

Major Land Resource Area 047X

Wasatch and Uinta Mountains

Accessed: 05/11/2025

Ecological site keys

MLRA 47X LRU B - Southern Wasatch Mountains

I. Site receives no extra moisture beyond normal precipitation.

A. Temperature regime is frigid, soil moisture regime is ustic and annual precipitation is 9 to 16 inches.

1 Annual precipitation is 9 to 14 inches, 5,000 to 7,000 ft elevation.

i. Semidesert Ecological Zone.

a. Restrictive layer present within 60" of soil surface.

1) Restrictive layer less than 20" below soil surface. R047XB236UT. ... R047XB236UT – Semidesert Shallow Loam (black sagebrush)

2) Site not as above. Unclassified.

b. No restrictive layer present within 60" of soil surface.

1) Surface soil texture gravelly loam or sandy loam or silt loam.

a) Surface soil texture sandy or gravelly loam with rock content greater than 35% in soil profile. ... R047XB214UT – Semidesert Gravelly Loam (Wyoming big sagebrush)

b) Surface soil texture sandy or gravelly loam with rock content less than 35% in soil profile. ... R047XB222UT – Semidesert Loam (Wyoming big sagebrush)

c) Surface soil texture silt loam.

(1) No gravels present on the soil surface. R047XB244UT. ... R047XB244UT – Semidesert Silt Loam (winterfat)

(2) Gravels present on surface, between 20-45% by volume. R047XB252UT. ... R047XB252UT – Semidesert Stony Loam (black sagebrush)

(3) Site not as above. Unclassified.

2) Surface soil texture loam.

a) Subsurface gravels are less than 20% by volume.

(1) Surface soil texture loam or sandy loam, dominant plant is black sagebrush. R047XB221UT. ... R047XB221UT – Semidesert Loam (black sagebrush)

(2) Surface soil texture loam or clay loam, dominant plant is basin big sagebrush. R047XB220UT. ... R047XB220UT – Semidesert Loam (basin big sagebrush)

(3) Site not as above. Unclassified.

b) Subsurface gravels are greater than 20% by volume. R047XB210UT. ... R047XB210UT – Semidesert Gravelly Loam (black sagebrush)

2 Annual precipitation is 12 to 16 inches, 6,800 to 8,500 ft elevation.

i. Upland Ecological Zone.

a. Restrictive layer within 60" of soil surface.

1) Restrictive layer between 20-40". R047XB333UT. ... R047XB333UT – Upland Stony Loam (pinyon/Utah juniper)

2) Restrictive layer between 10-20".

a) Rock fragments not present on soil surface, surface soil texture clay loam. R047XB312UT.

... R047XB312UT – Upland Shallow Clay (pinyon/Utah juniper)

b) Rock fragments present on the soil surface, soil texture variable.

(1) Subsurface gravels less than 25% by volume.

(a) Utah juniper trees present on the site.

(1) Juniper trees are pre-European settlement (over 150 years old), slopes generally steep, up to 70%. R047XB326UT. ... R047XB326UT – Upland Shallow Loam (pinyon/Utah juniper)

(2) Juniper trees are young, post-European settlement, slopes generally not as steep as above, up to 35%. R047XB322UT. ... R047XB332UT – Upland Stony Loam (black sagebrush)

(3) Site not as above. Unclassified.

(4) Juniper trees are pre European settlement (over 150 years ols), slopes generally over 50% ... R047XB345UT – Upland Very Steep Shallow Loam (pinyon/Utah juniper/Douglas-fir)

(b) Utah juniper trees not present, mountain big sagebrush site, slopes between 1-35%. R047XB322UT. ... R047XB322UT – Upland Shallow Loam (mountain big sagebrush)

(2) Subsurface gravels greater than 25% by volume.

(a) Soil subsurface contains a hardpan layer (cemented by calcium carbonate).

(1) Juniper trees present, rocks larger than 3" may be less than or greater than 30% by volume on surface.

(a) Juniper trees are pre-European settlement (old age class) rocks larger than 3" are 3-14% by volume on surface. R047XB318UT. ... R047XB318UT – Upland Shallow Hardpan (pinyon/Utah juniper)

(b) Juniper trees are post-European settlement (younger than 150 years), rocks larger than 3" are greater than 30% by volume on surface. R047XB316UT. ... R047XB316UT – Upland Shallow Hardpan (black sagebrush)

(c) Site not as above. Unclassified.

