Habitat Surveys

of

Elk Springs Estates

for

Sacramento Mountains Checkerspot Butterfly
(*Euphydryas anicia cloudcroftii*)

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October 2007

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Introduction

The Sacramento Mountains checkerspot butterfly (hereafter referred to as checkerspot) is found only in mountain meadows within a six mile radius of the Village of Cloudcroft. In 2001, the U.S. Fish and Wildlife Service (USFWS) proposed to list the checkerspot as endangered with critical habitat. Threats to the checkerspot were habitat loss from proposed development, stochastic events such as drought and wildfire, and potential degradation of habitat and host plants from livestock grazing. Local parties from Otero County and the Village of Cloudcroft stepped forward in January 2004 and proactively addressed conservation needs of the checkerspot. Meetings were held with the Village of Cloudcroft, Otero County, the U.S. Forest Service, and the U.S. Fish and Wildlife Service to develop a conservation strategy for the species. Certain threats were reduced, such as the curtailment of development into butterfly habitat. Representatives from local governments and Federal agencies met several times and collaboratively prepared the Sacramento Mountains Checkerspot Butterfly Conservation Plan (finalized in November, 2005) and signed a Memorandum of Understanding to confirm commitments to implement conservation actions. In December, 2005, the checkerspot was withdrawn as a proposed species for federal listing. However, as a rare species, its population numbers remain small and Federal projects are required to evaluate impacts to the checkerspot under its current status as a "sensitive species". Monitoring of its populations along with conserving its habitat are important to the checkerspot's survival and to the reduction of the possibility of becoming a federally listed threatened or endangered species in the future.

The general approach to assist this species involves a combination of protection of both occupied meadow habitats as well as meadow habitat that is unoccupied but that has the floral components important to the butterfly. In August of 2005, the Otero County Subdivision Ordinance (Ordinance No. 01-05) was signed with the purpose of protecting occupied and suitable checkerspot habitat on private lands slated for development, etc. However, it is the understanding of our client, Tom Austin, that the ordinance is not currently active because it has not yet been submitted to the State of New Mexico for approval and signature.

In accordance with the Ordinance, we surveyed potential habitat for the checkerspot. The study area was limited to the un-forested portion of the 115-acre parcel, and targeted the three perennial plant species utilized by the checkerspot: New Mexico penstemon (NM penstemon; *Penstemon neomexicanus*); tobacco root (*Valeriana edulis*); and sneezeweed [*Helenium hoopsei* (synonym of *Hymenoxys hoopsei*)]. In addition to these plants, noxious weeds were noted and mapped for these surveys.

Methods

We completed surveys on foot on 2 October 2007 within the meadows and grasslands along and above James Canyon Creek, ca. 4.2 road miles (6.7 kilometers) east of Cloudcroft, New Mexico on US highway 82. We targeted 28 acres of meadow, grassland, and short stretches of wetland/creek habitat. We surveyed on separate paths parallel to the

property boundaries, as indicated on the preliminary plat supplied for our survey, completing tighter transects in open and relatively disturbed areas and spreading out in areas with tall, dense stands of grass. In other words, we covered all of the property designated for survey, but increased our efforts in more favorable habitat for the target plant species.

We visited known habitat for the checkerspot and familiarized ourselves with the current lifestage conditions of the caterpillar and occupied host plants. This allowed us to gauge the state of development of the checkerspot and the appearance of herbivorized NM penstemons. Larvae were active but not abundant within the known habitat.

Within the study area, upon finding tobacco root or NM penstemon, we examined individuals carefully, looking for signs of herbivory, turning leaves and looking for signs of the presence of the checkerspot caterpillar. The caterpillar is a small (6-13 mm, or .24-.5 in.) and cryptic insect that is difficult to detect. However, when present, the condition of the penstemon host plant shows signs of its presence. The caterpillar forms tents at the base of occupied penstemons and feeds extensively on the leaves and bracts of the inflorescence. The inflorescence, if present, yellows and reveals the presence of caterpillar excrement. Cursory surveys examining small subsamples of the penstemons present are insufficient to detect the presence of checkerspot larvae at this time of year. When we encountered penstemon or tobacco root, we examined all of the individuals occurring in small clumps thoroughly. When concentrations of several hundred penstemon were encountered we looked closely for signs of herbivory on all individuals, examining all plants and bare ground visually, but only turning leaves on plants possessing partly consumed leaves, spider webs, or other potential signs of the checkerspot caterpillar. Within these large groups we sometimes took the time to examine all individuals very closely; but other times we examined a majority, but not all of the plants.

