Major Land Resource Area 058A
Northern Rolling High Plains, Northern Part

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Ecological site keys

MLRA 58A Determination Key

I. MLRA wide provisional ecological site descriptions

II. Legacy 2004 Era RRU ecological site descriptions

- **A. Sites in the western half of the MLRA with little bluestem and blue grama the only warm season species present in the area.**
- **B. Site located in the eastern half of the MLRA with a minor component of additional warm season species present in the area beyond blue grama and little bluestem.**

MLRA 58A Provisional ESD Key

I. Site Occurs in a 10-14" precipitation zone

- **i. Site Receives additional moisture**
  - **A. Soil Saline (EC ? 4) and/or Sodic (SAR ? 13) within surface 4" (10 cm)**
    - **1 Seasonal high water table 24-40” from ground surface; salt tolerant plants dominate site ...** R058AY737MT – Saline Subirrigated 10-19
    - **2 Seasonal high water table > 40” from ground surface; site regularly receives more than normal soil moisture because of run-in or stream overflow; salt tolerant plants dominate site ...** R058AY713MT – Saline Overflow 10-14
  - **B. Soil neither saline nor sodic [EC ? 4 and SAR ? 13 within surface 4" (10 cm)]**
    - **ii Seasonal high water table ? 40“**
      - **a. Seasonal high water table 24" to 40" (60-102 cm) ...** R058AY738MT – Subirrigated 10-19
      - **b. Seasonal high water table < 24" (60 cm) ...** R058AY723MT – Wet Meadow 10-19
    - **iii. Seasonal high water table > 40 “ or sites receiving run-in moisture only**
      - **a. Site is located outside of the floodplain; Upland swales, coulees, and ephemeral drainageways ...** R058AY720MT – Swale 10-14
      - **b. Site is located inside the floodplain**
        - **1) Site Dominated by woody vegetation, typically lower stream terraces ...** R058AY736MT – Riparian Woodland 10-19

2) **Site dominated by herbaceous vegetation, typically upper stream terraces** ... R058AY711MT – Overflow 10-14

ii. **Site does not receive additional moisture**

1 **Soil saline and/or sodic within surface 20” (50 cm) or soils with natric or relic natric horizons.**

i. **Massive, subangular blocky, or prismatic structure; effective rooting depth > 8" (20 cm)**

a. **Clay content ? 35% in surface mineral 4” (10 cm) [able to make a ribbon < 2” long]** ... R058AY714MT – Saline Upland 10-14

b. **Clay content > 35% in surface mineral 4” (10 cm) [able to make a ribbon > 2” long]** ... R058AY706MT – Dense Clay Sodic 10-14

ii. **Columnar structure, abrupt root or water restrictive clay layer present within 8” (20 cm) of soil surface**

a. **Less than 4” (10cm) of surface over clay layer (evidenced by columnar structure)**

1) **1" (2.5 cm) or less of surface over clay layer (evidenced by columnar structure)** ... R058AY712MT – Panspot 10-14

2) **Greater than 1" (2.5 cm) of surface over clay layer (evidenced by columnar structure)** ... R058AY721MT – Thin Claypan 10-14

b. **Soil has 4 to 8” (10-20cm) of surface over clay layer (evidenced by columnar structure)** ... R058AY703MT – Claypan 10-14

2 **Soil neither saline nor sodic [EC < 4 and SAR < 13 within surface 20" (50 cm)]**

i. **Coarse granular clay (typically acid shales), site contains sandy vegetation (e.g. Prairie sandreed)** ... R058AY704MT – Coarse Clay 10-14

ii. **Site not as above**

a. **Soils shallow to very shallow [< 20” (50 cm) deep to bedrock, lithic, or paralithic root restrictive layer]**

1) **Soil very shallow [< 10” (25cm) deep to bedrock, lithic, or paralithic root restrictive layer]** ... R058AY722MT – Very Shallow 10-14

