

Guano Creek/Sink Lakes

Lucile A. Housley

Lakeview District BLM, 1301 South G Street, Lakeview, Oregon 97630

*As I traveled through the remote sagebrush covered hills in southern Lake County, I spotted barren light colored hills off in the distance. I turned my pickup toward the hills, knowing they could harbor some interesting plants. Approaching the hills, I could see they were covered with pin cushion-like plants ablaze in yellow flowers. Grabbing a hand lens, camera, and trowel I headed off to see what they were. As I sat on the ground examining the plants, I knew this was an *Eriogonum* I had never seen before. –Virginia Crosby Pyles*

Thus, over twenty-five years ago, Lakeview BLM botanist Virginia Crosby discovered a new species of buckwheat in the southern part of Guano Valley. It was described in 1978 and named *Eriogonum crosbyae* (Reveal 1981). Crosby's buckwheat is limited to southwestern Harney County and southeastern Lake County, Oregon, and Washoe County in northwestern Nevada. Like several other rare buckweats in Lake County, Crosby's buckwheat is restricted to white tuffaceous ash flow soils that are stratified with rhyolite. Although there is little competition from other plants in this environment, plants must survive the rigors of intense sun without a protective canopy, nutrient-poor soil, frost heaving, and soil movement (Kaye and others 1990). In addition to Guano Creek/Sink Lakes RNA, this low, woody, matted buckwheat grows near Fish Fin Rim (23 miles northeast), and on Oregon State land that lies south of Highway 140. However, the RNA is one of the best sites to study this buckwheat and its habitat; particularly, at the end of a closed jeep trail one mile west of the valley floor where bright yellow balls of yellow flowers over gray-green cushions of buckwheat stand out on the white hillsides.

Guano Creek/Sink Lakes RNA/ACEC

Guano Valley is a large north-south trending Pleistocene pluvial lake bed 20 miles east of Adel in southeastern Lake County. If you

follow a dirt road (BLM 6106-0-0A) north of Highway 140 for twelve miles, you arrive at the uninhabited Shirk Ranch. Once a local bustling center, the ranch was abandoned 20 years ago, and now the area and structures have been nominated for the National Register of Historic Places. A mile north of the ranch, Guano Creek flows into the valley from a canyon to the west. With headwaters at Blue Sky on Hart Mountain, Guano Creek, an intermittent desert water course, carved Guano Canyon through the basalt layers below the dam at Jacob's Reservoir, winding six miles through lava banks and white pumice hills to reach the broad, open Guano Valley. The hill on the north side of the creek rises to a high plateau where three vernal pools lie among the bunch grasses and sagebrush. The area that surrounds Guano Creek, including the up-



Pin cushion-like Crosby's buckwheat (*Eriogonum crosbyae*) ablaze with yellow flowers. Photo by Steve Shelly.

lands (Sink Lakes), was declared a Research Natural Area /Area of Critical Environmental Concern (RNA/ACEC) in November 2003 (USDI-BLM 2003a). (All RNAs in the BLM are managed as ACECs.) The Guano Creek/Sink Lakes RNA/ACEC encompasses 11,199 acres and includes all of the Guano Creek Wilderness Study Area (T38S R26E; T38S R27E). Hart Mountain National Antelope Refuge abuts the northern boundary of the ACEC. Some of the reasons for designating this RNA/ACEC were to protect

three sensitive plant species and Oregon Natural Heritage Program ecosystem "cells" of biological diversity (BLM 1988).

Rare Plants

On the west-facing cliffs above Guano Creek, near the Crosby's buckwheat habitat, but on a slightly different substrate, grows another rare plant, *Eriogonum prociduum*, prostrate buckwheat. Both buckweats are BLM sensitive species and on Oregon Natural Heritage Program (ONHP) List 1 (threatened or endangered throughout range).

In 1988, BLM botanists Ginger King and Steve Shelly and volunteer Elaine Reese discovered grimy ivesia (*Ivesia rhypara* var. *rhypara*) while hiking up a steep hillside of vitric ash flow pumice



Crosby's buckwheat is restricted to white tuffaceous ash flow soils that are stratified with rhyolite. Photo by Ginger King.

