USDA Natural Resources Conservation Service

Ecological site R024XY006NV DRY FLOODPLAIN

Accessed: 04/18/2024

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.

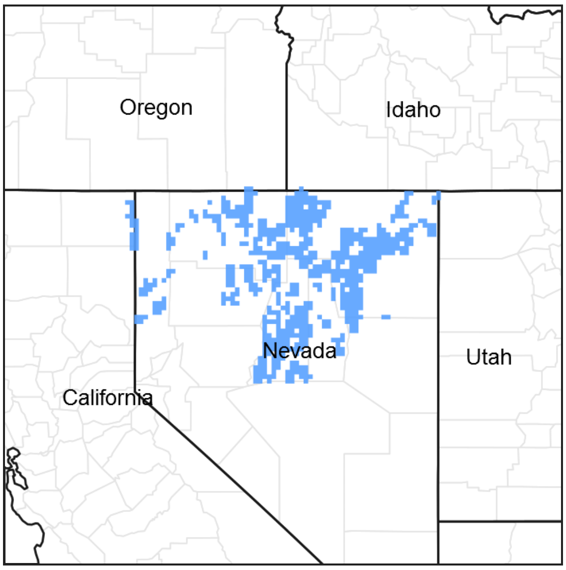

Figure 1. Mapped extent

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.

MLRA notes

Major Land Resource Area (MLRA): 024X–Humboldt Basin and Range Area

Major land resource area (MLRA) 24, the Humboldt Area, covers an area of approximately 8,115,200 acres (12,680 sq. mi.). It is found in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. Elevations range from 3,900 to 5,900 feet (1,205 to 1,800 meters) in most of the area, some mountain peaks are more than 8,850 feet (2,700 meters).

A series of widely spaced north-south trending mountain ranges are separated by broad valleys filled with alluvium washed in from adjacent mountain ranges. Most valleys are drained by tributaries to the Humboldt River. However, playas occur in lower elevation valleys with closed drainage systems. Isolated ranges are dissected, uplifted fault-block mountains. Geology is comprised of Mesozoic and Paleozoic volcanic rock and marine and continental sediments. Occasional young andesite and basalt flows (6 to 17 million years old) occur at the margins of the mountains. Dominant soil orders include Aridisols, Entisols, Inceptisols and Mollisols. Soils of the area are generally characterized by a mesic soil temperature regime, an aridic soil moisture regime and mixed geology. They are generally well drained, loamy and very deep.

Approximately 75 percent of MLRA 24 is federally owned, the remainder is primarily used for farming, ranching and mining. Irrigated land makes up about 3 percent of the area; the majority of irrigation water is from surface water sources, such as the Humboldt River and Rye Patch Reservoir. Annual precipitation ranges from 6 to 12 inches (15 to 30 cm) for most of the area, but can be as much as 40 inches (101 cm) in the mountain ranges. The majority of annual precipitation occurs as snow in the winter. Rainfall occurs as high-intensity, convective thunderstorms in the spring and fall.

Ecological site concept

This ecological site occurs on stream terraces and on fan skirts along intermittent drainageways. Soils are very deep, moderately well drained and formed in alluvium derived from mixed rocks with components of loess and volcanic ash. The soil profile is characterized by an ochric epipedon and a pH of >8.0 at the soil surface that increases with depth. The seasonal high water table ranges can be as high as 100cm for between 2-6 weeks in the early spring. The water table remains below 150cm, but within the rooting zone of native perennial plants, throughout the remainder of the year.

The plant community is dominated by basin wildrye. Big sagebrush is an important associated species. Important abiotic factors associated with this site include silt loam soil textures resulting in increased water holding capacity, pH above 8.0 and a landform position that experiences rare flooding and concentrates run-in moisture. For the period of time that increased moisture (flooding or seasonal high water table) is available in the soil profile it mitigates salinity by diluting salts and reducing drought stress.