2) **Soil shallow [10”-20” (25-50cm) deep to bedrock, lithic, or paralithic root restrictive layer]**

a) **Clay content ? 32% in surface mineral 4" (10 cm) [ribbon < 2” long]** ... R058AY717MT – Shallow 10-14

b) **Clay content > 32% in surface mineral 4” (ribbon length > 2” long)** ... R058AY718MT – Shallow Clay 10-14

b. **Soils moderately deep, deep, or very deep [? 20” (50 cm) deep to bedrock, lithic, or paralithic root restrictive layer]**

1) **Soil skeletal within 20" (50 cm) of the surface [averages ? 35% rock fragments in the 10”-20” layer]**

a) **Soil sandy-skeletal**

(1) **Soil sandy-skeletal within 10 inches of the surface** ... R058AY707MT – Gravelly 10-14

(2) **Soil sandy-skeletal within 10-20 inches of the surface** ... R058AY719MT – Shallow to Gravel 10-14

b) **Soil loamy-skeletal** ... R058AY709MT – Loamy Gravel 10-14

2) **Soil not skeletal in surface 20” (50 cm) [averages < 35% rock fragments in the 10”-20” layer]**

a) **Slope < 15%**

(1) **Fine sandy loam or coarser texture within surface mineral 4” ...** R058AY715MT – Sandy 10-14

(2) **Very fine sandy loam or finer texture within surface mineral 4”**

(a) **Clay content is > 32% in surface mineral 4” of mineral soil (ribbon > 2” long)**

(1) **Soil > 32% to 45% clay within surface mineral 4” ...** R058AY701MT – Clayey 10-14

(2) **Soil > 45% clay within surface mineral 2” ...** R058AY705MT – Dense Clay Non-Sodic 10-14

(b) **Clay content is ? 32% in surface mineral 4” ...** R058AY708MT – Loamy 10-14

b) **Slope ? 15%**

(1) **Fine sandy loam or coarser texture within surface mineral 4” ...** R058AY716MT – Sandy Steep 10-14

(2) **Very fine sandy loam or finer texture within surface mineral 4”**

(a) **Clay content is > 32% in surface mineral 4” of mineral soil (ribbon > 2” long) ...** R058AY702MT – Clayey Steep 10-14

(b) **Clay content is ? 32% in surface mineral 4” ...** R058AY710MT – Loamy Steep 10-14

II. **Site Occurs in a 15-19" precipitation zone**

A. **Site Receives additional moisture**

1 **Soil Saline (EC > 4) and/or Sodic (SAR > 13) within surface 4" (10 cm)**

i. **Seasonal high water table 24-40” from ground surface; salt tolerant plants dominate site ...** R058AY737MT – Saline Subirrigated 10-19

2 **Soil neither saline nor sodic [EC < 4 and SAR < 13 within surface 4" (10 cm)]**

i. **Seasonal high water table ? 40 “**

a. **Seasonal high water table 24" to 40" (60-102 cm) ...** R058AY738MT – Subirrigated 10-19

b. **Seasonal high water table < 24" (60 cm) ...** R058AY723MT – Wet Meadow 10-19

ii. **Seasonal high water table > 40 “ or sites receiving run-in moisture only**

a. **Site is located outside of the floodplain; Upland swales, coulees, and ephemeral drainageways ...** R058AY726MT – Woody Draw 15-19

b. **Site is located inside the floodplain**

1) **Site Dominated by woody vegetation, typically lower stream terraces ...** R058AY736MT – Riparian Woodland 10-19

2) **Site dominated by herbaceous vegetation, typically upper stream terraces ...** R058AY729MT – Overflow 15-19

B. **Site does not receive additional effective moisture**

1 **Trees or evidence of tree cover (i.e. burned stumps, charcoal in soil profile) common. Typically, shallow to moderately deep soils formed from interbedded sedimentary rock. ...** R058AY730MT – Ponderosa Pine 15-19

