

Ecological site group DX035X01GESG10

Chinle Valley Sandy Bottoms Perennial

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Key Characteristics

- Chinle Valley
- Sandy
- Bottoms
- Perennial streamflow

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 group occurs in a bottom position along perennial or seasonal streams, and on spring fed section of streams where surface water is present throughout a significant portion of the growing season. Slopes are generally less than 2 percent but may be higher on bank slopes and in bedrock controlled sections.

Climate

The climate of the land resource unit is arid with warm summers and cool winters. This is one of the driest land resource units on the Colorado Plateau with an average annual precipitation ranging from 6 to 14 inches per year. It is also very erratic, often varying substantially from year to year. 40 to 50 percent of the precipitation is received from October through early May. This precipitation comes as gentle rain or snow from frontal storms coming out of the Pacific Ocean. Snow is common from November through February. Generally no more than an inch or two of snow accumulates and usually melts within a day or two. The remaining precipitation, approximately 50 to 60 percent, is received from July through September as spotty, unreliable and sometimes violent thunderstorms. The moisture for this precipitation originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the area on the north end of the Mexican monsoon. Late May through late June is generally a dry period. The mean annual temperature ranges from 53 to 56 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 135 to 160 days (@ 50 percent probability). Strong winds are common, especially in the spring.

Soil features

The soils on this group are very deep (60+") and moderately well drained. They are formed in alluvium from sandstone, granite and quartzite. Surface textures are generally fine sand to loamy sand. Subsurface textures include loamy fine sand, gravelly coarse sand and sand. There can be thin layers of loamy textures. Hazard of water erosion is none and hazard of wind erosion is severe.

Vegetation dynamics

An ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in productivity and occurrence of individual species. Spatial boundaries of the communities; however, can be recognized by characteristic patterns of species composition, association, and community structure. The historic climax plant community for this ecological site has been described by sampling relict or relatively undisturbed sites and/or reviewing historic records. The historic climax plant community is the plant community that evolved over time with the soil forming process and long term changes in climatic conditions of the area. It is the plant community that was best adapted to the unique

combination of environmental factors associated with the site.

Natural disturbances, such as drought, fire, grazing of native fauna, and insects, are inherent in the development and maintenance of these plant communities. The effects of these disturbances are part of the range of characteristics of the ecological site. Fluctuations in plant community structure and function caused by the effects of natural disturbances help establish the boundaries and characteristics of an ecological site. They are accounted for as part of the range of characteristics of the ecological site. Recognizable plant community phases are identified in the reference state of the ecological site. Some sites may have a small range of variation, while others have a large range. Some plant community phases may exist for long periods of time, while others may only occur for a couple of years after a disturbance.

Deterioration of the plant community, hydrology, or soil site stability on an ecological site can result in crossing a threshold or potentially irreversible boundary to another state, or equilibrium. This can occur as a result of the loss of soil surface through erosion, the loss of the stability of the site due to disturbances that cause active erosion on the site, increases in the amounts and/or patterns or runoff from rainstorms, changes in availability of surface and subsurface water, significant changes in plant structural and functional types, or the introduction of non-native species. When these thresholds are crossed, the potential of the ecological site to return to the historic climax plant community can be lost, or restoration will require significant inputs. There may be multiple states possible for an ecological site, determined by the type and or severity of disturbance.

The known states and transition pathways for this ecological site are described in the state and transition model. Within each state, there may be one or more known plant community phases. These community phases describe the different plant community that can be recognized and mapped across this ecological site. The state and transition model is intended to help land users recognize the current plant community on the ecological site, and the management options for improving the plant community to the desired plant community.

