

Ecological site group DX035X01GESG24

Chinle Valley Sandstone Moderately Deep to Very Deep, MAST < 54 degrees F

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Key Characteristics

- Chinle Valley
- Sandstone or sandy loam
- Moderately deep to very deep
- MAST < 54 degrees F

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Physiography

This ecological group occurs in an upland position on gently sloping plains or alluvial fans on treads of high stream terraces, fan remnants of undulating plateaus, structural benches, and cuestas. It neither benefits significantly from run-in nor experiences excessive runoff of moisture. Slopes range from 1 to 8 percent. Elevations range from 4,700 to 6,100 feet.

Climate

Mean annual precipitation varies from 6 to 14 inches. About 60% of this moisture comes as rain from April through October. May and June are the driest months. Most of the moisture from November through March comes as snow. Much of the summer precipitation occurs as convection thunderstorms.

Mean temperatures for the hottest month (July) is 72 degrees F; for the coldest month (January) is 32 degrees F. Extreme temperatures of 105 degrees F and -26 degrees F have been recorded. Long periods with little or no effective moisture are relatively common. Extreme temperatures of 104 degrees F and -17 degrees F have been recorded. The frost-free period ranges from 140 to 160 days.

Winds of high velocity during late winter and early spring are common.

Cool season plants begin growth in early spring and mature in the early summer. Warm season plants take advantage of summer rains and grow from July through September.

Soil features

These soils are moderately deep to very deep and well drained. Surface horizons have textures of sandy loam to fine sandy loam about 4 to 10 inches thick. Subsurface horizons have textures ranging from clay to sandy loam. There may be thin strata of finer and/or coarser textures. They are formed in alluvium or eolian deposits derived from sandstone. Surface textures include loamy fine sand and fine sandy loam. The subsoil has textures of very fine sandy loam, fine sandy loam, loamy coarse sand, and loamy sand. Permeability is moderately rapid. Available water holding capacity is low to moderate. Runoff is very low to low, and the hazard of water erosion is very slight to slight. The hazard of soil blowing is slight to severe. The soils are slightly to strongly alkaline (pH 7.4-9.0), nonsaline to slightly saline below 24 inches (EC 0-8), and nonsodic to slightly sodic (SAR 0-13). Biological crust cover is characterized by a weak crust, with light cyanobacteria and/or isolated moss clumps, with no continuity or isolated pinnacles of lichen and moss with little continuity.

Vegetation dynamics

This group has a plant community made up primarily of short- and mid-grasses, some shrubs, and a small percentage of forbs. In the original plant community there is a mixture of both cool- and warm-season grasses. Plant species most likely to invade or increase on this site when it deteriorates are cheatgrass and other annual weeds, sixweeks fescue, galleta, and broom snakeweed. Continuous livestock grazing during winter and spring will decrease the cool-season grasses, which are replaced by lower forage value grasses and shrubs.

In disturbed areas, rodent activity, water flow patterns, and coppice mounding of shrubs are more common than on sites in the reference state.

As ecological condition deteriorates due to overgrazing, Indian ricegrass, and needleandthread decrease while galleta, spiny hopsage, and Cutler mormontea increase. When the potential natural plant community is burned, spiny hopsage, blackbrush and fourwing saltbush decreases while Cutler mormontea, broom snakeweed, Indian ricegrass and galleta increase. Cheatgrass, Russian thistle, and Utah juniper are most likely to invade this site. As the calcic layer in the soil goes deeper, the spiny hopsage decreases and grasses increase.

Suitability for rangeland seeding is poor to fair. The major limiting factor is precipitation that can be variable with low years. Disturbed areas can be seeded to control erosion. Plants suitable for seeding include Indian ricegrass, crested wheatgrass, and other adapted native plants.