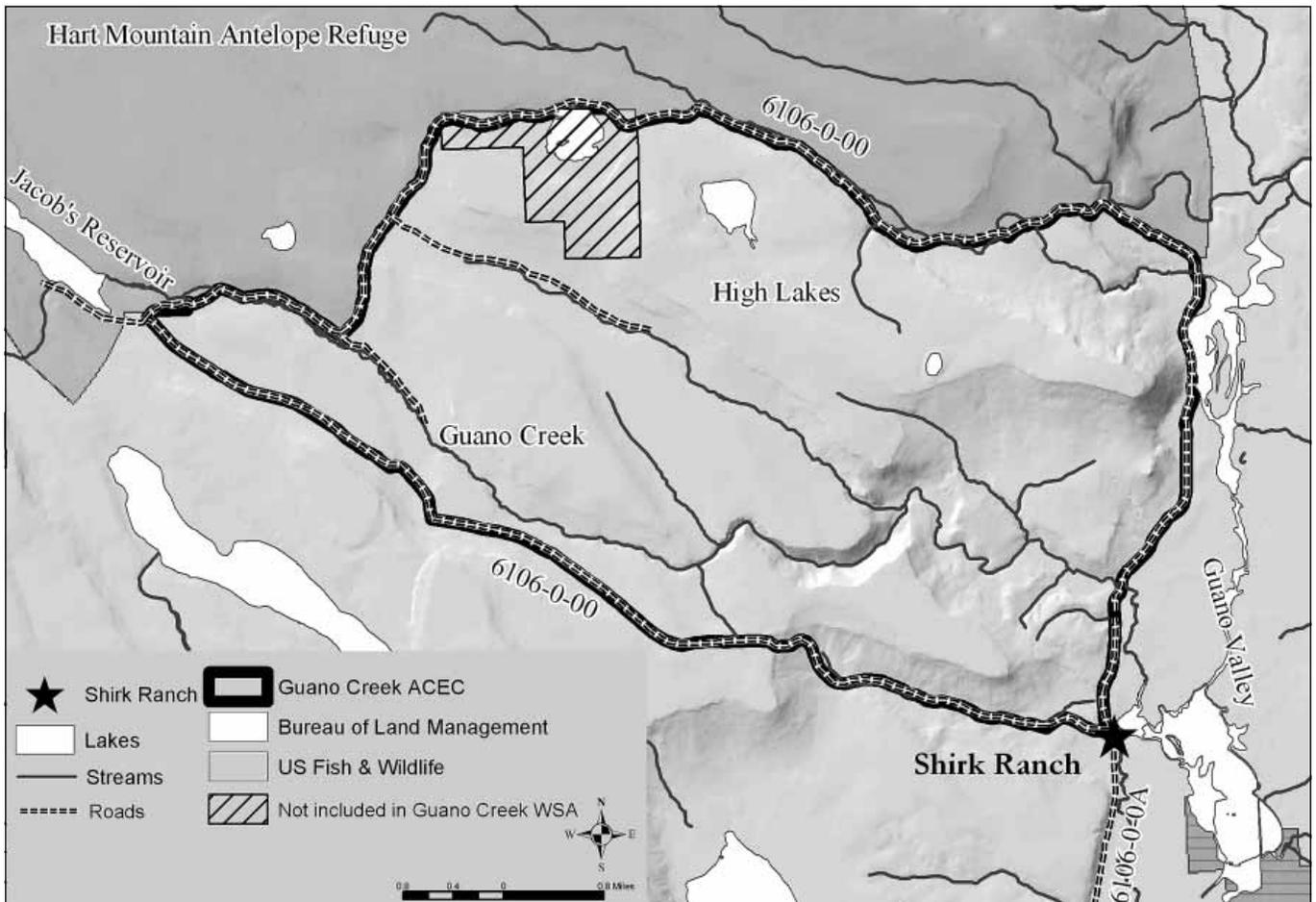
near the Crosby's buckwheat site. A tiny cushion-shaped member of the rose family, its small flowers are white petals on a yellow "cup." It grows in four long shallow cracks that cross the ash flow hillside. The only other population of grimy ivesia in Oregon is in Malheur County (see article about Leslie Gulch on page 3). Disjunct populations occur in Washoe and Elko counties, Nevada (Kaye and others 1991). Grimy ivesia is a BLM Bureau sensitive species and on ONHP List 1. The Guano Creek area was closed to grazing in 1994, when livestock trampling reduced the ivesia to 28 indi-

