Soil Based Key to Major Land Resource Area (MLRA) 30, Mohave Desert, Ecological Sites Found in Arizona

Prepared by:
USDA – NRCS
Arizona State Office

Major Land Resource Area 30, Mohave Desert

Major Land Resource Area (MLRA) 30, Mojave Desert, is found in southern California, southern Nevada, the extreme southwest corner of Utah and northwestern Arizona within the Basin and Range Province of the Intermontane Plateaus.

The climate of the area is hot (hyperthermic and thermic) and dry (aridic). Elevations range from below 1000 feet to 4500 feet or more in the higher mountain areas found within the MLRA.

In Arizona the MLRA is separated into three Common Resource Areas (CRA):

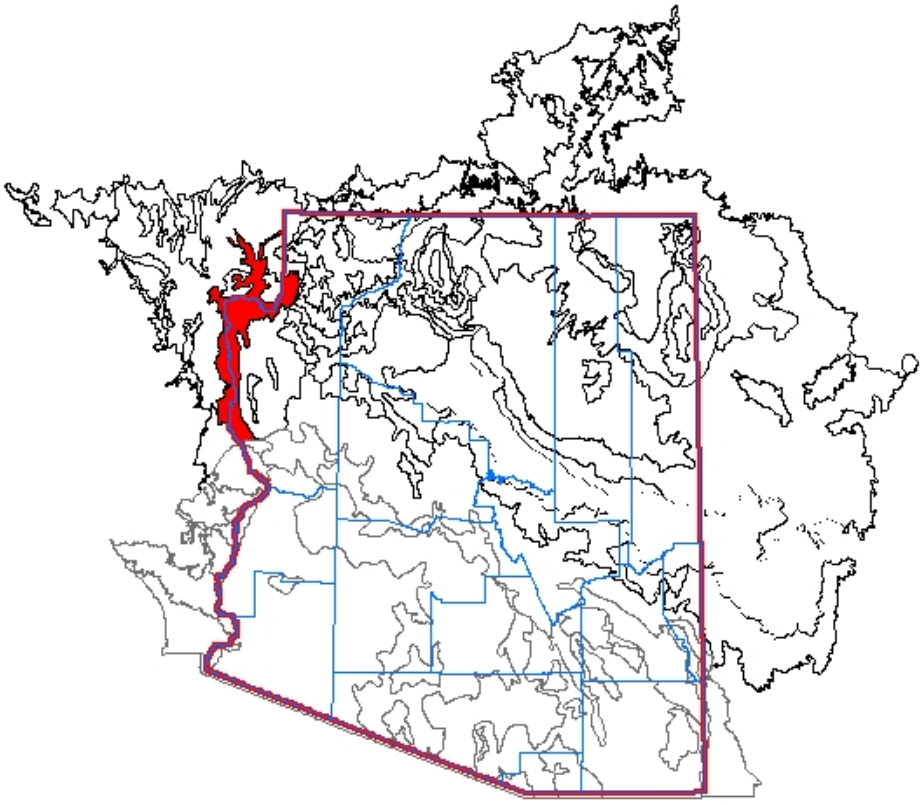
30.AZ1 – Lower Mohave Desert Page 5

30.AZ2 – Middle Mohave Desert Page 9

30.AZ3 – Upper Mohave Desert Page 16

Common Resource Area 30.AZ1 – Lower Mojave Desert

CRA 30.AZ1 – Lower Mohave Desert	
Elevations range from 400 to 2500 feet and precipitation averages 3 to 6 inches per year. Vegetation includes creosotebush, white bursage, Mormon tea, and brittlebush. The soil temperature regime is hyperthermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.	



Common Resource Area 30.AZ1, Lower Mohave Desert, Ecological Site List

R030XA101AZ	Basalt Hills3-6" p.z.
R030XA102AZ	Breaks3-6" p.z.
R030XA103AZ	Clayey Bottom3-6" p.z.
R030XA104AZ	Granitic Hills3-6" p.z.
R030XA105AZ	Limy Fan3-6" p.z.
R030XA106AZ	Limy Hills3-6" p.z.
R030XA107AZ	Limy Slopes3-6" p.z.
R030XA108AZ	Limy Upland3-6" p.z.
R030XA109AZ	Limy Upland3-6" p.z.Deep
R030XA110AZ	Loamy Bottom3-6" p.z.
R030XA111AZ	Saline Bottom3-6" p.z.
R030XA112AZ	Sandy Terrace3-6" p.z.
R030XA113AZ	Sandy Upland3-6" p.z.
R030XA114AZ	Sandy Loam Upland3-6" p.z.
R030XA115AZ	Sandy Wash3-6" p.z.
R030XA116AZ	Cobbly Limy Upland3-6" p.z.Deep
R030XA117AZ	Gypsum Upland3-6" p.z.
R030XA118AZ	Volcanic Hills3-6" p.z.
R030XA119AZ	Channery Hills3-6" p.z.
R030XA120AZ	Sandy Loam Hills3-6" p.z.Limy, Gravelly, Shallow
R030XA121AZ	Limy Fan3-6" p.z.Sandy
R030XA122AZ	Cobbly Sandy Upland3-6" p.z.
R030XA123AZ	Gypsum Hills3-6" p.z.
R030XA124AZ	Basalt Upland3-6" p.z.
R030XA125AZ	Sandy Bottom3-6" p.z.Wet
R030XA126AZ	Limestone Hills3-6" p.z.
R030XA127AZ	Sandy Bottom3-6" p.z.Marsh

