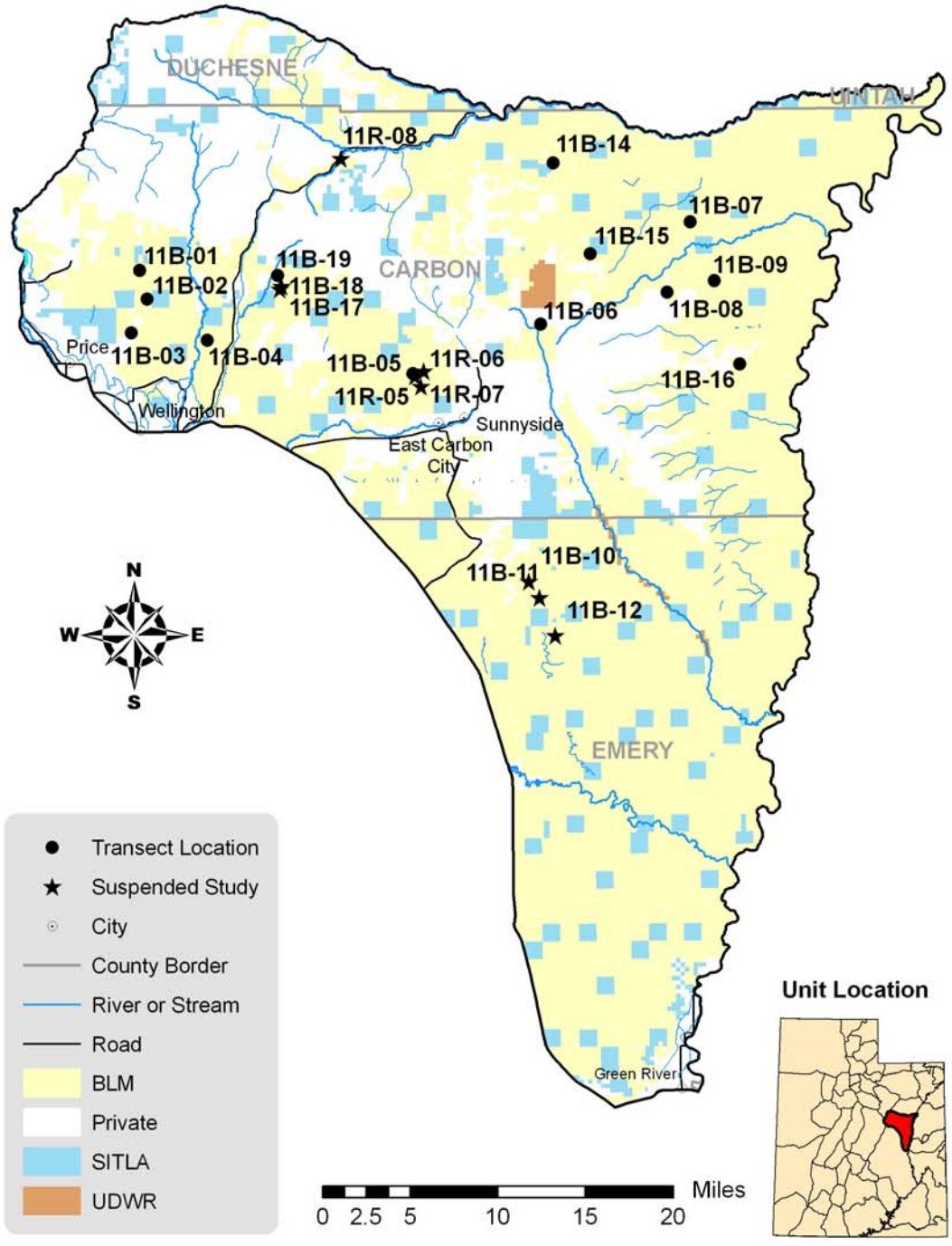
Management Unit 11B



WILDLIFE MANAGEMENT UNIT 11B - NINE MILE, RANGE CREEK

Boundary Description

Carbon, Duchesne and Emery counties - Boundary begins in Green River and Interstate 70; then west on I-70 to highway US-6; northwest on US-6 to Highway US-191; northeast on US-191 to the Argyle Canyon road; southeast on the Argyle Canyon road to the Nine-mile Canyon road; east on the Nine-Mile Canyon road to its end near Bull Canyon; then continuing along Nine-Mile Creek to the Green River; south along the Green River to I-70 and beginning point.

Management Unit Description

The Nine Mile, Range Creek unit contains the eastern portion of Carbon County, the northeastern part of Emery County, and a small piece of southern Duchesne County. This triangular unit encompasses the West Tavaputs Plateau, bounded by the Book Cliffs and Soldier Canyon on the west, the Price River-Duchesne River drainage divide on the north and Green River on the east. Topography is steep and rough. The major drainages are Nine-Mile Creek, which drains Minnie Maude, Dry, Argyle, Cow and Harmon Canyons into the Green River; Range Creek, which drains the east side; Pace, Whitmore and Horse Canyons. Elevation ranges from 4,064 feet at Green River to 10,285 feet on Bruin Point. Communities within the unit include Helper, Price, Wellington, Sunnyside, East Carbon, and Green River. Major activities in the area include mining and grazing.

