
Plant Associations of the Beaverhead Mountains Section: Vegetation key and descriptions

We have developed a dichotomous key to the vegetation types and prepared written descriptions for approximately 50% of the plant associations (total of 273) occurring in the Beaverhead Head Mountains Section. The approach of the Montana Natural Heritage Program has been to incorporate the classifications or type descriptions of other researchers into our more encompassing classification; this is because the work of our predecessors has been peer reviewed and found to be scientifically rigorous as well as eminently applicable by managers. Usually, but not always, these classifications of regional and/or physiognomic types (e.g. Pfister et al. 1977 of forested types on national forest holdings) have been crosswalked with those of neighboring states or provinces so that a west-wide and eventually national classification can be constructed. Though a purported national classification of plant associations has been published, "International classification of ecological communities: Terrestrial vegetation of the United States" Anderson et al. (1998, Volume II), it is important to note that this is more a listing of types at the plant association level and not a formal taxonomy. Without a formal taxonomy (key to plant associations) there is no consistent way one can identify a piece of vegetation on the ground. One can go to all the disparate original sources for a type's description but often even these sources do not always have a "working key" that can be conveniently and consistently employed to differentiate one vegetation type from another.

One of the critical points of a community's description is how it differs from those communities to which it is most closely related (either floristically or environmentally). Vegetation keys at the alliance and plant association levels are shorthand means of discriminating among vegetation types. Though the TNC claims to have produced a national vegetation classification (Anderson et al. 1998) in fact at the alliance and plant

association levels it is nothing more than a laundry list with no convenient way of identifying the vegetation with which one is dealing and for this reason cannot be effectively employed. Thus, we deemed it imperative that vegetation keys be developed for this report so that users of the classification would not feel stymied in trying to put names on and understand vegetation types. However, these keys are perhaps a weak link in this report because they have not enjoyed a critical analysis but rather have been pieced together, incorporating first those keys from original sources. These keys have also not been tested, except with existing plot data in an office setting. It should be appreciated that some fraction of the vegetation extant on the landscape will not key to a particular plant community type. This is because the type may be unique, tied to a particular substrate type for example, and was not sampled in the inventory process. For efficiency, sampling is stratified by major environmental parameters leaving literally hundreds, if not thousands, of square miles of this ecoregion unvisited. Alternatively, leads in the key could have inadvertently left gaps through which certain types have fallen.

The key to the various physiognomic types was designed to be in accord with the National Vegetation Classification (NVC) and its concepts of forest, woodland, shrubland, etc. In other words, above the floristically based Alliance and Plant Association levels, we have largely subscribed to the NVC treatment of structure and cover to define units from the highest levels (Order) all the way down to Formation.

The keys within various physiognomic types, say woodlands or shrublands, are based on floristic composition. The floristic composition is weighted by canopy cover as defined by Daubenmire (1959), regardless of the life form being tallied. Daubenmire's canopy cover is conceived to be the vertical projection of a imaginary polygon about the outermost perimeter of a plant's canopy and expressed as a fraction of the total plot area sampled; this concept of cover has largely been

accepted in the western US, particularly in Montana.

We have tried to capture the insights and good science of our predecessors who have constructed keys to various components (e. g. just forest or alpine types) of the vegetation of southwestern Montana, basing our keys on theirs to the extent possible. A significant number of plant associations have been newly described or identified since these preceding keys were written. We have intercalated these plant associations not treated by previous works into our keys based on the principles that guided our predecessor's key construction (at least as we interpreted their efforts).

In general, keys written for Montana vegetation, regardless of the dominant lifeform, have been structured to identify first the wettest or most environmentally unique sites (as reflected in their unique flora), or the most shade tolerant (in the case of forested alliances). The order progresses to associations successively drier, or less tied to specific site conditions or supporting less shade tolerant tree species.

The vegetation key is a tool that functions best when combined with a vegetation description. A formalized and highly reviewed description of a plant association in a global context is referred to as a Community Characterization Abstract (CCA). The production of carefully edited CCAs is critical in turn to producing useful floristic level classifications. Very few of these abstracts have been produced to date and we have provided the few CCAs that are applicable to the BVHDMS. The plant association descriptions within this report constitute an important source of information for the future synthesis of CCAs.

Use of the vegetation key

Instructions

1) Seek a homogenous site. Homogeneity (environment and history of use) and the vegetation cover are primary considerations in plot location selection. The plot being inventoried and classified should be representative of the stand as a whole, if not, then relocate the plot and re-estimate plant cover (thoroughly reconnoiter a stand before taking a plot sample).

a) Note that environmental gradients are often steep and that the size of homogeneous vegetation types may be extremely restricted (< 10m²), especially in alpine environments.

b) Homogeneity is most easily appraised as an area supporting a particular suite of dominants and subordinate indicator species.

2) Accurately identify and estimate canopy cover for all indicator species used in the key. In the following key and main body of text the canopy coverage (c.c.) concept employed is that of Daubenmire (1959); a vertical projection about the outermost perimeter of a plant's canopy expressed as a fraction of the area sampled. The following terms are applied when referring to species in the leads of the vegetation keys.

Present: trace to 100% canopy coverage (c.c.) versus **Absent:** 0% c.c.

Common: species with 1% or more c.c. versus **Scarce:** having less than 1% c.c.

Well represented: species with at least 5% c.c. versus **Poorly represented:** less than 5% c.c.

Abundant: species having 25% or greater c.c. versus **Not Abundant:** species having less than 25% c.c.

Reproducing Successfully: Generally at least 10 seedlings or saplings per acre and not confined to microsites.

3) On sites where the vegetation is obviously depauperate (unusually sparse) due to heavy grazing, browsing, or closed canopy stage of forest vegetation succession adjust the key downward to reflect the reduced canopy cover (e.g. "well represented" would become "common").

4) If severely disturbed or early seral conditions are encountered, the p. a. (at least as regards potential vegetation, especially forested conditions) is best determined by extrapolating from the nearest relatively undisturbed mature stand with similar site conditions (slope, aspect, elevation, and soils).

5) The following key is dichotomous; all criteria for one of the two choices of each couplet must be satisfied to obtain a correct determination. (NOTE: There are many couplets where one of the choices leads to an "undefined" or "undescribed" vegetation type. There are several reasons for this, the most obvious one being it that not all the landscape has been inventoried and there exist many permutations of site and vegetation composition that have not been described.)

6) Identify the lifeform group using "**KEY TO PHYSIOGNOMIC TYPES (LIFEFORM CATEGORIES)**."

7) Within the correct lifeform follow the key literally to identify a) in the case of forest and woodland vegetation the series (or alliance) level and then progress to the plant association (p. a.) level; b) in the case of other lifeforms (shrublands, grasslands, etc.) the key will identify plant associations directly.

8) Consult the table of contents to obtain the page number for the physiognomic types. Plant associations are ordered alphabetically within lifeform (e.g. forest shrubland, dwarf shrubland, etc.).

Caveats when using keys

1) This key is generally structured to identify, within lifeform types, the wettest sites first and progresses to successively drier sites.

2) In applying the key to actual field conditions the cover definitions cited above might need adjusting to the next lower coverage class, e.g. "well represented" becomes "common." This may be necessary when the closed canopy stage of forest succession obtains, or when grazing pressure has altered community composition.

3) In the case of early successional stages, particularly with regard to potentially forested sites, the current stand composition may not "key out" to a described plant association; this is because the keys are intended for use with relatively mature vegetation. It is the intention of the National Vegetation Classification Standard (NVC) to treat all existing vegetation types, including seral stages, as discrete plant associations, but this intention has not been realized for any appreciable area in the western US. See Arno et al. (1985, 1986), Steele (1988) or Hansen et al. (1995) for approaches dealing with classification and description of seral vegetation; Hansen et al. (1995, pages 24-27 and Figure 3) is particularly helpful in explaining terminology such as plant association versus community type and habitat type.

4) To discriminate shrublands (including dwarf-shrublands) from "non-shrublands" we have included the NVC approach in normal typeface but in boldface type we have included an alternative set of leads which should be followed at this time. The boldface leads are necessary because of the significant discrepancy between the NVC criteria for a shrubland (at least 25% canopy cover of shrubs) versus the criteria employed by Mueggler and Stewart (1980), the most authoritative guide to rangeland types in Montana and the source whose key the Montana Natural Heritage Program has adhered to in the past. Mueggler and Stewart (1980) distinguish a "shrubland aspect" which they define as having woody plants common, with at least 5% canopy cover. It should be

noted that, based on average canopy cover of the shrub component, none of the shrubland types classified by Mueggler and Stewart would qualify as shrublands by NVC criteria. In other words, virtually all the upland shrublands would be classified by the NVC as shrub herbaceous (i. e. a temperate or subpolar grassland with a sparse shrub layer). We have insufficient resources at this time to follow the NVC model which would distinguish between, for example, an *Artemisia tridentata* / *Festuca idahoensis* Shrubland and an *A. tridentata* / *F. idahoensis* Shrub Herbaceous type; the only difference between these types might be the canopy cover of *A. tridentata*. We indicate in the written description for the plant association whether it is considered a shrubland or shrub herbaceous type by the NVC.

5) The keys and plant association type descriptions are arranged by decreasing size of the dominant lifeform and within lifeform the upland sites are placed first followed by wetland/riparian types. The order of presentation of plant association descriptions is alphabetical within dominant lifeforms.

6) Once a stand has been keyed to plant association, **the description of said associa-**

tion may not exist in this document, but references to the association, including the best sources for its description, will be found in Appendix D.

7) Some plant associations will key out in both upland and wetland keys because a) their habitat conditions are known to span that range, b) field personnel may be unfamiliar with the fine points of ascertaining wetland criteria so that by including some essentially wetland associations (that to the uninitiated appear as upland types) in the upland key, these types will be correctly identified to plant association.

8) **The dichotomous key is only a convenience for identifying plant associations / community types; it is not the classification! Validate your determinations by comparing vegetation/site characteristics with parameters of plant association descriptions; be especially aware that vegetation composition and environmental conditions described come from sampled sites and personal observation and almost certainly do not include all the sites (the total range of environments) over which the type is found.**

KEY TO PHYSIOGNOMIC TYPES (LIFEFORM CATEGORIES)

The leads below are slightly altered or reworded from the National Vegetation Classification (NVC) with the following exception: **To discriminate shrublands (including dwarf-shrublands) from “non-shrublands” we have included the NVC approach in normal typeface but in boldface type we have included an alternative set of leads which should be followed at this time (see #4 under “Caveats when using keys” for a complete explanation).**

The ultimate NVC classification unit designated in the physiognomic key below is subclass; once physiognomic type is determined continue with the Series or Alliance Level Keys for forests and woodlands and for the shrublands, etc. go directly to the plant association keys which are arranged in the following order; shrublands, dwarf-shrublands, grasslands, perennial forb vegetation, nonvascular vegetation)

1. Trees (deciduous or evergreen) dominant with at least 25% canopy cover, or rarely less than 25%, if the cover of other life forms (shrub, dwarf-shrub, herb, nonvascular) is less than 25% and tree cover exceeds the combined cover of these other lifeforms2
1. Trees not dominant, their cover less than 25% and if less than 25% then the combined cover of other lifeforms is greater than that of the canopy trees.....3
2. Tree crowns at least partially overlapping, forming 60 to 100% canopy cover.....**FOREST**
 - a. Evergreen trees (non-deciduous conifers) present and reproducing successfully (10 trees per acre, minimum) and not confined to microsites (note that at closed canopy stage there may be no evidence of reproduction by any conifer species) **EVERGREEN FOREST**
 - b. Evergreen trees absent **or**, if present, then restricted to microsites and not reproducing successfully (unthrifty specimens, generally < 10 trees / acre) **DECIDUOUS FOREST**
2. Tree crowns usually not touching, forming 25 to 60% canopy cover.....**WOODLAND** (see a & b below)
 - a. Evergreen trees (non-deciduous conifers) present and reproducing successfully (10 trees per acre, minimum) and not confined to microsites (note that at „closed canopy%stage there may be no evidence of reproduction by any conifer species) **EVERGREEN WOODLAND**
 - b. Evergreen trees absent **or**, if present, then restricted to microsites and not reproducing successfully (unthrifty specimens, generally < 10 trees / acre) **DECIDUOUS WOODLAND**
3. Shrubs generally greater than 0.5 m tall with individuals not touching to overlapping and canopy cover greater than 25%; shrub canopy cover (uncommonly) may be less than 25% if the canopy cover of other life forms (dwarf-shrub, herbs, nonvasculars) is less than 25% and exceeded by that of the shrubs [N.B., 1) by following this lead only shrub communities with a size potential greater than that of dwarf-shrubs will be found, 2) some types considered shrublands prior to NVC will now be found in shrub herbaceous vegetation; a list of dwarf-shrub species used to define plant associations will be found in the following lead, #4].....**SHRUBLAND (NVC DEFINITION)**
- 3*. Shrubs generally greater than 0.5 m tall and presenting, in the aggregate, a shrubland aspect with at least 5% canopy coverSHRUBLAND (Definition currently used by MTNHP)**
3. Not as above, i. e. shrubs either less than 0.5 m tall or their combined cover less than 25%.....4
- 3*. Not as above (3*); shrubs either less than 0.5 m tall or in the aggregate not presenting a shrubland aspect, their canopy cover less than 5%4**
4. Dwarf-shrubs (as individuals or clumps with a potential height less than 0.5 m) generally forming 25% or greater canopy cover [taxa include *Artemisia arbuscula* (low sagebrush), *A. arbuscula* ssp. *longiloba* (early low sagebrush), *A. nova* (black sagebrush), *A. pedatifida* (birdfoot sagebrush), *A. tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), *A. tripartita* (three-tip sagebrush), *Atriplex gardneri* (Gardner’s saltbush), *Cassiope mertensiana* (Mertens’mountain heather), *Dryas octopetala* (white dryas), *Kalmia*

microphylla (small-leaved laurel), *Phyllodoce empetriformis* (red mountain-heath), *P. glanduliflora* (yellow mountain-heath), *Pentaphylloides floribunda* (shrubby cinquefoil), *Salix arctica* (alpine willow), *S. candida* (hoary willow), *S. barratiana* (Barratt willow), *S. brachycarpa* (short-fruited willow), *S. glauca* (glaucous willow), *S. planifolia* var. *monica* (dwarf planeleaf willow), *S. reticulata* (snow willow)]; though an uncommon condition, dwarf-shrub cover may be less than 25% but exceeding the combined cover of the other lifeforms present (shrubs, herbs, nonvasculars) which is less than 25%

- **DWARF-SHRUBLAND (NVC definition)**
- 4*. **Dwarf-shrubs (as individuals or clumps with a potential height less than 0.5 m) forming a shrubland aspect with at least 5% canopy cover (see list of dwarf-shrub species in lead 4 above).....DWARF-SHRUBLAND (Definition currently used by MTNHP)**
4. Not as above; dwarf-shrub cover less than 25%; graminoids, forbs or nonvasculars constitute the dominant canopy cover, though trees and shrubs may be present and have to 25% canopy cover5
- 4*. **Not as above (4*); dwarf-shrub cover insufficient to present a shrubland aspect, canopy cover less than 5%.....5**
5. Herbs (graminoids, forbs, ferns and fern allies) dominant, usually constituting at least 25% canopy cover; in the unusual case where herb canopy cover is less than 25% it still exceeds the cover of each of the other lifeforms present.....6
5. Herbs not dominant, in the aggregate constituting less than 25% canopy cover7
6. Perennial graminoid vegetation constitutes at least 50% of the total herbaceous canopy cover **GRASSLANDS**
6. Of the total herbaceous cover perennial graminoids constitute less than 50% relative cover and conversely perennial forbs (including biennials and ferns) constitute more than 50% canopy cover **PERENNIAL FORB VEGETATION**
7. Nonvascular vegetation (bryophytes, lichens, algae) generally comprise at least 25% canopy cover; in unusual instances nonvascular canopy cover may be less than 25% where it exceeds the cover of each of the other lifeforms present; areas dominated by crustose lichens should be placed in the Sparsely Vegetated Class..... **NONVASCULAR VEGETATION**
7. Not as above 8
8. Vegetation is scattered or nearly absent; total vegetation cover (excluding crustose lichens the cover of which often far exceeds 10%) is generally 1-10% **SPARSE VEGETATION**
8. Vegetation cover is less than 1% **NON-VEGETATED**

KEY TO EVERGREEN FORESTS AND WOODLANDS [INCLUDES UPLAND AND WETLAND TYPES]

Key to Series Level

[series are arranged alphabetically following this key; key based largely on Pfister et al. (1977), Steele et al. (1983), Hansen et al. (1995)]; series comparable to NVC Alliance Level if only potential vegetation were addressed]

1. *Abies lasiocarpa* (subalpine fire) present and reproducing successfully; not confined to microsites **Abies lasiocarpa Series**
1. *A. lasiocarpa* absent or not reproducing successfully and if present, confined to microsites 2
2. *Picea* (spruce) spp. [mostly *P. engelmannii* (Engelmann spruce), but including hybrid swarms of *P. engelmannii* x *P. glauca* (white spruce)] present and reproducing successfully..... **Picea spp. Series**
2. *Picea* spp. absent or not reproducing successfully or confined to microsites..... 3
3. *Pinus albicaulis* (whitebark pine) present and reproducing successfully; *A. lasiocarpa* (subalpine fir) and *Picea* (spruce) spp. may be present with more than 10 seedlings/saplings but they are stunted, unthrifty specimens **Pinus albicaulis Series**
3. *P. albicaulis* absent or not reproducing successfully 4
4. *Pinus flexilis* (limber pine) present and reproducing successfully (though episodically) and often sharing this status with *Pseudotsuga menziesii* (Douglas-fir)..... **Pinus flexilis Series**
4. *P. flexilis* absent or not reproducing successfully 5
5. *Pseudotsuga menziesii* (Douglas-fir) present and reproducing successfully..... **Pseudotsuga menziesii Series**
5. *P. menziesii* absent or not reproducing successfully 6
6. *Pinus contorta* (lodgepole pine) occurring in virtually pure stands, not necessarily reproducing, lacking evidence as to climax potential **Pinus contorta Series**
6. *P. contorta* absent or not reproducing successfully 7
7. *Pinus ponderosa* (ponderosa pine) present, reproducing successfully (though mainly episodically), not accidental or confined to microsites **Pinus ponderosa Series**
7. *P. ponderosa* absent or accidental 8
8. *Juniperus scopulorum* (Rocky Mountain juniper) the indicated site dominant, having canopy cover greater than or equal to that of *Cercocarpus ledifolius* (curl-leaf mountain mahogany) **Juniperus scopulorum Series**
8. *J. scopulorum* not the indicated site dominant 9
9. *Cercocarpus ledifolius** (curl-leaf mountain mahogany) the indicated site dominant **Cercocarpus ledifolius Series**
9. *C. ledifolius* not the indicated site dominant **Forest or woodland Series (Alliance) as yet unrecognized for the Beaverhead Mountains Section**

**Cercocarpus ledifolius* is considered a shrub in most floras, but those with experience in the Great Basin may consider it a tree; we have included it in both the woodland and forest key and the shrubland key.