Key to Ecological Site found in Common Resource Area 30.AZ1, Lower Mohave Desert

Rangeland

I. Flooded (bottom position, or receives additional moisture from the valley-side or over-bank) and/or having a water table within reach of plant roots

   A. Flooding occurrence is at least rare

      1. Occurs on floodplain or low terrace of drainage way

         a. Soil surface clay loam to clay 4 to 10 inches thick. Less than 15 percent coarse fragments in soil profile – Clayey Bottom (R030XA103AZ)

         b. Soil surface loam, fine sandy loam, or silt loam 4 to 8 inches thick – Loamy Bottom (R030XA110AZ)

         c. Soil surface sandy loam to clay 6 to 12 inches thick. Soluble salt accumulations are high – Saline Bottom (R030XA111AZ)

         d. Soil surface very gravelly loamy sand, very cobbly coarse sand, or gravelly loamy sand. Subsurface extremely gravelly loamy coarse sand, extremely gravelly coarse sand, very gravelly coarse loamy sand, gravelly loam sand, and/or extremely gravelly loamy sand – Sandy Wash (R030XA115AZ)

   B. Flooding occurrence is at least occasional and there is a water table during the growing season

         a. Soil surface very gravelly loamy coarse sand or very stony loamy coarse sand. Subsurface stony and/or extremely gravelly loamy coarse sand. Soil slightly to strongly effervescent – Sandy Terrace (R030XA112AZ)

         b. Soil surface very cobbly to gravelly loamy sand. Subsurface extremely loamy coarse to extremely gravelly loamy coarse sand – Sandy Bottom, Wet (R030XA125AZ)

II. Not Flooded (upland position, receives only precipitation)

   A. Slopes Generally Less Than 15%

      1. Soils Shallow or Very Shallow

         a. Soil surface gravelly loam to very gravelly loam 2 to 6 inches thick. Soil is shallow to moderately deep to a layer high in lime content – Limy Upland (R030XA108AZ)

      2. Soils Moderately Deep or Deeper

a. Soil surface gravelly loam to very gravelly loam 2 to 6 inches thick. Soil is shallow to moderately deep to a layer high in lime content – Limy Upland (R030XA108AZ)

b. Soil surface extremely gravelly loam or extremely gravelly sandy loam. Subsurface gravelly sandy loam, very gravelly sandy loam, very gravelly coarse sandy loam, and/or extremely gravelly loamy sand. Soil calcareous – Limy Upland, Deep (R030XA109AZ)

c. Soil surface very cobbly sandy loam or extremely cobbly sandy loam. Subsurface very gravelly sandy loam, very cobbly loamy sand, very gravelly loamy sand, very gravelly sand, gravelly sandy loam, and/or extremely gravelly sandy loam. Soil calcareous – Cobbly Limy Upland, Deep (R030XA116AZ)

d. Soil surface very gravelly loam or very gravelly loamy sand. Subsurface sandy loam, gravelly sand, and/or loamy sand. Soil calcareous – Limy Fan (R030XA105AZ)

e. Soil surface fine sand. Subsurface fine sand – Limy Fan, Sandy (R030XA121AZ)

f. Soil surface fine sandy loam to sandy loam 2 to 10 inches thick. Gravel generally less than 35 percent of the total soil volume – Sandy Loam Upland (R030XA114AZ)

g. Soil surface sand. Subsurface sand. Occurs as stable dunes – Sandy Upland (R030XA113AZ)

