Major Land Resource Area 047X
Wasatch and Uinta Mountains

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Ecological site keys

MLRA 47X LRU A - Northern Wasatch Mountains

I. Site receives no extra water beyond normal precipitation.
- A. Greater than 35" annual precipitation.
  - 1 Site is capable of supporting subalpine fir and Engelmann spruce.
    - i. Subalpine ecological zone.
      - a. No restrictive layer within 60".
        - 1) Gravels on surface are greater than 5% by volume.
          - a) Dominant plant is Engelmann spruce. ... F047XA610UT – Subalpine Gravelly Loam (subalpine fir/Engelmann spruce)
          - b) Site is dominated by grasses and forbs. ... R047XA611UT – Subalpine Clay Loam (mixed grasses/forbs)
        - 2) Gravels on surface are less than 5% by volume.
          - a) Surface soil texture is loam or silty clay.
            - (1) Surface soil texture is loam.
              - (a) Surface soil texture loam, dominant plant is tufted hairgrass. ... R047XA624UT – Subalpine Semiwet Meadow (tufted hairgrass)
              - (b) Surface soil texture loam, dominant plant is other than above. Unclassified.
            - (2) Surface soil texture is silty clay.
              - (a) Surface soil texture silty clay, dominant plants are sedges. ... R047XA660UT – Subalpine Wet Meadow (sedge)
              - (b) Surface soil texture silty clay, dominant plants other than above. Unclassified.
          - b) Surface soil texture not as above. Unclassified.
      - b. Restrictive layer within 60".
        - 1) Restrictive layer between 20-60".
          - a) Restrictive layer between 20-40".
            - (1) Dominant plant snowfield sagebrush. ... R047XA630UT – Subalpine Stony Loam (snowfield sagebrush)
            - (2) Site dominated by grasses and forbs. ... R047XA614UT – Subalpine Loam (cranesbill)
          - b) Restrictive layer between 40-60".
            - (1) Dominant plant is alpine Timothy. ... R047XA620UT – Subalpine Meadow (alpine timothy)
            - (2) Dominant plant not as above. Unclassified.
        - 2) Restrictive layer not as above. Unclassified.
  - 2 Site is above timberline.
    - i. Alpine ecological zone.
- B. Less than 35" precipitation.
  - 1 22-40" annual precipitation.

i. High mountain ecological zone.

a. Slope is generally under 30%.

1) No restrictive layer within 60" of the soil surface.

a) Surface soil texture sandy loam to very cobbly sandy loam with the dominant aspect of the site being trees. ... F047XA542UT – High Mountain Stony Sandy Loam (lodgepole pine)

b) Surface soil textures mainly sandy loam to gravelly loam and the dominant aspect on the site is grasses and forbs.....R047XA557UT ... R047XA557UT – High Mountain Gravelly Loam (tall forb)

c) Surface soil texture loam or clay loam.

(1) Gravels on the surface are greater than 15% by volume.

(a) Surface soil texture is silt loam.

(b) Surface soil texture is loam (rock fragments over 15% by volume).

(2) Gravels on the surface are less than 15% by volume.

(a) Surface soil texture is silt loam.

(1) Slope is between 6-35%.

(2) Slope is less than 10%.

(3) Site not as above. Unclassified.

(b) Surface soil texture is loam or clay.

(1) Dominant plant is silver sagebrush.

(2) Dominant plant is mulesears, surface loam, subsurface texture clay loam to loam, argillic horizon between 11-32".

(3) Site not as above. Unclassified.

2) Restrictive layer present within 60".

a) Surface soil texture clay with rocks between 15-30% by volume. ... R047XA504UT – High Mountain Clay (slender wheatgrass)

b) Surface soil texture not as above.

(1) Surface gravels less than 9% by volume.

(a) Slope between 5-10%, rock fragments generally larger than 3". F047XA508UT ... F047XA508UT – High Mountain Loam (quaking aspen)

(b) Slope between 6 and 70%, rock fragments not present or smaller than 3". ... R047XA516UT – High Mountain Loam (mountain big sagebrush)

(c) Site not as above. Unclassified.

(2) Surface gravels greater than 9% by volume.