***Abies lasiocarpa* (subalpine fir) Series Key to Plant Associations**

1. Sites at or above the cold limits of *Pseudotsuga menziesii* (Douglas-fir) and also meeting one of following criteria;
 - a. *Pinus albicaulis* (whitebark pine) well represented as either seral or climax component;
 - b. *Luzula hitchcockii* (smooth woodrush) present, not related to microsites;
 - c. *Ribes montigenum* (mountain gooseberry) present;
 - d. Stands at upper timberline, growth stunted, tree height not much exceeding 50 ft.;

UPPER SUBALPINE & TIMBERLINE HABITATS.....lead #15
1. Not as above 1
2. *Ledum glandulosum* (Labrador tea) well represented (at least 5% canopy cover),
 ***Abies lasiocarpa* / *Ledum glandulosum* Forest**
 - a. One, or any combination of, the following species well represented: *Calamagrostis canadensis* (bluejoint reedgrass), *C. stricta* (narrow-spiked reedgrass), *Senecio triangularis* (arrowleaf groundsel) ***Calamagrostis canadensis* phase**
 - b. Not as above; *C. canadensis*, *C. stricta*, *S. triangularis* poorly represented; undergrowth may be variously dominated by *Vaccinium scoparium* (grouse whortleberry), *V. cespitosum* (dwarf huckleberry), *Linnaea borealis* (twinline), *Cornus canadensis* (bunchberry), *Calamagrostis rubescens* (pinegrass), or *Carex geyeri* (elk sedge)..... ***Ledum glandulosum* phase**
2. *L. glandulosum* poorly represented 3
3. *Calamagrostis canadensis* (bluejoint reedgrass) or *C. stricta* (narrow-spike reedgrass), alone or in combination, well represented ***Abies lasiocarpa* / *Calamagrostis canadensis* Forest**
 - a. *Vaccinium cespitosum* (dwarf huckleberry) common..... ***Vaccinium cespitosum* phase**
 - b. *V. cespitosum* scarce ***Calamagrostis canadensis* phase**
3. *C. canadensis* and *C. stricta*, singly or their combined cover poorly represented 4
4. *Streptopus amplexifolius* (twisted stalk), *Senecio triangularis* (arrowleaf groundsel), *Mitella pentandra* (five-stamened mitrewort) common, either individually or their combined cover (and not confined to microsites) ***Abies lasiocarpa* / *Streptopus amplexifolius* Forest**
 - a. *Menziesia ferruginea* (fool's huckleberry) well represented..... ***Menziesia ferruginea* phase**
 - b. *M. ferruginea* poorly represented ***Streptopus amplexifolius* phase**
4. The above-listed forbs, alone or their combined cover, having less than 1% cover..... 5
5. *Galium triflorum* (sweetscented bedstraw) and *Actaea rubra* (baneberry) either singly or their combined canopy cover at least 1% ***Abies lasiocarpa* / *Galium triflorum* Forest**
5. *G. triflorum* and *A. rubra*, singly or combined cover, less than 1% 6
6. *Menziesia ferruginea* (fool's huckleberry) well represented
 ***Abies lasiocarpa* / *Menziesia ferruginea* Forest**
6. *M. ferruginea* poorly represented 7
7. *Linnaea borealis* (twinline) common..... ***Abies lasiocarpa* / *Linnaea borealis* Forest**
7. *L. borealis* scarce 8
8. *Vaccinium cespitosum* (dwarf huckleberry) common.....
 ***Abies lasiocarpa* / *Vaccinium cespitosum* Forest**
8. *V. cespitosum* scarce 9
9. *Alnus viridis* ssp. *sinuata* (Sitka alder) well represented.....
 ***Abies lasiocarpa* / *Alnus viridis* ssp. *sinuata* Forest**
9. *A. viridis* ssp. *sinuata* poorly represented 10

10.	<i>Xerophyllum tenax</i> (beargrass) common	<i>Abies lasiocarpa</i> / <i>Xerophyllum tenax</i> Forest	
10.	<i>X. tenax</i> scarce.....		11
11.	<i>Vaccinium membranaceum</i> (= <i>V. globulare</i> , big or globe huckleberry) well represented.....	<i>Abies lasiocarpa</i> / <i>Vaccinium globulare</i> Forest	
11.	<i>V. membranaceum</i> poorly represented.....		12
12.	<i>Vaccinium scoparium</i> [grouse whortleberry, including <i>V. myrtilus</i> (dwarf bilberry)] well represented	<i>Abies lasiocarpa</i> / <i>Vaccinium scoparium</i> Forest	
12.	<i>V. scoparium</i> (and <i>V. myrtilus</i>) poorly represented		13
13.	<i>Thalictrum occidentale</i> (western meadowrue) or <i>T. fendleri</i> (Fendler's meadowrue) well represented	<i>Abies lasiocarpa</i> / <i>Thalictrum occidentale</i> Forest	
13.	<i>T. occidentale</i> (and <i>T. fendleri</i>) poorly represented		14
14.	<i>Clematis columbiana</i> var. <i>columbiana</i> (formerly <i>C. pseudoalpina</i> , Rocky Mountain clematis) or <i>C. columbiana</i> var. <i>tenuiloba</i> (formerly <i>C. tenuiloba</i> , matted purple virgin's-bower) present or <i>Pinus flexilis</i> (limber pine) common (sites invariably with calcareous substrates).....	<i>Abies lasiocarpa</i> / <i>Clematis columbiana</i> var. <i>columbiana</i> Forest	
14.	<i>C. columbiana</i> var. <i>columbiana</i> and <i>C. columbiana</i> var. <i>tenuiloba</i> absent and <i>P. flexilis</i> scarce		15
15.	<i>Calamagrostis rubescens</i> (pine grass) well represented	<i>Abies lasiocarpa</i> / <i>Calamagrostis rubescens</i> Forest	
15.	<i>C. rubescens</i> poorly represented.....		16
16.	<i>Carex geyeri</i> (elk sedge) well represented.....	<i>Abies lasiocarpa</i> / <i>Carex geyeri</i> Forest	
16.	<i>C. geyeri</i> poorly represented.....		17
17.	<i>Arnica cordifolia</i> (heartleaf arnica) undergrowth dominant	<i>Abies lasiocarpa</i> / <i>Arnica cordifolia</i> Forest	
17.	<i>A. cordifolia</i> not the undergrowth dominant.....	Undefined plant associations within <i>Abies lasiocarpa</i> Series	
18.	<i>Abies lasiocarpa</i> (subalpine fir) and <i>Picea</i> (spruce) spp. scarce or, if common, then unthrifty specimens; <i>Pinus albicaulis</i> (whitebark pine) the indicated dominant tree at projected longterm stable state	<i>Pinus albicaulis</i> Series	
18.	Not as above		19
19.	Timberline habitats; <i>Abies lasiocarpa</i> (subalpine fir) and <i>Picea</i> (spruce) spp. stunted, <i>Pinus contorta</i> (lodgepole pine) scarce, <i>Menziesia ferruginea</i> (fool's huckleberry) absent.....	<i>Pinus albicaulis</i> - <i>Abies lasiocarpa</i> Woodland	
19.	Not as above, forest environments with <i>A. lasiocarpa</i> at least 50 ft. at maturity		20
20.	<i>Luzula glabrata</i> var. <i>hitchcockii</i> (smooth woodrush, formerly <i>L. hitchcockii</i>) common	<i>Abies lasiocarpa</i> / <i>Luzula glabrata</i> var. <i>hitchcockii</i> Woodland	
20.	<i>L. glabrata</i> var. <i>hitchcockii</i> scarce, confined to snow deposition microsites		21
21.	<i>Vaccinium scoparium</i> (grouse whortleberry, including <i>V. myrtilus</i> , dwarf bilberry) well represented; <i>Pinus albicaulis</i> (whitebark pine) persisting, even reproducing, well into longterm stable state due to open canopy nature of stand structure.....	<i>Abies lasiocarpa</i> - <i>Pinus albicaulis</i> / <i>Vaccinium scoparium</i> Woodland	
21.	Not as above		22
22.	<i>Ribes montigenum</i> (mountain gooseberry) present and not relegated to microsites	<i>Abies lasiocarpa</i> / <i>Ribes montigenum</i> Woodland	

22. *R. montigenum* absent **Undefined plant associations within *Abies lasiocarpa* Series**

***Cercocarpus ledifolius* (curl-leaf mountain mahogany) Series
Key to Plant Associations**

- 1. *Festuca idahoensis* (Idaho fescue) well represented or the dominant graminoid
..... ***Cercocarpus ledifolius* / *Festuca idahoensis* Woodland**
- 1. *F. idahoensis* poorly represented and not the dominant graminoid 2
- 2. *Pseudoroegneria spicata* (= *Agropyron spicatum*, *Elymus spicatus*, bluebunch wheatgrass) or
Achnatherum (Oryzopsis) hymenoides (Indian ricegrass), constituting in their individual or combined
cover the dominant graminoids
..... ***Cercocarpus ledifolius* / *Pseudoroegneria spicata* Woodland**
- 2. *P. spicata* and *A. hymenoides*, individually or their combined cover, not the dominant graminoids
..... **Undefined *Cercocarpus ledifolius*-dominated plant association / community type**

***Juniperus scopulorum* (Rocky Mountain Juniper) Series
Key to Plant Associations**

- 1. Cottonwood (*Populus* spp.) species well represented or *Cornus sericea* (= *Cornus stolonifera*, red-
osier dogwood), *Poa pratensis* (Kentucky bluegrass) or *Agrostis stolonifera* (redtop, also *A. alba*)
singly or combined cover, common; riparian sites ***Juniperus scopulorum* / *Cornus sericea* Woodland**
- 1. Cottonwood (*Populus* spp.) species poorly represented and *C. stolonifera*, *P. pratensis*, and *A.*
stolonifera, singly or their combined cover, scarce 2
- 2. *Cercocarpus ledifolius* (curl-leaf mountain mahogany) well represented
..... ***Juniperus scopulorum* / *Cercocarpus ledifolius* Woodland**
- 2. *C. ledifolius* poorly represented 3
- 3. *Artemisia nova* (black sagebrush) well represented
..... ***Juniperus scopulorum* / *Artemisia nova* Woodland**
- 3. *A. nova* poorly represented 4
- 4. *Artemisia tridentata* (usually subspecies *wyomingensis* or *tridentata*) well represented
..... ***Juniperus scopulorum* / *Artemisia tridentata* Woodland**
- 4. *A. tridentata* poorly represented 5
- 5. *Pseudoroegneria spicata* (= *Agropyron spicatum*, *Elymus spicatus*, bluebunch wheatgrass) well
represented or the dominant graminoid
..... ***Juniperus scopulorum* / *Pseudoroegneria spicata* Woodland**
- 5. *P. spicata* poorly represented or not the dominant graminoid
..... **Undefined plant association(s) within the *Juniperus scopulorum* Series**

***Picea* (spruce) spp. [predominantly *P. engelmannii* (Engelmann spruce) and *P. engelmannii* x *P. glauca* (white spruce) hybrids] Series
Key to plant associations**

1. *Equisetum arvense* (field horsetail) abundant.....
..... ***Picea (engelmannii X glauca, engelmannii) / Equisetum arvense* Forest**
1. *E. arvense* not abundant.....2
2. *Carex disperma* (soft-leaved sedge) well represented
..... ***Picea (engelmannii X glauca, engelmannii) / Carex disperma* Forest**
2. *C. disperma* poorly represented.....3
3. *Calamagrostis canadensis* (bluejoint reedgrass), *C. stricta* (narrow-spiked reedgrass), or *Senecio triangularis* (arrowleaf groundsel) common, either alone or in combination
..... ***Picea engelmannii / Calamagrostis canadensis* Forest**
3. *C. canadensis*, *C. stricta*, and *S. triangularis* scarce4
4. *Cornus sericea* (= *C. stolonifera*, red-osier dogwood) or *Alnus incana* (mountain alder) common
..... ***Picea engelmannii / Cornus sericea* Woodland**
4. *C. sericea* scarce.....5
5. Two of the following moist-site forbs present or one or more common; *Streptopus amplexifolius*, (clasping-leaved twisted stalk), *Galium triflorum* (sweetscented bedstraw), *Actaea rubra* (baneberry). ..
..... ***Picea (engelmannii X glauca, engelmannii) / Galium triflorum* Forest**
5. Not as above6
- N.B. Sites above this level in the key are usually wetlands and/or associated with riparian features**
4. *Linnaea borealis* (twinline) common..... ***Picea engelmannii / Linnaea borealis* Forest**
4. *L. borealis* scarce5
5. *Physocarpus malvaceus* (mallow ninebark) well represented
..... ***Picea engelmannii / Physocarpus malvaceus* Forest**
5. *P. malvaceus* poorly represented.....6
6. *Maianthemum stellatum* (formerly *Smilacina stellata*, starry Solomon's seal) or *Thalictrum occidentale* (western meadowrue) common.....***Picea engelmannii / Maianthemum stellatum* Forest**
6. *M. stellatum* and *T. occidentale* scarce.....7
7. *Packera streptanthifolia* (= *Senecio streptanthifolius*, Rocky Mountain butterweed) present; undergrowth generally depauperate.....
..... ***Picea (engelmannii X glauca, engelmannii) / Senecio streptanthifolius* Forest**
 - a. *Pseudotsuga menziesii* (Douglas-fir) common ***Pseudotsuga menziesii* phase**
 - b. *P. menziesii* scarce, sites above its elevational limits..... ***Picea* spp. phase**
7. *S. streptanthifolius* absent, undergrowth various **Undefined p.a.'s. within *Picea* spp. Series**

***Pinus albicaulis* (whitebark pine) Series Key to Plant Associations**

- 1. *Vaccinium scoparium* (grouse whortleberry) well represented (not necessarily dominant undergrowth species in the presence of high coverage~~s~~ of various herbs, usually *Arnica latifolia* (broadleaf arnica) or *A. cordifolia* (heart-leaf arnica))..... ***Pinus albicaulis* / *Vaccinium scoparium* Woodland**
- 1. *V. scoparium* poorly represented2
- 2. *Carex geyeri* (elk sedge) well represented..... ***Pinus albicaulis* / *Carex geyeri* Woodland**
- 2. *C. geyeri* poorly represented3
- 3. *Juniperus communis* (common juniper), *Astragalus miser* (weedy milkvetch), or *Shepherdia canadensis* (Canada buffaloberry) well represented or dominant, either singly or collectively
..... ***Pinus albicaulis* / *Juniperus communis* Woodland**
- 3. Not as above4
- 4. *Festuca idahoensis* (Idaho fescue) common ***Pinus albicaulis* / *Festuca idahoensis* Woodland**
- 4. *F. idahoensis* scarce **Undefined p.a.'s./c.t.'s. within the *Pinus albicaulis* Series**

***Pinus contorta* (lodgepole pine) Series Key to Plant Associations**

- 1. *Calamagrostis canadensis* (bluejoint reedgrass) or *C. stricta* (narrow-spike reedgrass), singly or their combined cover, well represented
..... ***Pinus contorta* / *Calamagrostis canadensis* Forest (see a. below)**
 - a. *Vaccinium cespitosum* (dwarf huckleberry) present having at least 1% canopy cover
..... ***Vaccinium cespitosum* phase**
 - a. *V. cespitosum* scarce, having less than 1%..... ***Calamagrostis canadensis* phase**
- 1. *C. canadensis* and *C. stricta*, poorly represented, either individually or their combined cover 2
- 2. *Vaccinium cespitosum* (dwarf huckleberry) common.....
..... ***Pinus contorta* / *Vaccinium cespitosum* Forest**
- 2. *V. cespitosum* scarce3
- 3. *Linnaea borealis* (twinline) common..... ***Pinus contorta* / *Linnaea borealis* Forest**
- 3. *L. borealis* scarce4
- 4. *Xerophyllum tenax* (beargrass) well represented ***Pinus contorta* / *Xerophyllum tenax* Forest**
- 4. *X. tenax* poorly represented5
- 5. *Vacuun scoparium* (grouse whortleberry) well represented.....
..... ***Pinus contorta* / *Vaccinium scoparium* Forest**
- 5. *V. scoparium* poorly represented6
- 6. *Thalictrum occidentale* (western meadowrue) or *T. fendleri* (Fendler's meadow rue) well represented ...
..... ***Pinus contorta* / *Thalictrum occidentale* Forest**
- 6. *T. occidentale* and *T. fendleri* poorly represented.....7
- 7. *Calamagrostis rubescens* (pine grass) well represented
..... ***Pinus contorta* / *Calamagrostis rubescens* Forest**
- 7. *C. rubescens* poorly represented8
- 8. *Carex geyeri* (elk sedge) well represented..... ***Pinus contorta* / *Carex geyeri* Forest**
- 8. *C. geyeri* poorly represented9

- 9. *Purshia tridentata* (antelope bitterbrush) common ***Pinus contorta* / *Purshia tridentata* Woodland**
- 9. *P. tridentata* scarce 10
- 10. *Carex rossii* (Ross sedge) well represented or the undergrowth dominant
..... ***Pinus contorta* / *Carex rossii* Woodland**
- 10. *C. rossii* poorly represented or not the undergrowth dominant 11
- 11. *Arnica cordifolia* (heartleaf arnica) or *Astragalus miser* (weedy milkvetch) well represented, either
singly or their combined cover ***Pinus contorta* / *Arnica cordifolia* Forest**
- 11. *A. cordifolia* and *A. miser* poorly represented, alone or their combined cover
..... **Undefined *Pinus contorta*-dominated type**

***Pinus flexilis* (limber pine) Series
Key to Plant Associations**

- 1. *Cercocarpus ledifolius* (curl-leaf mountain mahogany) well represented (° 5 % canopy cover)
..... ***Pinus flexilis* / *Cercocarpus ledifolius* Woodland**
- 1. *C. ledifolius* poorly represented 2
- 2. *Juniperus communis* (common juniper) or *J. horizontalis* (creeping juniper) well represented
..... ***Pinus flexilis* / *Juniperus communis* Woodland**
- 2. *J. communis* and *J. horizontalis* poorly represented 3
- 3. *Festuca campestris* (= *Festuca scabrella*, rough fescue) common
..... ***Pinus flexilis* / *Festuca campestris* Woodland**
- 3. *F. campestris* scarce 4
- 4. *Festuca idahoensis* (Idaho fescue) well represented... ***Pinus flexilis* / *Festuca idahoensis* Woodland**
- 4. *F. idahoensis* poorly represented 5
- 5. *Pseudoroegneria spicata* (= *Agropyron spicatum*, bluebunch wheatgrass) well represented
..... ***Pinus flexilis* / *Pseudoroegneria spicata* Woodland**
- 5. *P. spicata* poorly represented **Undefined communities within *Pinus flexilis* Series**

