

WILDLIFE MANAGEMENT UNIT 3 - OGDEN

Boundary Description

Weber, Box Elder, Cache and Morgan counties - Boundary begins at Hyrum and SR-101; east on SR-101 to the Ant Flat Road (at Hardware Ranch); south on this road to SR-39; west and south on SR-39 to SR-167 (Trappers Loop Road); south on SR-167 to SR-30 at Mountain Green; west along SR-30 to Interstate 84; west on I-84 to Interstate 15; north on I-15 to US-91; east and north on US-91 to SR-101; east on SR-101 to Hyrum.

Management Unit Description

The Ogden Management Unit is located within Weber, Cache, Box Elder, and Morgan counties. Municipalities located within or along the unit boundaries include: Hyrum, Wellsville, Mantua, Perry, Willard, Ogden, Mountain Green and Huntsville. The major drainages are the Little Bear River, Ogden River and Box Elder Creek. Smaller drainages are Davenport Creek, Paradise Dry Canyon, Hyrum Dry Canyon, Hyrum Green Canyon, Perry Canyon and Willard Canyon. The topography is steep and rough on the western face of the Wasatch Mountains above Willard, Perry, Ogden, east of Avon and Paradise, and more gentle in-between. Elevation ranges from 4,400 feet near Willard to 9,764 feet on Willard Peak. According to the most recent Utah Big Game Management Plan (2006) for the unit, there is approximately 139,907 acres of deer winter range in the unit. Summer range totals 198,069 acres. A majority of the winter range (80%) and summer range (70%) is on private land. The U.S. Forest Service administers 10% of the summer range and 9% of the winter range. The Division of Wildlife Resources maintains 15% of the deer summer range and 11% of the winter range on the unit.

Major deer wintering areas are found between 4,600 feet and 7,000 feet on the Wasatch face above Willard and Perry; between 5,100 to 7,000 feet north and east of Mantua Reservoir; from 5,600 to 7,000 feet in Threemile Canyon; and between 5,400 and 7,000 feet along the slopes on the southeast side of Cache Valley above Paradise and Avon. During severe winters, snow restricts deer use to Threemile Canyon, the East Fork of the Little Bear River, the area south of Porcupine Reservoir, Paradise Dry Canyon, Hyrum Dry Canyon, Perry Canyon and the southeast corner of the unit south of Willard (King and Muir 1971).

Range Trend Studies

Six interagency range trend studies were sampled in Unit 3 during the summer of 2011. A total of nineteen studies have been established within Unit 3. Fourteen studies were established in 1984, and of these studies six studies [Northeast Mantua (3-2), Clay Valley (3-3), Anderson Ranch (3-4), Cook canyon (3-9), Hyrum Canyon (3-10), Porcupine Dam, and Perry Basin (3-13)] sample mountain big sagebrush communities; two studies [Threemile Canyon (3-12) and Brigham Face (3-19)] sample antelope bitterbrush communities; one study [East Mantua (3-1)] samples a juniper community; one study [Mathias Canyon (3-5)] samples a smooth sumac community; two studies [White's Orchard (3-6) and Facer Canyon (3-8)] sample basin big sagebrush communities; and one study [Mouth of Pearson's Canyon (3-7)] samples a perennial grass community. Five studies were established in 1985, and of these studies one study [Middle Fork (3-17)] samples a low sagebrush community; two studies [Geertsen Canyon (3-18) and Maple Canyon (3-16)] sample mountain big sagebrush communities; one study [Uintah Junction (3-14)] samples a Gamble oak community; and one study [Ogden Canyon (3-15)] samples a rabbitbrush community.

In 1990, one study (East Mantua) was suspended. In 1996, ten studies (Mathias Canyon, Mouth of Pearson's Canyon, Facer Canyon, Hyrum Canyon, Porcupine Dam, Perry basin, Uintah Junction, Ogden Canyon, Maple Canyon, and Brigham Face) were suspended. In 2001, two studies (White's Orchard and Cook Canyon) were suspended. These sites were suspended for various reasons and if the need arises in the future these studies can be sampled again. To access maps, discussions, and data tables for suspended studies see:

<http://www.wildlife.utah.gov/range>.