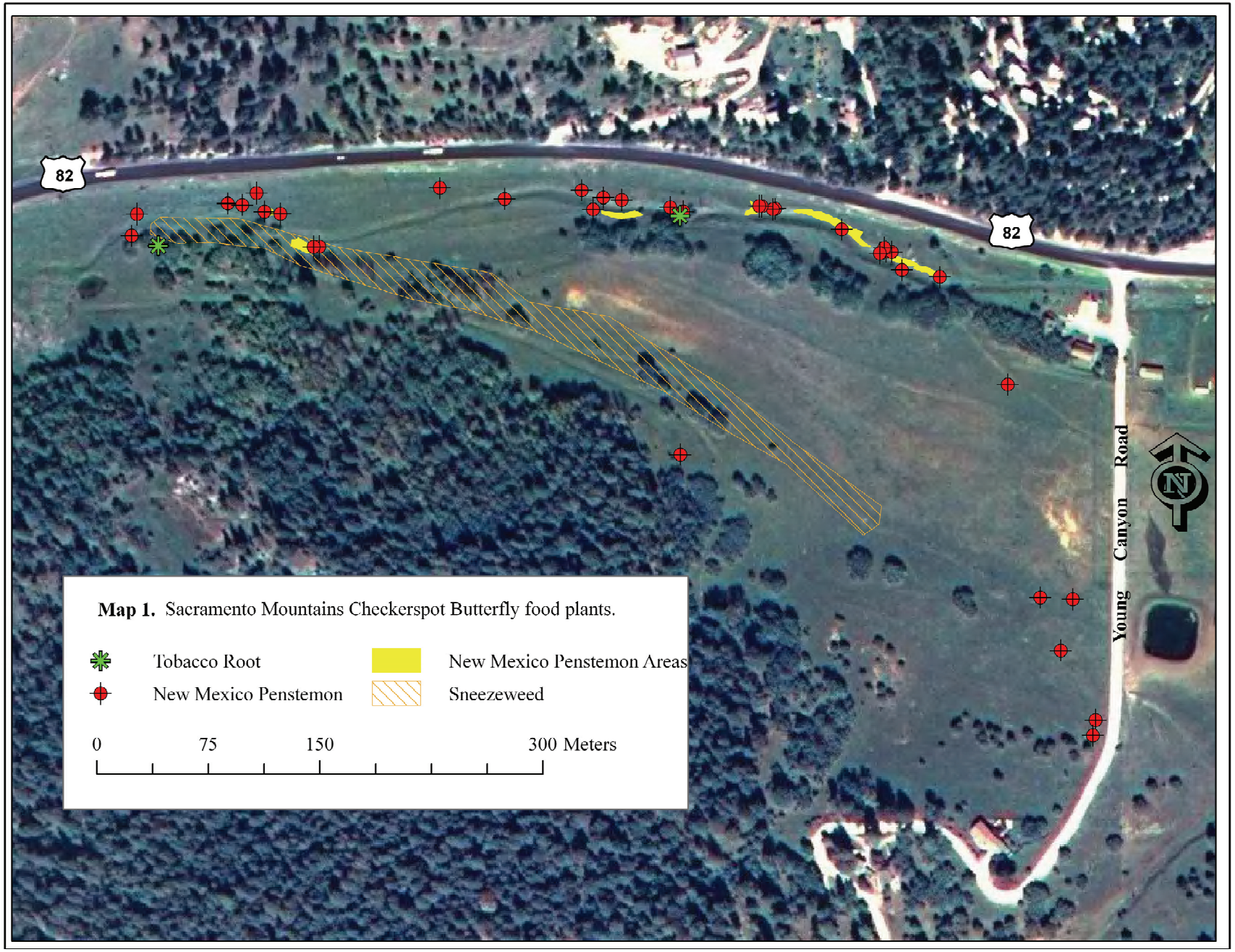
When we encountered tobacco root or NM penstemon we mapped their locations using a Trimble GeoXT GPS unit running TerrasyncPro 2.6 software. Satellite coverage was reliable throughout the survey period and all point locations were accurate to $\leq$ 1.2 meters. Points were used to represent individuals or small groups of plants. Larger colonies were mapped as small areas by walking the perimeter of the colony while collecting a polygon feature. GPS data was refined using GPS Pathfinder Office 4.0 and ArcGIS 9.2 software. General locations for weeds and sneezeweed were added during map development using ArcMap.

