

**DEER HERD UNIT MANAGEMENT PLAN**  
**Deer Herd Unit # 1**  
**(Box Elder)**  
**March 2013**

**BOUNDARY DESCRIPTION**

**Box Elder, Tooele, Salt Lake, Davis and Weber counties** - Boundary begins at the Utah-Idaho state line and Interstate 15; then west along this state line to the Utah-Nevada state line, south along this state line to Interstate 80, east on I-80 to I-15, north on I-15 to the Utah-Idaho state line.

Subunit 1 A: Consists of the western half of Box Elder county.

Subunit 1 B: Consists of the eastern half of Box Elder county (Kelton - east).

Subunit 1 C: Consists of Tooele, Salt Lake and Weber counties north of I-80 and west of I-15.

**LAND OWNERSHIP**

**RANGE AREA AND APPROXIMATE OWNERSHIP**

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	47,174	6%	25,491	4%
Bureau of Land Management, Dept. of Defense	35,185	22%	57,466	8%	243,074	37%
Utah State Institutional Trust Lands	2,387	2%	17,752	2%	40,309	6%
Native American Trust Lands	0	0%	0	0%	0	0%
Private	115,756	73%	638,378	84%	341,858	53%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	2,263	<1%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	4,796	3%	0	0%	0	0%
<b>TOTAL</b>	158,124	100%	763,033	100%	650,732	100%

## **UNIT MANAGEMENT GOALS**

Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing. Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies. Maintain the population at a level that is within the long-term capability of the available habitat to support.

## **POPULATION MANAGEMENT OBJECTIVES**

Target Winter Herd Size - The short term objective is to achieve 20,000 wintering deer (13,000 for subunits 1A & 1C and 7,000 for subunit 1B) which are viewed as obtainable by regional biologists.

Subunit 1 A West Box Elder – The past objective was 13,000 deer. This number has not been reached since 1988, when a 12 year wet cycle culminated. Over the last 14 years, this area reached a peak population of around 11,000 deer in the year 2000; the population averaged less than 7,000 animals during that period. Based on this population performance, DWR recommends maintaining the objective of 13,000 animals.

Subunit 1 B- East Box Elder - This area reached and exceeded 8,000 deer in 1999. A severe winter range fire on the Promontory peninsula occurred in 2001 and has reduced the ability of the range to support as many animals. Therefore we have reduced the objective by approximately 1,000 animals. Consequently, the objective is maintained at 7,000 deer.

We will recommend revisions of the short term objective if review of habitat conditions or the next range trend monitoring period indicates that changes are needed.

Herd Composition – General Hunt portion of Box Elder Unit: Maintain a 3-year average postseason buck to doe ratio of 15-17:100 in accordance with the statewide plan.

### **Unit 1**

1994-2005 Objective:	24,000
2006-2013 Objective:	20,000
<u>2013-2018 Objective:</u>	<u>20,000</u>

Change from last plan      0

## **POPULATION MANAGEMENT STRATEGIES**

### **Monitoring**

- < Population Size - Using harvest data, postseason and spring classifications and mortality estimates, a computer model has been developed and used to estimate winter population size. Over winter mortality estimates will be determined using observations of mortality, and change-in-ratios from classification data.
- < Buck Age Structure - Estimates of the age class structure of the buck population will be determined primarily (directly) through the use of hunter harvested bucks at checking stations and field bag checks, and secondarily (indirectly) using post-season classification observations.
- < Harvest - The primary technique used to estimate harvest over the unit is the statewide uniform harvest surveys. Data collected at checking stations will also be used to compare with the uniform survey. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck:doe ratios. Antlerless harvest will be achieved, as needed, using a variety of methods and seasons to maintain a wintering population and to address depredation conflicts.