Associated sites

R024XY003NV	**SODIC TERRACE 6-8 P.Z.**
R024XY005NV	**LOAMY 8-10 P.Z.**
R024XY007NV	**SALINE BOTTOM**
R024XY022NV	**SODIC TERRACE 8-10 P.Z.**
R025XY001NV	**MOIST FLOODPLAIN**

Similar sites

R024XY007NV	**SALINE BOTTOM** SAVE4 dominant shrub; ARTR2 rare to mostly absent.
R025XY001NV	**MOIST FLOODPLAIN** More productive site; LETR5 dominant to codominant grass.
R024XY022NV	**SODIC TERRACE 8-10 P.Z.** SAVE4-ARTR2 codominant; less productive site.
R025XY003NV	**LOAMY BOTTOM 8-14 P.Z.** More productive site; SAVE4 & DISP absent; soils not saline-alkali affected.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata subsp. tridentata*
Herbaceous	(1) *Leymus cinereus*

Physiographic features

This site occurs on valley bottoms, fan skirts, and along intermittent drainageways. Slopes range from 0 to 15 percent, but are mostly 0 to 2 percent. Elevations range from 3900 to 5000 feet.

Table 2. Representative physiographic features

Landforms	(1) Valley floor (2) Fan skirt (3) Drainageway
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding frequency	None

Elevation	3,900–5,000 ft
Slope	0–2%
Water table depth	54–72 in
Aspect	Aspect is not a significant factor

Climatic features

The climate is semiarid, characterized by cold, moist winters, and warm, somewhat dry summers. Average annual precipitation is 6 to 10 inches. Mean annual air temperature is 45 to 53 degrees F. The average growing season is about 90 to 130 days.

Table 3. Representative climatic features

Frost-free period (average)	105 days
Freeze-free period (average)	140 days
Precipitation total (average)	8 in

Climate stations used

- (1) OROVADA 3 W [USC00265818], Orovada, NV
- (2) WINNEMUCCA MUNI AP [USW00024128], Winnemucca, NV

Influencing water features

This site is associated with a seasonal high water table below 120cm.

Soil features

The soils associated with this site are very deep, moderately well drained and formed in alluvium derived from mixed rocks with a component of loess and volcanic ash. The soil profile is characterized by an ochric epipedon, SAR <13 and pH of 8.2 at the surface with salinity increasing with depth. Soils are characterized by less that 10% CaCo3 indicating the pH is largely driven by salts more soluble that CaCo3. Soil textures are silt loam or silty clay loam throughout, have high available water holding capacity, are subject to rare flooding. Seasonal high water table can be as high as 100cm for at least 2 weeks in the early spring. Ground water probably remains within 3-5m throughout the remainder of the year.

Where this site is correlated to soils characterized by a drainage class other than somewhat poor or moderately well will be field checked for correlation to a more appropriate ecological site or soil.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Very fine sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained to well drained
Permeability class	Slow to moderately rapid
Soil depth	72–84 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	7–8 in

Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	1–13
Soil reaction (1:1 water) (0-40in)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

An ecological site is the product of all the environmental factors responsible for its development and it has a set of key characteristics that influence a site's resilience to disturbance and resistance to invasives. Key characteristics include 1) climate (precipitation, temperature), 2) topography (aspect, slope, elevation, and landform), 3) hydrology (infiltration, runoff), 4) soils (depth, texture, structure, organic matter), 5) plant communities (functional groups, productivity), and 6) natural disturbance regime (fire, herbivory, etc.) (Caudle et al. 2013). Biotic factors that influence resilience include site productivity, species composition and structure, and population regulation and regeneration (Chambers et al 2013).

The ecological site is dominated by deep-rooted cool season perennial bunchgrasses and long-lived shrubs (50+ years) with high root to shoot ratios. The dominant shrubs usually root to the full depth of the winter-spring soil moisture recharge, which ranges from 1.0 to over 3.0 m. (Comstock and Ehleringer 1992). Root length of mature sagebrush plants was measured to a depth of 2 meters in alluvial soils in Utah (Richards and Caldwell 1987). These shrubs have a flexible generalized root system with development of both deep taproots and laterals near the surface (Comstock and Ehleringer 1992). The perennial bunchgrasses generally have somewhat shallower root systems than the shrubs, but root densities are often as high as or higher than those of shrubs in the upper 0.5 m but taper off more rapidly than shrubs. However, basin wildrye is weakly rhizomatous and has been found to root to depths of 1m or more and to exhibit greater lateral root spread than many other grass species (Abbott et al. 1991). General differences in root depth distributions between grasses and shrubs results in resource partitioning in these shrub/grass systems.

