

Ecological site DX035X03G003 Meadow

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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.

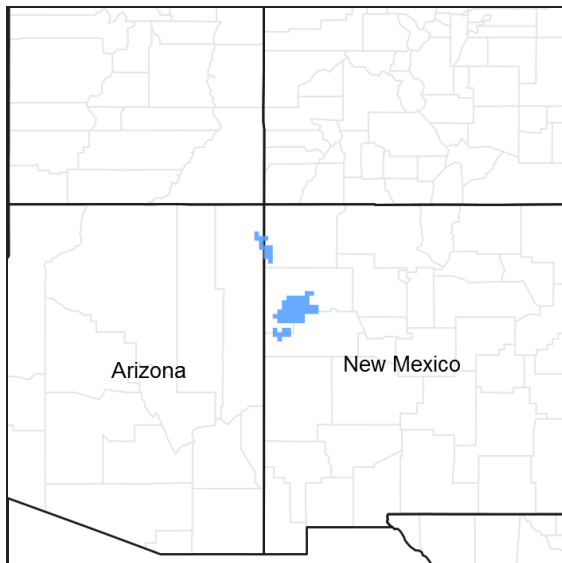


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Legacy ID

R035XH001NM

Physiographic features

This site occurs on basins and valleys and below seeps and springs and may be from 0.25 to 20 acres in area. It receives runoff water from adjacent sites. It may be inundated for very short periods of time in the spring from snowmelt. Drainages associated with the site are not dissected and allow the water to fan out. This results in a high water table and even some surface water in the spring and summer. Slopes average three percent, but may range up to 10 percent when associated with springs and seeps. Elevation ranges from 7,400 to 9,500 feet above sea level.

Wetlands of the United States, Circular 39, U.S. Fish and Wildlife Service, 1954, classifies these sites as wetlands. Type 1 is seasonally flooded basins while type 2 is inland fresh meadows with saturated soils but without standing water during most of the growing season.

Table 2. Representative physiographic features

Landforms	(1) Depression (2) Mountain valley
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Rare to occasional
Elevation	2,256–2,896 m
Slope	0–5%
Ponding depth	3–10 cm
Water table depth	3–102 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 18 to 25 inches. Forty percent occurs during the months of June to September. Most of the summer precipitation comes in the form of high intensity-short duration thunderstorms. Many of these storms are accompanied by hail. Snow accumulation typically occurs from November to March. Typically, depths range from 1 to 4 feet.

The average annual air temperature is about 43 degrees F. However, there are wide ranges in both yearly and daily temperatures. Temperatures may fluctuate as much as 75 degrees F in any 24-hour period. The frost-free period ranges from 80 to 100 days. The last killing frost is in June and the first killing frost is in September.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F respectively.

Table 3. Representative climatic features

Frost-free period (average)	174 days
Freeze-free period (average)	197 days
Precipitation total (average)	457 mm

Influencing water features

This site is influenced by water from seeps and springs

Soil features

The soils of this site are moderately deep to deep and are typically very poorly drained to somewhat poorly drained. Some areas may be moderately well drained. They are formed from mixed alluvium and have varying surface textures. The soils are non-saline and have high organic content. Available water-holding capacity is high to very high.

Soil Series

Inclusion

Polich

Saladon

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Silt loam
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Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Very slow
Soil depth	152–183 cm
Available water capacity (0-101.6cm)	22.86–30.48 cm
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	15–30%

Ecological dynamics

This highly productive site is suited to late spring through mid-fall livestock grazing use under a planned grazing scheme. Sub-irrigation reduces the fluctuations in forage production.

This site provides forage for grazing and browsing animals.

Over utilization results in a reduction and eventual elimination of the preferred grass and forb components. Tufted hairgrass, muhly spp., wheatgrass spp., prairie junegrass and native bluegrasses will decrease. Excessive browsing of willows during the growing season will also result in their reduction and eventual elimination. Grass and grass-like that will increase are Kentucky bluegrass, sages and rushed. Shrubby cinquefoil, rabbitbrush and forbs will also increase.

