

# Landscape Conservation Forecasting Handbook

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## Appendix 1

Working descriptions of Ecological Systems (Biophysical Settings) and their Vegetation Classes

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<b>Agriculture 10070</b>	<i>Overview:</i> Agricultural lands and obvious irrigated pastures where soils may have been graded or modified.
U:Agriculture 100070122	<b>Agriculture:</b> Irrigated pastures, crops, alfalfa fields.
<b>Alpine (ALP) 11440</b>	<i>Overview:</i> The Alpine BpS is the treeless vegetated area generally above the 3,383m (11,100ft) contour line in the southern Snake Range. Vegetation varies from low-laying, wind-blown shrubland, to herbaceous forb and grass areas squeezed among rocks, to more humid pockets resembling small wet meadows after snow melt. Mineral soil cover is generally very high. (Completely barren areas of rock are labelled as barren/rock/mud, and not alpine). Primary disturbances are lightning strikes, animal mounding, and thick and local snow deposition lasting well into July during very wet years.
A:All	<b>Early:</b> 0-10% cover of graminoids; <90% soil cover; 0-2 yrs
B:Closed	<b>Late-closed:</b> >11% cover of graminoids and forbs; <10% cover of low shrubs; <80% soil cover; >2 yrs
<b>Antelope Bitterbrush-black sagebrush (BS) 10795</b>	<i>Overview:</i> There are three Antelope Bitterbrush systems that correspond to the three dominant sagebrush species: Mountain big sagebrush, Wyoming big sagebrush, and black sagebrush. Unlike Mountain Shrub ecological sites (various 1086) where the mountain shrub species is dominant and sagebrush is uncommon and never exceeding 10% cover, the Antelope Bitterbrush systems can have co-dominance by sagebrush species (>10% cover possible) while bitterbrush is always common and well distributed. The Antelope Bitterbrush-black sagebrush BpS is a new model from 2022 and is occasionally mostly found on BLM lands with very minor occurrences in the Kious Basin within Park boundaries. While <i>Purshia tridentata</i> is the dominant species, <i>Artemisia nova</i> is present to co-dominant. Soils are peculiar to meet the root requirements of both bitterbrush and black sagebrush. Bitterbrush requires rapidly permeable soil made of decomposed granite and coarse sand, whereas black sagebrush tends to grow where there is a calcite-based (non-clay) root-limiting layer in the soil profile at about 16" of depth. Therefore, this BpS is expected on decomposed granite or coarse sandy soils in which a calcite-based hardpan is found. Antelope bitterbrush is more likely found from 12 to 36" of precipitation that corresponds to >1,981 m (>6,500'), whereas black sagebrush is found from as low as 1,372 m (4,500') to as high as 2,743 m (9,000'); therefore this BpS is expected from 1,981 m (6,500') to 2,434 m(8,000'). The BpS mostly occurs on Great Basin alluvial fans, piedmonts, bajadas, rolling hills and mountain slopes. The BpS can also be found on flats. While black sagebrush soils generally support relatively low fuel loads, the presence of permeable soils favors species such as Indian ricegrass ( <i>Achnatherum hymenoides</i> ), needle-and-thread ( <i>Hesperostipa comata</i> ), and bottlebrush squirreltail ( <i>Elymus elymoides</i> ). Because of the black sagebrush influence, low-growing and cushion forbs and scattered bunchgrasses such as Thurber's needlegrass ( <i>Achnatherum thurberianum</i> ), Sandberg's bluegrass ( <i>Poa secunda</i> ), and bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> ) at higher elevations. Forbs often include buckwheats ( <i>Eriogonum</i> spp.), fleabanes ( <i>Erigeron</i> spp.), phloxes ( <i>Phlox</i> spp.), paintbrushes ( <i>Castilleja</i> spp.), globemallows ( <i>Sphaeralcea</i> spp.), and lupines ( <i>Lupinus</i> spp.). <i>Note to past modelers: The 4-box structure of the model proved inadequate for the Snake Range where a clear successional stage was missing between the original C and D classes: The Christmas tree phase.</i>
A:All 10795010	<b>Early-all:</b> <10% cover of bitterbrush and rabbitbrush; 10-40% cover of grass; <50% cover mineral soil; 0-25 yrs
B:Open 10795022	<b>Mid-open:</b> <10% cover of bitterbrush; <10% cover of black sagebrush and rabbitbrush; 10-30% grass cover; <40% cover of mineral soil; 25-119 yrs,

C:Closed 10795030	<b>Mid-closed:</b> ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; 10-30% cover of grasses; <10% pinyon-juniper seedling or young sapling cover but conifers can be absent; 120-149 yrs
D:Open 10795042	<b>Late-Open:</b> >5% cover of conifer 1-3m high (Christmas tree phase); ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; <30% cover of grasses; 150-194 yrs
E:Closed 10795050	<b>Late-Closed:</b> >20% cover of pinyon or juniper >3m tall; 1-10% cover of bitterbrush; <10% black sagebrush cover; <10% grass cover; >194 yrs
U-A:Annual Spp (aka: AG) 10795100	<b>Annual-Species:</b> >10% cover of non-native annual species; <10% cover of shrubs
U-A:Bare Ground (aka: BAGR) 10795101	<b>Bare Ground:</b> primarily bare ground due primarily to anthropogenic disturbances
U-A:Exotic Forb (aka: EF) 10795108	<b>Exotic-Forbs:</b> 5-100% exotic forbs (thistles, halogeton, knapweed); cover of rabbitbrush and black sagebrush increases with successional age; native grasses may be present
U-A:Early-Shrub (aka: ES) 10795105	<b>Early-Shrub:</b> 10-40% cover rabbitbrush species
U-A:SAP (aka: ASPG) 10795124	<b>Shrub-Annual-Species-Perennial-Grass-early:</b> >5% cover of non-native annual species; ≥5% native grasses; <10% cover of bitterbrush and rabbitbrush
U-A:Seeded Native (aka: SD) 10795135	<b>Seeded:</b> >5% seeded native; cover of bitterbrush and other shrubs varies with successional age
U-A:SI (aka: SDI-A) 10795129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-A:SI+AS 10795138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-B:SAP (aka: ASPG) 10795224	<b>Shrub-Annual-Species-Perennial-Grass+mid:</b> ≥5% cover of non-native annual species; ≥5% native grasses; ≤10% cover of bitterbrush and rabbitbrush
U-B:SI (aka: SDI-B) 10795229	<b>Seeded-Introduced-Mid:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-19% cover of bitterbrush, black sagebrush and rabbitbrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-B:SI+AS 10795238	<b>Seeded-Introduced-Mid+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-19% cover of bitterbrush, black sagebrush and rabbitbrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-C:Depleted (aka:DP) 10795303	<b>Depleted:</b> ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; <5% herbaceous cover; <10% pinyon or juniper sapling cover
U-C:SA 10795321	<b>Shrub-Annual-Species:</b> >5% non-native annual species cover; ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; <5% cover of native grass; <10% pinyon or juniper sapling cover
U-C:SAP (aka: ASPG) 10795324	<b>Shrub-Annual-Species-Perennial-Grass+late:</b> ≥5% cover of non-native annual species; <10% pinyon-juniper sapling cover; ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; ≥5% native grasses; ≤10% cover of shrubs

U-C:SI (aka: SDI-C) 1079329	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% pinyon-juniper sapling cover; ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-C:SI+AS 10795338	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% pinyon-juniper sapling cover; ≥10% cover of bitterbrush; ≥10% cover of black sagebrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-D:Depleted (aka: DPL) 10795403	<b>Depleted:</b> >5% cover of conifer 1-3m high (Christmas tree phase); ≥5% cover of bitterbrush; ≥5% cover of black sagebrush; <5% herbaceous native cover; <5% herbaceous non-native cover
U-D:SA 10795421	<b>Shrub-Annual-Species:</b> >5% non-native annual species cover; >5% cover of conifer 1-3m high (Christmas tree phase); >5% cover of bitterbrush; >5% cover of black sagebrush; <5% cover of native grass
U-D:SAP 10795424	<b>Shrub-Annual-Species-Perennial-Grass+-late:</b> ≥5% cover of non-native annual species; ≥5% native grasses; >5% cover of conifer 1-3m high (Christmas tree phase); ≥5% cover of bitterbrush; ≥5% cover of black sagebrush; ≤10% cover of shrubs
U-D:SI (aka: SDI-D) 10795429	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); >5% cover of conifer 1-3m high (Christmas tree phase); <10% cover of bitterbrush; <10% cover of black sagebrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-D:SI+AS (aka: SI-D+AG) 10795438	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); >5% cover of conifer 1-3m high (Christmas tree phase); 10% cover of bitterbrush; <10% cover of black sagebrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-E:SI (aka: SDI-D) 10795529	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); >5% cover of mature pinyon or juniper 3-8m tall; 1-5% bitterbrush cover; <5% black sagebrush cover; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-E:SI+AS (aka: SI-D+AG) 10795538	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-40% cover of pinyon or juniper 3-8m tall; 1-5% bitterbrush cover; <5% black sagebrush cover; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-E:TEA 10795544	<b>Tree-Encroached-Annual-Species:</b> >10% mature pinyon or juniper cover 3-8m tall; <5% bitterbrush cover or dead stems visible; <b>either</b> <5% native herbaceous cover <b>and</b> <5% non-native annual species; <b>OR</b> ≥5% non-native annual species <b>and</b> >0% native herbaceous cover

<p><b>Antelope Bitterbrush-mountain big sagebrush (AB) 11265</b></p>	<p><i>Overview:</i> There are three Antelope Bitterbrush systems that correspond to the three dominant sagebrush species: Mountain big sagebrush, Wyoming big sagebrush, and black sagebrush. Unlike Mountain Shrub ecological sites (various 1086) where the mountain shrub species is dominant and sagebrush is uncommon and not exceeding 10% cover ever, the Antelope Bitterbrush systems can have co-dominance by sagebrush species (&gt;10% cover possible) while bitterbrush is always common and well distributed. The original BpS previously code 11262, which is now 11265, was the original description for Great Basin National Park in 2010. The Antelope Bitterbrush-mountain sagebrush BpS is found between Wyoming big sagebrush, black sagebrush, and montane sagebrush steppe on decomposed granite soils primarily located in the Kious Basin southwest of the town of Baker, NV. However, this BpS has now been frequently found elsewhere on the southern Snake Range, also often on decomposed granite or sandier loams. Elevation is generally 1,951 to 2,073m (6,400-6,800'), although the main occurrences are observed at the higher end of the gradient. In general this system shows an affinity for mild topography and highly permeable soils made of decomposed granite or sandy loam. Soils generally are moderately deep to deep, well-drained, and can contain coarse fragments primarily derived from the granite formation immediately upslope. Vegetation types are usually dominated by antelope bitterbrush (<i>Purshia tridentata</i>) with <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> present, although <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> can be present at the lower end of the elevation gradient. A variety of other shrubs can be present, but these are seldom dominant unless the soil is disturbed (rabbitbrush species [<i>Ericameria</i>] and snakeweed [<i>Gutierrezia sarothrae</i>]). Abundant forbs (e.g., <i>Lupinus</i> spp.) are an indicator of good range condition. Grasses can be abundant and diverse, but somewhat drought tolerant, such as Indian ricegrass (<i>Achnatherum hymenoides</i>), needle-and-thread (<i>Hesperostipa comata</i>), and bottlebrush squirreltail (<i>Elymus elymoides</i>) due to the highly permeable soils. The BpS is very important to mule deer winter range.</p>
<p>A:All 11265010</p>	<p><b>Early-all:</b> 0-10% canopy of antelope bitterbrush/mountain shrub; 10-80% grass/forb cover; 0-12 yrs</p>
<p>B:Open 11265022</p>	<p><b>Mid--open:</b> 11-30% cover of antelope bitterbrush/ mountain big sagebrush/mountain shrub; &gt;50% herbaceous cover; 13-38 yrs</p>
<p>C:Closed 11265030</p>	<p><b>Mid--closed:</b> 31-50% cover of antelope bitterbrush/mountain big sagebrush/mountain shrub; 25-50% herbaceous cover, &lt;10% conifer sapling cover; 38+ yrs</p>
<p>D:Open 11265042</p>	<p><b>Late-open:</b> 10-20% pinyon cover &lt;5m; 25-40% cover of antelope bitterbrush/mountain big sagebrush/mountain shrub; &lt;30% herbaceous cover; 80-129 yrs</p>
<p>E:Closed 11265050</p>	<p><b>Late-closed:</b> 21-40% pinyon cover 10-25m; 6-20% antelope bitterbrush/mountain big sagebrush/mountain shrub; &lt;20% herbaceous cover; 130+ yrs</p>
<p>U-A:Annual Spp 11265100</p>	<p><b>Annual-Species:</b> &gt;10% cover of non-native annual species; &lt;10% cover of shrubs</p>
<p>U-A:Bare Ground (aka: BAGR) 11265101</p>	<p><b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances</p>
<p>U-A:Early-Shrub 11265105</p>	<p><b>Early-Shrub:</b> &gt;20% cover of rabbitbrush and snakeweed species; native grasses present</p>
<p>U-A:Exotic Forb (aka: EF) 11265108</p>	<p><b>Exotic Forbs: Exotic-Forb:</b> 1-100% exotic forbs (e.g., thistles, knapweed).</p>
<p>U-A:SAP (aka: AGPG) 11265124</p>	<p><b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% non-native annual species cover; ≤10% cover of antelope bitterbrush (dominant) and mountain big sagebrush; &gt;5% cover of native grass; no conifers</p>

U-A:Seeded Native (aka: SD) 11265135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs
U-A:SI (aka: SDI-A) 11265129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced grasses and shrubs; 0-10% canopy of antelope bitterbrush and mountain big sagebrush; native grasses present to common; <5% cover of non-native annual species
U-A:SI+AS (aka: SDI-A+AG) 11265138	<b>Seeded-Introduced-Early+Annual-Species-Early:</b> >10% seeded introduced grasses and shrubs; 0-10% canopy of antelope bitterbrush and mountain big sagebrush; native grasses present to common; ≥5% cover of non-native annual species
U-B:SAP 11265224	<b>Mid-Shrub-Annual-Species-Perennial-Grass:</b> 5-14% non-native annual species cover; 11-50% cover of antelope bitterbrush (dominant) and mountain big sagebrush; >5% cover of native grass
U-B:SI (aka: SDI-B) 11265229	<b>Seeded-Introduced-Mid-open:</b> >10% seeded introduced grasses and shrubs; 11-30% cover of antelope bitterbrush and mountain big sagebrush; native grasses present to common; <5% cover of non-native annual species
U-B:SI+AS (aka: SDI-B+AG) 11265238	<b>Seeded-Introduced-Mid-Open+Annual-Species:</b> >10% seeded introduced grasses and shrubs; 11-30% cover of antelope bitterbrush and mountain big sagebrush; native grasses present to common; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 11265303	<b>Depleted-closed;</b> 20-50% cover of antelope bitterbrush and mountain big sagebrush; <5% herbaceous cover; <10% pinyon sapling cover
U-C:SA 11265321	<b>Shrub-Annual-Species:</b> 5-14% non-native annual species cover; >10% cover of antelope bitterbrush (dominant) and mountain big sagebrush (dominant) and; ≤5% cover of native grass; <30% conifer sapling cover
U-C:SI (aka: SDI-C) 11265329	<b>Seeded-Introduced-Mid-Closed:</b> >5% seeded introduced grasses and shrubs; >30% cover of antelope bitterbrush and mountain big sagebrush; native grasses present to common; <10% conifer sapling cover; <5% cover of non-native annual species
U-C:SI+AS (aka: SDI-C+AG) 11265338	<b>Seeded-Introduced-Mid-Closed+Annual-Species:</b> >5% seeded introduced grasses and shrubs; >30% cover of antelope bitterbrush and mountain big sagebrush; native grasses present to common; <10% conifer sapling cover; ≥5% cover of non-native annual species
U-D:SI (aka: SDI-D) 11265429	<b>Seeded-Introduced-Late-Open:</b> >5% seeded introduced grasses and shrubs; 10-30% conifer cover; 25-40% cover of antelope bitterbrush and mountain big sagebrush; native grasses present to common; <5% cover of non-native annual species
U-D:SI+AS (aka: SDI-D+AG) 11265438	<b>Seeded-Introduced-Late-Open+Annual-Species:</b> >5% seeded introduced grasses and shrubs; 10-30% conifer cover; 25-40% cover of antelope bitterbrush and mountain big sagebrush; native grasses present to common; ≥5% cover of non-native annual species.
U-D:Depleted (aka: D-DP) 11265403	<b>Depleted-open:</b> 10-20% young conifer cover; 20-40% cover of antelope bitterbrush and mountain big sagebrush; <5% native grasses; <5% cover of non-native annual species
U-D:SAP 11265424	<b>Late-Shrub-Annual-Species-Perennial-Grass:</b> 10-20% young conifer cover; 20-40% cover of antelope bitterbrush and mountain big sagebrush; <5% native grasses; <5% cover of non-native annual species
U-E:TEA 11265544	<b>Tree-Encroached-Annual-Species:</b> >20% pinyon-juniper cover 3-8m tall; <5% antelope bitterbrush/mountain big sagebrush cover; <5% herbaceous cover; <5% non-native annual species cover <b>OR</b> >20% pinyon-juniper cover 3-8m tall; ≥5% non-native annual species cover; ≥5% antelope bitterbrush/sagebrush cover; ≥5% herbaceous cover

<p><b>Antelope Bitterbrush-Wyoming big sagebrush (AB) 10805</b></p>	<p><i>Overview:</i> There are three Antelope Bitterbrush systems that correspond to the three dominant sagebrush species: Mountain big sagebrush, Wyoming big sagebrush, and black sagebrush. Unlike Mountain Shrub ecological sites (various 1086) where the mountain shrub species is dominant and sagebrush is uncommon and not exceeding 10% cover ever, the Antelope Bitterbrush systems can have co-dominance by sagebrush species (&gt;10% cover possible) while bitterbrush is always common and well distributed. The Antelope Bitterbrush-Wyoming big sagebrush BpS is frequently found elsewhere on the southern Snake Range on BLM lands also often on decomposed granite or sandier loams. Elevation is generally 1,676 to 2,073m (5,500-6,800'). In general this system shows an affinity for mild topography and highly permeable soils made of decomposed granite or sandy loam. Soils generally are moderately deep to deep, well-drained, and can contain coarse fragments primarily derived from the granite formation immediately upslope. Vegetation types are usually dominated by antelope bitterbrush (<i>Purshia tridentata</i>) with <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> present to common. A variety of other shrubs can be present, but these are seldom dominant unless the soil is disturbed (rabbitbrush species [<i>Ericameria</i>] and snakeweed [<i>Gutierrezia sarothrae</i>]). Abundant forbs (e.g., <i>Lupinus</i> spp.) are an indicator of good range condition. Grasses can be abundant and diverse, but somewhat drought tolerant, such as Indian ricegrass (<i>Achnatherum hymenoides</i>), needle-and-thread (<i>Hesperostipa comata</i>), and bottlebrush squirreltail (<i>Elymus elymoides</i>) due to the highly permeable soils. The BpS is very important to mule deer winter range.</p>
<p>A:All 10805010</p>	<p><b>Early-all:</b> 0-10% canopy of antelope bitterbrush/mountain shrub; 10-80% grass/forb cover; 0-12 yrs</p>
<p>B:Open 10805022</p>	<p><b>Mid--open:</b> 11-20% cover of antelope bitterbrush/ Wyoming big sage/mountain shrub; &gt;50% herbaceous cover; 13-38 yrs</p>
<p>C:Closed 10805030</p>	<p><b>Mid--closed:</b> &gt;20% cover of antelope bitterbrush/Wyoming big sage/mountain shrub; 25-50% herbaceous cover, &lt;10% conifer sapling cover; 38+ yrs</p>
<p>D:Open 10805042</p>	<p><b>Late-open:</b> 10-20% pinyon cover &lt;5m; &gt;20% cover of antelope bitterbrush/ Wyoming big sage /mountain shrub; &lt;30% herbaceous cover; 80-129 yrs</p>
<p>E:Closed 10805050</p>	<p><b>Late-closed:</b> &gt;20% pinyon cover 10-25m; &gt;5% antelope bitterbrush/ Wyoming big sage/mountain shrub; &lt;20% herbaceous cover; 130+ yrs</p>
<p>U-A:Annual Spp 10805100</p>	<p><b>Annual-Species:</b> &gt;10% cover of non-native annual species; &lt;10% cover of shrubs</p>
<p>U-A:Bare Ground (aka: BAGR) 10805101</p>	<p><b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances</p>
<p>U-A:Early-Shrub 10805105</p>	<p><b>Early-Shrub:</b> &gt;20% cover of rabbitbrush and snakeweed species; native grasses present</p>
<p>U-A:Exotic Forb (aka: EF) 10805108</p>	<p><b>Exotic Forbs: Exotic-Forb:</b> 1-100% exotic forbs (e.g., thistles, knapweed).</p>
<p>U-A:SAP (aka: AGPG) 10805124</p>	<p><b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% non-native annual species cover; ≤10% cover of antelope bitterbrush (dominant) and Wyoming big sagebrush; &gt;5% cover of native grass; no conifers</p>
<p>U-A:Seeded Native (aka: SD) 10805135</p>	<p><b>Seeded-Native:</b> &gt;10% seeded native grasses, forbs, and shrubs</p>
<p>U-A:SI (aka: SDI-A) 10805129</p>	<p><b>Seeded-Introduced-Early:</b> &gt;10% seeded introduced grasses and shrubs; 0-10% canopy of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; &lt;5% cover of non-native annual species</p>