### **Limiting Factors (May prevent achieving management objectives)**

- < Crop Depredation - Address depredation issues as prescribed by state law and DWR policy. Some geographic populations may be maintained at lower levels due to conflicts with crop production and private landscapes.
- < Habitat - Two-thirds of the Promontory peninsula critical winter range on subunit 1B burned in 2001. This loss will correspond to a 1,000 deer reduction in subunit 1B's short term objective. Subunit 1A has very little summer range and the DWR's range trend site's indicate that it is in good condition. Pinyon-juniper encroachment on summer and winter range in Unit 1A is increasing resulting in less forage and increased fire risk. Excessive habitat utilization will be addressed by antlerless harvests.
- < Predation –
  - Refer to DWR predator management policy.
  - Assess need for control by species, geographic area and season of year.
  - Seek assistance from ADC when deer populations are depressed and where there is a reasonable chance of gaining some relief through a predator control effort. Predator control efforts will be focused just before and during the spring fawning period. Coyote removal through a bounty system is currently underway and future fawn/doe ratios will be used to determine if the removal was effective.
  - Recommend cougar harvest to benefit deer while maintaining the cougar as a valued resource in its own right.
- < Highway Mortality - The cooperation with the Utah Department Of Transportation to prevent vehicle collisions in terms of highway fences, underpasses, and earthen ramps along Interstates 15 and 84, and warning signs as needed throughout the unit is greatly appreciated. A significant number of highway mortalities may tend to reduce deer populations in the following areas: I-15 and I-84 from Tremonton to the Idaho border and SR-30 from Kelton to Rosette. Reduced speed limits in these areas should be considered by the Department Of Transportation.
- < Illegal Harvest, Crippling Loss, Disease and Parasites, White-tailed Deer - Although poaching losses appear insignificant in the Box Elder Unit, due primarily to a highly visible law enforcement effort, crippling losses are a concern, especially under buck-only hunting. Hunter survey studies (Austin, D.D. 1992. Great Basin Naturalist 52:364-372) suggests as many as 18 deer may be left in the field per 100 hunters. Disease is very difficult to evaluate, but high mortality in the spring is often associated with disease. The animal disease diagnostic facility associated with Utah State University acts as the laboratory to identify disease problems. Chronic Wasting disease is of further concern though it has not yet been detected on the unit. Surveillance will be implemented by testing hunter harvested animals as well as targeted surveillance of symptomatic animals.

### **HABITAT**

#### **Habitat Description**

The Box Elder Management Unit is one of the largest in the state. However, big game range accounts for less than one-third of the unit. The Box Elder Subunit 1B (Promontory region) is located in the east side and consists primarily of private land. The Pilot Mountain Subunit 1C is made up of the most southern portion of the unit, and the Raft River Subunit 1A is located in the western portion of the unit. The land area of this subunit is comprised mostly of the Raft River, Grouse Creek, and Goose Creek Mountains.

The Raft River Mountains run east-west, parallel to the Utah-Idaho border. Slopes on this mountain range are moderately steep on the south and east, and gentler on the north and west. The highest point is 9,925

feet on Dunn Benchmark peak at the head of the Clear Creek drainage. The Grouse Creek Mountains are relatively narrow and steep, and run north-south. At 9,000 feet, Red Butte is the highest point in the Grouse Creek Range. The topography of the Goose Creek Mountains is generally more nominal, the highest point being 8,584 feet on Twin Peaks. The Dove Creek Mountains are rougher, but the terrain becomes gentler near the Three Corners area.

Seasonal migration consists mainly of elevational and north to south migrations from summer range to winter range. A substantial number of deer spend their summers in Idaho then migrate south onto Unit 1 winter ranges. Summer range is located in the upper portions of the Raft River, Goose Creek and Grouse Creek Mountains. Areas specifically listed as summer concentration areas for deer are the uppermost elevations of the Raft River Mountains, Johnson Creek Drainage, the head of Lynn Valley, the crest of the Grouse Creek Mountains, and Hardister Creek Plateau.

Winter range mostly follows the foothills of the major mountain ranges within the sub-unit. The upper limit of normal deer winter range varies from 6,000 to 8,000 feet over the sub-unit based on the mountain range on which it occurs. The lower limit of normal deer winter range typically follows the line of Hwy 30 from Curlew Junction to the Nevada border, with further deer winter range occurring in Nevada and Idaho. This sub-unit has a unique situation during severe winters. The limits for the severe deer winter range are not only lowered at the upper limit, but are also raised at the lower limit. This is because the low growing vegetation at the lower limits of normal deer winter range are easily covered by heavy snowfall, making them unavailable for big game use.