There is an estimated 881,000 acres classified as deer range on Unit 11B with 62% classified as winter range, 24% as summer range and 14% as year-long range. Bureau of Land Management (BLM) managed land comprises 61% of this range, Utah State Institutional Trust Lands (SITLA) comprises 9% and private land comprises 30% of the range. There is approximately 713,600 acres classified as elk range on Unit 11B with 43% classified as winter range, 23% as summer range and 35% as year-long range. Of the elk range, 59% is administered by the BLM, 9% by SITLA, 1% by the Division of Wildlife Resources (DWR) and 31% is on private land. The unit presents several challenges to public land and wildlife managers. Since a majority of the summer range is private land, hunting access is limited. Some of the ranches are privately managed for trophy hunting.

Normal winter range below the 8,500 foot elevation completely encompasses the summer range. Severe winter range is limited to areas below 7,000 feet. On the east side of the unit, steep bare slopes limit use to the ridge tops and canyon bottoms along lower Nine-Mile Creek and the Green River. During severe winters, all deer wintering in these areas are forced into the canyon bottoms, usually causing heavy winter losses. Along the west side of the unit, from Soldier Creek Canyon east to Horse Canyon, access to the winter range is good. However, from Horse Canyon south, the Roan and Book Cliffs drop off sharply presenting major obstacles to deer migration and preventing use of much of the lower elevation range. Winter concentration areas include: Nine-Mile Creek, Rock House Cow Camp area, Cedar Ridge, Argyle Canyon, and Little Park.

Range Trend Studies

Thirteen interagency range trend studies were sampled on Unit 11B in the summer of 2010. Nine of the studies were established in 1986 with regular monitoring through 2010. Of these studies, three studies [Deadman (11B-1), Airport Bench (11B-2) and 'B' Canyon (11B-5)] sample chained and seeded pinyon-juniper communities. Deadman was retreated with a bullhog and seeding treatment in 2007. Two studies [Coal Creek (11B-4) and Cottonwood (11B-7)] sample Wyoming big sagebrush communities, one study [Airport (11B-3)] samples a chained and seeded Wyoming big sagebrush community, one study [Upper Cottonwood Ridge (11B-6)] samples a high elevation, dry meadow, one study [Cedar Corral (11B-8)] samples a pinyon-juniper community and one study [Cedar Ridge (11B-9)] samples a black sagebrush community. Three further studies were established in 1994 with two of these studies [Twin Hollow (11B-15) and Steer Ridge (11B-16)] sampling mountain brush communities and one study [Prickly Pear (11B-14)] sampling a

chained pinyon-juniper community. There was a special study [Dugout Creek PJ Chained (11B-19)] that was established in 1997 and read as a regular trend study since 2005, which samples a chained pinyon-juniper community. There are nine studies on Unit 11B that have been suspended for various reasons and were not sampled in 2010. For further information on suspended studies, refer to past reports at http://wildlife.utah.gov/range/.

SUMMARY
WILDLIFE MANAGEMENT UNIT 11B - NINE MILE, RANGE CREEK

Community Types

Deer winter range within a unit is summarized into three categories based on ecological potentials which inlude low potential, mid-level potential and high potential. Low potential sites include desert shrub, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and cliffrose (*Cowania mexicana* ssp. *stansburiana*) communities. Mid-level potential sites include mountain big sagebrush (*A. tridentata* ssp. *vaseyana*) communities. High potential sites include mountain brush communities. Black sagebrush (*A. nova*) and basin big sagebrush (*A. tridentata* ssp. *tridentata*) communities are placed within the low potential or mid-level potential scales based on precipitation and elevation. Deer summer range is summarized separately from winter range as a fourth category and typically includes aspen (*Populus tremuloides*) and high elevation mountain brush or meadow communities. Thirteen interagency range trend studies were sampled in Unit 11B during the summer of 2010. Four of the studies [Cedar Corral (11B-8), Cedar Ridge (11B-9), Prickly Pear (11B-14) and Steer Ridge (11B-16)] are categorized as mid-level potential sites for deer winter range and sample communities with a mixture of mountain big sagebrush and other mixed mountain brush. The Cedar Ridge study is dominated by black sagebrush with a small component of mountain big sagebrush and other mountain brush. All four of these studies are also considered to be elk winter range. Seven of the studies [Deadman (11B-1), Airport Bench (11B-2), Airport (11B-3), Coal Creek (11B-4), 'B' Canyon (11B-5), Cottonwood (11B-7) and Dugout Creek PJ Chaining (11B-19)] are classified as low potential deer winter