***Pseudotsuga menziesii* (Douglas-fir) Series**

Key to plant associations

1. Habitats on steep slopes (generally > 40%) composed of unstable substrates, from gravel to coarse rock, and lacking soil development; undergrowth canopy cover sparse and spatially quite variable
..... ***Pseudotsuga menziesii* Scree Woodland**
1. Not as above; sites with some soil development due to stability of substrate; undergrowth cover more uniform reflecting lack of microsites 2
2. *Cornus sericea* (red-osier dogwood), potentially tall *Salix* spp. (willows, excepting *S. scouleriana*, Scouler willow), *Actaea rubra* (baneberry), *Poa pratensis* (Kentucky bluegrass) or *Equisetum arvense* (field horsetail) common, individually or their combined cover
..... ***Pseudotsuga menziesii* / *Cornus sericea* Woodland**
2. Above listed species considered individually or their combined cover, scarce..... 3
3. Sites with at least one of the following wetland attributes present: hydrophytic vegetation, wetland hydrology, hydric soils **Unclassified Wetland or Riparian Sites**
3. Sites lacking any one of the above-listed wetland attributes 4
4. *Vaccinium cespitosum* (dwarf huckleberry) common.....
..... ***Pseudotsuga menziesii* / *Vaccinium cespitosum* Forest**
4. *V. cespitosum* scarce 5
5. *Linnaea borealis* (twinline) common..... ***Pseudotsuga menziesii* / *Linnaea borealis* Forest**
5. *L. borealis* scarce 6
6. *Physocarpus malvaceus* (mallow ninebark) well represented
..... ***Pseudotsuga menziesii* / *Physocarpus malvaceus* Forest**
6. *P. malvaceus* poorly represented..... 7
7. *Vaccinium membranaceum* (big huckleberry, formerly *V. globulare*) well represented.....
..... ***Pseudotsuga menziesii* / *Vaccinium membranaceum* Forest**
7. *V. membranaceum* poorly represented..... 8
8. *Symphoricarpos albus* (common snowberry) well represented
..... ***Pseudotsuga menziesii* / *Symphoricarpos albus* Forest**
8. *S. albus* poorly represented 9
9. *Calamagrostis rubescens* (pine grass) well represented
..... ***Pseudotsuga menziesii* / *Calamagrostis rubescens* Forest**
9. *C. rubescens* poorly represented 10
10. *Carex geyeri* (elk sedge) well represented..... ***Pseudotsuga menziesii* / *Carex geyeri* Forest**
10. *C. geyeri* poorly represented 11
11. *Spiraea betulifolia* (shiny-leaf spiraea) well represented
..... ***Pseudotsuga menziesii* / *Spiraea betulifolia* Forest.**
11. *S. betulifolia* poorly represented..... 12
12. *Arctostaphylos uva-ursi* (kinnikinnick) well represented
..... ***Pseudotsuga menziesii* / *Arctostaphylos uva-ursi* Forest**
12. *A. uva-ursi* poorly represented 13

13.	<i>Juniperus communis</i> (common juniper) or <i>Juniperus horizontalis</i> (creeping juniper) the undergrowth dominant.....	<i>Pseudotsuga menziesii</i> / <i>Juniperus communis</i> Forest
13.	<i>J. communis</i> and <i>J. horizontalis</i> not the undergrowth dominants	14
14.	<i>Symphoricarpos oreophilus</i> (mountain snowberry) well represented	<i>Pseudotsuga menziesii</i> / <i>Symphoricarpos oreophilus</i> Forest
14.	<i>S. oreophilus</i> poorly represented	15
15.	<i>Arnica cordifolia</i> (heartleaf arnica) or <i>Antennaria racemosa</i> (raceme pussy-toes) the dominant undergrowth species	<i>Pseudotsuga menziesii</i> / <i>Arnica cordifolia</i> Forest
15.	Neither <i>A. cordifolia</i> nor <i>A. racemosa</i> the dominant undergrowth species	16
16.	<i>Cercocarpus ledifolius</i> (curl-leaf mountain mahogany) or <i>Juniperus scopulorum</i> (Rocky Mountain juniper) or their combined cover well represented	17
16.	<i>C. ledifolius</i> and <i>J. scopulorum</i> poorly represented	18
17.	<i>Cercocarpus ledifolius</i> (curl-leaf mountain mahogany) having greater canopy cover than <i>Juniperus scopulorum</i> (Rocky Mountain juniper)...	<i>Pseudotsuga menziesii</i> / <i>Cercocarpus ledifolius</i> Woodland
17.	<i>C. ledifolius</i> having less canopy cover than <i>J. scopulorum</i>	<i>Pseudotsuga menziesii</i> / <i>Juniperus scopulorum</i> Woodland
18.	<i>Festuca campestris</i> (= <i>Festuca scabrella</i> , rough fescue) common	<i>Pseudotsuga menziesii</i> / <i>Festuca campestris</i> Woodland
18.	<i>F. campestris</i> scarce	19
19.	<i>Festuca idahoensis</i> (Idaho fescue) common	<i>Pseudotsuga menziesii</i> / <i>Festuca idahoensis</i> Woodland
19.	<i>F. idahoensis</i> scarce	20
20.	<i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , <i>Elymus spicatus</i> , bluebunch wheatgrass) well represented	<i>Pseudotsuga menziesii</i> / <i>Pseudoroegneria spicata</i> Woodland
20.	<i>P. spicata</i> poorly represented	Undefined p.a. of the <i>Pseudotsuga menziesii</i> Series

KEY TO DECIDUOUS FORESTS AND WOODLANDS INCLUDING UPLAND AND WETLAND TYPES

[based largely on Hansen et al. (1995) & Mueggler (1988)]

1. *Populus angustifolia* (narrowleaf cottonwood) and *P. balsamifera* ssp. *trichocarpa* (formerly *P. trichocarpa*, black cottonwood) alone or their combined canopy cover, at least 25% or the dominant lifeform..... 2
1. *P. angustifolia* and *P. balsamifera* ssp. *trichocarpa* with < 25% canopy cover and not the dominant species, *P. tremuloides* (trembling aspen) dominant and having at least 25% cover, singly or in combination with *P. angustifolia* or *P. balsamifera* 12
2. *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) with greater canopy cover than *P. angustifolia* (narrowleaf cottonwood) 3
2. *P. balsamifera* ssp. *trichocarpa* having less canopy cover than *P. angustifolia* 7
3. Site recently deposited alluvial bar or overflow reach with seedling and sapling size classes (dbh <5.0 in.) dominating..... **Populus balsamifera ssp. trichocarpa / Recent Alluvial Bar p. a.**
3. *P. trichocarpa* represented by pole or mature size classes 4
4. Shrub species having at least 15% canopy cover or *Cornus sericea* (red-osier dogwood, formerly *C. stolonifera*) common..... 5
4. Shrub species having less than 15% canopy cover and *Cornus sericea* scarce..... 6
5. *Cornus sericea* (red-osier dogwood) common.....
..... **P. balsamifera ssp. trichocarpa / Cornus sericea p. a.**
5. *C. sericea* scarce; undergrowth may be dominated by any combination of *Symphoricarpos albus* (western snowberry), *S. occidentalis* (common snowberry), *Rosa woodsii* (woods rose), or *Rosa acicularis* (prickly rose)..... **P. balsamifera ssp. trichocarpa / Symphoricarpos occidentalis p. a.**
6. *Poa pratensis* (Kentucky bluegrass), *Poa palustris* (fowl bluegrass), or *Agrostis alba* (redtop) abundant, or dominating the undergrowth **P. balsamifera ssp. trichocarpa / Poa pratensis p. a.**
6. Not as above **Undefined p. a. within P. balsamifera ssp. trichocarpa Series**
7. *Populus angustifolia* seedling or sapling size classes (dbh < 5.0 in.) dominate recently deposited alluvial bars **Populus angustifolia / Recent Alluvial Bar p.a.**
7. *P. angustifolia* pole or mature size classes dominate the site, regardless of substrate 8
8. Shrub species having a single or combined canopy cover of 25% or *Cornus sericea* (red-osier dogwood) at least common 9
8. Shrub species having less than 15% canopy cover..... 10
9. *Cornus sericea* (red-osier dogwood) common..... **Populus angustifolia / Cornus sericea p. a.**
9. *C. sericea* scarce..... 10
10. Undergrowth may be dominated by any combination of *Symphoricarpos albus* (western snowberry), *S. occidentalis* (common snowberry), *Rosa woodsii* (woods rose), or *Rosa acicularis* (prickly rose)
..... **Populus angustifolia / Symphoricarpos occidentalis p. a.**
10. Not as above: none of the listed shrubs dominating the undergrowth..... 11
11. *Poa pratensis*, *Poa palustris*, or *Agrostis alba*, singly or combined cover, abundant, or dominant.....
..... **Populus angustifolia / Poa pratensis p. a.**
11. Not as above **Undefined p.a. within Populus angustifolia Series**
12. *Calamagrostis canadensis* (bluejoint reedgrass) or *C. stricta* (narrow-spike reedgrass), singly or in combination, well represented..... **Populus tremuloides / Calamagrostis canadensis p. a.**

12. *C. canadensis* or *C. stricta*, either singly or their combined canopy cover, poorly represented 13
13. *Salix* (willow) spp., *Cornus sericea* (red-osier dogwood), *Alnus incana* (mountain alder) or *Prunus virginiana* (common chokecherry), individually or combined canopy cover, well represented
..... **Populus tremuloides / Cornus sericea p.a.**
13. *Salix* spp., *C. sericea*, *A. incana*, and *P. virginiana*, individually or combined cover, poorly represented 14
14. Any two of the following species common (not confined to microsites) or any single one well represented; *Angelica arguta* (sharptooth angelica), *Osmorhiza occidentalis* (western sweet-cicely), *Heracleum maximum* (= *H. lanatum*, cow parsnip), *Actaea rubra* (baneberry), or *Galium triflorum* (sweetscented bedstraw) **Populus tremuloides / Osmorhiza occidentalis p. a.**
14. Not as above; considered individually all of the above species poorly represented and as pairs not more than scarce..... 15
15. One or more members of the tall forb group prominent, their single or combined canopy cover at least 10%; *Agastache urticifolia* (stinging nettle), *Aster engelmannii* (Engelmann's aster), *Delphinium occidentale* (western larkspur), *Hackelia floribunda* (showy stickseed), *Heracleum lanatum* (cow parsnip), *Mertensia ciliata* (mountain bluebell), *Osmorhiza occidentalis* (western sweet-cicely), *Senecio serra* (tall butterweed), *Valeriana occidentalis* (western valerian)
..... **Populus tremuloides / tall forb p.a.**
15. No single one of the above species or any combination thereof constituting 10% canopy cover 16
16. Considered singly or in any combination, any of the following species having at least 10 % canopy cover; *Thalictrum fendleri* (Fendler's meadowrue) *T. occidentale* (western meadowrue), *Osmorhiza chilensis* (western sweet-cicely), *O. depauperata* (blunt-fruit sweet-cicely), *Geranium viscosissimum* (sticky geranium), **Populus tremuloides / Thalictrum fendleri p.a.**
16. None of the above-listed species, singly or in any combination, totaling 10% cover 17
17. *Calamagrostis rubescens* (pine grass) or *Carex geyeri* (elk sedge) dominant, their individual or combined cover, at least 10 % **Populus tremuloides / Calamagrostis rubescens p.a.**
17. Neither *C. rubescens* nor *C. geyeri* nor their combined cover exceeding 10% 18
18. *Bromus marginatus* (= *B. carinatus* mountain brome), *B. anomalus* (nodding brome), *Elymus glaucus*, blue wildrye), *Elymus trachycaulus* (bearded wheatgrass), *Achnatherum occidentale* (*Stipa occidentalis*, western needlegrass), alone or in any combination, comprising at least 10% canopy cover.....
..... **Populus tremuloides / Bromus marginatus p.a.**
18. Not as above; singly or in combination, the above species comprise less than 10% cover 19
19. *Poa pratensis* (Kentucky bluegrass) dominates the undergrowth.....
..... **Populus tremuloides / Poa pratensis p.a.**
19. *P. pratensis* not the undergrowth dominant **Undefined p. a. within Populus tremuloides Series**

KEY TO SHRUBLAND PLANT ASSOCIATIONS INCLUDING UPLAND AND WETLAND TYPES

[based largely on Hansen et al. 1995, Mueggler and Stewart 1980]

1. Sites with at least one of the following wetland attributes: hydrophytic vegetation, hydric soils, wetland hydrology see %**KEY TO WETLAND / RIPARIAN SHRUBLAND COMMUNITIES**% following lead 49
1. Sites lacking any of the wetland attributes listed above.....2

2. *Dasiphora floribunda* (= *Pentaphylloides floribunda*, *Potentilla fruticosa*, shrubby cinquefoil) well represented (often partially obscured by lush herbaceous vegetation; other shrubby taxa may be well represented as well) 3
2. *Dasiphora floribunda* poorly represented 8

3. *Carex utriculata* (beaked sedge), *C. atherodes* (awned sedge), *C. vesicaria* (inflated sedge), *C. aquatilis* (water sedge), singly or combined cover at least 10% ***Dasiphora floribunda* / *Carex utriculata* p. a.**
3. *C. utriculata*, *C. atherodes*, *C. vesicaria*, and *C. aquatilis* poorly represented, singly or combined 4

4. *Deschampsia cespitosa* (tufted hairgrass) common, or only present as scattered individuals under intensive grazing regimes..... ***Dasiphora floribunda* / *Deschampsia cespitosa* p. a.**
4. *D. cespitosa* scarce 5

5. *Festuca campestris* (= *F. scabrella*, rough fescue) common, or only present as scattered individuals with intensive grazing ***Dasiphora floribunda* / *Festuca campestris* p. a.**
5. *F. campestris* scarce 6

6. *Festuca idahoensis* (Idaho fescue) well represented (only common with intensive grazing) ***Dasiphora floribunda* / *Festuca idahoensis* p. a.**
6. *F. idahoensis* poorly represented (or scarce under intensive grazing regime) 7

7. *Potentilla ovina* (sheep cinquefoil) common, the undergrowth dominant of a depauperate undergrowth; substrates may be water-scoured and eroded..... ***Dasiphora floribunda* / *Potentilla ovina* p. a.**
6. *P. ovina* scarce and not the undergrowth dominant..... **Undefined *Dasiphora floribunda*-dominated vegetation**

8. *Artemisia cana* (silver sagebrush) having at least 10% canopy cover (other *Artemisia* taxa may be present) 9
8. *A. cana* having less than 10% cover 14

9. *Leymus cinereus* (= *Elymus cinereus*, giant or basin wildrye) well represented (or common under intensive spring grazing regime) ***Artemisia cana* / *Leymus cinereus* p. a.**
9. *L. cinereus* poorly represented 10

10. *Poa secunda* (Sandberg's bluegrass, only that portion of the taxon formerly known as *Poa nevadensis*, Nevada bluegrass or *P. juncifolia*, alkali bluegrass), or *Carex praegracilis* (clustered field sedge) common, singly or combined cover..... ***Artemisia cana* / *Poa secunda* p. a.**
10. *P. secunda* (= *P. nevadensis*, *P. juncifolia*) and *C. praegracilis* scarce, individually or any combination 11

11. *Pascopyrum smithii* (= *Agropyron smithii*, western wheatgrass) or *Elymus lanceolatus* (= *A. dasystachyum*, thick-spike wheatgrass) well represented ***Artemisia cana* / *Pascopyrum smithii* p. a.**
11. *P. smithii* and *E. lanceolatus* poorly represented 12

12. Either *Festuca idahoensis* (Idaho fescue) or *Elymus trachycaulus* (= *Agropyron caninum*, bearded or slender wheatgrass) well represented (only common under grazing) see a & b below
 - a. *F. idahoensis* well represented **Artemisia cana / Festuca idahoensis p.a.**
 - b. *F. idahoensis* poorly represented and *E. trachycaulus* well represented
..... **Artemisia cana / Elymus trachycaulus p. a.**
12. *F. idahoensis* and *E. trachycaulus* poorly represented 13
13. Either *Hesperostipa comata* (= *Stipa comata*, needle-and-thread) or *Poa pratensis* (Kentucky bluegrass) well represented See a & b below
 - a. *H. comata* well represented and *P. pratensis* poorly represented
..... **Artemisia cana ssp. cana / Hesperostipa comata p.a.**
 - b. *H. comata* poorly represented and *P. pratensis* well represented
..... **Artemisia cana / Poa pratensis p.a.**
13. *H. comata* and *P. pratensis* both poorly represented
..... **Undefined p.a. within Artemisia cana alliance**
14. *Artemisia tridentata* ssp. *tridentata* (Basin big sagebrush) either singly, or its combined cover with *A. tridentata* ssp. *vaseyana* (Vasey or mountain big sagebrush), well represented (other *Artemisia* taxa may be present) **and** *Sarcobatus vermiculatus* (black greasewood) scarce (should *S. vermiculatus* be common then lead #72)..... 15
14. *A. tridentata* v. *tridentata* or its combined cover with *A. tridentata* ssp. *vaseyana* poorly represented and *S. vermiculatus* scarce 18
15. Rhizomatous wheatgrasses, *Elymus lanceolatus* (= *Agropyron dasystachyum*, thick-spike wheatgrass) or *Pascopyrum smithii* (= *A. smithii*, western wheatgrass) common, individually or their combined cover **Artemisia tridentata ssp. tridentata / Pascopyrum smithii p.a.**
15. *E. lanceolatus* and *Pascopyrum smithii* or other wheatgrasses scarce 16
16. *Festuca idahoensis* (Idaho fescue) well represented (or only common if intensive grazing a factor)
..... **Artemisia tridentata ssp. tridentata / Festuca idahoensis p.a.**
16. *F. idahoensis* poorly represented 17
17. *Hesperostipa comata* (= *Stipa comata*, needle-and-thread) or *H. spartea* (= *Stipa spartea*, porcupine-grass) well represented **Artemisia tridentata v. tridentata / Stipa comata p.a.**
17. *H. comata* and *H. spartea* poorly represented
..... **Undefined p.a. within Artemisia tridentata v. tridentata Alliance**
18. *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) well represented..... 19
18. *A. tridentata* ssp. *vaseyana* poorly represented..... 27
19. *Leymus cinereus* (formerly *Elymus cinereus*, basin or giant wildrye) well represented (only common under intensive grazing regime)..... **Artemisia tridentata ssp. vaseyana / Leymus cinereus p.a.**
19. *L. cinereus* poorly represented..... 20
20. *Festuca campestris* (= *Festuca scabrella*, rough fescue) common (only as scattered plants with intensive grazing) **Artemisia tridentata ssp. vaseyana / Festuca campestris p.a.**
20. *F. campestris* scarce 21
21. *Symphoricarpos oreophilus* (mountain snowberry) well represented 22
21. *S. oreophilus* poorly represented 24
22. *Bromus marginatus* (= *B. carinatus*, mountain brome), *B. anomalus* (nodding brome) or *B. inermis* var. *pumpellianus* (pumpelly brome) well represented, individually or combined coverage
..... **Artemisia tridentata ssp. vaseyana – Symphoricarpos oreophilus / Bromus marginatus p. a.**
22. *B. marginatus*, *B. anomalus* and *B. inermis* var. *pumpellianus* poorly represented, individually or their combined cover 23