(2) Juniper trees not present, rocks larger than 3" are greater than 30% by volume on surface. R047XB316UT. ... R047XB316UT – Upland Shallow Hardpan (black sagebrush)

(b) Soil subsurface does not contain hardpan layer, soil is shallow to bedrock.

R047XB326UT. ... R047XB326UT – Upland Shallow Loam (pinyon/Utah juniper)

b. No restrictive layer present.

1) Soil surface and subsurface is influenced by clay.

a) Juniper trees present, surface rock volume variable.

(1) Juniper trees are pre-European settlement (old age class) rocks larger than 3" are not present on the surface. R047XB303UT. ... R047XB303UT – Upland Clay (pinyon/Utah juniper)

(2) Juniper trees are pre-European settlement; rocks larger than 3" are greater than 30% by volume on soil surface. R047XB301UT. ... R047XB301UT – Upland Clay (black sagebrush)

(3) Site not as above. Unclassified.

b) Juniper trees not present, surface rocks larger than 3" are greater than 25% by volume.

R047XB301UT. ... R047XB301UT – Upland Clay (black sagebrush)

2) Soil surface and subsurface not as above.

a) Surface calcium carbonate equivalent is 0, soil does not strongly effervesce with acid.

(1) Surface rocks larger than 3" are less than 2% by volume. R047XB308UT. ...

R047XB308UT – Upland Loam (mountain big sagebrush/Indian ricegrass)

(2) Surface rocks larger than 3" are greater than 2% by volume.

(a) Soil profile contains an argillic and calcic horizon (clay and calcium carbonate accumulation), surface rocks larger than 3" are up to 10%. R047XB306UT. ...

R047XB306UT – Upland Gravelly Loam (black sagebrush)

(b) Soil profile generally contains only an argillic horizon (clay accumulation), higher rock volume than the above site (up to 35% for rocks larger than 3"). R047XB336UT. ...

R047XB336UT – Upland Stony Loam (mountain big sagebrush)

(c) Site not as above. Unclassified.

b) Surface calcium carbonate equivalent up to 15%, soil effervesces with acid.

(1) Subsurface rocks larger than 3" are less than 5% by volume, slopes between 1-15%.

R047XB309UT. ... R047XB309UT – Upland Loam (black sagebrush)

(2) Subsurface rocks larger than 3" are greater than 5% by volume, slopes variable.

(a) Juniper trees present.

(1) Juniper trees are pre-European settlement, older than 150 years old and rock fragment in the top 24" is generally greater than 50%..... R047XB333UT. ...

R047XB333UT – Upland Stony Loam (pinyon/Utah juniper)

(2) Juniper trees are pre-European settlement, older than 150 years and rock fragment in the top 24" is generally less than 50%..... R047XB304UT ...

R047XB304UT – Upland Gravelly Loam (pinyon/Utah juniper)

(3) Juniper trees are post-European settlement, trees young. R047XB332UT. ...

R047XB332UT – Upland Stony Loam (black sagebrush)

(4) Site not as above.....Unclassified.

(b) Juniper trees not present, black sagebrush dominant. R047XB332UT. ...

R047XB332UT – Upland Stony Loam (black sagebrush)

(3) Subsurface rocks larger than 3" are less than 5% by volume, slopes between 35-60%.

... R047XB310UT – Upland Loam (shrub)

B. Temperature regime is frigid or cryic and annual precipitation is 16 to 40 inches.

1 Temperature regime is frigid, soil moisture regime is ustic and annual precipitation is 16 to 22 inches.

i. Mountain Ecological Zone.

a. No restrictive layer present in the top 60" of soil.

1) Surface gravels greater than 15% by volume.

a) Subsurface rocks larger than 3" are greater than 5% by volume.

(1) Gravel surface volume 15-25%, greater volume than site below, dominant shrub is mountain big sagebrush. R047XB462UT. ... R047XB462UT – Mountain Stony Loam (mountain big sagebrush)

(2) Rock fragments in the top 24" generally greater than 50% volume dominant shrub is Gambel Oak ... R047XB463UT – Mountain Stony Loam (oak)

(3) Rock fragments in the top 24" generally greater than 35% volume dominant vegetation is mountain big sagebrush ... R047XB406UT – Mountain Gravelly Loam (mountain big sagebrush)

(4) Rock fragments in the top 24" generally greater than 35% volume dominant vegetation is Gambel Oak ... R047XB410UT – Mountain Gravelly Loam (oak)

(5) Site not as above.....Unclassified.

b) Subsurface rocks larger than 3" are less than 15% by volume.