B. Slopes Generally Greater Than 15 percent

1. Soils Shallow

a. Hills

i. Soil surface very gravelly loam to very gravelly clay loam 2 to 4 inches thick. Soil is shallow to basalt bedrock – Basalt Hills (R030XA101AZ)

ii. Soil surface very stony loam, very gravelly sandy loam, or extremely cobbly sandy loam. Subsurface very gravelly loam, extremely gravelly loam, and/or extremely gravelly sandy loam. Soil calcareous – Sandy Loam Hills, Limy, Gravelly, Shallow (R030XA120AZ)

iii. Soil surface extremely gravelly sandy loam or very cobbly sandy loam. Subsurface very gravelly sandy loam and/or extremely gravelly sandy loam. Hard granite of gneiss bedrock at 6 to 16 inches – Granitic Hills (R030XA104AZ)

iv. Soil surface extremely gravelly sandy loam or extremely stony fine sandy loam. Subsurface extremely gravelly sandy loam and/or very gravelly sandy loam. Andesite bedrock at 9 to 13 inches – Volcanic Hills (R030XA118AZ)

b. Escarpments

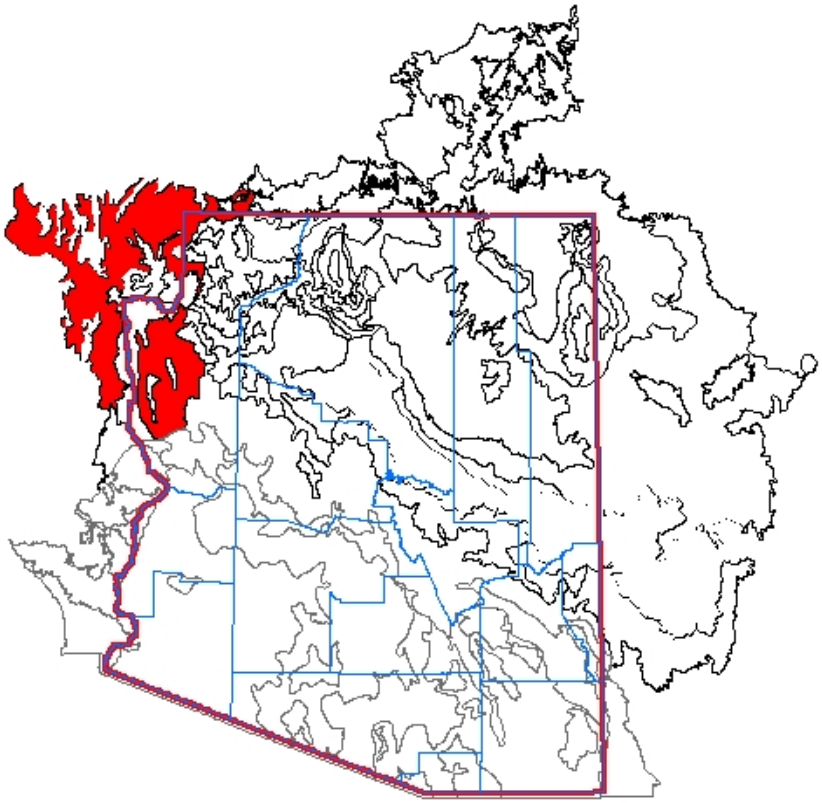
i. Soil surface texture sand to clay 1 to 60 inches thick. Gravel content of the soil is greater than 35 percent – Breaks (R030XA102AZ)

2. Soils Moderately Deep or Deeper

a. Soil surface very gravelly sandy loam. Subsurface extremely gravelly sandy loam and/or extremely gravelly loamy sand. Soil calcareous – Limy Slopes (R030XA107AZ)

Common Resource Area 30.AZ2, Middle Mohave Desert

CRA 30.AZ2 – Middle Mohave Desert	
Elevations range from 1500 to 3200 feet and precipitation averages 6 to 9 inches per year. Vegetation includes creosotebush, white bursage, yucca, prickly pear and cholla species, Mormon tea, flattop buckwheat, ratany, winterfat, bush muhly, threeawns, and big galleta. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.	



Common Resource Area 30.AZ2, Middle Mohave Desert, Ecological Site List

Site ID Number	Site Name
R030XB201AZ	Andesite Hills6-9" p.z.Coarse
R030XB202AZ	Basalt Hills6-9" p.z.
R030XB203AZ	Basalt Slopes6-9" p.z.
R030XB204AZ	Breaks6-9" p.z.
R030XB205AZ	Sandy Loam Upland6-10" p.z.Limy Subsurface, Gravelly
R030XB206AZ	Cobbly Limy Upland6-9" p.z.Deep
R030XB207AZ	Granitic Hills6-9" p.z.
R030XB208AZ	Gypsum Hills6-9" p.z.
R030XB209AZ	Loamy Upland6-10" p.z.
R030XB210AZ	Limestone Hills6-9" p.z.
R030XB211AZ	Limy Fan6-9" p.z.
R030XB212AZ	Limy Slopes6-9" p.z.
R030XB213AZ	Gypsum Upland6-9" p.z.Alkaline
R030XB214AZ	Limy Upland6-9" p.z.
R030XB215AZ	Sandy Loam Upland6-9" p.z.Limy
R030XB217AZ	Sandy Bottom6-9" p.z.
R030XB218AZ	Sandy Wash6-9" p.z.
R030XB219AZ	Channery Hills6-9" p.z.
R030XB220AZ	Andesite Hills6-9" p.z.
R030XB221AZ	Sandy Upland6-9" p.z.
R030XB222AZ	Gypsum Hills6-9" p.z.Alkaline
R030XB223AZ	Cobbly Gypsum Hills6-9" p.z.
R030XB224AZ	Gypsum Fan6-9" p.z.
R030XB225AZ	Loamy Wash6-9" p.z.Gypsic
R030XB226AZ	Sandy Loam Upland6-9" p.z.Fine
R030XB227AZ	Clay Loam Upland6-9" p.z.
R030XB228AZ	Sandy Loam Upland6-9" p.z.
R030XB229AZ	Loamy Swale6-9" p.z.Sodic
R030XB230AZ	Loamy Slopes6-9" p.z.Limy, Cobbly
R030XB231AZ	Loamy Wash6-9" p.z.