Plant production information in this site description is standardized to the annual production on an air-dry weight basis in near normal rainfall years.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XB273AZ–Sandy Bottom 6-10" p.z. Perennial

Correlated Map Unit Components

22397167, 22397174, 22397171, 22397283, 22397247, 23000004

Stage

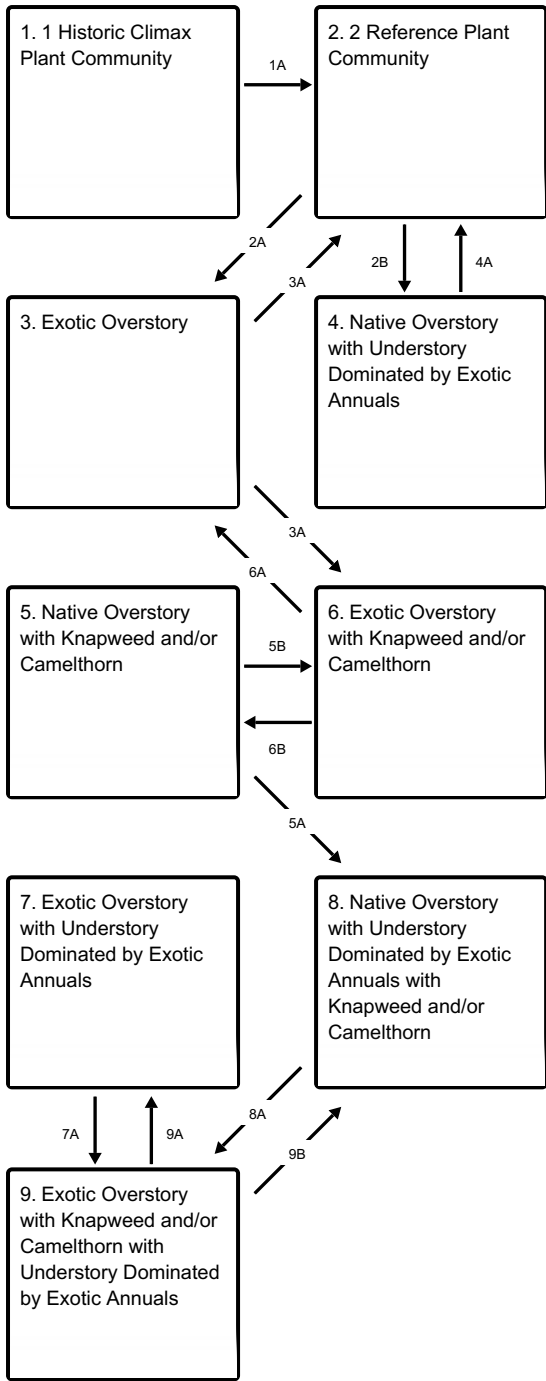
Provisional

Contributors

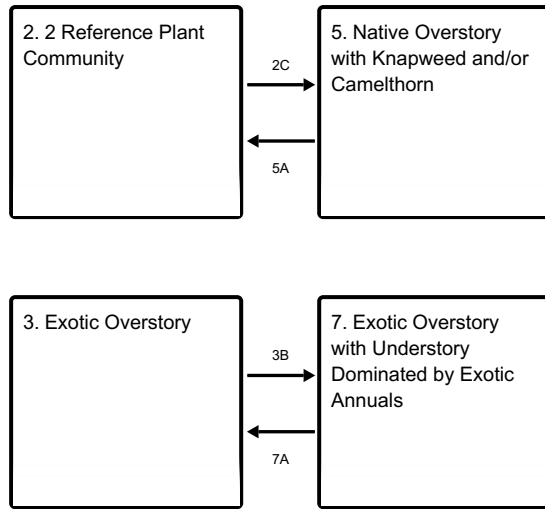
Curtis Talbot

State and transition model

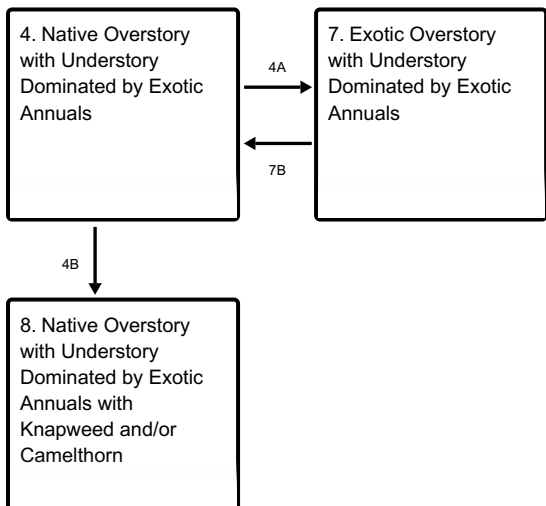
Ecosystem states



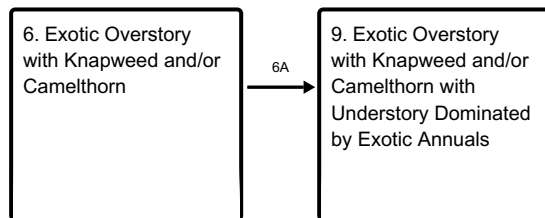
States 2, 5, 3 and 7 (additional transitions)



States 4, 7 and 8 (additional transitions)



States 6 and 9 (additional transitions)



State 2 submodel, plant communities

2.1. Fremont
cottonwood/desert
saltgrass/alkali sacaton
with exotic annuals

State 3 submodel, plant communities

3.1. Exotic overstory
with desert
saltgrass/alkali sacaton
with exotic annuals

State 4 submodel, plant communities

4.1. Native overstory
with understory
dominated by exotic
annuals

State 5 submodel, plant communities

5.1. Native overstory
w/ desert
saltgrass/alkali sacaton
w/ exotic annuals w/
knapweed and/or
camelthorn

State 6 submodel, plant communities

6.1. Exotic
overstory/desert
saltgrass/alkali sacaton
w/ exotic annuals w/
knapweed and/or
camelthorn

State 7 submodel, plant communities

7.1. Exotic overstory
with understory
dominated by exotic
annuals

State 8 submodel, plant communities

8.1. Native overstory
with understory
dominated by exotic
annuals with
knapweed and/or
camelthorn

State 9 submodel, plant communities

9.1. Exotic overstory/knapweed and/or camelthorn with understory dominated by exotic annuals

State 1

1 Historic Climax Plant Community