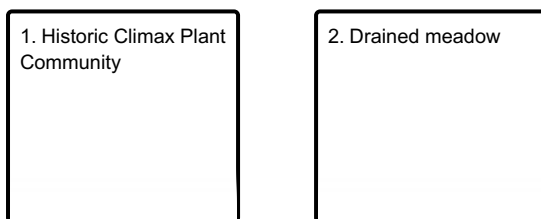
Redtop and timothy may invade the site and become naturalized. Their production may exceed that of the native species.

Elimination of the preferred components may allow the formation of gullies, which lower the water table. Once the water table has been lowered Arizona fescue and mountain muhly along with Kentucky bluegrass become predominant. Ponderosa pine will move onto the site from surrounding areas. In these instances the site index for ponderosa pine is 85+.

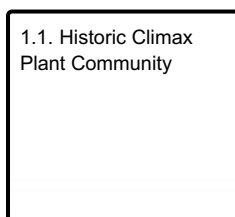
Mechanical manipulation and removal of the vegetation will substantially increase the hazard of water erosion and therefore, lead to gutting the meadow. Management alternatives will reduce water erosion. Constructing rock and brush dams or utilizing beaver may revitalize small gutted meadows.

State and transition model

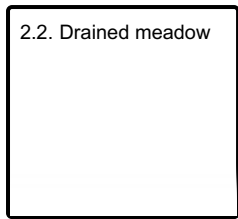
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

Cool-season grasses with a sparse overstory of shrubs dominate the overall physiognomy. Western wheatgrass, tufted hairgrass, sedges, rushes and bluegrasses are predominant. Sedges and rushes are most conspicuous in areas where there is surface water. Major forbs include clovers, iris and western yarrow. The very sparse shrub and half-shrub layer consists of willows and shrubby cinquefoil. Wildrose and water hemlock may be present. This highly productive site is suited to late spring through mid-fall livestock grazing use under a planned grazing scheme. Sub-irrigation reduces the fluctuations in forage production. This site provides forage for grazing and browsing animals. Over utilization results in a reduction and eventual elimination of the preferred grass and forb components. Tufted hairgrass, muhly spp., wheatgrass spp., prairie junegrass and native bluegrasses will decrease. Excessive browsing of willows during the growing season will also result in their reduction and eventual elimination. Grass and grass-like species that will increase are Kentucky bluegrass, sages and rushes. Shrubby cinquefoil, rabbitbrush and forbs will also increase. Redtop and timothy may invade the site and become naturalized. Their production may exceed that of the native species. Elimination of the preferred components may allow the formation of gullies, which lower the water table. Once the water table has been lowered Arizona fescue and mountain muhly along with Kentucky bluegrass become predominant. Ponderosa pine will move onto the site from surrounding areas. In these instances the site index for ponderosa pine is 85+. Mechanical manipulation and removal of the vegetation will substantially increase the hazard of water erosion and therefore, lead to gutting the meadow. Management alternatives will reduce water erosion. Constructing rock and brush dams or utilizing beaver may revitalize small gutted meadows. Other species that could appear on this site include: alpine timothy, sheep fescue, prairie junegrass, red fescue, muttongrass, bluejoint reedgrass, muhly spp., meadow barley, false hellebore, thistle and water hemlock. Redtop, timothy and Kentucky bluegrass may have become naturalized to the site.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2144	2501	2858
Forb	202	235	269
Shrub/Vine	76	89	101
Total	2422	2825	3228

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	50%
Forb foliar cover	5-7%
Non-vascular plants	0%
Biological crusts	0%
Litter	35-40%
Surface fragments >0.25" and <=3"	0-2%

Surface fragments >3"	0-2%
Bedrock	0%
Water	0%
Bare ground	15%

Figure 5. Plant community growth curve (percent production by month). NM1001, R035XH001NM-Meadow-HCPC. Cool-season grassland with sparse shrub overstory in AN1.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

