

### 2.3.7 PR-11 Mine Expansion Area Vegetation

Baseline vegetation mapping and plant species reconnaissance was conducted during the summer of 2021 on the approximately 137.08-acre PR-11 Mine Expansion Area. This area is located adjacent to the northwestern boundary of the previously approved Trapper Mine permit area. The vegetation mapping effort was conducted in accordance with Regulations of the Colorado Mined Land Reclamation Board for Coal Mining (effective 8/30/1980, last revised 9/14/2005).

#### 2.3.7.1 Methods for Mapping and Plant Species Identification

*Vegetation Mapping.* For the PR-11 Mine Expansion Area vegetation sampling effort in 2021 a detailed map was prepared in accordance with Rule 2.04.10(1), which requires that plant communities be delineated based on visually dominant plant species. The vegetation mapping was initially prepared using high resolution aerial photographs taken in the fall of 2017, with minor adjustments to the photographic mapping made based upon extensive experience in the PR-11 Mine Expansion Area. The boundaries of vegetation blocks within the PR-11 Mine Expansion Area were delineated using high definition aerial photographs as the investigator (consultant Forrest Luke) walked the boundaries.

The detailed delineation of the vegetation types found within the PR-11 Mine Expansion Area is shown on Map 48B. This map shows the extent of vegetation types within the proposed mine expansion area. The vegetation boundaries of all lands located within one-half mile of the PR-11 Mine Expansion Area also are shown on this map.

*Rare and Endangered Plant Species:* The potential presence of rare and endangered plants was determined based upon a careful review of the existing scientific literature. The most comprehensive treatment of this topic is found on the website of the Colorado Natural Heritage Program found at [www.cnhp.colostate.edu](http://www.cnhp.colostate.edu), which contains the *Colorado Rare Plant Field Guide* published in 1999, and an update called the *Colorado Rare Plant Field Guide - 2002 Update*. These documents were used to determine the presence or absence of rare and endangered plant species during the field survey.

#### 2.3.7.2 2021 Field Work

Fieldwork for the vegetation mapping and species list documentation was conducted between September 6 and September 22, 2021. A total of 115 plant species were identified during the survey. Table 2.3-26, PR-11 Mine Expansion Area - Plant Species List, shows the plant species encountered during field sampling.

The field mapping of the Wetland Plant Community within the PR-11 expansion area will occur during the summer of 2022. The formal wetland delineation, employing USACE protocols and vegetation sampling, will be accomplished by a certified wetlands contractor.

**Table 2.3-26 PR-11 Mine Expansion Area List of Observed Plant Species**

SPECIES	SCIENTIFIC NAME	COMMON NAME	LIFE FORM
<b>Grasses &amp; Grass-like Species</b>			
AGRCRI	<i>Agropyron cristatum</i>	Crested Wheatgrass	IPCSGRASS
AGRDAS	<i>Agropyron dasystachyum</i>	Thickspike Wheatgrass	IPCSGRASS
AGRINT	<i>Agropyron intermedium</i>	Intermediate Wheatgrass	IPCSGRASS
AGRRIP	<i>Agropyron riparium</i>	Streambank Wheatgrass	NPCSGRASS
AGRSMI	<i>Agropyron smithii</i>	Western Wheatgrass	NPCSGRASS
AGRSPI	<i>Agropyron spicatum</i>	Bluebunch Wheatgrass	NPCSGRASS
AGRSTO	<i>Agrostis stolonifera</i>	Spreading Bentgrass	NPCSGRASS
AGRTRA	<i>Agropyron trachycaulum</i>	Slender Wheatgrass	NPCSGRASS
AGRTRI	<i>Agropyron trichophorum</i>	Pubescent Wheatgrass	IPCSGRASS
BROINE	<i>Bromus inermis</i>	Smooth Bromegrass	IPCSGRASS
BROJAP	<i>Bromus japonicus</i>	Meadow Chess	IAGRASS
BROTEC	<i>Bromus tectorum</i>	Cheatgrass	IAGRASS
CARAQU	<i>Carex aquatilis</i>	Water Sedge	NPGL
CARNEB	<i>Carex nebrascensis</i>	Nebraska Sedge	NPGL
CARUTR	<i>Carex urticulata</i>	Beaked Sedge	NPGL
ELYCIN	<i>Elymus cinereus</i>	Great Basin Wildrye	NPGRASS
ELYJUN	<i>Elymus junceus</i>	Russian Wildrye	IPCSGRASS
FESovi	<i>Festuca ovina</i>	Sheep Fescue	NPCSGRASS
HORJUB	<i>Hordeum jubatum</i>	Foxtail Barley	NPGRASS
JUNARC	<i>Juncus arcticus</i>	Arctic Wiregrass	NPGL
KOEMAC	<i>Koeleria macrantha</i>	Prairie Junegrass	NPGRASS
ORYHYM	<i>Oryzopsis hymenoides</i>	Indian Ricegrass	NPGRASS
PHLPRA	<i>Phleum pratense</i>	Timothy	IPCSGRASS