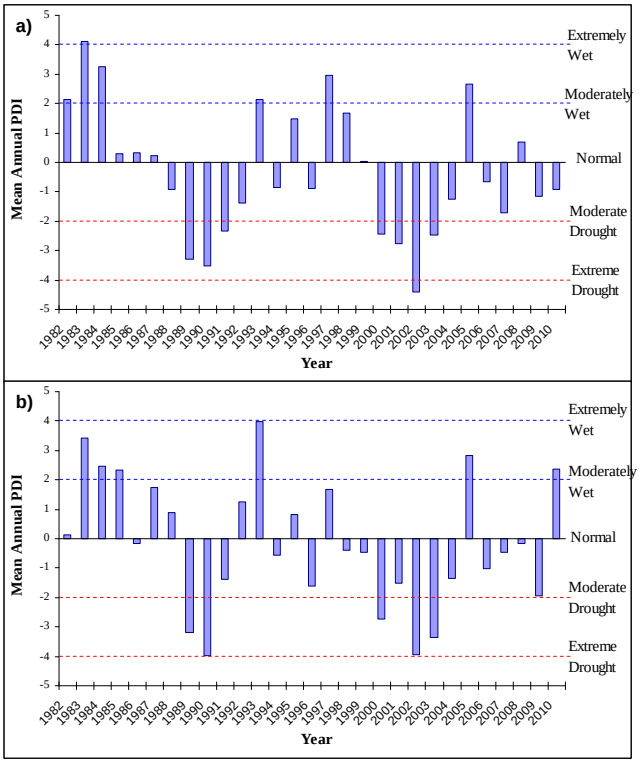


Figure 1. a) The 29 year mean annual Palmer Drought Severity Index (PDSI) for the Uinta Basin (Division 6). **b)** The 29 year mean annual PDSI for the Southeast Division (Division 7). The PDSI is based on climate data gathered from 1895 to 2010. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤-4.0 = Extreme Drought (Time Series Data 2011).

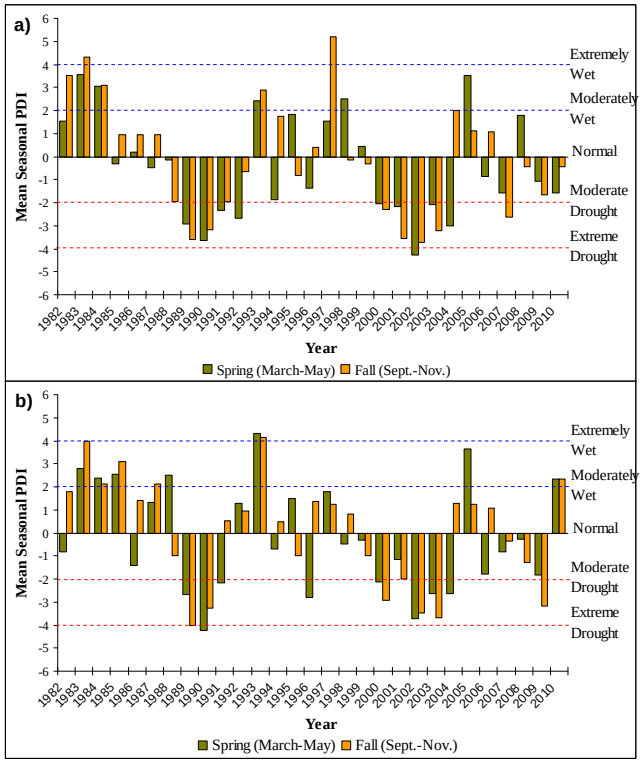


Figure 2. a) The 29 year mean spring (March-May) and fall (Sept.-Nov.) Palmer Drought Severity Index (PDSI) for the Uinta Basin (Division 6). **b)** The 29 year mean spring (March-May) and fall (Sept.-Nov.) PDSI for the Southeast Division (Division 7). The PDSI is based on climate data gathered from 1895 to 2010. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤-4.0 = Extreme Drought (Time Series Data 2011).

range sites and sample a mixture of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) communities, and Wyoming big sagebrush communities. The 'B' Canyon and Dugout Creek PJ Chaining studies are also considered to be year-long elk range and the Cottonwood study is considered to be elk winter range. Only one of the range trend studies in the unit [Twin Hollow (11B-15)] was categorized as a high potential site for deer winter range, and one study [Upper Cottonwood Ridge (11B-6)] is categorized as summer range. Because each of these categories has only one study, they are not included in this summary. For further information on these studies, refer to the discussion section.