2 **Grassland or shrubland; typically trees (or evidence of tree cover) rare or absent**

i. **Soils shallow to very shallow [< 20” (50 cm) deep to bedrock, lithic, or paralithic root restrictive layer]**

a. **Soil very shallow [< 10” (25cm) deep to bedrock, lithic, or paralithic root restrictive layer] ...** R058AY735MT – Very Shallow 15-19

b. **Soil shallow [10”-20” (25-50cm) deep to bedrock, lithic, or paralithic root restrictive layer]**

1) **Clay content ? 32% in surface mineral 4" (10 cm) [ribbon < 2” long] ...** R058AY733MT – Shallow 15-19

2) **Clay content > 32% in surface mineral 4” (ribbon length > 2” long) ...** R058AY734MT – Shallow Clay 15-19

ii. **Soils moderately deep, deep, or very deep [? 20” (50 cm) deep to bedrock, lithic, or paralithic root restrictive layer]**

a. **Slope < 15%**

1) **Fine sandy loam or coarser texture within surface mineral 4” ...** R058AY731MT – Sandy 15-19

2) **Very fine sandy loam or finer texture within surface mineral 4”**

a) **Clay content is > 32% in surface mineral 4” of mineral soil (ribbon > 2” long) ...** R058AY724MT – Clayey 15-19

b) **Clay content is ? 32% in surface mineral 4” ...** R058AY727MT – Loamy 15-19

b. **Slope ? 15%**

1) **Fine sandy loam or coarser texture within surface mineral 4” ...** R058AY732MT – Sandy Steep 15-19

2) **Very fine sandy loam or finer texture within surface mineral 4”**

a) **Clay content is > 32% in surface mineral 4” of mineral soil (ribbon > 2” long) ...** R058AY725MT – Clayey Steep 15-19

b) **Clay content is ? 32% in surface mineral 4” ...** R058AY728MT – Loamy Steep 15-19

Montana Legacy RRU Central ESD Key

I. **Site receives additional effective moisture**

A. **Soil saline (EC> 4 within surface 4”) and water table > 24”**

1 **Seasonal high water table 24-40” from ground surface; salt tolerant plants dominate site – Saline Subirrigated (SSb) ...** R058AC619MT – Saline Subirrigated (SSb) RRU 58A-C 11-14" p.z.

2 **Seasonal high water table? 40” from ground surface; salt tolerant plants dominate site; site regularly receives more than normal soil moisture because of run-in or stream overflow – Saline Overflow (SOv) ...** R058AC618MT – Saline Overflow (SOv) RRU 58A-C 11-14" p.z.

B. Site not as above

1 Seasonal high water table ? 40” from ground surface; site regularly receives more than normal soil moisture because of run-in or stream overflow – Overflow (Ov) ... R058AC045MT – Overflow (Ov) RRU 58A-C 11-14" p.z.

2 Seasonal high water table < 40” from ground surface

i. Site located in the flood plain ... R058AC617MT – Riparian Subirrigated (RSb) RRU 58A-C 11-14" p.z.

ii. Site not located in flood plain

a. Seasonal high water table 24” to 40” – Subirrigated (Sb) ... R058AC044MT – Subirrigated (Sb) RRU 58A-C 11-14" p.z.

b. Seasonal high water table < 24” ... R058AC043MT – Wet Meadow (WM) RRU 58A-C 11-14" p.z.

II. Site does not receive additional effective moisture

A. Soil saline or saline-sodic within surface 20” or soils with natric or relic natric horizons.

1 No columnar structure; site dominated by salt tolerant plants – Saline Upland (SU) ... R058AC050MT – Saline Upland (SU) RRU 58A-C 11-14" p.z.

2 Columnar structure present, abrupt root or water restrictive clay layer present within 8” of soil surface ... R058AC054MT – Claypan (Cp) RRU 58A-C 11-14" p.z.

B. Site not as above

1 Coarse granular clay (typically acid shales), site contains sandy vegetation (e.g. Prairie sandreed) – Coarse Clay (CoC) ... R058AC614MT – Coarse Clay (CC) RRU 58A-C 11-14" p.z.