In the Great Basin, the majority of annual precipitation is received during the winter and early spring. This continental semiarid climate regime favors growth and development of deep-rooted shrubs and herbaceous cool season plants using the C3 photosynthetic pathway (Comstock and Ehleringer 1992).

Winter precipitation and slow melting of snow results in deeper percolation of moisture into the soil profile. Herbaceous plants, more shallow-rooted than shrubs, grow earlier in the growing season and thrive on spring rains, while the deeper rooted shrubs lag in phenological development because they draw from deeply infiltrating moisture from snowmelt the previous winter. Periodic drought regularly influences sagebrush ecosystems and drought duration and severity has increased throughout the 20th century in much of the Intermountain West. Major shifts away from historical precipitation patterns have the greatest potential to alter ecosystem function and productivity. Species composition and productivity can be altered by the timing of precipitation and water availability within the soil profile (Bates et al 2006).

The Great Basin sagebrush communities have high spatial and temporal variability in precipitation both among years and within growing seasons. Nutrient availability is typically low but increases with elevation and closely follows moisture availability. The moisture resource supporting the greatest amount of plant growth is usually the water stored in the soil profile during the winter. The invasibility of plant communities is often linked to resource availability. Disturbance can decrease resource uptake due to damage or mortality of the native species and depressed competition or can increase resource pools by the decomposition of dead plant material following disturbance. The invasion of sagebrush communities by cheatgrass has been linked to disturbances (fire, abusive grazing) that have resulted in fluctuations in resources (Chambers et al 2007).

Hydrology of basin wildrye dominated sites is critical for site function and maintenance. Seasonally high water tables have been found necessary for maintenance of site productivity and reestablishment of basin wildrye stands following disturbances such as fire, drought or excessive herbivory (Eckert et al. 1973). The sensitivity of basin wildrye seedling establishment to reduced soil water availability is increased as soil pH increases (Stuart et al. 1971). Lowering of the water table through extended drought, channel incision or water pumping will decrease basin wildrye production and establishment while sagebrush, black greasewood, rabbitbrush, and non-native species increase. Farming and abandonment may facilitate the creation of surface vesicular crust, increased surface ponding and decreased infiltration; which leads to dominance by sprouting shrubs with annual understory.

This ecological site is maintained by a relatively narrow disturbance return interval, allowing for the dominance of perennial bunchgrasses over shrubs. Basin wildrye grows on a wide variety of soil conditions, but prefer deep, fine textured soils on landscape positions that receive run in moisture from the surrounding landscape.
Natural seed viability has been found to be low and seedlings lack vigor (Young and Evans 1981). Roundy (1985) found that although basin wildrye is adapted to seasonally dry saline soils, high and frequent spring precipitation is necessary to establish it from seed suggesting that establishment of natural basin wildrye seedlings occurs only during years of unusually high precipitation. Because of these reasons it is estimated the majority of basin wildrye production in vegetative.

Basin big sagebrush (A. tridentata subsp tridentata) is one of the most widespread shrubs in western North America. It grows in relatively more mesic habitats that other species of big sagebrush (A. tridentata). It is typically described as growing on well drained soils, but it commonly found on areas adjacent to drainages, high water tables, or deep moisture accumulations (Tirmenstein 1999). Like other big sagebrush species, basin big sagebrush reproduces solely from seed. Flowering occurs in late summer and seeds fall from parent plant in the fall-winter. Seedlings emerge in the warly spring soon after snowmelt, but survival is dependent on adequate soil moisture conditions for the first several growing seasons.

Black greasewood can form pure stands in high saline/sodic conditions, but should not be used as an indicator of salinity as it also grows well on non-saline sites. It is usually associated with soils characterized by a run-in landscape position or that have a water table within rooting depth (Anderson 2004).

Disturbance Ecology:
During settlement of the West (1850's-1880's), many cattle in the Great Basin were wintered on extensive basin wildrye stands however due to sensitivity to spring use many stands were decimated by early in the 20th century (Young et al. 1975). Basin wildrye is primarily a spring emergent making it very sensitive to spring grazing Less palatable species such as black greasewood, rabbitbrush and inland salt grass increased in dominance along with invasive non-native species such as povertyweed, Russian thistle, mustards and cheatgrass (Roundy 1985). Spring defoliation of basin wildrye and/or consistent, heavy grazing during the growing season has been found to significantly reduce basin wildrye production and density (Krall et al. 1971). Inadequate rest and recovery from defoliation causes a decrease in basin wildrye and an increase in basin big sagebrush, rabbitbrush, and black greasewood, along with western wheatgrass and creeping wildrye. Further deterioration of the sites promotes shrub dominance, increased bare ground and the invasion of annual weeds, primarily cheatgrass and Russian thistle.