Key to Ecological Site found in Common Resource Area 30.AZ2, Middle Mojave Desert

Rangeland

III. Flooded (bottom position, or receives additional moisture from the valley-side or over-bank) and/or having a water table within reach of plant roots

A. Flooding occurrence is at least rare

1. Occurs on floodplain or low terrace of drainage way

a. Soil surface very fine sandy loam, loamy fine sand, silty clay loam, or silt loam. Subsurface fine sand, very fine sandy loam, fine sandy loam, silt loam, loamy fine sand, and/or silty clay – Loamy Wash (R030XB231AZ)

b. Soil surface very fine sandy loam or fine sandy loam. Subsurface very fine sandy loam, fine sandy loam, and/or loam. Soil calcareous and gypsiferous throughout the profile – Loamy Wash, Gypsic (R030XB225AZ)

c. Soil surface gravelly sandy loam or sandy loam. Subsurface gravelly sandy loam, extremely gravelly loamy sand, very gravelly loamy coarse sand, loamy sand, gravelly loamy sand, gravelly sand, coarse loamy sand, and/or extremely gravelly coarse sandy loam – Sandy Bottom (R030XB217AZ)

d. Soil surface gravelly sandy loam, very gravelly sandy loam, very cobbly sandy loam, or very gravelly loamy sand. Subsurface very gravelly sandy loam, extremely gravelly sand, extremely gravelly loamy sand, very cobbly sand, very gravelly sand, and/or loamy sand – Sandy Wash (R030XB218AZ)

B. Flooding occurrence is at least occasional and there is a water table during the growing season

IV. Not Flooded (upland position, receives only precipitation)

A. Slopes Generally Less Than 15percent

1. Soils Moderately Deep or Deeper

a. Soil surface very gravelly sandy loam. Subsurface clay loam, clay, cobbly clay loam – Clay Loam Upland (R030XB227AZ)

b. Soil surface gravelly fine and very fine sandy loam, very gravelly and extremely gravelly loam, very cobbly and cobbly loam, gravelly sandy loam, stony sandy loam, very gravelly sandy loam and/or very cobbly sandy loam. Subsurface very gravelly loam, very gravelly sandy loam, very gravelly

clay loam, very gravelly sandy clay loam, bravely sandy loam, gravelly fine sandy loam, gravelly loam, extremely gravelly loam, very cobbly loam, loamy sand and/or cobbly fine sandy loam. Lime content is 15 to 35 percent in soil profile. Hard pan occurs at 9 to 32 inches. Deeper soils are weakly lime cemented at shallow depths – Limy Upland (R030XB214AZ)

c. Soil surface gravelly fine sandy loam, gravelly sandy loam, gravelly clay loam, very cobbly loam, or very gravelly loam. Subsurface gravelly sandy clay loam, gravelly sandy loam, sandy clay loam, and/or gravelly loamy sand. Lime content 15 to 35 percent in the soil profile – Limy Fan (R030XB211AZ)

d. Soil surface very gravelly sandy loam or very stony sandy loam. Subsurface very gravelly sandy loam, gravelly sandy loam, cobbly sandy loam, very cobbly sandy clay loam, very cobbly sandy loam, very cobbly loamy sand, very cobbly loam, and/or extremely cobbly loamy coarse sand. Surface is covered with gravely, rock and stone – Limy Sandy Loam Upland, Cobbly (R030XB206AZ)

e. Soil surface sandy loam. Subsurface sandy clay loam and/or coarse sandy loam. Soil non-effervescent in the surface – Sandy Loam Upland (R030XB226AZ)

