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.

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 Gamble 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 Gable 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.

MLRA 47X LRU C - Uinta Mountains

I. Site receives extra water beyond normal precipitation from runoff from adjacent slopes, from intermittent or perennial streams or from a high water table.

A. Run-In Ecological Zone.

1 Surface soil texture clay loam.

i. Dominant plants are narrowleaf cottonwood and coyote willow. R047XC006UT. ... R047XC006UT – Semi-wet Fresh Streambank (narrowleaf cottonwood)

ii. Site other than above. Unclassified.

2 Surface soil texture other than clay loam.

i. Surface soil texture is loamy, site found in a meadow and will generally have greater than 10% volume of gravels in the soil profile R047XC004UT. ... R047XC004UT – Semi-wet Fresh Meadow

ii. Surface soil texture is loamy, site found in a meadow and will generally not have gravels in the soil profile and be more strongly influenced by water than the site above R047XC008UT ... R047XC008UT – Wet Fresh Meadow (sedge)

iii. Surface soil is loamy, site NOT found in meadows with generally less water influence than the above sites is well drained and does not have gravels >3” in the soil profile. R047XC016UT ... R047XC016UT – Loamy Bottom (basin big sagebrush)

iv. Site other than above.

a. Soil surface texture sandy loam.

1) Rock fragments on the surface (between 2-6% by volume). R047XC007UT. ... R047XC007UT

– Semi-moist Stream Terrace (ponderosa pine)

2) No rock fragments on the soil surface. R047XC003UT. ... R047XC003UT – Interzonal Semi-wet Streambank (narrowleaf cottonwood)

3) Site not as above. Unclassified.

b. Surface soil texture other than sandy loam. Unclassified.

II. Site receives no extra water beyond normal precipitation.

A. Site receives less than 25" annual precipitation, elevation is less than 9,500 feet.

1 Site receives 10-16" annual precipitation and is capable of supporting sagebrush and browse. Elevation from 6,000-8,500 feet.

i. Upland Ecological Zone.

a. No restrictive layer above 60 inches.

1) Surface texture is silt loam. R047XC309UT ... R047XC309UT – Upland Loam (birchleaf mountain mahogany)

2) Surface texture fine sandy loam, sandy loam or loam with slopes less than 40%.

R047XC310UT ... R047XC310UT – Upland Loam (mountain big sagebrush)

3) Surface texture fine sandy loam with slopes greater than 40%. R047XC340UT ... R047XC340UT – Upland Very Steep Stony Loam (pinyon/Utah juniper)

4) Surface texture other than above.

a) Top 24” of soil profile generally has greater than 50% rock fragments by volume.

(1) Surface texture loam with coarse modifier. R047XC332UT ... R047XC332UT – Upland Stony Loam (black sagebrush)

(2) Surface texture sandy loam with coarse modifier with Bonneville/Mountain Big Sagebrush the predominant plant. R047XC336UT ... R047XC336UT – Upland Stony Loam (Bonneville big sagebrush)

(3) Surface texture sandy loam with coarse modifier with numerous deciduous shrubs codominant with sagebrush. R047XC339UT ... R047XC339UT – Upland Stony Loam (shrub)

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

b) Top 24” of soil profile generally has less than 50% rock fragments by volume.

(1) Soil surface contains less than 8% rock fragments >3”. R047XC312UT ... R047XC312UT – Upland Loam (shrub)

(2) Soil surface contains greater than 8% rock fragments >3”. R047XC311UT ... R047XC311UT – Upland Loam (black sagebrush)

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

b. Restrictive layer present within 60 inches.

1) Restrictive layer between 10-20” from soil surface.

a) Soil surface contains less than 10% rock fragments >3” and trees on site are 150 years or younger (post European settlement) R047XC320UT ... R047XC320UT – Upland Shallow Loam (black sagebrush)

b) Soil surface contains greater than 10% rock fragments >3” and majority of tees on site are 150 years or older (pre-European settlement). R047XC326UT ... R047XC326UT – Upland Shallow Loam (pinyon/Utah juniper)

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

2) Restrictive layer between 20-60” from soil surface.

a) Soil surface texture clay loam. R047XC302UT ... R047XC302UT – Upland Clay (black sagebrush)

b) Soil surface texture other than above.

(1) 9. Top 24” of soil profile generally has greater than 50% rock fragments by volume and

trees on site are 150 years or younger (post European settlement). R047XC338UT ... R047XC338UT – Upland Stony Loam (Wyoming big sagebrush)

(2) Top 24” of soil profile generally has greater than 50% rock fragments by volume and trees on site are 150 years or older (pre European settlement). R047XC335UT ... R047XC335UT – Upland Stony Loam (pinyon/Utah juniper)

(3) Top 24” of soil profile generally has less than 50% rock fragments by volume.

(a) 10. Soil surface contains less than 15% rock fragments on the surface or in the profile. R047XC308UT ... R047XC308UT – Upland Loam (Wyoming big sagebrush)

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

2 Site receives 14-25" annual precipitation, occurs at elevations between 6,000-9,500 feet.

i. Mountain Ecological Zone.

a. Site has no restrictive layer within 60" of soil surface.

1) Slope is less than 25%.

a) Rock fragments are present on the soil surface or in the soil profile.