Grassland communities with a basin wildrye component historically experienced mostly infrequent to frequent stand replacing fires. Grassland vegetation types experienced both short fire intervals of less than 35 years as well as intervals ranging from 35 to 100 years, depending on climate and ignition sources. Fire maintained the grass dominance of these ecosystems therefore increases in the fire return interval favors increases in the shrub component of the plant community, potentially facilitating increases in bare ground, inland salt grass and invasive weeds. Lack of fire combined with excessive herbivory converts these sites to sagebrush, black greasewood and rabbitbrush dominance.

Basin wildrye is top-killed by fire. Older basin wildrye plants with large proportions of dead material within the perennial crown can be expected to show higher mortality due to fire than younger plants having little debris. Basin wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions. The major adaptation of western wheatgrass to fire is its rhizomatous growth form. During a fire the coarse culms usually burn fast with little or no heat transferred to the roots. Recovery takes about 2 to 5 years after a fire. Creeping wildrye is top-killed by fire. Creeping wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions. Basin big sagebrush is readily killed when aboveground plant parts are charred by fire. Prolific seed production from nearby unburned plants coupled with high germination rates enables seedlings to establish rapidly following fire. Black greasewood may be killed by severe fires, but it commonly sprouts soon after low to moderate-severity fires.

State and transition model

Dry Floodplain
R024XY006NV

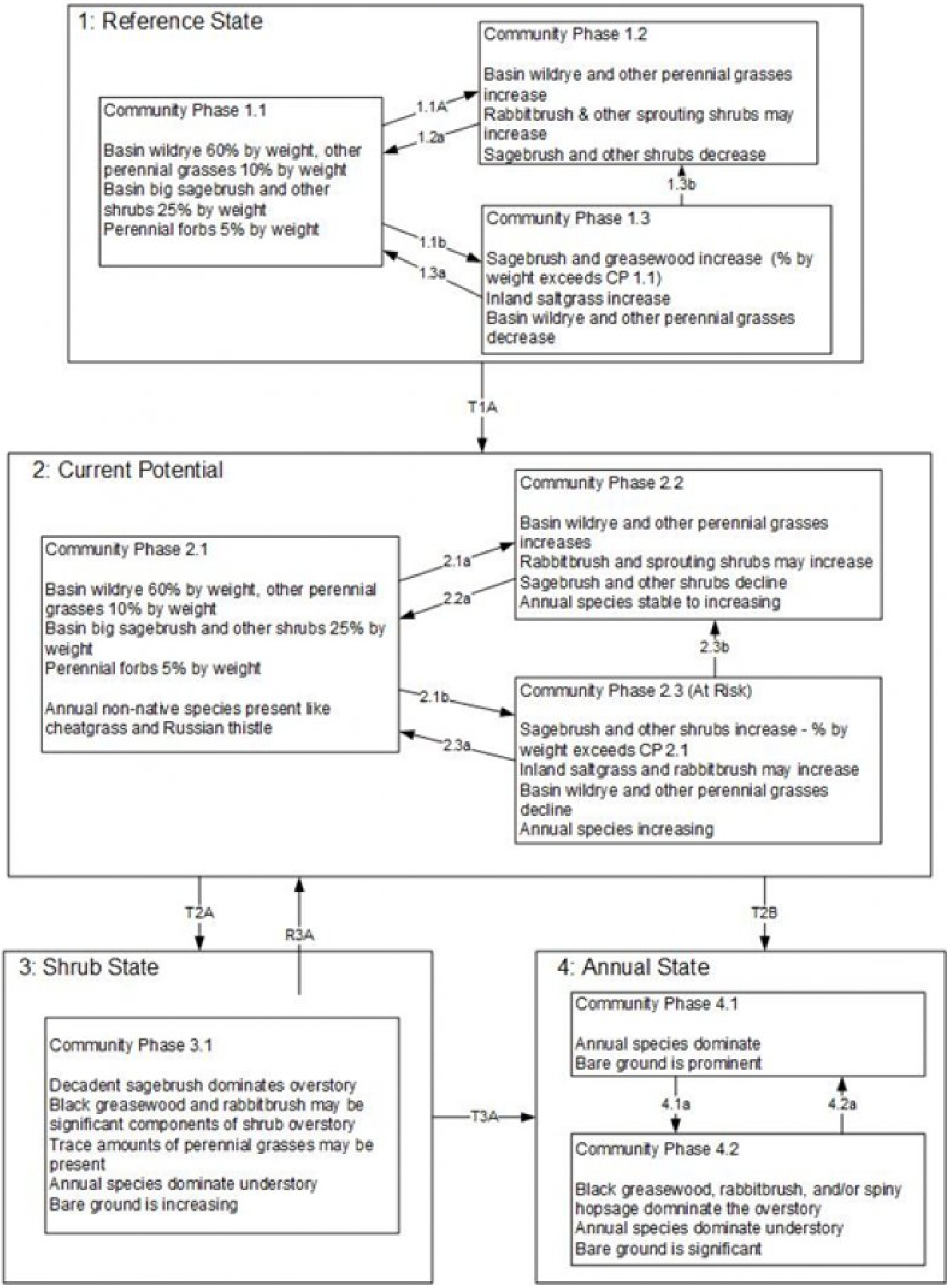

Figure 6. 024XY006NV STM

State 1
Reference State

The Reference State is a representative of the natural range of variability under pre-Euro settlement conditions. State dynamics are maintained by interactions between climatic patterns and disturbance regimes. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These include the presence of all structural and functional groups, low fine fuel loads, and retention of organic matter and nutrients. Plant community phase changes are primarily driven by fire, periodic drought and/or insect or disease attack.

Community 1.1
Reference Community Phase

