

# Major Land Resource Area 043B

## Central Rocky Mountains

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### Ecological site keys

#### MLRA 43B Wyoming East Divide Absaroka Lower Foothills Ecological Site Key

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I. Site receives additional effective moisture<sup>1</sup> – If no, refer to Group II

A. Sites with a water table present for at least part of the growing season, site dominated by hydrophilic plants (ie. Wetland sedges, bulrushes, willows, tufted hairgrass, etc)<sup>2</sup>

1 Site has water above soil surface part of the growing season, and a water table present within 0-12" (0-30 cm) annually ... EX043B23A178 – Wetland (WL) Absaroka Lower Foothills

2 Site has a seasonal water table

i. Soil is saline, saline-sodic, or sodic<sup>5</sup> ( $SAR \geq 13$ , or an  $EC \geq 4$  dS/m) in the upper 4" (10 cm) of mineral soil; salt tolerant plants dominate site (i.e. greasewood, alkali sacaton, Nuttall's alkaligrass, alkali bluegrass, alkali cordgrass, inland saltgrass, etc)<sup>2</sup>

a. Seasonal water table is between 12-40" (30-100 cm) below the soil surface ... EX043B23A142 – Saline Subirrigated (SS) Absaroka Lower Foothills

b. Seasonal water table > 40" (100 cm) below mineral soil surface; site regularly receives higher than normal soil moisture because of run-in or stream overflow ... EX043B23A138 – Saline Lowland (SL) Absaroka Lower Foothills

ii. Soil is non-saline, non-saline-sodic, non-sodic

a. Seasonal water table is between 12-40" (30-100 cm) below the soil surface ... EX043B23A174 – Subirrigated (Sb) Absaroka Lower Foothills

b. Seasonal water table > 40" (100 cm) below the mineral soil surface; site regularly receives higher than normal soil moisture because of run-in or stream overflow ... EX043B23A128 – Lowland (LL) Absaroka Lower Foothills

B. Site receives periodic overflow from adjacent slopes, but without a water table within 78" (200 cm)

1 Soil is saline, saline-sodic, or sodic<sup>5</sup>; site typically occurs on stream terraces along incised channels, and is dominated by greasewood<sup>2</sup> and other salt tolerant plants (i.e. Gardner's saltbush, alkali sacaton)<sup>2</sup> ... EX043B23A140 – Saline Lowland Drained (SLDr) Absaroka Lower Foothills

2 Soil is non-saline, non-saline-sodic, non-sodic; occur on floodplain steps, terraces, concave landscape positions, and positions lower in the landscape

i. Soil has  $\geq 35\%$  clay in the upper 8" (20 cm) of the mineral soil surface ... EX043B23A106 – Clayey Overflow (CyO) Absaroka Lower Foothills

ii. Soil has < 35% clay in the upper 8" (20 cm) of the mineral soil surface ... EX043B23A130 – Overflow (Ov) Absaroka Lower Foothills

II. Site does not receive additional effective moisture<sup>1</sup>

A. Soil is saline, saline-sodic, or sodic<sup>5</sup> ( $SAR \geq 13$ , or an  $EC \geq 4$  dS/m) in the upper 20" (50 cm) of the mineral soil surface; site is dominated by salt tolerant plants (i.e. Gardner's saltbush, greasewood, alkali sacaton, alkali seepweed, etc)<sup>2</sup>

1 Soil is very shallow (< 10" (25 cm) to shale (lithic or paralithic contact)); productivity very low ... EX043B23A154 – Shale (Sh) Absaroka Lower Foothills

2 Soil is shallow to very deep ( $\geq 10$ " (25 cm) to bedrock (lithic or paralithic contact)) ... EX043B23A144 – Saline Upland (SU) Absaroka Lower Foothills

B. Soil is non-saline, non-saline-sodic, non-sodic in the upper 20" (50 cm) of the mineral soil surface

1 Soil is very shallow (< 10" (25 cm) or shallow (< 20" (50 cm) to bedrock (lithic or paralithic contact)

i. Soils very shallow, includes areas of exposed bedrock and may include pockets of deep soil, often on steep (up to 60%) slopes with very low productivity potential

a. Soil with igneous or volcanic bedrock<sup>8</sup> or are found on limestone parent material with a dominance of black sagebrush ... EX043B23A116 – Igneous (Ig) Absaroka Lower Foothills

b. Soil with sedimentary bedrock, common on windswept ridges, (if productivity is high and > 35% rock fragments are present use Gravelly(Gr)) ... EX043B23A176 – Very Shallow (VS) Absaroka Lower Foothills

ii. Soils shallow, productivity potential is LOW

a. Soil derived from limestone or an igneous parent material (igneous or volcanic bedrock)<sup>8</sup>, with a dominance of black sagebrush ... EX043B23A160 – Shallow Igneous (SwIg) Absaroka Lower Foothills

b. Soil derived from sedimentary parent material (i.e. sandstone or shale bedrock)

1) Soil has ≥ 35% clay ... EX043B23A158 – Shallow Clayey (SwCy) Absaroka Lower Foothills

2) Soil has < 18% clay ... EX043B23A166 – Shallow Sandy (SwSy) Absaroka Lower Foothills

3) Soil has ≥ 18% but < 35% clay ... EX043B23A162 – Shallow Loamy (SwLy) Absaroka Lower Foothills