f. Soil surface gravelly loamy sand, gravelly sandy loam, loamy sand, or sandy loam. Subsurface very gravelly loamy sand, gravelly sandy loam, gravelly coarse sandy loam, extremely gravelly sandy loam, sandy loam, loamy sand, gravelly loamy sand, gravelly sandy clay loam, fine sandy loam, and/or gravelly loamy coarse sand. Soil limy in subsurface – Sandy Loam Upland, Limy Subsurface, Gravelly (R030XB205AZ)

g. Soil surface fine and very fine sandy loam. Subsurface sand, loamy sand, and sandy loam, occasionally channery. Soil slightly to moderately alkaline throughout the soil profile. Gypsum crystals found throughout the soil profile – Gypsum Upland, Alkaline (R030XB213AZ)

h. Soil surface very gravelly fine sandy loam. Subsurface fine sandy loam, sand, very cobbly sandy loam, and/or loam. Soil gypsiferous throughout the profile – Gypsum Fan (R030XB224AZ)

i. Soil surface fine sand. Subsurface fine sand and/or gravelly fine sand. Soil surface non-calcareous – Sandy Upland (R030XB221AZ)

B. Slopes Generally Greater Than 15 percent

1. Soils Shallow

a. Slopes

i. Soil surface very gravelly fine sandy loam and loam, occasionally cobbly. Subsurface very gravelly to extremely gravelly fine sandy loam and loam, occasionally cobbly. Soil shallow to petrocalcic horizon – Limy Slopes (R030XB212AZ)

b. Hills

i. Soil surface extremely gravelly sandy loam. Subsurface very gravelly sandy loam. Soil very shallow to andesite bedrock. Slope range 15 to 35 percent – Andesite Hills, Coarse (R030XB201AZ)

ii. Soil surface extremely gravelly sandy loam. Subsurface very gravelly sandy loam. Soil very shallow to andesite bedrock. Slope range 20 to 70 percent – Andesite Hills (R030XB220AZ)

iii. Soil surface extremely cobbly loam or extremely stony loam. Subsurface extremely gravelly loam. Soil shallow to basalt bedrock – Basalt Hills (R030XB202AZ)

iv. Soil surface very cobbly fine sandy loam or sandy loam. Subsurface very cobbly loam, gravelly loam, gravelly sandy loam, sandy loam, cobbly fine sandy loam, loam, and/or loamy sand. Basalt cobbles and stones cover Moenkopi formation mudstones. Usually occurs as an escarpment, but may be in hill form. Soil is shallow to very deep – Basalt Slopes (R030XB203AZ)

v. Soil surface extremely cobbly sandy loam or very gravelly sandy loam. Subsurface very gravelly sandy loam. Soil very shallow to shallow to hard granite or gneiss bedrock – Granitic Hills (R030XB207AZ)

vi. Soil surface fine sandy loam or loam. Subsurface loam. Soil shallow to hard gypsum – Gypsum Hills (R030XB208AZ)

vii. Soil surface fine sandy loam. Subsurface loam. Soil shallow to very shallow to hard gypsum. Soil moderately alkaline throughout – Gypsum Hills, Alkaline (R030XB222AZ)

viii. Soil surface extremely gravelly loam. Subsurface extremely gravelly loam. Soil calcareous throughout.

Soil shallow or very shallow to limestone bedrock – Limestone Hills (R030XB210AZ)

ix. Soil surface very cobbly sandy loam. Subsurface sandy loam. Soil surface covered with basalt cobble – Cobbly Gypsum Hills (R030XB222AZ)

c. Escarpments

i. Soil surface very cobbly fine sandy loam or sandy loam. Subsurface very cobbly loam, gravelly loam, gravelly sandy loam, sandy loam, cobbly fine sandy loam, loam, and/or loamy sand. Basalt cobbles and stones cover Moenkopi formation mudstones. Usually occurs as an escarpment, but may be in hill form. Soil is shallow to very deep – Basalt Slopes (R030XB203AZ)

