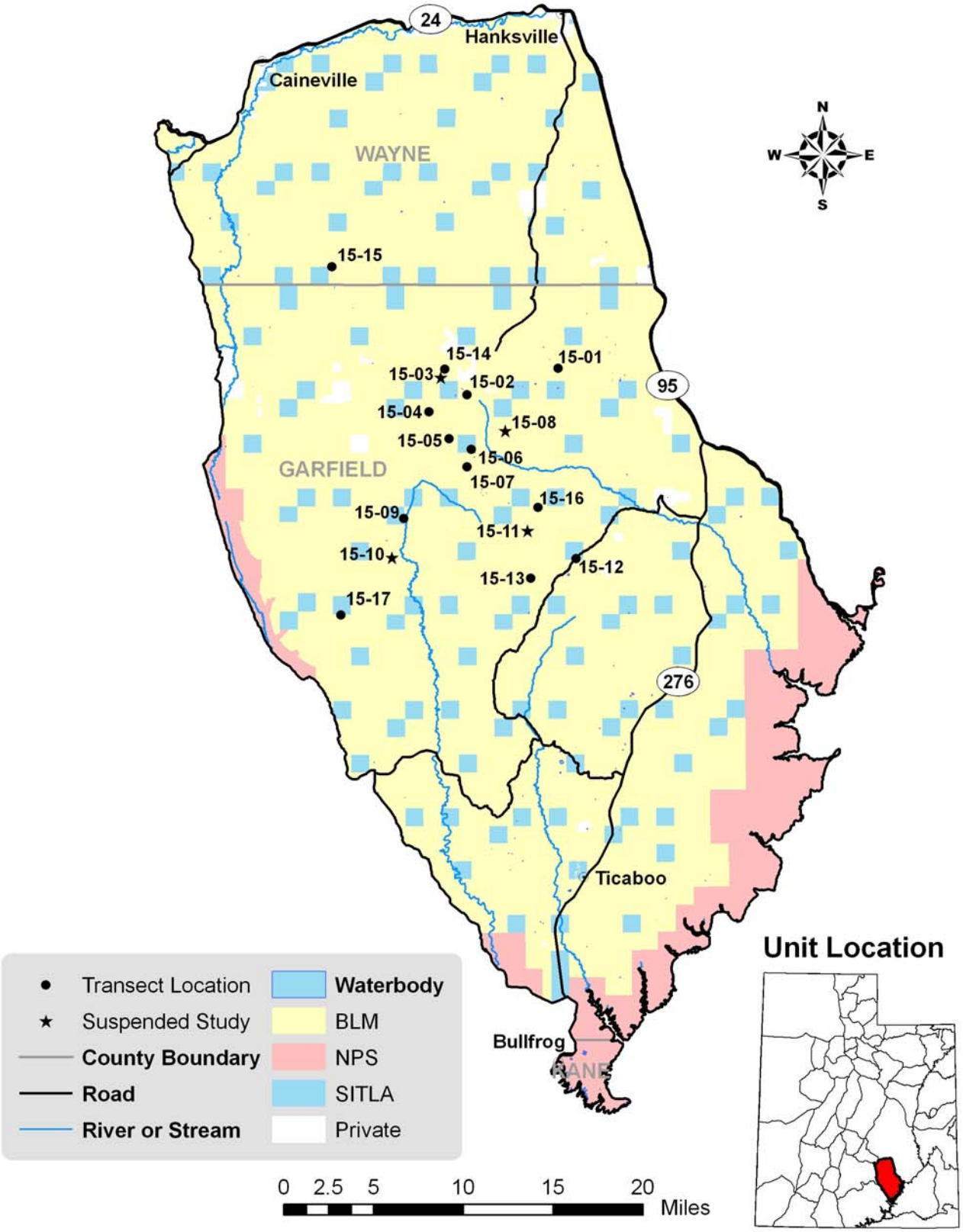
Management Unit 15



WILDLIFE MANAGEMENT UNIT 15 - HENRY MOUNTAINS

Boundary Description

Garfield and Wayne Counties - Boundary begins in Hanksville at the junction of SR-24 and SR-95; south on SR-95 to Lake Powell; south along the west shore of Lake Powell to SR-276 at Bullfrog; north along SR-276 from Bullfrog to Notom Road; north along this road to SR-24; east on SR-24 to Hanksville.