viduals. Annual monitoring during the past nine years has shown that the population has remained relatively stable, probably because the species is a long-lived perennial. Threats that could slowly decimate the population are the possibility of climate warming and diminished variability due to a small gene pool. Although nothing can be done about either factor, the health of the population continues to be monitored. Nevada mining projects have threatened *Ivesia* populations; however, because of the WSA nomination and RNA creation, mining does not pose a threat at Guano Creek (BLM 2000).

Plant Communities

Guano Creek/Sink Lakes RNA is in the Northern Basin and Range Ecoregion (Allen and others 2001). The bright green riparian canyon bottom contrasts sharply with gray-green sagebrush/bunchgrass hillsides and outcrops of strange ash formations, dark basalt cliffs and white pumice. The Oregon Natural Heritage Program designated the following three cells: riparian willow, silver sagebrush/basin wildrye, and big sagebrush/Idaho fescue. In addition to these three cells in the Guano Creek portion, two more are represented in the Sink Lakes area (see below).

In addition to the rare *Ivesia* and *Eriogonum* species, the canyon is worth visiting for its rich displays of wildflowers in late May and early June. Scattered juniper (*Juniperus occidentalis*) grace the hillsides. Blue camas (*Camassia quamash*), white yampah



Guano Creek/Sink Lakes RNA/ACEC. Map prepared by Shannon Theall.

(*Perideridia* spp.), wild iris (*Iris missouriensis*), various sedges, silver sagebrush (*Artemisia cana*), and basin wildrye (*Leymus cinereus*) grow on the valley floor with fringed water-plantain (*Damasonium californicum*) in the flowing stream; all contribute to the rich diversity of the plant community. Several species were used by Native Americans in the past and are “cultural plants” protected under Tribal Trust Responsibilities (Forest Service and BLM 1995). These plants are indicated in the species list by #.



Guano Creek winds six miles through lava banks and white pumice hills to reach the broad, open Guano Valley. Photo by Lucile Housley.

Willows (*Salix exigua*, *S. lasiolepis*, *S. lucida*) border the lower reaches of the creek, but the upper tributary is too harsh and rocky for willows. The striking white pumice hills support a distinctive vegetation. OHNP has nominated these ash flow soil plant communities for designation as a unique “cell” for study in southeastern Oregon. Some of the plants found on the ash flows are ball-headed gilia (*Gilia congesta*), prickly phlox (*Leptodactylon pungens*), Watson’s white forget-me-not (*Cryptantha watsonii*), Hood’s phlox (*Phlox hoodii*), dwarf skullcap (*Scutellaria nana*), fennel-leaved lomatium (*Lomatium foeniculaceum* var. *macdougalii*), and desert paintbrush (*Castilleja chromosa*). Surrounding the ash hills, the vegetation is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), two different rabbitbrushes (*Ericameria nauseosa*, *E. viscidiflora*), other buckwheats (*Eriogonum ovalifolium*, *E. caespitosum*), and evening primrose (*Oenothera cespitosa*). Higher on the hillside, Wyoming big sagebrush mixes with dense stands of Idaho fescue (*Festuca idahoensis*), needle-and-thread (*Hesperostipa comata*) and Indian ricegrass (*Achnatherum hymenoides*).

The northern half of the RNA is called “the Sink Lakes” for three seasonal lakes (vernal pools) lying on a large, treeless, flat plateau of low sagebrush (*Artemisia arbuscula*), forbs, and bunchgrasses. In 2000, Billy Burr Lake and surrounding area was granted to the

BLM by The Nature Conservancy. The two ONHP “cells” in this part of the RNA are low sagebrush/Sandberg bluegrass scabland and low elevation vernal ponds.