U-A:SI+AS (aka: SDI-A+AG) 10805138	<b>Seeded-Introduced-Early+Annual-Species-Early:</b> >10% seeded introduced grasses and shrubs; 0-10% canopy of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; ≥5% cover of non-native annual species
U-B:SAP 10805224	<b>Mid-Shrub-Annual-Species-Perennial-Grass:</b> 5-14% non-native annual species cover; >10% cover of antelope bitterbrush (dominant) and Wyoming big sagebrush; >5% cover of native grass
U-B:SI (aka: SDI-B) 10805229	<b>Seeded-Introduced-Mid-open:</b> >10% seeded introduced grasses and shrubs; >10% cover of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; <5% cover of non-native annual species
U-B:SI+AS (aka: SDI-B+AG) 10805238	<b>Seeded-Introduced-Mid-Open+Annual-Species:</b> >10% seeded introduced grasses and shrubs; >10% cover of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 10805303	<b>Depleted-closed;</b> >20% cover of antelope bitterbrush and Wyoming big sagebrush; <5% herbaceous cover; <10% pinyon sapling cover
U-C:SA 10805321	<b>Shrub-Annual-Species:</b> 5-14% non-native annual species cover; >10% cover of antelope bitterbrush (dominant) and Wyoming big sagebrush (dominant) and; ≤5% cover of native grass; <30% conifer sapling cover
U-C:SI (aka: SDI-C) 10805329	<b>Seeded-Introduced-Mid-Closed:</b> >5% seeded introduced grasses and shrubs; >20% cover of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; <10% conifer sapling cover; <5% cover of non-native annual species
U-C:SI+AS (aka: SDI-C+AG) 10805338	<b>Seeded-Introduced-Mid-Closed+Annual-Species:</b> >5% seeded introduced grasses and shrubs; >30% cover of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; <10% conifer sapling cover; ≥5% cover of non-native annual species
U-D:SI (aka: SDI-D) 10805429	<b>Seeded-Introduced-Late-Open:</b> >5% seeded introduced grasses and shrubs; 10-30% conifer cover; 25-40% cover of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; <5% cover of non-native annual species
U-D:SI+AS (aka: SDI-D+AG) 10805438	<b>Seeded-Introduced-Late-Open+Annual-Species:</b> >5% seeded introduced grasses and shrubs; 10-30% conifer cover; 25-40% cover of antelope bitterbrush and Wyoming big sagebrush; native grasses present to common; ≥5% cover of non-native annual species.
U-D:Depleted (aka: D-DP) 10805403	<b>Depleted-open:</b> 10-20% young conifer cover; 20-40% cover of antelope bitterbrush and Wyoming big sagebrush; <5% native grasses; <5% cover of non-native annual species
U-D:SAP 10805424	<b>Late-Shrub-Annual-Species-Perennial-Grass:</b> 10-20% young conifer cover; 20-40% cover of antelope bitterbrush and Wyoming big sagebrush; <5% native grasses; <5% cover of non-native annual species
U-E:TEA 10805544	<b>Tree-Encroached-Annual-Species:</b> >20% pinyon-juniper cover 3-8m tall; <5% antelope bitterbrush/ Wyoming big sagebrush cover; <5% herbaceous cover; <5% non-native annual species cover <b>OR</b> >20% pinyon-juniper cover 3-8m tall; ≥5% non-native annual species cover; ≥5% antelope bitterbrush/sagebrush cover; ≥5% herbaceous cover

<b>Aspen-Mixed Conifer (ASM) 10610</b>	<i>Overview:</i> The Aspen-Mixed Conifer BpS is commonly called “seral aspen.” <i>Populus tremuloides</i> is the dominant tree species, except in late succession where prolonged fire exclusion and ungulate herbivory allow dominance by mixed conifers, such as white fir and Douglas-fir. The presence of even a single aspen tree in a stand provides strong evidence that the area historically supported aspen clones. This BpS typically occurs on flat to steep terrain (<80%) on all aspects. Elevation generally ranges from 2,135 m to 2,745 m (7,000' to 9,000'). Soils are highly variable, but generally cool. Often, the BpS occurs where groundwater is closer to the surface or emerging at springs. This type occurs above the pinyon-juniper and/or sagebrush zones but below the spruce and limber pine zone. Aspen stands that are difficult to “see through” are considered healthy because of young aspen and mesic shrub growth before conifers dominate the understory or mid-story. Shrub, forb, and grass species typical of mesic sites are very diverse and plant cover is very high.
A:All 10610010 <sup>1</sup>	<b>Early-all:</b> 10-100% cover aspen <4.9m; mountain snowberry and <i>Ribes</i> common; 0-9 yrs
B:Closed 10610021	<b>Mid1-closed:</b> 40-99% cover aspen 5-9.9m; mountain snowberry and <i>Ribes</i> common; 10-39 yrs
C:Closed 10610030	<b>Mid2-closed:</b> 40-99% cover aspen 10-24m; conifer saplings visible in mid-story; mountain snowberry and <i>Ribes</i> common; 40-79 yrs
D:Open 10610042	<b>Late1-open:</b> 10-39% cover aspen 10-25 m; 10-25% mixed conifer cover 5-10 m; mountain snowberry and <i>Ribes</i> common; >80 yrs
E:Closed 10610050	<b>Late1-closed:</b> 40-80% cover of mixed conifer 10-50m; <40% cover of aspen 10-25m; mountain snowberry and <i>Ribes</i> present; >100 yrs
U-A:Depleted 10610109	<b>Early-depleted:</b> <10% cover aspen <4.9m; 0-40% cover of mixed conifer variously thinned by fire or mechanical thinning with tree height ranging from bole-size to mature trees; woody debris often abundant mountain snowberry and <i>Ribes</i> common; 0-9 yrs
U-B:Depleted (aka: DP) 10610203	<b>Depleted-Mid1-open:</b> 10-39% cover of pole size aspen <5-9.9m; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; at most few conifers in mid-story; 10-39 yrs
U-C:Depleted (aka: DP) 10610303	<b>Depleted-Late1-open:</b> 10-39% cover of aspen 10-25m; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; young conifers up to 3m high common in mid-story; 39 -99 yrs
U-D:Depleted (aka: DP) 10610403	<b>Depleted-Late2-open:</b> 10-39% cover of older aspen 10-25m; mature conifer sub-dominant or co-dominant with large aspen no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory
U-A:Lost-Aspen (aka: No-ASP) 10610109	<b>Loss of clone:</b> permanent conversion to Mixed Conifer – 1052; >50% white fir and/or limber pine cover; aspen absent or in trace amount; dead aspen boles may be present and may be the only diagnostic attribute but aspen will not return after fire.

<sup>1</sup> Remote Sensing code (geotiff code)

<b>Aspen-Subalpine Conifer (ASF) 10611</b>	<i>Overview:</i> The Aspen-Subalpine Conifer BpS is a special case of Aspen-Mixed Conifer BpS. <i>Populus tremuloides</i> is the dominant tree species, except in late succession where fire exclusion and ungulate herbivory allow dominance by limber pine, white fir and, very sporadically, Engelmann spruce and Douglas-fir. The presence of even a single aspen tree in a stand provides strong evidence that the area historically supported aspen clones. The BpS typically occurs on flat to steep terrain (<80%) on all aspects. Elevation generally ranges from 2,745 m to 3,353 m (9,000' to 11,000'). Soils are highly variable, but generally cool to frigid. This type occurs at the same elevation as the subalpine spruce-fir zone. Aspen exist in single-storied or multi-storied stands. The understory structure may be complex with multiple shrub and herbaceous layers, or simple with just an herbaceous layer. The herbaceous layer may be dense or sparse, dominated by graminoids or forbs. Plant species diversity is often high. The early- and mid-successional classes after fire are excellent bighorn sheep foraging habitat.
A:All 10610010 <sup>2</sup>	<b>Early:</b> 50-100% cover aspen <2m; mountain snowberry and <i>Ribes</i> common; 0-9 yrs
B:Closed 10610021	<b>Mid1-closed:</b> 40-99% cover aspen <5-10m; mountain snowberry and <i>Ribes</i> common; no or few young subalpine conifers in midstory; 10-39 yrs
C:Open 10610022	<b>Mid2-open:</b> 10-30% cover aspen 10-24m; >10% cover of young to pole-size limber pine, white fir, and occasional Engelmann spruce; mountain snowberry and <i>Ribes</i> common; 40-169 yrs
D:Closed 10610030	<b>Late1-closed:</b> 40-50% cover of primary limber pine, white fir, and occasional Engelmann spruce cover 25-50m; 1-30% cover of aspen; mountain snowberry and <i>Ribes</i> common; >169 yrs
U-A:Depleted 10611103	<b>Early-depleted:</b> <50% aspen regeneration, often sparse; 0-40% cover of limber pine, white fir, and occasional Engelmann spruce and Douglas-fir variously thinned by fire or mechanical thinning with tree height ranging from bole-size to mature trees; woody debris often abundant
U-B:Depleted (aka: DP) 10611203	<b>Depleted-Mid1-open:</b> 1-10% cover of pole size aspen <5-9.9m;; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; no or few young subalpine conifers in midstory; 10-39 yrs
U-C:Depleted (aka: DP) 10611303	<b>Depleted-Late1-open:</b> >10% cover of pole-size limber pine, white fir, and occasional Engelmann spruce; 1-10% cover of mature aspen 10-25m; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; 40-169 yrs
U-A:Lost-Aspen (aka: No-ASP) 10611109	<b>Loss of Clone:</b> >50% limber pine and occasional spruce; aspen absent or in trace amount; dead aspen boles may be present and may be the only diagnostic attribute but aspen will not return after fire.

<p><b>Aspen Woodland (ASP) 10110</b></p>	<p><i>Overview:</i> The Aspen Woodland BpS is dominated by <i>Populus tremuloides</i> and is commonly called “stable aspen.” Aspen woodland is a debated BpS as it is assumed, but not proven, that soils prevent encroachment of conifers even with fire exclusion, therefore soils maintain the <u>relative</u> cover of conifers to &lt;25%. Where the BpS is adjacent to conifers, an occasional conifer seedling may occur, but conifers do not drive the fire regime. Elevations generally range from 1,525 to 3,050 m (5,000’-10,000’), but occurrences can be found at lower elevations in some regions. Distribution of this ecological system is limited primarily by adequate soil moisture required to meet its high evapotranspiration demand, and secondarily by the length of the growing season or low temperatures. This BpS occurs commonly as multi-storied stands. Stands are usually closed. Aspen suckers 1.5 m to 4.6 m (5-15’) tall will be present in all classes (min. 500 stems/acre). The Aspen Woodland BpS typically occurs above pinyon/juniper and adjacent to mountain big sagebrush. At elevations below 6,500’ this group grades into black and narrowleaf cottonwood types along riparian corridors. On Great Basin ranges, the BpS is found both on dry sites, but where subsurface water is within rooting depth, and in more mesic areas where fir species are largely absent. Understory consists of abundant herbaceous and shrub components. Often species of tall forbs, perennial grasses and shrubs are found in the understory. The herbaceous layer may be lush and diverse.</p>
<p>A:All 10110010</p>	<p><b>Early-all:</b> 10-100% cover of aspen &lt;5m; 0-9 yrs</p>
<p>B:Closed 10110021</p>	<p><b>Mid1-closed:</b> 40-99% cover of aspen 5-9.9m (this class also includes aspen thickets caused by heavy snowbank deposition); 10-39 yrs</p>
<p>C:Closed 10110030</p>	<p><b>Late1-closed:</b> 40-99% cover of aspen 10-25m; few conifers in mid-story; 39 -99 yrs</p>
<p>D:Open 10110042</p>	<p><b>Late1-open:</b> 10-39% cover of aspen 10-25 m; conifers may be present but less than 25% relative cover; &gt;99 yrs</p>
<p>U-A:Depleted (aka: DP) 10110103</p>	<p><b>Depleted-Early-open:</b> 1-9% cover of aspen &lt;5m tall (suckers); no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; 0-9 yrs.</p>
<p>U-B:Depleted (aka: DP) 10110203</p>	<p><b>Depleted-Mid1-open:</b> 10-39% cover of pole size aspen &lt;5-9.9m; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; at most few conifers in mid-story; 10-39 yrs</p>
<p>U-C:Depleted (aka: DP) 10110303</p>	<p><b>Depleted-Late1-open:</b> 10-39% cover of aspen 10-25m; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; at most few conifers in mid-story; 39 -99 yrs</p>
<p>U-D:Depleted (aka: DP) 10110403</p>	<p><b>Depleted-Late2-open:</b> 10-39% cover of older aspen 10-25m; no or little aspen regeneration; mountain big sagebrush common in understory; high visibility through the midstory; at most few conifers in mid-story</p>
<p>U-&gt;A:Lost-Aspen (aka: No-ASP) 10110109</p>	<p><b>Loss of clone:</b> permanent conversion to montane sagebrush steppe - 1126; dead clone of aspen; very few aspen stems present; dead boles may be visible on the ground; 5-50% cover of mountain big sagebrush/mountain shrub; &lt;50% herbaceous cover</p>
<p><b>Badland 10002</b></p>	<p><i>Overview:</i> Natural badlands formed of barren to very sparsely vegetated soils. Usually associated with erosional lacustrine hills or sumps, or unwelded tuff. Soil is usually highly reflective.</p>
<p>A:Bare Ground 10002101</p>	<p><b>Bare Ground:</b> &gt;90% mineral soil; &lt;5% cover of shrubs, grasses or forbs</p>
<p><b>Barren-Rock-Mud (Barren) 10000</b></p>	<p><i>Overview:</i> This feature can be present as natural barren areas of soil, rock, or mud, or human-caused barren areas.</p>

A 10000001	<b>Barren:</b> natural barren areas of soil, rock, or mud
U-A:Bare Ground 10000101	<b>Bare Ground:</b> Human-caused barren area
<b>Basin Big Sagebrush-Greasewood (aka, BBS) 10806</b>	<i>Overview:</i> The Basin Big Sagebrush-Greasewood BpS is found in fine loamy soils, old lake shores, fine soil mounds resembling stabilized sand dunes at mostly low elevations, and along stream terraces and dry drainages where slopes range from flat to moderately steep matching mostly the semi-desert zones or lower montane zone. While soils are deep and made of fine loam, rocky material can be present in dry washes. Often at low elevations, this system is small and surrounded by greasewood, winterfat, or mixed salt desert BpSs. The dominant shrub species are basin big sagebrush ( <i>Artemisia tridentata</i> spp. <i>tridentata</i> ) and black greasewood ( <i>Sarcobatus vermiculatus</i> ). This latter species may be occasional to co-dominant but basin big sagebrush is always present and common. Basin wildrye is generally absent and there is no evidence of even traces of it. Due to stature and distinctive leaf morphology, the species is easily distinguished from other big sagebrush which are rarely to occasionally present when soil is more shallow. Rabbitbrush species ( <i>Ericameria</i> spp.) are present to co-dominant depending on disturbance levels. Indian ricegrass ( <i>Oryzopsis hymenoides</i> ), bottlebrush squirreltail ( <i>Sitanion hystrix</i> ), needle -and-tread ( <i>Stipa comata</i> ), and <i>Poa secunda</i> are common native grasses.
A:All 10806010	<b>Early-all:</b> 10-25% herbaceous cover; >5% cover of black greasewood; <10% cover of rabbitbrush species; <10% cover of basin big sagebrush; 0-9 yrs.
B:Open 10806022	<b>Mid-open:</b> 11-30% cover of basin big sagebrush; >5% cover of black greasewood; 10-25% herbaceous cover; 10-30 yrs.
C:Closed 10806030	<b>Late1-closed:</b> >30% cover of basin big sagebrush; >5% cover of black greasewood; 10-20% native herbaceous cover; 60-100 yrs.
U-A:Annual Spp (aka: AG) 10806100	<b>Annual-Species:</b> >10% cover of non-native annual species.
U-A:Bare Ground (aka: BAGR) 10806101	<b>Bare Ground:</b> Primarily bare ground due primarily to anthropogenic disturbances.
U-A:Early-Shrub (aka: ES) 10806105	<b>Early-Shrub:</b> >10% cover of rabbitbrush species or snakeweed
U-A:Exotic Forb (aka: EF) 10806108	<b>Exotic-Forb:</b> >5% cover of halogeton, exotic mustards, or thistles; <10% cover of non-native annual species; >50% cover of mineral soil.
U-A:SAP (aka: AGPG) 10806124	<b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% cover non-native annual species; <10% cover of Wyoming big sagebrush <0.5m tall; ≥5% cover of native grasses; pinyon-juniper absent.
U-A:Seeded Native (aka: SD) 10806135	<b>Seeded-Native:</b> >10% cover of seeded native grasses, forbs, and shrubs; <5% cover of non-native annual species.
U-A:SI (aka: SDI-A) 10806129	<b>Seeded-Introduced-Early:</b> ≥10% cover of introduced forage species (e.g., Siberian wheatgrass, crested wheatgrass, intermediate wheatgrass, smooth brome, or forage kochia); <10% cover of rabbitbrush species; <10% cover of basin big sagebrush; >5% cover of black greasewood; native grass may be present to common; <5% cover of non-native annual species.

U-A:SI+AS 10806138	<b>Seeded-Introduced-Early+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., Siberian wheatgrass, crested wheatgrass, intermediate wheatgrass, smooth brome, or forage kochia); <10% cover of rabbitbrush species; 11-20% cover of basin big sagebrush; >5% cover of black greasewood; native grass may be present to common; ≥5% cover of non-native annual species.
U-B:SAP 10806224	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% cover of non-native annual species; 11-30% cover of basin big sagebrush <0.5m tall; ; >5% cover of black greasewood; 5-20% cover of native grasses; scattered pinyon-juniper saplings may be present later in succession at higher elevations.
U-B:SI (aka: SDI-B) 10806229	<b>Seeded-Introduced-Mid-open:</b> ≥10% cover of introduced forage species (e.g., Siberian wheatgrass, crested wheatgrass, intermediate wheatgrass, smooth brome, or forage kochia); 11-30% cover of basin big sagebrush; >5% cover of black greasewood; native grass may be present to common; <5% cover of non-native annual species.
U-B:SI+AS 10806238	<b>Seeded-Introduced-Mid-open+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., Siberian wheatgrass, crested wheatgrass, intermediate wheatgrass, or forage kochia); 11-30% cover of basin big sagebrush; >5% cover of black greasewood; native grass may be present to common; ≥5% cover of non-native annual species.
U-C:Depleted (aka: DP) 10806303	<b>Depleted:</b> >20% cover of basin big sagebrush (dominant); >5% cover of black greasewood; <5% herbaceous cover; <30% cover of conifer saplings at lower elevations; litter and mineral soil common.
U-C:SA 10806321	<b>Shrub-Annual-Species:</b> ≥5% cover of non-native annual species; ≥10% cover of basin big sagebrush <0.5m tall; >5% cover of black greasewood; scattered pinyon-juniper saplings may be present at higher elevations; native grasses rare.
U-C:SI (aka: SDI-C) 10804329	<b>Seeded-Introduced-Late1-closed:</b> ≥10% cover of introduced forage species (e.g., Siberian wheatgrass, crested wheatgrass, intermediate wheatgrass, or forage kochia); >30% cover of basin big sagebrush; >5% cover of black greasewood; native grass may be present to common; <5% cover of non-native annual species.
U-C:SI+AS 10804338	<b>Seeded-Introduced-Late1-closed+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., Siberian wheatgrass, crested wheatgrass, intermediate wheatgrass, or forage kochia); >30% cover of basin big sagebrush; >5% cover of black greasewood; native grass may be present to common; ≥5% cover of non-native annual species.
U-C:TEA 10804544	<b>Tree-Encroached-Annual-Species:</b> 11-60% cover of trees 5-9m tall at higher elevations; non-native annual species may be present to abundant; remnant sagebrush may be present; native grasses absent or present in trace amounts.