Results

Butterfly Habitat

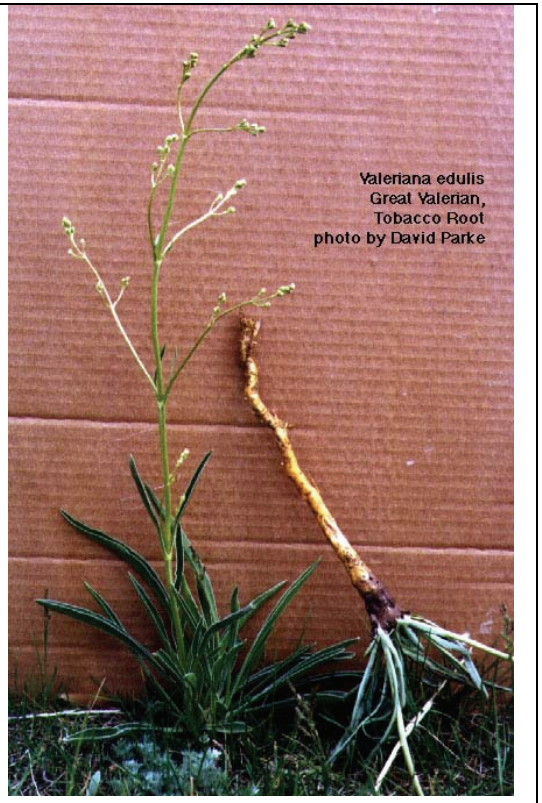
We encountered all of the three targeted plant species within the study area. NM penstemon was present in high abundance (727 plants), with sneezeweed (ca. 200 plants) less so. Tobacco root was present in low numbers and was only encountered at two small sites consisting of eight individuals growing in partial shade beneath Gambel oak. Most of the target plant colonies were associated with James Canyon Creek, occurring on the banks and terraces of this feature or within close proximity (Map 1). An incidental plant species list is included as Appendix 1.

Much of the study area was covered with thick grass that contained few target plants. NM pentemon and sneezeweed were present in low abundance and tobacco root was not encountered within thick Indiangrass (*Sorghastrum nutans*) grasslands. However, wherever there were breaks in the grass cover, especially when accompanied by disturbance (rodent, elk, and likely historical livestock), we found marginal habitat for the penstemon and sporadic patches of sneezeweed. Few penstemon were observed in this area. A small number were encountered at Elk Spring, near the southeastern corner of the property, and in the swale below. Only one individual was encountered above the old road that skirts the northeast edge of the forested hill within the proposed development.


82
82
Young Canyon Road
N
Map 1. Sacramento Mountains Checkerspot Butterfly food plants.
Tobacco Root
New Mexico Penstemon
New Mexico Penstemon Areas
Sneezeweed
0
75
150
300 Meters

New Mexico p\Penstemon (*Penstemon neomexicanus*)

Sneezeweed (*Helenium hoopsei*)



Tobacco Root (*Valeriana edulis*).

Figure 1. Photos of target food plants of the Sacramento Mountains checkerspot butterfly.

Weeds

The county ordinance also requires that the landowner develop a plan to monitor noxious weeds, and, if present within the property, to develop and implement a weed-control plan. We encountered large stands of noxious weeds within the project area, primarily consisting of musk thistle (*Carduus nutans*) and teasel (*Dipsacus fullonum*), Figure 2, Map 2. There were also a few (ca. 3) burdock (*Arctium minus*) located in a single group.

Teasel flower head

Teasel Leaf and Stem

Musk thistle head

Figure 2. Photos of the two most problematic weeds on within the study area. The two teasel photos were taken by Patrick Alexander.


82
82
Young Canyon Road
N
Map 2. Weed locations within the project area.
Species with Relative Estimated Density
Teasel - High Density
Musk Thistle - Low Density
Musk Thistle - High Density
Musk Thistle - Medium Density
0
75
150
300 Meters

Discussion

Butterfly Habitat

We conducted surveys during the larval, pre-diapause, stage of the checkerspot butterflies' life cycle. There had not yet been a freeze within this area and caterpillars, if present in high abundance, would certainly have been detected. However, this taxon is often present in low concentrations and quite difficult to detect as it is a small, inconspicuous, and often cryptic early instar caterpillar. While we completed thorough surveys and were familiar with the species, its host plants, and signs indicating its presence, we can not say with certainty that this insect does not exist within the study area.