(a) Soil subsurface generally clay to clay loam with rock fragments between 1024" over 30% on surface. ... R047XA528UT – High Mountain Stony Clay (slender wheatgrass)

(b) Site not as above.

(1) Site generally contains rock fragments larger than 10", surface soil texture cobbly silt loam. ... F047XA533UT – High Mountain Stony Loam (mixed conifer)

(2) Site not as above, surface soil texture loam, may or may not have rock fragments.

(a) Rock fragments larger than 3" are less than 20% by volume on the surface soils at least moderately deep.

(1) Soils are shallow (10-20")

(a) Site dominated by shrubs and herbaceous species. ... R047XA525UT – High Mountain Shallow Loam (low sagebrush)

(b) Site is dominated by trees. ... R047XA526UT – High Mountain

Shallow Loam (Douglas-fir)

(2) Soils are moderately deep (20-40"). ... R047XA530UT – High Mountain Gravelly Loam (subalpine big sagebrush)

(b) Rock fragments larger than 3" are greater than 20% by volume on surface. ... R047XA516UT – High Mountain Loam (mountain big sagebrush)

(c) Flagstones larger than 3" are greater than 20% volume on surface. ... R047XA574UT – High mountain windswept ridge (fringed sagewort)

b. Slope is generally over 30%.

1) Restrictive layer not present within 60" of surface.

b) Surface soil texture loam or gravelly loam.

(1) 15-30% by volume of rock fragments on surface (gravelly loam). F047XA531UT. ... F047XA531UT – High Mountain Stony Loam (quaking aspen)

(2) Less than 15% by volume of rock fragments on the surface.

(a) Site is in Utah. R047XA510UT. ... R047XA510UT – High Mountain Loam (bigtooth maple)

(b) R047XY010ID ... R047XY010ID – High Mountain Loam 25-35 PZ ACSAG2/PHMA5/BRCA5

(3) Site not as above. Unclassified.

2) Restrictive layer present between 10-60".

a) Surface soil texture silt loam (may have rock fragments).

(1) Dominant tree is Douglas fir. ... F047XA512UT – High Mountain Loam (Douglas-fir)

(2) Dominants are a mix of conifers. ... F047XA533UT – High Mountain Stony Loam (mixed conifer)

(3) Site not as above. Unclassified.

b) Surface soil texture other than silt loam.

(1) Surface soil texture is fine sandy loam with over 15% gravel by volume (i.e. gravelly fine sandy loam). ... R047XA516UT – High Mountain Loam (mountain big sagebrush)

(2) Surface soil texture is loam with over 15% gravel by volume (i.e. gravelly loam).

(a) Subsurface rock larger than 3" are between 9-14% by volume.

(1) Site is in Utah. ... R047XA510UT – High Mountain Loam (bigtooth maple)

(2) Site is in Idaho. ... R047XY010ID – High Mountain Loam 25-35 PZ ACSAG2/PHMA5/BRCA5

(b) Subsurface rock larger than 3" are greater than 15% by volume.

(1) Surface gravel volume between 0-10%, dominant plant is Douglas fir. ... F047XA532UT – High Mountain Stony Loam (Douglas-fir)

(2) Surface gravel volume between 5-20%, generally 20%, dominant plant is mountain big sagebrush. ... R047XA560UT – High Mountain Gravelly Loam (mountain big sagebrush)

(3) Site not as above. Unclassified.

2 Less than 22" precipitation.

i. 16-22" annual precipitation (except some south and west slopes or soils with poor water holding capacity), adjacent areas are capable of supporting gambel oak.

a. Mountain ecological zone.

1) Site located in area of snow accumulation on north facing slopes, dominant plant is shrubby aspen. ... R047XA458UT – Mountain Stony Loam (quaking aspen thicket)

2) Site not as above.

a) No restrictive layer within 60" of soil surface.

(1) Surface soil texture silty clay, clay loam, or silt loam.

(a) Surface soil texture silty clay or clay loam. ... R047XA402UT – Mountain Clay (slender wheatgrass)

(b) Surface soil texture silt loam.

(1) Site is in Utah. R047XA418UT ... R047XA418UT – Mountain Loam (bigtooth maple)

(2) Site is in Idaho. R047XY009UT ... R047XY009ID – Mountain Loam 18-22 PZ ACGRG/ARTRV/PSSP6

(c) Site not as above. Unclassified.