<b>Basin Wildrye-montane (BW) 10801</b>	<i>Overview:</i> The Basin Wildrye BpS is a Great Basin grassland dominated by Great Basin wildrye ( <i>Leymus cinereus</i> ). The BpS is found at elevations from about 914 m to 1,829 m (3,000' to 6,000') with extensions to as high as 2,286 m (7,500') in valley bottoms. Typically, soils are deep to very deep with loamy to coarse loamy textures. Soils are well drained with water tables below the rooting zone of the dominant shrubs. Salts, if present, can increase with depth. Soils were formed through alluvial processes and typically form valley bottoms with slopes generally less than 8%, and typically between 0 and 4%. Annual precipitation ranges from 20 to 35 cm (8" to 14"). Many locations occur along valley bottoms outside of the wet meadow areas, but within zones where water tables may attain heights of 150 to 75 cm (60" to 30"). On lower precipitation sites (20 to 25 cm or 8 to 10") these locations may be positioned at the base of slopes such that water may run onto these sites. Not much is written specifically about the dynamics of this BpS. This is a grassland-shrubland mixture dominated by basin wildrye, a deep-rooted cool-season bunchgrass, with basin big sagebrush or mountain big sagebrush subdominant (<15% cover) later in succession. Other shrubs generally represent less than 10 % of the overall cover and include various species and subspecies of rabbitbrush. Other grasses are generally cool season bunchgrasses, with the exception of some rhizomatous grasses on the dry meadows with deep soils and high precipitation. Forbs represent less than 10 % of the herbaceous cover.
A:All 10801010	<b>Early:</b> 5-20% cover of basin wildrye; 0-10 yrs
B:Closed 10801021	<b>Mid-closed:</b> 21-80% cover of basin wildrye; <11% shrub cover; 11-75 yrs
C:Open 10801032	<b>Late-open:</b> 11-20% cover of big sagebrush and rabbitbrush; <75% cover of basin wildrye; >75 yrs
U-A:Annual Spp (aka: AS) 10801100	<b>Annual-Spp:</b> 5-40% cover of non-native annual species
U-A:Bare Ground (aka: BAGR) 10801101	<b>Bare-Ground:</b> Mostly bare ground
U-A:Early-Shrub (aka: ES) 10801105	<b>Early-Shrub:</b> >20% cover of rabbitbrush species; native grasses present
U-A:Exotic Forb (aka: EF) 108012108	<b>Exotic-Forb:</b> 5-100% exotic forbs (knapweed, tall whitetop, purple loosestrife)
U-A:Seeded-Native (aka:SD) 10801135	<b>Seeded-Native:</b> >10% seeded basin wildrye, forbs, and shrubs; <5% non-native annual species (if ≥5 non-native annual species, then ASPG or even AS)
U-A:SI (aka: SDI) 10801129	<b>Seeded-Introduced:</b> >10% seeded introduced grasses, forbs, and shrubs
U-A:SI+AS (aka: SDI+AG) 10801138	<b>Seeded-Introduced+Annual-Species:</b> >10% seeded introduced grasses, forbs, and shrubs, ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 10801303	<b>Depleted:</b> >20% cover of native shrubs, especially basin big sagebrush and rabbitbrush; <5% basin wildrye; >20% mineral soil and litter cover
U-C:SAP 10801324	<b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% cover of non-native annual species; >10% cover of native shrubs; ≥0% basin wildrye
U-C:TEA 10801344	<b>Tree-Encroached-Annual-Species:</b> ≥10% cover of conifers; ≥0% (i.e., absent to common) cover of non-native annual species

<b>Big Sagebrush semi-desert (BSsd) 10802</b>	<i>Overview:</i> The Big Sagebrush semi-desert BpS exists in form distinct forms in the general area. the Big Sagebrush semidesert BpS occurs on well-drained and/or shallow loamy soils on foothills, terraces, slopes and plateaus. Wyoming and basin big sagebrush characterize the BpS, with basin big sagebrush established on hills with deep soils. Elevation ranges from 1,280 m to 1,981 m (4,200' – 6,500'), which corresponds to annual precipitation zones from 20 cm to 30 cm (8 to 12"). The BpS is found on soil depths as shallow as 25 cm (10") and as deep as 152 cm (60+"). When Wyoming and basin big sagebrush are found on deeper soil, annual precipitation is <25 cm (<10"). The BpS is found just above the low elevation salt desert shrub typically unfavorable to tree establishment. Thus, other site characteristics (e.g. aspect, drainage) should be considered in identifying this BpS. At the precipitation extremes, this BpS generally occurs as small patches and stringers. Shrub canopy cover generally ranges from 5 to 25%, but can exceed 30% at the upper elevations, deeper soils, and precipitation zones. Wyoming big sagebrush sites have fewer understory species relative to other big sagebrush types. Rubber rabbitbrush and spiny hopsage may be co-dominant and basin big sagebrush might occur on concave sites with finer soils. Perennial forb cover is usually <10% and perennial grass cover reaches 40-60% on more productive sites. Thurber's needlegrass may be a dominant species following replacement fires and as a co-dominant after 20 years. Bottlebrush squirreltail, Indian ricegrass, and Sandberg bluegrass are common on more xeric sites. Percent cover and species richness of understory are determined by site limitations.
A:All 10802010	<b>Early-All:</b> ≥20% cover of native grasses (bottlebrush and Indian ricegrass); <10% shrub (various rabbitbrushes, snakeweed, and Wyoming big sagebrush) cover; mineral soil abundant; 0-9yrs
B:Closed 10802022	<b>Mid-closed:</b> 10-19% cover of Wyoming big sagebrush and rabbitbrush; ≥20% native grass cover; 10-39 yrs
C:Open 10802032	<b>Late-open:</b> ≥20% cover of Wyoming big sagebrush, with other shrub (winterfat and low rabbitbrush) present; 5-25% cover of native grasses; pinyon and juniper saplings might be present; >40 yrs
U-A:Annual Spp (aka: AG) 10802100	<b>Annual-Species:</b> >10% non-native annual species cover; <10% shrubs, especially rabbitbrush and snakeweed; native grasses may be present
U-A:Bare Ground (aka: BAGR) 10802101	<b>Bare Ground:</b> primarily bare ground due primarily to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10802105	<b>Early-Shrub:</b> >20% cover of rabbitbrush and snakeweed species; native grasses present
U-A:Exotic Forb (aka: EF) 10802108	<b>Exotic-Forb-early:</b> 5-100% exotic forbs (thistles, halogeton, knapweed); <10% cover of rabbitbrush species; <10% cover of big sagebrush; native grass and forbs may be present
U-A:SAP (aka: ASPG) 10802124	<b>Shrub-Annual-Species-Perennial-Grass-Early:</b> >5% cover of non-native annual species; <10% cover of big sagebrush and other shrubs; ≥5% native grasses; 0-9 yrs
U-A:Seeded Native (aka: SD) 10802135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs; <5% non-native annual species cover; shrub cover ranges from early to late-successional
U-A:SI (aka: SDI-A) 10802129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced grasses and shrubs; <10% native shrub (various rabbitbrushes, snakeweed, and basin big sagebrush) cover; <5% non-native annual species cover
U-A:SI+AS 10802138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced grasses and shrubs; <10% native shrub (various rabbitbrushes, snakeweed, and basin big sagebrush) cover; ≥5% cover of non-native annual species;

U-B:SAP (aka B-SAP) 10802224	<b>Shrub-Annual-Species-Perennial-Grass-Mid:</b> >5% cover of non-native annual species; 10-19% cover of Wyoming big sagebrush ≥5% native grasses; 10-39 yrs
U-B:SI (aka: SDI-B) 10802229	<b>Seeded-Introduced-Mid:</b> >10% seeded introduced grasses and shrubs; 10-19% native shrub (various rabbitbrushes, snakeweed, and basin big sagebrush) cover; <5% non-native annual species cover
U-B:SI+AS 10802238	<b>Seeded-Introduced-Mid+Annual-Species:</b> >10% seeded introduced grasses and shrubs; 10-19% native shrub (various rabbitbrushes, snakeweed, and Wyoming big sagebrush) cover; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 10802303	<b>Depleted:</b> ≥10% cover of Wyoming big sagebrush), rabbitbrush, and rabbitbrush; <5% native grass cover; >20% mineral soil and litter cover; >10 yrs
U-C:SA 10802321	<b>Shrub-Annual-Species:</b> 5-14% cover of non-native annual species; ≥10% cover of big sagebrush and other shrubs; <5% native grasses; >39 yrs
U-C:SAP (aka: ASPG) 10802324	<b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% cover of non-native annual species; ≥20% cover of big sagebrush and other shrubs; ≥5% native grasses >39 yrs
U-C:SI (aka: SDI-C) 10802329	<b>Seeded-Introduced-Late:</b> >10% seeded introduced grasses and shrubs; ≥20% native shrub (various rabbitbrushes, snakeweed, and Wyoming big sagebrush) cover; <5% non-native annual species cover
U-C:SI+AS 10802338	<b>Seeded-Introduced-Late+Annual-Species:</b> >10% seeded introduced grasses and shrubs; ≥20% native shrub (various rabbitbrushes, snakeweed, and Wyoming big sagebrush) cover; ≥5% cover of non-native annual species
U-C:TEA 10802344	<b>Tree-Encroached-Annual-Species:</b> ≥10% cover of conifers; <20% cover of shrubs; <b>either</b> <5% non-native annual species cover <b>AND</b> <5% native grass cover <b>OR</b> ≥5% non-native annual species cover <b>AND</b> ≥5% native grass cover
<b>Black Sagebrush (BS) 10791</b>	<i>Overview:</i> The Black Sagebrush BpS is found throughout the project area. <i>Artemisia nova</i> is the dominant species. Black sagebrush tends to grow where there is a calcite-based root-limiting layer in the soil profile. Wyoming big sagebrush and basin big sagebrush generally occur with black sagebrush on moderately deep to deep soils that are well-drained. Elevations range from 1,500 m to 2,600 m (4,920' to 6,530'), although the BpS is sometimes found as high as 2,743 m (9,000'). The BpS mostly occurs on Great Basin alluvial fans, piedmonts, bajadas, rolling hills and mountain slopes. The BpS can also be found on flats and plains. Black sagebrush generally has relatively low fuel loads with low-growing and cushion forbs and scattered bunchgrasses such as Thurber's needlegrass ( <i>Achnatherum thurberianum</i> ), Sandberg's bluegrass ( <i>Poa secunda</i> ), Indian ricegrass ( <i>Achnatherum hymenoides</i> ), and bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> ) at higher elevations. Forbs often include buckwheats ( <i>Eriogonum</i> spp.), fleabanes ( <i>Erigeron</i> spp.), phloxes ( <i>Phlox</i> spp.), paintbrushes ( <i>Castilleja</i> spp.), globemallows ( <i>Sphaeralcea</i> spp.), and lupines ( <i>Lupinus</i> spp.). <i>Note to past modelers:</i> The 4-box structure of the model proved inadequate for the Snake Range where a clear successional stage was missing between the original C and D classes: The Christmas tree phase.
A:Animal Mound 10791012	<b>Early-Animal Mound:</b> >70% bare ground cover made of mineral soil excavated by either small mammals or ants in the form of a small mound with a concentric area cleared of debris that persists for decades; <25% cover of scattered rabbitbrush, snake weed; <5% cover of non-native annual species
A:All 10791010	<b>Early-all:</b> <10% cover rabbitbrush; 10-40% cover of grass; <50% cover mineral soil; 0-25 yrs
B:Open 10791022	<b>Mid-open:</b> 10-19% cover of black sagebrush and rabbitbrush; 10-30% grass cover; <40% cover of mineral soil; 25-119 yrs

C:Closed 10791030	<b>Mid-closed:</b> ≥20% cover of black sagebrush; 10-30% cover of grasses; <10% pinyon-juniper seedling or young sapling cover but conifers often absent; 120-149 yrs
D:Open 10791042	<b>Late-Open:</b> >5% cover of conifer 1-3m high (Christmas tree phase); ≥20% cover of black sagebrush; <30% cover of grasses; 150-194 yrs
E:Closed 10791050	<b>Late-Closed:</b> >20% cover of pinyon or juniper >3m tall; <10% black sagebrush cover; <10% grass cover; >194 yrs
U-A:Annual Spp (aka: AG) 10791100	<b>Annual-Species:</b> >10% cover of non-native annual species; <10% cover of shrubs
U-A:Bare Ground (aka: BAGR) 10791101	<b>Bare Ground:</b> primarily bare ground due primarily to anthropogenic disturbances
U-A:Exotic Forb (aka: EF) 10791108	<b>Exotic-Forbs:</b> 5-100% exotic forbs (thistles, halogeton, knapweed); cover of rabbitbrush and black sagebrush increases with successional age; native grasses may be present
U-A:Early-Shrub (aka: ES) 10791105	<b>Early-Shrub:</b> 10-40% cover rabbitbrush species
U-A:SAP (aka: ASPG) 10791124	<b>Shrub-Annual-Species-Perennial-Grass-early:</b> >5% cover of non-native annual species; ≥5% native grasses; <10% cover of shrubs
U-A:Seeded Native (aka: SD) 10791135	<b>Seeded:</b> >5% seeded native; cover of shrub varies with successional age
U-A:SI (aka: SDI-A) 10791129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-A:SI+AS 10791138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-B:SAP (aka: ASPG) 10791224	<b>Shrub-Annual-Species-Perennial-Grass+mid:</b> ≥5% cover of non-native annual species; ≥5% native grasses; ≤10% cover of shrubs
U-B:SI (aka: SDI-B) 10791229	<b>Seeded-Introduced-Mid:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-19% cover of black sagebrush and rabbitbrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-B:SI+AS 10791238	<b>Seeded-Introduced-Mid+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-19% cover of black sagebrush and rabbitbrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-C:Depleted (aka:DP) 10791303	<b>Depleted:</b> 20-50% cover of black sagebrush; <5% herbaceous cover; <10% pinyon or juniper sapling cover
U-C:SA 10791321	<b>Shrub-Annual-Species:</b> >5% non-native annual species cover; 10-50% cover of black sagebrush; <5% cover of native grass; <10% pinyon or juniper sapling cover
U-C:SAP (aka: ASPG) 10791324	<b>Shrub-Annual-Species-Perennial-Grass+late:</b> ≥5% cover of non-native annual species; <10% pinyon-juniper sapling cover; 20-30% cover of black sagebrush; ≥5% native grasses; ≤10% cover of shrubs
U-C:SI (aka: SDI-C) 1079329	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% pinyon-juniper sapling cover; 20-30% cover of black sagebrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover

U-C:SI+AS 10791338	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% pinyon-juniper sapling cover; 20-30% cover of black sagebrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-D:Depleted (aka: DPL) 10791403	<b>Depleted:</b> >5% cover of conifer 1-3m high (Christmas tree phase); >20% cover of black sagebrush; <5% herbaceous native cover; <5% herbaceous non-native cover
U-D:SA 10791421	<b>Shrub-Annual-Species:</b> >5% non-native annual species cover; >5% cover of conifer 1-3m high (Christmas tree phase); >10% cover of black sagebrush; <5% cover of native grass
U-D:SAP 10791424	<b>Shrub-Annual-Species-Perennial-Grass+late:</b> ≥5% cover of non-native annual species; ≥5% native grasses; >5% cover of conifer 1-3m high (Christmas tree phase); 20-30% cover of black sagebrush; ≤10% cover of shrubs
U-D:SI (aka: SDI-D) 10791429	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); >5% cover of conifer 1-3m high (Christmas tree phase); <10% black sagebrush cover; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-D:SI+AS (aka: SI-D+AG) 10791438	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); >5% cover of conifer 1-3m high (Christmas tree phase); <10% black sagebrush cover; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-E:SI (aka: SDI-D) 10791529	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); >5% cover of mature pinyon or juniper 3-8m tall; <10% black sagebrush cover; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-E:SI+AS (aka: SI-D+AG) 10791538	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-40% cover of pinyon or juniper 3-8m tall; <10% black sagebrush cover; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-E:TEA 10791544	<b>Tree-Encroached-Annual-Species:</b> >10% mature pinyon or juniper cover 3-8m tall; <5% shrub cover; <b>either</b> <5% native herbaceous cover <b>and</b> <5% non-native annual species; <b>OR</b> ≥5% non-native annual species <b>and</b> >0% native herbaceous cover

<b>Curl-leaf Mountain Mahogany (CMM) 10620</b>	<p><i>Overview:</i> The Curl-leaf Mountain Mahogany BpS is usually found on upper slopes and ridges between 2,133 m to 3,200 m (7,000' to 10,500') elevation. Most stands occur on rocky shallow soils and outcrops. Stands are assumed to reach old age, &gt;1,000 years, without fire. The BpS is present in two distinct forms due to soil differences: 1) savannas of old and well-dispersed trees form open and often grassy woodlands (with mature stand cover between 10-55%) with a diverse understory on soils with a large proportion of boulders above and below ground; and 2) dense thickets of old shrubs (56% to 100% cover) with thick litter and little understory cover form on soils without bouldering. Curl-leaf mountain mahogany (<i>Cercocarpus ledifolius</i>) is both a primary early successional colonizer rapidly occupying bare mineral soils after disturbance and the dominant long-lived species. Seedlings require mineral soil without plant competition to reestablish after fire. Reproduction often appears dependent upon geographic variables (slope, aspect, and elevation) more than biotic factors. Where curl-leaf mountain mahogany has reestablished quickly after fire, rabbitbrush (<i>Ericameria nauseosus</i>) may co-dominate. Litter and shading by woody plants inhibits establishment of curl-leaf mountain mahogany. Mountain big sagebrush is the most common codominant with curl-leaf mountain mahogany, although mountain shrub species such as manzanita (<i>Arctostaphylos patula</i>), tobaccobrush (<i>Ceanothus velutinus</i>), and green ephedra (<i>Ephedra viridis</i>) often codominate on some sites. Snowberry, Utah serviceberry, and currant are present on cooler sites, with more moisture. Singleleaf pinyon, white fir, and limber pine may be present, with less than 10% total cover. In old closed canopy stands, understory may consist largely of prickly phlox (<i>Leptodactylon pungens</i>).</p>
A:All 10620010	<b>Early:</b> <70% cover of mountain mahogany; other shrubs (snowberry, rabbitbrush) and grasses may be present; 0-20 yrs
B:Open 10620022	<b>Mid-open:</b> 10-30% cover mountain mahogany and other shrubs; 20-60 yrs
C:Closed 10620030	<b>Mid-closed:</b> 30-70% cover of mountain mahogany, other shrubs (snowberry, rabbitbrush, big sagebrush, bitterbrush, black sagebrush) abundant; 60-150 yrs
D:Open (aka: D) 10620042	<b>Late-open:</b> 10-30% cover of mountain mahogany; big sagebrush, black sagebrush, bitterbrush; grasses abundant; occasional ponderosa pine possible; 150+ yrs
D:Closed (aka: E) 10620040	<b>Late-closed:</b> >30% cover of mountain mahogany; 0-10% cover of pinyon-juniper; snowberry may be common; occasional pine or fir possible; 150+ yrs
U-A:Annual Spp (aka: AG) 10620100	<b>Annual-Species:</b> ≥10% non-native annual species cover; mountain mahogany largely absent; ≤80% cover of mineral soil, bedrock, and rock
U-A:SAP (aka: ASPG) 10620124	<b>Shrub-Annual-Species-Perennial-Grass-early:</b> >5% cover of non-native annual species; ≥5% native grasses; <10% cover of shrubs that are not curl-leaf mountain mahogany
U-A:SI (aka: SDI) 10620129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-A:SI+AS (aka: SDI+AG) 10620138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-B:SAP 10620224	<b>Shrub-Annual-Species-Perennial-Grass-mid:</b> ≥5% cover of non-native annual species; ≥5% native grasses; 10-30% cover young mountain mahogany (required) and other shrubs (e.g, Utah serviceberry); 20-60 yrs
U-C:FIC 10620352	<b>Fire-Intolerant Conifers-Late-Open:</b> >30% cover of older (≥100 yrs old) pinyon, juniper; <10% cover of curl-leaf mountain mahogany; no or very scattered pine or fir trees may be present

U-C:TEA (aka, TA) 1062344	<b>Tree with Annual-Species-mid:</b> >5% non-native annual species cover; >30% cover of mid-successional mountain mahogany; 40% cover of mineral soil, bedrock, and rock
U-D:TEA (aka: TA) 10620444	<b>Tree-Encroached or with Annual-Species-late:</b> >5% non-native annual species cover; >30% cover of mountain mahogany; pinyon and juniper trees may be absent to co-dominant with curl-leaf mountain mahogany; Utah serviceberry may be present to common; 40% cover of mineral soil, bedrock, and rock
<b>Desert Wash (DWA) 11544</b>	<i>Overview:</i> The Desert Wash BpS comprises intermittent to dry desert drainages with mostly deeper subsurface flow whose banks can be deeply incised, but usually on one side of meanders. Flash-flooding is the major disturbance in this BpS. Gravels and desert shrub species dominate the system with shrub cover increasing with time since last flood. Common species include burrobrush, big sagebrush, snakeweed, rabbitbrush, Indian ricegrass, squirreltail, and bush muhly.
A:All 11544010	<b>Early-all:</b> 30-50% cover may be gravel, sands, and/or flood debris; 10-19% cover of burrobrush, rabbitbrush, snakeweed, and desert willows present; ≥5% cover of grasses (bush muhly, Indian ricegrass, squirreltail); forbs present to abundant; 0-5 yrs
B:Closed 11544021	<b>Mid-closed:</b> 10-30% of gravel and rocks; 20-50% cover of big sagebrush, burrobrush, and rabbitbrush; 5-10% cover of grasses (big galleta, bush muhly, Indian ricegrass, squirreltail); forbs present to abundant; 5-19 yrs
C:Closed 11544030	<b>Late-closed:</b> <10% of gravel and rocks; 30-50% cover of big sagebrush, burrobrush, rabbitbrush, Woods Rose, and other tall shrubs; 5-10% cover of grasses (big galleta, bush muhly, Indian ricegrass, squirreltail); forbs present to abundant; >20 yrs
U-A:Bare Ground (aka: BAGR) 11544101	<b>Bare-Ground:</b> mineral soil exposed by human-caused disturbances
U-A:Early-Shrub (aka: ES) 11544105	<b>Early-Shrub:</b> 20-50% cover of snakeweed, burrobrush, or rabbitbrush species
U-A:EFT 11544106	<b>Exotic-Forb-Tree:</b> >5% cover of salt cedar, Russian olive, or exotic forbs (knapweed, tall whitetop); ≥10% cover of burrobrush, big sagebrush, rabbitbrush, and sagebrush. Gravel and rocks common to abundant
U-B:SA 11544221	<b>Shrub-Annual-Species:</b> >5% non-native annual species (Bromus tectorum, Bromus rubens, Erodium cicutarium) cover; 0-50% small trees and shrubs; <5% cover of native grasses; mineral soil may be common
U-B:SAP 11544224	<b>Shrub-Annual-Species-Perennial-Grass:</b> >5% non-native annual species (Bromus tectorum, Bromus rubens, Erodium cicutarium) cover; 0-50% small trees and shrubs, ≥5% cover of grasses (bush muhly, Indian ricegrass, squirreltail); mineral soil may be common
<b>Dry Wet Meadow (DWM) 11453</b>	<i>Overview:</i> The Dry Wet Meadow BpS is a drier version of wet meadows that usually do not have an obvious spring or proximate waterway. Dry wet meadows are usually sub-irrigated and dry out by mid-July as graminoids become senescent. Maybe found on gentle slope. Some dry wet meadow can be found in the outer concentric ring of wet meadows. Because soils are not heavily saturated with water or channels are not present, channel incision or hummocking are not found. Saturated soils during the spring and early summer favor graminoid dominance, but the dominant graminoids differ from those of wetter meadows. The presence of shrubs (Wood's rose, sagebrush, rabbitbrush) at the meadow's edge increases during consecutive drought years and decreases during consecutive high water years. With grazing pressure, early shrub species, such as rabbitbrush, increase in abundance.
A:All 11453010	<b>Early-all:</b> 10-60% herbaceous cover – mostly graminoids; 0-2 yrs