23.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common under intensive grazing)	
	..... Artemisia tridentata ssp. vaseyana – Symphoricarpos oreophilus / Festuca idahoensis p. a.	
23.	<i>F. idahoensis</i> poorly represented	24
24.	<i>Pascopyrum smithii</i> (western wheatgrass) or <i>Elymus lanceolatus</i> (thick-spike wheatgrass) well represented, individually or their combined coverage; <i>Festuca idahoensis</i> (Idaho fescue) poorly represented	Artemisia tridentata ssp. vaseyana / Pascopyrum smithii p. a.
24.	<i>P. smithii</i> and <i>E. lanceolatus</i> poorly represented, individually or combined	25
25.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common under intensive grazing regime)	
	..... Artemisia tridentata ssp. vaseyana / Festuca idahoensis p.a. (see a-e below for proposed modifications of this associations, elevating phases to the p. a. level and defining new p. as.	
25.	<i>F. idahoensis</i> poorly represented	26
a.	<i>Pascopyrum smithii</i> (western wheatgrass) or <i>Elymus lanceolatus</i> (thick-spike wheatgrass) well represented	A. tridentata ssp. vaseyana / F. idahoensis – Pascopyrum smithii p. a.
b.	Not as above; <i>Stipa occidentalis</i> (western needlegrass) or <i>Stipa richardsonii</i> (Richardson's needlegrass) common	A. tridentata ssp. vaseyana / F. idahoensis – Stipa occidentalis p. a.
c.	Not as above; <i>Elymus trachycaulus</i> (bearded wheatgrass), <i>Bromus marginatus</i> (= <i>B. carinatus</i> , mountain brome) or <i>B. anomalus</i> (nodding brome) common, individually or in any combination; or <i>Geranium viscosissimum</i> (sticky geranium), <i>Potentilla glandulosa</i> (sticky cinquefoil), or <i>Potentilla gracilis</i> (slender cinquefoil) present	
	..... A. tridentata ssp. vaseyana / F. idahoensis / Geranium viscosissimum p. a.	
d.	Not as above, <i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) well represented (reduce to common under intensive grazing regimes)	
	..... A. tridentata ssp. vaseyana / F. idahoensis – Pseudoroegneria spicata p. a.	
e.	Not as above; <i>P. spicata</i> poorly represented	undefined A. tridentata ssp. vaseyana vegetation type
26.	<i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , <i>Elymus spicatus</i> , bluebunch wheatgrass) well represented (reduce to common under intensive grazing regimes)	
	..... Artemisia tridentata ssp. vaseyana / Pseudoroegneria spicata p.a.	
26.	<i>P. spicata</i> scarce	Undefined/unrecorded Artemisia tridentata ssp. vaseyana vegetation type
27.	<i>Artemisia nova</i> (black sagebrush) well represented (other <i>Artemisia</i> taxa may be present, even well represented)	28
27.	<i>A. nova</i> poorly represented	30
28.	<i>Festuca idahoensis</i> (Idaho fescue) well represented	Artemisia nova / Festuca idahoensis p. a.
28.	<i>F. idahoensis</i> poorly represented	29
29.	<i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) or <i>Achnatherium hymenoides</i> (= <i>Oryzopsis hymenoides</i> (Indian ricegrass) common, individually or their combined cover	
	..... Artemisia nova / Pseudoroegneria spicata p.a.	
29.	<i>A. spicatum</i> and <i>A. hymenoides</i> scarce	Undefined p. a. within Artemisia nova Alliance
30.	<i>Cercocarpus ledifolius</i> (curl-leaf mountain mahogany) well represented	31
30.	<i>C. ledifolius</i> poorly represented (and by population structure not likely to increase)	33
31.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common if intensively grazed)	
	..... Cercocarpus ledifolius / Festuca idahoensis p.a.	
31.	<i>F. idahoensis</i> poorly represented (or scarce with grazing)	32
32.	<i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) or <i>Achnatherum hymenoides</i> (= <i>Oryzopsis hymenoides</i> (Indian ricegrass), individual or combined cover, the dominant graminoids	
	..... Cercocarpus ledifolius / Pseudoroegneria spicata p.a.	
32.	<i>P. spicata</i> and <i>O. hymenoides</i> , singly or combined cover, not the dominant graminoids	
	..... Undefined p. a. within Cercocarpus ledifolius Alliance	

33.	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> (Wyoming big sagebrush) well represented	34
33.	<i>A. tridentata</i> ssp. <i>wyomingensis</i> poorly represented	36
34.	<i>Elymus lanceolatus</i> (= <i>Agropyron dasystachyum</i> , thick-spike wheatgrass) or <i>Pascopyrum smithii</i> (= <i>Agropyron smithii</i> , western wheatgrass), individually or their combined cover, common.....	
	..... <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> / <i>Elymus lanceolatus</i> p.a.	
34.	<i>E. lanceolatus</i> and <i>P. smithii</i> scarce	35
35.	<i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) well represented (only common with intensive grazing).....	
	..... <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> / <i>Pseudoroegneria spicata</i> p.a.	
35.	<i>P. spicata</i> (poorly represented)	
	..... Undefined p.a. within <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> Alliance	
36.	<i>Artemisia tripartita</i> (three-tip sagebrush) the dominant shrub spp. (<i>Artemisia</i> spp).....	37
36.	<i>A. tripartita</i> not the dominant shrub spp.	40
37.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common under intensive grazing)	
	..... <i>Artemisia tripartita</i> / <i>Festuca idahoensis</i> p. a.	
37.	<i>F. idahoensis</i> poorly represented.....	38
38.	<i>Elymus lanceolatus</i> (= <i>Agropyron dasystachyum</i> , thick-spike wheatgrass) or <i>Pascopyrum smithii</i> (= <i>Agropyron smithii</i> , western wheatgrass), individually or in combination, common and the dominant graminoids	
	..... <i>Artemisia tripartita</i> / <i>Elymus lanceolatus</i> p. a.	
38.	<i>E. lanceolatus</i> and <i>P. smithii</i> , individually or their combined cover, poorly represented and neither being the dominant graminoids	39
39.	<i>Pseudoroegneria spicata</i> (bluebunch wheatgrass, formerly <i>Agropyron spicatum</i>) well represented (only common under intensive grazing) and, excepting <i>Poa secunda</i> (Sandberg's bluegrass), constitutes the dominant graminoid	
	..... <i>Artemisia tripartita</i> / <i>Pseudoroegneria spicata</i> p. a.	
39.	<i>P. spicata</i> poorly represented, not the dominant graminoid.....	
	..... Undefined p. a. within <i>Artemisia tripartita</i> Alliance	
40.	<i>Rhus trilobata</i> (skunk-bush sumac) well represented, as scattered patches, or the dominant shrub ...	41
40.	<i>R. trilobata</i> poorly represented, not the dominant shrub.....	43
41.	<i>Festuca idahoensis</i> (Idaho fescue) well represented or dominant graminoid.....	
	..... <i>Rhus trilobata</i> / <i>Festuca idahoensis</i> p.a.	
41.	<i>F. idahoensis</i> poorly represented, not dominant graminoid.....	42
42.	<i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) common or dominant graminoid	
	..... <i>Rhus trilobata</i> / <i>Pseudoroegneria spicata</i> p.a.	
42.	<i>P. spicata</i> scarce or not the dominant graminoid.....	
	..... Undefined p. a. within <i>Rhus aromatica</i> Alliance	
43.	<i>Chrysothamnus viscidiflorus</i> (green rabbitbrush) well represented or the dominant shrub.....	44
43.	<i>C. viscidiflorus</i> poorly represented or not the dominant shrub.....	45
44.	<i>Hesperostipa comata</i> (= <i>Stipa comata</i> , needle-and-thread) common or the dominant herbaceous species	
	..... <i>Chrysothamnus viscidiflorus</i> / <i>Stipa comata</i> p. a.	
44.	<i>H. comata</i> scarce, not the dominant herbaceous species	
	..... Undefined <i>Chrysothamnus viscidiflorus</i>-dominated vegetation type	
45.	<i>Sarcobatus vermiculatus</i> (black greasewood) well represented (valley locations with saline or alkaline soils).....	46
45.	<i>S. vermiculatus</i> poorly represented.....	49

- 46. *Distichlis spicata* (= *D. stricta*, Inland saltgrass) well represented (usually alkali flat conditions prevail, for example salt efflorescence) **Sarcobatus vermiculatus / Distichlis spicata p. a.**
- 46. *D. spicata* poorly represented, habitat conditions various 47
- 47. *Leymus cinereus* (= *Elymus cinereus*, basin or giant wildrye) common
..... **Sarcobatus vermiculatus / Leymus cinereus p.a.**
- 47. *L. cinereus* scarce, not the dominant graminoid 48
- 48. *Pascopyrum smithii* (western wheatgrass) or *Elymus lanceolatus* (thick-spike wheatgrass), individually or their combined cover, the dominant component of herbaceous vegetation
..... **Sarcobatus vermiculatus / Pascopyrum smithii (Elymus lanceolatus) Shrub Herbaceous**
- 48. *P. smithii* and *E. lanceolatus* not the dominant herb
..... Undefined/unrecorded p.a./c.t. of the *Sarcobatus vermiculatus* alliance
- 49. Undefined/unreported shrubland type(s) or see „KEY TO DWARF-SHRUBLAND PLANT ASSOCIATIONS, INCLUDING UPLAND AND WETLAND TYPES” or go to next lead „KEY TO “WETLAND / RIPARIAN SHRUBLAND COMMUNITIES”

KEY TO WETLAND / RIPARIAN SHRUBLAND COMMUNITIES

(see Alpine Key for high subalpine or alpine habitats where dwarf or prostrate shrubs [for example *Salix* spp.] are well represented)

- 1. *Salix* spp. (willow species) with at least 10% canopy cover 2
- 1. *Salix* spp. having less than 10% canopy cover 28
- 2. *Salix geyeriana* (Geyer willow), *S. boothii* (Booth willow), *S. drummondiana* (Drummond willow) or *S. lutea* (yellow willow) with at least 10% canopy cover, individually or combined 3
- 2. Above listed willow species, individually or combined, less than 10% canopy cover 16
- 3. *Salix lutea* (yellow willow) with greater canopy cover than *S. drummondiana* (Drummond willow) or the combined cover of *S. geyeriana* (Geyer willow) and *S. boothii* (Booth willow) 4
- 9. *S. lutea* having less canopy cover than *S. drummondiana* or combined cover of *S. geyeri* and *S. boothii* 6
- 4. *Carex utriculata* (beaked sedge), *C. vesicaria* (inflated sedge), *C. atherodes* (awned sedge), *C. aquatilis* (water sedge) or *C. lenticularis* (lentil-fruit sedge), individually or in any combination, well represented (5% or greater canopy cover) **Salix lutea / Carex utriculata Shrubland**
- 4. The above listed *Carex* spp., either individually or in any combination, having less than 5% cover 5
- 5. *Calamagrostis canadensis* (bluejoint reedgrass), *C. stricta* (narrow-spiked reedgrass) or *Deschampsia cespitosa* (tufted hairgrass), individually or in combination, having at least 5% canopy cover **Salix lutea / Calamagrostis canadensis Shrubland**
- 5. *C. canadensis*, *C. stricta* and *D. cespitosa* individually or their combined cover less than 10%
..... **Salix lutea Plant Association** (a default community)
- 6. *Salix drummondiana* with a greater canopy cover than the individual or combined cover of *S. boothii* and *S. geyeriana* 7
- 6. *S. drummondiana* with less cover than the combined or individual cover of *S. boothii* and *S. geyeriana* 9
- 7. *Carex utriculata* (beaked sedge), *C. vesicaria* (inflated sedge), *C. atherodes* (awned sedge), *C. aquatilis* (water sedge) or *C. lenticularis* (lentil-fruit sedge), individually or in any combination, well represented (5% canopy cover) **Salix drummondiana / Carex utriculata Shrubland**
- 7. The above listed *Carex* spp., either individually or in any combination, having less than 5% cover 8

- 8. *Calamagrostis canadensis* (bluejoint reedgrass), *C. stricta* (narrow-spiked reedgrass) or *Deschampsia cespitosa* (tufted hairgrass), individually or in combination, having at least 5% canopy cover **Salix drummondiana / Calamagrostis canadensis p. a.**
- 8. Not as above; the above listed species, either singly or their combined canopy cover less than 5% **Salix drummondiana Plant Association** (a default community)

- 9. *Salix boothii* (Booth willow) having at least as much canopy cover as *S. geyeriana* (Geyer willow)..... 10
- 9. *S. boothii* having less canopy cover than *S. geyeriana* 12

- 10. *Carex utriculata* (beaked sedge), *C. vesicaria* (inflated sedge), *C. atherodes* (awned sedge), *C. aquatilis* (water sedge) or *C. lenticularis* (lentil-fruit sedge), individually or in any combination, well represented (5% canopy cover) **Salix boothii / Carex utriculata p. a.**
- 10. None of the above listed *Carex* spp., either individually or in any combination, exceeding 5% cover .. 11

- 11. *Calamagrostis canadensis* (bluejoint reedgrass), *C. stricta* (narrow-spiked reedgrass) or *Deschampsia cespitosa* (tufted hairgrass), individually or in combination, having at least 5% canopy cover **Salix boothii / Calamagrostis canadensis p. a.**
- 11. Not as above; the above listed species, either singly or their combined canopy cover less than 5% **Undefined Salix boothii-dominated p. a.**

- 12. *Carex utriculata* (beaked sedge), *C. vesicaria* (inflated sedge), *C. atherodes* (awned sedge), *C. aquatilis* (water sedge) or *C. lenticularis* (lentil-fruit sedge), individually or in any combination, well represented (5% or greater canopy cover) **Salix geyeriana / Carex utriculata p. a.**
- 12. All of the above-listed *Carex* spp. with individual or combined cover less than 5% 13.

- 13. *Calamagrostis canadensis* (bluejoint reedgrass) or *C. stricta* (narrow-spiked reedgrass) well represented (5% or greater canopy cover), either individually or in combination **Salix geyeriana / Calamagrostis canadensis p. a.**
- 13. Not as above; the above listed species, either singly or in combination, poorly represented (canopy cover less than 5%)..... 14

- 14. *Deschampsia cespitosa* (tufted hairgrass) well represented (>5% canopy cover); if site grazed intensively *D. cespitosa* need only be common (greater than 1%) **Salix geyeriana / Deschampsia cespitosa p. a.**
- 14. *D. cespitosa* poorly represented (< 5% canopy cover) 15

- 15. Considered singly or in any combination, the following primarily disturbance associated species, dominate the herbaceous layer; *Poa pratensis* (Kentucky bluegrass), *P. palustris* (fowl bluegrass), *Phleum pratense* (timothy), *Agrostis stolonifera* (redtop), or *Juncus balticus* (Baltic rush) **Salix geyeriana / Mesic graminoids p. a.**
- 15. None of the above-listed species, singly or in any combination dominate the herbaceous layer **Undefined Salix geyeriana-dominated p. a.**

- 16. Canopy cover of *Salix planifolia* (planeleaf willow) or *S. commutata* (undergreen willow), or their combined cover, is at least 10% 17
- 16. *S. planifolia* or *S. commutata*, their individual or combined cover, is less than 10%. 19

- X. *Carex scopulorum* (mountain sedge) well represented (° 5 % canopy cover) **Salix planifolia / Carex scopulorum p. a.**
- X. *C. scopulorum* poorly represented 17

- 17. *Carex aquatilis* (water sedge) or *C. utriculata* (beaked sedge) well represented, individually or in combination **Salix planifolia / Carex aquatilis p. a.**
- 17. *C. aquatilis* and *C. utriculata* poorly represented 18

17. <i>Carex nebrascensis</i> (Nebraska sedge) or <i>C. simulata</i> (short-beaked sedge) well represented, either individually or in combination	Salix planifolia / Carex nebrascensis p.a.
18. <i>C. nebrascensis</i> and <i>C. simulata</i> poorly represented, individually or in combination	Undefined p. a. within Salix planifolia or S. commutata alliances
19. <i>Salix candida</i> (hoary willow) having at least 10% canopy cover.....	20
19. <i>S. candida</i> having less than 10% canopy cover	22
20. <i>Carex utriculata</i> (beaked sedge) or <i>C. aquatilis</i> (water sedge), or any combination of the two, well represented	Salix candida / Carex utriculata p.a.
20. <i>C. rostrata</i> and <i>C. aquatilis</i> poorly represented, individually or in combination	21
21. <i>Carex lasiocarpa</i> (slender sedge), <i>C. lanuginosa</i> (woolly sedge), or <i>C. buxbaumii</i> (Buxbaum's sedge) well represented, individually or in any combination.....	Salix candida / Carex lasiocarpa p. a.
21. Not as above; above listed sedges poorly represented, individually or in any combination.....	Undefined p. as. within Salix candida alliance
22. <i>Salix wolfii</i> (Wolf's willow) having at least 10% canopy cover.....	23
22. <i>S. wolfii</i> with less than 10% canopy cover	25
23. <i>Carex utriculata</i> (beaked sedge), <i>C. vesicaria</i> (inflated sedge), <i>C. atherodes</i> (awned sedge), <i>C. aquatilis</i> (water sedge) or <i>C. lenticularis</i> (lentil-fruit sedge), considered singly or in any combination, well represented	Salix wolfii / Carex aquatilis p.a.
23. Any of the above-listed species, considered singly or in any combination, poorly represented.....	24
24. <i>Deschampsia cespitosa</i> (tufted hairgrass) or <i>Juncus balticus</i> (Baltic rush) or their combined cover well represented; accept <i>D. cespitosa</i> as common (1% or greater canopy cover) where grazing is intensive	Salix wolfii / Deschampsia cespitosa p.a.
24. <i>D. cespitosa</i> or <i>J. balticus</i> or their combined cover poorly represented	Undefined p. a. within Salix wolfii alliance
25. Individual non- <i>Salix</i> (non-willow) species having a greater canopy cover than any individual <i>Salix</i> species	28
25. Individual <i>Salix</i> species with greater canopy than any individual non- <i>Salix</i> species	26
26. <i>Salix bebbiana</i> (Bebb willow) with greater canopy cover than any other <i>Salix</i> species	Salix bebbiana p.a.
26. <i>S. bebbiana</i> having less canopy cover than any other <i>Salix</i> species	27
27. <i>Salix exigua</i> (sandbar willow) having greater canopy cover than any other <i>Salix</i> species.....	Salix exigua p. a.
27. <i>S. exigua</i> having less canopy cover than any other individual <i>Salix</i> species	Undefined Salix spp.-dominated riparian-wetland site type
28. <i>Betula nana</i> (formerly <i>B. glandulosa</i> , bog birch) having at least 10% canopy cover.....	29
28. <i>B. nana</i> having less than 10% canopy cover	30
29. <i>Carex utriculata</i> (beaked sedge), <i>C. vesicaria</i> (inflated sedge), <i>C. atherodes</i> (awned sedge), <i>C. aquatilis</i> (water sedge) or <i>C. lenticularis</i> (lentil-fruit sedge), individually or in any combination, well represented (5% canopy cover).....	Betula nana / Carex utriculata p.a.
29. All of the above-listed <i>Carex</i> spp. with individual or combined canopy covers less than 5%	Undefined p. a. within B. nana alliance
30. <i>Kalmia microphylla</i> (small-leaved laurel) having at least 10% canopy cover	31
30. <i>K. microphylla</i> having less than 10% canopy cover.....	32