(2) Surface soil texture not as above.

(a) Site dominated by Douglas fir. ... R047XA408UT – Mountain Gravelly Loam (Douglas-fir)

(b) Site not dominated by Douglas fir.

(1) Slope less than 15%.

(a) Subsurface rock fragments under 15% by volume. ... R047XA416UT – Mountain Loamy Bottom (basin big sagebrush)

(b) Subsurface rock fragments greater than 15% by volume.

(1) Surface soil texture gravelly loam (gravels up to 3" 15-30% by volume). ... R047XA430UT – Mountain Loam (mountain big sagebrush)

(2) Surface soil texture cobbly loam (rocks 3-10" 15-30% by volume). ... R047XA406UT – Mountain Gravelly Loam (mountain big sagebrush)

(3) Site not as above. Unclassified.

(2) Slope greater than 15%.

(a) Gravels less than 5% by volume on soil surface.

(1) Subsurface rocks larger than 3" are greater than 8% by volume.

(2) Subsurface rocks larger than 3" are less than 8% by volume.

(a) Dominant shrub is oak. ... R047XA432UT – Mountain Loam (oak)

(b) Site not dominated by oak. ... R047XA434UT – Mountain Loam (shrub)

(c) Site not as above. Unclassified.

(b) Gravels greater than 5% by volume on soil surface.

(1) Rock fragments larger than 3" are greater than 10% by volume on soil surface.

(a) Site located on a ridge, dominant shrub is black or low sagebrush. ... R047XA475UT – Mountain Windswept Ridge (black sagebrush)

(b) Site not as above.

(1) Dominant shrub is oak.

(a) Subsurface rock fragments are between 30-60% by volume.

(b) Subsurface rock fragments are greater than 60% by volume.

(1) Site generally occurs on slopes greater than 40%. ... R047XA471UT – Mountain Very Steep Stony Loam (oak)

(2) Site generally occurs on slopes between 15-40%. ... R047XA463UT – Mountain Stony Loam (Gambel oak)

(3) Site not as above. Unclassified.

(2) Site not as above.

(a) Dominant shrub is mountain big sagebrush.

(b) Dominant shrub is antelope bitterbrush. ... R047XA456UT – Mountain Stony Loam (antelope bitterbrush)

(c) Site not as above. Unclassified.

(2) Rock fragments larger than 3" are less than 10% by volume on soil surface.

(a) Surface soil texture loam, no rock fragments over 15% by volume. ... R047XA434UT – Mountain Loam (shrub)

(b) Surface soil texture loam, but rock fragments are over 15% by volume (i.e. gravelly loam, cobbly loam).

(1) Subsurface rocks larger than 3" are less than 3% by volume.

(a) Surface rock fragments larger than 3" are between 3-15% by volume.

(b) Site not as above. Unclassified.

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

(a) Dominant shrub is mountain big sagebrush.

(b) Dominant shrub is oak. ... R047XA410UT – Mountain Gravelly Loam (oak)

(c) Site not as above. Unclassified.

b) Restrictive layer present between 10-60" below soil surface.

(1) Restrictive layer between 20-60" below soil surface.

(a) Restrictive layer between 20-40" below soil surface.

(1) Surface soil texture fine sandy loam or sandy loam.

(a) If juniper trees are present, they are pre-European settlement, surface soil texture sandy loam. ... R047XA465UT – Mountain Stony Loam (Rocky Mountain juniper)

(b) If juniper trees present, they are young, post-European settlement, surface soil texture fine sandy loam. ... R047XA438UT – Mountain Shallow Loam (black sagebrush)

(c) Site not as above. Unclassified.

(2) Surface soil texture loam.

(a) Dominant shrub is mountain big sagebrush.

(1) Surface soil texture loam, rocks in the top 24" are greater than 50% by volume. ... R047XA461UT – Mountain Stony Loam (mountain big sagebrush)

(2) Surface soil texture loam, rocks are generally less than 35-50% by volume.

(3) Site not as above. Unclassified.

(b) Dominant shrub is other than sagebrush or is a mix of shrubs.

(1) Dominant shrub is oak.

(2) Dominant shrub is other than oak.