B:Closed 11453021	<b>Mid-closed:</b> 61-100% herbaceous cover – mostly graminoids; 3-22 yrs
C:Open 11453032	<b>Late-open:</b> 5-10% shrub (Wood’s rose, sagebrush, rabbitbrush) cover; 60-80% herbaceous cover – mostly graminoids; >22 yrs
U-A:Annual Spp (aka: AG) 11453100	<b>Annual-Species:</b> >5% cover of non-native annual species; < 10% shrub cover
U-A:Bare Ground (aka: BAGR) 11453101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 11453105	<b>Early-Shrub:</b> >20% cover of mostly rabbitbrush species
U-A:Exotic Forb (aka: EF) 11453108	<b>Exotic-Forb:</b> >5% exotic forbs (knapweed, purple loosestrife, thistles)
U-A:SAP (aka: ASPG) 11453124	<b>Shrub-Annual-Perennial-Grass-Early:</b> 5-14% cover of non-native annual species; native graminoids dominant; no shrubs; soil cover may be high
U-A:SI (aka: SDI) 11453129	<b>Seeded-Introduced:</b> ≥10% cover of introduced forage species (e.g., smooth brome, intermediate wheatgrass); native graminoids present to common
U-A:SI+AS (aka: SDI) 11453138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced species e.g., smooth brome, intermediate wheatgrass); ≥5% non-native annual species cover
U-B:SAP 11453224	<b>Shrub-Annual-Perennial-Grass-Mid:</b> ≥5% cover of non-native annual species; 61-100% herbaceous cover – mostly graminoids
U-C:SA 11453121	<b>Shrub-Annual-Species:</b> >10% cover of native shrubs; <5% native graminoid cover; ≥5% cover of non-native annual species
U-C:SAP 11453324	<b>Shrub-Annual-Perennial-Grass-Mid:</b> ≥5% cover of non-native annual species; 61-80% herbaceous cover – mostly graminoids; 5-10% shrub (Wood’s rose, sagebrush, rabbitbrush) cover
U-C:Shrb-Frb Encr 11453337	<b>Shrub-Forb-Encroached:</b> >10% cover of less palatable grasses and forbs (e.g., Iris missouriensis) <b>OR</b> >10% shrub cover (willow, Wood’s rose, sagebrush, aspen); 10-30% cover of bare ground
U-C:TEA 11453344	<b>Tree-Encroached-Annual-Species (on incised meadow):</b> >20% conifer cover 10-25m; <5% shrub cover; <5% native herbaceous cover; ≥0% cover of non-native annual species
<b>Engelmann’s Spruce (SF) 10560</b>	<i>Overview:</i> The Engelmann’s Spruce BpS is found at elevations typically ranging from 2,590 m to 3,353 m (8,500-11,000’) in the subalpine zone on gentle to moderately steep terrain (10-60% slopes). These forests are found on mountain slopes, high-elevation ridge tops and upper slopes, plateau like surfaces, basins, alluvial terraces, well-drained benches, and inactive stream terraces. Occurrences are typically found in locations with cold-air drainage or ponding, or where snowpacks linger late into the summer, such as north-facing slopes and high-elevation ravines. They can extend down in elevation below the subalpine zone in places where cold-air ponding occurs; northerly and easterly aspects predominate. The overstory is typically dominated by Engelmann’s spruce. Other tree species may include aspen, limber pine, bristlecone pine, and Douglas-fir. Understory shrub, forbs, and graminoid species are limited to a few high elevation species. Litter is often the dominant ground cover.
A:All 10560010	<b>Early:</b> 5-100% cover of Engelmann’s spruce and subalpine fir seedling/shrub/grass <5m; 0-39 yrs

B:Closed 10560021	<b>Mid1-closed:</b> 40-100% cover of Engelmann's spruce and subalpine fir, and aspen 5-24m pole size; 40-129yrs
B:Open 10560022	<b>Mid1-open:</b> 5-39% cover of Engelmann's spruce and subalpine fir, 5-24m pole size; 40-129yrs
C:Closed 10560030	<b>Late1-closed:</b> 40-100% cover of Engelmann's spruce and subalpine fir 25-49m; ≥130 yrs
<b>Four-Wing Saltbush (FWS) 10811</b>	<i>Overview:</i> The Four-Wing Saltbush BpS occurs from 1,524 – 1,585 m (5,000 – 5,200'). It is part of the Mixed Salt Desert community, but the high stature and high density of four-wing saltbush ( <i>Atriplex canescens</i> ) makes it stand apart. Soils are alkaline, made of loamy fine sand, highly permeable, and very deep (>152 cm or >60"). Many soils are derived from eolian deposits and often associated with dunes. Average annual precipitation ranges from 0-25.4 cm (0 to 10"). This system generally occurs as small patches and stringers. Summers are hot and dry with many days reaching 30 degrees C (100 degrees F). Spring is the only dependable growing season with moisture both from winter and spring precipitation. Cool springs can delay the onset of plant growth and drought can curtail the length of active spring growth. Four-wing saltbush are tall shrubs found at high density (3-5 plants per sq. m) interspersed with low to mid-height bunch grasses. Other shrubs include basin big sagebrush ( <i>Artemisia tridentata</i> ssp. <i>tridentata</i> ) and rubber rabbitbrush ( <i>Ericameria nauseosa</i> ). Common bunch grass species are Indian ricegrass ( <i>Achnatherum hymenoides</i> ), needle-and-thread ( <i>Hesperostipa comata</i> ), and, where monsoonal influences are present, rhizomatous/sod forming grasses such as galleta grass ( <i>Pleuraphis jamesii</i> ) and sand dropseed ( <i>Sporobolus cryptandrus</i> ). The biophysical setting has not evolved with fire and fire is absent from the reference condition.
A:All 10811010	<b>Early-all:</b> ≥10% Indian ricegrass, galleta grass, needle-and-thread, or bottlebrush cover; <5% young four-wing saltbush or rubber rabbitbrush cover; mineral soil common to abundant; 0-5 yrs
B:Open 10811022	<b>Mid1-open:</b> 5-20% four-wing saltbush, basin big sagebrush, or rabbitbrush cover; >10% Indian ricegrass, galleta grass, needle-and-thread, or bottlebrush cover; mineral soil common to abundant; 6-19 yrs
C:Closed 10811030	<b>Late1-closed:</b> >20% four-wing saltbush and basin big sagebrush cover >1m tall; 10-20% Indian ricegrass, galleta grass, needle-and-thread, or bottlebrush cover; ≥20 years
U-A:Annual Spp (aka: AG) 10811100	<b>Annual-Species:</b> ≥10% non-native annual species cover; <5% shrub cover; native grass may be present to common
U-A:Bare Ground (aka: BAGR) 10811101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10811105	<b>Early-Shrub:</b> 10-40% cover rabbitbrush and snakeweed species
U-A:Exotic Forb (aka: EF) 10811108	<b>Exotic Forb:</b> >5% halogeton, knapweed, or other noxious weeds.
U-A:Seeded Native (aka: SD) 10811135	<b>Seeded-Native:</b> >10% native grass and four-wing saltbush seed mix cover; <5% non-native annual species cover
U-A:SI (aka: SDI) 10811129	<b>Seeded-Introduced:</b> >10% seeded introduced grasses and shrub species (crested wheatgrass and forage kochia); <5% non-native annual species cover; native shrubs may be present to common

U-A:SI+AS (aka: SDI+AG) 10811138	<b>Seeded-Introduced+Annual-Species:</b> >10% seeded introduced grasses and shrub species (crested wheatgrass and forage kochia); ≥5% non-native annual species cover; native shrubs may be present to common
U-C:Depleted (aka: DP) 10811303	<b>Depleted:</b> 5-20% cover of four-wing saltbush, basin big sagebrush, or rabbitbrush; <10% native grass; <5% non-native annual species cover
U-C:SAP 10811324	<b>Shrub-Annual-Species:</b> 5-14% non-native annual species cover; ≥5% cover of four-wing saltbush, basin big sagebrush, or rabbitbrush; native grass may be present to common
<b>Greasewood-Basin Big Sagebrush (GW) 11530</b>	<b>Overview:</b> The Greasewood-Basin Big Sagebrush BpS occurs on alluvial flats or lake plains usually adjacent to playas. Sites typically have saline to sodic soils, shallow water table, and flood intermittently, but remain dry for most growing seasons. The water table remains high enough to maintain vegetation, despite salt accumulations. Slope gradients of less than 2 percent are most typical. Elevations range from 1,158 to 1,768 m (3,800 to 5,800'). Average annual precipitation is 13 to 20 cm (5 to 8"); mean temperature is 45 to 50 degrees F; average growing season is 100 to 120 days. The surface layer normally crusts over, inhibiting water infiltration and seedling emergence. This BpS sometimes occurs as a mosaic of multiple communities, with open to moderately-dense shrublands dominated or co-dominated by <i>Sarcobatus vermiculatus</i> (black greasewood). <i>Atriplex confertifolia</i> (shadscale) and basin big sagebrush ( <i>Artemisia tridentata</i> spp. <i>tridentata</i> ) may be present or co-dominant. An herbaceous layer, if present, is usually dominated by salt-tolerant graminoids. There may be inclusions of <i>Sporobolus airoides</i> (alkali sacaton), <i>Distichlis spicata</i> (inland saltgrass), and basin wildrye ( <i>Leymus cinereus</i> ). Vegetation on this site is normally restricted to coppice mound areas that are surrounded by playa-like depressions or nearly level, usually barren, inner spaces. In eastern Nevada and Utah, this BPS also occurs along creek floodplains and in washes with fine saline to sodic soils. As ecological condition declines, herbaceous understory is reduced or eliminated, and the site becomes a community of halophytic shrubs dominated by greasewood.
A:All 11530010	<b>Early-all:</b> >5% herbaceous cover of inland salt grass, alkali sacaton, or basin wildrye; ≤5% young or resprouting greasewood; >25% mineral soil; flood debris may be abundant; 0-4 years
B:Closed 11530021	<b>Mid-closed:</b> >5% cover of mature greasewood with other shrubs possible (basin big sagebrush and shadscale); >5% herbaceous cover of inland salt grass, alkali sacaton, or basin wildrye; mineral soil may be common; >4 years
U-A:Annual Spp (aka: AG) 11530100	<b>Annual-Species:</b> >10% cover of non-native annual species; <5% cover of mature greasewood and other shrubs
U-A:Bare Ground (aka: BAGR) 11530101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Exotic Forb (aka: EF) 11530108	<b>Exotic-Forb:</b> 5-100% exotic forbs (knapweed, tall whitetop, purple loosestrife)
U-A:SI (aka: SDI) 11530129	<b>Seeded-Introduced:</b> >10% seeded introduced grasses (usually Russian wheatgrass), forbs, and shrubs; greasewood and other shrubs may be present to common; <5% non-native annual species cover
U-A:SI+AS (aka: SDI+AG) 11530138	<b>Seeded-Introduced+Annual-Species:</b> >10% seeded introduced grasses (usually Russian wheatgrass), forbs, and shrubs; greasewood and other shrubs may be present to common; ≥5% non-native annual species cover.
U-B:SAP 11530224	<b>Shrub-Annual-Perennial-Grass:</b> >5% non-native annual species cover; >5% cover of mature greasewood or basin big sagebrush; native grasses may be present to common; >4 years

<b>Limber-Bristlecone Pine-dry (LB) 10200</b>	<i>Overview:</i> The Limber-Bristlecone Pine-dry BpS is often the highest subalpine forest type. The BpS produces the ancient (>4,000 years old) woodlands. Elevation ranges from 2,438 m to 3,505 m (8,000' to 11,500') on mid to upper slopes. The areas are typically in rain shadows, and are the dry and cold extent of tree cover. Stands occur on thin, stony soils, high windswept ridges and open slopes with minimal ground cover. <i>Pinus longaeva</i> and <i>Pinus flexilis</i> can exist separately or as mixed stands. <i>Picea engelmannii</i> and <i>Pseudotsuga menziesii</i> may occur incidentally with <i>Pinus longaeva</i> . Sparse forbs, grasses and short shrubs form an understory.
A:All 10200010	<b>Early-all:</b> 0-10% limber and bristlecone pine cover 0-5m tall; abundant mineral soil or talus cover; sparse ground cover; 0-99 yrs
B:Open 10200022	<b>Mid1-open:</b> 11-30% limber and bristlecone pine cover 5-10m tall; abundant mineral soil or talus cover; sparse ground cover; 100-249 yrs
C:Open 10200032	<b>Late1-open:</b> very old trees; 11-30% limber and bristlecone pine cover 5-25m tall; abundant mineral soil or talus cover; sparse ground cover; >250 yrs
<b>Limber-Bristlecone Pine-mesic (LBm) 10201</b>	<i>Overview:</i> The Limber-Bristlecone Pine-mesic BpS is completely dominated by <i>Pinus longaeva</i> form closed-canopied forests, and not woodlands. The mesic bristlecone pine forests are found on the southwest slope of Mt. Washington and northwest slope of Lincoln Peak from 2,834 m to 2,896m (9,300 to 9,500 ft) of elevation; however, a few other locations exist too. This BpS does not form ancient forests because the mesic soils promote heart rot in the bole of bristlecone pine, which may not exceed 500 years of age. Soils are moderately deep and contain coarse rocky fragments because organic pine needles accumulated for centuries on the limestone shelves where these forests are perched. Sparse forbs, grasses and short shrubs form an understory. Early-successional forests after fires are high-quality bighorn sheep foraging habitat, as observed after the Philips Ranch Fire.
A:All 10201010	<b>Early-all:</b> 0-10% bristlecone pine cover 0-5m high, abundant soil or talus; <i>Ribes</i> and <i>Poa</i> present; 0-49 yrs
B:Open 10201022	<b>Mid1-open:</b> 11-20% bristlecone pine cover 5-10m high; <i>Ribes</i> and <i>Poa</i> present; 50-199 yrs
C:Closed 10201030	<b>Late1-Closed;</b> old trees but not ancient; 20-40% bristlecone pine cover 5-25m high; <i>Ribes</i> and <i>Poa</i> present; >200 yrs
<b>Little-leaf Mountain Mahogany (LLMM) 10862</b>	<i>Overview:</i> The Little-leaf Mountain Mahogany BpS is one of four mountain shrub types, where little-leaf mountain mahogany ( <i>Cercocarpus intricatus</i> ) is the indicator species. Elevation ranges from 1,219 m to 2,580 m (4,000' to 8,500'). The BpS is typically found on limestone ridges and cliff ledges with very shallow carbonate and dry unproductive soils over bedrock. Pinyon and/or juniper can co-dominate in communities that have not burned for a long time.
A:All 10862010	<b>Early-all:</b> 0-10% canopy of little-leaf mountain mahogany; ≥5% grass and forb cover; mineral soil and bedrock cover high; 0-12 yrs
B:Open 10862022	<b>Mid-open:</b> 11-20% cover of little-leaf mountain mahogany; ≥10% herbaceous cover; <10% conifer sapling cover; 13-79 yrs
C:Closed 10862030	<b>Late-closed:</b> 10-20% pinyon pine-juniper cover; >21% cover of little-leaf mountain mahogany; <10% herbaceous cover; 80+ yrs
U-A:Annual Spp (aka: AG) 10862100	<b>Annual-Species:</b> >10% cover of non-native annual grasses; snakeweed or rabbitbrush may be present; dead standing stems of little-leaf mountain mahogany often present.
U-A:SAP (aka: AGPG) 10862124	<b>Shrub-Annual-Species-Perennial-Grass-Early:</b> ≥5% non-native annual species cover; ≤10% cover of little-leaf mountain mahogany; native herbaceous cover usually present; tree samplings may be present

U-B:SAP 10862224	<b>Shrub-Annual-Species-Perennial-Grass-Mid:</b> ≥5% non-native annual species cover; >10% cover of little-leaf mountain mahogany; native herbaceous cover usually present; tree samplings may be present
U-C:TEA 10862344	<b>Tree-Encroached-Annual-Species:</b> >10% mature pinyon-juniper cover; <b>IF</b> ≥5% cover of non-native annual grasses and forbs <b>THEN</b> >0% cover of little-leaf mountain mahogany <b>OR IF</b> <5% cover of non-native annual grasses and forbs <b>THEN</b> <10% cover of little-leaf mountain mahogany <b>AND</b> <5% native herbaceous cover.
<b>Low Sagebrush-semidesert (LS) 10790</b>	<i>Overview:</i> Low sagebrush ( <i>Artemisia arbuscula</i> ) is the dominant species. Low sagebrush semi-desert tends to grow where there is a clay-based root-limiting layer in the soil profile. Big sagebrush species generally occur on deeper loamy soils. Elevations range from 1,500 m to 2,600 m (4,920' to 6,530'), although the BpS is sometimes found as high as 2,743 m (9,000'). The BpS mostly occurs on Great Basin alluvial fans, piedmonts, bajadas, rolling hills and mountain slopes. The BpS can also be found on flats and plains. Low sagebrush generally has relatively low fuel loads with low-growing and cushion forbs and scattered bunchgrasses such as Thurber needlegrass ( <i>Achnatherum thurberianum</i> ), Sandberg's bluegrass ( <i>Poa secunda</i> ), Indian ricegrass ( <i>Achnatherum hymenoides</i> ), and bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> ) at higher elevations. Forbs often include buckwheats ( <i>Eriogonum</i> spp.), fleabanes ( <i>Erigeron</i> spp.), phloxes ( <i>Phlox</i> spp.), paintbrushes ( <i>Castilleja</i> spp.), globemallows ( <i>Sphaeralcea</i> spp.), and lupines ( <i>Lupinus</i> spp.). Utah juniper ( <i>Juniperus osteosperma</i> ), more than singleleaf pinyon ( <i>Pinus monophylla</i> ), may occasionally establish in low sagebrush's harsh soils; however, low sagebrush does not generally support trees.
A:All 10790010	<b>Early-all:</b> <10% cover rabbitbrush and other shrubs; >10% cover of grass; <50% cover mineral soil; 0-24 yrs
B:Open 10790022	<b>Mid-open:</b> 10-19% cover of low sagebrush and rabbitbrush; >10% grass cover; <40% cover of mineral soil; 25-119 yrs
C:Closed 10790030	<b>Late-closed:</b> >20% cover of low sagebrush; <3% mature juniper (maybe pinyon) cover; ≤5% juniper (maybe pinyon) sapling cover; >5% cover of grasses; >120 yrs
U-A:Annual Spp (aka: AG) 10790100	<b>Annual-Species:</b> >10% cover of non-native annual species; <10% cover of shrubs (primarily rabbitbrush and snakeweed)
U-A:Bare Ground (aka: BAGR) 10790101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10790105	<b>Early-Shrub:</b> 10-40% cover rabbitbrush species
U-A:SAP (aka: AGPG) 10790124	<b>Shrub-Annual-Species-Perennial-Grass-early:</b> 5-14% cover of non-native annual species; ≥5% native grasses; <10% cover of shrubs; trees absent
U-A:Seeded Native (aka: SD) 10790135	<b>Seeded-Native:</b> >5% seeded native grass and forb species; <10% cover of shrubs; <5% non-native annual species cover.
U-A:SI (aka: SDI-A) 10790129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-A:SI+AS 10790138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of shrubs; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover

U-B:SA 10790221	<b>Shrub-Annual-Species:</b> ≥5% non-native annual species cover; >10% cover of low sagebrush; <5% cover of native grass; <3% mature juniper (maybe pinyon) cover; ≤5% pinyon or juniper sapling cover
U-B:SAP 10790224	<b>Shrub-Annual-Species-Perennial-Grass-Mid:</b> ≥5% non-native annual species cover; >10% cover of low sagebrush; >5% cover of native grass; <3% mature juniper (maybe pinyon) cover; <5% pinyon or juniper sapling cover
U-B:SI (aka: SDI-B) 10790229	<b>Seeded-Introduced-Mid:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-19% cover of low sagebrush and rabbitbrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-B:SI+AS 10790238	<b>Seeded-Introduced-Mid+Annual-Species:</b> >10% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); 10-19% cover of low sagebrush and rabbitbrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover
U-C:Depleted (aka: DP) 10790303	<b>Depleted:</b> >20% cover of low sagebrush; <5% herbaceous cover; <3% mature juniper (maybe pinyon) cover; ≤5% pinyon or juniper sapling cover
U-C:SAP 10790324	<b>Shrub-Annual-Species-Late:</b> ≥5% non-native annual species cover; >10% cover of low sagebrush; <5% cover of native grass; <3% mature juniper (maybe pinyon) cover; ≤5% pinyon or juniper sapling cover
U-C:SI (aka: SDI-C) 10790329	<b>Seeded-Introduced-Late:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <3% mature juniper (maybe pinyon) cover; ≤5% pinyon or juniper sapling cover; >20% cover of low sagebrush; native grasses and forbs may be present to abundant; <5% non-native annual species cover
U-C:SI+AS 10790338	<b>Seeded-Introduced-Late+Annual-Species:</b> >5% seeded introduced species (crested wheatgrass, intermediate wheatgrass, or forage kochia); <3% mature juniper (maybe pinyon) cover; ≤5% pinyon or juniper sapling cover; >20% cover of low sagebrush; native grasses and forbs may be present to abundant; ≥5% non-native annual species cover.
U-C:TEA (aka: TE or TA) 10790344	<b>Tree- Encroached or with Annual-Species:</b> ≥3% mature pinyon or juniper cover; <10% low sagebrush and other shrub cover; ≥5% non-native annual species; >0% native herbaceous cover <b>OR</b> <5% low sagebrush and other shrub cover; <5% non-native annual species; <5% native herbaceous
<b>Low Sagebrush Steppe (LSS) 11240</b>	Overview: The Low Sagebrush Steppe BpS is found on upper-montane to subalpine clay soils. Low sagebrush ( <i>Artemisia arbuscula</i> ) and Idaho fescue ( <i>Festuca idahoensis</i> ) are the dominant species. Low sagebrush tends to grow where there is a clay-based root-limiting layer in the soil profile that causes a perched spring water table and poor aeration after wetting. Big sagebrush species generally occur on deeper loamy soils. The BpS occurs on mountain slopes and basins. Elevation is above 2,438 m (8,000'), although the BpS is sometimes higher, where precipitation is greater than 41 cm (16"). Low sagebrush steppe has higher fuel loads than the low sagebrush BpS and, therefore, the steppe's mean fire return interval will be shorter. The dominant grass species is Idaho fescue with Cusick's bluegrass ( <i>Poa cussikii</i> ) subdominant. Forbs often include balsamorhizae ( <i>Balsamorhiza spp.</i> ), buckwheats ( <i>Eriogonum spp.</i> ), fleabanes ( <i>Erigeron spp.</i> ), phloxes ( <i>Phlox spp.</i> ), paintbrushes ( <i>Castilleja spp.</i> ), globemallows ( <i>Sphaeralcea spp.</i> ), and lupines ( <i>Lupinus spp.</i> ). Utah serviceberry ( <i>Amelanchier utahensis</i> ) and antelope bitterbrush ( <i>Purshia tridentata</i> ) will be subdominant shrubs. Subalpine conifers may occasionally establish in low sagebrush steppe's harsh soils; however, low sagebrush does not generally support trees.
A 11240010	<b>Early-all:</b> >15% cover of grass; <10% cover rabbitbrush and other shrubs; <50% cover mineral soil; 0-24 yrs
B 11240022	<b>Mid-open:</b> 10-19% cover of low sagebrush, Utah serviceberry, snowberry, and rabbitbrush; >15% grass cover; <20% cover of mineral soil; 25-119 yrs

C 11240030	<b>Late-closed:</b> >20% cover of low sagebrush low sagebrush, Utah serviceberry, and snowberry; <3% mature conifer cover; ≤5% conifer sapling cover; 10-15% cover of grasses; >120 yrs
U-B:Depleted (aka: DP) 11240203	<b>Depleted-mid:</b> 10-19% cover of low sagebrush, Utah serviceberry, and snowberry; <5% herbaceous cover
U-C:Depleted (aka: DP) 11240303	<b>Depleted-late:</b> >20% cover of low sagebrush, Utah serviceberry, and snowberry; <5% herbaceous cover; <3% mature conifer cover; ≤5% conifer sapling cover
U-A:Early Shrub (aka: ES) 11240105	<b>Early-Shrub-early:</b> >10% cover rabbitbrush species; <10% cover of low sagebrush and other shrubs
U-B:Early Shrub (aka: ES) 11240205	<b>Early-Shrub-mid:</b> >10% cover rabbitbrush species; 10-19% cover of low sagebrush and other shrubs
U-B:SAP 11240224	<b>Shrub-Annual-Species-Perennial-Grass: newly added to model</b>
U-C:Early Shrub (aka: ES) 11240305	<b>Early-Shrub-late:</b> >10% cover rabbitbrush species; >20% cover of low sagebrush and other shrubs
U-C:TEA (aka: TE) 11240344	<b>Tree-Encroached-or-Annual-Grass :</b> ≥3% mature conifer cover; <10% low sagebrush and other shrub cover; {<5% native herbaceous cover; <5% cheatgrass; <b>OR</b> ≥5% native herbaceous cover; ≥5% cheatgrass}
U-A:Unpalat. Forb (aka: UF) 11240146	<b>Unpalatable-Forb-early:</b> >25% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; <10% cover rabbitbrush and other shrubs
U-B:Unpalat. Forb (aka: UF) 11240246	<b>Unpalatable-Forb-mid:</b> >25% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; 10-19% cover low sagebrush and other shrubs
U-C:Unpalat. Forb (aka: UF) 11240346	<b>Unpalatable-Forb-late:</b> >25% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; 10-19% cover low sagebrush and other shrubs; <3% mature conifer cover
<b>Mixed Conifer (MC) 10520</b>	<i>Overview:</i> The Mixed Conifer BpS is found at elevations ranging from 1,200 m to 2,743 m (4,000'-9,000'). Sites include lower and middle slopes of ravines, along stream terraces, moist concave topographic positions, and north- and east-facing slopes which burn somewhat infrequently. White fir ( <i>Abies concolor</i> ) and Douglas-fir ( <i>Pseudotsuga menziesii</i> ) are most common canopy dominants, but ponderosa pine ( <i>Pinus ponderosa</i> ), Engelmann spruce ( <i>Picea engelmannii</i> ), limber pine ( <i>Pinus flexilis</i> ), and bristlecone pine ( <i>Pinus longeava</i> ) may be occasional. Pure white fir forest patches are common in Nevada; however, a few small occurrences of true mixed species conifer forests do occur, such as above the lead mine along the road in the Keyhole property. Many cold-deciduous shrub, graminoid, and forbs species can occur, although litter is often the dominant understory cover. Aspen is absent and there is no evidence of remnant aspen boles.
A:All 10520010	<b>Early-all:</b> 0-15% cover of young trees/shrub/grass; <5m; 0-29 yrs`
B:Closed (aka: B) 10520021	<b>Mid1-closed:</b> 35-100% cover of pole-sized conifers <24m; 30-99 yrs

B:Open (aka: C) 10520022	<b>Mid1-open:</b> 0-35% cover of pole-sized conifers <24m; 30-99 yrs
C:Open (aka: D) 10520032	<b>Late1-open:</b> 0-35% cover of mature conifers 25-49m; >100 yrs
C:Closed (aka: E) 10520030	<b>Late1-closed:</b> 35-100% cover of mature conifers 25-49m; >100 yrs
U-A:Annual Spp (aka: AG) 10520100	<b>Annual-Species:</b> saplings plus >10% non-native annual grass cover
U-B:TEA (aka: TA) 10520244	<b>Tree-Annual-Species:</b> any mid- to late-successional class plus >5% non-native annual grass cover
<b>Mixed Salt Desert (MSD) 1081</b>	<i>Overview:</i> The Mixed Salt Desert BpS occurs from lower slopes to valley bottoms ranging in elevation from 1,158 – 1981m (3,800 - 6,500'). Soils are often alkaline or calcareous. Soil permeability ranges from high to low, with more impermeable soils occurring in valley bottoms. Water ponds on alkaline bottoms. Texture is variable becoming finer toward valley bottoms. Many soils are derived from alluvium. Average annual precipitation ranges from 7.5-25.4cm (3 to 10"); however, this system is in 12.7-30.3 cm (5-8") of effective moisture within this broader range. Thus, other site characteristics (e.g. aspect, drainage, soil type) should be considered in identifying this biophysical setting. At the precipitation extremes, this system generally occurs as small patches and stringers. Summers are hot and dry with many days reaching 30 degrees C (100 degrees F). Spring is the only dependable growing season with moisture both from winter and spring precipitation. Cool springs can delay the onset of plant growth and drought can curtail the length of active spring growth. Freezing temperatures are common from November through April. Mixed Salt Desert generally lies above playas, lakes, and greasewood communities. Up slope the BpS is bordered by low elevation big sagebrush groups, commonly Wyoming big sagebrush, low sagebrush, and black sagebrush communities. Mixed Salt Desert includes low (<0.91 m or 3') and medium-sized shrubs found widely scattered (often 6.1-9.1 m [20-30'] apart) to high density (3-5 plants per sq. m) shrubs interspersed with low to mid-height bunch grasses. Common shrubs are shadscale, winterfat, budsage, Nevada ephedra, horsebrush, low rabbitbrush, broom snakeweed, and spiny hopsage. Shrub dominance is highly dependent on the site. Some of these shrubs will be present. Common bunchgrass species are Indian ricegrass, needle-and-thread, purple three-awn, and bottlebrush squirreltail, and where monsoonal influences are present one may find common rhizomatous/sod forming grasses such as galleta grass, sand dropseed, and blue grama. Globemallows are the most common and widespread forbs. The understory grasses and forbs are salt-tolerant, not particularly drought tolerant, and are variably abundant. The relative abundance of species may vary in a patchwork pattern across the landscape in relation to subtle differences in soils (e.g., sand sheets or other surface textural differences) and reflect variation in disturbance history. Total cover rarely exceeds 25% and annual cover is closely linked to prior 12 months precipitation. Stand-replacing disturbances (insects, extended wet periods and drought) shift dominance between shrub and grass species. Following drought coupled with insect infestations, the system will tend more toward bud sagebrush dominance. The biophysical setting has not evolved with fire and fire is absent from the reference condition.
A:All 10810010	<b>Early-all:</b> 0-5% cover of young <i>Atriplex</i> spp. or other shrubs; Indian ricegrass and squirreltail common; 0-5 yrs

B:Open 10810022	<b>Late1-open:</b> >5% cover <i>Atriplex</i> spp. or other shrubs; Indian ricegrass and squirreltail present to common; ≥6 yrs
C:Open 10810032	<b>Late2-open:</b> >5% cover budsage <0.25m; Indian ricegrass and squirreltail present to common; ≥6 years
U-A:Annual Spp (aka: AG) 10810100	<b>Annual-Species:</b> ≥5% non-native annual species cover; <5% shrub cover
U-A:Bare Ground (aka: BAGR) 10810101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10810105	<b>Early-Shrub:</b> ≥10% cover rabbitbrush and snakeweed species.
U-A:Seeded Native (aka: SD) 10810135	<b>Seeded-Native:</b> >10% native seed mix, including shadscale, cover; <5% non-native annual species cover
U-SI (aka: SDI) 10810129	<b>Seeded-Introduced:</b> >10% seeded introduced grasses, forbs, and shrubs; <5% non-native annual species cover; shrubs may be present to common
U-SI+AG (aka: SDI+AG) 10810138	<b>Seeded-Introduced+Annual-Species:</b> >10% seeded introduced grasses and shrubs; ≥5% non-native annual species cover; shrubs may be present to common.
U-B:SAP 10810224	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5-% non-native annual species cover; ≥5% cover of <i>Atriplex</i> spp. or other shrubs; native grasses may be present to common.
<b>Montane Riparian (MR) 11540</b>	<i>Overview:</i> The Montane Riparian BpS is found within a broad elevation range above 1,220 m (4,000'). Riparian forests and woodlands require flooding and gravel for reestablishment. The BpS is found in low- to mid-elevation canyons and draws, on floodplains, in steep-sided canyons, or narrow V-shaped valleys with rocky substrates. Sites are subject to temporary flooding during spring runoff, although summer flash floods can have dramatic effects on succession. Underlying gravels, which are favored substrates for cottonwood and willow germination, may keep the water table just below ground surface. In steep-sided canyons, streams typically have perennial flow on mid to high gradients. Surface water is generally high for variable periods. Soils are typically alluvial deposits of sand, clays, silts and cobbles that are highly stratified with depth due to flood scour and deposition. Codominant and diagnostic species include willow, buffaloberry, cottonwood, water birch, and conifers. Vegetation is very heterogeneous and diverse along river reaches. The description below corresponds to an older version when willow and cottonwood successional pathways were not separated.
A:Sediment 11540628	<b>Sediment-Early:</b> >70% cover of mineral soil (sand and silt) made of in-stream sediment associated with natural hydraulics and excessive post-fire debris flow.
A-Willow: All 11540014	<b>Early-Willow-all:</b> 0-40% cover of shrub—willow dominates after fire, whereas cottonwood and willow co-dominate after flooding; grass may co-dominate; <50% cover gravel, rock, and boulders, although this may be highly variable by reach; 0-5 yrs
B-Willow:Closed 11540024	<b>Mid-Willow-closed:</b> 31-100% cover of tall shrubs (willows, buffaloberry) and small trees (velvet ash, conifers) and small cottonwood trees; <20% gravel, rock, and boulders; 5-19yrs
A-Cottonwood:All 11540013	<b>Early-Cottonwood-all:</b> 1-40% cover of cottonwood seedlings and saplings; grass may co-dominate; <50% cover of gravel, rock, and boulders, although this may be highly variable by reach; 0-5 yrs.
B-Cottonwood:Closed 11540023	<b>Mid-Cottonwood-closed:</b> 31-100% cover of small cottonwood trees and other tall shrubs (willows, chokecherry); <20% cover of gravel, rock, and boulders; 5-19 yrs.

C-Cottonwood: Closed 11540033	<b>Late-Cottonwood-closed:</b> 31-100% cover of cottonwood, willow, conifers and other trees 10-24m; <20% gravel, rock, and boulders; >20 yrs
U-A:Agriculture	<b>Agriculture:</b> Irrigated pastures
U-A:Annual Spp (aka: AG) 11540100	<b>Annual-Species:</b> >10% cover of non-native annual species on dry <u>incised</u> banks; < 10% shrub cover
U-A:Bare Ground (aka: BAGR) 11540101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances on either incised (most common case) or un-incised banks
U-A:Early-Shrub (aka: ES) 11540105	<b>Early-Shrub:</b> 20-50% cover rabbitbrush species
U-A:EFT 11540106	<b>Exotic-Forb-Tree:</b> >10% cover of exotic forb or tree species (knapweed, tall whitetop, thistles, purple loosestrife, salt cedar, or Russian olive)
U-A:Hummocked (aka: HU) 11540110	<b>Hummocked:</b> Trampled by ungulates; graminoids present to common in and out of holes created by ungulate hoofs
U-A:Incised-EFT 11540111	<b>Incised-Exotic-Forb-Tree-early:</b> >5% cover of exotic forb species or tree species on <u>incised</u> banks (knapweed, tall whitetop, thistles, purple loosestrife, saltcedar, Russian olive); 5-20% native grass cover, especially basin wildrye; 0% cover of upland shrubs (e.g., big sagebrush, snakeweed, rabbitbrush, Wood's Rose, silver buffaloberry)
U-A:Inset 11540113	<b>Inset-Floodplain-early:</b> Reformed riparian floodplain at bottom of incised creeks; 1-40% cover of willow, young cottonwood may be present; grass may co-dominate or dominate; although this may be highly variable by reach; 0-5 yrs
U-A:Inset-EF 11540116	<b>Inset-Floodplain-Exotic-Forb-early:</b> Reformed riparian floodplain at bottom of incised creeks; ≥5% cover of exotic forb species or tree species in inset floodplains (knapweed, tall whitetop, thistles, purple loosestrife, saltcedar, Russian olive); 1-40% cover of willow, young cottonwood may be present; herbaceous cover ranges from none to 100%.
U-A:Inset-HU 11540117	<b>Inset-Floodplain-Hummocked:</b> Reformed riparian floodplain at bottom of incised creeks; Trampled by ungulates; graminoids present to common in and out of holes created by ungulate hoofs
U-A:Seeded Native (aka: SD) 11540135	<b>Seeded-Native:</b> >10% seeded basin wildrye, other grasses native to deep loamy soils, forbs, and shrubs; <5% non-native annual species (if ≥5 non-native annual species, then SAP or even AS)
U-A:SI (aka: SDI-A) 11543129	<b>Seeded-Introduced-early:</b> >10% seeded introduced grasses, with native grasses and forbs possible; <5% of non-native annual species
U-A:SI+AS (aka: SDA) 11540138	<b>Seeded-Introduced-Species-Annual-Species:</b> Incised river/creek with >20% introduced grass species cover; >0% non-native annual species cover (this class lumps the SI and SI+AG classes); pinyon-juniper may be present
U-C:Desertified (aka: DES) 11540304	<b>Desertified:</b> <u>Incised</u> river/creek with 10-50% cover of upland shrubs (e.g., big sagebrush, snakeweed, rabbitbrush); <5% native grass cover
U-C:SAP 11540324	<b>Shrub-Annual-Species-Perennial-Grass:</b> <u>Incised</u> river/creek with 10-50% cover of upland shrubs (e.g., big sagebrush); >5% non-native annual species cover; >5% native grass cover; ≤20% cover of pinyon-juniper
U-C:Shrb-Frb Encr (aka, SFE) 11540337	<b>Shrub-Forb-Encroached:</b> 10-50% cover of Wood's rose, sumac, or other unpalatable forbs and shrubs in open areas or under tree canopy

U-C:TEA (aka: TE) 11540344	<b>Tree-Encroached or with Annual-Species:</b> <u>Incised</u> river/creek with >20% cover of pinyon or juniper; highly variable cover of riparian shrubs and cottonwood; degree of incision is highly variable; non-native annual species may be present
<b>Montane Sagebrush Steppe-mountain soils (MSSs) 11261</b>	Overview: The Montane Sagebrush Steppe subalpine BpS (a.k.a., mountain big sagebrush) is found above and inter-grades with the upland soils of montane sagebrush steppe. Precipitation is above 41 cm (16"). Elevation varies with soil depth and aspect ranging above 1981 m (6,500') on deeper and colder aspects and generally above 2,591 m (8,500') on other shallower soils or warmer aspects. In general this system shows an affinity for mild to very steep topography, fine soils, and some source of subsurface moisture. Soils generally are moderately deep to deep, well-drained, and made of loam, sandy loam, clay loam, or gravelly loam textural classes; soils often have a substantial volume of coarse fragments, and are derived from a variety of parent materials. This system primarily occurs on deep soiled to stony flats, ridges, nearly flat ridge tops, and mountain slopes. Vegetation types are usually dominated by <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> . A variety of other shrubs can be found in some occurrences such as mountain snowberry, Utah serviceberry, antelope bitterbrush, but these are seldom dominant (if dominant, see Mountain Shrub BpS). Abundant forbs are an indicator of good range condition. Grasses are abundant, sometimes very abundant, and often diverse. As elevation or precipitation increase, spike-fescue, mountain brome, and Idaho fescue increase while bluebunch wheatgrass and Thurber's needlegrass decrease. Cheatgrass is nearly always absent from this BpS. White fir and limber pine may occupy this site in late-succession.
A 11261010	<b>Early-all:</b> ≥10% grass and forb cover; 0-10% cover of mountain sage, mountain brush; 0-12 yrs
B 11261022	<b>Mid-open:</b> 11-19% cover of mountain sage, mountain shrub; >50% herbaceous cover; 13-29 yrs
C 11261030	<b>Late1-closed:</b> 20%-49% cover of mountain sagebrush (dominant) and mountain brush; ≥25% herbaceous cover; <10% young conifer cover; >30 yrs
D (aka: E) 11261042	<b>Late2-open:</b> 10-30% cover of young mixed conifers <3m; 25-40% cover of mountain sagebrush (dominant) and mountain brush; >10% herbaceous cover; 75-149 yrs
E (aka: F) 11261050	<b>Late2-closed:</b> >30% mixed conifers cover ≥3m; 6-20% shrub cover; >10% herbaceous cover; ≥150 yrs
U-A:Annual Spp (aka: AS) 11261100	<b>Annual-Species:</b> >10% cover of non-native annual species; <10% native grasses; snakeweed or rabbitbrush may be present
U-A:Bare Ground (aka: BAGR) 11260101	<b>Bare-ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Seeded Native (aka: SD) 11261135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs
U-B:Depleted (aka: DP) 11261203	<b>Depleted-mid:</b> 11-19% cover of mountain sagebrush (dominant) and mountain brush; <10% herbaceous cover; <5% cover of non-native annual species; young conifer absent; litter and mineral soil common
U-C:Depleted (aka: DP) 11261303	<b>Depleted-late1:</b> 20-49% cover of mountain sagebrush (dominant) and mountain brush; <10% herbaceous cover; <5% cover of non-native annual species; <10% young conifer cover; litter and mineral soil common