However, the stipulations of the county ordinance are quite similar concerning occupied and potential habitat for *Euphydryas anicia cloudcroftii.* This area contains potential habitat for this subspecies as indicated by the presence and localized abundance of the three food plants utilized by the checkerspot butterfly. While the butterfly could potentially be present within the proposed Elk Springs Estates, it was not detected in its larval stage during this single survey. It does have all of the indicators of potential habitat and, as such, could be colonized by Cloudcroft's endemic butterfly in the future. In keeping with Ordinance 01-05 we will treat this area as if it were occupied and make management suggestions accordingly. This document states that "[r]egardless of the number of surveys conducted in a given area, some Sacramento Mountains Checkerspot [B]utterfly populations (e.g. low density) may not be detected [i]n a given year, indicating that one flight season may not be adequate to document presence/absence." This survey did not coincide with the adult flight season suggested, but not required, by the county. However, we did carefully delineate the larval host plants and indicate areas of relative sneezeweed abundance. This information will be useful if future surveys and monitoring are completed.

Weeds

Having a weed-control plan for the construction and revegetation phase of subdivision development would appear to be a good idea because construction activity has the potential to introduce new weeds into the area. Weeds are often carried as seed on earth-moving equipment or simply on the fenders, tire treads, etc. of vehicles entering from other geographic areas. The temporary increase in disturbance and traffic in the area may add to the abundance of existing weeds or introduce new weedy species to the site. Most seed mixtures for re-vegetating areas after construction contain exotic species such as cheat grass. High quality native grass mixes, while initially more costly, may prevent weed control issues in

the future. Purchasing seed mixes that are guaranteed to be pure, or of very low weed content, would be recommended.

As biologists familiar with the weed issues in the Sacramento Mountains we feel obligated to point out the potential damage of a poorly conceived and/or executed weed-control plan where it concerns the checkerspot and its food plants. Absent an all-encompassing plan that applies to all land of all ownerships, weed control on an isolated stretch of meadow along James Canyon Creek is unlikely to have a lasting positive effect on the property. As can be seen in figure 3., below, a photograph taken just upstream of the proposed Elk Springs Estates, there are hundreds of thousands, if not millions, of airborne musk thistle seeds waiting to recolonize the property should it be cleared of this species. Similarly, upstream teasel populations would recolonize James Canyon Creek in a short period of time if they were eliminated from the project area.

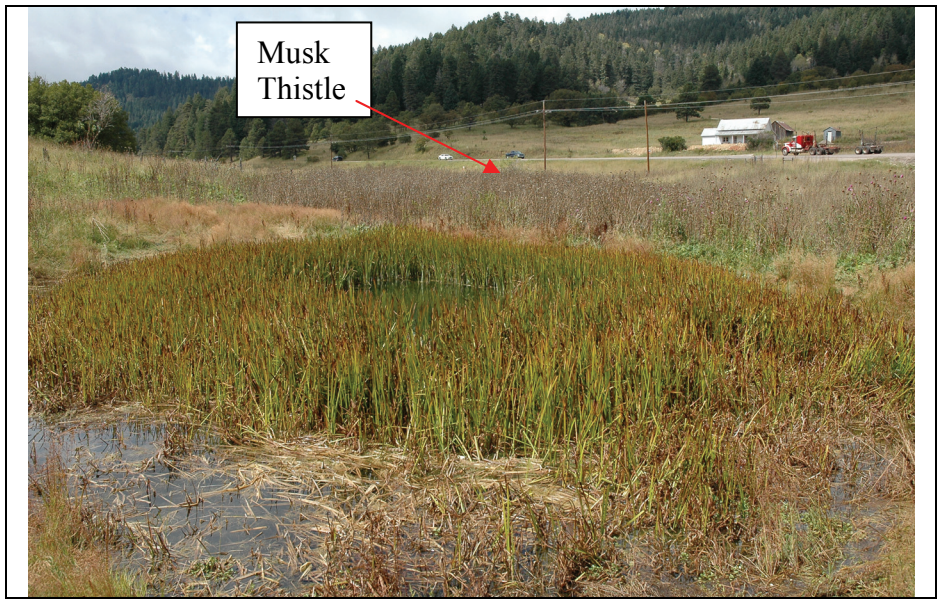


Figure 3. Musk thistle population extending beyond the western property boundary.