SUMMARY WILDLIFE MANAGEMENT UNIT 3 - OGDEN

Community Types

Deer winter range within a unit is summarized into three categories based on ecological potentials which include **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. Low sagebrush (*A. arbuscula*), 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 communities. Six interagency range trend studies were sampled in Unit 3 during the summer of 2011. All six of the studies [Northeast Mantua Reservoir (3-2), Clay Valley (3-3), Anderson Ranch (3-4), Threemile Canyon (3-12), Middle Fork (3-17), and Geertsen Canyon (3-18)] are categorized as mid-level potential sites for deer winter range, and sample mountain big sagebrush, antelope bitterbrush (*Purshia tridentata*), or black sagebrush communities. All of the studies are categorized as crucial deer and elk winter range.

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 Northern Mountains (Division 5). Western Utah had a historic annual mean precipitation of 19.16 inches from 1895 to 2011. The mean annual PDSI of the Northern Mountains displays a cycle of several wet years followed by several drought years, over the course of study years in the unit. Over the course of the study, wetter than normal years in the Northern Mountains included 1982-1986, 1993, 1995-1999, 2005, and 2011. Drought years included 1987-1992, 2000-2003 and 2007 (Figure 1 and Figure 2) (Time Series Data 2012). The 1961-1990 mean annual precipitation range was 18-20 in. on the Anderson Ranch study; 28-32 in. on the Northeast Mantua Reservoir study; 32-36 in. on the Clay Valley, Three Mile Canyon, and Geertsen Canyon studies; and 36-40 in. on the Middle Fork study (PRISM Climate Group 2011).

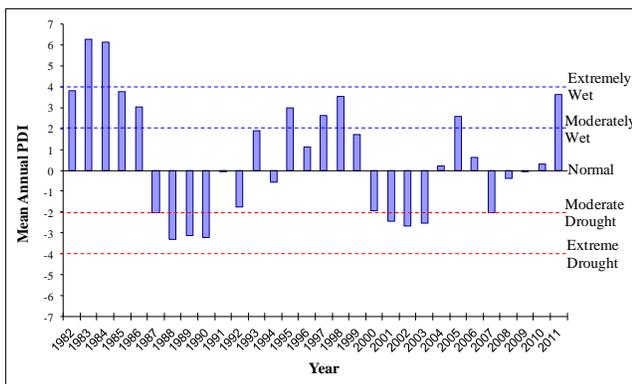


Figure 1. The 30 year mean annual Palmer Drought Severity Index (PDSI) for the Northern Mountains (Division 5). The PDSI is based on climate data gathered from 1895 to 2011. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = 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 -0.9 = 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 2012).

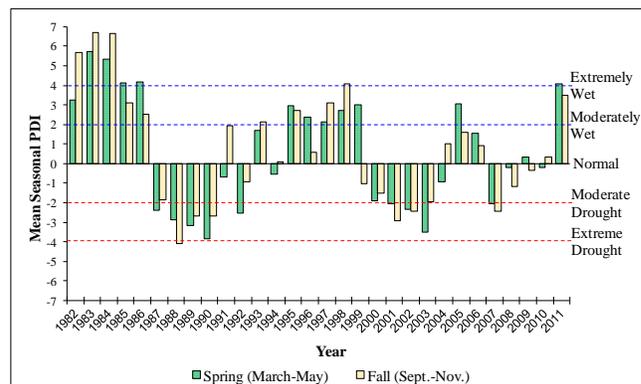


Figure 2. The 30 year mean spring (March-May) and fall (Sept.-Nov.) Palmer Drought Severity Index (PDSI) for the Northern Mountains (Division 5). The PDSI is based on climate data gathered from 1895 to 2011. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = 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 -0.9 = 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 2012).