Management Unit Description

The Henry Mountains WMU 15 encompasses approximately 856,812 acres, of which 247,645 acres are considered deer winter range and 14,966 acres are considered deer summer range. The Bureau of Land Management (BLM) manages the majority of both range types comprising 88% of winter and 81% of the summer range. The remaining winter range is comprised of 10% state land and 2% private land, while the remaining summer range is comprised of 14% state land and 5% private. The Henry Mountains lie between the waterpocket fold on the west and the canyon of the Colorado River to the east. The mountain peaks are the result of vertical intrusives of igneous rock that have penetrated from a broad basin into the sedimentary strata (Stokes 1986). The majority of the mountain rises gently upward to these peaks; which are (from north to south) Mt. Ellen (11,615 feet), Mt. Pennell (11,371 feet), Mt. Hillars (10,650 feet), Mt. Holmes (7,930 feet) and Mt. Ellsworth (8,235 feet). From the base of the peaks, gentle slopes extend out into the flat mesas and rough desert canyon lands which constitute the majority of the unit’s land area.

A literature review done by Nelson (1965) on the history of ungulate use on the Henry Mountains reveals that livestock grazing began with cattle in 1878. Cattle numbers increased substantially in the 1890's. Sheep were introduced prior to 1890, but the large herds did not appear until after 1900. Livestock numbers increased sharply in response to World War I; by 1925, sheep had largely replaced cattle. All of the summer allotments, except the Pennell permittee who has taken non-use, had been converted back to cattle by the 1980’s.

Big game utilizing the mountain consists of deer and bison. Occasional reports of elk sightings would indicate that perhaps a few descendants of a 1950 transplant (15 animals) may still be on the mountain or animals are coming from the eastern side of the Boulder Mountains.

Bison obtained from Yellowstone National Park were released near Robber's Roost Ranch north of the Dirty Devil River on the San Rafael Desert in 1941 (Nelson 1965). An additional release of five bulls was made in 1942 to replace those that scattered to the north. The bison left the San Rafael Desert in 1942 and most crossed the Dirty Devil River to the south and went onto the Burr Desert. Following a roundup and testing for brucellosis in 1963, the bison shifted their winter range from the Burr Desert to the foothills on the west side of the Henry Mountains. The bison continued to use the Henry Mountains during the other seasons. Bison have increased gradually since the initial transplant and have been hunted fairly consistently since 1960 (with the exception of 1964, 1965, 1972, and 1973). According to the Bison Unit Management Plan (UDWR 2007), the post-season population was managed for 275 adult and yearling animals post-season with the goal of increasing to 325 adult and yearling bison by 2012.

Since the 1960's, approximately 6,700 acres have been converted from pinyon-juniper woodland to a more productive grass-shrub type. Treatments done in these allotments represent 80% of that done in the Resource Area. Young pinyon and juniper trees have reoccupied most of the treated areas through release and/or invasion and are beginning to impact forage production. The Bison Unit Management Plan (UDWR 2007) addresses the need to maintain these treated areas to reduce tree density. Approximately 4,300 acres have been retreated or scheduled for retreatment to remove trees. Approximately 8,300 acres are currently being proposed as new treatments. Excluded from consideration for range improvements are the several wilderness study areas that have been identified within the Bison Unit Management Plan area. In 2003, two large fires, the Lonesome Beaver and Bulldog fires, burned 36,133 acres around Mt. Ellen and Mt. Pennell.

