

Ecological site R047XA010UT

Interzonal Wet Fresh Streambank (willow)

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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): 047X–Wasatch and Uinta Mountains

MLRA 47 occurs in Utah (86 percent), Wyoming (8 percent), Colorado (4 percent), and Idaho (2 percent). It encompasses approximately 23,825 square miles (61,740 square kilometers). The northern half of this area is in the Middle Rocky Mountains Province of the Rocky Mountain System. Parts of the western edge of this MLRA are in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. The MLRA includes the Wasatch Mountains, which trend north and south. The steeply sloping, precipitous Wasatch Mountains have narrow crests and deep valleys. Active faulting and erosion are a dominant force in controlling the geomorphology of the area. The mountains in this area are primarily fault blocks that have been tilted up. Alluvial fans at the base of the mountains are recharge zones for the basin fill aquifers. An ancient shoreline of historic Bonneville Lake is evident on the footslopes along the western edge of the area. Rocks exposed in the mountains are mostly Mesozoic and Paleozoic sediments. The average precipitation is from 12 to 16 inches in the valleys and can range up to 73 inches in the mountains. Peak precipitation occurs in the winter months. The average annual temperature is 30 to 50 degrees Fahrenheit (-1 to 15 C). The freeze-free period averages 140 days and ranges from 60 to 220 days, generally decreasing in length with elevation. The dominant soil orders in this MLRA are Entisols, Inceptisols, and Mollisols. The lower elevations are dominated by a frigid temperature regime, while the higher elevations experience cryic temperature regimes. The soil moisture regime is typically xeric. The minerology is generally mixed and the soils are very shallow to very deep, generally well drained, and loamy or loamy-skeletal.

LRU notes

This LRU includes the Wasatch Mountains which tend to run north and south. These steeply sloping, precipitous mountains have narrow crests and deep valleys. They are primarily fault blocks that have been tilted up. The alluvial fans located at the base of these mountains are important recharge zones for valley aquifers.

Ecological site concept

This site occurs on flood plains and stream terraces that often occur in mountain valleys. It is found on gently sloping terrain near perennial streams. The water table is typically 0 to 15 inches below the soil surface during May and June, and is accessible to most plant roots throughout the growing season. Flooding may occur on the site, but ponding is not typical. The soils of this site are deep and poorly drained. They formed in alluvium derived from limestone, sandstone, shale and quartzite. Surface textures are silty clay, silt loam to loam. Rock fragments may be present on the soil surface and throughout the profile, but make up less than 35 percent of the soil volume. Water holding capacity in the upper 40 inches of soil ranges from 3.0 to 9.0 inches. Soil moisture regime is aquic and soil temperature regime can be frigid to cryic.

Associated sites

R047XA004UT	Interzonal Cold Semi-wet Fresh Meadow (meadow sedge/tufted hairgrass)
R047XA008UT	Interzonal Wet Fresh Meadow (sedge)

R047XA006UT	Semi-wet Fresh Streambank (narrowleaf cottonwood)
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Similar sites

R047XA006UT	Semi-wet Fresh Streambank (narrowleaf cottonwood)
R047XA008UT	Interzonal Wet Fresh Meadow (sedge)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Salix</i>
Herbaceous	(1) <i>Carex aquatilis</i> (2) <i>Elymus glaucus</i>

Physiographic features

This site occurs on flood plains and stream terraces that often occur in mountain valleys. It is found on gently sloping terrain near perennial streams. The water table is typically 0 to 15 inches below the soil surface during May and June, and is accessible to most plant roots throughout the growing season. Flooding may occur on the site, but ponding is not typical.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Mountain valley
Runoff class	High to very high
Flooding duration	Long (7 to 30 days) to very long (more than 30 days)
Flooding frequency	None to frequent
Ponding frequency	None
Elevation	1,830 – 2,530 m
Slope	0 %

Water table depth	0 – 40 cm
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Low to very high
Flooding duration	Not specified
Flooding frequency	Not specified
Ponding frequency	Not specified
Elevation	Not specified
Slope	Not specified
Water table depth	Not specified

Climatic features

The climate of this site characterized by cold, snowy winters and cool summers. The average annual precipitation ranges from 18 to 25 inches. March thru May and August, are typically the wettest months with June and July being the driest. The most reliable sources of moisture for plant growth are the snow that accumulates over the winter, and spring rains. Summer thunderstorms are intermittent and sporadic in nature, and thus, are less reliable sources of moisture to support vegetative growth on this site.