U-D:Depleted (aka: DP) 11261403	<b>Depleted-Late2-open:</b> 10-30% cover of young mixed conifers <3m; 25-40% cover of mountain sagebrush (dominant) and mountain brush; ≤10% herbaceous cover
U-A:Early-Shrub (aka: ES) 11261105	<b>Early-Shrub-early:</b> >20% cover of snakeweed or rabbitbrush species; <10% cover of mountain sage, mountain brush; <5% cover of non-native annual species; native grass and forb may be present
U-B:Early-Shrub (aka: ES) 11261205	<b>Early-Shrub-mid:</b> >20% cover of snakeweed or rabbitbrush species; 11-19% cover of mountain sage, mountain shrub; <5% cover of non-native annual species; native grass and forb may be present
U-C:Early-Shrub (aka: ES) 11261305	<b>Early-Shrub-late:</b> >20% cover of snakeweed or rabbitbrush species; ≥20% cover of mountain sage, mountain shrub; <5% cover of non-native annual species; native grass and forb may be present
U-C:SA (aka: SA) 11261324	<b>Shrub-Annual-Species-Perennial-Grass-late1-closed:</b> >5% non-native annual species cover; 20-49% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass; <10% young conifer cover
U-A:SAP (aka: ASPG) 11261124	<b>Shrub-Annual-Species-Perennial-Grass-early:</b> ≥5% cover of non-native annual species; ≥10% native grasses; <10% shrub cover
U-B:SAP (aka: SAP-1) 11261224	<b>Shrub-Annual-Species-Perennial-Grass-mid-open:</b> >5% non-native annual species cover; 10-19% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass; <10% young conifer cover
U-C:SAP (aka: SAP-1) 11261324	<b>Shrub-Annual-Species-Perennial-Grass-late1-closed:</b> >5% non-native annual species cover; 20-49% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass; <10% young conifer cover
U-D:SAP (aka: SAP-1) 11261424	<b>Shrub-Annual-Species-Perennial-Grass-late2-open:</b> 10-30% cover of young mixed conifers <3m; >5% non-native annual species cover; 20-49% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass
U-E:TEA 12611544	<b>Tree-Encroached or Tree-Annual-Grass:</b> >20% mixed conifers cover; if <5% annual grass cover then <5% shrub cover; <5% herbaceous cover; OR if ≥5% cover of annual grass then >0% shrub cover; >5% herbaceous cover
U-A:Unpalat. Forb (aka: UF) 11261146	<b>Unpalatable-Forb-early:</b> >75% Increaser forb cover, such as mules' ears wyethia or narrowleaf balsamroot; 0-10% cover of mountain sage, mountain brush; <10% herbaceous cover; <5% cover of non-native annual species; young conifer absent;
U-B:Unpalat. Forb (aka: UF) 11261246	<b>Unpalatable-Forb-mid:</b> >65% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; 11-19% cover of mountain sagebrush (dominant) and mountain brush; <10% herbaceous cover; <5% cover of non-native annual species; young conifer absent;
U-C:Unpalat. Forb (aka: UF) 11261346	<b>Unpalatable-Forb-late1:</b> >25% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; 20-49% cover of mountain sagebrush (dominant) and mountain brush; <10% herbaceous cover; <5% cover of non-native annual species; <10% young conifer cover
U-D:Unpalat. Forb (aka: UF) 11261446	<b>Unpalatable-Forb-late2-open:</b> >25% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; 10-30% cover of young mixed conifers <3m; ≥20% cover of mountain sagebrush (dominant) and mountain brush; <10% herbaceous cover; <5% cover of non-native annual species
U-E:Unpalat. Forb (aka: UF) 11261546	<b>Unpalatable-Forb-late2-closed:</b> >25% Increaser forb cover, such as Northern mules' ear or arrowleaf balsamroot; >30% mixed conifers cover ≥3m; 6-20% shrub cover; <10% herbaceous cover; <5% cover of non-native annual species

<b>Montane Sagebrush Steppe-upland soils (MSS) 11260</b>	<i>Overview:</i> The Montane Sagebrush Steppe BpS (a.k.a., mountain big sagebrush) is found above and intergrades with the mesic sites of the Wyoming Big Sagebrush BpS. Elevation is generally above 2,134 m (6,500') in the southern Great Basin. In general this system shows an affinity for mild topography, fine soils, and some source of subsurface moisture. Soils generally are moderately deep to deep, well-drained, and of loam, sandy loam, clay loam, or gravelly loam textural classes; soils often have a substantial volume of coarse fragments and are derived from a variety of parent materials. This system primarily occurs on deep soiled to stony flats, ridges, nearly flat ridge tops, and mountain slopes. Vegetation types are usually dominated by <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> , but other high-elevation sagebrush species can be present. A variety of other shrubs can be found in some occurrences, but these are seldom dominant. Abundant forbs are an indicator of good range condition. Grasses are abundant, sometimes very abundant, and often diverse. This widespread system is increasingly prone to invasion by non-native annual species and encroachment by conifers towards lower elevations or on southern slopes.
A:All 11260010	<b>Early-all:</b> 10-80% grass and forb cover; 0-10% canopy of mountain sagebrush, mountain brush; 0-12 yrs
B:Open 11260022	<b>Mid-open:</b> 11-30% cover of mountain sagebrush, mountain shrub; >50% herbaceous cover; 13-38 yrs
C:Closed 11260030	<b>Mid-closed:</b> >30% cover of mountain sagebrush (dominant) and mountain brush; 25-50% herbaceous cover; <10% conifer sapling cover; 39+ yrs
D:Open 11260042	<b>Late-open:</b> 10-30% cover of young pinyon-juniper; 25-40% cover of mountain sagebrush (dominant) and mountain brush; >10% herbaceous cover; 80-129 yrs
E:Closed 11260050	<b>Late-closed:</b> >30% older pinyon-juniper (>100 years) cover; 6-20% shrub cover; >10% herbaceous cover; 130+ yrs
U-A:Annual Spp (aka: AG) 11260100	<b>Annual-Species:</b> >10% cover of non-native annual species; snakeweed or rabbitbrush may be present
U-A:Bare Ground (aka: BAGR) 11260101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 11260105	<b>Early-Shrub:</b> >20% cover of snakeweed or rabbitbrush species
U-A:SAP (aka: AGPG) 11260124	<b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% non-native annual species cover; ≤10% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass; no conifers
U-A:Exotic Forb (aka: EF) 11260108	<b>Exotic Forbs: Exotic-Forb:</b> 1-100% exotic forbs (e.g., thistles, knapweed).
U-A:Seeded Native (aka: SD) 11260135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs
U-A:SI (aka: SDI-A) 11260129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced grasses and shrubs; 0-10% canopy of mountain sagebrush, mountain brush; native grasses present to common; <5% cover of non-native annual species
U-A:SI+AS (aka: SDI-A+AG) 11260138	<b>Seeded-Introduced-Early+Annual-Species-Early:</b> >10% seeded introduced grasses and shrubs; 0-10% canopy of mountain sagebrush, mountain brush; native grasses present to common; ≥5% cover of non-native annual species
U-B:SAP 11260224	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% non-native annual species cover; 11-50% cover of mountain sagebrush (dominant) and mountain brush; occasional blackbrush above Mojave Desert slopes; >5% cover of native grass; <30% conifer sapling covers

U-B:SI (aka: SDI-B) 11260229	<b>Seeded-Introduced-Mid-open:</b> >10% seeded introduced grasses and shrubs; 11-30% cover of mountain sagebrush and mountain shrub; native grasses present to common; <5% cover of non-native annual species
U-B:SI+AS (aka: SDI-B+AG) 11260238	<b>Seeded-Introduced-Mid-Open+Annual-Species:</b> >10% seeded introduced grasses and shrubs; 11-30% cover of mountain sagebrush and mountain shrub; native grasses present to common; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 11260303	<b>Depleted:</b> >20% cover of mountain sagebrush (dominant) and mountain brush; <5% herbaceous cover; <30% conifer sapling cover; litter and mineral soil common
U-C:SA 11261321	<b>Shrub-Annual-Species:</b> ≥5% non-native annual species cover; >10% cover of mountain sagebrush (dominant) and mountain brush; ≤5% cover of native grass; <30% conifer sapling cover
U-C:SAP (aka: SAP-1) 11260324	<b>Shrub-Annual-Species-Perennial-Grass-late1-closed:</b> >5% non-native annual species cover; 20-49% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass; <10% young conifer cover
U-C:SI (aka: SDI-C) 11260329	<b>Seeded-Introduced-Mid-Closed:</b> >5% seeded introduced grasses and shrubs; >30% cover of mountain sagebrush and mountain shrub; native grasses present to common; <10% conifer sapling cover; <5% cover of non-native annual species
U-C:SI+AS (aka: SDI-C+AG) 11260338	<b>Seeded-Introduced-Mid-Closed+Annual-Species:</b> >5% seeded introduced grasses and shrubs; >30% cover of mountain sagebrush and mountain shrub; native grasses present to common; <10% conifer sapling cover; ≥5% cover of non-native annual species
U-D:SAP (aka: SAP-1) 11260424	<b>Shrub-Annual-Species-Perennial-Grass-late2-open:</b> 10-30% cover of young mixed conifers <3m; >5% non-native annual species cover; 20-49% cover of mountain sagebrush (dominant) and mountain brush; >5% cover of native grass
U-D:SI (aka: SDI-D) 11260429	<b>Seeded-Introduced-Late-Open:</b> >5% seeded introduced grasses and shrubs; 10-30% conifer cover; 25-40% cover of mountain sagebrush and mountain shrub; native grasses present to common; <5% cover of non-native annual species
U-D:SI+AS (aka: SDI-D+AG) 11260438	<b>Seeded-Introduced-Late-Open+Annual-Species:</b> >5% seeded introduced grasses and shrubs; 10-30% conifer cover; 25-40% cover of mountain sagebrush and mountain shrub; native grasses present to common; ≥5% cover of non-native annual species.
U-E:TEA (aka: TE or TA) 11260544	<b>Tree-Encroached-Annual-Species:</b> >20% pinyon-juniper cover 3-8m tall; <5% shrub cover; <5% herbaceous cover; <5% non-native annual species cover <b>OR</b> >20% pinyon-juniper cover 3-8m tall; ≥5% non-native annual species cover; ≥5% shrub cover; ≥5% herbaceous cover
<b>Montane-Subalpine Grassland (MG) 11460</b>	<i>Overview:</i> The Subalpine-Upper Montane Grassland BpS generally ranges above 2,590 m (8,500') but the most iconic example is at about 3,139 to 3,170m (10,300 to 10,400 ft) in the first mile of the Wheeler Peak trail at Great Basin National Park. Slopes are flat to moderately steep. The soils are shallow to bedrock, well drained, and appears made of schist. These soils have high volumes of pebbles, gravel, rock fragments through their profile. On rockier soils, some shrub species increase in cover. Heavy snow accumulation on this site often persists into summer and significantly reduces the potential plant growth period. Snow melt adds to the soil moisture supply. Graminoids are dominant. Sheep fescue ( <i>Festuca ovina</i> ) and muttongrass ( <i>Poa fendleriana</i> ) typically co-dominate. Lupines ( <i>Lupinus</i> spp.) are sub-dominant forb species. A few shrub species are normally incidental to common: Shrubby cinquefoil ( <i>Potentilla fruticosa</i> ), rabbitbrush ( <i>Chrysothamnus</i> spp.), mountain snowberry ( <i>Symphoricarpos oreophilus</i> ).
A:All 11460010	<b>Early-open:</b> <10% herbaceous cover — graminoids, forbs, and sedges; abundant bare ground and rock cover; 0-4 yrs
B:Closed 11460020	<b>Mid-closed:</b> 11-30% herbaceous cover — graminoids, forbs, and sedges; <10% low shrub cover; abundant bare ground and rock cover; 5-9 yrs

C:Open 11460032	<b>Late-open:</b> 11-30% herbaceous cover — graminoids, forbs, and sedges ; 10-30% low shrub cover; common bare ground and rock cover; >10 yrs
<b>Mountain Shrub (US) 10860</b>	<b>Overview:</b> The Mountain Shrub BpS is possibly dominated by several mountain shrub types, where Utah serviceberry ( <i>Amelanchier utahensis</i> ) is the common mountain shrub occurrence. Sagebrush species cannot be dominant or co-dominant if these sites, often absent or not exceeding 10% cover at the maximum and latest seral stage. The BpS occupies the same elevation band as pinyon-juniper woodlands and big sagebrush steppe. These shrublands occur between 1,500-2,900 m (4,921-9,515') elevation and are usually associated with exposed sites, rocky substrates, shallow soils over fractured bedrock, and dry conditions, which limit tree growth. Scattered trees or inclusions of grassland patches or sagebrush steppe may be present, but the vegetation is typically dominated by a variety of shrubs including <i>Amelanchier utahensis</i> , <i>Ribes cereum</i> , <i>Symphoricarpos oreophilus</i> , and <i>Prunus virginiana</i> . While uncommon, it is possible that <i>Prunus fasciculata</i> (desert almond) occurs in very localized areas on BLM land. If <i>Purshia tridentata</i> is dominant, see Antelope Bitterbrush BpS. Grasses are represented as species of <i>Muhlenbergia</i> spp., <i>Bouteloua</i> spp., <i>Stipa</i> spp., and <i>Elymus spicatus</i> . Fire plays an important role in this system as the dominant shrubs are usually affected by severe die-back, although some plants will stump sprout. When trees are present, they include pinyon pine, juniper, and limber pine. Douglas-fir and white fir may be found on more mesic sites.
A:All 10860010	<b>Early-all:</b> 0-10% canopy of mountain shrub species; 10-80% grass and forb cover; 0-4 yrs
B:Closed 10860021	<b>Mid-closed:</b> 11-30% cover of mountain shrub species; >50% herbaceous cover; 5-19 yrs
C:Closed 10860030	<b>Mid-closed:</b> 31-50% cover of mountain shrub species, with sagebrush at most sub-dominant; 25-50% herbaceous cover; <10% conifer sapling cover; 20-79 yrs
D:Open 10860042	<b>Late-open:</b> 10-20% pinyon pine-juniper cover <5m; 25-40% cover of mountain shrub species; ≥5% herbaceous cover; ≥80 yrs
U-A:Annual Spp (aka: AG) 10860100	<b>Annual-Species:</b> ≥10% cover of non-native annual species; snakeweed or rabbitbrush may be present.
U-A:Bare Ground (aka: BAGR) 10860101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10860105	<b>Early-Shrub:</b> 20-50% cover rabbitbrush species
U-A:SAP (aka: AGPG) 10860124	<b>Shrub-Annual-Species-Perennial-Grass-Early:</b> >5% non-native annual species cover; ≤10% cover of mountain brush (dominant); >5% cover of native grass; no conifers
U-A:SI (aka: SDI-A) 10860129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced grass and shrubs; 0-10% canopy of mountain shrub species; 10-80% grass and forb cover; <5% cover of non-native annual species
U-A:SI+AS (aka: SDI-A+AG) 10860138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced grass and shrubs; 0-10% canopy of mountain shrub species; 10-80% grass and forb cover; ≥5% cover of non-native annual species

U-B:SAP (aka: AGPG) 10860224	<b>Shrub-Annual-Species-Perennial-Grass-Mid:</b> ≥ 5% non-native annual species cover; >10% cover of mountain brush (dominant); >5% cover of native grass; no conifers
U-B:SI (aka: SDI-B) 10860229	<b>Seeded-Introduced-Mid-open:</b> >10% seeded introduced grass and shrubs; 11-30% cover of mountain shrub species; >50% herbaceous cover; <5% cover of non-native annual species
U-B:SI+AS (aka: SDI-B+AG) 10860238	<b>Seeded-Introduced-Mid-open+Annual-Species:</b> >10% seeded introduced grass and shrubs; 11-30% cover of mountain shrub species; >50% herbaceous cover; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 10860303	<b>Depleted:</b> 31-50% cover of mountain shrub species; <5% herbaceous cover; <10% conifer sapling cover
U-C:SAP (aka: AGPG) 10860324	<b>Shrub-Annual-Species-Perennial-Grass-Late:</b> ≥5% non-native annual species cover; 31-50% cover of mountain shrub species; 25-50% herbaceous cover; <10% conifer sapling cover
U-C:SI (aka: SDI-C) 10860329	<b>Seeded-Introduced-Mid-closed:</b> >10% seeded introduced grass and shrubs; 31-50% cover of mountain shrub species; 25-50% herbaceous cover; <10% conifer sapling cover; <5% cover of non-native annual species
U-C:SI+AS (aka: SDI-C+AG) 10860338	<b>Seeded-Introduced-Mid-closed+Annual-Species:</b> >10% seeded introduced grass and shrubs; 31-50% cover of mountain shrub species; 25-50% herbaceous cover; <10% conifer sapling cover; ≥5% cover of non-native annual species
U-D:SI (aka: SDI-D) 10860429	<b>Seeded-Introduced-Late-open:</b> >10% seeded introduced grass and shrubs; 10-20% pinyon pine-juniper cover <5m; 25-40% cover of mountain shrub species; ≥5% herbaceous cover; <5% cover of non-native annual species
U-D:SI+AS (aka: SDI-D+AG) 10860438	<b>Seeded-Introduced-Late-open+Annual-Species:</b> >10% seeded introduced grass and shrubs; 10-20% pinyon pine-juniper cover <5m; 25-40% cover of mountain shrub species; ≥5% herbaceous cover; ≥5% cover of non-native annual species
U-D:TEA (aka: TA, TE) 108660444	<b>Tree-Encroached or with Annual-Species:</b> >21% pinyon pine-juniper cover 3-8m; <5% shrub cover; <5% native herbaceous cover; <5% cover of non-native annual species <b>OR</b> >21% pinyon pine-juniper cover 3-8m; ≥5% cover of non-native annual grasses and forbs; ≥5% cover of mountain shrub species; <30% herbaceous cover
<b>Pickleweed (PW) 11531</b>	<i>Overview:</i> The pickleweed ( <i>Salicornia</i> spp.) ecological system is found at the transition between playa and greasewood, often forming a “bathtub ring” around playas on BLM lands. <i>Salicornia</i> spp. is often the only species present, although grasses found in greasewood flats can also be found in this system depending on soil moisture.
A:All 11531010	<b>Early-all:</b> ≥5% pickleweed; <5% herbaceous cover of inland salt grass, alkali sacaton, or basin wildrye; >25% mineral soil; flood debris may be present
<b>Pinyon-Juniper Woodland (PJ) 10190</b>	<i>Overview:</i> The Pinyon-Juniper Woodland BpS is typically found from 1,675-2,440 m (5,500-8,000') above the black sagebrush and Wyoming big sagebrush zones. This BpS generally occurs on most soils and landforms, especially fire-safe sites of steep and rocky slopes. Soils supporting this system are less productive than those of sagebrush systems and vary in texture ranging from stony, cobbly, gravelly sandy loams to clay loam or clay. Soils are often more reflective than surrounding systems. Woodlands comprising this system can be dominated by a mix of <i>Pinus monophylla</i> and <i>Juniperus osteosperma</i> ; by pure or nearly pure occurrences of <i>Pinus monophylla</i> ; or solely by <i>Juniperus osteosperma</i> . Understory layers are variable. Grass and shrub species are often diverse and common, although not abundant.

A:All 10190010	<b>Early-all:</b> 5-20% herbaceous cover; charred stumps and trunks; 0-9 yrs
B:Open 10190022	<b>Mid1-open:</b> 11-30% cover big sagebrush, black sagebrush, or bitterbrush <1.0m, 10-40% herbaceous cover; 10-29 yrs
C:Open 10190032	<b>Mid2-open:</b> 11-20% cover of young (<100 yrs old) pinyon and/or juniper <5m, 10-20% shrub cover, <20% herbaceous cover; 30-99 yrs
D:Open 10190042	<b>Late-open:</b> 21-60% cover of pinyon and/or juniper <5m-9m, 10-40% shrub cover, <20% herbaceous cover; ≥100 yrs
U-A:Annual Spp (aka: AG) 10190100	<b>Annual-Species:</b> >10% non-native annual species cover; dead pinyon or juniper visible.
U-A:Bare Ground (aka: BAGR) 10190101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Exotic Forb (aka: EF) 10190108	<b>Exotic-Forb:</b> 5-100% exotic forbs (e.g., thistles, knapweed).
U-A:SAP 10190124	<b>Shrub-Annual-Species-Perennial-Grass:</b> >5% non-native annual species; <40% herbaceous cover with several annual native species; ≤10% cover big sagebrush, black sagebrush, or bitterbrush <1.0m
U-A:Seeded Native (aka: SD) 10190135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs; <5% non-native annual species cover.
U-A:SI (aka: SDI) 10190129	<b>Seeded-Introduced:</b> >10% seeded introduced grass and forbs; <5% cover of non-native annual species
U-A:SI+AS (aka: SDI+AG) 10190138	<b>Seeded-Introduced+Annual-Species:</b> >10% seeded introduced grass and forbs; ≥5% cover of non-native annual species.
U-B:SAP (aka: SAP) 10190224	<b>Shrub-Annual-Species-Perennial-Grass-Mid:</b> ≥ 5% non-native annual species cover; 11-30% cover big sagebrush, black sagebrush, or bitterbrush <1.0m; >5% cover of native grass; no conifers
U-D:TEA (aka: TA) 10190444	<b>Tree-Encroached or with Annual-Species:</b> ≥20% pinyon-juniper cover 3-8m tall; <5% shrub cover; <5% herbaceous cover; <5% non-native annual species cover <b>OR</b> ≥20% pinyon-juniper cover 3-8m tall; ≥5% non-native annual species cover; ≥5% shrub cover; ≥5% herbaceous cover; ≥30 yrs
<b>Playa (PL) 10001</b>	<i>Overview:</i> Dry salt flats of high reflectance that may be inundated during wetter years, especially during the winter and spring.
Barren 10001001	<b>Barren:</b> Salt flat with high reflectance that are usually dry but can be temporally inundated.