Precipitation

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Precipitation and Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the Uintah Basin (Division 6) and the Southeast (Division 7) Divisions. The Upper Cottonwood Ridge, Cottonwood, Cedar Corral, Cedar Ridge, Prickly Pear, Twin Hollow and Steer Ridge studies fall within the Uintah Basin, while the Deadman, Airport Bench, Airport, Coal Creek, 'B' Canyon and Dugout Creek PJ Chaining studies are within the Southeast Division. The Uintah Basin and Southeast Divisions had historic annual mean precipitation of 7.99 inches and 9.07 inches, respectively, from 1895 to 2010. Over the course of the study years in Unit 11B, the mean annual PDSI of both of the Divisions display several periods of prolonged drought. Moderate to extreme wet years in the Uintah Basin included 1982-1984, 1993, 1997 and 2005, and moderate to extreme drought years included 1989-1991 and 2000-2003 (Figure 1a and Figure 2a). Moderate to extreme wet years in the Southeast Division included 1983-1985, 1993, 2005 and 2010, and moderate to extreme drought years included 1989-1990, 2000, 2002-2003 and 2009 (Figure 1b and Figure 2b) (Time Series Data 2011).

Mountain Big Sagebrush Communities
(Mid-Level Potential Winter Range)

Browse: The mid-level potential cumulative median browse trend had a slight increase in 1994 and increased further in 2010 (Figure 8a). The browse composition on the studies is primarily a mixture of mountain big sagebrush and a mixture of other mountain brush species. The Cedar Ridge study is dominated by black sagebrush with a limited component of other browse species. The prevalent browse species on the Prickly Pear study is true mountain mahogany (*Cercocarpus montanus*), but browse is fairly limited on this study. Bitterbrush (*Purshia tridentata*) is a co-dominant browse species with mountain big sagebrush in cover on the Steer Ridge study. Serviceberry (*Amelanchier utahensis*) is also common on the Cedar Corral and Steer Ridge studies, but was not included in this summary. The density of mountain big sagebrush is moderate on the studies and the mean density increased significantly in 2010 (Figure 4a). This increase in sagebrush the mean density was due to a substantial increase in the recruitment of young plants on the Steer Ridge study. Density of mountain big sagebrush remained similar on the other studies in 2010. The mean cover of mountain big sagebrush was significantly high in 2000 and 2010 (Figure 4b). The mean decadence of mountain big sagebrush has been fairly low, though decadence was significantly higher in 2000 and 2005 at more moderate levels (Figure 4c). Black sagebrush was sampled on only two studies, Cedar Corral and Cedar Ridge. Density of black sagebrush is high on these studies, especially on the Cedar Ridge study. The mean density was significantly lower in 2005 than the other sample years (Figure 4a) and the mean decadence was significantly higher in 2005 (Figure 4c). Despite this, the mean cover of black sagebrush was higher in 2005 than in the other sample years (Figure 4b). True mountain mahogany is also sampled on only two studies, Cedar Corral and Prickly Pear. Density and cover of mahogany is low on these sites, but cover of mahogany has steadily increased on the Prickly Pear study. There was a significant increase in the mean cover of mahogany in 2000, but cover remained low (Figure 4b).

Herbaceous Understory: There was a general downward trend in the mid-level potential median cumulative grass trend since 1986 (Figure 8a). Grasses within most of these communities are diverse, but only moderatly abundant with the exception of the Steer Ridge study which has high cover of perennial grasses. The annual species cheatgrass (*Bromus tectorum*) is present, but is not overly abundant on any of the study sites. The

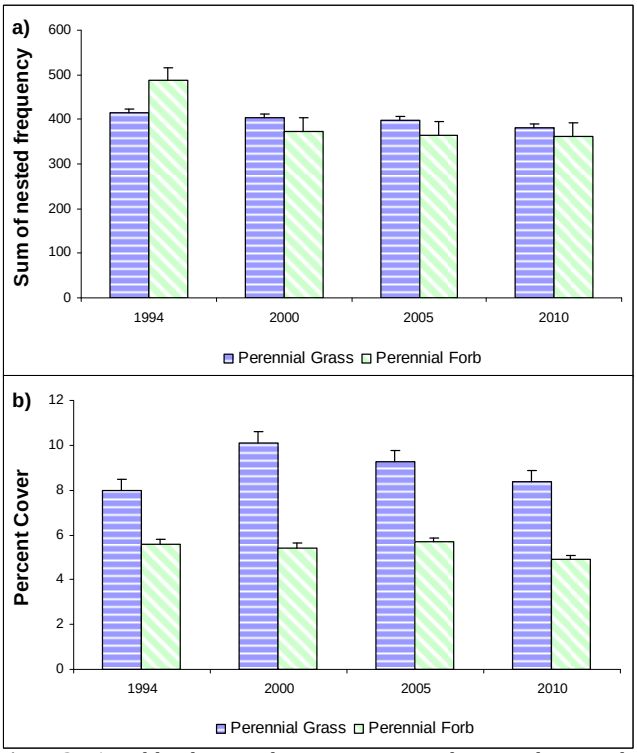


Figure 3. a) Mid-level potential sites mean perennial grass and perennial forb sum of nested frequency (n=4) by year for WMU 11B, Nine Mile, Range Creek. **b)** Mid-level potential sites mean perennial grass, perennial forb and cheatgrass cover (n=4) by year for WMU 11B.