This community is dominated by basin wildrye. Basin big sagebrush is an important associated species. Forbs and other grasses make up smaller components. Potential vegetative composition is about 70% grasses, 5% forbs and 25% shrubs. Approximate ground cover (basal and crown) is 30 to 40 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	420	770	1050
Shrub/Vine	150	275	375
Forb	30	55	75
Total	**600**	**1100**	**1500**

Community 1.2
Community Phase

This community is dominated by basin wildrye, western wheatgrass and creeping wildrye. Basin big sagebrush is much reduced or absent. Rabbitbrush and spiny hopsage may increase 1-2 seasons following fire. Black greasewood may resprout, quickly returning to pre-fire desity, depending on fire intensity.

Community 1.3
Community Phase

Basin big sagebrush and other shrubs increase. Shrub cover and percent by weight exceeds the reference community phase. Perennial grasses are declining from drought, inadequate rest and recovery from defoliation and competition from shrubs. Inland saltgrass may increase due to low palatability and resulting resource acquisition from the decline in other perennial grass species.

Pathway 1.1a
Community 1.1 to 1.2

Fire reduces vegetation cover. Immediate recovery favors perennial bunchgrasses.

Pathway 1.1b
Community 1.1 to 1.3

Drought and/or inadequate rest and recovery from defoliation.

Pathway 1.2a
Community 1.2 to 1.1

Absence of disturbance and natural regeneration over time allows for re-establishment of shrubs. Sagebrush establishing soley from seed and may take many years to return to pre-fire densities. Sprouting shrubs will recover quickly, but decrease over time.

Pathway 1.3a
Community 1.3 to 1.1

Prescribed grazing, release from drought and/or other disturbance/management action that reduces shrub canopy and allows for the perennial grasses to increase over time.

Pathway 1.3b
Community 1.3 to 1.2

Fire temporarily removes vegetation, favoring an increase in perennial bunchgrass.

State 2
Current Potential State

This state is similar to the Reference State. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of non-native annual weeds. Communities invaded by annuals will experience a different rate of response following disturbances like fire. Non-native annuals can be highly flammable and may increase fire frequency.

Community 2.1
Community Phase

Figure 8. Dry Floodplain Community Phase 2.1 NV777 MU732 Kelk Soil T. Stringham April 2010

This community is dominated by basin wildrye. Basin big sagebrush is common. This community is compositionally similar Community Phase 1.1 with a trace of weedy annual species like cheatgrass and Russian thistle.

