Part V: Listing Factor Analysis

PART V. LISTING FACTOR ANALYSIS

The U.S Fish and Wildlife Service evaluates five Listing Factors when considering potential listing actions under the Endangered Species Act. The USFWS 12-month finding (U.S. Fish and Wildlife Service 2005) described the Listing Factors as they relate to greater sage-grouse. This Plan addresses all five Listing Factors. Please see strategy crosswalk to Listing Factors in the Strategy Tables in Section III.

Listing Factor A- The present or threatened destruction, modification, or curtailment of its habitat or range

Threats identified under this listing factor by the USFWS (U.S. Fish and Wildlife Service 2005) included habitat conversion, habitat fragmentation, infrastructure (power lines, fences, pipelines, communication towers, roads, and railroads), grazing, mining, energy development, fire, invasive species and noxious weeds, pinyon-juniper expansion, and urbanization.

The GSGWG acknowledges that some of the issues above did occur in the past in Northwest Colorado, for example conversion to agriculture, but large scale habitat conversion is not taking place today. Although conversion did occur in the past, a large proportion of this acreage is trending back to sage grouse habitat (e.g. CRP and sagebrush moving back into these grassland habitats).

This Conservation Plan will enhance greater sage-grouse habitat through coordinated planning of greater sage-grouse habitat management by private individuals and by county, state, and Federal agencies. Such coordinated habitat management efforts have been ongoing for several years. See Appendix C for a list of habitat projects completed to date. Furthermore, opportunities exist to develop Candidate Conservation Agreements with Assurances within the Northwest Colorado planning area. This Plan describes strategies to use fire and/or other habitat management actions to restore native plant composition and enhance ecosystem vitality in sagebrush habitats used by greater sage-grouse. This Plan will reduce modification and destruction of greater sage-grouse habitat through implementing the following actions:

-development of an information and education program to improve awareness of greater sage-grouse habitat requirements;
-improved and restored quality greater sage-grouse habitat through habitat enhancement, livestock grazing management, and big game population management;
-targeted, well designed assessment and modification of habitat to benefit greater sage-grouse;
-implementation of Best Management Practices for sagebrush habitat treatments and management;
-avoidance and/or mitigation for long-term or permanent loss of habitat;
-monitoring of applied measures to document habitat improvement and population increases;
- encourage implementation of adaptive strategies to minimize impacts from oil and gas development;

- encourage implementation of adaptive strategies to minimize impacts from surface coal mining;
- encourage implementation of adaptive strategies to minimize impacts from residential development;
- provided strategies to maintain and enhance CRP or similar type of programs.

Fire suppression is a man-made issue leading to change in habitat through invasion of pinyon-juniper and allowing sagebrush habitat types to become over-mature to the detriment of greater sage-grouse habitat quality. The Plan has strategies to address pinyon juniper expansion and incorporate fire use in sagebrush ecosystems.

Listing Factor B-Overutilization for commercial, recreational, scientific, or educational purposes

Threats identified under this listing factor by the USFWS (U.S. Fish and Wildlife Service 2005) include hunting, and scientific and recreational use. Scientific use is further described to include research studies that involve capture and handling of the species. This category also includes translocations. Under recreational use, lek viewing, general wildlife viewing and photography were identified as having possible effects on sage grouse.

This Conservation Plan will address Factor B through the following actions:

- reduction of physical disturbance to greater sage-grouse by altering hunting seasons;
- limiting impacts of wildlife/lek viewing; and
- where appropriate, recommend hunting closures in specific management zones.

The hunting season in Northwest Colorado has been reduced from a 30-day season down to a 7-day season with a 2/4 bag/possession limit as a result of this Conservation Plan. An approach to recommending season openings and closings based on documented greater sage-grouse population trends has been developed and has been successfully used to both close and open hunting seasons as appropriate. Hunting is not considered to be a limiting factor in greater sage-grouse numbers in Northwest Colorado.

There is no other recreational or commercial use occurring or anticipated at present. Scientific study is ongoing, but sage grouse are carefully handled under the provisions of the Colorado Division of Wildlife's sage grouse trapping and handling protocol and animal care and use standards. Research sage grouse in Northwest Colorado are returned alive to the wild. No consumptive scientific study is anticipated. Scientific studies, educational field trips, and wildlife viewing are not likely to cause a disturbance to greater sage-grouse if proper scientific and viewing protocols are followed.