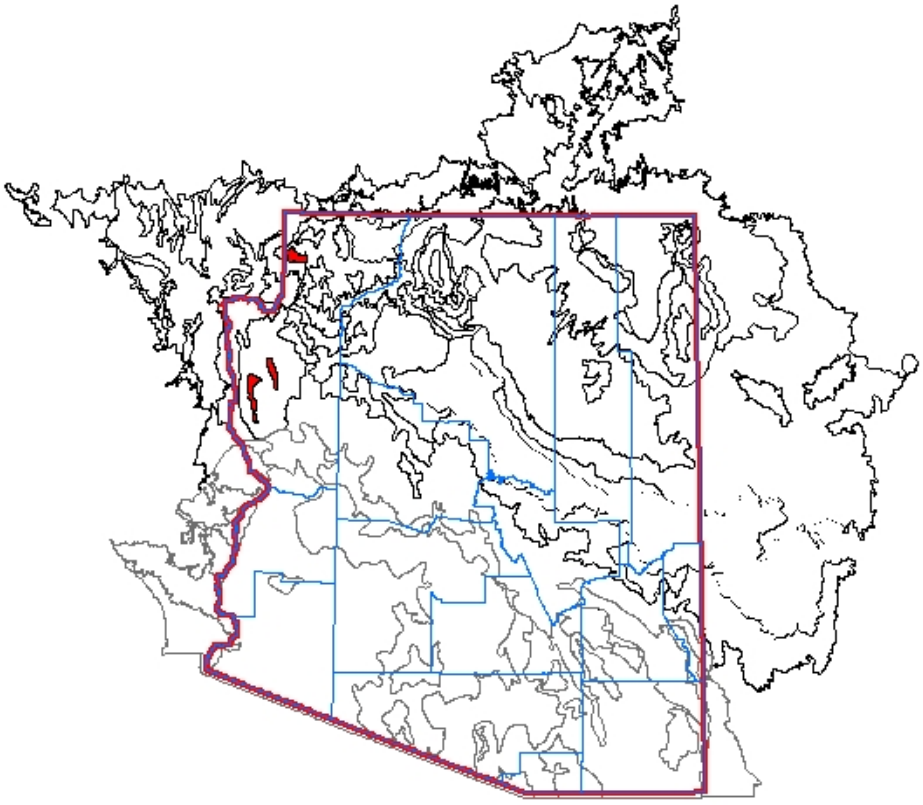
ii. Soil surface very cobbly and gravelly sandy loam to clay loam. Subsurface also very cobbly and gravelly sandy loam to clay loam – Breaks (R030XB204AZ)

2. Soils Moderately Deep or Deeper

i. Soil surface very cobbly fine sandy loam or sandy loam. Subsurface very cobbly loam, gravelly loam, gravelly sandy loam, sandy loam, cobbly fine sandy loam, loam, and/or loamy sand. Basalt cobbles and stones cover Moenkopi formation mudstones. Usually occurs as an escarpment, but may be in hill form. Soil is shallow to very deep – Basalt Slopes (R030XB203AZ)

Common Resource Area 30.AZ3, Upper Mohave Desert

CRA 30.AZ3 – Upper Mohave Desert	
Elevations range from 2800 to 4500 feet and precipitation averages 9 to 12 inches per year. Vegetation includes Joshua tree, blackbrush, creosotebush, ratany, bush muhly, big galleta, black grama, desert needlegrass, and Indian ricegrass. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.	



Common Resource Area 30.AZ3, Upper Mohave Desert, Ecological Site List

Site ID Number	Site Name
R030XC302AZ	Sandy Clay Loam Upland10-13" p.z.Gravelly
R030XC303AZ	Sandy Loam Upland10-13" p.z.Fine, Stony
R030XC304AZ	Clayey Upland10-13" p.z.
R030XC305AZ	Coarse Sandy Loam10-13" p.z.
R030XC306AZ	Granitic Hills10-13" p.z.Alkaline
R030XC307AZ	Limestone Hills10-13" p.z.
R030XC308AZ	Limy Fan10-13" p.z.
R030XC309AZ	Loamy Slopes10-13" p.z.Cobbly
R030XC311AZ	Limy Upland10-13" p.z.
R030XC312AZ	Sedimentary Cliffs10-13" p.z.
R030XC313AZ	Limy Upland10-13" p.z.Deep
R030XC314AZ	Sandy Loam Slopes10-13" p.z.Gravelly, Warm
R030XC315AZ	Sandy Loam Upland10-13" p.z.Fine, Gravelly
R030XC317AZ	Sandy Bottom10-13" p.z.
R030XC318AZ	Sandy Loam Upland10-13" p.z.Limy, Skeletal
R030XC320AZ	Sandy Loam Terrace10-13" p.z.
R030XC321AZ	Sandy Loam Upland10-13" p.z.Fine
R030XC322AZ	Sandy Wash10-13" p.z.
R030XC323AZ	Sandy Loam Upland10-13" p.z.Limy, Skeletal, Shallow
R030XC324AZ	Shallow Upland10-13" p.z.
R030XC325AZ	Basalt Hills10-13" p.z.Fine
R030XC326AZ	Basalt/Schist Hills10-13" p.z.
R030XC327AZ	Sandy Loam Hills10-13" p.z.Limy, Shallow
R030XC328AZ	Sandy Upland10-13" p.z.
R030XC329AZ	Granitic/Schist Upland10-13" p.z.Alkaline
R030XC330AZ	Basalt Slopes10-13" p.z.
R030XC331AZ	Sandy Loam Slopes10-13" p.z.Limy, Skeletal
R030XC332AZ	Volcanic Hills10-13" p.z.
R030XC333AZ	Basalt Hills10-13" p.z.Limy
R030XC334AZ	Clay Loam Upland10-13" p.z.
R030XC335AZ	Sandy Loam Hills10-13" p.z.Limy, Skeletal, Shallow, Warm
R030XC336AZ	Sandy Loam Upland10-13" p.z.Limy Subsurface, Fine, Gravelly
R030XC337AZ	Sandy Loam Slopes10-13" p.z.Limy, Fine, Gravelly