**Table 2.3-26 PR-11 Mine Expansion Area List of Observed Plant Species**

SPECIES	SCIENTIFIC NAME	COMMON NAME	LIFE FORM
POAFEN	<i>Poa fendleriana</i>	Muttongrass	NPGRASS
POAPRA	<i>Poa pratensis</i>	Kentucky Bluegrass	NPGRASS
POASEC	<i>Poa secunda</i>	Sandberg Bluegrass	NPGRASS
POLMON	<i>Polypogon monospermiensis</i>	Rabbitsfoot Grass	IAGRASS
SCHAME	<i>Schoenoplectus americanus</i>	Bulrush	NPGRASS
SPOCRY	<i>Sporobolus cryptandrus</i>	Sand Dropseed	NPGRASS
SITHYS	<i>Sitanion hystrix</i>	Squirreltail	NPGRASS
STICOL	<i>Stipa columbiana</i>	Columbia Needlegrass	NPGRASS
STICOM	<i>Stipa comata</i>	Needle and Thread Grass	NPGRASS
TYPLAT	<i>Typha latifolia</i>	Broad-leaved Cattail	NPGRALIK
<b>Forbs</b>			
ACHMIL	<i>Achillea millefolium</i>	Western Yarrow	NPFORB
ALYALY	<i>Alyssum alyssoides</i>	Yellow Alyssum	NAFORB
ANTROS	<i>Antennaria rosea</i>	Rose Pussytoes	NPFORB
AMSTES	<i>Amsinckia tessellate</i>	Bristly Fiddleneck	NAFORB
ARTLUD	<i>Artemisia ludoviciana</i>	Louisiana Wormwood	NPFORB
ARCMIN	<i>Arctium minus</i>	Common Burdock	IBFORB
ASCSP	<i>Asclepias speciosa</i>	Showy Milkweed	NPFORB
ASTCIC	<i>Astragalus cicer</i>	Cicer Milkvetch	IPFORB
ASTPUR	<i>Astragalus purshii</i>	Pursh Milkvetch	NPFORB
BALSAT	<i>Balsamorhiza sagittata</i>	Arrowleaf Balsamroot	NPFORB
CAPBUR	<i>Capsella bursa-pastoris</i>	Shepherd's Purse	IAFORB
CARDRA	<i>Cardaria draba</i>	Whitetop	IPF-NW
CARNUT	<i>Carduus nutans</i>	Musk Thistle	IBFORB

**Table 2.3-26 PR-11 Mine Expansion Area List of Observed Plant Species**

<b>SPECIES</b>	<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>LIFE FORM</b>
CHEALB	<i>Chenopodium album</i>	Lambsquarter	IAFORB
CIRARV	<i>Cirsium arvense</i>	Canada Thistle	INWEED
CIRUND	<i>Cirsium undulatum</i>	Gray Thistle	NPFORB
CLELIG	<i>Clematis ligusticifolia</i>	Virgin's Bower	NPFORB
CORRAM	<i>Cordylanthus ramosus</i>	Branched Birdsbeak	NAFORB
CYNOFF	<i>Cynoglossum officinale</i>	Houndstongue	IBF-NX
DELGEY	<i>Delphinium geyeri</i>	Geyer Larkspur	NPFORB
DESPIN	<i>Descurainia pinnata</i>	Pinnate Tanysmustard	IAFORB
EPIBRA	<i>Epilobium brachycarpum</i>	Tall Willowherb	NAFORB
ERICA	<i>Erigeron caespitosus</i>	Tufted Daisy	NPFORB
ERIUMB	<i>Erigonum umbellatum</i>	Sulfur Buckwheat	NPFORB
GLYLEP	<i>Glycyrrhiza lepidota</i>	American Licorice	NPFORB
GRISQU	<i>Grindelia squarrosa</i>	Curly Gumweed	NBFORB
HAPACA	<i>Haploppapus acaulis</i>	Stemless Goldenweed	NPFORB
HELANN	<i>Helianthus annus</i>	Common Sunflower	NAFORB
HELUNI	<i>Helianthella uniflora</i>	Onehead Sunflower	NPFORB
HETVIL	<i>Heterotheca villosa</i>	Hairy Goldenaster	NPFORB
KOCSCO	<i>Kochia scoparia</i>	Summer-cypress	IAFORB
LACSER	<i>Lactuca serriola</i>	Prickly Lettuce	IBFORB
LAPRED	<i>Lappula redowski</i>	Blueburr Stickweed	NAFORB
LINDAL	<i>Linaria dalmatica</i>	Dalmation Toadflax	INWEED
LINLEW	<i>Linum lewisii</i>	Lewis Flax	NPFORB
LITRUD	<i>Lithospermum ruderae</i>	Western Stoneseed	NPFORB
LUPARG	<i>Lupinus argenteus</i>	Silvery Lupine	NPFORB