(1) Rock fragments larger than 3" are generally less than 15% volume dominant plant mountain big sagebrush. ... R047XB430UT – Mountain Loam (mountain big sagebrush)

- (2) Rock fragments larger than 3" are generally greater than 15% volume dominant plant Gamble oak. ... R047XB463UT – Mountain Stony Loam (oak)
 - (3) Site not as above
- 2) Surface gravels less than 15% by volume.
 - a) Slopes greater than 15%.
 - (1) Rock fragments generally greater than 15% by volume on soil surface or subsurface. R047XB463UT. ... R047XB463UT – Mountain Stony Loam (oak)
 - (2) Rock fragments less than 15% by volume on soil surface or subsurface.
 - (a) Soil profile has a calcic horizon between 10-32". R047XB420UT. ... R047XB420UT – Mountain Loam (shrub)
 - (b) Soil profile does not have a calcic horizon, or has calcic horizon deeper than 10".
 - (1) Site generally found on moderate slopes (up to 30%), dominant shrub is mountain big sagebrush. R047XB430UT. ... R047XB430UT – Mountain Loam (mountain big sagebrush)
 - (2) Site generally found on steep slopes (up to 60%), soil surface may have an organic layer of leaves and twigs, dominant shrub is oak. R047XB432UT. ... R047XB432UT – Mountain Loam (oak)
 - (3) Site not as above. Unclassified.
 - b) Slopes less than 15%.
 - (1) Site dominated by ponderosa pine R047XB433UT ... R047XB433UT – Mountain Loam (ponderosa pine)
 - (2) Site not dominated by ponderosa pine.
 - (a) Subsurface gravel volume greater than 20%. R047XB428UT. ... R047XB428UT – Mountain Loam (low sagebrush)
 - (b) Subsurface gravel volume less than 20%.
 - (1) Site dominated by Gamble Oak. R047XB432UT. ... R047XB432UT – Mountain Loam (oak)
 - (2) Site not as above.
 - (a) Surface calcium carbonate equivalent is greater than 5%.
 - (1) Dominant shrub is a mix of species, slopes between 2 and 30%. R047XB420UT. ... R047XB420UT – Mountain Loam (shrub)
 - (2) Dominant shrub is black sagebrush, slopes less than 15%. R047XB426UT. ... R047XB426UT – Mountain Loam (black sagebrush)
 - (3) Site not as above
 - (b) Surface calcium carbonate equivalent is less than 5%.
 - (1) Dominant shrub is mountain big sagebrush. R047XB430UT ... R047XB430UT – Mountain Loam (mountain big sagebrush)
 - (2) Site may contain mountain big sagebrush, but it is codominant with other shrubs. R047XB420UT. ... R047XB420UT – Mountain Loam (shrub)
 - (3) Site not as above
 - b. Restrictive layer present within the top 60" of soil.
 - 1) Restrictive layer between 10-20" from soil surface.
 - a) Gravel volume on the soil surface less than 10%.
 - (1) Subsurface rock volume larger than 3" less than 30%, slopes between 2-60%, elevation ranges from 6,800-8,500 feet. R047XB442UT. ... R047XB442UT – Mountain Shallow Loam (low sagebrush)
 - (2) Subsurface rock volume larger than 3" greater than 30%, slopes between 20-70%,

elevation ranges from 8,300-9,400 feet. R047XB438UT. ... R047XB438UT – Mountain Shallow Loam (black sagebrush)

(3) Site not as above. Unclassified.

b) Gravel volume on the soil surface 10% or greater.

(1) Subsurface gravel volume 5% or less. R047XB438UT. ... R047XB438UT – Mountain Shallow Loam (black sagebrush)

(2) Subsurface gravel volume greater than 5%.

(a) Dominant plant is ponderosa pine. R047XB450UT. ... R047XB450UT – Mountain Shallow Loam (ponderosa pine)

(b) Dominant plant not as above.

(1) Rock fragments >3" on the soil surface is >5% volume and the dominant plant is curl-leaf mountain mahogany, slopes generally moderate. R047XB440UT. ... R047XB440UT – Mountain Shallow Loam (curl-leaf mountain mahogany)

(2) Rock fragments >3" on the soil surface is <5% volume and the dominant plant is curl leaf mountain mahogany, slopes generally steep. R047XB468UT. ... R047XB468UT – Mountain Very Steep Shallow Loam (curl-leaf mountain mahogany)

(3) Site not as above.