(1) Gravel rock volume on the soil surface is greater than 15% and the dominant vegetation is mountain big sagebrush. R047XC462UT. ... R047XC462UT – Mountain Stony Loam (mountain big sagebrush)

(2) Gravel rock volume on the soil surface is greater than 15% and the dominant vegetation is bitterbrush. R047XC456UT ... R047XC456UT – Mountain Stony Loam (antelope bitterbrush)

(3) Gravel rock volume on the soil surface is greater than 15% and the dominant vegetation is aspen. R047XC458UT ... F047XC458UT – Mountain Stony Loam (quaking aspen thicket)

(4) Gravel rock volume on the surface is less than 15%. R047XC461UT & R047XY378CO

(a) Site is in Utah. R047XC461UT ... R047XC461UT – Mountain Stony Loam (curl-leaf mountain mahogany)

(b) Site is in Colorado. R047XY378CO ... R047XY378CO – Mountain Stony Loam

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

b) No rock fragments on the soil surface or in the soil profile.

(1) Surface soil texture loamy and dominant vegetation is shrubs.

(a) Site is in Utah. R047XC430UT ... R047XC430UT – Mountain Loam (mountain big sagebrush)

(b) Site is in Colorado. R047XY247CO ... R047XY247CO – Deep Clay Loam

(2) Surface soils texture is loamy with cobbles and the dominant vegetation is trees. F047XC405UT ... F047XC405UT – Mountain Cobbly Sandy Loam (ponderosa pine)

(3) Surface soil texture silty clay loam. R047XC404UT ... R047XC404UT – Mountain Clay (silver sagebrush)

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

2) Slope is greater than 25%.

a) Rock volume on the soil surface 5-20%. R047XC460UT. ... R047XC460UT – Mountain Stony Loam (shrub)

b) Rock volume on the soil surface less than 1% and the dominant vegetation is shrubs. R047XC461UT & R047XY378CO

(1) Site is in Utah. R047XC461UT ... R047XC461UT – Mountain Stony Loam (curl-leaf mountain mahogany)

(2) Site is in Colorado. R047XY378UT ... R047XY378CO – Mountain Stony Loam

c) Rock volume on the soil surface less than 1% and dominant vegetation is trees. F047XC405UT ... F047XC405UT – Mountain Cobbly Sandy Loam (ponderosa pine)

d) Site not as above.....Unclassified

b. Site has restrictive layer between 10-60" from soil surface.

1) Restrictive layer between 10-40" below soil surface.

a) Slopes between 3-40%.

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

(a) Subsurface soil contains flag rock fragments greater than 60% volume.

R047XC446UT ... R047XC446UT – Mountain Shallow Loam (mountain big sagebrush)

(b) Subsurface soil contains cobble rock fragments greater than 60% volume.

R047XC453UT ... R047XC453UT – Mountain Shallow Sandy Loam (ponderosa pine)

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

(2) Surface soil texture silt loam. R047XC475UT ... R047XC475UT – Mountain Windswept Ridge (black sagebrush)

b) Slopes between 8 and 70%. with soil depths 10-20". R047XC478UT ... R047XC478UT – Mountain Windswept Ridge (mountain big sagebrush)

c) Slopes between 4 and 60% with soil depths 20-40". R047XC476UT ... R047XC476UT – Mountain Windswept Ridge (low sagebrush)

2) Restrictive layer between 20 and 60 inches below soil surface with a stony, flaggy or cobbly surface texture. R047XC474UT. ... R047XC474UT – Mountain Very Steep Stony Loam (shrub)

3) Restrictive layer between 20 and 60 inches below soil surface with a loam surface texture.

R047XC472UT ... R047XC472UT – Mountain Very Steep Stony Loam (bitterbrush)

B. Site receives greater than 25" annual precipitation.

1 Site receives 22-40" annual precipitation.

i. High Mountain Ecological Zone.

a Slopes generally less than 50%

1) Surface texture is loam.

a) Dominant vegetation is a tree. F047XC508UT ... F047XC508UT – High Mountain Loam (quaking aspen)

b) Dominant vegetation is other than a tree. R047XC510UT ... R047XC510UT – High Mountain Stony Loam (mountain big sagebrush)

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

2) Surface texture other than loam.

a) Site does not contain rock fragments on the soil surface.

(1) Site is dominated by lodgepole pine. F047XC542UT ... F047XC542UT – High Mountain Stony Sandy Loam (lodgepole pine)

(2) Site generally has a mixture of coniferous trees. F047XC520UT ... F047XC520UT – High Mountain Stony Loam (mixed conifer)

b) Site generally contains >50% rock fragments in the top 24" of the soil profile.

(1) Soil has an epipedon that is generally mollic and the dominant vegetation is aspen.

F047XC531UT ... F047XC531UT – High Mountain Stony Loam (quaking aspen)

(2) Soil does not have a mollic epipedon and coniferous trees are dominant.

F047XC512UT ... F047XC512UT – High Mountain Stony Loam (Douglas-fir)

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

b. Slopes greater than 50%.

1) Rock fragments in the top 24" is than 50% volume and the dominant vegetation is Douglas fir.

F047XC541UT. ... F047XC541UT – High Mountain Very Steep Stony Loam (Douglas-fir)

2) Site not as above. Unclassified.

2 Site receives greater than 35", most coming as snow in the winter, site capable of supporting fir and spruce or above timberline.

i. Site is capable of fir and spruce.

a. Subalpine Ecological Zone. Unclassified.

ii. Site is above timberline.

a. Alpine Ecological Zone. Unclassified.