2 Soils moderately deep to very deep (> 20" (50 cm) to bedrock (lithic or paralithic contact)

i. Soil is skeletal (> 35% rock fragments<sup>7</sup>) in the upper 20" (50 cm) of the mineral soil surface

a. Soil is skeletal throughout the upper 20" (50 cm) of the mineral soil surface

1) Soil has < 18% clay; surface fragments and fragments in the soil profile are dominantly < 3" (76mm) in diameter, but may range in size ... EX043B23A112 – Gravelly (Gr) Absaroka Lower Foothills

2) Soil has ≥ 18% but < 60% clay; surface fragments and fragments in the soil profile are dominantly ≥ 3" (76mm) in diameter but < 10" (250 mm), but may range in size

a) Violent effervescence<sup>3</sup> starting within 4" (10 cm) from the mineral soil surface, calcium carbonate increases with depth ... EX043B23A121 – Limy Skeletal (LiSk) Absaroka Lower Foothills

b) None to slight effervescence<sup>3</sup> in the upper 4" (10 cm) of the mineral soil surface ... EX043B23A175 – Skeletal (Sk) Absaroka Lower Foothills

b. Soil is skeletal starting within the upper 8-20" (20-50 cm) from the mineral soil surface

1) Soil has < 18% clay through the upper 20" (50 cm) of the mineral soil surface and fragments are comprised of sedimentary channers and/or flagstones ... EX043B23A100 – Channery Upland (CnU) Absaroka Lower Foothills

2) Soil has ≥ 18% but < 60% clay through the upper 20" (50 cm) of the mineral soil surface

a) Fragments typically consisting of stones and boulders (fragments > 10" (250 mm) in diameter), surface fragments (5-15%) increase in stones and boulders, common on Glacial outwash ... EX043B23A172 – Stony Upland (StU) Absaroka Lower Foothills

b) Fragments typically consisting of cobbles (fragments are dominantly > 3" (76 mm) but < 10" (250 mm) in diameter); a few stones and boulders (0-5%) are present, common on landslides ... EX043B23A109 – Cobbly Upland (CoU) Absaroka Lower Foothills

ii. Soil is not skeletal in the upper 20" (50 cm) of the mineral soil surface

a. Soil has ≥ 35% clay throughout the upper 20" (50 cm) of the mineral soil – may have a lighter textured cap or may decrease lower in the profile

1) Abrupt clay increase<sup>6</sup> to > 40% clay present within 4-8" (10-20 cm) of the mineral soil surface, significant surface cracking (plant community dominated by birdfoot sagebrush) ... EX043B23A110 – Dense Clay (DC) Absaroka Lower Foothills

2) Soil has  $\geq 35\%$  clay starting within the upper 4" (10 cm) and continues throughout the upper 20" (50 cm) of mineral soil surface; plant community dominated by Wyoming or Mountain big sagebrush<sup>2</sup> ... EX043B23A104 – Clayey (Cy) Absaroka Lower Foothills

b. Site not as above

1) Soil has  $< 18\%$  clay starting within the upper 4" (10 cm) and continues throughout the upper 20" (50 cm) of mineral soil ... EX043B23A150 – Sandy (Sy) Absaroka Lower Foothills

2) Soil has  $\geq 18\%$  but  $< 35\%$  clay in the upper 20" (50 cm) of the mineral soil surface

a) Soil is calcareous (violent effervescence<sup>3</sup>) within 20" (50 cm) of the mineral soil surface

(1) Soil is calcareous within the upper 8" (20 cm) of the mineral soil surface, calcium carbonate increases with depth ... EX043B23A120 – Limy Upland (LiU) Absaroka Lower Foothills

(2) Soil is calcareous starting within the upper 8-20" (20-50 cm) from the mineral soil surface ... EX043B23A123 – Loamy Calcareous (LyCa) Absaroka Lower Foothills

b) Soil is non-calcareous (none to slight effervescence<sup>3</sup>) within 20" (50 cm) of the mineral soil surface ... EX043B23A122 – Loamy (Ly) Absaroka Lower Foothills

1. For areas that receive additional moisture through snow trapping, consider adjusting to a wetter LRU consistent with the vegetation observed for the site keyed. It is anticipated that most snow-trap sites will not have a water table.

2. Specific plant species listed in the key are not to be used as the only determining factor. Management or disturbance may have removed or altered the plant composition that could reflect the wrong ecological site.

3. Soils derived from Dolomite or similar geology may not react as "violently" as other calcareous parent materials; dolomite site may be loamy calcareous with only a strong effervescence. Soils with  $< 18\%$  clays only need a CCE of 5% to be calcic or calcareous, while soils with  $> 18\%$  clays need a CCE of 15%.

5. Saline, saline sodic, and sodic soils have a pH of 7.9 to 9.0 and an EC (electrical conductivity)  $> 4$  dS/m [dS/m = mmhos/cm]. Salts, including gypsum will lower the pH without affecting the EC. Soils that are sodic generally have a SAR of  $\geq 13$  typically have a pH of 8.8 or higher.

6. The dense clay site will have a lighter textured cap or "A" horizon with an abrupt clay increase, commonly the clay percent will then decrease as move lower in the profile. The abrupt increase in the upper portion of the profile with significant cracking is the key for this site. Clayey may have a lighter textured cap but typically maintains or increases in clay as move through the profile.

7. When calculating percent rock fragments in the profile to determine if a site is skeletal, pararock fragments (parachanners) are not considered, however, channers are. The difference between a parachanner and a channer is how "hard" the rock is. Soft flat fragments (ruptured by hand) are parachanners, while harder flat fragments are channers.