Monitoring studies indicate that the health and diversity of vernal pool plant communities have improved since grazing was discontinued; the dryland area will be slower to demonstrate vegetative change. Silver sagebrush rings the vernal pools, which are surrounded by slightly rolling uplands dominated by low sagebrush grasslands. The dry lakebeds differ in their vegetative composition, but all may be dominated by tansyleaf evening primrose (*Camissonia tanacetifolia*). The middle lake is best characterized as a silver sagebrush/Nevada bluegrass plant community. Baltic rush (*Juncus balticus*) and leafy arnica (*Arnica chamissonis*) fill the lakes in wet years. Povertyweed (*Iva axillaris*) and lanceleaf goldenweed (*Pyrocoma lanceolata*) dominate the lake beds when they dry out. Other grass species present in the dried pools are mat muhly (*Muhlenbergia richardsonis*) and water foxtail (*Alopecurus geniculatus*) (BLM 2003a).

Low sagebrush grasslands dominate the surrounding uplands, which also display a variety of wild flowers in May and June. The grasses include Sandberg’s bluegrass (*Poa secunda*), Wheeler’s bluegrass (*Poa nervosa*), bottlebrush squirreltail (*Elymus elymoides*) and Thurber’s needlegrass (*Achnatherum thurberianum*). There are small stands of Wyoming big sagebrush, rock currant (*Ribes cereum*), chokecherry (*Prunus virginiana*), aspen (*Populus tremuloides*), and mountain mahogany (*Cercocarpus ledifolius*).

Climate, Geology and Soils

Elevation within the RNA ranges from 5,300 to 5,980 feet. The climate is arid, with average precipitation less than ten inches per year, falling mainly as snow in the winter (January) and rain in spring (May). The geology of the RNA is spectacular; the lower reaches of Guano Creek cut through Tertiary-age tuffaceous and pumiceous sedimentary rock and locally welded tuffs. Faulting in



Grimy ivesia (*Ivesia rhypara* var. *rhypara*) grows on a steep hillside of vitric ash flow pumice. Photo by Ginger King.



The small flowers of grimy ivesia reveal that it is a member of the rose family. Photo by Ginger King.

the area largely controls the course of Guano Creek. The Sink Lakes lie on Tertiary-age basalt flows dissected by the Eugene-Denio lineament. In this area, numerous normal and reverse faults create a series of northwest-southeast trending grabens that contain intermittent lakes. These graben lakes are characterized by Quaternary-age clayey, silty, and in some cases, sandy playa deposits. Tertiary tuffaceous sedimentary rocks along the eastern portion of the RNA contain late Miocene vertebrate fossils, which may be viewed, but not collected (BLM 1989).

Wildlife

Guano Creek/Sink Lakes provide season-long habitat for mule deer and pronghorn antelope. Bighorn sheep can occasionally be seen on the rims. Another inhabitant of the RNA, northern sage grouse, is a candidate species for Federal threatened and endangered status. Wintering concentrations are high, and there is at least one strutting ground (lek) within the area. Although no known raptor nest sites lie within the RNA boundary, one golden eagle and two prairie falcon nests occur within six miles. Guano Creek is the habitat for Sheldon tui chub, a Federal Species of Concern, State Candidate, and ONHP List 1. Its range is limited to a few springs and streams in northwest Nevada and southeast Oregon. Waterfowl, including gadwalls, pintails, shovelers, mallards, and Canada geese, nest among the emergent vegetation of Sink Lakes and Guano Creek during wet years. These same areas provide resting and feeding habitat for these and other migrating birds each spring. The RNA contains habitat for pygmy rabbit, coyote, skunk, badger, porcupine, weasel, numerous birds, small mammals,



The bright green riparian canyon bottom of Guano Creek contrasts sharply with gray-green sagebrush/bunchgrass hillsides. Photo by Lucile Housley.

amphibians, Western rattlesnakes, gopher snakes, fence lizards, and other reptiles (Forest Service and BLM 1989, BLM 1988).