Community 2.2
Community Phase

Figure 9. 24-06 Dry Floodplain Phase 2.2 T. Stringham Summer 2010

Perennial bunchgrasses, especially basin wildrye, respond positively to fire. Annual species, like cheatgrass and Russian thistle, are present and typically increase following wildfire due to increased resource availability. Rabbitbrush and spiny hopsage may be resprout 1-2 years following fire.

Community 2.3
Community Phase (at risk)

Figure 10. Plant community 3.2a

Figure 11. Plant community 3.2b

Perennial grasses decline and the shrubs dominate. Annual weedy species are stable or increasing within the understory. Inland saltgrass may be increasing. This community phase is at risk of crossing a threshold into state 3 or 4. Prevent a transition to a less desirable state by using prescribed grazing and encouraging low intensity fires (depending on the invasive annual understory species). Basin wildrye is a very resilient plant and will increase given the opportunity. Dormant season grazing by livestock my reduce brush cover and favor an increase in basin wildrye.

Pathway 2.1a
Community 2.1 to 2.2

Community Phase

Community Phase

Fire reduces vegetation, favoring an increase perennial bunchgrasses.

Pathway 2.1b
Community 2.1 to 2.3

Community Phase

Community Phase (at risk)

Inadequate rest and recovery from defoliation, long-term drought and/or the absence of fire or other disturbance.

Pathway 2.2a
Community 2.2 to 2.1

Community Phase

Community Phase

Time and lack of disturbance allows for re-establishment of sagebrush after fire.

Pathway 2.3a
Community 2.3 to 2.1

Community Phase (at risk)

Community Phase

Release from drought and/or introduction of grazing management. Cool season/low-intensity fire can reduce shrubs cover. Fire as a restoration tool should be used with caution, depending on amount of non-native annuals present in the understory.

Pathway 2.3b
Community 2.3 to 2.2

Community Phase (at risk)

Community Phase

Fire reduces decadent shrub cover and favors an increase in perennial bunchgrasses.

State 3
Shrub State

This state is characterized by shrub dominance. Basin wildrye and other perennial bunchgrasses are drastically reduced or even missing. Shrub overstory dominates site resources such that soil water, nutrient capture, nutrient cycling and soil organic matter are temporally and spatially redistributed. Bare ground may be significant with soil redistribution occurring between interspace and canopy locations.

Community 3.1
Community Phase

Figure 12. Dry Floodplain Community Phase 3.1 NV775 MU1031 Teman Soil T. Stringham August 2010

Figure 13. Dry Floodplain Community Phase 3.1 NV775 MU1031 Teman Soil T. Stringham August 2010

Decadent basin big sagebrush dominates the overstory. Black greasewood and rabbitbrush may be significant components of the shrub overstory. Trace amounts of perennial grasses may or may not be present. Annual species dominate the understory. Bare ground is increasing throughout the community. Spatial and temporal energy capture and nutrient cycling has been altered. Hydrological processes, like infiltration, may be inhibited due to a lack of ground cover.

State 4
Annual State

The plant communities have crossed an abiotic and biotic threshold and ecological dynamics are controlled by frequent fire, annual weedy species dominance, and wind and water erosion. Currently successful technologies to restore this state are not available.

Community 4.1
Community Phase

Annual weedy species dominate. Trace amounts of perennial grasses or shrubs may be present. Bare ground is prominent and affecting infiltration and seedling establishment.

Community 4.2
Community Phase

Black greasewood, rabbitbrush and/or spiny hopsage are resprouting after fire or other soil disturbing practices. Perennial bunchgrass remain a minor component or absent. Non-native annual species dominate herbaceous vegetation. Bare ground may be significant and increasing.

Pathway 4.1a
Community 4.1 to 4.2

Lack of disturbance and natural regeneration over time allows for sprouting shrubs to re-establish.

Pathway 4.2a
Community 4.2 to 4.1

Fire removes vegetation and favors an increase in non-native annuals. Trace amounts of perennial bunchgrasses may be present.

Transition T1A
State 1 to 2

Trigger: This transition is caused by the introduction of non-native annual weeds, such as cheatgrass and Russian thistle. Slow variables: Over time the annual non-native plants will increase within the community. Threshold: Any amount of introduced non-native species causes an immediate decrease in the resilience of the site. Annual non-native species cannot be easily removed from the system and have the potential to significantly alter disturbance regimes from their historic range of variation.