Range Trend Studies

The key areas that were selected to be monitored are associated primarily with the pinyon-juniper chaining and revegetation treatments. The exceptions are other areas that are frequently used by bison and mule deer. The studies were located in areas where deer and/or bison "have demonstrated a definite pattern of use during normal climate conditions over a long period" (Interagency Range Trend Study Guidelines, 1983). Of the studies sampled in 2009, nine studies were initially established in 1987 [Eagle Bench (15-1), Nasty Flat (15-2), South Creek Chaining (15-4), Bates Knob (15-5), Box Springs Chaining (15-6), Airplane Spring (15-7), Cave Flat Chaining (15-9), Quaking Aspen Spring (15-12) and Sidehill Spring (15-13)], two studies were established in 2004 [Dugout Creek (15-14) and Steven's Mesa (15-15)] and two studies were established in 2009 [Coyote Spring (15-16) and Swap Mesa (15-17)]. Four studies [Dugout (15-3), Garden Basin (15-8), Cave Flat (15-10) and Above Coyote Bench (15-11)] have been suspended for various reasons and were not monitored in 2009.

SUMMARY
WILDLIFE MANAGEMENT UNIT 15 - HENRY MOUNTAINS

Community Types

There were thirteen Range Trend studies sampled in WMU 15 during the summer of 2009. Seven of the studies [Eagle Bench (15-1), South Creek Chaining (15-4), Bates Knob (15-5), Box Springs Chaining (15-6), Airplane Spring (15-7), Cave Flat Chaining (15-9) and Quaking Aspen Spring (15-12)] sampled areas that had been chained and seeded in the past to remove pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). The Quaking Aspen Spring (15-12) study burned in the Bulldog wildfire in 2003 and was subsequently reseeded. One of the new studies established in 2009, Coyote Spring (15-16), samples a pinyon and juniper community that also burned in the Bulldog fire and was seeded in 2003. All eight of the studies that sample historic pinyon and juniper communities are considered to be crucial year round bison habitat. Six of the historic pinyon and juniper sites (15-1, 15-4, 15-5, 15-9, 15-12, and 15-16) are considered to be crucial deer winter habitat, one site (15-6) is considered crucial deer spring/fall/summer habitat, and one site (15-7) is considered crucial year round deer habitat.

Two study sites [Sidehill Spring (15-13) and Dugout Creek (15-14)] sample mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) communities. The Sidehill Spring (15-13) study is considered to be crucial year round habitat for both bison and deer, while the Dugout Creek (15-14) study is considered crucial deer winter habitat. The Sidehill Spring study site burned in the 2003 Bulldog wildfire and was reseeded. Two study sites [Steven's Mesa (15-15) and Swap Mesa (15-17)] sample two desert shrub communities that are considered to be crucial year long habitat for bison and crucial winter habitat for deer. The remaining study [Nasty Flat (15-2)] samples an aspen (*Populus tremuloides*) community that is considered to be crucial year long bison habitat and crucial deer summer habitat.

Precipitation

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Precipitation data from this herd unit were compiled from the Hanksville and Capital Reef National Park weather stations (Figures 1 and 2). The units 27 year annual mean was 6.53 inches, the 28 year spring (March to May) mean was 1.51 inches, and the 27 year fall (Sept. to Nov.) mean was 1.98 inches. The unit annual precipitation was below 75% of the normal annual mean (drought conditions) in 1989, 1996, 2002, 2007, and 2008 (Figure 1). Spring precipitation was below 75% of normal in 1982, 1989, 1994, 1996, 1998, 2000, 2002, 2003, and 2008 (Figure 2). Fall precipitation was below 75% of normal in 1983, 1984, 1988, 1989, 1992, 1993, 1995, 1999, 2001, 2007, and 2008 (Figure 2) (Utah Climate Summary 2009).

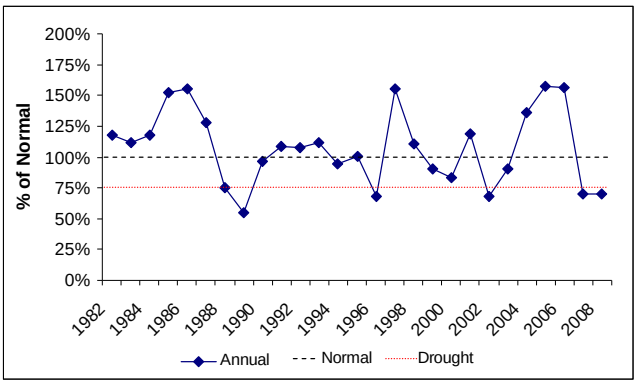


Figure 1. Percent annual precipitation based on the 27 year mean precipitation for WMU 15, Henry Mountains. Precipitation data were collected at the Hanksville and Capital Reef National Park weather stations (Utah Climate Summary 2009).