Human History

Although a thorough inventory of all cultural resources within the Guano Creek/Sink Lakes area has not been completed, surveys for project work have uncovered some sites, including lithic scatters of obsidian flakes, stone rings, and rock art. During the 10,000 years that Native Americans have been visiting this area, their activities may have included stone quarry work, occupation while collecting plants and hunting, and rock art which could be of a religious nature (BLM 1988). Guano Creek may have provided a travel corridor between hunting/gathering at lower elevations and activities higher on the plateau and Hart Mountain.

In the historic past, the entire area was grazed by cattle and sheep. Partly because there is no grazing of livestock at the present time, few people travel through or to this area of the Lakeview District. In the spring, the RNA is worth visiting for its "rock garden" wild flowers; while in the fall, hunters utilize the area.

Management

The Wilderness Study Area (WSA) complicates management decisions. However, the following decisions have been made for the present: new rights-of-way will be excluded, and off highway vehicles (OHVs) will be limited to designated roads and trails,

even if the area is released from wilderness study. Due to its WSA status, the area will be managed as Visual Resource Management (VRM) Class I, which preserves the existing character of the landscape. This class limits management activity, allowing only natural ecological changes. If the area is released from wilderness study, it will be managed as VRM Class III, which is to partially retain the existing character of the landscape. Regardless of the fate of the wilderness proposal, the area will remain closed to grazing, as described in a recent plan amendment and the Oregon Public Lands Transfer and Protection Act of 1998. Commercial and personal plant collecting will be limited; research permits may be available at the Lakeview BLM office. Due to WSA status, the area is closed to mineral disposal and leasing; this will remain the same under RNA strictures, even if the area is released from WSA status. Mineral location within the WSA will be subject to the no reclamation requirement of the wilderness

Interim Management Plan. If released from wilderness study, the WSA will be open to all mineral location, subject to the preparation of a plan of operations (BLM 2003b). During the WSA process,

Guano Creek WSA was recommended as “suitable” for wilderness designation; however, it awaits Congressional approval for the finalization of the process (BLM 1989).

Research

Research projects within the RNA have centered around grimy ivesia and Crosby's buckwheat, including monitoring, pollination, genetics, electrophoresis, and seed viability studies (Kaye and others 1990, 1991). Monitoring will continue and a Conservation Agreement for the ivesia and the two buckwheats has been recommended. The BLM and The Nature Conservancy have conducted vegetative plot studies to determine changes in plant cover, especially in the areas of the vernal pools. Future research could include studies of invertebrates of the vernal pools, comparison of this *Ivesia* population to the closest population on the Sheldon National Wildlife Refuge (45 miles to the southeast) and studies of the hydrology and effects to the creek due to altered hydrologic/sediment transport regime relating to Jacob's Reservoir. The Guano Creek riparian area and canyon is a classic example of connectivity between the lower lands of Guano Valley and the uplands of Hart Mountain (D. Dobkin, pers. comm.). Blue camas occurs at Blue Sky on Hart Mountain and follows the riparian zone of Guano Creek through an area where lilies would not otherwise occur to the east end of Guano Canyon. No one has looked at the connectivity of other species of plants, insects, birds or animals along this corridor in a “desert” environment.



Low sagebrush grasslands on the surrounding uplands display a variety of wild flowers in May and June. Photo by Lucile Housley.

Recreational Opportunities

While it takes a concerted effort to visit this RNA located 67 miles northeast of Lakeview, a description of the area in the Oregon Wilderness Environmental Impact Statement (BLM 1989) entices visitors. Opportunities for solitude exist throughout the RNA. Native plant communities and rare plant and animal species enhance the already outstanding primitive, unconfined recreational opportunities, such as day hiking, wildlife viewing, photography, horseback riding, and hunting for deer or antelope. Day hiking routes vary from easy (strolling the flat terrain at the top of the plateau) to difficult (scaling the steep, rugged terrain in the canyon and rims). Visitors can easily isolate themselves in the canyon and along the rimrock, where the landform and junipers offer screening. The bowl-like depressions that form the sink lakes in the basalt uplands offer isolation in spite of the low vegetation. The remoteness of the RNA elicits a feeling of solitude even on the open sage flats.