Transition T2A
State 2 to 3

Trigger: Inappropriate, long-term grazing of perennial bunchgrasses during the growing season would favor sagebrush and/or channel incisement leading to a lowering of the water table and reduction of overflow from adjacent stream. Slow variables: Long term decrease in deep-rooted perennial grass density. Threshold: Loss of deep-rooted perennial bunchgrasses changes spatial and temporal nutrient cycling and nutrient redistribution, and reduces soil organic matter.

Transition T2B
State 2 to 4

Trigger: To Community Phase 4.1: Severe fire and/or soil disturbing treatments. To Community Phase 4.2: Inappropriate grazing management that favors shrubs in the presence of non-native species. Slow variables: Increased production and cover of non-native annual species. Threshold: Loss of deep-rooted perennial bunchgrasses and shrubs truncates, spatially and temporally, nutrient capture and cycling within the community. Increased, continuous fine fuels from annual non-native plants modify the fire regime by changing intensity, size and spatial variability of fires.

Restoration pathway R3A
State 3 to 2

Restoration of this state would require mechanical or chemical brush treatment and control of annual invasive weed species. Seeding of grasses may be necessary if basin wildrye is severely reduced or no longer present in the community. Fire is not a recommended treatment. If channel incision has lowered the water table or altered spring soil moisture the probability of establishment of a basin wildrye seeding will be significantly reduced.

Transition T3A
State 3 to 4

Trigger: To Community Phase 4.1: Severe fire and/or soil disturbing treatments. To Community Phase 4.2: Inappropriate grazing management in the presence of annual non-native species. Slow variables: Increased production and cover of non-native annual species. Threshold: Increased, continuous fine fuels modify the fire regime by changing intensity, size and spatial variability of fires. Changes in plant community composition and spatial variability of vegetation due to the loss of perennial bunchgrasses and sagebrush truncate energy capture spatially and temporally thus impacting nutrient cycling and distribution.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			715–1045	
	basin wildrye	LECI4	*Leymus cinereus*	605–715	–
	beardless wildrye	LETR5	*Leymus triticoides*	55–165	–
	western wheatgrass	PASM	*Pascopyrum smithii*	55–165	–
2	**Secondary Perennial Grasses**			55–165	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	6–55	–
	saltgrass	DISP	*Distichlis spicata*	6–55	–
	squirreltail	ELEL5	*Elymus elymoides*	6–55	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	6–55	–
	alkali sacaton	SPAI	*Sporobolus airoides*	6–55	–
Forb					
3	**Perennial Forbs**			22–88	
	milkvetch	ASTRA	*Astragalus*	6–22	–
	povertyweed	IVAX	*Iva axillaris*	6–22	–
	thelypody	THELY	*Thelypodium*	6–22	–
Shrub/Vine					
4	**Primary Shrubs**			132–253	
	basin wildrye	LECI4	*Leymus cinereus*	605–715	–
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	110–165	–
	greasewood	SAVE4	*Sarcobatus vermiculatus*	22–88	–
5	**Secondary Shrubs**			22–88	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	11–33	–
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	11–33	–
	spiny hopsage	GRSP	*Grayia spinosa*	11–33	–
	alkali sacaton	SPAI	*Sporobolus airoides*	10–28	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Grazing management should be keyed to dominant grasses and palatable shrubs production. The early growth and abundant production of basin wildrye make it a valuable source of forage for livestock. It is important forage for cattle and is readily grazed by cattle and horses in early spring and fall. Though coarse-textured during the winter, basin wildrye may be utilized more frequently by livestock and wildlife when snow has covered low shrubs and other grasses. Western wheatgrass provides important forage for domestic sheep. Fall regrowth cures well on the stem, so western wheatgrass is good winter forage for domestic livestock. Creeping wildrye can be used for forage and is very palatable to all livestock. Once established it is very rhizomatous and maintains stands for many years. Basin big sagebrush may serve as emergency food during severe winter weather, but it is not usually sought out by livestock. Black greasewood is an important winter browse plant for domestic sheep and cattle. It also receives light to moderate use by domestic sheep and cattle during spring and summer months. Black greasewood contains soluble sodium and potassium oxalates that may cause poisoning and death in domestic sheep and cattle if large amounts are consumed in a short time.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