(a) Surface textures are generally very gravelly or very stony loams and dominant plant is mountain big sagebrush. R047XB446UT. ... R047XB446UT – Mountain Shallow Loam (mountain big sagebrush)

(b) Surface textures are generally very cobbly to extremely cobbly loams and dominant plant is low sagebrush (tend to be found at higher elevations). R047XB442UT. ... R047XB442UT – Mountain Shallow Loam (low sagebrush)

(c) Site not as above.....Unclassified.

2) Restrictive layer between 20 and 60" from soil surface.

a) Restrictive layer between 20 and 40"

(1) Slopes are greater than 40%. R047XB420UT. ... R047XB420UT – Mountain Loam (shrub)

(2) Slopes are less than 40%.

(a) Gravel volume on the soil surface is less than 15% and site generally occurs on mid mountain slopes or pediments. R047XB430UT. ... R047XB430UT – Mountain Loam (mountain big sagebrush)

(b) Gravel volume on the soil surface is less than 15% and site occurs on hill/ridge tops with low statured vegetation. R047XB475UT. ... R047XB475UT – Mountain Windswept Ridge (black sagebrush or low sagebrush)

(c) Site not as above.....Unclassified.

b) Restrictive layer 40" or deeper.

(1) Slopes between 2-5%. R047XB433UT. ... R047XB433UT – Mountain Loam (ponderosa pine)

(2) Slopes between 8-25%. R047XB428UT. ... R047XB428UT – Mountain Loam (low sagebrush)

(3) Site not as above.....Unclassified.

2 Temperature regime is cryic, soil moisture regime is udic and annual precipitation is 22 to 40 inches.

i. Sites are not above timberline, (8,500-10,000 feet).

a. High Mountain Ecological Zone.

1) Site does not have a restrictive layer in the upper 60" of soil.

a) Surface organic matter 4-6%, pH 6.1-7.3, generally has a mollic epipedon, dominant plant

is aspen. R047XB508UT. ... R047XB508UT – High Mountain Loam (aspen)

b) Site not as above.

(1) Dominant plant is Douglas fir. F047XB512UT. ... F047XB512UT – High Mountain Loam (Douglas-fir)

(2) Dominant plant is Douglas fir. F047XB512UT. ... R047XB516UT – High Mountain Loam (mountain big sagebrush)

(3) Site not as above. Unclassified.

2) Site contains a restrictive layer in the upper 60" of soil.

a) Rocks larger than 3" are less than 50% volume on soil surface. R047XB519UT ... R047XB519UT – High Mountain Loam (mixed conifer)

b) Rocks larger than 3" are less than 50% volume on soil surface and rocks <3" are greater than 25% volume within the soils profile. R047XB532UT ... R047XB532UT – High Mountain Stony Loam (Douglas-fir)

c) Rocks larger than 3" are greater than 50% volume on soil surface. R047XB539UT ... R047XB539UT – High Mountain Stony Loam (mixed conifer)

d) Soil not as above.....Unclassified.

ii. Sites are above timberline (> 10,500 ft).

a. Alpine Ecological Zone. Unclassified.

II. Site receives extra water beyond normal precipitation through high water table and/or run-in water.

A. Temperature regime is frigid.

1 Run-In Ecological Zone.

i. Site occurs below 5,900 feet. Unclassified.

ii. Site occurs above 5,900 feet.

a. Site occurs between 5,900 and 7,200 feet.

1) Water table is between 0-36" from soil surface.

a) Water table is between 0-24", site located in a meadow. R047XB008UT.

b) Site not as above. Unclassified.

2) Water table greater than 36" from soil surface.

a) Basin wildrye is the dominant plant. R047XB016UT.

b) Site not as above. Unclassified.

b. Site occurs above 6,800 feet.

1) Water table is 0-36" below soil surface.

a) Water table is between 8-36", site is located in a meadow. R047XB004UT.

b) Site not as above. Unclassified.

2) Water table is greater than 36" from soil surface.

a) Basin wildrye is dominant plant. R047XB016UT.

b) Site not as above. Unclassified.

B. Temperature regime is cryic.

1 Sites are above timberline.

i. Alpine Ecological Zone. Unclassified.