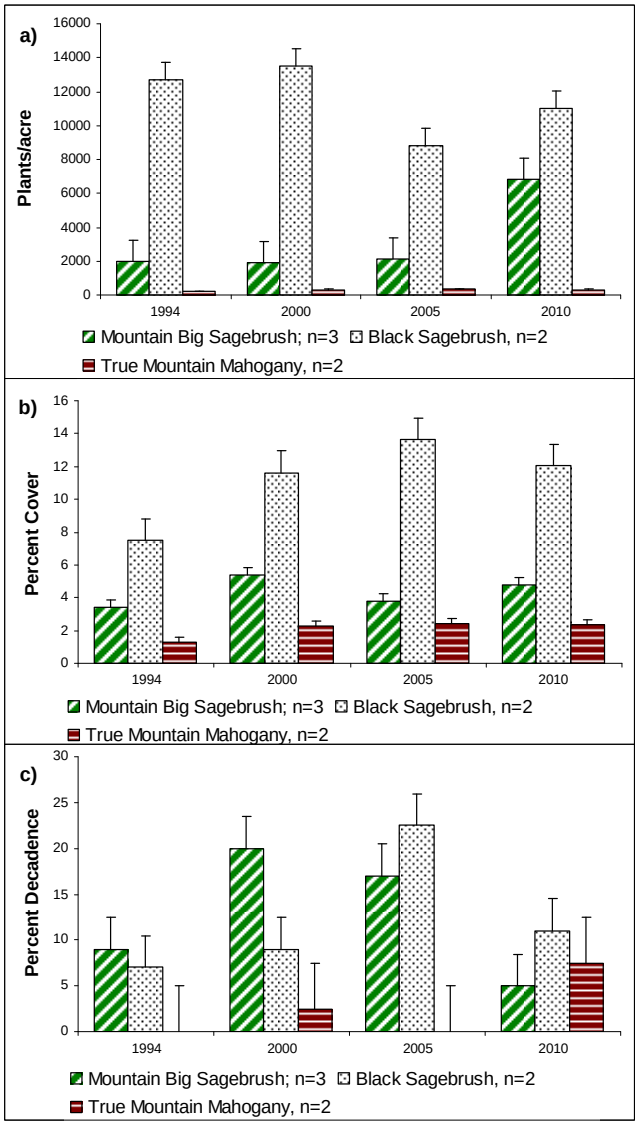


Figure 4. a) Mid-level potential sites mean density of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), blacks agebrush (*A. nova*) and true mountain mahogany (*Cercocarpus montanus*) by year for WMU 11B, Nine Mile, Range Creek. **b)** Mid-level potential sites mean cover of mountain big sagebrush, black sagebrush and true mountain mahogany by year for WMU 11B. **c)** Mid-level potential sites mean population decadence of mountain big sagebrush, black sagebrush and true mountain mahogany by year for WMU 11B.

mean sum of nested frequency of perennial grasses has remained similar throughout the sample years (Figure 3a). Mean cover of perennial grasses increased significantly in 2000, but has steadily decreased with each subsequent sample year (Figure 3b).

The mid-level potential median cumulative forb trend for the unit decreased in 1994, but has remained relatively stable in the other sample years (Figure 8a). Perennial forbs are also diverse within the sampled communities, and are typically nearly as abundant as perennial grasses. The mean sum of nested frequency of perennial forbs was higher than perennial grasses in 1994, but decreased significantly in 2000 and remained lower throughout the remained sample years (Figure 3a). Cover of perennial forbs was similar throughout the course of the study (Figure 3b).

Utilization: Pellet group transect data indicates that elk predominantly use these areas, with the highest elk use sampled on the Steer Ridge study. The mean elk days use/acre on the unit has been mostly moderate with a large decrease in 2010. The mean deer days use/acre has been mostly light, but there was a large increase in use in 2010. Cattle use appears to be minimal on these studies (Figure 9a). Use by horses has also been sampled at light rates on all of the studies.

Deer Desirable Components Index (DCI): The mid-level potential deer DCI has slightly, but steadily, increased during each sample year. Much of the increase is due to increases in recruitment of young preferred browse species. The ranking of the DCI has been fair to fair-good throughout the sample years (Table 1 and Figure 7).

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
94	13.9	9.7	7.1	16.0	0.0	8.7	0.0	**55.5**	Fair
97/00	20.0	8.6	4.5	17.9	0.0	8.7	0.0	**59.6**	Fair
05	20.8	8.5	6.9	17.1	-0.3	9.4	0.0	**62.4**	Fair
10	20.1	9.8	10.4	16.3	-0.1	8.7	0.0	**65.2**	Fair-Good

Table 1. Mid-level potential scale mean deer DCI scores (n=4) by year for WMU 11B, Nine Mile, Range Creek. The deer DCI scores are divided into three categories based on ecological potentials which inlude low, mid-level and high.