R030XC338AZ	Loamy Upland10-13" p.z.Limy Subsurface, Gravelly
R030XC343AZ	Saline Bottom10-13" p.z.
R030XC346AZ	Granitic/Schist Upland10-13" p.z.
R030XC352AZ	Sandy Loam Upland10-13" p.z.Limy Subsurface
R030XC353AZ	Sandy Loam Slopes10-13" p.z.Fine, Skeletal
R030XC355AZ	Granitic/Schist Hills10-13" p.z.
R030XC356AZ	Sandy Loam Slopes10-13" p.z.Limy, Gravelly, Warm
F030XC375AZ	Pinus monophylla/Quercus turbinella-Ceanothus greggii/Poa fendleriana-Achnatherum speciosum
F030XC377AZ	Pinus ponderosa-Abies concolor/Cercocarpus montanus-Robinia neomexicana
R030XC379AZ	Loamy Slopes13-17" p.z.Stony Surface
R030XC380AZ	Sandy Loam Upland13-17" p.z.Cobbly Surface
R030XC381AZ	Limestone/Sandstone Cliffs13-17" p.z.

Key to Ecological Site found in Common Resource Area 30.AZ3, Upper Mohave Desert

Forestland

Soil surface very stony sandy loam or very gravelly loam. Subsurface gravelly sandy loam, very gravelly sandy loam, cobbly sandy loam, cobbly sandy clay loam, extremely cobbly sandy loam, and/or very gravelly loam – Granitic Hills, Stony (F030XC375AZ)

Rangeland

V. Flooded (bottom position, or receives additional moisture from the valley-side or over-bank) and/or having a water table within reach of plant roots

   A. Flooding occurrence is at least rare

      1. Occurs on floodplain or low terrace of drainage way

         a. Soil surface very gravelly sand, sandy loam, or gravelly sandy loam. Subsurface gravelly loamy coarse sand. very cobbly coarse sand, very gravelly coarse sand, extremely gravelly sand, very gravelly sand, gravelly sandy loam, loamy sandy, and/or sand – Sandy Bottom (R030XC317AZ)

         b. Soil surface extremely gravelly sand, gravelly loamy sand, gravelly fine sandy loam, or gravelly loamy sand. Subsurface extremely gravelly sand, gravelly loamy sand, gravelly fine sandy loam, and/or gravelly sandy loam – Sandy Wash (R030XC322AZ)

   B. Flooding occurrence is at least occasional and there is a water table during the growing season

VI. Not Flooded (upland position, receives only precipitation)

   A. Slopes Generally Less Than 15 percent

      1. Soils Shallow or Very Shallow

         a. Soil surface cobbly loam, extremely gravelly loam, very gravelly sandy loam, or very cobbly loam. Subsurface gravelly loam, gravelly clay loam, very gravelly loam, loam, very gravelly sandy loam, very gravelly fine sandy loam, and/or very stony loam. A lime cemented hardpan is encountered at depths of 15 to 32 inches and soil is strongly to violently effervescent throughout the profile – Limy Upland (R030XC311AZ)

         b. Soil surface very gravelly sandy loam, very gravelly fine sandy loam, gravelly fine sandy loam, very gravelly loam or very cobbly sandy loam. Subsurface very gravelly sandy loam, fine sandy loam, gravelly loam, very gravelly loam,

and/or very cobbly loam. Soil strongly to violently calcareous throughout – Shallow Upland (R030XC324AZ)

2. Soils Moderately Deep or Deeper

   a. Soil surface very gravelly sandy loam, gravelly loamy sand, or sandy loam. Subsurface very gravelly clay, very gravelly sandy clay, very gravelly loam, clay loam, clay, and/or cobbly clay loam – Clay Loam Upland (R030XC334AZ)

   b. Soil surface loam, gravelly sandy loam, very gravelly sandy loam, very gravelly sand, loamy sand, or sandy loam. Subsurface loam, gravelly sandy loam, very gravelly sandy loam, sandy loam, loamy coarse sand, gravelly sandy clay loam, extremely gravelly sand, coarse sandy loam, gravelly loamy sand, and/or fine sandy loam. Soil generally non-effervescent in the surface to a depth of 10 inches or more – Coarse Sandy Loam (R030XC305AZ)