This site has a plant community made up primarily of mid grasses, shrubs and Fremont cottonwood trees. Forbs are a minor component of the site. Plant species most likely to invade or increase on this site when it deteriorates are cheatgrass, annual weeds, threadleaf rubber rabbitbrush, tamarisk, Russian knapweed, camelthorn and Russian olive.

State 2

2 Reference Plant Community

Exotic annual grasses and forbs have been introduced into the ecosystem. The overstory is dominated by cottonwoods and other native shrubs. The understory is made up of native grasses, forbs and shrubs with a few exotic annual grasses and forbs.

Community 2.1

Fremont cottonwood/desert saltgrass/alkali sacaton with exotic annuals

The overstory is dominated by cottonwoods and other native shrubs. The understory is made up of native grasses, forbs and shrubs with a few exotic annual grasses and forbs.

State 3

Exotic Overstory

Exotic trees have been introduced into the ecosystem. Saltcedar dominates the scattered overstory. Exotic annual grasses and forbs are mixed with native grasses and forbs in the understory.

Community 3.1

Exotic overstory with desert saltgrass/alkali sacaton with exotic annuals

Saltcedar dominates the scattered overstory. Exotic annual grasses and forbs are mixed with native grasses and forbs in the understory.

State 4

Native Overstory with Understory Dominated by Exotic Annuals

Cottonwoods and other native shrubs dominate the overstory. Exotic annual grasses dominate the understory.

Community 4.1

Native overstory with understory dominated by exotic annuals

Cottonwoods and other native shrubs dominate the overstory. Exotic annual grasses dominate the understory.

State 5

Native Overstory with Knapweed and/or Camelthorn

Cottonwoods and other native shrubs dominate the overstory. Knapweed and exotic annual grasses dominate the understory.