Seven general vegetation types appear to dominate the big-game range. Sagebrush makes up 55% of the winter range and 58% of the summer range. Black sagebrush occupies ridge tops within the summer range and the upper reaches of the winter range. On the summer range, the black sagebrush type has the highest abundance of grasses and forbs. Within the summer range, the browse type is dominated by curlleaf mountain mahogany on the drier sites and by maple on the more mesic sites. This type provides a good variety of spring-fall forage, yet makes up less than 1% of the winter range. The sagebrush-juniper and juniper types, together account for 31% of the winter range. In these vegetation types, juniper trees are more important for the thermal cover than for forage. Although small amounts of the aspen-timber and forb-grass types are found along the upper edges of winter range, their primary value is as summer range. A more detailed description and vegetation maps of the different vegetation types for Wildlife Management Unit 1 can be found in the 1970 Range Inventory Report published in 1971 by King and Muir.

## **HABITAT CONCERNS**

Summer range on the Box Elder Unit is mostly at higher elevations in the Sawtooth National Forest and Grouse Creek Mountain Range. Summer range habitat concerns are mainly the loss of forbs and shrubs due to pinyon-juniper encroachment.

Higher elevation summer range and water resources are the major limiting factors for mule deer populations in the Western portion of the Box Elder unit. Lower elevation winter range is at risk of becoming a limiting factor on the Eastern portion of the unit due to the potential for development and urbanization, especially along the West Hills north of I-84 and west of I-15, and Thatcher Mountain west of SR-102.

Additional threats and losses to deer summer and winter range in the West Box Elder area is the reduction in habitat quality due to the loss of critical browse species (sagebrush, bitterbrush etc). This loss has been attributed to a number of factors such as fire, agriculture, drought etc. However, the abundance of weedy annual grasses and the increase of other invasive weeds 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. These annual grasses can also increase fuel loads and increase the chance of a catastrophic fire event.

Mule deer winter range habitat has seen a decrease in sagebrush density. Causes of sagebrush decline are varied and multiple causes may have compounded effects on the low potential studies in this unit. The moderate drought in recent years has likely caused increased stress on plants, and negatively impacted them. Sagebrush age structure across the area is generally old and one age class. The lack of regeneration of the stand through establishment of young sagebrush is a concern. Annual grass species are present but not prevalent through most of the areas. However, the range trend does show increases of weedy species such as cheatgrass and bulbous bluegrass in many of the low potential studies in this unit. Perennial grass and forb species have increased on many of the studies as browse species decline, and may compete with browse establishment. This is especially the case for the seeded perennial species crested wheatgrass which is prevalent throughout West Box Elder County.

Crucial mule deer habitat in all areas on the Box Elder Unit is also being lost and degraded through Pinyon-Juniper expansion. In certain areas where Pinyon-Juniper stands occur, the spread and invasion of young juniper have had a dramatic negative impact on existing browse and other understory species.

## HABITAT MANAGEMENT

Contributing factors to the loss of browse species such as the impact of the increase in weedy species, particularly annual grasses, juniper expansion, lack of browse regeneration and other variables are all of concern in the habitat management of the Box Elder Unit. Maintenance and/or enhancement of forage production through direct range improvements throughout summer range on sub-unit 1A and on winter range portions of the southern Promontory peninsula on sub-unit 1B must be continued to achieve population management objectives. Working with private and federal agencies to maintain and protect critical and existing summer and winter range from future losses, and providing improved habitat security and escapement opportunities for deer must also be continued to achieve population management objectives.

Loss of critical winter ranges to development is the highest cause of loss of mule deer habitat on the East Box Elder area. The loss of sagebrush and other browse species on the remaining winter range is important when considering habitat quality. Contributing factors to the loss of browse species such as the impact of the increase in weedy species, particularly annual grasses, juniper expansion, lack of browse regeneration and other variables are all of a concern in the habitat management of the Box Elder Unit.