Listing Factor C-Disease or predation
Threats identified under this listing factor by the USFWS (U.S. Fish and Wildlife Service 2005) include both disease and predation.

No disease/parasite problems had been identified to be active in greater sage-grouse in Northwest Colorado until West Nile Virus appeared in the summer of 2006. The appearance of West Nile Virus in Northwest Colorado greater sage-grouse is of concern, but the long-term implications are far from clear. Research sage grouse are being monitored for presence of the disease. Moffat County has an aggressive testing and treatment program in place and should provide warning if the disease makes major encroachment into Northwest Colorado.

Predation is one of the issues the GSGWG believes could be having an adverse effect on greater sage-grouse nest success, reproduction and recruitment in Northwest Colorado. Ground and aerial predators include golden eagles, hawks, coyotes, foxes and badgers, and nest predators include coyotes, foxes, skunks, badgers, ravens, ground squirrels, and possibly raccoons.

The Plan contains many strategies to address predation. A predator study is proposed to gain understanding of predator/prey relationships in Northwest Colorado and assess the need for direct predator management to maintain greater sage-grouse populations. Results will influence future applications of conservation strategies. Many of the conservation actions in the Plan also have objectives for enhancing greater sage-grouse habitat and managing predator populations to reduce predation on greater sage-grouse and to expand greater sage-grouse populations over the long term.

Listing Factor D- The inadequacy of existing regulatory mechanisms
The Colorado Division of Wildlife, a branch of the Colorado Department of Natural Resources, has responsibility for the management and conservation of wildlife resources as defined and directed by state laws.

The USDI Bureau of Land Management has responsibility for conservation and management of natural resources and land uses, including management of greater sage-grouse habitat on Public Lands through a number of Federal Laws and Regulations. The BLM considers the greater sage-grouse a sensitive species and analyzes the effects of actions on sage grouse and attempt to minimize potential effects. The BLM recently revised their RMP and has had significant public participation. The Little Snake RMP addresses several strategies designed to benefit sage grouse.

The USDA Natural Resources Conservation Service partners with private landowners for conservation of greater sage-grouse habitat on private property through various Federal laws. Furthermore, the NRCS consults with CDOW on projects designed to enhance sage grouse habitat.

The USDI Fish & Wildlife Service (USFWS) has authority for conservation of greater sage-grouse, if listed as Threatened or Endangered, through the Endangered Species Act of 1973 and other Federal laws.

In 1995, the state of Colorado and the U.S. Department of Interior entered into a Memorandum of Agreement which committed agencies in the Department of Interior and the state to collaborate and cooperate in management and conservation of declining populations of fish and wildlife and their habitat. This agreement has two important tasks: "The state and the Department agree to develop and implement programs to determine and monitor the status of species at risk;" and "The state and the Department will encourage partners and stake holders to take a leadership role in working with the state and the Department to develop and implement conservation actions through Conservation Agreements and Recovery Agreements." A list of species for which the Department and the state would initially focus conservation actions on was included in the agreement. This list specifically mentioned declining populations of greater sage-grouse.

The Board of County Commissioners of Moffat County has authority to regulate land use, land planning, and protection of the environment. Moffat County has regulations to exercise such authorities including the review, approval or denial of proposed activities and uses of land.

- Moffat County has been proactive in implementing adaptive strategies to benefit sage grouse habitat through their oil and gas leasing and permitting process of own county minerals;
- Moffat County's land use planning process provides mechanisms for consultation with CDOW and Federal agencies.

All of the above mentioned authorities and regulatory agencies are signatories to this Conservation Plan.

Listing Factor E-Other natural or manmade factors affecting its continued existence
Threats identified under this listing factor by the USFWS (U.S. Fish and Wildlife Service 2005) included pesticides, contaminants, non-consumptive recreational activities, drought/climate change, and life history traits that affect the population viability. Pesticides included the direct mortality of individuals and reduction in available food sources (insects) that may contribute to sage grouse mortality as well as herbicide applications that can kill sagebrush and forbs needed by sage grouse. The contaminant discussion lists many sources that potentially occur as a result of various human activities ranging from agricultural practices, energy development, pipeline operations, and transportation of materials along roads and railways. Non-consumptive recreational activities included hiking, camping, pets, and off-highway vehicle use. Primary impact to sage grouse from recreation activities was disturbance related, but impacts to vegetation and soils and spread of noxious weeds were also mentioned. The discussion of life-history traits centered on low reproductive rates of sage grouse and their polygamous mating system and how these traits may affect population growth rates.