Community 5.1

Native overstory w/ desert saltgrass/alkali sacaton w/ exotic annuals w/ knapweed and/or camelthorn

Cottonwoods and other native shrubs dominate the overstory. Knapweed and/or camelthorn with exotic annual grasses dominate the understory.

State 6

Exotic Overstory with Knapweed and/or Camelthorn

Saltcedar and/or Russian Olive dominate the overstory. Knapweed and/or camelthorn and native and exotic grasses dominate the understory.

Community 6.1

Exotic overstory/desert saltgrass/alkali sacaton w/ exotic annuals w/ knapweed and/or camelthorn

Saltcedar and/or Russian Olive dominate the overstory. Knapweed and/or camelthorn and native and exotic grasses dominate the understory.

State 7

Exotic Overstory with Understory Dominated by Exotic Annuals

Saltcedar and/or Russian olive dominate the overstory. Exotic annual grasses dominate the understory.

Community 7.1

Exotic overstory with understory dominated by exotic annuals

Saltcedar and/or Russian olive dominate the overstory. Exotic annual grasses dominate the understory.

State 8

Native Overstory with Understory Dominated by Exotic Annuals with Knapweed and/or Camelthorn

Cottonwoods and other native shrubs dominate the overstory. Knapweed and/or camelthorn and exotic grasses and forbs dominate the understory.

Community 8.1

Native overstory with understory dominated by exotic annuals with knapweed and/or camelthorn

Cottonwoods and other native shrubs dominate the overstory. Knapweed and/or camelthorn and exotic grasses and forbs dominate the understory.

State 9

Exotic Overstory with Knapweed and/or Camelthorn with Understory Dominated by Exotic Annuals

Saltcedar and/or Russian olive dominate the scattered overstory. Knapweed and/or camelthorn with exotic annual grasses and forbs dominate the understory.

Community 9.1

Exotic overstory/knapweed and/or camelthorn with understory dominated by exotic annuals

Saltcedar and/or Russian olive dominate the scattered overstory. Knapweed and/or camelthorn with exotic annual grasses and forbs dominate the understory.

Transition 1A
State 1 to 2

Introduction of exotic annuals to the site.

Transition 2A
State 2 to 3

Introduction of exotic overstory species to the site.

Transition 2B
State 2 to 4

Continuous, extreme herbivory.

Transition 2C
State 2 to 5

Introduction of knapweed and/or camelthorn to the site.

Restoration pathway 3A
State 3 to 2

Remove exotic overstory.

Transition 3A
State 3 to 6

Introduction of knapweed and/or camelthorn to the site.

Transition 3B
State 3 to 7

Continuous, extreme herbivory.

Restoration pathway 4A
State 4 to 2

continuous, extreme herbivory; control exotic annuals; replace native understory.

Transition 4A
State 4 to 7

Introduction of exotic overstory species to the site.

Transition 4B
State 4 to 8

Introduction of knapweed and/or camelthorn to the site.

Restoration pathway 5A
State 5 to 2

Control of knapweed and/or camelthorn.

Transition 5B

State 5 to 6

Introduction of exotic overstory species to the site.

Transition 5A

State 5 to 8

Continuous, extreme herbivory.

Restoration pathway 6A

State 6 to 3

Control of knapweed and/or camelthorn.

Restoration pathway 6B

State 6 to 5

Remove exotic overstory.

Transition 6A

State 6 to 9

Continuous, extreme herbivory.

Restoration pathway 7A

State 7 to 3

Control of exotic annuals, replace native understory.

Restoration pathway 7B

State 7 to 4

Remove exotic overstory.

Transition 7A

State 7 to 9

Introduction of knapweed and/or camelthorn to the site.

Transition 8A

State 8 to 9

Introduction of exotic overstory species to the site.

Restoration pathway 9A

State 9 to 7

Control of knapweed and/or camelthorn.

Restoration pathway 9B

State 9 to 8

Remove exotic overstory.

Citations