**Table 2.3-26 PR-11 Mine Expansion Area List of Observed Plant Species**

<b>SPECIES</b>	<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>LIFE FORM</b>
MACCAN	<i>Machaeranthera canescens</i>	Hoary Aster	NPFORB
MEDSAT	<i>Medicago sativa</i>	Alfalfa	IPFORB
MELALB	<i>Melilotus alba</i>	White Sweetclover	IBFORB
MELOFF	<i>Melilotus officinalis</i>	Yellow Sweetclover	IBFORB
MENALB	<i>Mentzelia laevicaulis</i>	Blazingstar	NBFORB
MIRLIN	<i>Mirabilis linearis</i>	Narrowleaf Four o'clock	NPFORB
OENCAE	<i>Oenothera caespitosa</i>	Tufted Evening Primrose	NPFORB
ORTLUT	<i>Orthocarpus luteus</i>	Yellow Owl-clover	NAFORB
PHLHOO	<i>Phlox hoodii</i>	Carpet Phlox	NPFORB
PLAMAJ	<i>Plantago major</i>	Broadleaf Plantain	IPFORB
POLAVI	<i>Polygonum aviculare</i>	Chivalry-grass	NAFORB
RUMCRI	<i>Rumex crispus</i>	Curled Dock	NPFORB
RUMSAL	<i>Rumex salicifolius</i>	Willow Dock	NPFORB
SALKAL	<i>Salsola kali</i>	Russian-thistle	IAFORB
SISALT	<i>Sisymbrium altissimum</i>	Tumble Mustard	IAFORB
SPHCOC	<i>Sphaeralcea coccinea</i>	Common Globemallow	NPFORB
SYMASC	<i>Symphyotrichum ascendens</i>	Western Aster	NPFORB
SYMCHI	<i>Symphyotrichum chilense</i>	Pacific Aster	NPFORB
SYMERI	<i>Symphyotrichum ericoides</i>	White Heath Aster	NPFORB
TAROFF	<i>Taraxacum officinale</i>	Common Dandelion	IPFORB
THLARV	<i>Thlaspi arvense</i>	Fanweed	IAFORB
TRADUB	<i>Tragopogon dubius</i>	Oyster-plant	IBFORB
VERTHA	<i>Verbascum thapsus</i>	Woolly Mullein	IPFORB
VERANA	<i>Veronica anagallis-aquatica</i>	Water Speedwell	NPFORB

**Table 2.3-26 PR-11 Mine Expansion Area List of Observed Plant Species**

SPECIES	SCIENTIFIC NAME	COMMON NAME	LIFE FORM
<b>Shrubs, Subshrubs &amp; Succulents</b>			
AMEALN	<i>Amelanchier alnifolia</i>	Serviceberry	NSHRUB
ARTCAN	<i>Artemisia cana</i>	Silver Sagebrush	NSHRUB
ARTFRI	<i>Artemisia frigida</i>	Fringed Sagebrush	NSSHRUB
ARTTRI	<i>Artemisia tridentata</i>	Big Sagebrush	NSHRUB
ARTTRIT	<i>Artemisia t. tridentata</i>	Basin Big Sagebrush	NSHRUB
ARTTRIV	<i>Artemisia t. vaseyana</i>	Wyoming Big Sagebrush	NSHRUB
ATRCAN	<i>Atriplex canescens</i>	Four-wing Saltbush	NSHRUB
CERLAN	<i>Ceratoides lanata</i>	Winterfat	NSSHRUB
CHRNAU	<i>Chrysothamnus nauseosus</i>	Rubber Rabbitbrush	NSHRUB
CHRVIS	<i>Chrysothamnus viscidiflorus</i>	Douglas Rabbitbrush	NSHRUB
GUTSAR	<i>Gutierrezia sarothrae</i>	Broom Snakeweed	NSSHRUB
OPURHO	<i>Opuntia rhodantha</i>	Prickly Pear	SUCCULENT
POPANG	<i>Populus angustifolia</i>	Narrowleaf Cottonwood	NTREE
PRUVIR	<i>Prunus virginiana</i>	Black Chokecherry	NSHRUB
PURTRI	<i>Purshia tridentata</i>	Antelope Bitterbrush	NSHRUB
RIBAU	<i>Ribes aureum</i>	Golden Currant	NSHRUB
ROSWOO	<i>Rosa woodsii</i>	Woods Rose	NSHRUB
SALAMY	<i>Salix amygdaloides</i>	Peachleaf Willow	NSHRUB
SALEXI	<i>Salix exigua</i>	Coyote Willow	NSHRUB
SYMORE	<i>Symphoricarpos oreophilus</i>	Mountain Snowberry	NSHRUB
TETCAN	<i>Tetradymia canescans</i>	Gray Horsebrush	NSHRUB