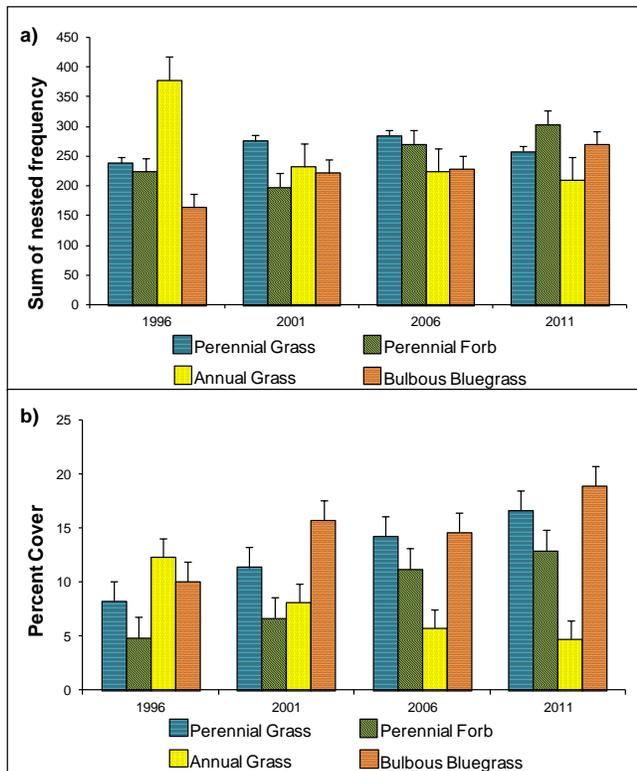


Figure 3. a) Mid-level potential sites mean perennial grass (-POBU), perennial forb, annual grass, and bulbous bluegrass (*Poa bulbosa*) sum of nested frequency by year for WMU 3, Ogden. b) Mid-level potential sites mean perennial grass (-POBU), perennial forb, annual grass, and bulbous bluegrass cover by year for WMU 3.

Mountain Big Sagebrush and Black Sagebrush Communities (Mid-Level Potential)

Browse: The mid-level potential site cumulative median browse trend for the unit has decreased since the outset of the studies in 1984. Most of the decrease in trend came in the 2006 and 2011 sample years (Figure 6). The dominant browse species on the majority of the mid-level potential studies is mountain big sagebrush. The mean density of mountain big sagebrush has steadily decreased since 1996, and was significantly lower in 2011 than in 1996 (Figure 4a). The mean cover of mountain big sagebrush decreased significantly in 2006, and remained at reduced levels in 2011 (Figure 4b). The mean decadence of mountain big sagebrush has been moderate to high, with significantly higher decadence in 2001 and 2006 than in 1996 and 2011 (Figure 4c).

Antelope bitterbrush is the dominant browse species on the Threemile Canyon study and a co-dominant browse species on the Anderson Ranch study. It also occurs in very low densities on the Northeast Mantua Reservoir and Middle Fork studies. Because it bitterbrush occurred in such low density on these two studies, they were not included in the summary for decadence. The mean bitterbrush density and cover has remained similar since 1996 (Figure 4a and Figure 4b). Mean decadence of bitterbrush was low in 1996, but has steadily increased to more moderate rates in 2011. Decadence of bitterbrush was particularly high on the Anderson Ranch study, which had been treated with an aerial application of 2,4-D in June of 2011 (Figure 4c). Low sagebrush (*Artemisia arbuscula*) is the dominant browse species on the Middle Fork study, but did not