2 Site not as above

i. Soils shallow to very shallow (< 20” deep to bedrock, lithic, or paralithic root restrictive layer)

a. Soil very shallow (< 10” deep to bedrock, lithic, or paralithic root restrictive layer)

1) Bedrock is Shale ... R058AC052MT – Shale (Sh) RRU 58A-C 11-14" p.z.

2) Other ... R058AC058MT – Very Shallow (VSw) RRU 58A-C 11-14" p.z.

b. Soil shallow (10” – 20” deep to bedrock, lithic, or paralithic root restrictive layer)

1) Clay content < 32% in surface mineral 4” (able to make a ribbon < 2” long) ... R058AC057MT – Shallow (Sw) RRU 58A-C 11-14" p.z.

2) Clay content > 32% in surface mineral 4” (ribbon length > 2” long) – Shallow Clay (SwC) ... R058AC059MT – Shallow Clay (SwC) RRU 58A-C 11-14" p.z.

ii. Soils moderately deep, deep, or very deep (? 20” deep to bedrock, lithic, or paralithic root restrictive layer)

a. Soil skeletal to within 20” of soil surface (averages > 35% rock fragments in the 10”-20” layer)

1) Sandy-skeletal within 10-20” of soil surface & typically consists of gravels and/or cobbles ... R058AC194MT – Shallow to Gravel (SwGr) RRU 58A-C 11-14" p.z.

2) Sandy-skeletal within 10” of soil surface – Gravelly (Gr) ... R058AC055MT – Gravel (Gr) RRU 58A-C 11-14" p.z.

b. Site not as above

1) **Slope < 15%**

a) **Coarse sandy loam to fine sandy loam texture within surface mineral 4”** ... R058AC042MT – Sandy (Sy) RRU 58A-C 11-14" p.z.

b) **Site not as above**

(1) **Clay content is > 32% in surface mineral 4” of mineral soil (ribbon > 2” long)**

(a) **Soil 32% to 45% clay within surface mineral 4” – Clayey (Cy)** ... R058AC041MT – Clayey (Cy) RRU 58A-C 11-14" p.z.

(b) **Soil > 45% clay within surface mineral 2” – Dense Clay** ... R058AC053MT – Dense Clay (DC) RRU 58A-C 11-14" p.z.

(2) **Clay content is < 32% in surface mineral 4”** ... R058AC040MT – Silty (Si) RRU 58A-C 11-14" p.z.

2) **Slope ?15%**

a) **Mollic epipedon present** ... R058AC049MT – Silty-Steep (SiStp) RRU 58A-C 11-14" p.z.

b) **Mollic epipedon not present** ... R058AC616MT – Thin Breaks (TB) RRU 58A-C 11-14" p.z.

Montana Legacy RRU East ESD Key

I. **Site receives additional effective moisture**

A. **Soil saline (EC> 4 within surface 4”) and water table > 40”** ... R058AE012MT – Saline Lowland (SL) RRU 58A-E 10-14" p.z.

B. **Site not as above**

1 **Seasonal high water table ? 40” from ground surface; site regularly receives more than normal soil moisture because of run-in or stream overflow – Overflow (Ov)** ... R058AE007MT – Overflow (Ov) RRU 58A-E 10-14" p.z.

2 **Seasonal high water table < 40” from ground surface**

i. **Seasonal high water table < 24 “** ... R058AE009MT – Wet Meadow (WM) RRU 58A-E 10-14" p.z.

ii. **Seasonal high water table 24” to 40” – Subirrigated (Sb)** ... R058AE008MT – Subirrigated (Sb) RRU 58A-E 10-14" p.z.

II. **Site does not receive additional effective moisture**

A. **Soil saline or saline-sodic within surface 20” or soils with natric or relic natric horizons.**

1 **No columnar structure**

i. **Site dominated by salt tolerant plants – Saline Upland (SU)** ... R058AE011MT – Saline Upland (SU) RRU 58A-E 10-14" p.z.

ii. **Site has a component of salt tolerant plants** ... R058AE193MT – Silty-Saline (SiS) RRU 58A-E 10-14" p.z.