This Conservation Plan includes strategies aimed at minimizing the impacts of pesticides, contaminants, and non-consumptive recreational activities on sage grouse. Many strategies also attempt to minimize the impacts of drought on sage grouse.

GLOSSARY AND ACRONYMS USED IN THE CONSERVATION PLAN

Anthropogenic: caused by human activity.

Abiotic factors: non-living components of the environment such as soils, slope, geographic setting, and climate.

Additive mortality: often used in conjunction with hunting harvest. When harvest mortality results in a total mortality that exceeds what would have died naturally.

BLM: Bureau of Land Management

Best management practice: Methods that have been determined to be the most effective, practical means of maintaining or reaching a habitat management goal.

Biotic factors: living components of the environment.

Brood: the number of birds hatched from a single clutch of eggs. Often used to refer to the group of chicks that a female produces in a season.

Bunch grasses: Any of several grasses, especially of the western United States, that grow in tufts rather than forming turf. Grasses that grow as distinct plants.

CDOW: Colorado Division of Wildlife

CRP: Conservation Reserve Program. A program, created in the Food Security Act of 1985, to retire from production up to 45 million acres of highly erodible and environmentally sensitive farmland. Landowners who sign contracts agree to keep retired lands in approved conserving uses for 10-15 years. In exchange, the landowner receives an annual rental payment, cost-share payments to establish permanent vegetative cover and technical assistance.

Canopy cover a) The percentage of the ground included in a vertical projection of imaginary polygons drawn about the total natural spread of foliage of the individuals of a species (usually used for the herbaceous plants); or b) The percentage of the ground covered by a projection of the crown, stems, and leaves of the plant onto the ground surface (usually used for shrubs) (Connelly et al. 2003).

Carnivore: an animal that feeds on other animals. A meat eater.

Clutch size: the number of eggs laid by a female in a nesting season. Clutch is also sometimes used to refer to a brood of chicks.

Community diversity: The number and variety of organisms found within a specified geographic region. Measures include **species richness**, which is the number of species present, and **species diversity**, which relates to both the number of species present and the relative abundance of the species present.

Compensatory mortality: often used in conjunction with hunting harvest. With compensatory mortality, if hunting mortality increases then there is a compensatory decrease in natural mortality factors such that hunting mortality does not affect overall survival.

Conservation Plan: a plan developed by the local Working Group that details voluntary conservation actions designed to benefit sage grouse and their habitat.

Corvids: members of the Crow family (*Corvidae*), includes crows, ravens, and magpies and jays.

Cryptic: serving to conceal; describes the form or coloring of animals that hides them from potential predators. Cryptic coloration is such that the animal blends into the background.

DAU: Data Analysis Unit is the herd planning unit used by the CDOW. DAUs represent big game herd units. They are based on the assumption that interchange across DAU boundaries is minimal.

Defoliation: loss of leaves from plants.

Demographic parameters: quantifiable vital statistics of populations including survival rates, reproductive rates, and age distributions.

Desired plant community: a plant community designed to meet a specific set of goals. This plant community may differ from the native plant community.

Droop height: measurement from the ground to where a grass or forb bends (droops). The grass stalk is not fully extended to its full length in this measurement.

ESA: Endangered Species Act

Ecological site: A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. The ecological site is largely defined by the soils and moisture regime.

Ecological fitness: the ability of an organism to survive and reproduce.

Ecosystem: a dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit.

Edge: the transition between two different types of vegetation or vegetation structures.

Facultative species: species that survive equally well in sagebrush systems as other systems. Species that use big sagebrush ecosystems for habitat, but that do not depend only on big sagebrush ecosystems.

Forb: a broad-leaved herb that is not a grass.

GIS: Geographic Information System. A system of spatially referenced information.

GMU: Game Management Units (GMUs) are smaller management units within Data Management Units where harvest management can be more specifically targeted. GMU boundaries are frequently drawn on topographic or political boundaries.