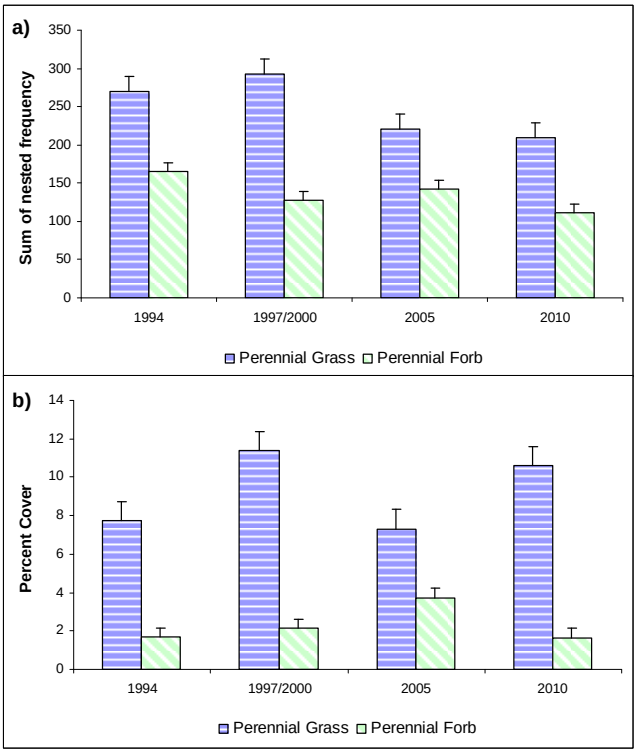


Figure 5. a) Low potential sites mean perennial grass and perennial forb sum of nested frequency (n=7) by year for WMU 11B, Nine Mile, Range Creek. **b)** Low potential sites mean perennial grass and perennial forb cover (n=7) by year for WMU 11B.

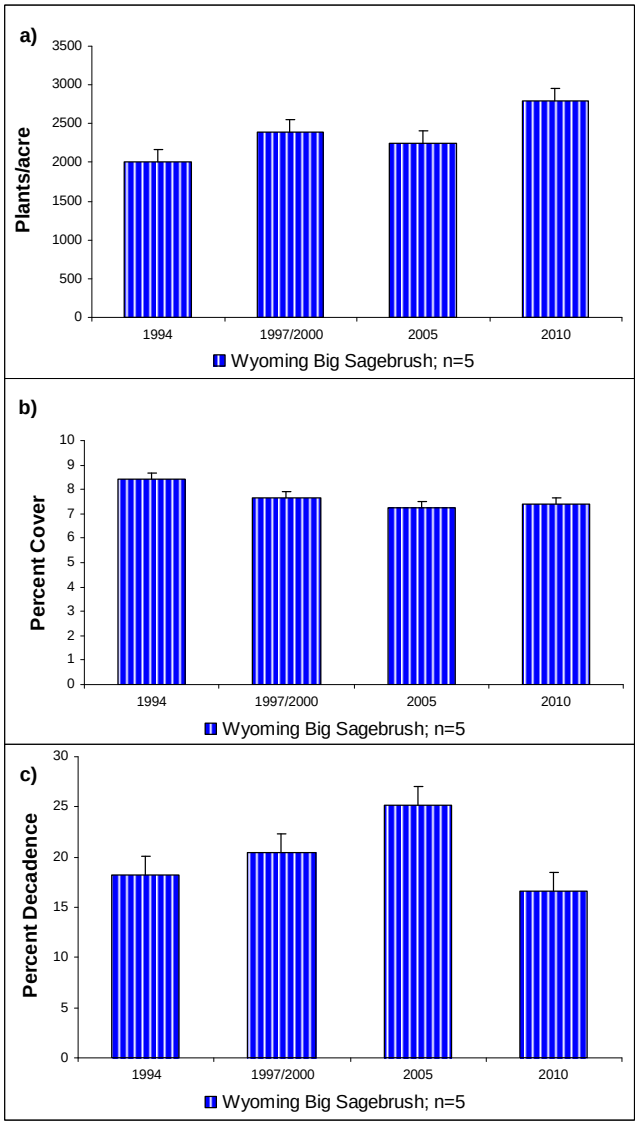


Figure 6. a) Low potential sites mean density of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) by year for WMU 11B, Nine Mile, Range Creek. **b)** Low potential sites mean cover of Wyoming big sagebrush by year for WMU 11B. **c)** Low potential sites mean population decadence of Wyoming big sagebrush by year for WMU 11B.