31. *Carex scopulorum* (Holm's Rocky Mountain Sedge or *C. nigricans* (black alpine sedge) or their combined cover well represented ***Kalmia microphylla* / *Carex scopulorum* p. a.**
31. *C. scopulorum* or *C. nigricans* or their combined cover poorly represented
 **Undefined *K. microphylla*-dominated p. a.**
32. *Betula occidentalis* (water or river birch) having at least 10% canopy cover and with the greatest cover of the tallest vegetation layer..... ***Betula occidentalis* p. a.**
32. *B. occidentalis* having less than 10% canopy cover 33
33. *Alnus incana* (mountain alder) having at least 10% canopy cover and with greatest canopy cover in tallest layer ***Alnus incana* p. a.**
33. *A. incana* having less than 10% canopy cover or not having the greatest canopy cover of the tallest layer 34
34. *Dasiphora fruticosa* ssp *floribunda* (= *Pentaphylloides floribunda*, *Potentilla fruticosa*, shrubby cinquefoil) having at least 10% canopy cover 35
34. *D. fruticosa* having less than 10% canopy cover 37
35. *Carex utriculata* (beaked sedge), *C. atherodes* (awned sedge), *C. vesicaria* (inflated sedge), *C. aquatilis* (water sedge), individually or in any combination, having at least 10% canopy cover
 ***Dasiphora fruticosa* ssp *floribunda* / *Carex utriculata* p. a.**
35. *C. utriculata*, *C. atherodes*, *C. vesicaria*, and *C. aquatilis* poorly represented, singly or combined 36
36. *Deschampsia cespitosa* (tufted hairgrass) or *Juncus balticus* (Baltic rush) or their combined cover well represented; under intensive grazing *D. cespitosa* may be only common
 ***Dasiphora fruticosa* ssp *floribunda* / *Deschampsia cespitosa* p. a.**
36. *D. cespitosa* and *J. balticus* poorly represented
 **Undefined p. a. within *Dasiphora fruticosa* alliance**
37. *Artemisia cana* (silver sagebrush) well represented 38
37. *A. cana* poorly represented 42
38. *Leymus cinereus* (= *Elymus cinereus*, giant or basin wildrye) well represented (or merely common under intensive spring grazing regime) ***Artemisia cana* / *Leymus cinereus* p. a.**
38. *L. cinereus* poorly represented 39
39. *Poa secunda* (Sandberg's bluegrass, considering only that portion of the taxon formerly known as *Poa nevadensis*, Nevada bluegrass or *P. juncifolia*, alkali bluegrass), or *Carex praegracilis* (clustered field sedge) common, singly or their combined cover ***Artemisia cana* / *Poa secunda* p. a.**
39. *P. secunda* (narrowly defined as above) and *C. praegracilis* scarce, individually or any combination . 40
40. *Pascopyrum smithii* (= *Agropyron smithii*, western wheatgrass) or *Elymus lanceolatus* (= *A. dasystachyum*, thick-spike wheatgrass) well represented (canopy cover \geq 5 %)
 ***Artemisia cana* / *Pascopyrum smithii* p. a.**
40. *P. smithii* and *E. lanceolatus* poorly represented 41
41. Either *Festuca idahoensis* (Idaho fescue) or *Elymus trachycaulus* (bearded wheatgrass) well represented (reduce to only common under intensive grazing) see a & b below
- a. *F. idahoensis* well represented ***Artemisia cana* / *Festuca idahoensis* p. a.**
- b. *F. idahoensis* poorly represented and *E. trachycaulus* well represented
 ***Artemisia cana* / *Elymus trachycaulus* p. a.**
41. *F. idahoensis* and *E. trachycaulus* poorly represented
 **Undefined p. a. within *Artemisia cana* alliance**

42. *Sarcobatus vermiculatus* (black greasewood) well represented or if vegetation depauperate then the shrub layer dominant; *S. vermiculatus* often not shrub layer dominant (expect *Artemisia* or *Chrysothamnus* spp.) 43
42. *S. vermiculatus* poorly represented or, if depauperate conditions obtain, then not the shrub layer dominant..... 46
43. *Distichlis spicata* (inland saltgrass, formerly *Distichlis stricta*) well represented (alkali flats conditions prevail)..... **Sarcobatus vermiculatus / Distichlis stricta p.a.**
43. *D. stricta* poorly represented 44
44. *Leymus cinereus* (= *Elymus cinereus*, giant or basin wildrye) well represented (reduced to only common under intensive grazing) **Sarcobatus vermiculatus / Leymus cinereus p.a.**
44. *L. cinereus* poorly represented..... 45
45. *Pascopyrum smithii* (= *Agropyron smithii*, western wheatgrass) or *Elymus lanceolatus* (= *Agropyron dasystachyum*, thickspike wheatgrass) the dominant component of herbaceous layer **Sarcobatus vermiculatus / Pascopyrum smithii (Elymus lanceolatus) Shrub Herbaceous**
45. *P. smithii* and *E. lanceolatus* not the dominant undergrowth component..... **Undescribed Sarcobatus vermiculatus p.a(s).**
46. *Betula occidentalis* (water birch) having at least 15% canopy cover **and** constituting the greatest canopy cover in the tallest layer **Betula occidentalis p. a.**
46. *B. occidentalis* having less than 15% canopy cover **or** not having the greatest canopy cover within the tallest stratum 47
47. *Alnus incana* (mountain alder) having at least 15% canopy cover **and** having the greatest cover of the tallest layer present **Alnus incana p. a.**
47. *A. incana* having less than 15% canopy cover **or** without the greatest canopy cover in the tallest stratum..... 48
48. *Shepherdia argentea* (thorny buffaloberry) having at least 15% canopy cover **and** comprising the greatest canopy cover of the tallest stratum **Shepherdia argentea p. a.**
48. *S. argentea* having less than 15% cover **or** not exhibiting the greatest canopy cover among species of the uppermost stratum 49
49. *Rosa woodsii* (woods rose) or *R. acicularis* (prickly rose) or any combination of the two having at least 15% canopy cover **and** they comprise greatest cover in the tallest vegetation layer **Rosa woodsii p. a.**
49. *R. woodsii* and *R. acicularis*, or any combination of the two having less than 15% cover **or** not comprising the greatest canopy cover in the uppermost vegetation layer..... 50
50. *Symphoricarpos occidentalis* (western snowberry) or *S. albus* (common snowberry), their individual or combined cover greater than 15% **and** having the greatest canopy cover in the tallest layer **Symphoricarpos occidentalis p.a.**
50. *S. occidentalis* and *S. albus* or their combined cover less than 15% **or** not comprising the greatest canopy cover in the tallest vegetation layer 51
51. Site having at least one of the following wetland criteria present: hydrophytic vegetation, hydric soils, wetland hydrology **Undefined riparian-wetland p.a.**
51. Site not exhibiting any of the above-listed wetland criteria **Upland Site**

KEY TO DWARF-SHRUBLAND PLANT ASSOCIATIONS INCLUDING UPLAND AND WETLAND TYPES

[Dwarf-shrubs (as individuals or clumps with a potential height less than 0.5 m) generally forming 25% or greater canopy cover (taxa include *Artemisia arbuscula* (low sagebrush), *A. arbuscula* ssp. *longiloba* (early low sagebrush), *A. nova* (black sagebrush), *A. pedatifida* (birdfoot sagebrush), *A. tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), *A. tripartita* (three-tip sagebrush), *Atriplex gardneri* (Gardner's saltbush), *Cassiope mertensiana* (Mertens' mountain heather), *Dryas octopetala* (white dryas), *Kalmia microphylla* (small-leaved laurel), *Phyllodoce empetriformis* (red mountain-heath), *P. glanduliflora* (yellow mountain-heath), *Pentaphylloides floribunda* (shrubby cinquefoil), *Salix arctica* (alpine willow), *S. candida* (hoary willow), *S. barratiana* (Barratt willow), *S. brachycarpa* (short-fruited willow), *S. glauca* (glaucous willow), *S. planifolia* var. *monica* (dwarf planeleaf willow), *S. reticulata* (snow willow)); though an uncommon condition, dwarf-shrub cover may be less than 25% but exceeding the combined cover of the other lifeforms present (shrubs, herbs, nonvasculars) which is less than 25%]

1.	1. <i>Salix</i> spp. (willow species) with at least 10% canopy cover	2
1.	1. <i>Salix</i> spp. having less than 10% canopy cover	14
2.	2. <i>Salix planifolia</i> var. <i>monica</i> (dwarf planeleaf willow) the dominant <i>Salix</i> spp.	3
2.	2. <i>S. planifolia</i> var. <i>monica</i> not the dominant <i>Salix</i> spp.	4
3.	3. <i>Carex scopulorum</i> (Holm's Rocky Mountain sedge) well represented and dominating the herbaceous layer (though <i>Deschampsia cespitosa</i> (tufted hairgrass) attains this status as well)	5
3.	3. <i>C. scopulorum</i> poorly represented and not the herbaceous layer dominant	Undefined <i>Salix planifolia</i> / <i>Carex scopulorum</i> p. a.
4.	4. <i>Salix candida</i> (hoary willow) the dominant <i>Salix</i> spp.	5
4.	4. <i>S. candida</i> not the dominant <i>Salix</i> spp.	7
5.	5. <i>Carex utriculata</i> (beaked sedge), <i>C. atherodes</i> (awned sedge), <i>C. vesicaria</i> (inflated sedge), <i>C. aquatilis</i> (water sedge) well represented (cover ≥ 5%)	Undefined <i>Salix candida</i> / <i>Carex utriculata</i> p. a.
5.	5. None of the above-listed species well represented, individually or in combination	7
6.	6. <i>Carex lasiocarpa</i> (slender sedge) or <i>C. buxbaumii</i> (Buxbaum's sedge), well represented (cover ≥ 5%), singly or combined	Undefined <i>Salix candida</i> / <i>Carex lasiocarpa</i> p. a.
6.	6. <i>C. lasiocarpa</i> and <i>C. buxbaumii</i> poorly represented, singly or combined cover	Undefined <i>Salix candida</i>-dominated vegetation type
7.	7. <i>Salix brachycarpa</i> (short-fruited willow) the dominant <i>Salix</i> spp.	8
7.	7. <i>S. brachycarpa</i> not the dominant species of <i>Salix</i>	9
8.	8. <i>Carex utriculata</i> (beaked sedge) or <i>C. aquatilis</i> (water sedge) well represented, singly or combined cover	Undefined <i>Salix brachycarpa</i> / <i>Carex aquatilis</i> p. a.
8.	8. <i>S. brachycarpa</i> not the dominant <i>Salix</i> spp.	Undefined <i>Salix brachycarpa</i>-dominated vegetation type
9.	9. <i>Salix nivalis</i> (= <i>Salix reticulata</i> v. <i>nivalis</i> , snow willow) the dominant <i>Salix</i> spp; <i>Dryas octopetala</i> (white dryas) not abundant	10
9.	9. <i>S. reticulata</i> not the dominant <i>Salix</i> spp; <i>D. octopetala</i> may be abundant	11
10.	10. <i>Caltha leptosepala</i> (elkslip marsh-marigold) present (often abundant), but not necessarily dominating a diverse forb layer	Undefined <i>Salix reticulata</i> / <i>Caltha leptosepala</i> p. a.
10.	10. <i>C. leptosepala</i> not present	Undefined <i>Salix reticulata</i>-dominated vegetation type
11.	11. <i>Salix arctica</i> (Arctic willow) the dominant <i>Salix</i> spp.	12
11.	11. <i>S. arctica</i> not the dominant <i>Salix</i> spp.	13

12. *Polygonum bistortoides* (American bistort) or *Polygonum viviparum* (alpine bistort), singly or combined cover, well represented, though somewhat ephemeral and diminutive, often contributing the most forb cover **Salix arctica / Polygonum bistortoides p. a.**
12. *P. bistortoides* and *P. viviparum* poorly represented **Undefined S. arctica-dominated vegetation type**
13. *Salix glauca* (glaucous willow) the dominant *Salix* spp., undergrowth variable **Salix glauca p. a.**
13. *S. glauca* not dominating the shrub layer **Undefined Salix-dominated vegetation type**
14. *Kalmia microphylla* (small-leaved laurel) having at least 10% canopy cover 15
14. *K. microphylla* having less than 10% canopy cover 16
15. *Carex scopulorum* (Holm's Rocky Mountain sedge) or *Carex nigricans* (black alpine sedge) well represented, singly or in combination **Kalmia microphylla / Carex scopulorum p. a.**
15. *C. scopulorum* and *C. nigricans* poorly represented, singly or in combination **Undefined Kalmia microphylla vegetation type**
16. *Phyllodoce empetriformis* (red mountain-heath) or *P. glanduliflora* (yellow mountain-heath) dominating the shrub layer, singly or in concert, their canopy cover generally abundant 17
16. *P. empetriformis* and *P. glanduliflora* not the shrub-layer dominants, not abundant 18
17. *Antennaria lanata* (woolly pussy-toes) common .. **Phyllodoce empetriformis / Antennaria lanata p. a.**
17. *A. lanata* scarce **Undefined Phyllodoce empetriformis-dominated vegetation type**
18. *Cassiope mertensiana* (Mertens's mountain heather) dominating the shrub layer 19
18. *C. mertensiana* not the shrub-layer dominant 20
19. *Carex paysonis* (Payson sedge) common **Cassiope mertensiana / Carex paysonis p. a.**
19. *C. paysonis* scarce **Undefined Cassiope mertensiana vegetation type**
20. *Dryas octopetala* (white dryas) as the shrub-layer dominant, generally abundant 21
20. *D. octopetala* not the shrub-layer dominant 23
21. Relatively mesic sites of protected slopes giving the impression of nearly total vegetation coverage (turf sites); *Polygonum viviparum* (alpine bistort), *P. bistortoides* (American bistort), *Zigadenus elegans* (glaucous death-camas) and *Oxytropis viscida* (sticky crazyweed) common, either singly or in any combination **Dryas octopetala / Polygonum viviparum p. a.**
21. Not as above, *P. viviparum*, *P. bistortoides*, *Z. elegans*, and *O. viscida* scarce; vegetation coverage various but not sparse 22
22. Sparsely vegetated sites of exposed positions (ridgetops, shoulders, saddles, etc.) with *Dryas octopetala* occurring in distinct clumps of highly variable coverage, usually surrounded by bare ground or gravel (rock pavement); commonly occurring forb-layer components include *Phlox pulvinata* (cushion phlox), *Oxytropis campestris* (slender crazyweed), *Minuartia obtusiloba* (= *Saxifraga obtusiloba*, Arctic sandwort), *Douglasia montana* (Rocky Mountain Douglasia); *Carex rupestris* (curly sedge) and *C. elynoides* (Kobresia-like sedge) dominate the sparse graminoid layer **Dryas octopetala / Carex rupestris p. a.**
22. Not as above **Undefined Dryas octopetala-dominated vegetation type**
23. Any of the following species well represented or constituting the dwarf-shrub layer dominant, *Atriplex gardneri* (Gardner's saltsage, formerly *A. nuttallii*), *Artemisia arbuscula* (low sagebrush), *A. arbuscula* ssp. *longiloba* (early low sagebrush), *A. nova* (black sagebrush), *A. pedatifida* (birdfoot sagebrush), *A. tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), *A. tripartita* (three-tip sagebrush) 31
23. Not as above; none of the named species well represented or constituting dwarf-shrub layer dominant 24