   c. Soil surface very fine sandy loam, sandy loam, very gravelly loam, or gravelly fine sandy loam. Subsurface very fine sandy loam, fine sandy loam, silt loam, cobbly very fine sandy loam, sandy clay loam, sandy loam, gravelly sandy loam, and/or gravelly sandy clay loam. Soil is generally strongly to violently effervescent throughout the profile – Limy Fan (R030XC308AZ)

   d. Soil surface cobbly loam, extremely gravelly loam, very gravelly sandy loam, or very cobbly loam. Subsurface gravelly loam, gravelly clay loam, very gravelly loam, loam, very gravelly sandy loam, very gravelly fine sandy loam, and/or very stony loam. A lime cemented hardpan is encountered at depths of 15 to 32 inches and soil is strongly to violently effervescent throughout the profile – Limy Upland (R030XC311AZ)

   e. Soil surface sandy loam, gravelly sandy loam, or gravelly loam. Subsurface sandy clay loam, coarse sandy loam, gravelly sandy loam, gravelly sandy clay loam, very gravelly sandy loam, sandy loam, extremely gravelly sand, and/or gravelly loamy sand. Sandy Loam Upland, Fine (R030XC321AZ)

   f. Soil surface gravelly loamy sand. Subsurface sandy clay loam, sandy clay, gravelly sandy clay, and/or gravelly loamy sand. Soil generally non-effervescent in the surface to a depth of 10 inches or more – Sandy Loam Upland, Fine, Gravelly (R030XC315AZ)

   g. Soil surface gravelly sandy loam, very gravelly sandy loam, gravelly fine sandy loam, fine sandy loam, or very gravelly

loamy sand. Subsurface gravelly sandy clay loam, gravelly sandy loam, very gravelly sandy loam, very gravelly loam, very gravelly sandy clay loam, very gravelly loamy sand, very gravelly sand, extremely gravelly sandy loam. Soil strongly to violently effervescent throughout the profile – Sandy Loamy Upland, Limy, Skeletal (R030XC318AZ)

h. Soil surface very gravelly sandy loam, or gravelly sandy loam. Subsurface gravelly fine sandy loam, extremely gravelly sandy loam, sandy loam, and/or sandy clay loam. Soil strongly to violently effervescent throughout the profile – Sandy Loam Terrace (R030XC320AZ)

i. Soil surface gravelly sandy loam, gravelly fine sandy loam, very gravelly fine sandy loam, or very cobbly loamy fine sand. Subsurface gravelly sandy loam, very gravelly sandy loam, gravelly fine sandy loam, fine sandy loam, very gravelly loam, extremely gravelly loamy sand, gravelly loamy fine sand, very gravelly sand, loamy fine sand, very gravelly sand, loamy fine sand, and/or very gravelly loamy coarse sand. Soil generally strongly to violently effervescent throughout the profile – Limy Upland, Deep (R030XC313AZ)

B. Slopes Generally Greater Than 15 percent

1. Soils Shallow

a. Slopes

i. Soil surface very cobbly fine sandy loam. Subsurface very cobbly loam, cobbly fine sandy loam, gravelly loam, gravelly sandy loam, loam, and/or loamy sand. Soil generally covered with basalt cobble and stone – Basalt Slopes (R030XC330AZ)

b. Hills

i. Soil surface extremely cobbly loam or extremely stony loam. Subsurface extremely gravelly loam. Soil is shallow to basalt bedrock – Basalt Hills (R030XC333AZ)

ii. Soil surface extremely stony sandy loam, extremely cobbly sandy loam, extremely stony coarse sandy loam, or very gravelly coarse sandy loam. Subsurface very gravelly sandy loam, extremely cobbly loam, very gravelly clay, very gravelly clay loam, extremely stony coarse sandy loam, and/or very gravelly coarse sandy loam. Soil very shallow or shallow to granite bedrock – Granitic/Schist Hills, Alkaline (R030XC306AZ)

iii. Soil surface extremely cobbly loam, extremely gravelly sandy loam, extremely gravelly sandy clay, or

very cobbly loam. Subsurface extremely cobbly fine sandy loam, very gravelly clay loam, extremely gravelly loam, very gravelly loam, extremely cobbly loam. Soil surface covered with channers, gravel, cobbles and stones. Soil very shallow or shallow to limestone bedrock – Limestone Hills (R030XC307AZ)

c. Escarpments

2. Soils Moderately Deep or Deeper

a. Soil surface very gravelly loamy sand or gravelly loamy sand. Subsurface very gravelly sandy clay loam, very gravelly loam, very gravelly sandy loam, gravelly loamy sand, gravelly sandy clay loam, gravelly loam, and/or gravelly sandy loam. Soil surface with 50 to 60 percent gravel cover. Soil strongly to violently effervescent throughout profile – Sandy Loam Slopes, Limy, Skeletal (R030XC331AZ)