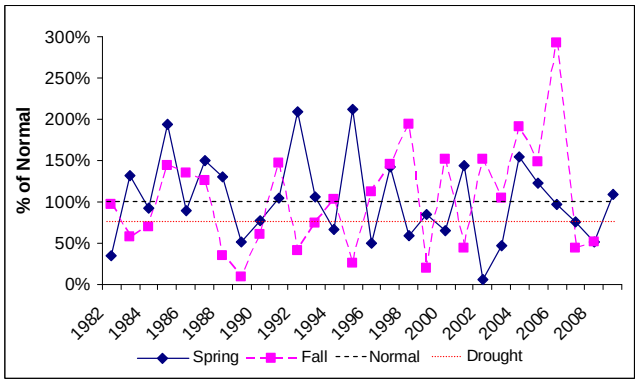


Figure 2. Percent annual precipitation based on the 27 year mean for spring (March-May) and fall (Sept.-Nov.) precipitation for WMU 15, Henry Mountains. Precipitation data were collected at the Hanksville and Capital Reef National Park weather stations (Utah Climate Summary 2009).

Browse

The median browse trend has remained relatively steady since 1987 with a slight increase between 2004 and 2009 (Figure 5). Three sagebrush species were sampled in the unit; Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*), and black sagebrush (*A. nova*). Mountain big sagebrush was sampled at six study sites on the unit: 15-2, 15-4, 15-5, 15-6, 15-13 and 15-14. The mean density and cover of mountain big sagebrush was similar from 1994 to 2009, but increased significantly from 2004 to 2009 (Figure 3a and 3b). Much of the increase in density is due to a large recruitment of young plants in two studies, South Creek Chaining (15-4) and Dugout Creek (15-14). Mean mountain big sagebrush population decadence has remained low at below 10% since 1994. Decadence of mountain big sagebrush was significantly lower in 1999 compared to the other sample years (Figure 3c). Wyoming big sagebrush was sampled on two sites in the unit: 15-1 and 15-12. The mean density of Wyoming big sagebrush has remained similar since 1994 with a slight decrease in 2004 (Figure 3a). The mean Wyoming big sagebrush cover increased significantly from 1994 to 1999, but then remained similar through 2009 (Figure 3b). The mean population decadence of Wyoming big sagebrush was low at below 14% since 1994. Decadence of Wyoming big sagebrush increased significantly from 1999 to 2004, but decreased significantly again in 2009 (Figure 3c). Black sagebrush was sampled in four studies in the unit: 15-4, 15-12, 15-13 and 15-14. The mean density and cover of black sagebrush decreased significantly from 1999 to 2004 (Figure 3a and 3b). The large decline in black sagebrush was due to the Bulldog fire which burned the Quaking Aspen Spring and Sidehill Spring study sites in 2003. The mean population decadence of black sagebrush was slightly higher in 2004, but was low (less than 10%) in all sample years (Figure 3c).