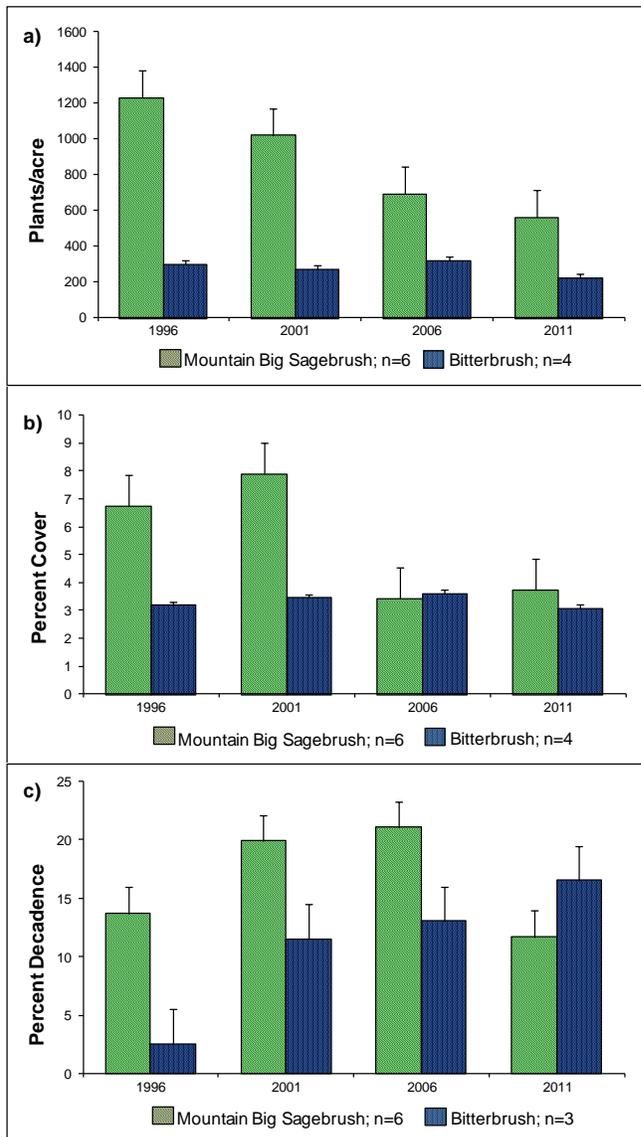


Figure 4. a) Mid-level potential sites mean density of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) by year for WMU 3, Ogden. b) Mid-level potential sites mean cover of mountain big sagebrush and antelope bitterbrush by year for WMU 3. c) Mid-level potential sites mean decadence of mountain big sagebrush and antelope bitterbrush, excluding Northeast Mantua Reservoir and Middle Fork, by year for WMU 3.

occur on any other studies in the unit. For further information on the trends of low sagebrush, refer to the discussion section for the Middle Fork study.

Herbaceous Understory: The mid-level potential median cumulative grass trend for the unit has fluctuated somewhat, but has remained fairly stable over the course of the study years. There was an increase in trend in 1990, but trend decreased again in 1996. Trend increased slightly in 2001 and 2006, but decreased slightly in 2011 (Figure 6). Grasses within these communities are typically diverse and abundant. Annual grass species, comprised primarily of cheatgrass (*Bromus tectorum*) and Japanese chess (*B. japonicus*), are common on most of the studies. The weedy perennial species bulbous bluegrass (*Poa bulbosa*) is common, and has steadily increased in mean nested frequency and cover since 1996. Mean sum of nested frequency of perennial grasses, excluding bulbous bluegrass, increased significantly in 2001, but decreased significantly again in 2011. Despite the fluctuations in the mean sum of nested frequency, mean cover of perennial grasses has steadily increased since 1996. The mean nested frequency of annual grasses decreased significantly in 2001, and mean cover has steadily decreased since 1996 (Figure 3a and Figure 3b).

The mid-level potential median cumulative forb trend for the unit decreased from 1984 to 1996, but has steadily increased from 1996 to 2011 (Figure 6). Perennial forbs are also diverse and abundant within the sampled communities, but the forb composition is often dominated by weedy or low value forage species. The mean sum of nested frequency and cover of perennial forbs has increased substantially since 1996 (Figure 3a and Figure 3b).