Teasel and musk thistle are biennial to short-lived perennial species. They persist as a basal rosette until conditions are right and then send up a flowering stalk, flower, set fruit, and die. They are prolific seed producers; a teasel plant can produce 2,000 seeds (Wisconsin DNR 1998) and a musk thistle can produce 100,000 seeds (10,000 is average; Beck 1999). These seeds can remain viable, with a high germination potential, in the soil for at least two years (teasel) to at least 10 years (musk thistle; CWMA 2007). Without a weed control plan that applies to all land of all ownerships in the area, the singling out of subdivisions as sole land stewards for this purpose makes little biological sense.

An effective weed plan that would increase the likelihood of success, where it concerns the musk thistle and teasel, would necessitate unprecedented cooperation,

coordination, and rigid and rapid implementation schedules. Such an effort would have to be revisited and re-implemented annually, creating a constant maintenance issue.

Where weed control concerns the checkerspot's food plants, each plant species would likely be placed in jeopardy using traditional herbicide applications in the area. There would likely be collateral damage of these and other native species under the most commonly adopted weed management strategies. Direct spraying or overspray from herbicide application is almost certain to adversely impact the native flora upon which the checkerspot depends and may also cause damage to the checkerspot itself. We would not recommend general application of herbicide to the area. The use of herbicide on individual plants, while preferable, is not practical given the current extent of the infestation. The Sacramento Mountains Checkerspot Butterfly Conservation Plan recommends no spraying within habitat for this species (USFWS 2005). Since we have determined that much of the project area constitutes potential habitat, herbicide use in this area would go against the recommendations of this document which calls for manual hand pulling of noxious weeds.

The use of fire for control of musk thistle and teasel is not supported. While late-spring burns are reported to have some beneficial effect with regard to teasel control they are said to improve habitat for musk thistle (FEIS 2007), which thrives on open areas. Likewise, mowing would almost certainly spread weeds if there were any current or past seeds to be scattered by this activity.

Biological controls have not been successfully demonstrated in the Sacramento Mountains. These measures have been employed with limited effectiveness to weeds and have detrimentally affected the native flora (Sivinski 2007).

Biological controls and herbicide applications in the Sacramento Mountains have been responsible for damage to, and/or mortality in, two threatened and endangered species occurring in the area this year and would likely have the same effect on the checkerspot host plants (Sivinski 2007, Tonne 2007). Their use would not be recommended as a weed-control measure within the survey area.

Our recommendation is to avoid all of the weed control measures discussed above other than hand pulling or seed head removal of teasel and/or musk thistle. We recognize the limits of what could be accomplished given the extent of the infestation and the condition of neighboring land. However, should a weed problem develop in newly disturbed land during construction, well removed from the checkerspots' food plants, limited and controlled use of herbicide might make sense. Care should be taken not to confuse native thistles with the exotic musk thistle under any weed-control measure.

Careful planning of the subdivision to avoid increased erosion could go a long way towards preventing the spread of noxious weeds beyond their current condition on this property.

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Appendix 1.

Incidental Plant List:

Scientific Name	COMNAME	Family
Abies concolor	white fir	Pinaceae
Achillea millefolium	common yarrow	Asteraceae
Achnatherum robustum	sleepygrass	Poaceae
Amaranthus hybridus	slim amaranth	Amaranthaceae
Antennaria sp.	Pussytoes	Asteraceae
Arctium minus	lesser burdock	Asteraceae
Argentina anserina	silverweed cinquefoil	Rosaceae
Artemisia dracunculus	tarragon	Asteraceae
Artemisia ludoviciana	white sagebrush	Asteraceae
Besseya oblongifolia	eggleaf coraldrops	Scrophulariaceae
Bidens sp.	Beggarticks	Asteraceae
Boerhavia gracillima	slimstalk spiderling	Nyctaginaceae
Bromus sp.	Brome	Poaceae
Bromus ciliatus	fringed brome	Poaceae
Bromus inermis ssp. inermis	smooth brome	Poaceae
Chenopodium	goosefoot	Chenopodiaceae
Cirsium parryi	Parry's thistle	Asteraceae
Cirsium undulatum	wavyleaf thistle	Asteraceae
Convolvulus arvensis	field bindweed	Convolvulaceae
Conyza canadensis	Canadian horseweed	Asteraceae
Cosmos sp.	Cosmos	Asteraceae
Dipsacus fullonum	Fuller's teasel	Dipsacaceae
Elymus elymoides	squirreltail	Poaceae
Epilobium ciliatum	fringed willowherb	Onagraceae
Erigeron divergens	spreading fleabane	Asteraceae
Erodium cicutarium	crane's beak	Geraniaceae
Gaura sp.	Beeblossom	Onagraceae
Geranium caespitosum	pineywoods geranium	Geraniaceae
Geranium richardsonii	Richardson's geranium	Geraniaceae
Gnaphalium	cudweed	Asteraceae
Grindelia squarrosa	curlycup gumweed	Asteraceae
Helenium autumnale	common sneezeweed	Asteraceae
Helenium autumnale	common sneezeweed	Asteraceae
Helianthus pauciflorus	stiff sunflower	Asteraceae
Heliomeris multiflora	showy goldeneye	Asteraceae
Humulus lupulus	hops	Cannabaceae
Hymenoxys hoopsei	sneezeweed	Asteraceae
Ipomopsis aggregata	scarlet gilia	Polemoniaceae
Iris missouriensis	Rocky Mountain iris	Iridaceae