State 2
Drained meadow

Community 2.1
Drained meadow

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Tufted Hairgrass			147–442	
2	Spike Muhly			147–442	
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	147–442	–
3	Oatgrass			89–147	
	timber oatgrass	DAIN	<i>Danthonia intermedia</i>	89–147	–
4	western wheatgrass slender wheatgrass			147–588	
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	147–588	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	147–588	–
5	nebraska sedge			295–442	
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	295–442	–
6	rush spp.			147–295	
	rush	JUNCU	<i>Juncus</i>	147–295	–
7	Bluegrass Species			147–295	
	bluegrass	POA	<i>Poa</i>	147–295	–
8	Arizona Fescue			0–59	
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	0–59	–
9	Mountain Muhly			0–59	
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	0–59	–
Forb					
10	clover spp. mountain iris yarrow			206–295	
	milfoil wattle	ACMI	<i>Acacia millefolia</i>	206–295	–
	Rocky Mountain iris	IRMI	<i>Iris missouriensis</i>	206–295	–
	clover	TRIFO	<i>Trifolium</i>	206–295	–
	pullup muhly	MUFI2	<i>Muhlenbergia filiformis</i>	29–147	–
Shrub/Vine					
12	willow mountain peachleaf			29–147	
	clover	TRIFO	<i>Trifolium</i>	29–147	–
	peachleaf willow	SAAM2	<i>Salix amygdaloides</i>	29–147	–
	false mountain willow	SAPS	<i>Salix pseudomonticola</i>	29–147	–
13	shrubby cinquefoil wildrose			29–147	
	yarrow	ACHIL	<i>Achillea</i>	147–295	–
	thistle	CIRSI	<i>Cirsium</i>	147–295	–
	sunflower	HELIA3	<i>Helianthus</i>	147–295	–
	iris	IRIS	<i>Iris</i>	147–295	–
	rose	ROSA5	<i>Rosa</i>	29–147	–

Animal community

Habitat for Wildlife:

Because of their size and distribution throughout the range, these sites provide important habitat components for mule deer, turkey and elk. Elk utilize this site for feeding and wallowing. Deer utilize this site for browsing. Turkey feed along the edges of the meadow.

Where permanent or semi-permanent aquatic habitats occur, these sites are used by mallard, teal, snipe, killdeer

and blackbirds.

Animal which utilize this ecosite for feeding, shelter or reproduction include: elk, mule deer, brown bear, coyote, gray fox meadow vole, Merriam's turkey, green horned owl, red winged-blackbird, mallard, green wing teal, snipe, killdeer, western bluebird, vesper sparrow violet-green swallow, leopard frog and western chorus frog.

Hydrological functions

Soil Series Hydrologic Group

Inclusion D

Polich C

Saladon D

Recreational uses

The visual qualities of the site are very pleasing, especially against a setting of coniferous trees. Due to the wetness, recreational uses are limited.

Wood products

Under normal conditions this site provides no wood products. Only when the meadow has become gutted will the site produce species that can be utilized.

Other products

Grazing:

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If fences must cross meadows, ballasting posts may be required to keep posts from sinking into the soil. The high water table precludes vehicles from crossing these soils. Roads will have to be ballasted to provide reliable trafficability.

Other information

Meadow

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM

100 - 76 .75 - 1.5

75 - 51 1.0 - 2.0

50 - 26 1.5 - 3.5

25 - 0 3.5+

Gutted Meadow

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM

100 - 76 4.4 – 5.7

75 – 51 5.6 – 8.6

50 – 26 8.5 – 17.0

25 – 0 17.0+

Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the Arizona and New Mexico Mountains 39 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. McKinley and Cibola Soil Surveys

Type locality

Location 1: McKinley County, NM

Location 2: Cibola County, NM

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):**
-
5. **Number of gullies and erosion associated with gullies:**
-
6. **Extent of wind scoured, blowouts and/or depositional areas:**
-
7. **Amount of litter movement (describe size and distance expected to travel):**
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
-
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:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

-
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:**
-

17. **Perennial plant reproductive capability:**
-