Table 4 Representative climatic features

Frost-free period (characteristic range)	80-100 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	460-640 mm
Frost-free period (average)	
Freeze-free period (average)	
Precipitation total (average)	560 mm

Influencing water features

The water table is typically 0 to 15 inches below the soil surface during May and June, and is accessible to most plant roots throughout the growing season. Flooding may occur on the site, but ponding is not typical.

Wetland description

Further review is required.

Soil features

The soils of this site are deep and poorly drained. They formed in alluvium derived from limestone, sandstone, shale and quartzite. Surface textures are silty clay, silt loam to loam. Rock fragments may be present on the soil surface and throughout the profile, but make up less than 50 percent of the soil volume. Water holding capacity in the upper 40 inches of soil ranges from 3.0 to 9.0 inches. Soil moisture regime is aquic and soil temperature regime can be frigid to cryic.

Table 5. Representative soil features

Parent material	(1) Alluvium – sedimentary rock
Surface texture	(1) Silty clay loam (2) Silt loam (3) Loam
Family particle size	(1) Fine-loamy
Drainage class	Poorly drained to very poorly drained
Permeability class	Moderately slow
Surface fragment cover <=3"	Not specified
Available water capacity (0-101.6cm)	7.62 – 22.86 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified

Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	20 – 50 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

It is impossible to determine in any quantitative detail the Historic Climax Plant Community (HCPC) for this ecological site because of the lack of direct historical documentation preceding all human influence. In the 1860s, Europeans brought cattle and horses to the area, grazing large numbers of them on unfenced parcels year-long.

Below is a State and Transition Model diagram to illustrate the “phases” (common plant communities), and “states” (aggregations of those plant communities) that can occur on the site. Differences between phases and states depend primarily upon observations of a range of disturbance histories in areas where this ESD is represented. These situations include grazing gradients to water sources, fence-line contrasts, patches with differing dates of fire, herbicide treatment, tillage, etc. Reference State 1 illustrates the common plant communities that probably existed just prior to European settlement.

The major successional pathways within states, (“community pathways”) are indicated by arrows between phases. “Transitions” are indicated by arrows between states. The drivers of these changes are indicated in codes decipherable by referring to the legend at the bottom of the page and by reading the detailed narratives that follow the diagram. The transition between Reference State 1 and State 2 is considered irreversible because of the naturalization of exotic species of both flora and fauna, possible extinction of native species, and climate change. There may have also been accelerated soil erosion.

When available, monitoring data (of various types) were employed to validate more subjective inferences made in this diagram. See the complete files in the office of the State Range Conservationist for more details.

State and transition model

Figure 1. State and Transition Model

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
0	Dominant Grasses			634-1298	
1	Sub-Dominant Grasses			722-1297	
	Grass, annual	2GA	<i>Grass, annual</i>	288-433	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	288-433	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	29-86	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	29-86	–
	alpine timothy	PHAL2	<i>Phleum alpinum</i>	29-86	–
	muttongrass	POFE	<i>Poa fendleriana</i>	29-86	–
Forb					
2	Forbs			1013-2160	
	Forb, annual	2FA	<i>Forb, annual</i>	288-433	–

	Forb, perennial	2FP	<i>Forb, perennial</i>	288-433	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	29-86	–
	nettleleaf giant hyssop	AGUR	<i>Agastache urticifolia</i>	29-86	–
	tall mountain larkspur	DESC	<i>Delphinium scaposum</i>	29-86	–
	field horsetail	EQAR	<i>Equisetum arvense</i>	29-86	–
	northern bedstraw	GABO2	<i>Galium boreale</i>	29-86	–
	common cowparsnip	HEMA80	<i>Heracleum maximum</i>	29-86	–
	Nevada pea	LALA3	<i>Lathyrus lanszwertii</i>	29-86	–
	feathery false lily of the valley	MARAR	<i>Maianthemum racemosum ssp. racemosum</i>	29-86	–
	thickleaf ragwort	SECR	<i>Senecio crassulus</i>	29-86	–
	alpine clover	TRDA2	<i>Trifolium dasyphyllum</i>	29-86	–
	tobacco root	VAED	<i>Valeriana edulis</i>	29-86	–
	hookedspur violet	VIAD	<i>Viola adunca</i>	29-86	–

