Ecological site F035XF637AZ
Loamy Bottom
13-17" p.z.

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General information

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.

MLRA notes

Major Land Resource Area (MLRA): 035X–Colorado Plateau

This ecological site occurs in Common Resource Area 35.6 - the Colorado Plateau Pinyon-Juniper-Sagebrush The Common Resource Area occurs within the Colorado Plateau Physiographic Province. Elevations range from 5800 to 7300 feet and precipitation averages 13 to 17 inches per year. Vegetation includes pinyon, juniper, big sagebrush, cliffrose, Mormon tea, muttongrass, prairie junegrass, squirreltail, western wheatgrass, and blue grama. The soil temperature regime is mesic and the soil moisture regime is aridic ustic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

Associated sites

R035XF601AZ	**Sedimentary Cliffs 13-17" p.z.** This site is located on cliff faces and talus slopes above the referenced site.
R035XF606AZ	**Sandy Loam Upland 13-17" p.z.** This site is located on upper stream terraces above the referenced site.

Similar sites

F035XC332AZ	**Sandy Bottom 10-14" (PODEW, SAEX), Perennial (Provisional)** This site has similar dominant vegetation as the referenced site, but is found in CRA 35-3. It may be located downstream from the referenced site.

Table 1. Dominant plant species

Tree	(1) *Populus deltoides ssp. wislizeni*
Shrub	(1) *Salix exigua*
Herbaceous	Not specified

Physiographic features

This site occurs on floodplains and low floodplain steps of perennial or intermittent streams with perennial subsurface flows. The site receives additional moisture from occasional, very brief periods of flooding. Depth to a seasonal high water table is 0 to 40 inches that also benefits the site. Slopes generally range from 0-5%.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Bar (3) Flood-plain step
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	1,770 – 2,230 m
Slope	0 – 10 %
Water table depth	0 – 100 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this land resource unit is semiarid with warm summers and cool winters. The mean annual precipitation ranges from 13 – 17 inches, but it is very erratic, often varying substantially from year to year. The majority of the precipitation comes from October through April. 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 a few inches of snow accumulates, melting within a few days, but may last a week or more. The remaining precipitation comes 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 air temperature ranges from 47 to 49 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 113 to 144 days (at 50 percent probability). Strong winds are common, especially in the spring.

Table 3 Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	160 days
Precipitation total (average)	430 mm

Influencing water features

The natural stream type for this site was most likely a Rosgen type “E” channel. Historic photographic evidence shows that the streams within this site were Rosgen type “D” channels at the turn of this century. That is they have slopes less than 4%, were braided with high bedloads and bank erosion. Stream channels were wide and relatively shallow.

Soil features

The soils are very deep and moderately well drained. They are formed in alluvium derived from sandstone, granite and quartzite. Surface textures include fine sandy loam to loam. Subsurface textures include very gravelly loamy sand, loamy sand, and fine sandy loam. Stratified layers below 40 inches may have greater then 35% rock fragments and more than 15% clay. Hazard of water erosion is moderate to high and hazard of wind erosion is moderate to high. Soil surface rock fragments are uncommon unless the surface has eroded to a coarse alluvial layer. Rock fragments are more common on surface of active stream channel.

Soil survey map unit components correlated to this ecological site include;

SSA-712 Canyon de Chelly National Monument MU 21, Yaggy Family;
SSA-713 Chinle Area MU's 36 Oxyaquic haplostolls.

Table 4. Representative soil features

Parent material	(1) Alluvium – sandstone
Surface texture	(1) Fine sandy loam (2) Loam
Family particle size	(1) Sandy
Drainage class	Moderately well drained
Permeability class	Moderate to rapid
Soil depth	180 – 250 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	11.18 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4

Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological 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.

State and transition model

Figure 3. 35.6 Loamy bottom

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial Rhizomatous Grass**			22-135	
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	22-112	–
	mountain rush	JUARL	*Juncus arcticus ssp. littoralis*	1-22	–
	Mexican rush	JUME4	*Juncus mexicanus*	1-22	–
2	**Perennial Bunchgrass**			1-22	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	6-22	–