(a) Surface rocks larger than 3" are greater than 25% by volume. ... R047XA473UT – Mountain Very Steep Stony Loam (browse)

(b) Surface rocks larger than 3" are less than 25% by volume.

(1) Cobbles and stones (3-24") are between 30-60% by volume. ... R047XA456UT – Mountain Stony Loam (antelope bitterbrush)

(2) Cobbles (3-10") are between 15-30%. ... R047XA460UT – Mountain Stony Loam (browse)

(3) Site not as above. Unclassified.

(b) Restrictive layer between 40-60" below soil surface.

(1) Surface soil texture loam.

(a) Rock fragment content greater than 60%.

(1) Dominant plant is gambel oak, soil surface generally has an organic layer of twigs and leaves.

(2) Dominant plant is mountain big sagebrush, organic layer usually not present.

(a) Site located on a very steep slope. ... R047XA474UT – Mountain Very Steep Stony Loam (mountain big sagebrush)

(b) Site can be found on steep slopes, but generally found on gentle to moderate slopes. ... R047XA461UT – Mountain Stony Loam (mountain big sagebrush)

(c) Site not as above. Unclassified.

(b) Rock fragment content between 30-60%.

(1) Dominant plant is gambel oak, soil surface generally has an organic layer of twigs and leaves.

(2) Dominant plant is mountain big sagebrush, organic layer usually not present.

(3) Site not as above. Unclassified.

(2) Surface soil texture silty clay loam. ... R047XA454UT – Mountain Stony Clay (slender wheatgrass)

(2) Restrictive layer between 10-20" below soil surface.

(a) Surface soil texture loam or fine sandy loam.

(1) Surface CaCO3 equivalent between 3-40%.

(a) Rock fragments larger than 3" are less than 10% by volume on the surface.

(b) Rock fragments larger than 3" are greater than 10% by volume on the surface. ... R047XA442UT – Mountain Shallow Loam (low sagebrush)

(c) Site not as above. Unclassified.

(2) Surface CaCO3 equivalent is between 0-3%.

(a) Most rock fragments on soil surface or in soil profile are smaller than 3".

(b) Most rock fragments are larger than 3".

(1) Rock fragments larger than 3" are greater than 30% by volume on surface, site located on steep slopes (>40%). ... R047XA469UT – Mountain Very Steep Shallow Loam (mountain big sagebrush)

(3) Rock fragments larger than 3" are less than 30% by volume on surface, slope gentle to very steep.

(a) Dominant shrub is mountain big sagebrush, surface rock fragments are between 8-28% by volume. ... R047XA446UT – Mountain Shallow Loam (mountain big sagebrush)

(b) Dominant shrub is antelope bitterbrush, surface rock fragments are between 16-23% by volume.

(c) Site not as above. Unclassified.

(2) Rock fragments larger than 3" are greater than 30% volume on the surface, site on gentle to moderate slopes (<40%). ... R047XA476UT – Mountain Windswept Ridge (low sagebrush)

(b) Surface soil texture sandy loam or silt loam.

(1) Surface soil texture silt loam. ... R047XA440UT – Mountain Shallow Loam (curl-leaf mountain mahogany)

(2) Surface soil texture sandy loam (with 15-30% rock fragment by volume). ... R047XA448UT – Mountain Shallow Loam (oak)

(3) Site not as above. Unclassified.

ii. Less than 16" annual precipitation.

a. 12-16" annual precipitation. Up to 20" on south and west slopes or soils with poor water holding capacity, site is too dry to support gambel oak.

1) Upland ecological zone.

a) Site has a restrictive layer within 60" of the soil surface.

(1) Restrictive layer is between 20-40".

(a) Soil surface rock fragment volume for rocks larger than 3" is generally greater than 9%.

(1) Soils generally have a surface CaCO3 equivalent between 0-15%.

(a) Gravel volume on the soil surface is greater than 15% by volume. ... R047XA334UT – Upland Stony Loam (mountain big sagebrush)

(b) Gravel volume on the soil surface is less than 15%. ... R047XA308UT – Upland Loam (basin big sagebrush)

(c) Site not as above. Unclassified.

(2) Soils generally have a greater surface CaCO3 equivalent up to 40%. ... R047XA332UT – Upland Stony Loam (black sagebrush)

(b) Soil surface rock fragment volume for rocks larger than 3" is generally less than 9%.