GSGWG: Northwest Colorado Greater Sage-Grouse Working Group

Gallinaceous birds: refers to members of the family *Phasianidae*, particularly the subfamily *Tetraominae* that includes grouse. Used to refer to grouse, turkeys, pheasants, partridges, etc.

Genetic variation (diversity): The variation that exists in a given set of genes, whether in an organism or a population. Genetic variation is considered advantageous for continued population persistence.

Genetic depression: lacking genetic variation.

Gizzard: the muscular potion of the stomach in which food is ground up prior to passing into the small intestine.

HIP: Hunter Information Program

HPP: Habitat Partnership Program. A CDOW program in which a percentage of big game license fees are distributed to local committees to help alleviate game damage problems or enhance big game habitat.

Habitat: An area in which a specific plant or animal naturally lives, grows and reproduces; the area that provides a plant or animal with adequate food, water, shelter and living space.

Habitat fragmentation: landscape transformation that includes the breaking of large habitat into smaller pieces. The reduction and isolation of patches of habitat.

Habitat loss: a process of land use change in which one habitat-type is removed and replaced with some other habitat-type.

Habitat quality: the ability of the environment to provide conditions appropriate for individual or population persistence.

Herbaceous vegetation: vegetation that does not have a woody tissue/stem. A plant with soft rather than woody tissue. Includes both grasses and forbs.

Herbivore: an organism that eats only plants.

Herbivory: refers to the loss of vegetation due to consumption by another organism.

Herptile: used to collectively describe an amphibian or reptile.

Home range: the area in which an animal normally ranges.

Hybridization: the mixing of different species to produce hybrids. Hybrids contain the genetics of both parental species.

LSFO: Little Snake Field Office of the BLM

Lagomorph: relatively large gnawing animals; distinguished from rodents by having two pairs of upper incisors specialized for gnawing. Includes hares, rabbits and pikas.

Lek activity status: CDOW mapping definition. Lek sites are classified as active, unknown, inactive, or historic. **Active leks** are display areas that have had 2 or more males counted in 2 or more of the previous 5 years. **Unknown leks** are potentially "active leks" for which there is insufficient information to accurately categorize the site (insufficient counts, etc.). Additionally, leks with male sage-grouse displaying or breeding in the last 5 years, but that do not have 2 or more males in 2 or more years in the previous 5 are considered unknown. **Inactive leks** are display areas that have not been utilized (no male sage-grouse) for display or breeding in the last 5 years. **Historic l**eks are display areas that have not been utilized for display or breeding in the last 10 years.

Lek count: a count where the observer counts all the sage grouse on a lek. Male high counts, the highest count of males at a particular lek during the breeding season, are often used to show trend in the sage grouse population.

Lek site: a traditional area where male sage grouse gather to display and breed with females. Also called strutting grounds.

Listing Factors: Five factors are addressed when determining whether a species is listed as threatened or endangered under the Endangered Species Act: 1) the present or threatened destruction, modification, or curtailment of the species' habitat or range; 2) overutilization for

commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) the inadequacy of existing regulatory mechanisms; and 5) other natural or manmade factors affecting the species' survival.

Mesic: used to describe sites characterized by intermediate moisture conditions. In the dry areas of northwestern Colorado, mesic is used to describe areas that are generally moist such as draws.

Migratory status: non-migratory or 1 or 2-stage migratory (Connelly et al. 2000). A **non-migratory** population is one where breeding, summer-late brood rearing, and winter habitats for the population are all within 6.2 miles (10 kilometers) of each other. A **one-stage migratory** population occupies either a combined winter/breeding habitat with summer-late brood rearing habitat located more than 6.2 miles (10 kilometers) away or winter range located more than that distance from combined breeding/summer-late brood rearing habitat. **Two-stage migratory** populations occupy separate breeding, summer-late brood rearing, and winter habitats all located more than 6.2 (10 kilometers) apart.

Management Zones: The Conservation Plan divides Northwest Colorado greater sage-grouse habitat into 10 management zones. They serve as the smallest areas for sage grouse conservation planning, habitat management, and evaluation under this Conservation Plan. Greater sage-grouse habitat in Northwest Colorado is too extensive and too diverse to effectively manage as a single unit. These management zones include areas of greater sage-grouse habitat with similar vegetation and climatic potential and serve as manageable building blocks to ensure the conservation of greater sage-grouse across Northwest Colorado.