Brush Management and seeding can be used to improve the vegetation in deteriorated areas of the range that are producing more woody shrubs than would be present in the potential natural plant community. Suitable brush management practices include prescribed burning, chemical spraying, and mechanical treatment.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- DX035X01I117–Sandy Loam Upland 10-14" p.z.
- R035XB219AZ–Sandy Loam Upland 6-10" p.z.
- R035XC317AZ–Sandy Loam Upland 10-14" p.z.
- R035XY217UT–Semidesert Sandy Loam (Spiny Hopsage)

Correlated Map Unit Components

22397389, 22397509, 22397316, 22397317, 22397468, 22397363, 22397396, 22397483, 22397484, 22397488, 22397431, 22397608, 22397606, 22397223, 22397272, 22397614, 22397591, 22397320, 22397321, 22397619, 22397569, 22397568, 22397592, 22397290, 22397572, 22397581, 22999604, 22999623, 22999667, 22999666, 22999813, 22601108, 22601543

Stage

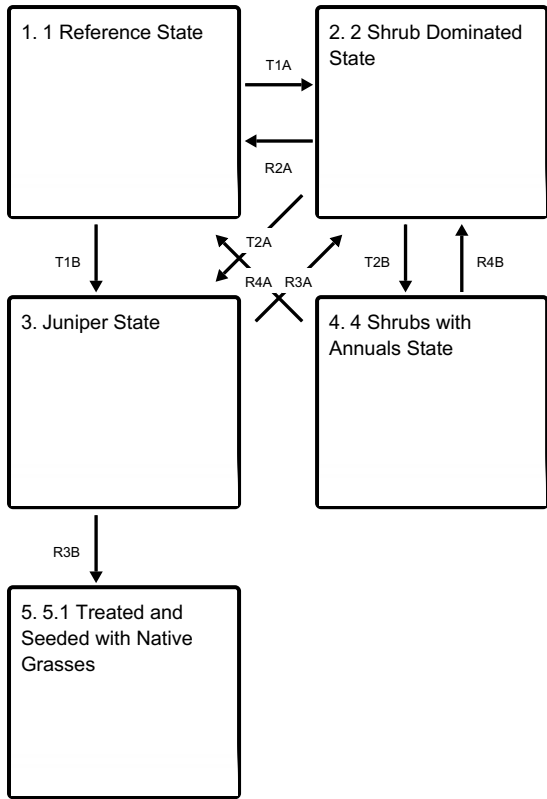
Provisional

Contributors

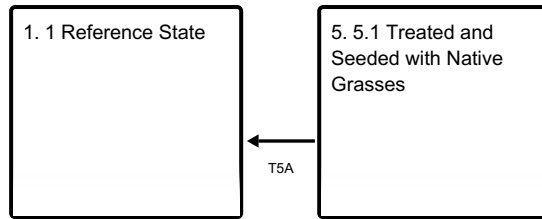
Curtis Talbot

State and transition model

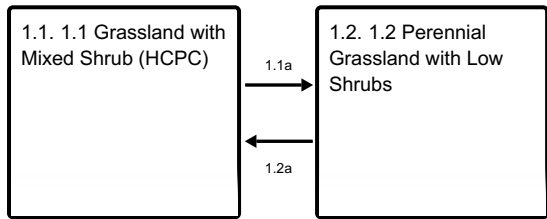
Ecosystem states



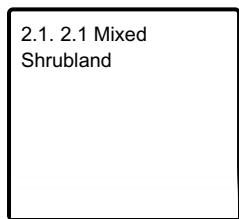
States 1 and 5 (additional transitions)



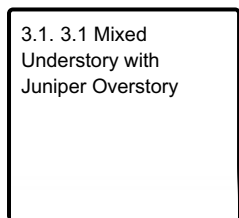
State 1 submodel, plant communities



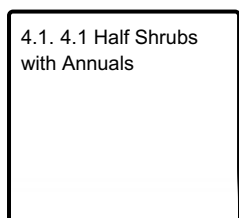
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1

1 Reference State

The reference state includes the Historic Climax Plant community (HCPC). The HCPC plant community is a grassland composed primarily of warm season and cool season grasses with some half-shrubs.

Community 1.1

1.1 Grassland with Mixed Shrub (HCPC)

The reference state plant community is composed primarily of warm season mid-grasses and short grasses with a small percentage of cool season grasses and half-shrubs. Dominant grasses include blue grama, black grama, sand dropseed and galleta. Dominant shrubs include fourwing saltbush and Greene's rabbitbrush. Natural climatic variation result in changes in the amount of and ratio of both individual plants and warm season versus cool season plants, especially grasses.

Community 1.2

1.2 Perennial Grassland with Low Shrubs

This plant community is characterized as a perennial grassland with scattered shrubs. Grasses that are dominant on the site are blue grama, galleta, Indian ricegrass, dropseeds and occasional black grama and needle and thread. The shrub component is mostly low growing small shrubs such as snake weed, Greene's rabbitbrush, mormon tea, fourwing saltbush and occasional winterfat and Bigelow sage.