<b>Ponderosa Pine (PP) 10540</b>	<i>Overview:</i> The Ponderosa Pine BpS is found at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests typically in warm, dry, exposed sites. Occurrences are found on all slopes and aspects, though moderately steep to very steep slopes or ridge tops are most common. The BpS generally occurs on igneous, metamorphic, and sedimentary material-derived soils, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acid pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. <i>Pinus ponderosa</i> is the predominant conifer; <i>Pseudotsuga menziesii</i> , <i>Pinus monophylla</i> , and <i>Juniperus</i> spp. may be present in the tree canopy. The understory is usually shrubby, with <i>Artemisia nova</i> , <i>Artemisia tridentata</i> , <i>Arctostaphylos patula</i> , <i>Arctostaphylos uva-ursi</i> , <i>Cercocarpus montanus</i> , <i>Cercocarpus ledifolius</i> , <i>Purshia stansburiana</i> , <i>Purshia tridentata</i> , <i>Symphoricarpos oreophilus</i> , <i>Prunus virginiana</i> , <i>Amelanchier alnifolia</i> , and <i>Rosa</i> spp. as common species. <i>Pseudoroegneria spicata</i> and species of <i>Hesperostipa</i> , <i>Achnatherum</i> , <i>Festuca</i> , <i>Muhlenbergia</i> , and <i>Bouteloua</i> are some of the common grasses. <i>Pinus ponderosa</i> / <i>Arctostaphylos patula</i> represents the extreme with typically a high percentage of rock and bare soil present.
A:All 10540010	<b>Early-all:</b> 5-60% cover of shrub/grass; conifer seedlings can be abundant <5m; 0-39yrs
B:Closed (aka: B) 10540021	<b>Mid-closed:</b> 31-60% cover of ponderosa pine, pinyon, juniper, Douglas-fir, and white fir 5-10m; dense shrub cover possible; 40-159 yrs
B:Open (aka: C) 10540022	<b>Mid-open:</b> 5-30% cover of ponderosa pine (dominant), Douglas-fir, pinyon, juniper, and white fir 5-10m; abundant shrub and grass cover; 40-159 yrs
C:Open (aka: D) 10540032	<b>Late-open:</b> 5-30% cover of ponderosa pine (dominant), Douglas-fir, pinyon, juniper, and white fir 11-50m; abundant shrub and grass cover; ≥160 yrs
C:Closed (aka: E) 10540030	<b>Late-closed:</b> 31-80% cover of ponderosa pine, Douglas-fir, pinyon, juniper, and white fir 11-50m; mountain snowberry common; ≥160 yrs
U-A:Annual Spp (aka: AG)	<b>Annual-Species:</b> >10% non-native annual grass cover; ponderosa pine saplings may be present
U-A:Bare Ground (aka: BAGR) 105401101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:FIC-All 10540151	<b>Fire-Intolerant Conifers-Early:</b> ≥10% herbaceous cover; cover of mountain big sagebrush, black sagebrush, or bitterbrush increases with succession; charred trunks and limbs of conifers and curl-leaf mountain mahogany should be visible; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found
U-A:SI (aka: SDI) 10190129	<b>Seeded-Introduced:</b> >10% seeded introduced grass and forbs; <5% cover of non-native annual species
U-A:SI+AS (aka: SDI+AG) 10190138	<b>Seeded-Introduced+Annual-Species:</b> >10% seeded introduced grass and forbs; ≥5% cover of non-native annual species.
U-B:FIC-Closed 10540251	<b>Fire-Intolerant Conifers-Mid-Closed:</b> >20% cover of young (<100 yrs old) pinyon, juniper, and/or curl-leaf mountain mahogany; 10-20% shrub cover; <20% herbaceous cover; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found
U-B:FIC-Open 10540252	<b>Fire-Intolerant Conifers-Mid-Open:</b> 11-20% cover of young (<100 yrs old) pinyon, juniper, and/or curl-leaf mountain mahogany; 10-20% shrub cover; <20% herbaceous cover; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found

U-B:TEA (aka: TA) 10540244	<b>Tree-Encroached or with Annual-Species:</b> Any class B,C,D, or E plus >5% non-native annual grass cover
U-C:FIC-Closed 10540351	<b>Fire-Intolerant Conifers-Late-Closed:</b> >20% cover of older (≥100 yrs old) pinyon, juniper, and/or curl-leaf mountain mahogany; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found
U-C:FIC-Open 10540352	<b>Fire-Intolerant Conifers-Late-Open:</b> ≤20% cover of older (≥100 yrs old) pinyon, juniper, and/or curl-leaf mountain mahogany; no or very scattered ponderosa pine tree may be present; historically-logged stump of ponderosa pine sometimes found; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found
<b>Pygmy Sagebrush (PS) 10792</b>	<i>Overview:</i> The Pygmy Sagebrush BPS is a classic badland type often located at the ecotone between the Winterfat BPS and Black Sagebrush BPS. The BpS's landform is typically where the slopes breaks between winterfat and black sagebrush, although it is also found on flat to slightly sloping badland formations, including bright clay hills. Occurrences are nearly always <1 acre. Soil is highly reflective. Pygmy sagebrush ( <i>Artemisia pygmaea</i> ) dominates at low cover and bottlebrush squirreltail and Indian ricegrass ( <i>Elymus elymoides-Achnatherum hymenoides</i> ) are the most common associated grass species. The species is considered rare.
A-All 10792010	<b>Early-all:</b> 1-10% herbaceous cover; ≤1%pygmy sagebrush cover; badland soil >90% cover, sometimes very bright
B:Open 10792022	<b>Mid-open:</b> >1% cover of pygmy sagebrush <15cm; 1-10% native grass cover; reflective badland soil >80% cover
C:Open 10792032	<b>Late-Open:</b> >5% cover of Utah juniper in badland setting; >1% cover of pygmy sagebrush <15cm; 1-10% native grass cover
U-A:SAP (aka, AGPG) 10792124	<b>Shrub-Annual-Species-Perennial-Grass-early:</b> >5% non-native annual species cover; >1% cover of pygmy sagebrush <15cm; 1-10% native grass cover; reflective badland soil >80% cover
<b>Riparian Ponderosa Pine (RPP) 11545</b>	<i>Overview:</i> The Riparian Ponderosa Pine BpS follows drainages where cold air and water allow ponderosa pine to grow below its normal montane elevation zone. The BpS can be found adjacent to the montane sagebrush steppe, pinyon-juniper woodland, and upper Wyoming big sagebrush BpSs. Both fire and flooding are major disturbances in this system. In the southern Snake Range, the BpS existed in drainages where ponderosa pine is not found today as witnessed by historic photographs and tax accounts of historic logging. For example, Strawberry Creek was believed to be bordered by ponderosa pine, but no trees of the species are found today. <i>Pinus ponderosa</i> is the predominant conifer; <i>Pseudotsuga menziesii</i> , <i>Abies concolor</i> , <i>Pinus monophylla</i> , and <i>Juniperus</i> spp. may be present in the tree canopy. Ponderosa pine trees reach large diameter in this moist system without being old compared to upland ponderosa pine trees, especially those growing on the southern Snake Range's quartzite and limestone. The understory is usually shrubby with a mix of willows and other riparian shrubs and upland mountain shrubs such as <i>Arctostaphylos patula</i> , <i>Arctostaphylos uva-ursi</i> , <i>Cercocarpus montanus</i> , <i>Symphoricarpos oreophilus</i> , <i>Prunus virginiana</i> , <i>Amelanchier</i> spp, and <i>Rosa</i> spp.. <i>Pseudoroegneria spicata</i> and species of <i>Carex</i> spp., <i>Hesperostipa</i> , <i>Achnatherum</i> , <i>Festuca</i> , <i>Muhlenbergia</i> , and <i>Bouteloua</i> are some of the common grasses.
A:All 11545010	<b>Early:</b> 0-60% cover of cottonwood, willow (early in succession) and ponderosa pine (later in succession) saplings <5m high; carex may be abundant; 0-20yrs
B:Closed 11545020	<b>Mid-closed:</b> 41-60% cover of ponderosa pine (dominant), white fir 5-10m; dense willow cover possible; 20-59 yrs

B:Open 11545022	<b>Mid-open:</b> 11-40% cover of ponderosa pine 5-10m; abundant willow and carex cover; 20-59 yrs
C:Open 11545032	<b>Late-open:</b> 11-40% cover of ponderosa pine 11-25m; abundant willow and carex cover; ≤60 yrs
C:Closed 11545030	<b>Late-closed:</b> 41-60% cover of ponderosa pine and white fir 11-25m; willow and carex common; ≤60 yrs
U-A:Annual Spp (aka: AG) 11545100	<b>Annual-Species:</b> >10% non-native annual grass cover; ponderosa pine saplings may be present
U-A:Bare Ground (aka: BAGR) 10545101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:FIC-All 11545151	<b>Fire-Intolerant Conifers-Early:</b> : 0-40% cover of shrub—willow dominates after fire, whereas cottonwood and willow co-dominate after flooding; grass may co-dominate; <50% cover gravel, rock, and boulders, although this may be highly variable by reach; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found; 0-4 yrs
U-B:FIC-Closed 11545251	<b>Fire-Intolerant Conifers-Mid-Closed:</b> 31-100% cover of tall shrubs (willows, buffaloberry) and small trees (velvet ash, conifers) and small cottonwood trees; <20% gravel, rock, and boulders; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found; 5-19 yrs
U-B:TEA (aka: TA) 11545244	<b>Tree-Encroached or with Annual-Species:</b> Any class B,C,D, or E plus >5% non-native annual grass cover
U-C:FIC-Closed 11545351	<b>Fire-Intolerant Conifers-Late-Closed:</b> 31-100% cover of cottonwood, willow, conifers and other trees 10-24m; <20% gravel, rock, and boulders; no or very scattered ponderosa pine trees may be present; historically-logged stumps of ponderosa pine sometimes found; >20 yrs
<b>Roads-Local 10032</b>	<i>Overview:</i> County-maintained dirt roads and larger unmaintained dirt roads, but not two-tracks.
U-A:Bare Ground 10032101	<b>Bare-Ground:</b> Local dirt road bigger than two-track roads
<b>Roads-Paved 10031</b>	<i>Overview:</i> Paved roads.
U-A:Paved 10031120	<b>Paved:</b> Paved roads
<b>Saline Meadow (WMas) 11451</b>	<i>Overview:</i> The Wet Meadow-Alkali Sacaton BpS is wetted by an elevated water table or is spring-fed. Saturated soils support graminoid dominance. Soils are deep and saline. These wet meadows are found at the bottom of broad valleys and on alluvial flats at elevations of 1,630 m to 1,676 m (5,350 to 5,500') with slopes between 0-2%, usually surrounded by salt tolerant plant communities. Average annual precipitation ranges from 20 to 25 cm (8" to 10"). Alkali sacaton ( <i>Sporobolus airoides</i> ) dominates, although inland saltgrass ( <i>Distichlis spicata</i> ) may co-dominate on some soils. Black greasewood and four-wing saltbush may be present at low abundance.
A:All 11451010	<b>Early-all:</b> 10-60% alkali sacaton or inland saltgrass cover; 0-2 yrs

B:Closed 11451021	<b>Mid-closed:</b> 61-100% alkali sacaton or inland saltgrass cover; 3-22 yrs
C:Open 11451032	<b>Late-open:</b> 5-10% shrub (greasewood and four-wing saltbush) cover; 60-80% alkali sacaton or inland saltgrass cover; >22 yrs
U-A:SAP (aka: AGPG) 11451124	<b>Annual-Species-Perennial-Grass-Early:</b> <10% cover of native shrubs; ≥10% alkali sacaton or inland saltgrass cover; ≥5 non-native annual species cover; >10% mineral soil cover
U-A:Annual Spp (aka: AG) 11451100	<b>Annual-Species:</b> >10% cover of non-native annual species; <10% alkali sacaton or inland saltgrass cover; <10% shrub cover; >10% mineral soil cover
U-A:Bare Ground (aka: BAGR) 11451101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Exotic Forb (aka: EF) 11451108	<b>Exotic-Forb:</b> >5% exotic forbs (tall whitetop, knapweed, purple loosestrife, Russian thistle)
U-A:Pasture (aka: PAS) 11451119	<b>Pasture:</b> Agricultural pasture irrigated or fallow
U-C:Depleted (aka: DP) 11451303	<b>Depleted:</b> ≥10% shrub cover (greasewood and other shrubs); <60% of inland saltgrass and Baltic rush cover; 10-30% cover of bare ground.
U-C:SAP 11451324	<b>Shrub-Annual-Species-Perennial-Grass-Late:</b> ≥10% cover of native shrubs; >10% alkali sacaton or inland saltgrass cover; ≥5 non-native annual species cover; >10% mineral soil cover
<b>Seep 11546</b>	<i>Overview:</i> The Seep BpS is a localized system that is disconnected from true streams or desert washes. Seeps are typically small (<1 acre) and while likely sub-irrigated water is rarely observed. The BpS can be found in many landform positions where sub-irrigation occurs. Tall shrubs and vines ( <i>Clematis</i> spp.) dominate in near impenetrable tickets. Common shrubs are <i>Amelanchier Utahensis</i> , <i>Ribes cereum</i> , and occasional willows. While unpalatable shrubs <i>Rosa Woodsii</i> and <i>Rhus trilobata</i> may be present, these species will dominate under continuous grazing pressure.
A:All 11546010	<b>Early-all:</b> >5% shrub cover; Shrub height <1m after fire or flash flood (if in proximity of lateral dry washes); 0-2 yrs
B:Closed 11546021	<b>Latye-Closed:</b> >60% shrub cover; >5% cover of vines; >2 yrs after fire or flash flood
U-B:Shrb-Frb Encr (aka, SFE) 11546237	<b>Shrub-Forb-Encroached:</b> 10-50% cover of Wood's rose, sumac, or other unpalatable forbs and shrubs in open areas or under tree canopy

<b>Semi-Desert Grassland (SDG) 11350</b>	<i>Overview:</i> The Semi-Desert Grassland BpS occupies sandy soil and is found at approximately 1,450m to 2,320 m (4,750’-7,610’) of elevation. Indian ricegrass ( <i>Achnatherum hymenoides</i> ) is often the diagnostic and dominant grass species. These grasslands occur in lowland and upland areas and may occupy swales, playas, mesa tops, plateau parks, alluvial flats, and plains, but sites are typically xeric. Substrates are often well-drained sandy or loamy-textured soils derived from sedimentary parent materials but are quite variable and may include fine-textured soils derived from igneous and metamorphic rocks. Where they occur near foothill grasslands, they will be at lower elevations. These grasslands occur on a variety of aspects and slopes. Sites may range from flat to moderately steep. Annual precipitation is usually from 20-40 cm (7.9”-15.7”). Grasslands within this system are typically characterized by a sparse to moderately dense herbaceous layer dominated by medium-tall and short bunch grasses, often in a sod-forming growth. The dominant perennial bunch grasses and shrubs within this system are all very drought-resistant plants.
A:All 11350010	<b>Early-all:</b> <5% shrub cover (rabbitbrush); >10% cover of grasses (Indian ricegrass, big galleta, bush muhly, desert needlegrass); sandy soil cover may be high; 0-19 yrs
B:Closed 11350021	<b>Mid-closed:</b> ≥5% shrub cover (rabbitbrush, sagebrush); >25% cover of grasses (Indian ricegrass, big galleta, bush muhly, desert needlegrass); sandy soil cover may be high; ≥20 yrs
U-A:Bare Ground (aka: BAGR) 11350101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-B:Depleted (aka: DP) 11350203	<b>Depleted:</b> ≥5% shrub (mostly rabbitbrush, sagebrush) cover; <10% cover of grasses; 10-30% bare ground cover; <20% cover of pinyon or juniper saplings; sandy soil cover may be high
U-A:Early-Shrub (aka: ES) 11350105	<b>Early Shrub:</b> 10-30% cover of rabbitbrush; 10-30% bare ground cover; <10% native grass cover; sandy soil cover may be high
U-A:SAP 11350124	<b>Shrub-Annual-Perennial-Grass-early:</b> ≥5% cover of non-native annual grasses;<5% shrub (mostly rabbitbrush, sagebrush) cover; native grasses may be present to common; 0% cover of pinyon or juniper saplings; sandy soil cover may be high
U-A:Seeded Native (aka: SD) 11350135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs; <5% non-native annual species cover.
U-A:SI (aka: SDI) 11350129	<b>Seeded-Introduced:</b> >10% cover of introduced seeded grass species; <5% cover of non-native annual species; sagebrush and other shrubs may be present; sandy soil cover may be moderately high
U-A:SI+AS (aka: SDI+AG) 11350138	<b>Seeded-Introduced+Annual-Species:</b> >10% cover of introduced seeded grass species; ≥5% cover of non-native annual grasses; sagebrush and other shrubs may be present; sandy soil cover may be moderately high
U-B:SAP 11350224	<b>Shrub-Annual-Perennial-Grass-Late:</b> ≥5% cover of non-native annual grasses; ≥5% shrub (mostly rabbitbrush, sagebrush) cover; native grasses may be present to common; <20% cover of pinyon or juniper saplings; sandy soil cover may be high
U-B:TEA 11350244	<b>Tree-Encroached or with Annual-Species:</b> >20% mature pinyon-juniper cover; <5% cover of shrubs; <b>either</b> <5% cover native grasses <b>AND</b> <5% cover of non-native annual species <b>OR</b> ≥5% cover of non-native annual species <b>AND</b> ≥5% cover native grasses; sandy soil cover may be moderately high.

<b>Sodic Pools (SP) 11391</b>	<i>Overview:</i> The Sodic Pool BpS is a cross among small playas, saline meadows, greasewood, and vernal pools. The BpS is very locally situated in the southeast part of Spring Valley (38°50'27.62" N 114°26'50.47"W) and appears spring fed from the east, thus not being true vernal pools, which are snowmelt fed. The system is made of an intricate network of small pools (<10m across) at most 1 m deep and small floodplains. The floodplain is made of saline meadow vegetation and/or greasewood vegetation. Pools are often inundated when adjacent playas are dry, but can be dry during dry summers. Soils are sodic and pools are salt crusted with abundant inland saltgrass.
A:Water 11391011	<b>Water:</b> Open water in pool, usually from winter to summer.
A:All 11391010	<b>Early:</b> 10-60% alkali sacaton or inland saltgrass cover; 0-2 yrs
B:Closed 11391021	<b>Mid-closed:</b> 61-100% alkali sacaton or inland saltgrass cover; 3-22 yrs
C:Open 11391032	<b>Late-open:</b> 5-10% shrub (greasewood and rabbitbrush species) cover; 60-80% alkali sacaton or inland saltgrass cover; >22 yrs
U-A:Bare Ground (aka: BAGR) 11391101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
<b>Sparsely Vegetated 10030</b>	<i>Overview:</i> The Sparsely Vegetated BpS is used to describe sites with little vegetation, such as rocky outcrops, talus, scree, steep slopes, and canyon walls. Includes broad range of vegetation types.
A:Sparse 10030002	<b>Early-Sparse:</b> Scattered vegetation on rocky outcrops, talus, scree, steep slopes, and canyon walls. Vegetation <10%.
<b>Stansbury Cliffrose (SC) 10861</b>	<i>Overview:</i> The Stansbury Cliffrose BpS is one of three mountain shrub types, where Stansbury cliffrose ( <i>Purshia mexicana</i> ) is the indicator species. Elevation ranges from 915 m to 2,438 m (3,000' to 8,000'), typically on mountain foothills and lower slopes, most likely on BLM lands. The BpS is found in small patches on different montane landforms with shallow unproductive soils. This cliffrose form of mountain shrub is usually at lower elevations and adjacent or imbedded in the montane zone adjacent to pinyon - juniper woodlands on moderate to steep slopes, and often follows linear geologic features (rock ledges).
A:All 10861010	<b>Early-all:</b> 0-10% canopy of Stansbury cliffrose or desert bitterbrush (often resprouting); 10-80% grass and forb cover; 0-12 yrs
B:Closed 10861021	<b>Mid-closed:</b> 11-20% cover of Stansbury cliffrose or desert bitterbrush; >25% herbaceous cover;<10% conifer sapling cover; 13-79 yrs
C:Open 10861032	<b>Late-open:</b> 10-20% pinyon pine-juniper cover 3-8m; >21% cover of Stansbury cliffrose or desert bitterbrush; <30% herbaceous cover; 80-129 yrs
U-A:Annual Spp (aka: AG) 10861100	<b>Annual-Species:</b> >10% cover of non-native annual grasses; snakeweed or rabbitbrush may be present; dead standing stems of Stansbury cliffrose or desert bitterbrush often present, with desert bitterbrush resprouts if the species is present.
U-A:Bare Ground (aka: BAGR) 10861101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10861105	<b>Early-Shrub:</b> >10% snakeweed or rabbitbrush; <5% non-native annual species cover; native grass may be present; Stansbury cliffrose or desert bitterbrush may be present
U-A:Seeded Native (aka: SD) 10861135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs; <5% non-native annual species cover.