Microhabitat: a small area with physical and ecological characteristics that distinguish it from its immediate surrounding area

Monoterpenes: are terpenoid compounds with 10 carbon atoms derived from two fused isoprene units. Monoterpenes are an important component of the volatile portion of terpenes and often emit very strong odors. Monoterpenes are chemicals that have been shown to repel plant herbivores.

NRCS: Natural Resources Conservation Service

Neotropical passerine: birds belonging to the land-dwelling order Passeriformes, often called perching birds or songbirds, that breed in North America, but winter in tropical North America, the West Indies, and South America.

Noxious weeds: any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind which is of foreign origin, is new to or not widely prevalent in the U.S., and can directly or indirectly injure crops, other useful plants, livestock, poultry or other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or the public health. (FEDERAL NOXIOUS WEED ACT OF 1974).

Occupied habitat: CDOW mapping definition. Areas of suitable habitat contiguous with areas of known use, which do not have effective barriers to sage-grouse movement from known use areas, are mapped as occupied habitat unless specific information exists that documents the lack of sage-grouse use. It is mapped from any combination of telemetry locations, sightings of sage grouse or sage grouse sign, local biological expertise, GIS analysis, or other data sources.

Patch size/minimum patch size: the minimum size of a given habitat fragment that is necessary for a population to survive.

PECE: U.S. Fish and Wildlife Service's Policy for Evaluation of Conservation Efforts

Perennial vegetation: vegetation living year after year.

Pinyon-juniper encroachment: refers to a successional stage where pinyon and juniper trees begin to grow in areas that were primarily dominated by sagebrush. The trees then shade out much of the sagebrush and herbaceous vegetation.

Potentially suitable habitat: CDOW mapping definition. Represents unoccupied habitats that could be suitable for occupation of sage-grouse if practical restoration were applied.

Polygamous: having more than one mate at a time. In sage grouse one male will breed with several females.

Plant vigor: overall plant health and ability to grow and survive.

Production (nesting) area: CDOW mapping definition. Defined as areas that include the majority of important greater sage-grouse nesting habitat, and shown as radii around active and unknown status lek sites. CDOW has traditionally assumed that 80% of nests were located within 2 miles of leks, but currently considers 80% of nests to be located within 4 miles of leks based on the information referred to above.

Raptor: a bird of prey.

Radio-telemetry: a technique used to locate wildlife over distances. For sage grouse, transmitters are attached to the bird. The transmitters emit signals and then antennas are used to locate the signal of the transmitter.

Range of natural variability: the full range of composition and spatial extent that a plant community may experience under natural successional processes.

Residual cover: living and dead vegetation that persists over-winter and provides protective and breeding cover during critical periods the following spring before new growth takes over this function.

Reclamation: The process by which lands disturbed as a result of mining activity are reclaimed back to a beneficial land use. Involves contouring the soil as well as planting vegetation and restoring hydrologic functioning.

Rotational grazing system: grazing systems where livestock are moved periodically during the year and between years so that areas are grazed at different times in different years.

Sagebrush obligates: species that depend on sagebrush ecosystems for their survival.

Sagebrush steppe: refers to is a dry environment found in the western United States. It can be identified by the sagebrush, shrubs, and short bunch grasses that grow in it. Its name comes from the most dominant plant found in the ecosystem (sage) and "steppe," which describes a largely treeless, dry, level grassland.

Seral/mid-seral stage: pertaining to the successional stage of biotic communities.

Severe winter range: CDOW mapping definition. Habitat for 90% or more of the birds in the worst two of ten winters.

Stocking rate: the number of animals per unit area over a given period.

Tebuthiron: also called Spike. An herbicide used to kill sagebrush and other vegetation.

Threatened and Endangered: A federal designation defined by the Endangered Species Act of 1973. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

Treatment (vegetation): any mechanical, chemical, prescribed fire, or flooding treatment used to affect a change in plant community composition or structure.

USFWS: United States Fish and Wildlife Service.

Ungulate: a hoofed mammal such as deer, elk, horse.

Vacant or unknown habitat: CDOW mapping definition. Defined as suitable habitat for sage-grouse that is separated (not contiguous) from occupied habitats that has either not been adequately inventoried, or has not had documentation of grouse presence in the past 10 years.

Vegetation composition: the mix of different species within a plant community.