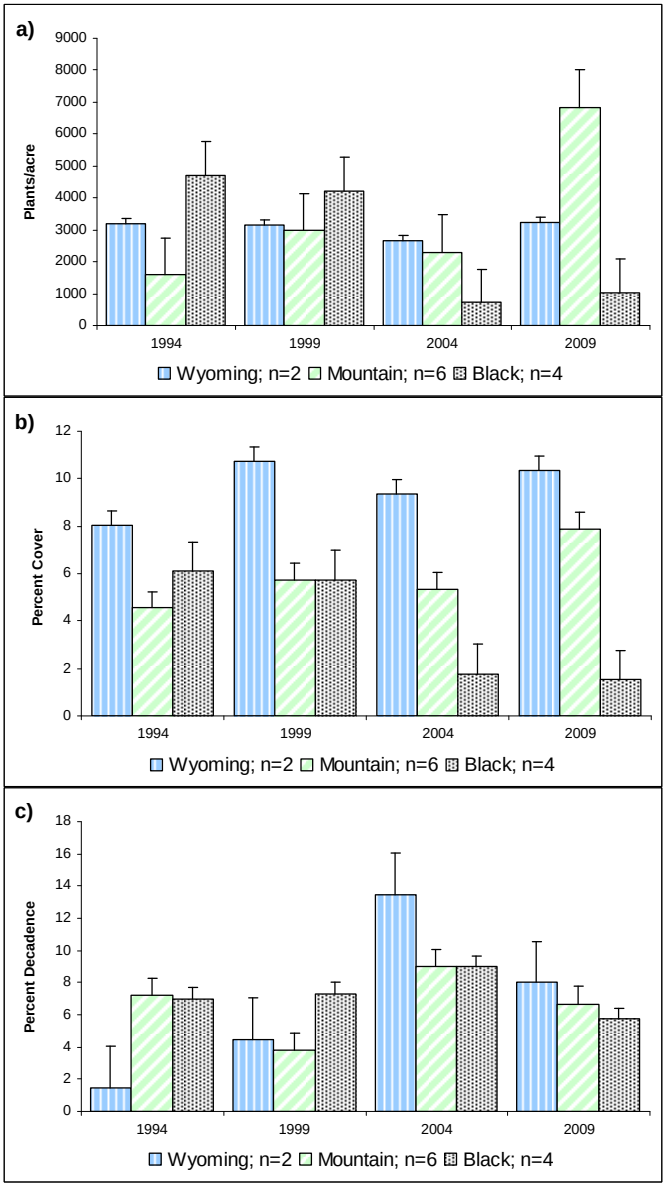


Figure 3. a) Mean density of sagebrush (*Artemisia spp.*) by year for WMU 15, Henry Mountains. **b)** Mean cover of sagebrush by year for WMU 15. **c)** Mean population decadence of sagebrush by year for WMU 15.

Herbaceous Understory

The median grass trend decreased from 1987 to 1994 and again from 1999 to 2004, but increased again 2009 (Figure 5). The mean perennial grass sum of nested frequency was similar in 1994, 1999 and 2009, but was significantly lower in 2004 than all other sample years (Figure 4a). This same trend is reflected in the mean cover of perennial grass on the unit (Figure 4b). Cheatgrass (*Bromus tectorum*) has had a relatively low presence on the unit, but was significantly higher in nested frequency and cover in 1999 (Figure 4a and 4b).

The median forb trend decreased slightly from 1987 to 1994, then decreased more from 1999 to 2004 (Figure 5). The mean perennial forb sum of nested frequency has decreased slightly, but steadily since 1994. The sum of nested frequency of perennial forbs was significantly lower in 2004 and 2009 than in 1994 (Figure 4a). The