Browse Utilization & Animal Presence: Mountain big sagebrush plants on most of the mid-level potential studies have displayed mostly light to moderate use throughout the study years. Utilization of mountain big sagebrush was heavy on the Northeast Mantua Reservoir, Anderson Ranch, and Threemile Canyon studies at the outset of the studies in 1984, but use has been light to moderate in subsequent sample years. While prolonged heavy utilization of browse can have detrimental effects on the health of the browse community, it does not appear that animal utilization of mountain big sagebrush is a primary concern for the mid-level potential studies on this unit.

Pellet group transect data indicates that deer predominantly occupy these study areas. The mean abundance of sampled deer pellet groups on the unit has steadily decreased from high abundance use in 1996 to more moderate abundance in 2011. Deer pellet groups were sampled in the highest abundance on the Clay Valley and Anderson Ranch studies, but abundance was much lower on all of the studies except the Middle Fork study in 2011. The reduced presence was most likely due to the severe winter of 2010-2011, which likely limited access to the sites. Elk pellet groups were sampled in much lower abundance on all of the studies in this unit. Elk pellet groups were sampled in the highest abundance on the Anderson Ranch study. Livestock sign was also sampled in low abundance on the studies where it occurred (Figure 7).

Deer Desirable Components Index (DCI): The mid-level potential deer DCI has remained fairly stable since 1996, with rankings ranging from poor to poor-fair throughout the sample years. Attributes of preferred browse species have decreased slightly since 1996, but perennial grass cover has increased and annual grass cover has decreased (Table 1 and Figure 5). Bulbous bluegrass is excluded from the perennial grass cover scores.

Discussion: The decline of mountain big sagebrush populations on these important winter ranges gives reason for concern. The Northeast Mantua Reservoir, Clay Valley, and Geertsen Canyon studies have driven the pattern of mountain big sagebrush decline for mid-level potential studies on the unit. Causes of sagebrush decline are varied and multiple causes may have compounded effects on the mid-level potential studies in this unit.

Precipitation can have large impacts on the vegetation trends, and there have been several moderate drought periods since 1996 (Figure 1 and Figure 2). While lack of precipitation may have caused some stress on sagebrush plants, it does not appear to be the primary cause of the decline on the mid-level potential studies.

The abundance of weedy annual grass and forb species, and the increase of the exotic, weedy, perennial grass bulbous bluegrass are the more likely causes of sagebrush decline. These weedy species can form dense mats of cover that compete with seedling and young sagebrush plants, which limits establishment of new sagebrush plants into the population. As the sagebrush population matures, decadence increases and density decreases as old plants begin to die. Annual grass species can also increase fuel loads and increase the chance of a catastrophic fire event. Annual grass species are present on all of the mid-level potential studies, but are most prevalent on the Northeast Mantua Reservoir, Threemile Canyon, and Geertsen Canyon studies. Annual grasses have shown decreases on the Northeast Mantua Reservoir, Clay Valley, Anderson Ranch, Threemile Canyon, Middle Fork, and Geertsen Canyon studies since 1996. However, decreases in annual grasses appear to correspond with increases in the weedy species bulbous bluegrass. Bulbous bluegrass is prevalent on all of the mid-level potential studies in this unit, and has shown marked increases on the Northeast Mantua Reservoir, Anderson Ranch, and Threemile Canyon studies since 1996. There has been a slight decrease of bulbous bluegrass on the Clay Valley study.

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	14.2	10.1	7.2	15.5	-9.4	7.1	-1.3	43.3	Poor
01	16.1	8.0	4.3	21.0	-5.6	8.6	-1.0	51.4	Poor-Fair
06	11.2	6.7	3.9	23.2	-4.3	9.1	-1.3	48.4	Poor-Fair
11	10.1	7.1	3.6	23.5	-3.6	9.5	-1.3	48.9	Poor-Fair

Table 1. Mid-level potential scale mean deer DCI scores and rankings (n=6) by year for WMU 3, Ogden. The deer DCI rankings are divided into three categories based on ecological potentials which include low, mid-level and high.