24.	<i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> (= <i>Pentaphylloides floribunda</i> , <i>Potentilla fruticosa</i> , shrubby cinquefoil) well represented (often partially obscured by lush herbaceous vegetation; other shrubby taxa may be well represented as well).....	25
24.	<i>D. fruticosa</i> poorly represented Undefined dwarf-shrub vegetation type	
25.	<i>Carex utriculata</i> (beaked sedge), <i>C. atherodes</i> (awned sedge), <i>C. vesicaria</i> (inflated sedge), <i>C. aquatilis</i> (water sedge), singly or combined cover at least 10%	
	..... <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> / <i>Carex utriculata</i> p. a.	
25.	<i>C. utriculata</i> , <i>C. atherodes</i> , <i>C. vesicaria</i> , and <i>C. aquatilis</i> poorly represented, singly or combined	26
26.	<i>Deschampsia cespitosa</i> (tufted hairgrass) common, or only present as scattered individuals under intensive grazing regimes.....	
	..... <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> / <i>Deschampsia cespitosa</i> p. a.	
26.	<i>D. cespitosa</i> scarce	27
27.	<i>Juncus balticus</i> (Baltic rush) well represented and dominating the herbaceous layer	
	..... <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> / <i>Juncus balticus</i> p. a.	
27.	<i>J. balticus</i> poorly represented and not the herbaceous layer dominant	28
28.	<i>Festuca campestris</i> (rough fescue, formerly <i>F. scabrella</i>) common, or only present as scattered individuals with intensive grazing	
	..... <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> / <i>Festuca campestris</i> p. a.	
28.	<i>F. campestris</i> scarce	29
29.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common with intensive grazing)	
	..... <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> / <i>Festuca idahoensis</i> p. a.	
29.	<i>F. idahoensis</i> poorly represented (or scarce under intensive grazing regime).....	30
30.	<i>Potentilla ovina</i> (sheep cinquefoil) common, the undergrowth dominant of a depauperate undergrowth; substrates may be water-scoured and eroded	
	..... <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i> / <i>Potentilla ovina</i> p. a.	
30.	<i>P. ovina</i> scarce and not the undergrowth dominant.....	
	..... Undefined <i>Dasiphora fruticosa</i> ssp. <i>floribunda</i>–dominated vegetation	
31.	<i>Atriplex gardneri</i> (= <i>A. nuttallii</i> , Gardner’s saltsage) well represented or the dwarf-shrub layer dominant.....	32
31.	<i>A. gardneri</i> poorly represented and not the dwarf-shrub layer dominant.....	33
32.	<i>Achnatherum hymenoides</i> (= <i>Oryzopsis hymenoides</i> , Indian ricegrass) common or the herbaceous layer dominant.....	
	..... <i>Atriplex gardneri</i> / <i>Achnatherum hymenoides</i> p. a.	
32.	<i>A. hymenoides</i> scarce and not the herbaceous layer dominant.....	
	..... Undefined <i>Atriplex gardneri</i> vegetation type	
33.	<i>Artemisia pedatifida</i> (birdfoot sagebrush) well represented or the dwarf-shrub layer dominant.....	34
33.	<i>A. pedatifida</i> poorly represented and not the dwarf-shrub layer dominant	35
34.	<i>Festuca idahoensis</i> (Idaho fescue) common	
	..... <i>Artemisia pedatifida</i> / <i>Festuca idahoensis</i> p. a.	
34.	<i>F. idahoensis</i> scarce	
	..... Undefined <i>Artemisia pedatifida</i> vegetation type	
35.	<i>Artemisia arbuscula</i> ssp. <i>arbuscula</i> (low sagebrush) or <i>A. arbuscula</i> ssp. <i>longiloba</i> (early low sagebrush) well represented or the dwarf-shrub layer dominants	36
35.	<i>A. arbuscula</i> ssp. <i>arbuscula</i> and <i>A. arbuscula</i> ssp. <i>longiloba</i> poorly represented or not the dwarf-shrub layer dominants	42

36.	<i>A. arbuscula</i> ssp. <i>longiloba</i> (early low sagebrush) well represented and dominates the dwarf-shrub layer.....	37
36.	<i>A. arbuscula</i> ssp. <i>longiloba</i> poorly represented and not the dwarf-shrub layer dominant	40
37.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common, if grazing intensity is high)	
	..... Artemisia arbuscula ssp. longiloba / Festuca idahoensis p. a.	
37.	<i>F. idahoensis</i> poorly represented (or scarce in the presence of intensive grazing).....	38
38.	<i>Elymus lanceolatus</i> (= <i>Agropyron dasystachyum</i> , thick-spike wheatgrass, formerly) or <i>Pascopyrum smithii</i> (= <i>Agropyron smithii</i> , western wheatgrass), individually or in combination, well represented and the dominant graminoids	
	..... Artemisia arbuscula ssp. longiloba / Elymus lanceolatus p. a.	
38.	<i>E. lanceolatus</i> and <i>P. smithii</i> , individually or their combined cover, poorly represented and not the dominant graminoids	39
39.	<i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , <i>Elymus spicatus</i> , bluebunch wheatgrass) having ° 5 % canopy cover	
	..... Artemisia arbuscula ssp. longiloba / Pseudoroegneria spicata	
39.	<i>P. spicata</i> having less than 5 % canopy cover.....	undefined
	..... Artemisia arbuscula ssp. longiloba c.t.	
Must renumber		
40.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (may be only common with intensive grazing)	
	..... Artemisia arbuscula ssp. arbuscula / Festuca idahoensis p. a.	
40.	<i>F. idahoensis</i> poorly represented	41
41.	<i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , <i>Elymus spicatus</i> , bluebunch wheatgrass) well represented	
	..... Artemisia arbuscula ssp. arbuscula / Pseudoroegneria spicata p. a.	
41.	<i>P. spicata</i> poorly represented	Undefined
	..... Artemisia arbuscula ssp. Arbuscula c.t.	
42.	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> (Wyoming big sagebrush) well represented and the dwarf-shrub layer dominant.....	43
42.	<i>A. tridentata</i> ssp. <i>wyomingensis</i> poorly represented or not the dwarf-shrub layer dominant	45
43.	<i>Elymus lanceolatus</i> (thick-spike wheatgrass, formerly <i>Agropyron dasystachyum</i>) or <i>Pascopyrum smithii</i> (western wheatgrass, formerly <i>Agropyron smithii</i>), individually or in combination, common and the dominant graminoids	
	..... Artemisia tridentata ssp. wyomingensis / Pascopyrum smithii p. a.	
43.	<i>E. lanceolatus</i> and <i>P. smithii</i> , individually or their combined cover, poorly represented and not the dominant graminoids	44
44.	<i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , <i>Elymus spicatus</i> , bluebunch wheatgrass) well represented (only common under intensive grazing) and, excepting <i>Poa secunda</i> (Sandberg's bluegrass) the dominant graminoid.....	
	..... Artemisia tridentata ssp. wyomingensis / Pseudoroegneria spicata p. a.	
44.	<i>P. spicata</i> poorly represented, not the dominant graminoid.....	
	..... Undefined Artemisia tridentata ssp. wyomingensis vegetation type	
45.	<i>Artemisia tripartita</i> ssp. <i>tripartita</i> (three-tip sagebrush) the dominant dwarf-shrub	46
45.	<i>A. tripartite</i> ssp. <i>tripartita</i> not the dominant dwarf-shrub	49
46.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (only common under intensive grazing)	
	..... Artemisia tripartita ssp. tripartita / Festuca idahoensis p. a.	
46.	<i>F. idahoensis</i> poorly represented	47
47.	<i>Elymus lanceolatus</i> (= <i>Agropyron dasystachyum</i> , thick-spike wheatgrass) or <i>Pascopyrum smithii</i> (= <i>Agropyron smithii</i> , western wheatgrass), individually or in combination, common and the dominant graminoids	
	..... Artemisia tripartita ssp. tripartita / Elymus lanceolatus p. a.	
47.	<i>E. lanceolatus</i> and <i>P. smithii</i> , individually or their combined cover, poorly represented and not the dominant graminoids	48

- 48. *Pseudoroegneria spicata* (= *Agropyron spicatum*, *Elymus spicatus*, bluebunch wheatgrass) well represented (only common under intensive grazing) and, excepting *Poa secunda* (Sandberg's bluegrass), is the dominant graminoid **Artemisia tripartite ssp. tripartita / Pseudoroegneria spicata**
- 48. *P. spicata* poorly represented, not the dominant graminoid.....**Undefined Artemisia tripartita-dominated vegetation type**

- 49. *Artemisia nova* (black sagebrush) well represented and the dominant dwarf-shrub 50
- 49. *A. nova* poorly represented and not the dominant dwarf-shrub 51

- 50. *Pseudoroegneria spicata* (= *Agropyron spicatum*, bluebunch wheatgrass) or *Achnatherum hymenoides* (= *Oryzopsis hymenoides*, Indian ricegrass) singly or in combination, common or the dominant graminoids, excepting *Poa secunda* (Sandberg's bluegrass)..... **Artemisia nova / Pseudoroegneria spicata p. a.**
- 50. *P. spicata* and *A. hymenoides*, singly or in combination, scarce and not the dominant graminoids **Undefined Artemisia nova-dominated vegetation type**

- 51. Re-enter dwarf-shrub key at beginning lead and re-evaluate the effects of grazing on diagnostic species; see next lead if stand remains unclassifiable on second pass.
- 51. Undefined dwarf-shrub types should be accumulated here!

KEY TO GRASSLAND PLANT ASSOCIATIONS INCLUDING UPLAND AND WETLAND TYPES

In addition to vegetation types dominated by members of the Poaceae (grasses) we **include here** communities dominated by members of the families Juncaceae (rush family, including *Juncus* spp. [rush], *Luzula* spp. [woodrush]), Cyperaceae (sedge family, including *Carex* spp. [sedge], *Cyperus* spp. [galingale], *Dulichium arundinaceum* [dulichium], *Eleocharis* spp. [spike rush], *Eriophorum* spp. [cotton grass], *Kobresia* spp. [kobresia], *Scirpus* spp. [bulrush], Typhaceae (cattail family, *Typha* spp. [cattails], Juncaginaceae (arrow grass family, including *Lilaea scilloides* (flowering quillwort) and *Triglochin* spp. [arrow grass]). **Not included** as „graminoid“ types are vegetation types named for members of the ferns and „fern allies“ including Equisetaceae (horsetail family), Lycopodiaceae (club moss family), Marsileaceae (pepperwort family), Ophioglossaceae (grape fern family), Polypodiaceae (fern family), Selaginellaceae (spike moss family); these herbaceous, non-graminoid groups are found under forbs

1. Sites ranging from temporarily flooded to permanently saturated, includes all wetlands (and some near-wetlands) wherein a graminoid is the first designated diagnostic species; sites dominated by or supporting as a diagnostic taxon any of the following species

Agrostis stolonifera (redtop)
Bromus inermis (smooth brome)
Calamagrostis canadensis (bluejoint reedgrass), *C. stricta* (narrow-spiked reedgrass)
Carex aperta (Columbia sedge), *C. aquatilis* (water sedge), *C. atherodes* (awned sedge), *C. buxbaumii* (Buxbaum's sedge), *C. lanuginosus* (woolly sedge), *C. lasiocarpa* (slender sedge), *C. lenticularis* (lentil-fruit sedge), *C. limosa* (mud sedge), *C. nebrascensis* (Nebraska sedge), *C. praegracilis* (clustered field sedge), *C. scopulorum* (Holm's Rocky Mountain sedge), *C. simulata* (short-beaked sedge), *C. utriculata* (beaked sedge), *C. vesicaria* (inflated sedge)
Deschampsia cespitosa (tufted hairgrass)
Distichlis spicata (inland saltgrass)
Eleocharis acicularis (needle spike-rush), *E. palustris* (common spikesedge), *E. quinqueflora* (formerly *E. pauciflora*, few-flowered spike-rush), *E. rostellata* (beaked spike-rush)
Glyceria borealis (northern mannagrass)
Hordeum jubatum (foxtail barley)
Juncus balticus (Baltic rush)
Leymus cinereus (formerly *Elymus cinereus*, basin wildrye)
Pascopyrum smithii (western wheatgrass)
Phalaris arundinacea (reed canarygrass)
Poa pratensis (Kentucky bluegrass), *P. palustris* (fowl bluegrass)
Scirpus acutus (hardstem bulrush), *S. tabernaemontani* (formerly *S. validus*, softstem bulrush)
Sporobolus airoides (alkali sacaton)
Typha angustifolia (narrow-leaved cattail), *Typha latifolia* (common cattail)

- 2
1. Sites drier than described above or occurring at the highest elevations of the subalpine zone (above the distribution of *Pseudotsuga menziesii* [Douglas-fir] as a climax species **and** at the upper distribution limits of *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) **and**, with the exception of *Deschampsia cespitosa* (tufted hairgrass) in the sub-alpine/alpine, not supporting any of the above-listed species as dominants or diagnostic spp. see following section with subheading **GRAMINOID-DOMINATED COMMUNITIES: UPLANDS, HIGH-SUBALPINE, AND ALPINE**

Note: Leads 2 through 10 key to wetland plant associations with *Carex* spp. (sedges) as diagnostic species

2. *Carex* spp. (sedge species) listed in #1, individually or their combined canopy cover at least 25% or these taxa dominant 3
2. *Carex* spp. having less than 25% single or combined cover and not dominant 11
3. *Carex utriculata* (beaked sedge), *C. vesicaria* (inflated sedge), *C. atherodes* (awned sedge), individually or their combined cover, at least 25% **Carex utriculata p. a.** (see a, b, c)
 - a. *Carex aquatilis* (water sedge), *C. lenticularis* (lentil-fruit sedge) and grass species, individually or in combination having less than 5% cover Carex utriculata phase
 - b. *Carex aquatilis* and *C. lenticularis*, singly or combined, at least well represented Carex aquatilis phase

- c. *C. aquatilis* and *C. lenticularis*, singly or combined, poorly represented; grass species or *Juncus balticus* (Baltic rush) well represented, either as single species or their combined cover *Deschampsia cespitosa* phase
3. *C. utriculata*, *C. vesicaria*, and *C. atherodes*, individually or their combined cover, less than 25% 4
 4. *Carex aquatilis* (water sedge), *C. aperta* (Columbia sedge) and *C. lenticularis* (lentil-fruited sedge), as individual species or combined, having at least 25% canopy cover . ***Carex aquatilis* p. a.**(see a & b)
 - a. *Juncus balticus* (Baltic rush) and grass species, as lone species or in combination, having less than 5% canopy cover *Carex aquatilis* phase
 - b. *J. balticus* or grass species having at least 5% canopy cover *Deschampsia cespitosa* phase
 4. *C. aquatilis*, *C. aperta*, and *C. lenticularis*, individually or combined, having less than 25% cover 5
 5. *Carex limosa* (mud sedge) having at least 25% canopy cover ***Carex limosa* p. a.**
 4. *C. limosa* having less than 25% canopy cover 6
 6. *Carex lasiocarpa* (slender sedge), *C. lanuginosa* (woolly sedge), and *C. buxbaumii* (Buxbaum's sedge), individually or in any combination, having at least 25% canopy cover ... ***Carex lasiocarpa* p. a.**
 6. *C. lasiocarpa*, *C. lanuginosa*, and *C. buxbaumii*, individually or in combination, having less than 25% canopy cover 7.
 7. *Carex simulata* (short-beaked sedge) having at least 25% canopy cover ***Carex simulata* p. a.**
 7. *C. simulata* having less than 25% canopy 8
 8. *Carex scopulorum* (Holm's Rocky Mountain sedge) having 25% or greater canopy cover ***Carex scopulorum* p. a.**
 8. *C. scopulorum* having less than 25% canopy cover 9
 9. *Carex nebrascensis* (Nebraska sedge) with a greater canopy cover than any other individual sedge species ***Carex nebrascensis* p. a.**
 9. *C. nebrascensis* having less canopy cover than other sedge species present 10
 10. Site with at least one of the following wetland attributes present; hydrophytic vegetation, hydric soils, wetland hydrology **Unclassified wetland or riparian site**
 10. Site lacking any of the above listed wetland attributes **Upland site (see second item of lead #1)**

Note: Leads 11 through 35 key to wetland (or near-wetland) plant associations wherein *Carex* spp. are not the diagnostic species

11. *Typha latifolia* (common cattail) or *T. angustifolia* (narrow-leaved cattail), individually or their combined canopy cover, at least 25% **or** constituting the dominant vegetation ***Typha latifolia* p. a.**
11. *T. latifolia* and *T. angustifolia* having less than 25% canopy cover and not constituting the dominant vegetation 12
12. *Scirpus acutus* (hardstem bulrush) or *S. tabernaemontani* (formerly *S. validus*, softstem bulrush), individually or in combination, constitute the dominant vegetation ***Scirpus acutus* p. a.**
12. *S. acutus* and *S. tabernaemontani*, individually or in combination, not the dominant species 13
13. *Phalaris arundinacea* (reed canarygrass) having 25 % canopy cover or is the dominant species ***Phalaris arundinacea* p. a.**
13. *P. arundinacea* having less than 25% canopy cover and not the dominant species 14.
14. *Equisetum fluviatile* (water horsetail) having at least 25% canopy or is the dominant species ***Equisetum fluviatile* p. a.**
14. *E. fluviatile* having less than 25% canopy cover and not the dominant species 15
15. *Eleocharis palustris* (common spikeweed) or *E. acicularis* (needle spike-rush), individually or in combination, having 25% canopy cover or constitute the dominant species 15

.....	<i>Eleocharis palustris</i> p. a.	
15. <i>E. palustris</i> and <i>E. acicularis</i> , individually or in concert, with less than 25% canopy cover and not dominant.....		16
16. <i>Eleocharis quinqueflora</i> (= <i>Eleocharis pauciflora</i> , few-flowered spike-rush) and <i>E. rostellata</i> (beaked spike-rush), individually or in combination, having 25% canopy cover or constituting the dominant species	<i>Eleocharis quinqueflora</i> p.a.	
16. <i>E. pauciflora</i> and <i>E. rostellata</i> having less than 25% canopy cover and not the dominant species		17
17. <i>Glyceria borealis</i> (northern mannagrass) with at least 25% canopy cover or the dominant graminoid.....		
.....	<i>Glyceria borealis</i> p. a.	
17. <i>G. borealis</i> having less than 25% canopy cover and not the dominant graminoid		18
18. <i>Calamagrostis canadensis</i> (bluejoint reedgrass) or <i>C. stricta</i> (narrow-spiked reedgrass), individually or in concert, having at least 25% canopy cover or constituting the dominant graminoids		
.....	<i>Calamagrostis canadensis</i> p. a.	
18. <i>C. canadensis</i> and <i>C. stricta</i> having less than 25% cover, individually or combined, and not the dominant graminoids		19
19. <i>Deschampsia cespitosa</i> (tufted hairgrass) having at least 15% canopy cover and constituting the dominant graminoid	<i>Deschampsia cespitosa</i> p. a.	
19. <i>D. cespitosa</i> having less than 15% cover and is not the dominant graminoid		20.
20. <i>Juncus balticus</i> (Baltic rush) the dominant graminoid		21
20. <i>J. balticus</i> not the dominant graminoid.....		23
21. <i>Carex praegracilis</i> (clustered field sedge) or <i>Muhlenbergia richardsonis</i> (mat muhly), individually or combined canopy cover, well represented.....	<i>Juncus balticus</i> – <i>Carex praegracilis</i> p. a.	
21. <i>C. praegracilis</i> and <i>M. richardsonis</i> , their individual or combined coverage, poorly represented.....		22
22. <i>Juncus balticus</i> (Baltic rush) virtually a monospecific dominant, other species characteristically having less than 5% cover; generally occurring on continuously flooded or saturated soils, often drawdown zones of limnic environments		
.....	<i>Juncus balticus</i> c.t.	
22. <i>J. balticus</i> not a monospecific dominant; other graminoids and forbs occupying the site, though they may not be as dominant as <i>J. balticus</i>	<i>Juncus balticus</i> c.t.	
Note: Both leads of the couplet above yield the <i>Juncus balticus</i> type because that is where the Montana treatment by Hansen et al. 1995 now stands; this approach needs revision.		
23. <i>Distichlis spicata</i> (= <i>D. stricta</i> , inland saltgrass) having at least 15% canopy cover or dominating the graminoid layer	<i>Distichlis spicata</i> p. a.	
23. <i>D. spicata</i> having less than 15% cover and not the graminoid layer dominant		24.
24. <i>Leymus cinereus</i> (giant wildrye, formerly <i>Elymus cinereus</i>) well represented (characteristically on temporarily or seasonally flooded sites		25
24. <i>L. cinereus</i> poorly represented.....		26
25. <i>Puccinellia nuttalliana</i> (Nuttall's alkaligrass) or <i>P. distans</i> (weeping alkaligrass) or <i>Poa secunda</i> (Sandberg's bluegrass, formerly <i>Poa juncifolia</i> , alkali bluegrass), their individual or combined coverage well represented or dominant.....	<i>Leymus cinereus</i> – <i>Puccinellia nuttalliana</i> p. a.	
25. Not as above, <i>P. nuttalliana</i> , <i>P. distans</i> and <i>P. secunda</i> poorly represented and not dominant.....		
.....	Undefined <i>Leymus cinereus</i> vegetation type	
26. <i>Puccinellia nuttalliana</i> (Nuttall's alkaligrass) well represented or dominant; alkaline seeps or flats.....		
.....	<i>Puccinellia nuttalliana</i> p. a.	