(1) Pre European settlement trees not present, younger even aged trees may be present. ... R047XA338UT – Upland Stony Loam (Wyoming big sagebrush)

(2) Pre European settlement trees present, with older uneven aged trees. ... R047XA305UT – Upland Stony Loam (Utah juniper)

(3) Site not as above. Unclassified.

(2) Restrictive layer is less than 20" from the soil surface.

(a) Surface soil texture silt loam and generally does not have rocks larger than 3" in the soil profile. ... R047XA325UT – Upland Loamy Shale (low sagebrush)

(b) Surface soil texture loam and generally has rocks greater than 3" in the soil profile.

(1) Pre-European settlement juniper trees present, older, uneven aged trees. ... R047XA321UT – Upland Shallow Loam (Utah juniper)

(2) Pre-European settlement juniper trees not present; younger, even aged juniper trees may be present.

(a) Surface CaCO3 equivalent is between 15-30%. ... R047XA320UT – Upland Shallow Loam (Wyoming big sagebrush)

(b) Surface CaCO3 equivalent is between 30-60%. ... R047XA316UT – Upland Shallow Loam (black sagebrush)

(c) Site not as above. Unclassified.

b) Site does not have a restrictive layer within 60" of the soil surface.

(1) Gravel volume on the soil surface is greater than 15%.

(a) Soil surface rock larger than 3" is generally absent. ... R047XA306UT – Upland Gravelly Loam (Bonneville big sagebrush)

(b) Soil surface rock larger than 3" generally covers over 5% of the soil surface.

(1) Pre European settlement juniper trees present, older uneven aged trees. ... R047XA336UT – Upland Stony Loam (pinyon/Utah juniper)

(2) Pre European settlement trees not present, young, even aged trees may be present. ... R047XA302UT – Upland Clay (low sagebrush)

(3) Site not as above. Unclassified.

(2) Gravel volume on the soil surface is less than 15%.

(a) Soil profile generally contains an argillic horizon. ... R047XA309UT – Upland Loam

(birchleaf mountain mahogany)

(b) Soil profile generally does not contain an argillic horizon.

(1) Soil profile generally contains up to 10% gravel by volume. ... R047XA301UT – Upland Clay Loam (early sagebrush)

(2) Soil profile no or less than 10% gravel content by volume. ... R047XA310UT – Upland Loam (basin wildrye)

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

b. Less than 12" annual precipitation.

1) Wrong MLRA.

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

A. Run-in/Interzonal Ecological Zone.

1 Water table depth is 0-12" below the surface.

i. Site dominated by herbaceous vegetation.

a. Site dominated by sedges, soil subsurface contains rock fragments under 3" between 6-32% by volume. ... R047XA008UT – Interzonal Wet Fresh Meadow (sedge)

b. Site not as above. Unclassified.

ii. Site dominated by shrubs.

a. Site dominated by willows, soil subsurface contains rock fragments smaller than 3" under 10% by volume. ... R047XA010UT – Interzonal Wet Fresh Streambank (willow)

b. Site not as above. Unclassified.

2 Water table depth is 12-60" below the surface.

i. Soil surface gravel volume is greater than 15%.

a. Site is dominated by basin wildrye. ... R047XA016UT – Loamy Bottom (basin wildrye)

b. Site not as above. Unclassified.

ii. Soil surface gravel volume is less than 13%.

a. Site is generally located in a meadow, no defined channel present.

1) Site is dominated by sedges and grasses. ... R047XA004UT – Interzonal Cold Semi-wet Fresh Meadow (meadow sedge/tufted hairgrass)

2) Site not as above. Unclassified.

b. Site is associated with a streambank.

1) Dominant tree is narrowleaf cottonwood.

a) Site occurs at elevations between 4,800 to 5,100 feet. ... R047XA002UT – Semi-moist Streambank (narrowleaf cottonwood)

b) Site occurs at elevations between 5,400 to 7,200 feet. ... R047XA006UT – Semi-wet Fresh Streambank (narrowleaf cottonwood)

c) Site not as above. Unclassified.

2) Dominant tree or plant is other than cottonwood. Unclassified.