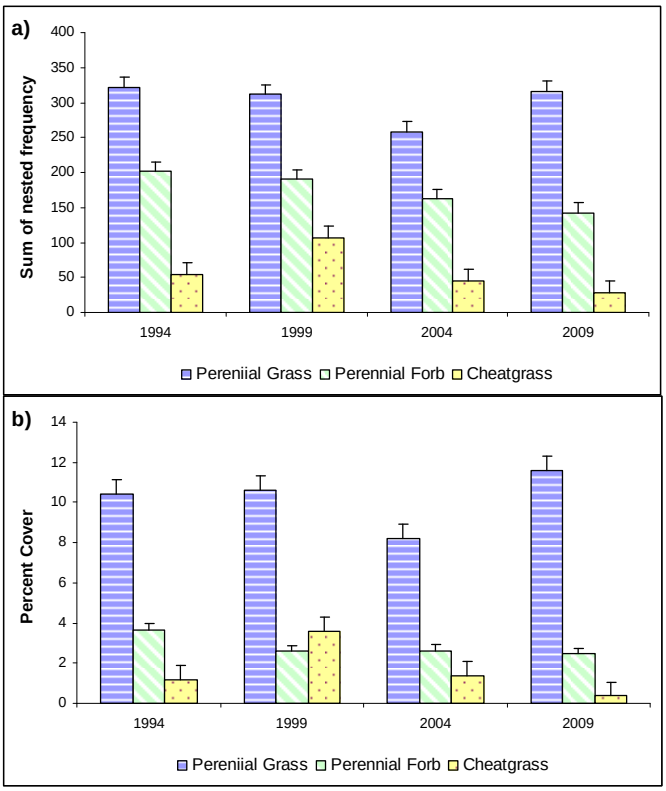


Figure 4. a) Mean perennial grass, perennial forb and cheatgrass sum of nested frequency by year for WMU 15, Henry Mountains. **b)** Mean perennial grass, perennial forb and cheatgrass cover by year for WMU 15.

increase in the perennial grass cover score (Table 2).

mean cover of perennial forbs decreased significantly from 1994 and 1999, but remained similar from 1999 to 2009 (Figure 4b). No noxious weeds were sampled on the studies in this herd unit.

Desirable Components Index

Five studies in this herd unit are considered within the low potential scale for the deer Desirable Components Index (DCI): 15-1, 15-9, 15-15, 15-16 and 15-17. The mean DCI ranking for these studies decreased from fair in 1994 and 1999 to poor and poor-fair in 2004 and 2009, respectively (Figure 6 and Table 1). The decrease in DCI scores is primarily due to a decrease in browse scores (Table 1). This is an artifact of the addition of three new trend sites, Steven's Mesa in 2004, and Coyote Creek and Swap Mesa in 2009, all of which had much lower browse scores than the Eagle Bench study. The seven remaining winter range studies, 15-4, 15-5, 15-6, 15-7, 15-12, 15-13 and 15-14, are within the mid-level potential scale. The mean DCI ranking for these studies remained steady at poor from 1994 to 2004, then increased to fair in 2009 (Figure 6 and Table 2). Much of the increase in the average DCI score was due to an

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	14.7	6.3	3.5	13.9	-2.7	1.7	0.0	**37.4**	Fair
99	16.2	7.7	4.1	9.9	-3.8	1.3	0.0	**35.6**	Fair
04	13.6	3.5	0.0	5.2	0.0	0.5	0.0	**22.7**	Poor
09	5.4	2.0	0.1	15.0	-0.1	2.1	0.0	**24.5**	Poor-Fair

Table 1. Low potential scale mean deer DCI scores (n=5) for WMU 15, Henry Moutains. The deer DCI scores are divided into three categories based on ecological potentials which inlude low, mid-level and high.

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	3.8	16.7	-0.2	4.7	0.0	**39.0**	Poor
99	11.1	4.8	3.7	17.8	-2.5	4.6	0.0	**39.5**	Poor
04	8.9	6.8	3.0	18.2	-1.5	5.1	0.0	**40.5**	Poor
09	11.6	9.8	7.0	24.7	-0.4	5.6	0.0	**58.2**	Fair

Table 2. Mid-level potential scale mean deer DCI scores (n=7) by year for WMU 15, Henry Moutnains. The deer DCI scores are divided into three categories based on ecological potentials which inlude low, mid-level and high.