To address the direct loss of habitat, efforts will be made towards the protection and conservation of remaining mule deer habitat. Efforts must be made to work with counties, cities, private landowners and federal agencies to maintain and protect critical and existing winter range from future losses. Through existing partnerships and developing new conservation partners efforts are being made to identify and prioritize critical habitat areas. Conservation easements will be an important part of this effort, and other conservation efforts will be ongoing throughout the unit.

To address habitat quality and degradation, habitat improvement projects have been, and will continue to be planned throughout the unit. Habitat projects have been and are being done on UDWR Wildlife Management Areas, private lands, US Forest Service lands, and Bureau of Land Management lands throughout the unit. The habitat projects are designed to address the specific issues within each project area. Recent past projects have included prescribed aspen burning on the Sawtooth National Forest, annual grass control and shrub plantings on Promontory Mountain, and pinyon-juniper thinning/removal on summer, winter, and transitional range in West Box Elder.

In critical winter range habitat, Pinyon-Juniper expansion is a crucial aspect of winter browse species loss. Projects that address the removal of P/J from these areas are of high importance and should be addressed whenever possible. These projects should be done on public and private lands when the opportunity is available. Addressing these needs on private land is crucial as a large majority of winter range falls on private lands. All tools that are available should be considered, such as chaining, lop and scatter, bullhog removal, and chemical removal as well. In accomplishing the removal of P/J on private land, private landowners' needs should also be considered.

On the Promontory Range, any opportunity to increase browse components on the range should be looked at closely. Hundreds of wintering mule deer have been observed utilizing the range on the Promontory, and any disturbance that could be beneficial to a browse enhancement project should be taken advantage of for the benefit of wintering mule deer.

The following are some of the areas that have been targeted for habitat projects within the unit over the next five years:

- < Straight Fork Creek, Etna Reservoir, Keg Springs. Projects on the west side of the Grouse Creek Range should be focused on removal of encroaching pinyon-juniper, and reestablishing understory with summer and winter browse species as well as species of plants that can be used in the spring by wintering deer.
- < Winter range enhancement on Promontory Mountain.
- < Prescribed burning of aspen and removal of encroaching pinyon-juniper on the Sawtooth National Forest.
- < Devil's Playground, Emigrant Pass, and Warm Springs Hill, Park Valley and Rosette. Projects on the east side of the Grouse Creek Range and south slope of the Raft River range should be focused on removal of encroaching pinyon-juniper, and reestablishing understory with summer and winter browse species as well as species of plants that can be used in the spring by wintering deer.
- < Riparian area protection near Kimball Creek and Straight Fork Creek.

## **HABITAT MANAGEMENT STRATEGIES**

Vegetative data collected by the UDWR Range Trend Studies crew is an additional component that will be used to address range restoration needs. The Range Trend Data is collected every five years on the 24 permanent trend transects on the Box Elder unit. These data will also be evaluated as related to deer management by the biologist.

In addition to these data, annual range utilization transects will be evaluated and enumerated.

Re-vegetation of poor condition rangeland and winter ranges damaged by wildfire will be accomplished as time and materials are available.

## **PERMANENT RANGE TREND DATA**

**Purpose of Range Trend Studies**-The ability to detect changes in vegetation composition (range trend) on big game winter ranges is an important part of the Division's big game management program. The health and vigor of big game populations are closely correlated to the quality and quantity of forage in key areas.

The majority of the permanent range trend studies are located on deer and elk winter ranges. Range trend data are used for habitat improvement planning purposes.

### **Objective**

Monitor, evaluate, and report range trend at designated key areas throughout the state, and inform Division biologists, public land managers, and private landowners of significant changes in plant community composition in these areas.

### **Expected Results and Benefits**

Range trend studies are resurveyed every five years, and vegetation condition and trend assessments are made for key areas.

## **Summary and Excerpts of 2011 Range Trend Result**

### **Unit 1 Box Elder**

Nineteen interagency range trend studies were sampled in Unit 1 during the summer of 2011. A total of twenty-four studies have been established within Unit 1. Five studies were suspended due to lack of use by wildlife. If the need arises in the future these studies can be sampled again.