Visiting Guano Creek/Sink Lakes

The boundary road (6106-0-00) circles the entire RNA and there are two short routes that enter the area from the west. The Sink Lakes section of the RNA can be reached by four-wheel drive three miles north of Shirk Ranch via the jeep trail west on the boundary between Hart Mountain and the RNA. This rough trail winds up through scattered junipers and in some places, over lava slabs. Or, one can travel west from Shirk Ranch on the dirt road (BLM 6106-0-00) a little over six miles to Jacob's Reservoir. Before arriving at the reservoir, take the jeep trail that goes to the north across Guano Creek and up onto the plateau, where the two roads meet near Billy Burr Lake. All of the RNA is accessible by hiking or horseback.

Acknowledgments

David S. Dobkin, director of the High Desert Ecological Research Institute in Bend, provided information concerning research on biological connectivity between highland and lowland areas. Virginia Crosby Pyles shared her experience discovering *Eriogonum crosbyae*. She still works for the BLM, in

Denver, Colorado. Other contributors to the species list, in addition to V. Crosby, include Steve Shelly, botanist and State RNA director, USFS in Montana; Kim Frymire, botanist Umatilla USFS; Ginger King Milota, former BLM botanist; Elaine Reese, former BLM volunteer; and Reid Schuller, botanist and Executive Director of Natural Areas Association, Bend, Oregon.

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Vascular Plant Species List

The following species list for Guano Creek/Sink Lakes RNA/ACEC was compiled by Lucile Housley. Nomenclature follows the Oregon Flora Project checklist. Names of taxa native to Oregon are printed in italic *Garamond*; alien taxa are in italic *Gill Sans*, a sans-serif type. An asterisk (*) indicates Bureau of Land Management Special Status Plant Species. Names followed by a pound sign (#) are cultural plants, used by Tribal people.

GYMNOSPERMS

CUPRESSACEAE (Cypress Family)

Juniperus occidentalis Hook. (western juniper)#

DICOTYLEDONS

APIACEAE (Carrot Family)

Lomatium foeniculaceum (Nutt.) J.M. Coult. & Rose var. *macdougallii* (J.M. Coult. & Rose) Cronquist (fennel leaved lomatium)#

Lomatium macrocarpum (Nutt.) J.M. Coult. & Rose (large fruited lomatium)#

Lomatium nudicaule (Pursh) J.M. Coult. & Rose (naked desert parsley)#

Perideridia bolanderi (A. Gray) A. Nelson & J.F. Macbr. (Bolander's yampa)#

ASTERACEAE (Sunflower Family)

Achillea millefolium L. (common yarrow)

Agoseris heterophylla (Nutt.) Greene (annual agoseris)

Antennaria dimorpha (Nutt.) Torr. & A. Gray (low pussytoes)

Arnica chamissonis Less. (meadow arnica)

Artemisia cana Pursh (silver sagebrush)

Artemisia arbuscula Nutt. (low sagebrush)#

Artemisia tridentata Nutt. ssp. *wyomingensis* Beetle & A. Young (Wyoming big sagebrush)#

Aster scopulorum A. Gray (crag aster)

Balsamorhiza sagittata (Pursh) Nutt. (arrowleaf balsamroot)#

Balsamorhiza serrata A. Nelson & J.F. Macbr. (toothed balsamroot)#

Blepharipappus scaber Hook. (eye-lash plant)

Chaenactis douglasii (Hook.) Hook. & Arn. (dustymaidens)

Crepis acuminata Nutt. (tapertip hawkbeard)

Ericameria nauseosa (Pall. ex Pursh) G.L. Nesom & G.I. Baird (gray rabbitbrush)

Ericameria viscidiflora (Hook.) L.C. Anderson (green rabbitbrush)

Erigeron linearis (Hook.) Piper (lineleaf fleabane)

Eriophyllum lanatum (Pursh) J. Forbes (Oregon sunshine)

Iva axillaris Pursh (povertyweed)

Pyrrcoma lanceolata (Hook.) Greene (lanceleaf goldenweed)

Senecio integerrimus Nutt. (western groundsel)

Taraxacum officinale Weber ex F.H. Wigg. (common dandelion)