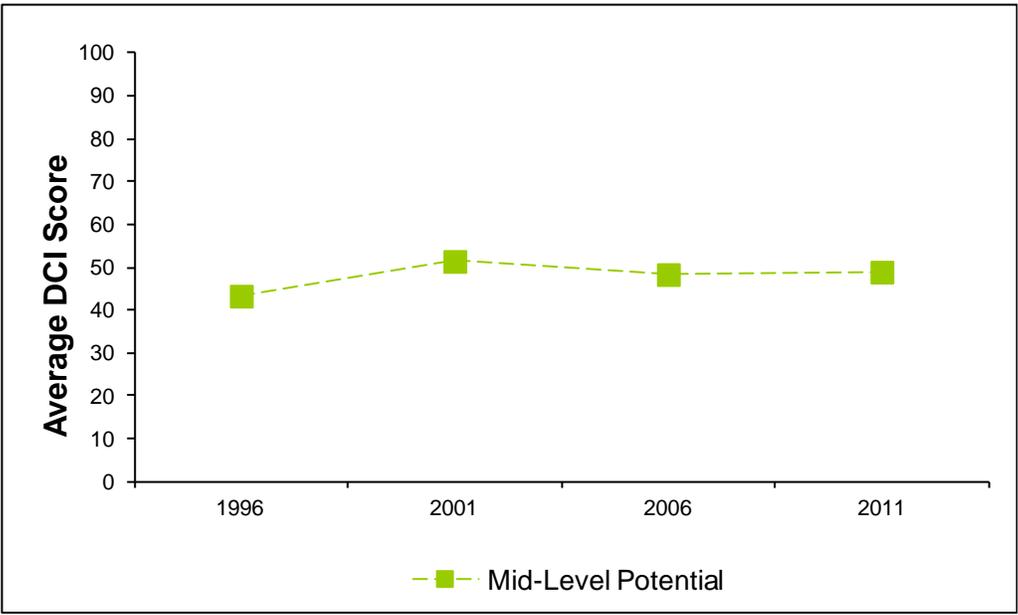


Figure 5. Mean mid-level (n=6) potential scale deer DCI scores by year for WMU 3, Ogden. The deer DCI rankings are divided into three categories based on ecological potentials which include low, mid-level and high.

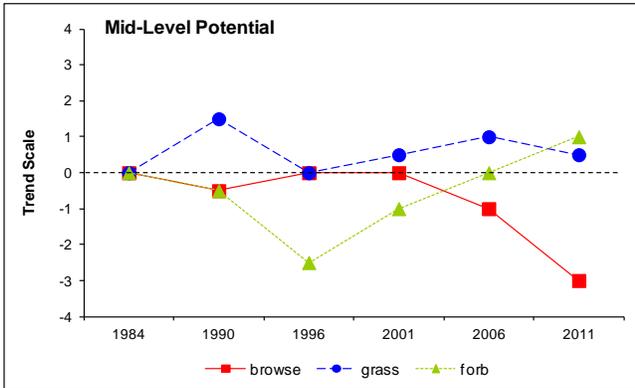


Figure 6. Mid-level potential sites cumulative median browse, grass and forb trends by year for WMU 3, Ogden.

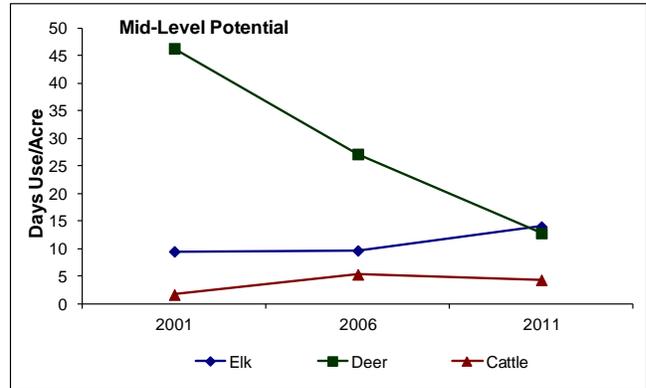


Figure 7. Mid-level potential sites mean animals days use/acre (n=6) by year for WMU 3, Ogden.