- 26. *P. nuttalliana* poorly represented and not dominant27
- 27. *Sporobolus airoides* (alkali sacaton) well represented or the dominant graminoid; typically on seasonally flooded alkaline seeps or alluvial flats..... ***Sporobolus airoides* p. a.**
- 27. *S. airoides* poorly represented and not the dominant graminoid28
- 28. *Pascopyrum smithii* (western wheatgrass, formerly *Agropyron smithii*) well represented or dominant graminoid; characteristic of basins or swales or alluvial flats (usually with heavy-textured soils) ***Pascopyrum smithii* / alluvial flat p. a.**
- 28. *P. smithii* poorly represented and not the dominant graminoid.....29
- 29. *Poa secunda* (Sandberg's bluegrass, formerly *Poa juncifolia* or *P. secunda* ssp. *juncifolia*, alkali bluegrass) well represented and dominant of graminoid layer; community characteristic of seasonally or temporarily flooded alluvial flats ***Poa secunda* p. a.**
- 29. *P. secunda* poorly represented and not dominant graminoid 30

Note: At lead 30 begins a section of wetland (or near wetland) vegetation types characterized by introduced graminoids.

- 30. *Poa palustris* (fowl bluegrass) having a greater canopy cover than other individual herbaceous species ***Poa palustris* c. t.**
- 30. *P. palustris* canopy cover less than that of other herbaceous species 31
- 31. *Agrostis stolonifera* (redtop) having a greater canopy cover than that of other individual herbaceous species ***Agrostis stolonifera* c. t.**
- 31. *A. stolonifera* canopy cover less than that of other herbaceous species32
- 32. *Hordeum jubatum* (foxtail barley) having a greater canopy cover than that of other individual species ... ***Hordeum jubatum* c. t.**
- 32. *H. jubatum* canopy cover less than that of other herbaceous species 33
- 33. *Bromus inermis* (smooth brome) having a greater canopy cover than that of other individual species ***Bromus inermis* c. t.**
- 33. *B. inermis* canopy cover less than that of other herbaceous species 34
- 34. *Poa pratensis* (Kentucky bluegrass)) having a greater canopy cover than other individual herbaceous species ***Poa pratensis* c. t.**
- 34. *P. pratensis* canopy cover less than that of other herbaceous species.....35
- 35. Sites possessing at a minimum one of the following wetland criteria: hydrophytic vegetation, wetland hydrology, hydric soils **Unclassified or unreported wetland or riparian site** (see also „Riparian Dominance Types of Montana“ [Hansen et al. 1988] to identify and describe the site)
- 35. Sites lacking all of the above-cited wetland criteria **Upland site**

GRAMINOID-DOMINATED COMMUNITIES; UPLANDS AND INCLUDING VARIOUS HIGH-SUBALPINE AND ALPINE ENVIRONMENTS

- 1. Sites ranging from moist uplands to seasonally saturated flats and seeps (including jurisdictional wetlands); dominated by any one of the following species, *Juncus balticus* (Baltic rush), *Deschampsia cespitosa* (tufted hairgrass), *Carex praegracilis* (clustered field sedge), *Muhlenbergia richardsonis* (mat muhly), *Hordeum jubatum* (foxtail barley), *Leymus cinereus* (giant or basin wildrye), *Pascopyrum smithii* (western wheatgrass), *Puccinellia nuttalliana* (Nuttall's alkaligrass), *P.*

	<i>distans</i> (weeping alkaligrass): this lead provided in case user has trouble distinguishing upland from wetlands	2
1.	Sites drier than described above or occurring at highest elevations of subalpine zone (above distribution of <i>Pseudotsuga menziesii</i> (Douglas-fir) as climax species, upper distribution of <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> [mountain big sagebrush]) upward into alpine and, with the exception of <i>D. cespitosa</i> in the sub-alpine/alpine, not supporting any of the above listed species as dominants.....	15
2.	<i>Deschampsia cespitosa</i> (tufted hairgrass) well represented (only common if grazing intensive)	3
2.	<i>D. cespitosa</i> poorly represented	5
3.	<i>Potentilla diversifolia</i> (diverse-leaved cinquefoil) common or <i>Phleum alpinum</i> (alpine timothy) and <i>Trisetum spicatum</i> (spike trisetum) present; <i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) not present; high subalpine to alpine meadows	<i>Deschampsia cespitosa</i> / <i>Potentilla diversifolia</i> p.a.
3.	<i>P. diversifolia</i> scarce, <i>P. alpinum</i> and <i>T. spicatum</i> absent; habitats various	4
4.	<i>Carex</i> spp. (sedge species, e.g) well represented or the dominant graminoids along with <i>D. cespitosa</i>	<i>Deschampsia cespitosa</i> – <i>Carex</i> spp.
4.	Not as above, <i>Carex</i> spp. not the dominant graminoids	see a & b below
	a. <i>Festuca idahoensis</i> (Idaho fescue) well represented (or only common under intensive grazing)	<i>Festuca idahoensis</i> – <i>Deschampsia cespitosa</i> p. a.
	b. <i>F. idahoensis</i> poorly represented (the following type represents largely lower elevation sites too wet to support <i>F. idahoensis</i> , yet not formal wetlands)	<i>Deschampsia cespitosa</i> p. a. (as described by Hansen et al. [1995])
5.	<i>Juncus balticus</i> (Baltic rush) is well represented	6
5.	<i>J. balticus</i> poorly represented	8
6.	<i>Carex praegracilis</i> (clustered field sedge) or <i>Muhlenbergia richardsonis</i> (mat muhly), individually or combined, well represented	<i>Juncus balticus</i>-<i>Carex praegracilis</i> p.a.
6.	<i>C. praegracilis</i> and <i>M. richardsonis</i> , individually or combined cover, well represented.....	7
7.	<i>Juncus balticus</i> (Baltic rush) virtually a monospecific dominant, among the few species present (<5); characteristically of drawdown zones of lemnic environments (includes just the most depauperate stands incorporated in Hansen et al. [1995])	<i>Juncus balticus</i> p.a.
7	<i>J. balticus</i> not a monospecific dominant; other graminoids and forbs occupying the site, though their canopy cover may be less than that of <i>J. balticus</i> (includes most of the <i>J. balticus</i> community type as conceived of by Hansen et al. [1995]).....	<i>Juncus balticus</i> p. a.
Note: Both leads of the couplet above yield the <i>Juncus balticus</i> type because that is where the Montana treatment by Hansen et al. 1995 now stands; this approach needs revision.		
8.	<i>Distichlis spicata</i> (inland saltgrass, formerly <i>D. stricta</i>) having at least 15% canopy cover or dominating the graminoid layer.....	<i>Distichlis spicata</i> p. a.
8.	<i>D. spicata</i> having less than 15% canopy cover and not the dominant graminoid.....	9
9.	<i>Leymus cinereus</i> (giant wildrye, formerly <i>Elymus cinereus</i>) well represented (characteristically on temporarily or seasonally flooded sites	10
9.	<i>L. cinereus</i> poorly represented.....	11
10.	<i>Puccinellia nuttalliana</i> (Nuttall's alkaligrass) or <i>P. distans</i> (weeping alkaligrass) or <i>Poa secunda</i> (Sandberg's bluegrass, formerly <i>Poa juncifolia</i> , alkali bluegrass), their individual or combined coverage well represented or dominant.....	<i>Leymus cinereus</i> – <i>Puccinellia nuttalliana</i> p. a.
10.	Not as above, <i>P. nuttalliana</i> , <i>P. distans</i> and <i>P. secunda</i> poorly represented and not dominant.....	Undefined <i>Leymus cinereus</i> vegetation type
11.	<i>Puccinellia nuttalliana</i> (Nuttall's alkaligrass) well represented or dominant; alkaline seeps or flats.....	<i>Puccinellia nuttalliana</i> p. a.

11.	<i>P. nuttalliana</i> poorly represented and not dominant	12
12.	<i>Sporobolus airoides</i> (alkali sacaton) well represented or the dominant graminoid; typically on seasonally flooded alkaline seeps or alluvial flats.....	<i>Sporobolus airoides</i> p. a.
12.	<i>S. airoides</i> poorly represented and not the dominant graminoid	13
13.	<i>Pascopyrum smithii</i> (western wheatgrass, formerly <i>Agropyron smithii</i>) well represented or dominant graminoid; characteristic of basins or swales or alluvial flats (usually with heavy-textured soils)	<i>Pascopyrum smithii</i> Herbaceous Vegetation
13.	<i>P. smithii</i> poorly represented and not the dominant graminoid.....	14
14.	<i>Poa secunda</i> (Sandberg's bluegrass, only taxa formerly known as <i>Poa juncifolia</i> or <i>P. secunda</i> ssp. <i>juncifolia</i> , alkali bluegrass, or <i>P. nevadensis</i>) well represented and dominant of graminoid layer; community characteristic of seasonally or temporarily flooded alluvial flats	<i>Poa secunda</i> p. a.
14.	<i>P. secunda</i> poorly represented and not dominant graminoid .....	... See lead #30 in the initial portion of "KEY TO GRASSLAND TYPES, UPLAND AND WETLAND" that treats wetlands
15.	Communities of high subalpine to alpine sites, generally above 8,500 ft., or if occurring lower then associated with windswept shoulders and ridges	40
15.	Not as above, communities of elevations generally considered to lie below the upper subalpine, roughly less than 8,500 ft. at this latitude and in this climatic regime	16
16.	<i>Bromus marginatus</i> (= <i>B. carinatus</i> , mountain brome) or <i>B. anomalus</i> (nodding brome) well represented, individually or collectively (other graminoids may be dominant).....	<i>Bromus marginatus</i> – <i>Bromus anomalus</i> p. a.
16.	<i>B. marginatus</i> or <i>B. anomalus</i> poorly represented, individually or collectively	17
17.	<i>Achnatherum richardsonii</i> (= <i>Stipa richardsonii</i> , Richardson's needlegrass) abundant (only well represented if under even moderate grazing intensity).....	18
17.	<i>A. richardsonii</i> not abundant (and poorly represented in the presence of grazing)	19
18.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (or common if grazing intensive	<i>Festuca idahoensis</i> - <i>Achnatherum richardsonii</i> p. a.
Note , the above community largely replaces <i>A. richardsonii</i> – <i>Festuca idahoensis</i> (which has been archived by NATURESERVE)		
8.	<i>F. idahoensis</i> poorly represented.....	Undefined <i>A. richardsonii</i> vegetation type
19.	<i>Festuca campestris</i> (= <i>F. scabrella</i> , rough fescue) well represented (only common under intensive grazing).....	20
19.	<i>F. campestris</i> poorly represented (or scarce under grazing)	22
20.	<i>Festuca idahoensis</i> (Idaho fescue) well represented, <i>Pseudoroegneria spicata</i> (formerly <i>Agropyron spicata</i> , bluebunch wheatgrass), if present, with less cover than <i>F. idahoensis</i>	<i>Festuca campestris</i> - <i>Festuca idahoensis</i> p.a.
20.	<i>F. idahoensis</i> (Idaho fescue) poorly represented, <i>P. spicata</i> (bluebunch wheatgrass) common or at least equal in cover to <i>F. idahoensis</i>	21
21.	<i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , bluebunch wheatgrass) common (reduced to scattered individuals with intensive grazing).....	<i>Festuca campestris</i> - <i>Pseudoroegneria spicata</i> p.a.
21.	<i>P. spicatum</i> scarce	Undefined/unreported p.a./c.t. within <i>Festuca campestris</i> alliance
22.	<i>Festuca idahoensis</i> (Idaho fescue) well represented (or only common under intensive grazing).....	23
22.	<i>F. idahoensis</i> poorly represented (or scarce under intensive grazing); <i>D. cespitosa</i> absent	27
23.	<i>Potentilla diversifolia</i> (diverse-leaved cinquefoil), <i>Carex scirpoidea</i> (Canadian single-spike sedge), <i>C. filifolia</i> (thread-leaved sedge) or <i>Phleum alpinum</i> (alpine timothy), their single or combined cover, common; sites at higher reaches of subalpine extending to alpine, extending lower on cold, exposed	

sites (includes portions of two Mueggler & Stewart (1980) types, <i>F. idahoensis</i> - <i>Carex scirpoidea</i> p.a. (hypothesized) and <i>F. idahoensis</i> - <i>Carex filifolia</i> p.a. (verified)).....	<i>Festuca idahoensis</i> / <i>Potentilla diversifolia</i> p.a.
23. <i>P. diversifolia</i> , <i>C. scirpoidea</i> , <i>C. filifolia</i> , <i>P. alpinum</i> scarce, either individual or combined cover; sites not of alpine to high subalpine, or not exposed or colder than prevailing climate	24
24. <i>Geranium viscosissimum</i> (sticky geranium) and <i>Potentilla gracilis</i> (slender cinquefoil) present and/or <i>Bromus marginatus</i> (<i>B. carinatus</i> , mountain brome), <i>B. anomalus</i> (nodding brome) or <i>Elymus trachycaulus</i> (formerly <i>Agropyron caninum</i> , bearded wheatgrass) common, individually or combined	<i>Festuca idahoensis</i> – <i>Elymus trachycaulus</i> p.a.
24. Not as above	25
25. <i>Pascopyrum smithii</i> (= <i>Agropyron smithii</i> , western wheatgrass) or <i>Elymus lanceolatus</i> (= <i>Agropyron dasystachyum</i> , thick-spike wheatgrass), their individual or combined cover, common.....	<i>Festuca idahoensis</i> / <i>Pascopyrum smithii</i> p.a.
25. <i>P. smithii</i> and <i>A. dasystachyum</i> , their individual or combined cover, scarce.....	26
26. <i>Pseudoroegneria spicata</i> (= <i>Agropyron spicatum</i> , bluebunch wheatgrass) common (accept merely present under intensive grazing regime).....	<i>Festuca idahoensis</i> - <i>Pseudoroegneria spicata</i> p.a.
26. <i>P. spicata</i> scarce	Undefined/unreported <i>Festuca idahoensis</i> vegetation type
27. <i>Pascopyrum smithii</i> (western wheatgrass) or <i>Elymus lanceolatus</i> (= <i>Agropyron dasystachyum</i> , thick-spike wheatgrass), their individual or combined cover, common.....	28
27. <i>P. smithii</i> and <i>E. lanceolatus</i> scarce except in stands where <i>P. spicata</i> well represented.....	30
28. <i>Pascopyrum smithii</i> (western wheatgrass) a nearly monospecific dominant of gentle flats and bottomlands with fine-textured (heavy) soils	<i>Pascopyrum smithii</i> Herbaceous Vegetation
28. <i>P. smithii</i> not virtually the only species of importance, sites including more than fine-textured bottomlands	29
29. <i>Elymus lanceolatus</i> (thick-spike wheatgrass) common and usually dominant component of early seral stages on sandy substrates.....	<i>Elymus lanceolatus</i> / <i>Phacelia hastata</i> p.a.
29. <i>Elymus lanceolatus</i> scarce and/or not dominant	<i>P. smithii</i> and/or <i>E. lanceolatus</i> vegetation types not currently recognized for Beaverhead Mtns. Section
30. <i>Pseudoroegneria spicata</i> (bluebunch wheatgrass) well represented (only common under intensive grazing, or where badland conditions or a high cover of exposed substrate, usually gravel, exists)	31
30. <i>A. spicatum</i> poorly represented (or scarce with grazing).....	36
31. Rhizomatous wheatgrasses, principally <i>Elymus lanceolatus</i> (thick-spike wheatgrass) and <i>Pascopyrum smithii</i> (western wheatgrass) common.....	<i>Pseudoroegneria spicata</i> - <i>Pascopyrum smithii</i> p.a.
31. Rhizomatous wheatgrasses scarce	32
32. <i>Bouteloua gracilis</i> (blue grama) well represented. <i>Pseudoroegneria spicata</i> - <i>Bouteloua gracilis</i> p.a.	
32. <i>B. gracilis</i> poorly represented.....	33
33. <i>Achnatherum hymenoides</i> (= <i>Oryzopsis hymenoides</i> , Indian ricegrass) present; sites either badlands with naturally (mostly) eroded conditions or excessively drained sandy soils	<i>Pseudoroegneria spicata</i> - <i>Achnatherum hymenoides</i> p.a.
33. <i>A. hymenoides</i> absent, sites not as above.....	34
34. Ridge shoulders or convexities exposed to prevailing winds (usually with soil deflation and much, 60%+, exposed substrate); at or below the upper subalpine zone; cushion plants (e.g <i>Eritrichium nanum</i> , <i>Douglasia montana</i> , <i>Townsendia</i> spp.) or compact forbs (e.g. <i>Oxytropis campestris</i> ,	