BORAGINACEAE (Borage Family)

Cryptantha celosioides (Eastw.) Payson (cockscumb cryptantha)

Cryptantha watsonii (A. Gray) Greene (Watson's catseye)

Mertensia ciliata (Torr.) G. Don (streamside bluebells)

Plagiobothrys scouleri (Hook. & Arn.) I.M. Johnst. (Scouler's popcorn flower)

BRASSICACEAE (Mustard Family)

Arabis holboellii Hornem. (Holboell's rock cress)

Cusickiella douglasii (A. Gray) Rollins (Douglas draba)

Phoenicaulus cherianthoides Nutt. ex Torr. & A. Gray (daggerpod)

CAMPANULACEAE (Bellflower Family)

Downingia elegans (Douglas ex Lindl.) Torr. (elegant downingia)

CAPRIFOLIACEAE (Honeysuckle Family)

Sambucus mexicana C. Presl ex DC. (blue elderberry)#

CARYOPHYLLACEAE (Pink Family)

Arenaria aculeata S. Watson (prickly sandwort)

FABACEAE (Legume Family)

Astragalus filipes Torr. ex A. Gray (threadstalk milkvetch)

Astragalus malacus A. Gray (shaggy milkvetch)

Astragalus obscurus S. Watson (arcane milkvetch)

**Astragalus tetrapterus* A. Gray (four winged milkvetch)

Lupinus uncialis S. Watson (inch high lupine)

GENTIANACEAE (Gentian Family)

Frasera albicaulis Douglas ex Griseb. (whitestem frasera)

GROSSULARIACEAE (Gooseberry Family)

Ribes aureum Pursh (golden currant)#

Ribes cereum Douglas (rock currant)#

HYDROPHYLLACEAE (Waterleaf Family)

Hesperochiron californicus (Benth.) S. Watson (false strawberry)

Phacelia hastata Douglas ex Lehm. (silverleaf phacelia)

Phacelia linearis (Pursh) Holz. (threadleaf phacelia)

Phacelia lutea (Hook. & Arn.) J.T. Howell (yellow phacelia)

LABIATAE (Mint Family)

Monardella odoratissima Benth. (mountain monarda)#

ONAGRACEAE (Evening Primrose Family)

Camissonia tanacetifolia (Torr. & A. Gray) P.H. Raven (tansyleaf evening primrose)

Oenothera cespitosa Nutt. (tufted evening primrose)#

OROBANCHACEAE (Broom-rape Family)

Orobanche uniflora L. (single flower broomrape)#

PAPAVERACEAE (Poppy Family)

Canbya aurea S. Watson (golden canbya, yellow pygmy-poppy)

POLEMONIACEAE (Phlox Family)

Collomia grandiflora Douglas ex Lindl. (large flowered collomia)

Ipomopsis congesta (Hook.) V.E. Grant (ballhead gilia)

Leptodactylon pungens (Torr.) Nutt. (prickly phlox)
Navarretia intertexta (Benth.) Hook. (needleleaf navarretia)
Phlox hoodii Rich. (woolly phlox)
Phlox longiflora Nutt. (longleaf phlox)

POLYGONACEAE (Buckwheat Family)

Eriogonum cespitosum Nutt. (mat buckwheat)
**Eriogonum crosbyae* Reveal (Crosby's buckwheat)
Eriogonum ovalifolium Nutt. (cushion buckwheat)
**Eriogonum prociduum* Reveal (prostrate buckwheat)
Eriogonum strictum Benth. (Blue Mountain buckwheat)

PORTULACACEAE (Purslane Family)

Lewisia rediviva Pursh (bitterroot)#

PRIMULACEAE (Primrose Family)

Dodecatheon conjugens Greene (desert shooting star)

RANUNCULACEAE (Buttercup Family)

Delphinium andersonii A. Gray (desert larkspur)
Ranunculus glaberrimus Hook. (sagebrush buttercup)
Ranunculus occidentalis Nutt. (western buttercup)

ROSACEAE (Rose Family)