Wildlife Interpretations:
Basin wildrye provides winter forage for mule deer, though use is often low compared to other native grasses. Basin wildrye provides summer forage for black-tailed jackrabbits. Because basin wildrye remains green throughout early summer, it remains available for small mammal forage for longer time than other grasses. Creeping wildrye is used for forage for many wildlife species and is often used for cover. Basin big sagebrush is the least palatable of all the subspecies of big sagebrush. Basin big sagebrush is browsed by mule deer from fall to early spring, but is not preferred. Black greasewood is an important winter browse plant for big game animals and a food source for many other wildlife species. It also receives light to moderate use by mule deer and pronghorn during spring and summer months. Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Sage-grouse prefer mountain big sagebrush and Wyoming big sagebrush communities to basin big sagebrush communities.

Hydrological functions

Runoff is very low to low. Permeability is slow to moderately rapid. Hydrologic soil groups are A, B, C, and D. Rills are none. Water flow patterns are none to slight. Pedestals are none. Gullies are none to rare. Deep-rooted perennial herbaceous bunchgrasses (basin wildrye) slow runoff and increase infiltration. Tall stature and relatively coarse foliage of basin wildrye and associated litter break raindrop impact and provide opportunity for snow catch and moisture accumulation on site.

Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site has potential for upland bird and big game hunting.

Other products

Basin wildrye was used as bedding for various Native American ceremonies, providing a cool place for dancers to stand. Some Native American peoples used the bark of big sagebrush to make rope and baskets. The leaves, seeds and stems of black greasewood are edible.

Other information

Basin wildrye is useful in mine reclamation, fire rehabilitation and stabilizing disturbed areas. Its usefulness in range seeding, however, may be limited by initially weak stand establishment. Western wheatgrass is a good soil binder and is well suited for reclamation of disturbed sites such as erosion control and soil stabilization. Creeping wildrye is primarily used for reclamation of wet, saline soils. Basin big sagebrush shows high potential for range restoration and soil stabilization. Basin big sagebrush grows rapidly and spreads readily from seed. Black greasewood is useful for stabilizing soil on wind-blown areas. It successfully revegetates eroded areas and sites too saline for most plant species.

Type locality

Location 1: Elko County, NV	
Township/Range/Section	T35 N R56 E S1
UTM zone	N
UTM northing	4533617
UTM easting	616809
Latitude	40° 56′ 43″
Longitude	115° 36′ 44″
General legal description	N½ Along Coal Mine Creek floodplain, north of I-80 at Rydon, Elko County, Nevada. This site also occurs in Eureka, Humboldt, Lander, and Pershing counties, Nevada.

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Contributors

CP/GKB

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)	Patti Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	12/17/2009
Approved by	PNovak-Echenique
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are none.

2. **Presence of water flow patterns:** Water flow patterns are none to slight.

3. **Number and height of erosional pedestals or terracettes:** None

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground ± 35%.

5. **Number of gullies and erosion associated with gullies:** Gullies are none to rare.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage of grasses and annual & perennial forbs) only expected to move during periods of flooding by adjacent streams. Persistent litter (large woody material) will remain in place except during major flooding events.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values will range from 4 to 6. (To be field tested.)

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

surface structure is platy, prismatic, or massive. Soil surface colors are light and soils have ochric epipedons. Organic matter can range from 2 to 3.5 percent for much of the upper 20 inches. (OM values derived from lab characterization data.)

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial herbaceous bunchgrasses (basin wildrye) slow runoff and increase infiltration. Tall stature and relatively coarse foliage of basin wildrye and associated litter break raindrop impact and provide opportunity for snow catch and moisture accumulation on site.

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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):** Compacted layers are not typical. Platy, prismatic, angular blocky, or massive subsurface layers are not to be interpreted as compaction.

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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: Tall-statured, deep-rooted, cool season, perennial bunchgrasses (basin wildrye)

    Sub-dominant: rhizomatous grasses > tall shrubs > shallow-rooted, cool season, perennial grasses and grass-like plants > deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, perennial forbs

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 25% of total woody canopy.

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14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (± 35%) and depth of litter <1 inch.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (through mid-June) ± 1100 lbs/ac; Winter and spring moisture significantly affect total 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:** Increasers include rubber rabbitbrush. Invaders include annual mustards, annual kochia, bassia, povertyweed, thistle, pigweed, salt cedar, and tall whitetop (perennial pepperweed).

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years.