Wyoming Big Sagebrush Communities (Low Potential Winter Range)

Browse: The low potential studies cumulative median browse trend decreased slightly in 1997/2000, but increased again in 2010 (Figure 8b). Browse species are not common on the Deadman, Airport and 'B' Canyon studies. The Deadman study was dominated by pinyon pine and Utah juniper and then treated by a bullhog and seeding in the fall of 2007 and the 'B' Canyon study burned in a wildfire during the summer of 1996. Wyoming big sagebrush is the dominant browse species on all of the other low potential studies except for the Dugout Creek PJ Chaining, which is dominated by black sagebrush. Only Wyoming big sagebrush is summarized for this unit. For further information on the trend of black sagebrush refer to the Dugout Creek PJ Chaining discussion. The mean

density of Wyoming big sagebrush has increased since 1994 with significant increases in 1997/2000 and 2010 (Figure 6a). Despite the increases in density, mean cover decreased slightly, but significantly, in 1997/2000 and remained lower throughout the remaining sample years. Mean decadence of Wyoming big sagebrush has been moderate over the unit and was significantly higher in 2005 than the other sample years (Figure 6c).

Herbaceous Understory: The low potential median cumulative grass trend increased in 1997/2000 and remained stable throughout the subsequent sample years (Figure 8b). Grasses within these communities are not particularly diverse and are typically dominated by one species. The annual species cheatgrass (*Bromus tectorum*) was sampled on several of the studies, but is not prevalent on the sites. The mean sum of nested frequency of perennial grasses decreased significantly in 2005 and remained lower in 2010 (Figure 5a). The mean cover of perennial grasses also decreased significantly in 2005, but increased significantly in 2010, returning to 1997/2000 levels (Figure 5b).

The low potential median cumulative forb trend decreased slightly in 1997/2000, but decreased further in 2010 (Figure 8b). Perennial forbs are diverse and fairly abundant within most of the sampled communities, though perennial forbs are limited on the Coal Creek and 'B' Canyon studies. The mean sum of nested frequency of perennial forbs decreased significantly in 1997/2000 and remained lower over the remaining sample years (Figure 5a). The mean perennial forb cover was significantly higher in 2005 than the other sample years (Figure 5b).

Utilization: Pellet group transect data indicates that deer predominantly use these study areas. The mean deer days use/acre on the unit has been moderately light over the course of the study years with the highest use occurring in 2005. The mean elk days use/acre has been mostly light on the sites, with a slight increase in use in 2010. Cattle use also appears to be light on the studies (Figure 9b).

Deer Desirable Components Index (DCI): The low potential deer DCI remained fairly stable over the sample years with a ranking of fair throughout the sample years (Table 2 and Figure 7).

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
94	10.0	3.9	1.0	15.3	0.0	3.1	0.0	**33.3**	Fair
00	7.9	2.0	4.5	19.9	0.0	4.1	0.0	**38.3**	Fair
05	9.0	3.0	4.2	14.0	0.0	6.2	0.0	**36.3**	Fair
10	8.3	5.2	7.4	16.5	0.0	3.3	0.0	**40.8**	Fair

Table 2. Low potential scale mean deer DCI scores (n=7) by year for WMU 11B, Nine Mile, Range Creek. The deer DCI scores are divided into three categories based on ecological potentials which inlude low, mid-level and high.