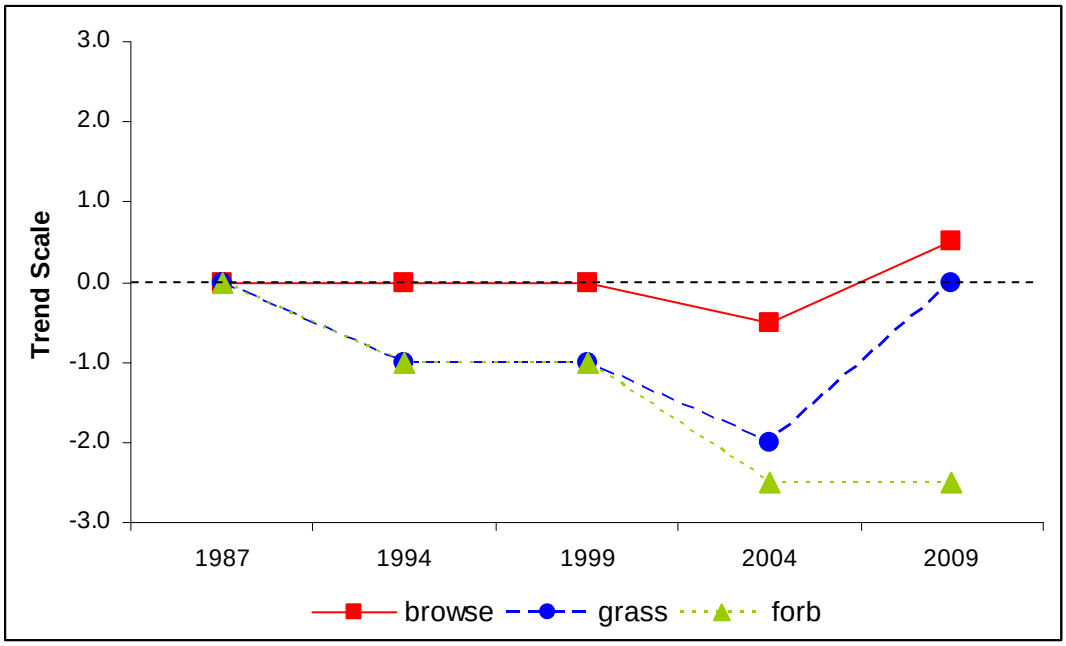


Figure 5. Cumulative median browse, grass and forb trends by year for WMU 15, Henry Mountains.

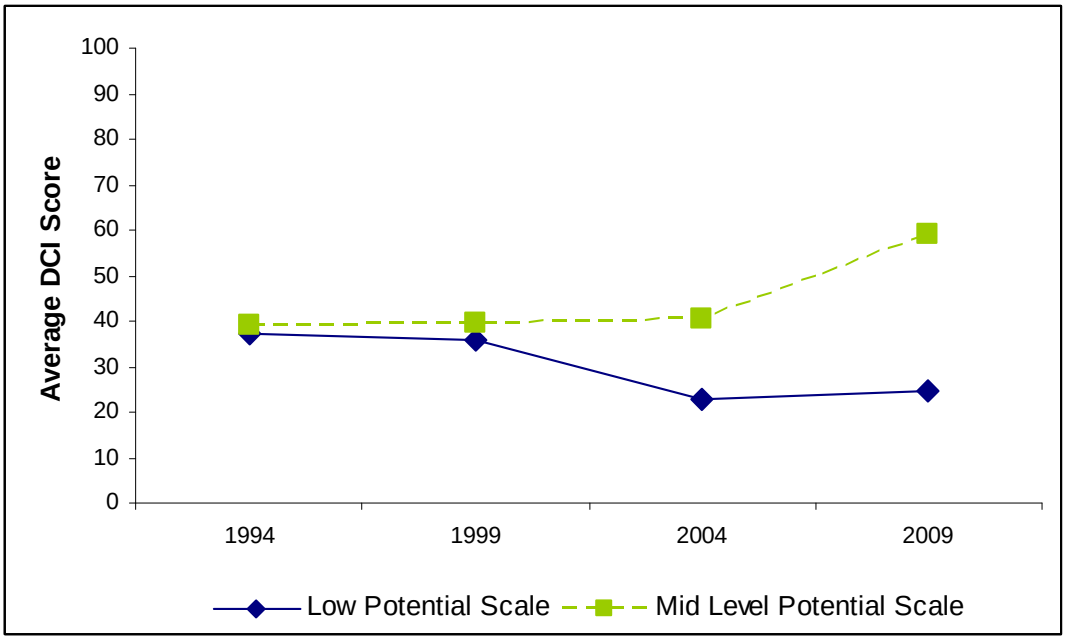


Figure 6. Mean low (n=5) and mid-level (n=7) potential scale DCI scores by year for WMU 15, Henry Mountains. The deer DCI scores are divided into three categories based on ecological potentials which inlude low, mid-level and high.