2 **Columnar structure present, abrupt root or water restrictive clay layer present within 8" of soil surface** ... R058AE013MT – Claypan (Cp) RRU 58A-E 10-14" p.z.

B. **Site not as above**

1 **Coarse granular clay (typically acid shales), site contains sandy vegetation (e.g. Prairie sandreed) – Coarse Clay (CoC)** ... R058AE192MT – Coarse Clay (CC) RRU 58A-E 10-14" p.z.

2 **Site not as above**

i. **Soils shallow to very shallow (< 20" deep to bedrock, lithic, or paralithic root restrictive layer)**

a. **Soil very shallow (< 10" deep to bedrock, lithic, or paralithic root restrictive layer)**

1) **Bedrock shale** ... R058AE015MT – Shale (Sh) RRU 58A-E 10-14" p.z.

2) **Other** ... R058AE017MT – Very Shallow (VSw) RRU 58A-E 10-14" p.z.

b. **Soil shallow (10" – 20" deep to bedrock, lithic, or paralithic root restrictive layer)**

1) **Clay content < 32% in surface mineral 4" (able to make a ribbon < 2" long)** ... R058AE019MT – Shallow (Sw) RRU 58A-E 10-14" p.z.

2) **Clay content > 32% in surface mineral 4" (ribbon length > 2" long) – Shallow Clay (SwC)** ... R058AE199MT – Shallow Clay (SwC) RRU 58A-E 10-14" p.z.

ii. **Soils moderately deep, deep, or very deep (? 20" deep to bedrock, lithic, or paralithic root restrictive layer)**

a. **Sand or loamy sand texture within surface mineral 4" – Sands (Sa)** ... R058AE018MT – Sands (Sa) RRU 58A-E 10-14" p.z.

b. **Site not as above**

1) **Slope < 15%**

a) **Soil sandy-skeletal**

(1) **Sandy-skeletal within 10" of soil surface – Gravelly (Gr)** ... R058AE016MT – Gravel (Gr) RRU 58A-E 10-14" p.z.

(2) **Sandy-skeletal within 10-20" of soil surface & typically consists of gravels and/or cobbles** ... R058AE191MT – Shallow to Gravel (SwGr) RRU 58A-E 10-14" p.z.

b) **Site not as above**

(1) **Coarse sandy loam to fine sandy loam texture within surface mineral 4"** ... R058AE003MT – Sandy (Sy) RRU 58A-E 10-14" p.z.

(2) **Site not as above**

(a) **Clay content is > 32% in surface mineral 4" of mineral soil (ribbon > 2" long)**

(1) **Soil 32% to 45% clay within surface mineral 4" – Clayey (Cy)** ... R058AE002MT – Clayey (Cy) RRU 58A-E 10-14" p.z.

(2) **Soil > 45% clay within surface mineral 2” – Dense Clay ...** R058AE014MT – Dense Clay (DC) RRU 58A-E 10-14" p.z.

(b) **Clay content is < 32% in surface mineral 4” ...** R058AY001MT – Loamy (Lo) 10-14 P.Z.

2) **Slope ? 15%**

a) **Coarse sandy loam to fine sandy loam texture within surface mineral 4” ...** R058AE006MT – Sandy-Steep (SyStp) RRU 58A-E 10-14" p.z.

b) **Site not as above**

(1) **Clay content is > 32% (ribbon > 2” long) in surface mineral 4” – Clayey Steep (CyStp) ...** R058AE005MT – Clayey-Steep (CyStp) RRU 58A-E 10-14" p.z.

(2) **Clay content is < 32% (ribbon < 2” long) in surface mineral 4” – Loamy Steep (LoStp) ...** R058AE004MT – Silty-Steep (SiStp) RRU 58A-E 10-14" p.z.