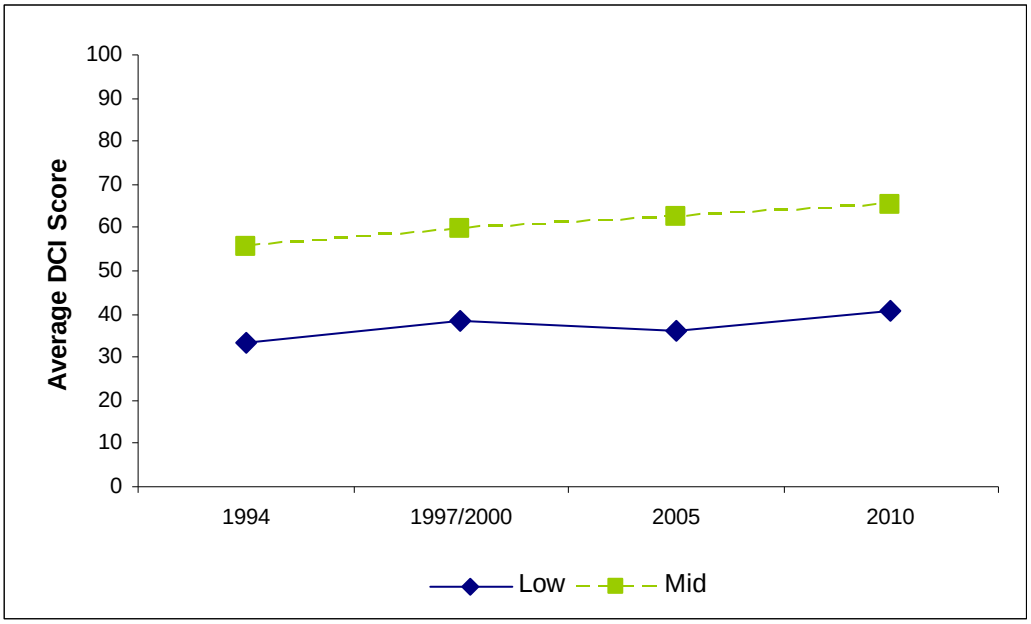


Figure 7. Mean low (n=7) and mid-level (n=4) potential scale deer DCI scores by year for WMU 11B, Nine Mile, Range Creek. The deer DCI scores are divided into three categories based on ecological potentials which inlude low, mid-level and high. For further information on the DCI for the only high potential study, refer to the Twin Hollow (11B-15) discussion section.

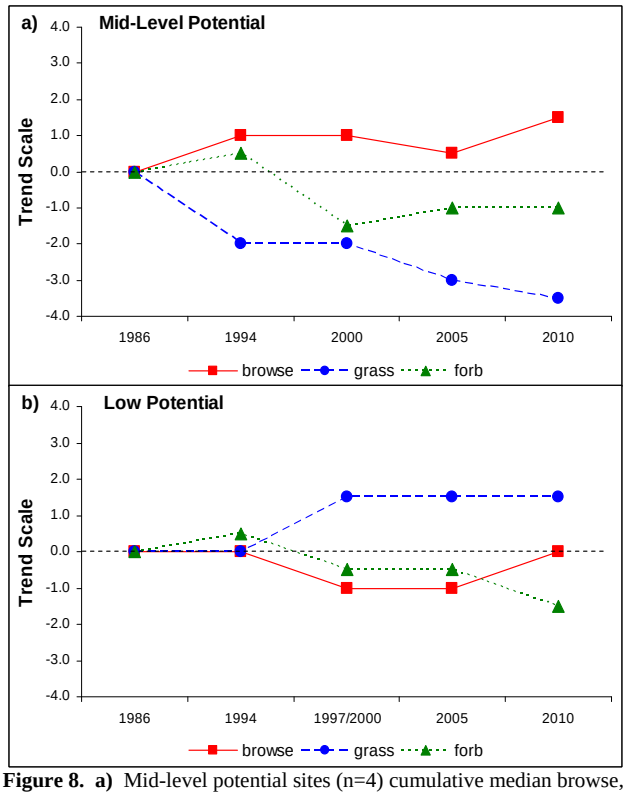


Figure 8. a) Mid-level potential sites (n=4) cumulative median browse, grass and forb trends by year for WMU 11B, Nine Mile, Range Creek. **b)** Low potential sites (n=7) cumulative median browse, grass and forb trends by year for WMU 11B. For further information on trends for the only high potential study, refer to the Twin Hollow (11B-15) discussion section.

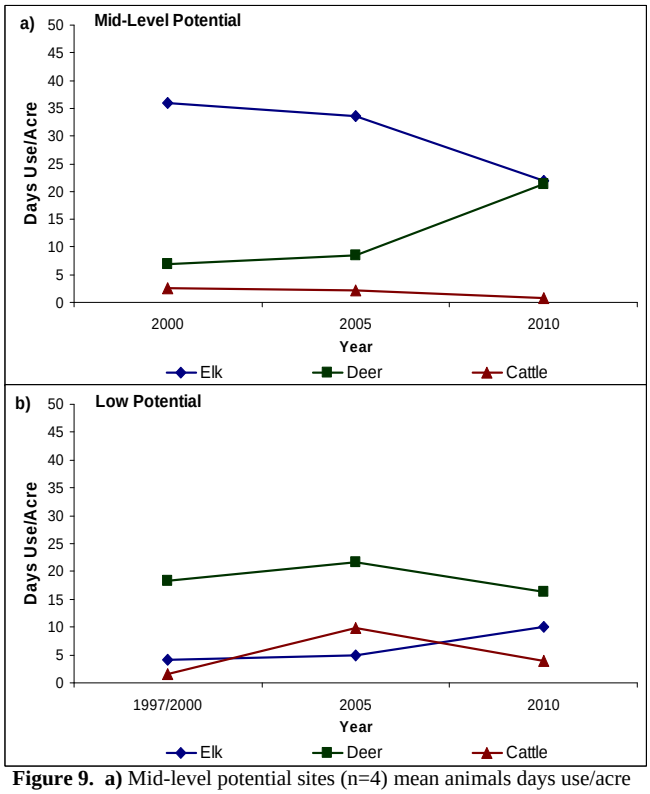


Figure 9. a) Mid-level potential sites (n=4) mean animals days use/acre by year for WMU 11B, Nine Mile, Range Creek. **b)** Low potential sites (n=7) mean animal days use/acre by year for WMU 11B. For further information on animal use for the only high potential study, refer to the Twin Hollow (11B-15) discussion section.