Scientific Name	COMNAME	Family
Koeleria macrantha	prairie Junegrass	Poaceae
Lappula redowskii	stickseed	Boraginaceae
Lathyrus eucosmus	bush vetchling	Fabaceae
Linum lewisii	prairie flax	Linaceae
Lupinus sp.	lupine	Fabaceae
Marrubium vulgare	horehound	Lamiaceae
Melilotus officinalis	yellow sweetclover	Fabaceae
Mentha arvensis	wild mint	Lamiaceae
Mentha arvensis	wild mint	Lamiaceae
Mertensia sp.	bluebells	Boraginaceae
Oenothera elata	Hooker's evening-primrose	Onagraceae
Oligoneuron rigidum	stiff goldenrod	Asteraceae
Panicum sp.	panicgrass	Poaceae
Panicum capillare	witchgrass	Poaceae
Pascopyrum smithii	western wheatgrass	Poaceae
Penstemon neomexicanus	New Mexico beardtongue	Scrophulariaceae
Pinus ponderosa	ponderosa pine	Pinaceae
Poa pratensis	Kentucky bluegrass	Poaceae
Polygonum sp.	knotweed	Polygonaceae
Populus tremuloides	quaking aspen	Salicaceae
Prunus virginiana	chokecherry	Rosaceae
Pseudotsuga menziesii	Douglas-fir	Pinaceae
Pteridium aquilinum	western brackenfern	Dennstaedtiaceae
Quercus gambelii	Gambel oak	Fagaceae
Ratibida columnifera	upright prairie coneflower	Asteraceae
Ribes sp.	currant	Grossulariaceae
Rubus idaeus	American red raspberry	Rosaceae
Rudbeckia laciniata	cutleaf coneflower	Asteraceae
Rumex sp.	dock	Polygonaceae
Salvia sp.	sage	Lamiaceae
Sambucus	elderberry	Caprifoliaceae
Scrophularia montana	Montana figwort	Scrophulariaceae
Solidago canadensis	Canada goldenrod	Asteraceae
Solidago wrightii	Wright's goldenrod	Asteraceae
Sorghastrum nutans	Indiangrass	Poaceae
Symphoricarpos	snowberry	Caprifoliaceae
Symphyotrichum ericoides	white heath aster	Asteraceae
Symphyotrichum praealtum	willowleaf aster	Asteraceae
Taraxacum officinale	common dandelion	Asteraceae
Thalictrum fendleri	Fendler's meadow-rue	Ranunculaceae

Scientific Name	COMNAME	Family
Toxicodendron rydbergii	western poison ivy	Anacardiaceae
Tragopogon dubius	yellow salsify	Asteraceae
Tragopogon porrifolius	salsify	Asteraceae
Trifolium repens	white clover	Fabaceae
Urtica dioica	stinging nettle	Urticaceae
Valeriana edulis	tobacco root	Valerianaceae
Verbascum thapsus	common mullein	Scrophulariaceae
Verbena macdougalii	MacDougal verbena	Verbenaceae
Verbesina encelioides	golden crownbeard	Asteraceae
Veronica americana	American speedwell	Scrophulariaceae
Vicia americana	American vetch	Fabaceae