Shrub/Vine

3	Shrubs			1584-2310	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	721-864	–
	gray alder	ALIN2	<i>Alnus incana</i>	86-145	–
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	86-145	–
	water birch	BEOC2	<i>Betula occidentalis</i>	86-145	–
	redosier dogwood	COSES	<i>Cornus sericea ssp. sericea</i>	86-145	–
	mallow ninebark	PHMA5	<i>Physocarpus malvaceus</i>	86-145	–
	Bebb willow	SABE2	<i>Salix bebbiana</i>	86-145	–
	Booth's willow	SABO2	<i>Salix boothii</i>	86-145	–
	Drummond's willow	SADR	<i>Salix drummondiana</i>	86-145	–
	yellow willow	SALU2	<i>Salix lutea</i>	86-145	–
	Pacific willow	SALUL	<i>Salix lucida ssp. lasiandra</i>	86-145	–

Tree

4	Trees			87-434	
	Engelmann spruce	PIEN	<i>Picea engelmannii</i>	29-145	–
	blue spruce	PIPU	<i>Picea pungens</i>	29-145	–
	narrowleaf cottonwood	POAN3	<i>Populus angustifolia</i>	29-145	–

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 4.2 plant community composition

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

This site produces a large volume of nutritious forage. To control soil erosion and degradation of the plant community this site may be properly grazed early with the animals being removed early to allow key plants to go un-grazed during the last part of the growing season. A stubble height of 4-6 inches should be adhered to. The potential is fair to poor for open land, good to fair for woodland, good to fair for wetland and poor to fair for rangeland habitat It is fair to good all around habitat for chukers, Hungarian partridge, quail, mule deer, moose, pheasants, songbirds, snowshoe rabbits, cottontails, coyotes, cougars, golden eagle, bald eagles and hawks. The diversity and interspersion of grasses, forbs, shrubs, and trees provide good habitat for most wildlife.

Hydrological functions

Soils in this site are in d hydrologic group due to water table. They have a high runoff potential. When the vegetation is in climax, the hydrologic curves will be 85 and 86. Refer to National Engineering Handbook Section 4 (USDA - NRCS) to determine runoff quantities from these curves. When range condition has declined from the climax, field investigations are needed in order to determine hydrologic curve numbers.

Recreational uses

This site has good values for aesthetics and natural beauty. It has a large number of forbs and shrubs which have flowers in bloom from early spring throughout the summer and into the fall. It has a combination of grasses, forbs, small shrubs, large shrubs, and trees, which offer some possibilities for screening and value as camping and picnicking areas. Hunting for upland game birds, snowshoe rabbits, elk, and mule deer is good to excellent on this site. Fishing is opportune on streams through and adjacent to this site.

Wood products

Values exist for saw logs primarily for sheathing, but in most instances it would be more feasible to leave the trees for aesthetic values and recreation. Posts and poles and crating lumber can be harvested from cottonwoods, water birch and thinleaf alder, but they are of much inferior quality to pine or fir. These trees produce suitable wood for fireplaces, campfires, and materials for novelties and ornamental uses.

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used.

Type locality

Location 1: AL	
General legal description	Modal Soil: Fluvaquentic Hapoborolls, 1-6% – Fluvaquentic Haploborolls Type Location: Beaver SCD; Bottoms in North Creek Northeast of Beaver, Utah

Other references

Galatowitsch, S.M. 1990. Using the original land survey notes to reconstruct pre-settlement landscapes in the American West. Great Basin Naturalist: 50(2): 181-191. Keywords: [Western U.S., conservation, history, human impact]

USDA-NRCS. 2003. National Range and Pasture Handbook. in USDA, editor, USDA-Natural Resources Conservation Service-Grazing Lands Technology Institute. Keywords: [Western US, Federal guidelines, Range pasture management]

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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	08/25/2026
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:
