

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 ... Key 2 – MLRA 58A Provisional ESD Key
- 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. ... Key 3 – Montana Legacy RRU Central ESD Key
 - 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. ... Key 4 – Montana Legacy RRU East ESD Key

MLRA 58A Provisional ESD Key

- I. Site Occurs in a 10-14" precipitation zone
 - i. Site Receives additional moisture
 - A. Soil Saline ($EC \geq 4$) and/or Sodic ($SAR \geq 13$) 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 [$EC \leq 4$ and $SAR \leq 13$ 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 $\leq 35\%$ 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-

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 $\leq 32\%$ 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 $\leq 32\%$ in surface mineral 4" ... R058AY727MT – Loamy 15-19
 - b. Slope $\geq 15\%$
 - 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 $\leq 32\%$ 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 ... R058AC046MT – Silty-Steep 11-14" p.z. Deleted. Refe
 - 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 ($\geq 20"$ 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 $\geq 15\%$
 - 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.