	<i>Stenotus acaulis</i> [formerly <i>Haplopappus acaulis</i>] dominate the undergrowth; graminoid component far reduced relative to forbs	
	..... <i>Pseudoroegneria spicata</i> / Cushion Plants p.a.	
34.	Not as above	35
35.	<i>Poa secunda</i> (= <i>P. sandbergii</i> , Sandberg's bluegrass) present, usually graminoid 2nd in importance to <i>Pseudoroegneria spicata</i> (bluebunch wheatgrass); <i>Hesperostipa</i> (= <i>Stipa</i>) <i>comata</i> (needle-and-thread) or <i>Hesperostipa</i> (<i>Stipa</i>) <i>spartea</i> (porcupine-grass) may be conspicuous components on lower alluvial slopes and benches and bottoms	<i>Pseudoroegneria spicata</i> - <i>Poa secunda</i> p.a.
35.	<i>P. secunda</i> absent, not as above	Undefined/unreported <i>Pseudoroegneria spicata</i> vegetation type
36.	<i>Hesperostipa</i> (= <i>Stipa</i>) <i>comata</i> (needle-and-thread) or <i>H. spartea</i> (= <i>S. spartea</i> , porcupine grass) and/or <i>Bouteloua gracilis</i> (blue grama) the dominant graminoids	37
36.	<i>H. comata</i> , <i>H. spartea</i> and <i>B. gracilis</i> not the dominant graminoids	39
37.	<i>Psoraleidium tenuiflorum</i> (= <i>Psoralea tenuiflora</i> , slender-flowered scurf-pea) present, usually the dominant forb in depauperate vegetation; substrate sandy	
	..... <i>Hesperostipa comata</i> / <i>Psoraleidium tenuiflorum</i> p. a.	
37.	<i>P. tenuiflorum</i> absent	38
38.	<i>Bouteloua gracilis</i> (blue grama) common	<i>Hesperostipa comata</i> - <i>Bouteloua gracilis</i> p.a.
38.	<i>B. gracilis</i> scarce	Undefined / unreported <i>Stipa comata</i> vegetation type
39.	<i>Distichlis spicata</i> (= <i>D. stricta</i> , Inland saltgrass) common, usually the dominant graminoid in salt-or alkali-affected sites	<i>Distichlis spicata</i> p.a.
39.	<i>D. spicata</i> poorly represented, may not be the dominant graminoid	Undefined / unreported herbaceous p.a./c.t. for southwestern MT

Note: from lead 40 to 66 the vegetation types treated are of subalpine to alpine environments, both wetlands and uplands

40.	Stands dominated by graminoids (grasses, sedges, rushes etc.)	41
40.	Stands not graminoid-dominated, but rather by forbs	
	..... see „ KEY TO PERENNIAL FORB VEGETATION INCLUDING UPLAND AND WETLAND TYPES ”%	
41.	Wetland sites with a floristic composition and/or soils/hydrology meeting wetland criteria	42
41.	Sites not wetlands, not meeting wetland criteria	44
42.	Wetland sites dominated by <i>Carex scopulorum</i> (Holm's Rocky Mountain sedge) <i>C. aquatilis</i> (water sedge), <i>C. lenticularis</i> (lentil-fruit sedge) or <i>C. aperta</i> (Columbia sedge), singly or in combination	43
42.	Site not dominated by any combination of the above-listed species	
	..... Undefined Graminoid-dominated Wetland	
43.	Site dominated by <i>Carex scopulorum</i> (Holm's Rocky Mountain sedge)	44
43.	Site not dominated by <i>C. scopulorum</i>	45
44.	<i>Caltha leptosepala</i> (elkslip marsh-marigold) or <i>Senecio cymbalarioides</i> (few-leaved groundsel), singly or combined, well represented	<i>Carex scopulorum</i> / <i>Caltha leptosepala</i> p. a.
44.	<i>C. leptosepala</i> and <i>S. cymbalarioides</i> poorly represented	
	..... Undefined <i>Carex scopulorum</i> vegetation type	
45.	Sites dominated by or having greater canopy cover of <i>Carex simulata</i> (short-beaked sedge) than any other single graminoid	<i>Carex simulata</i> p. a.
45.	Sites dominated by graminoids other than <i>C. simulata</i>	46

46.	<i>Carex aquatilis</i> (water sedge), <i>C. lenticularis</i> (lentil-fruit sedge) or <i>C. aperta</i> (Columbia sedge), singly or in combination, dominant or well represented	Carex aquatilis p. a. (see a & b below)	
	a. Grass species or <i>Juncus balticus</i> (Baltic rush), alone or in combination, poorly represented.....		
	.....	Carex aquatilis Phase	
	b. Grass species and <i>J. balticus</i> , alone or in combination, poorly represented.....		
	.....	Deschampsia cespitosa Phase	
46.	<i>C. aquatilis</i> , <i>C. lenticularis</i> , and <i>C. aperta</i> , singly or in combination, poorly represented and not dominant.....		47
47.	Snowbed communities (sites with greater accumulations of snow than other landscape positions and/or later melt-off of snow).....		48
47.	Not snowbed sites, not characterized by above average snow deposition or late melt-off		51
48.	Sites where snow is very long-persisting (longer than any other vegetated position) and <i>Carex nigricans</i> (black alpine sedge) is dominant and usually abundant.....	Carex nigricans p. a.	
48.	<i>C. nigricans</i> scarce, not the canopy dominant		49
49.	Snowbed sites often with depauperate herb cover, with <i>Juncus drummondii</i> (Drummond's rush), <i>Antennaria lanata</i> (woolly pussy-toes) and/or <i>Sibbaldia procumbens</i> (creeping sabbaldia) present and dominant.....	Juncus drummondiana / Antennaria lanata p. a.	
49.	Snowbed sites but not as above, lacking <i>J. drummondii</i> , <i>A. lanata</i> and <i>S. procumbens</i> as dominants....		50
50.	<i>Juncus parryi</i> (Parry's rush) the dominant graminoid with <i>Erigeron ursinus</i> (Bear River fleabane) common and consistently the dominant forb, though cover seldom exceeds 5%	Juncus parryi / Erigeron ursinus p. a.	
50.	<i>J. parryi</i> not the dominant graminoid and <i>E. ursinus</i> not dominant forb	Undefined Snowbed Sites	
51.	Stands dominated by one, or combinations, of the following six graminoids <i>Deschampsia cespitosa</i> (tufted hairgrass), <i>Festuca idahoensis</i> (Idaho fescue), <i>Festuca kingii</i> (spike-fescue, formerly <i>Hesperochloa kingii</i> or <i>Leucopoa kingii</i>) <i>Bromus inermis</i> var. <i>pumpellianus</i> (formerly <i>B. pumpellianus</i> , pumpelly brome), <i>Juncus balticus</i> (Baltic rush) or <i>Carex obtusata</i> (blunt sedge)		52
51.	Stands not dominated by any one, or combination, of the above listed graminoid species		59
52.	<i>Deschampsia caespitosa</i> (tufted hairgrass) well represented, the dominant graminoid of moist to wet meadows		53
52.	<i>D. caespitosa</i> poorly represented and not the dominant graminoid		55
53.	<i>Caltha leptosepala</i> (elkslip marsh-marigold) and/or <i>Senecio cymbalarioides</i> (few-flowered groundsel), singly or in combination, well represented or dominating the forb layer of wet meadows.....	Deschampsia caespitosa / Caltha leptosepala p. a.	
53.	<i>C. leptosepala</i> and <i>S. cymbalarioides</i> , alone or combined cover not dominant and poorly represented..		54
54.	<i>Potentilla diversifolia</i> (diverse-leaved cinquefoil) common	Deschampsia caespitosa / Potentilla diversifolia p. a.	
54.	<i>P. diversifolia</i> scarce	Undefined Deschampsia caespitosa vegetation type	
55.	<i>Festuca idahoensis</i> (Idaho fescue), <i>Carex obtusata</i> (blunt sedge), or <i>Bromus inermis</i> var. <i>pumpellianus</i> (pumpelly brome, formerly <i>B. pumpellianus</i>) or any combination of the three well represented or comprising the dominant graminoids		56
55.	Neither <i>F. idahoensis</i> , <i>C. obtusata</i> nor <i>B. inermis</i> var. <i>pumpellianus</i> or any combination of the three dominating the graminoid component.....		57
56.	<i>Potentilla diversifolia</i> (diverse-leaved cinquefoil) common	Festuca idahoensis / Potentilla diversifolia p. a.	

56. *P. diversifolia* scarce **Undefined *Festuca idahoensis* vegetation type**
57. *Festuca kingii* (spike fescue, formerly *Hesperochloa kingii* or *Leucopoa kingii*) the graminoid with greatest coverage in rather depauperate communities..... 58
57. *F. kingii* not the indicated dominant.....
..... **Undefined Graminoid-dominated vegetation type**
58. *Oxytropis campestris* (slender crazyweed) present and characteristic forb
..... ***Festuca kingii* / *Oxytropis campestris* p. a.**
58. *O. campestris* not present **Undefined *Festuca kingii* vegetation type**
59. Turf communities (commonly characterized by an abundance of dwarf, fibrous-rooted graminoids, usually *Carex* spp. [sedge species], but forbs may dominate some stands); dominant graminoids with individual or combined cover exceeding 15% including *Carex elynoides* (Kobresia-like sedge), *C. rupestris* (curly sedge), *C. scirpoidea* (Canadian single-spike sedge), *C. phaeocephala* (dunhead sedge), *C. albonigra* (black-and-white-scaled sedge), *C. atrata* (blackened sedge), *Festuca ovina* (sheep fescue), and *Calamagrostis purpurascens* (purple reedgrass)..... 60
59. Not graminoid-dominated or having reduced total (<50%) canopy coverage from turf communities as described above 66
60. Moist turf sites with one or any combination of the following *Carex* spp. (sedge species) dominant; *C. scirpoidea* (Canadian single-spike sedge), *C. phaeocephala* (dunhead sedge), *C. albonigra* (black-and-white-scales sedge), *C. atrata* (blackened sedge)..... 61
60. Dry turf sites (grading to cushion plant environments with much more open structure) with one or any combination of the following species dominant; *Carex rupestris* (curly sedge), *C. elynoides* (Kobresia-like sedge), *C. obtusata* (blunt sedge), *Festuca ovina* (sheep fescue), *Calamagrostis purpurascens* (purple reedgrass)..... 63
61. *Geum rossii* (Ross's avens) common (usually well represented and the dominant forb); substrates non-calcareous ***Carex scirpoidea* / *Geum rossii* p. a.**
61. *Geum rossii* scarce, other forbs dominant 62
62. *Potentilla diversifolia* (diverse-leaved cinquefoil) and/or *Phlox pulvinata* (cushion phlox) dominant and/or common ***Carex scirpoidea* / *Potentilla diversifolia* p. a.**
62. Not as above, *P. diversifolia* and *P. pulvinata* scarce and not dominant.....
..... **Undefined moist alpine turf vegetation types**
63. Turf nearly continuous, *Carex rupestris* (curly sedge), *C. obtusata* (blunt sedge) and *Calamagrostis purpurascens* (purple reedgrass) not dominant or codominant graminoids; forbs a minor component
..... ***Carex elynoides* p. a.**
63. Turf patchy, *C. rupestris*, *C. obtusata* or *Calamagrostis purpurascens* (purple reedgrass) dominant graminoids with openings forb dominated and much exposed gravel/rock substrate existing 64
64. *Calamagrostis purpurascens* (purple reedgrass) well represented or dominant graminoid of sometimes depauperate vegetation closer to fellfield than more typical turfland
..... ***Calamagrostis purpurascens* – *Carex rupestris* p. a.**
64. *C. purpurascens* poorly represented and not the dominant graminoid 65
65. *Carex rupestris* (curly sedge) or *C. obtusata* (blunt sedge) the dominant graminoid, well represented; *Potentilla ovina* (sheep cinquefoil) or *Phlox pulvinata* (cushion phlox) common, individually or combined, usually the dominant forbs..... ***Carex rupestris* / *Potentilla ovina* p. a.**
65. *P. ovina* and *P. pulvinata*, singly or combined, scarce and not the dominant forbs
..... **Undefined / unrecorded *Carex rupestris* vegetation types**

- 66. Forb dominated turf communities ranging from dense generally continuous plant cover to somewhat open plant cover characterized by well-distributed clumps of erect forbs, though cushion plants may be dominant..... see **”KEY TO PERENNIAL FORB VEGETATION TYPES, UPLAND AND WETLAND”**
- 66. More like cushion plant than turf communities, with erect forbs sparse and cushion plants dominant and/or there exists much exposed substrate
.....see **„KEY TO PERENNIAL FORB VEGETATION TYPES, UPLAND AND WETLAND”**

KEY TO PERENNIAL FORB VEGETATION INCLUDING UPLAND AND WETLAND TYPES

We **include** here as „forb-dominated“ types vegetation types named for members of the ferns and „fern allies“ including Equisetaceae (horsetail family), Lycopodiaceae (club moss family), Marsileaceae (pepperwort family), Ophioglossaceae (grape fern family), Polypodiaceae (fern family), Selaginellaceae (spike moss family) in addition to myriad other families, e.g. Asteraceae, Polymoniaceae, etc., the component species of which are traditionally thought of as forbs. **Not included** are members of the Poaceae (grasses) or members of the families Juncaceae (rush family, including *Juncus* spp. [rush], *Luzula* spp. [woodrush]), Cyperaceae (sedge family, including *Carex* spp. [sedge], *Cyperus* spp. [galingale], *Dulichium arundinaceum* [dulichium], *Eleocharis* spp. [spike rush], *Eriophorum* spp. [cotton grass], *Kobresia* spp. [kobresia], *Scirpus* spp. [bulrush], Typhaceae (cattail family, *Typha* spp. [cattails], Juncaginaceae (arrow grass family, including *Lilaea scilloides* (flowering quillwort) and *Triglochin* spp. [arrow grass]);

1. Sites ranging from moist uplands to temporarily flooded to permanently flooded or saturated; dominated by having one of the following diagnostic species present, *Angelica arguta* (sharptooth angelica) or *Angelica dawsonii* (Dawson’s angelica), *Equisetum fluviatile* (water horsetail), *Parnassia fimbriata* (fringed grass-of-parnassas), *Senecio triangularis* (arrowleaf groundsel), *Salicornia rubra* (red glasswort)..... 2
1. Not as above; sites drier than described above or occurring at highest elevations of the subalpine zone (above distribution of *Pseudotsuga menziesii* [Douglas-fir] as climax species, at upper distribution of *Artemisia tridentata* ssp. *vaseyana* [mountain big sagebrush]) upward into the alpine zone..... 5
2. *Equisetum fluviatile* (water horsetail) abundant (having at least 25% canopy cover)..... ***Equisetum fluviatile* p. a.**
2. *E. fluviatile* not abundant, canopy less than 25% 3
3. *Senecio triangularis* (arrowleaf butterweed or groundsel) well represented or any two of the following species common *S. triangularis*, *Parnassia fimbriata* (fringed grass-of-Parnassas), *Angelica arguta* (sharptooth angelica), *A. dawsonii* (Dawson’s angelica) ***Senecio triangularis* p. a.**
3. Not as above; *S. triangularis* poorly represented and all combinations of two of the above-listed species are scarce, less than 5% canopy cover. 4
4. *Salicornia rubra* (red glasswort) having a greater canopy cover than any other individual herbaceous species ***Salicornia rubra* p. a.**
4. *S. rubra* having a lesser canopy cover than any other individual herbaceous species **Undefined or undescribed perennial forb-dominated vegetation type**
5. *Geum rossii* (Ross’s avens) as erect forb, dominant or co-dominant 6
5. *G. rossii* present, not dominant, cespitose and reduced in size 9
6. Erect forb *Trifolium parryi* (Parry’s clover) dominant or co-dominant in forb layer..... ***Geum rossii-Trifolium parryi* p. a.**¹
6. *T. parryi* absent or not dominant/co-dominant 7
7. Cushion plant *Trifolium nanum* (dwarf clover) dominant/co-dominant in forb layer..... ***Geum rossii - Trifolium nanum* p. a.**¹
7. *T. nanum* not dominant/co-dominant 8
8. Cushion plant *Trifolium dasyphyllum* (whip-root clover) dominant/co-dominant..... ***Trifolium dasyphyllum - Geum rossii* p. a.**¹
8. *T. dasyphyllum* not dominant/co-dominant **Undescribed / undefined turf community types**

9. Fellfield (high degree of exposed rock) or cushion plant environments (exposed, wind-blasted positions, usually ridge crests, slope shoulders and saddles); cushion plants range from a dominant aspect of community to slightly subordinate to erect forbs 10
9. Sites not fellfields nor cushion plant communities, rather they include steep, either dry or wet slopes with a high degree of exposed substrate (>70%)..... 14
10. Cushion plant communities wherein *Geum rossii* (Ross's avens) and/or *Minuartia obtusiloba* (= *Arenaria obtusiloba*, arctic sandwort) are common or dominants of the forb layer (which is often depauperate with only scattered plants) ***Geum rossii* - *Minuartia obtusiloba* p. a.**
10. Neither *G. rossii* nor *M. obtusiloba* common, nor forb layer dominants..... 11
11. Moderately dense, single tier plant cover of prostrate and cespitose forbs, graminoid component depauperate, with *Phlox pulvinata* (cushion phlox) and *Trifolium dasyphyllum* (whip-root clover) providing more c.c. than other forbs..... ***Phlox pulvinata* - *Trifolium dasyphyllum* p. a.**¹
11. Not as above, neither *P. pulvinata* nor *T. dasyphyllum* the most important cushion plants 12
12. Scattered mixture of erect and cushion plants and graminoids with *Antennaria microphylla* (rosy pussy-toes) and/or *Artemisia scopulorum* (Rocky Mountain sagewort), alone or in combination, having the greatest forb cover..... ***Antennaria microphylla* - *Artemisia scopulorum* p. a.**¹
12. Cushion plant communities with neither *A. microphylla* nor *A. scopulorum* nor combinations of the two dominating the forb layer 13
13. Cushion plants dominant aspect of communities with varying combinations of the three species *Phlox multiflora* (many-flowered phlox), *Trifolium nanum* (dwarf clover) and *Eritrichium nanum* (pale alpine forget-me-not) providing the majority of canopy cover ***Phlox multiflora*-*Triflorum nanum* p. a.**¹
13. None of the above three species, alone or in combination, providing the dominant aspect of vegetation cover **Undefined Cushion Plant Vegetation Types**
14. Sites with predominantly northerly exposures, moderate to steep slopes with a high degree (at least 75%) of exposed substrate of which more than 80% is soil or gravel; soils moist to saturated throughout growing season: vegetative canopy cover is much reduced, not exceeding 40% but with no characteristic species assemblage **Alpine Fellfield / Moist**
14. Sites not as above 15
15. Sites with uniformly steep (>40%), often unstable slopes of southeast through west-facing exposures; of the large amount of exposed substrate (>55%) about 50% is gravel; *Elymus scribneri* (formerly *Agropyron scribneri*, spreading wheatgrass) is usually the one species with higher coverage and constancy in this "type" than other p.a.'s **Alpine Fellfield / Dry**
15. Sites not as described above **Undefined community types of Subalpine and Alpine Environments**

¹ Thilenius and Smith (1985): These types were identified by these authors and have not been incorporated into ECOART or NVCS.