Pathway 1.1a

Community 1.1 to 1.2

Drought, insect herbivory, unmanaged grazing

Pathway 1.2a

Community 1.2 to 1.1

Drought, insect/wildlife herbivory, unmanaged grazing

State 2

2 Shrub Dominated State

The general aspect of this site is shrubland with an increase of snakeweed, rabbitbrush, mormon tea and a decrease of fourwing saltbush, winterfat and Bigelow sage. Grasses are dominated by blue grama, galleta and dropseeds with a decline of black grama and cool season grasses. This site has an increase of run-off and bare ground.

Community 2.1

2.1 Mixed Shrubland

This plant community resembles 1.1, but includes a small percentage of non-native annual grasses and forbs, such as cheatgrass, filaree and Russian thistle and an increase in shrubs. It generally reacts to climatic fluctuations and grazing much like the reference state. Shrubs that increase on this site are Greene's rabbitbrush, snakeweed and Cutler's mormon tea. Other shrubs are present but in lesser amounts including fourwing saltbush, winterfat and Bigelow sage. Grasses are similar to reference state, except for a decline of black grama and cool season grasses with an increase in blue grama and galleta. Native and Non-native annual grasses and forbs can range in composition due to climatic fluctuations and grazing intensity. At higher elevations this plant community may have occasional scattered junipers.

State 3

Juniper State

The general aspect of this site is an overstory of junipers with half shrubs and succulents. The understory is mostly

blue grama, galleta with scattered forbs. This site has increased runoff and water flow patterns. Juniper canopies range from 10-20%, depending on grazing intensity, climate fluctuations and fire exclusion.

Community 3.1

3.1 Mixed Understory with Juniper Overstory

This site is characterized by an increase of juniper canopy greater than 10% with an understory of shrubs mainly comprised of half shrubs, Mormon tea and Yucca. Grasses consist primarily of blue grama with smaller percentages of galleta and dropseeds. There is an increase in annual forbs. A lack of fire, unmanaged grazing and above normal winter precipitation result in an increase of juniper and cool season annual forbs. As juniper canopies increase, bare ground and runoff rates increase and infiltration rates are reduced resulting in the loss of herbaceous cover.

State 4

4 Shrubs with Annuals State

The general aspect of the site is a low shrubland with annuals. Snakeweed and rabbitbrush are the dominant overstory species with low perennial herbaceous cover. Composition of annuals in this state can range from 20-50% depending on climate variation and disturbance frequency.

Community 4.1

4.1 Half Shrubs with Annuals

This plant community is characterized by a dominance of snakeweed, rabbitbrush and other shrubs with a mix of annual forbs. Dominant shrubs are rabbitbrush, snakeweed and Bigelow sage with scattered succulents and Mormon tea. Herbaceous cover is dominated by a mix of annual grasses and forbs. Common annuals include cheatgrass, false buffalograss, sixweeks fescue, Russian thistle and other annuals. Forb composition can range from 15 to 30% with a decline in perennial grass composition.

State 5

5.1 Treated and Seeded with Native Grasses

This plant community is characterized by a dominance of native grasses. The composition of the grasses, shrubs and forbs is varied and will depend on the species seeded and/or the seed sources available within the treated areas.

Transition T1A

State 1 to 2

Drought, unmanaged grazing

Transition T1B

State 1 to 3

Unmanaged grazing, seed source for juniper establishment, lack of fire, climatic conditions favorable for tree regeneration

Restoration pathway R2A

State 2 to 1

Woody species control, managed grazing

Transition T2A

State 2 to 3

Unmanaged grazing, seed source for juniper establishment, lack of fire

Transition T2B

State 2 to 4

Invasion of non-native annuals, drought, unmanaged grazing

Restoration pathway R3A

State 3 to 2

Tree canopy is reduced thru mechanical methods or burning; managed grazing, favorable climate

Transition R3B

State 3 to 5

Woody species control, prescribed fire, range reseeding, managed grazing, favorable climatic conditions.

Restoration pathway R4A

State 4 to 1

Woody species management, noxious/invasive weed treatment, range seeding, managed grazing, along with favorable climatic conditions.

Restoration pathway R4B

State 4 to 2

Woody species management, noxious/invasive weed treatment, range seeding, managed grazing, along with favorable climatic conditions.

Restoration pathway T5A

State 5 to 1

Favorable climate (moisture), managed grazing

Citations