	foxtail barley	HOJU	*Hordeum jubatum*	1-6	–
3	**Perennial Warm Season Rhizomatous Grass**			1-11	
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	1-11	–
4	**Annual Grasses**			1-6	
	sixweeks grama	BOBA2	*Bouteloua barbata*	1-6	–
	mouse barley	HOMU	*Hordeum murinum*	1-6	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	1-6	–
Forb					
5	**Perennial Forbs**			22-67	
	white sagebrush	ARLU	*Artemisia ludoviciana*	1-22	–
	thistle	CIRSI	*Cirsium*	1-11	–
	horsetail	EQUIS	*Equisetum*	1-11	–
	ragwort	SENEC	*Senecio*	1-11	–
	water speedwell	VEAN2	*Veronica anagallis-aquatica*	1-11	–
	fleabane	ERIGE2	*Erigeron*	1-6	–
	milkvetch	ASTRA	*Astragalus*	1-6	–
	common yarrow	ACMI2	*Achillea millefolium*	1-6	–
6	**Annual Forbs**			22-90	
	flatspine bur ragweed	AMAC2	*Ambrosia acanthicarpa*	1-6	–
	sandmat	CHAMA15	*Chamaesyce*	1-6	–
	Rocky Mountain beeplant	CLSE	*Cleome serrulata*	1-6	–
	American bugseed	COAMA2	*Corispermum americanum var. americanum*	1-6	–
	Canadian horseweed	COCA5	*Conyza canadensis*	1-6	–
	Texas croton	CRTE4	*Croton texensis*	1-6	–
	western tansymustard	DEPI	*Descurainia pinnata*	1-6	–
	wedgeleaf draba	DRCUC	*Draba cuneifolia var. cuneifolia*	1-6	–
	redstem stork's bill	ERCI6	*Erodium cicutarium*	1-6	–
	kiss me quick	POPI3	*Portulaca pilosa*	1-6	–
	globemallow	SPHAE	*Sphaeralcea*	1-6	–
	dandelion	TARAX	*Taraxacum*	1-6	–
	golden crownbeard	VEENE2	*Verbesina encelioides ssp. exauriculata*	1-6	–
Shrub/Vine					
7	**Dominant Shrubs**			112-224	
	narrowleaf willow	SAEX	*Salix exigua*	112-224	–
8	**Other Tall Shrubs**			6-28	
	redosier dogwood	COSES	*Cornus sericea ssp. sericea*	6-28	–
	chokecherry	PRVI	*Prunus virginiana*	6-28	–
	Woods' rose	ROWO	*Rosa woodsii*	6-17	–
9	**Halfshrubs**			6-28	
	hairy false goldenaster	HEVI4	*Heterotheca villosa*	6-28	–
Tree					
10	**Trees**			0-1289	
	Rio Grande cottonwood	PODEW	*Populus deltoides ssp. wislizeni*	224-673	–
	narrowleaf cottonwood	POAN3	*Populus angustifolia*	0-224	–
	narrowleaf willow	SAEX	*Salix exigua*	112-224	–
	boxelder	ACNE2	*Acer negundo*	0-224	–

	Goodding's willow	SAGO	*Salix gooddingii*	56-112	–
	arroyo willow	SALA6	*Salix lasiolepis*	56-112	–
	peachleaf willow	SAAM2	*Salix amygdaloides*	56-112	–
	Gambel oak	QUGA	*Quercus gambelii*	0-56	–
	Rocky Mountain juniper	JUSC2	*Juniperus scopulorum*	0-56	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Animal community

This site is suitable for grazing by livestock and wildlife during most of the grazing periods except when snow cover restricts availability of forage. Grazing must be managed to allow for periodic reproduction of cottonwood and willow species. Seeds germinate in beds of alluvium left after spring or summer floods. Spring seedlings require one full season to grow out of reach of grazing stock. Summer seedlings may require two seasons to reach a height where the terminal bud is out of reach. Seedlings of both species are very palatable to cattle. This wetland site attracts many species of upland and wetland wildlife Which use this site for nesting, feeding and resting. Competition with livestock can be year-round. The "Plant Preference By Animal Kind" Table Information below was compiled from information from similar riparian sites in Arizona and a summary table compiled for all sites in MLRA 35 in Utah.

Hydrological functions

This site is very important in the hydrology of southwestern stream systems. Large amounts of coarse woody debris form dams in large floods and spread waters over the floodplain. Beavers helped maintain a mosaic of marshy areas. Dense vegetation shade floodplains and stream channels to reduce evaporation. Vegetation traps sediment improving water quality and building floodplains.

Recreational uses

The cottonwood trees, understory shrubs and grasses, and perennial or intermittent stream beds provide an aesthetically pleasing site on the low floodplains. The winters are cold and the springs tend to be dry and windy. Late spring, summer and fall are the most pleasant seasons for outdoor activities such as bird watching, wildlife observation, hunting, and camping.

Wood products

The value of this plant community for wildlife is many times greater than its value for wood products. Cutting should be limited to flood damaged and fallen trees and driftwood.

Table 10. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
Rio Grande cottonwood	*PODEW*	130	150	75	100	–	–	–	

Type locality

Location 1: Coconino County, AZ	
UTM zone	N

UTM northing	4133947
UTM easting	977005

Other references

Updates and revisions for this ESD were conducted as part of a 2007-2012 Interagency Technical Assistance Agreement between the Bureau of Indian Affairs–Navajo Region and the NRCS-Arizona.

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

   _____

2. **Presence of water flow patterns:**

   _____

3. **Number and height of erosional pedestals or terracettes:**

   _____

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
