- CRONQUIST, A., A. HOLMGREN, N. HOLMGREN, AND J. REVEAL. 1972. Intermountain flora: vascular plants of the Intermountain West. vol. I. Hafner Publishing Company, Inc., New York.
- CRONQUIST, A., A. HOLMGREN, N. HOLMGREN, J. REVEAL, AND P. HOLMGREN. 1977. Intermountain flora: vascular plants of the Intermountain West. vol. VI. Columbia University Press, New York.
- NEESE, E., AND S. L. WELSH. 1981. *Astragalus* section *Desperati* (Leguminosae) and a new species from the Uinta Basin of Utah. *Rhodora* 83:455-460.
- WELSH, S. L. 1978. Utah flora: Fabaceae (Leguminosae). *Great Basin Nat.* 38:225-367.

- _____. 1980a. Utah flora: Malvaceae. *Great Basin Nat.* 40:27-37.
- _____. 1980b. Utah flora: miscellaneous families. *Great Basin Nat.* 40:38-58.
- _____. 1981. New taxa of western plants—In tribute. *Brittonia* 33:294-303.
- WELSH, S. L., N. D. ATWOOD, S. GOODRICH, E. NEESE, K. H. THORNE, AND B. ALBEE. 1981. Preliminary index of Utah vascular plant names. *Great Basin Nat.* 41:1-108.
- WELSH, S. L., AND G. MOORE. 1973. *Utah plants: Tracheophyta*. 3d ed. Brigham Young University Press, Provo, Utah.
- WELSH, S. L., AND J. L. REVEAL. 1977. Utah flora: Brassicaceae (Cruciferae). *Great Basin Nat.* 37:297-364.