Cercocarpus ledifolius Nutt. ex Torr. & A. Gray (curlleaf mountain mahogany)#
Geum triflorum Pursh (prairie smoke, old man's whiskers)
**Ivesia rhypara* Ertter & Reveal var. *rhypara* (grimy ivesia)
Potentilla anserina L. (common silverweed)#
Prunus virginiana L. (chokecherry)#

SALICACEAE (Willow Family)

Populus tremuloides Michx. (quaking aspen)
Salix exigua Nutt. (coyote willow)#
Salix lasiolepis Benth. (arroyo willow)#
Salix lucida Muhl. (shining willow)#

SAXIFRAGACEAE (Saxifrage Family)

Lithophragma glabrum Nutt. (smooth fringe-cup)

SCROPHULARIACEAE (Figwort Family)

Castilleja angustifolia (Nutt.) G. Don var. *dubia* A. Nelson (desert paintbrush)
Castilleja pilosa (S. Watson) Rydb. (hairy paintbrush)
Mimulus nanus Hook. & Arn. (purple monkeyflower)
Penstemon humilis Nutt. ex A. Gray (lowly penstemon)
Penstemon speciosus Douglas ex Lindl. (showy penstemon)

VIOLACEAE (Violet Family)

Viola beckwithii Torr. & A. Gray (Beckwith's violet)

MONOCOTYLEDONS

ALISMACEAE (Water-plantain Family)

Damasonium californicum Torr. (fringed water plantain)

CYPERACEAE (Sedge Family)

Eleocharis acicularis (L.) Roem. & Schult. var. *bella* Piper (delicate spike rush)#

Eleocharis palustris (L.) Roem. & Schult. (common spike rush)#

IRIDACEAE (Iris Family)

Iris missouriensis Nutt. (western iris)

JUNCACEAE (Rush Family)

Juncus balticus Willd. (Baltic rush)#

LILIACEAE (Lily Family)

Allium acuminatum Hook. (tapertip onion)#
Camassia quamash (Pursh) Greene (blue camas)#
Leucocrinum montanum Nutt. (sand lily)

POACEAE (Grass Family)#

Achnatherum hymenoides (Roem. & Schult.) Barkworth (Indian ricegrass)
Achnatherum thurberianum (Piper) Barkworth (Thurber's needlegrass)
Alopecurus geniculatus L. (water foxtail)
Bromus tectorum L. (cheatgrass)
Elymus elymoides (Raf.) Swezey (bottlebrush squirreltail)
Festuca idahoensis Elmer (Idaho fescue)
Hesperostipa comata (Trin. & Rupr.) Barkworth (needle and thread grass)
Koeleria macrantha (Ledeb.) Schult. (junegrass)
Leymus cinereus (Scribn. & Merr.) A. Löve (basin wildrye)
Muhlenbergia richardsonis (Trin.) Rydb. (mat muhly)
Poa secunda J. Presl (Nevada bluegrass)
Poa wheeleri Vasey (Wheeler's bluegrass)
Pseudoroegneria spicata (Pursh) A. Löve (bluebunch wheatgrass)

Lucile A. Housley has worked for the BLM as the area botanist in the Lakeview Resource Area (RA) for ten years. Among her many duties, she manages and coordinates the RNA/ACECs in the Resource Area. For the last four years, the Lakeview RA has been working on a new Resource Management Plan; and the designation of new RNA/ACECs and evaluating existing RNA/ACECs was her particular task, as well as Bureau Special Status plant species and cultural plants. With the signing of the Record of Decision, 15 ACECs now exist in the Lakeview Resource Area, 10 of which contain designated RNAs. She is a member of the Klamath Basin Chapter of NPSO. Before working for the BLM, Lucile was the Executive Director of Malheur Field Station in Harney County, a research station for 22 colleges and universities in the Northwest. Lucile received her BA in botany and plant ecology from Pomona College and her MA from Rancho Santa Ana Botanic Gardens in Claremont, California. For the past 35 years she has worked with Tribal members in the field of ethnobotany, carrying out research with the Pueblo peoples of New Mexico, the indigenous herbalists in Chile, and most recently with various tribes in the Northern Intermountain Region and Northern Great Basin.