### 2.3.7.3 Results

The detailed vegetation map of the PR-11 Mine Expansion Area is presented on Map 48B. This map is the result of both a desktop analysis and field delineation of the vegetation and land cover in the PR-11 Mine Expansion Area. The results show that for the 137.08 acres within the PR-11 Mine Expansion Area vegetation study area there are four different vegetation or land cover types, along with a small amount of disturbance from historic gravel pits and more recently built corrals.

- Grassland—Historic Cropland covering 94.89 acres;
- Big Sagebrush covering 27.91 acres;
- Drainage bottoms covering 4.95 acres, with a Wetland subtype, acreage to be determined during the summer of 2022;
- Mountain Shrub covering 0.15 acres;
- Disturbance covering 9.18 acres.

Within the broader mapping area extending for one-half mile outside the proposed expansion area, the same land cover types were mapped along with two additional plant communities and home sites.

- Grassland—Sub-irrigated Meadow (Big Bottom)
- Riparian (a bend of the Yampa River)
- Home Sites

#### Grassland (Historic Cropland) Plant Community

This vegetation type comprises the vast majority of the PR-11 expansion area. Historically, the area was a productive sagebrush habitat. In the middle of the 20<sup>th</sup> century it was converted to cropland; first to dryland wheat and then to alfalfa/grass hay. Over the past two decades the area was converted to a grassland plant community. It was replanted to introduced dryland pasture species. There is no evidence that any portion of this area has ever been irrigated. The Grassland vegetation type covers an area of approximately 94.89 acres and accounts for 69.22 percent of the PR-7 Mine Expansion Area.

Smooth Brome grass, a planted introduced perennial grass, was the dominant plant species growing on the grassland sites. Other dominant plant species included Intermediate Wheatgrass, Kentucky Bluegrass, Western Wheatgrass and Alfalfa. These species were all part of the original seed mixture seeded for this plant community.

#### Big Sagebrush Plant Community

This vegetation type is the second largest plant community type found within the PR-11 Mine Expansion Area and covers an area of approximately 27.91 acres and accounts for 20.36 percent of the PR-11 Mine Expansion Area. The Big Sagebrush plant communities are located on either side of the West Buzzard and East Buzzard drainages. The dominant plant species growing on the Big Sagebrush vegetation type is Mountain Big Sagebrush with an understory of primarily wheatgrasses and some forb and succulent (prickly pear) species.

### Mountain Shrub Plant Community

This vegetation type is encompassed within one very small area of the PR-11 Mine Expansion Area. It is located in a protected depression on the leeward side of a ridge top where additional snowpack is available. This site covers an area of approximately 0.15 acres and accounts for only 0.11 percent of the PR-11 Mine Expansion Area. The two dominant shrub species on this site are Black Chokecherry and Serviceberry.

### Drainage Bottom Plant Community

This vegetation type encompasses a small percentage of habitat within the PR-11 expansion area. It is found only in the incised West Buzzard and East Buzzard drainage bottoms that cross the expansion area from south to north. Dominant plant species include small, intermittent groves of Narrowleaf Cottonwood trees and various grass, sedge and forb species that grow in more mesic bottomland sites. A small acreage of jurisdictional wetlands also occurs within the plant community. This site covers an area of approximately 4.95 acres and accounts for only 3.61 percent of the PR-11 Mine Expansion Area.

### Grassland—Subirrigated Meadow, and Riparian

These two habitat types are not located within the PR-11 expansion area but are found within one-half mile of the edge of the expansion area. Both habitat types are associated with Yampa River alluvial areas.

### Disturbance

Disturbance within the PR-11 expansion area consisted of two historic gravel pits, likely used during the construction of old Highway 13, and corrals in the southeast corner of the area used for sorting cattle before shipping. Disturbance within one-half mile of the expansion area is associated primarily with Colorado Highway 13 and the Union Pacific Railroad line.

### Rare and Endangered Plants

Based upon a review of the listed threatened, endangered and sensitive plant species, as discussed in Appendix D-VI, there are only two that could potentially occur in the eastern Moffat County area: **Wetherill Milvetch** and **Alkaline Pepperwort**. As discussed in Section 2.3.6.3, the habitat conditions for these two species do not occur on the PR-11 Mine Expansion Area and no individuals of either plant species were encountered during the field reconnaissance of the site.