Vegetation structure: the spatial arrangement and relative relationships of plants within a plant community.

WRFO: White River Field Office of the BLM

Woody vegetation: vegetation with woody tissue/stems.

LIST OF SPECIES MENTIONED IN THE CONSERVATION PLAN

Birds	
American Crow	*Corvus brachyrhynchos*
American Kestrel	*Falco sparverius*
Bald Eagle	*Haliaeetus leucocephalus*
Black-billed Magpie	*Pica hudsonia*
Black-throated Sparrow	*Amphispiza bilineata*
Brewer's Sparrow	*Spizella breweri*
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*
Common Raven	*Corvus corax*
Cooper's Hawk	*Accipiter cooperii*
Ferruginous Hawk	*Buteo regalis*
Golden Eagle	*Aquila chrysaetos*
Great Horned Owl	*Bubo virginianus*
Greater Sage-Grouse	*Centrocercus urophasianus*
Green-tailed Towhee	*Pipilo chlorurus*
Gunnison Sage-Grouse	*Centrocercus minimus*
Lark Sparrow	*Chondestes grammacus*
Loggerhead Shrike	*Lanius ludovicianus*
Merlin	*Falco columbarius*
Northern Goshawk	*Accipiter gentilis*
Northern Harrier	*Circus cyaneus*
Red-tailed Hawk	*Buteo jamaicensis*
Ring-necked Pheasant	*Phasianus colchicus*
Rough-legged Hawk	*Buteo lagopus*
Sage Sparrow	*Amphispiza belli*
Swainson's Hawk	*Buteo swainsoni*
Vesper Sparrow	*Pooecetes gramineus*
Mammals	
American Badger	*Taxidea taxus*
Black-tailed Jackrabbit	*Lepus californicus*
Bobcat	*Lynx rufus*
Cottontail	*Sylvilagus spp.*
Coyote	*Canis latrans*

Elk	*Cervus elaphus*
Gray Wolf	*Canis lupis*
Kit Fox	*Vulpes macrotis*
Merriam's Shrew	*Sorex merriami*
Mule Deer	*Odocoileus hemionus*
Pronghorn Antelope	*Antilocapra americana*
Raccoon	*Procyon lotor*
Red Fox	*Vulpes vulpes*
Sagebrush Vole	*Lemmiscus curtatus*
Striped Skunk	*Mephitis mephitis*
Weasel	*Mustela spp.*
White-tailed Jackrabbit	*Lepus townsendii*
Wyoming ground squirrel	*Spermophilus elegans*
Reptiles	
Sagebrush Lizard	*Sceloporus graciosus*
Western Rattlesnake	*Crotalus viridis*
Insects	
Fruit Fly	*Drosophila melanogaster*
Plants*	
alfalfa	*Medicago sativa*
arrow leaved balsamroot	*Balsamorhiza sagittata*
aspen	*Populus tremuloides*
basin big sagebrush	*Artemisia tridentata ssp. tridentata*
big sagebrush	*Artemisia spp.*
bud sagebrush	*Artemisia spinescens*
cheatgrass	*Anisantha tectorum*
common dandelion	*Taraxacum officinale*
crested wheatgrass	*Agropyron desertorum*
fringed sagebrush	*Artemisia frigida*
globemallow	*Sphaeralcea parvifolia*
hawksbeard	*Crepis spp.*
intermediate wheatgrass	*Thinopyrum intermedium*
lepidium (peppergrass)	*Lepidium spp.*
low sagebrush	*Artemisia arbuscula*

lupine	*Lupinus spp.*
milkvetch	*Astragalus spp.*
mountain big sagebrush	*Artemisia tridentata ssp. vaseyana*
pinyon pine	*Pinus edulis*
prickly lettuce	*Lactuca serriola*
pubescent wheatgrass	*Thinopyrum intermedium trichophorum*
rocky mountain beeplant	*Cleome serrulata*
salsify	*Tragopogon spp.*
silver sagebrush	*Artemisia cana*
smooth brome	*Bromopsis inermis*
sweet clover	*Trifolium spp.*
Utah juniper	*Sabina osteosperma*
winterfat	*Krascheninnikovia lanata*
Wyoming big sagebrush	*Artemisia tridentata ssp. wyomingensis*
* Plant taxonomy follows Weber and Wittmann (2001) except for the sagebrush species	