U-A:SI (aka: SDI-A) 10861129	<b>Seeded-Introduced-Early:</b> >10% seeded introduced grass and shrubs; 0-10% canopy of Stansbury cliffrose or desert bitterbrush (often resprouting); 10-80% grass and forb cover; <5% cover of non-native annual species
U-A:SI+AS (aka:SDI-A+AG) 10861138	<b>Seeded-Introduced-Early+Annual-Species:</b> >10% seeded introduced grass and shrubs; 0-10% canopy of Stansbury cliffrose or desert bitterbrush (often resprouting); 10-80% grass and forb cover; ≥5% cover of non-native annual species
U-B:SAP 10861224	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% non-native annual species cover; >5% cover of Stansbury cliffrose or desert bitterbrush; native herbaceous cover usually present; trees may be present
U-B:SI (aka: SDI-B) 10861229	<b>Seeded-Introduced-Mid-open:</b> >10% seeded introduced grass and shrubs; 11-20% cover of Stansbury cliffrose or desert bitterbrush; >25% herbaceous cover; <10% conifer sapling cover; <5% cover of non-native annual species
U-B:SI+AS (aka:SDI-B+AG) 10861238	<b>Seeded-Introduced-Mid-open+Annual-Species:</b> >10% seeded introduced grass and shrubs; 11-20% cover of Stansbury cliffrose or desert bitterbrush; >25% herbaceous cover; <10% conifer sapling cover; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 10861303	<b>Depleted:</b> >20% cover of Stansbury cliffrose or desert bitterbrush; <5% herbaceous cover; <10% conifer sapling cover
U-C:SI (aka: SDI-C) 10861329	<b>Seeded-Introduced-Late-open:</b> >10% seeded introduced grass and shrubs; 10-20% pinyon pine-juniper cover 3-8m; >21% cover of Stansbury cliffrose or desert bitterbrush; <30% herbaceous cover; <5% cover of non-native annual species
U-C:SI+AS (aka:SDI-C+AG) 10861338	<b>Seeded-Introduced-Late-open+Annual-Species:</b> >10% seeded introduced grass and shrubs; 10-20% pinyon pine-juniper cover 3-8m; >21% cover of Stansbury cliffrose or desert bitterbrush; <30% herbaceous cover; ≥5% cover of non-native annual species
U-C:SAP 10860324	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% non-native annual species cover; 5-40% cover of mountain shrubs; native herbaceous cover usually present; trees may be present
U-C:TEA (aka, TE or TA) 10861344	<b>Tree-Encroached-Annual-Species:</b> >10% mature pinyon-juniper cover 3-8m; <b>IF</b> ≥5% cover of non-native annual grasses and forbs <b>THEN</b> >0% cover of Stansbury cliffrose or desert bitterbrush <b>OR</b> >0% native herbaceous cover; <b>IF</b> <5% cover of non-native annual grasses and forbs <b>THEN</b> <5% cover of Stansbury cliffrose <b>AND</b> <5% native herbaceous cover.
<b>Subalpine Riparian (SR) 11600</b>	<i>Overview:</i> The Subalpine Riparian is found above 2,438m (8,000') where very small upper-montane and subalpine creeks, seeps, and rivulets are bordered by dense willows and herbaceous patches. Often present as willow thickets in high-elevation snow basins and seep/spring areas where a single channel is not obvious because of the presence of many rivulets. With succession, white fir, Douglas-fir, and occasionally Engelmann's spruce can encroach among willow clumps, but they never dominate because soils are too water-logged.
A:All 11600010	<b>Early-all:</b> 10-29% cover of willow <3m tall; 10-30% cover of graminoids and forbs; 10-50% cover of bare ground; 0-4 yrs
A:Sediment 11600628	<b>Early-Sediment:</b> >70% cover of mineral soil (sand and silt) made of in-stream sediment associated with natural hydraulics and excessive post-fire debris flow.
B:Closed 11600021	<b>Mid-closed:</b> 30-100% cover of willow 3-5m tall; ≥10% cover of graminoids and forbs; 10-50% cover of bare ground; conifer (white fir, Douglas-fir, Engelmann's spruce) saplings may be present; 5+ yrs
C:Open 11600032	<b>Late-open:</b> >10% cover of conifers (white fir, Douglas-fir, Engelmann's spruce) 5-10m; 30-100% cover of willow 3-5m tall; ≥10% cover of graminoids and forbs; 10-50% cover of bare ground; 37+ yrs
U-A:Hummocked 11600110	<b>Hummocked:</b> Trampled by ungulates; graminoids present to common in and out of holes created by ungulate hoofs
U-A:Shrb-Forb Encr 11600137	<b>Shrub-Forb-Encroached-All:</b> 10-50% cover of Wood's rose, sumac, or other unpalatable forbs and shrubs in open areas or under tree canopy

<p><b>Swamp Cedars (SWC) 11151</b></p>	<p><i>Overview:</i> The Swamp Cedars BpS is an abnormal low-elevation (1722-1777 m [5,650-5,830 ft]) occurrence of Rocky Mountain juniper (<i>Juniperus scopulorum</i>) at the bottom of Spring Valley. This system's ecology, genetic isolation, and successional process have not been studied. Rocky Mountain juniper is generally a riparian tree in the montane zone of the eastern Great Basin ecoregion above at least 2,438 m (8,000 ft). Swamp Cedars partly exist in their present location because the shallow aquifer is perched above an extensive clay layer several thousands of feet deep (<i>pers. communication</i>, Dr. Dave Prudik). Access to water from the perched shallow aquifer and possible cold air drainage from the Snake Range and Schell Creek Range allow the species to thrive, probably as a Pleistocene relict. These conditions also favor greasewood and saline meadows communities; therefore, monsoonal rains are hypothesized to favor Rocky Mountain juniper seed germination and seedling survival. Because the water table is perched, moisture evaporates and salts accumulate. Soils are alkaline to sodic and slopes are flat (northern occurrences) to shallow (southeastern occurrence). At that elevation range on sodic soils, Rocky Mountain juniper is the only tree. While several age classes are found, trees can reach old age and stands are open woodlands of old growth. Two types of Swamp Cedars are found in Spring Valley. The classic type found in the BLM ACEC (Area of Critical Environmental Concern) north of Highway 50 is the old-growth woodland with the understory dominated by salt-adapted species such as greasewood (<i>Sarcobatus vermiculatus</i>), rabbitbrush species (<i>Chrysothamnus</i> spp.), and shadscale (<i>Atriplex confertifolia</i>). In less alkaline area, probably where soil mounds, basin big sagebrush (<i>Artemisia tridentata</i> ssp. <i>tridentata</i>) is found. Inland saltgrass (<i>Distichlis spicata</i>) and basin wildrye (<i>Elymus cinereus</i>) are common native grasses. Cordgrass (<i>Spartina</i> spp.) is found in the wettest areas. The other type is south of Hwy 50 and along State Route 894 among the center pivots of the Floyd Smith Ranch and Kirkeby Ranch on the east side of Spring Valley mostly contains smaller and more dense stands of trees growing in nearly pure grey clay with hydric graminoids sparsely populating the understory. Towards the lowest part of the slope of this clay occurrence west of State Route 894 Swamp Cedars' understory changes to resemble more the stands north of Hwy 50. <i>In the vegetation class descriptions below, ignore percentage of graminoids and shrubs if juniper are growing in clay sites of the southeast and follow tree development for classifying successional phase.</i></p>
<p>A:All 11151010</p>	<p><b>Early-all:</b> ≥10% graminoid cover; &lt;10% cover rabbitbrush and greasewood; standing dead tree occasionally observed; scattered saplings of Rocky Mountain juniper &lt;1m high present; 0-9 yrs</p>
<p>B:Open 11151022</p>	<p><b>Mid1-open:</b> 10-20% herbaceous cover; 5-10% cover of greasewood, rabbitbrush, and occasional basin big sagebrush; scattered Rocky Mountain juniper 1-2 m high, 10-29 yrs</p>
<p>C:Open 11151032</p>	<p><b>Mid2-open:</b> 11-20% cover of young (&lt;100 yrs old) Rocky Mountain juniper &lt;5m high; &gt;10% herbaceous cover; 10-20% shrub cover; 30-99 yrs</p>
<p>D:Open 11150042</p>	<p><b>Late-open:</b> ≥20% cover of older junipers; &gt;10% herbaceous cover; 5-10% shrub cover; ≥100 yrs</p>
<p>U-A:Bare Ground (aka: BAGR) 11151101</p>	<p><b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances</p>
<p>U-A:Early-Shrub (aka: ES) 11151105</p>	<p><b>Early-Shrub-Early:</b> ≥10% cover rabbitbrush species; &lt;10% graminoid cover; juniper sapling and young trees absent; 0-9 yrs</p>
<p>U-B:Early-Shrub (aka: ES) 11151205</p>	<p><b>Early-Shrub-Mid1:</b> ≥10% cover rabbitbrush species; &lt;10% graminoid cover; scattered Rocky Mountain juniper 1-2 m high, 10-29 yrs</p>
<p>U-C:Early-Shrub (aka: ES) 11151305</p>	<p><b>Early-Shrub-Mid2:</b> ≥10% cover rabbitbrush species; &lt;10% graminoid cover; : 11-20% cover of young (&lt;100 yrs old) Rocky Mountain juniper &lt;5m high; 30-99 yrs</p>

U-D:Early-Shrub (aka: ES) 11151405	<b>Early-Shrub-Late:</b> ≥10% cover rabbitbrush species; <10% graminoid cover ≥20% cover of older junipers; ≥100 yrs
U-A:Exotic Forb (aka: EF) 11151108	<b>Exotic-Forb:</b> >5% exotic forbs (knapweed, purple loosestrife, thistles) regardless of juniper succession
<b>Water 10040</b>	<i>Overview:</i> Consists of both natural water bodies and human-made ones.
Water 10040011	<b>Water:</b> natural waterway
U-A:Water 10040148	<b>Anthropogenic Water:</b> water in reservoirs, impoundment, or irrigation ditch
<b>Wet Meadow-Montane (WM) 11450</b>	<i>Overview:</i> The Wet Meadow-Montane BpS is wetted by an elevated water table adjacent to creeks or rivers, or is spring-fed. Saturated soils support graminoid dominance. Rushes and sedges dominate with tufted hairgrass and Sandberg bluegrass common. The presence of shrubs (aspen, willow, Wood's rose, sagebrush) at the meadow's edge increases during consecutive drought years and decreases during consecutive high water years.
A:Sediment 11450628	<b>Sediment-Early:</b> >70% cover of mineral soil (sand and silt) made of in-stream sediment associated with natural hydraulics and excessive post-fire debris flow often originating from elsewhere <b>in the watershed</b>
A:All 11450010	<b>Early-all:</b> 10-60% herbaceous cover – mostly graminoids; 0-2 yrs
B:Closed 11450021	<b>Mid-closed:</b> 61-100% herbaceous cover – mostly graminoids; 3-22 yrs
C:Open 11450032	<b>Late-open:</b> 5-10% tree-shrub (willow, Wood's rose, sagebrush, aspen) cover; 60-80% herbaceous cover – mostly graminoids; >22 yrs
U-A:Annual Spp (aka: AG) 11450100	<b>Annual-Species (on incised meadow):</b> >5% cover of non-native annual species; < 10% shrub cover
U-A:Bare Ground (aka: BAGR) 11450101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 11450105	<b>Early-Shrub (only on incised floodplain; if in floodplain then see SFE):</b> 20-50% cover rabbitbrush species
U-A:Exotic Forb (aka: EF) 11450108	<b>Exotic-Forb:</b> >5% exotic forbs (knapweed, purple loosestrife, thistles)
U-A:Hummocked (aka: HUM) 11450110	<b>Hummocked:</b> Trampled by ungulates; graminoids present to common in and out of holes created by ungulate hoofs.
U-A:Inset 11450113	<b>Inset-Floodplain:</b> Functional wet meadow dominated by graminoids has formed on a new floodplain at the bottom of a widened incision.
U-A:Inset-EF 11450116	<b>Inset-Floodplain-Exotic-Forb:</b> Functional wet meadow dominated by graminoids has formed on a new floodplain at the bottom of a widened incision; >5% exotic forbs (knapweed, purple loosestrife, thistles)
U-A:Inset-HU 11450117	<b>Inset-Floodplain-Hummocked:</b> Functional wet meadow has formed on a new floodplain at the bottom of a widened incision that has been trampled by ungulates; graminoids present to common in and out of holes created by ungulate hoofs.

U-A:SI (aka: SDI) 11450129	<b>Seeded-Introduced:</b> ≥10% cover of introduced forage species (e.g., smooth brome, intermediate wheatgrass); >10% native graminoid cover
U-C:Desertified (aka: DES) 11450304	<b>Desertified (= incised):</b> Entrenched water table with 10-50% cover of sagebrush
U-C:SA 11450321	<b>Shrub-Annual-Species (on incised meadow):</b> >10% cover of native shrubs; <5% native grass cover; 5-30% cover of non-native annual species
U-C:SFE 11450337	<b>Shrub-Forb-Encroached:</b> >10% cover of less palatable grasses and forbs (e.g., Iris missouriensis) <b>OR</b> >10% shrub cover (willow, Wood's rose, sagebrush, aspen); 10-30% cover of bare ground
U-C:TEA 11450344	<b>Tree-Encroached-Annual-Species (on incised meadow):</b> >20% conifer cover 10-25m; <5% shrub cover; <5% native herbaceous cover; ≥0% cover of non-native annual species
<b>Winterfat (WF) 10812</b>	<i>Overview:</i> The Winterfat BpS is generally considered part of the mixed salt desert scrub communities. Winterfat communities occupy saline silty or gravelly silty soils on shallow slopes between 1,158 – 1981m (3,800 - 6,500'). Such sites are often found in shallow dry drainages. Average annual precipitation ranges from 7.5-25.4cm (3 to 10"); however, this system is in 12.7-30.3cm (5-8") of effective moisture within this broader range. Winterfat ( <i>Krascheninnikovia lanata</i> ) is the dominant shrub, often monotypic. Snakeweed and rabbitbrush also can be common shrubs. Common grasses are Indian ricegrass, squirreltail, and needle-and-thread.
A:All 10812010	<b>Early-all:</b> >10% Indian ricegrass, squirreltail, other native grasses; ≤5% cover of rabbitbrush, snakeweed, and other salt desert shrubs; <60% mineral soil <0.5m; 0-49 yrs
B:Open 10812022	<b>Mid1-open:</b> 5-20% cover winterfat, rabbitbrush, and other desert shrubs <0.5m; >10% native grass cover; 50-149 yrs
C:Closed 10812030	<b>Late1-closed:</b> >20% cover winterfat, rabbitbrush, and other salt desert shrubs; >5% grass cover; >150 yrs
U-A:Annual Spp (aka: AG) 10812100	<b>Annual-Species:</b> >10% non-native annual species (non-native annual species, mustards) cover; <5% cover of native shrubs
U-A:Bare Ground (aka: BAGR) 108120101	<b>Bare-Ground:</b> Mostly mineral soil due to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10812105	<b>Early-Shrub:</b> >10% cover rabbitbrush species
U-A:Exotic Forb (aka: EF) 10812108	<b>Exotic-Forb:</b> >5% cover halogeton (most likely) or exotic mustards; <10% cover of non-native annual species; >50% mineral soil
U-A:SAP (aka: ASPG) 108122124	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% cover of non-native annual species; ≤5% cover of rabbitbrush, snakeweed, and other salt desert shrub; ≥5% native grasses
U-A:Seeded Native (aka: SD) 10812135	<b>Seeded-Native:</b> ≥10% native grass species seed mix cover; <5% non-native annual species cover
U-A:SI (aka: SDI) 10812129	<b>Seeded-Introduced:</b> ≥5% introduced species (crested wheatgrass, forage kochia) seed mix cover; <5% non-native annual species cover

U-A:SI+AS (aka: SDI-A+AG) 10812138	<b>Seeded-Introduced+Annual-Species:</b> ≥5% introduced species (crested wheatgrass, forage kochia) seed mix cover; ≥5% non-native annual species cover
U-B:SAP 10812224	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% non-native annual species cover; >5% cover of winterfat or other shrubs; >5% native grass cover
U-C:Depleted (aka: DP) 10812303	<b>Depleted:</b> >5% cover of winterfat or other shrubs; ≤5% native grass cover; ≤5% non-native annual species cover; ≤5% exotic forb cover
U-C:SA 10812321	<b>Shrub-Annual-Species:</b> ≥5% non-native annual species cover; >5% cover of winterfat or other shrubs; ≤5% native grass cover
<b>Wyoming Big Sagebrush- upland soils (WSup) 10804</b>	<i>Overview:</i> The Wyoming Big Sagebrush upland BpS is common in the Basin and Range province. It ranges from 1,219 m to 2,132 m (4,000' - 7,000') in elevation, and occurs on well-drained soils on foothills, terraces, slopes and plateaus. It is found on soil depths greater than 45 cm (18") and up to 152 cm (60+"). The BpS is found between low elevation salt desert shrub typically unfavorable to tree establishment and higher elevation mountain big sagebrush zones where pinyon and juniper can establish. The BpS occurs from 10 cm to 35 cm (4 to 14") precipitation zones; however, Wyoming big sagebrush requires 20-30 cm (8-12") of effective moisture within this broader range. Thus, other site characteristics (e.g. aspect, drainage) should be considered in identifying this BpS. At the precipitation extremes, this BpS generally occurs as small patches and stringers. Shrub canopy cover generally ranges from 5 to 25%, but can exceed 30% at the upper elevation and precipitation zones. Wyoming big sagebrush sites have fewer understory species relative to other big sagebrush types. Rubber rabbitbrush may be co-dominant and basin big sagebrush might occur on concave sites with finer soils. Perennial forb cover is usually <10% and perennial grass cover reaches 20 - 25% on more productive sites. Bluebunch wheatgrass may be a dominant species following replacement fires and as a co-dominant after 20 years, but only in precipitation zones above 25 cm (10"). Bottlebrush squirreltail and Indian ricegrass are common on more xeric sites. Percent cover and species richness of understory are determined by site limitations. Pinyon pine ( <i>Pinus monophyla</i> ) and juniper (generally <i>Juniperus osteosperma</i> ) are present, occasionally reaching 50% canopy cover in areas that have escaped fire.
A:All 10804010	<b>Early-all:</b> 10-25% herbaceous cover; <10% cover of rabbitbrush species; <10% cover of Wyoming big sagebrush; 0-20 yrs
B:Open 10804022	<b>Mid-open:</b> 11-20% cover of Wyoming big sagebrush; 10-25% herbaceous cover; 20-60 yrs
C:Closed 10804030	<b>Late1-closed:</b> >20% cover of Wyoming big sagebrush; 10-20% native herbaceous cover; 60-100 yrs;
D:Open 10804042	<b>Late2-open:</b> 1-15% pinyon or juniper sapling <5m tall; 10-25% cover of Wyoming big sagebrush; <15% native herbaceous cover; 100-150 yrs;
E:Closed 10812050	<b>Late2-closed:</b> >20% pinyon or juniper cover <10m tall; <10% cover of Wyoming big sagebrush; ~5% native herbaceous cover; 150+ yrs
U-A:Annual Spp (aka: AG) 10804100	<b>Annual-Species:</b> >10% cover of non-native annual species
U-A:Bare Ground (aka: BAGR) 10804101	<b>Bare Ground:</b> primarily bare ground due primarily to anthropogenic disturbances
U-A:Early-Shrub (aka: ES) 10804105	<b>Early-Shrub:</b> >10% cover rabbitbrush species

U-A:Exotic Forb (aka: EF) 10804108	<b>Exotic-Forb:</b> >5% cover halogeton, exotic mustards, or thistles; <10% cover of non-native annual species; >50% mineral soil
U-A:SAP (aka: AGPG) 10804124	<b>Shrub-Annual-Species-Perennial-Grass:</b> 5-14% cover non-native annual species; <10% Wyoming big sagebrush <0.5m; ≥5% cover native grasses; pinyon-juniper absent
U-A:Seeded Native (aka: SD) 10804135	<b>Seeded-Native:</b> >10% seeded native grasses, forbs, and shrubs; <5% non-native annual species cover.
U-A:SI (aka: SDI-A) 10804129	<b>Seeded-Introduced-Early:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of rabbitbrush species; <10% cover of Wyoming big sagebrush; native grass may be present to common; <5% cover of non-native annual species
U-A:SI+AS 10804138	<b>Seeded-Introduced-Early+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); <10% cover of rabbitbrush species; <10% cover of Wyoming big sagebrush; native grass may be present to common; ≥5% cover of non-native annual species
U-B:SAP 10804224	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% cover non-native annual species; ≥10% Wyoming big sagebrush <0.5m; ≥5-20% cover native grasses; pinyon-juniper saplings absent
U-B:SI (aka: SDI-B) 10804229	<b>Seeded-Introduced-Mid-open:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); 11-20% cover of Wyoming big sagebrush; native grass may be present to common; <5% cover of non-native annual species
U-B:SI+AS 10804238	<b>Seeded-Introduced-Mid-open+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); 11-20% cover of Wyoming big sagebrush; native grass may be present to common; ≥5% cover of non-native annual species
U-C:Depleted (aka: DP) 10804303	<b>Depleted:</b> >20% cover of big sage (dominant); <5% herbaceous cover; <30% conifer sapling cover; litter and mineral soil common
U-C:SA 10804321	<b>Shrub-Annual-Species:</b> ≥5% cover non-native annual species; ≥10% Wyoming big sagebrush <0.5m; scattered pinyon-juniper saplings may be present; native grasses rare
U-C:SAP 10804324	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% cover non-native annual species; ≥20% Wyoming big sagebrush <0.5m; ≥5% cover native grasses; scattered pinyon-juniper saplings may be present later in succession
U-C:SI (aka: SDI-C) 10804329	<b>Seeded-Introduced-Late1-closed:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); 20-40% cover of Wyoming big sagebrush; native grass may be present to common; <5% cover of non-native annual species
U-C:SI+AS 10804338	<b>Seeded-Introduced-Late1-closed+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); 20-40% cover of Wyoming big sagebrush; native grass may be present to common; ≥5% cover of non-native annual species
U-D:SAP 10804424	<b>Shrub-Annual-Species-Perennial-Grass:</b> ≥5% cover non-native annual species 10-25% cover of Wyoming big sagebrush; <15% native herbaceous cover; >5% cover of young pinyon or juniper sapling <3m tall (Christmas-tree phase)
U-D:SI (aka: SDI-D) 10804429	<b>Seeded-Introduced-Late2-open:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); 0-15% pinyon or juniper sapling <5m tall; 10-25% cover of Wyoming big sagebrush; native grass may be present to common; <5% cover of non-native annual species
U:SI-D+AS 10804438	<b>Seeded-Introduced-Late2-open+Annual-Species:</b> ≥10% cover of introduced forage species (e.g., crested wheatgrass, intermediate wheatgrass, or forage kochia); 0-15% pinyon or juniper sapling <5m tall; 10-25% cover of Wyoming big sagebrush; native grass may be present to common; ≥5% cover of non-native annual species

U-E:TEA 10804544	<b>Tree-Encroached-Annual-Species:</b> 11-60% cover of trees 5-9m; non-native annual species may be present to abundant; native grasses absent or trace amounts
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