The mid-level potential deer DCI has remained fairly stable since 1996, with rankings ranging from fair to fair-good 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. The decline of big sagebrush populations on winter ranges gives reason for concern, but big sagebrush remains prevalent on most of the mid-level potential studies on the unit. The Chokecherry Springs, Bovine Exclosure, Broad Hollow, Cedar Hills, and Patterson Pass studies have driven the pattern of big sagebrush decline for mid-level potential studies on the unit. Wildfires occurred on the Broad Hollow and Cedar Hills studies in 1996 and 2000, respectively. The wildfire on the Broad Hollow study occurred following the sample in 1996, and burned just part of the transect. The wildfire on the Cedar Hills study was larger and burned the entire study area, removing nearly all of the browse species. Decreases in density due to the fires on these sites comprised much of the decrease in the mean density of big sagebrush in 2001, but density of big sagebrush has continued to decrease on the Broad Hollow study and many of the other mid-level potential studies in subsequent sample years.

Causes of sagebrush decline are varied and multiple causes may have compounded effects on the mid-level potential studies in this unit. Drought has been a predominant factor in this area over the course of the study years, but these mid-level potential studies are at higher elevations and drought was likely not as acute as lower elevation studies. While lack of precipitation may have caused some stress on plants, it does not appear to be the primary cause of the decline on the mid-level potential studies. The abundance of the annual grass species cheatgrass is a more likely primary cause of sagebrush decline. This weedy species can form dense mats of cover that compete with seedling and young sagebrush plants, which thereby 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. Cheatgrass can also increase fuel loads and increase the chance of a catastrophic fire event. Cheatgrass has been especially prevalent on the Chokecherry Springs, Bovine Exclosure, Red Butte Exclosure, Broad Hollow, and Sheep Range Spring studies. However, cheatgrass has decreased on each of these studies since 1996. It appears that cheatgrass is having the largest impact on the big sagebrush populations on the Chokecherry Springs, Bovine Exclosure, and Broad Hollow studies.

The low potential deer DCI steadily decreased from good in 1996 to fair in 2006, but increased again in 2011, returning to 2001 levels. Much of the change in the DCI score is due to fluctuations in annual grass cover, but there has also been a decrease in preferred browse cover and recruitment of young preferred browse plants since 1996. Increases in perennial grass cover has compensated for some of the loss in preferred browse. The decline in density of Wyoming big sagebrush and black sagebrush is a cause of concern for these important deer winter ranges, though cover has remained relatively stable over the course of the study years. The Rosette, Mud Springs Basin, Raft River Narrows, and Bedke Springs studies have driven the pattern of Wyoming big sagebrush decline for low potential studies on the unit. A wildfire occurred on the Raft River Narrows study in 2000. The wildfire burned just part of the study transect, but reduced density on the study. Decreases in density due to the fire on this site comprised much of the decrease in the mean density of Wyoming big sagebrush in 2001, but density has continued to decrease on the Raft River Narrows study and many of the other low potential studies in subsequent sample years. The Devils Playground, Kimber Ranch, and Dake Pass studies have driven the pattern of decline of black sagebrush for the low potential studies on the unit.

Causes of sagebrush decline are varied and multiple causes may have compounded effects on the low potential studies in this unit. Drought has been a predominant factor in this area over the course of the study years (Figure 1 and Figure 2), and has likely negatively impacted these low elevation studies. The abundance of the annual grass species, especially the weedy species cheatgrass, is also likely a primary cause of sagebrush decline. Cheatgrass has been especially prevalent on the Rosette, Devils Playground, Mud Springs Basin, Kilgore Basin, Kimber Ranch, Raft River Narrows, Bedke Spring, and

Dake Pass studies. It appears that cheatgrass is having the largest impact on the sagebrush populations on the Rosette, Mud Springs Basin, Kimber Ranch, Raft River Narrows, Bedke Springs, and Dake Pass studies.

**Desirable Components Index:** The desirable components index (DCI) for deer was created as a tool to address condition and/or value of winter ranges for mule deer. This index was designed to score mule deer winter range based upon several important vegetation components (ie., preferred browse cover, shrub decadence, shrub young recruitment, cover of perennial grasses, cover of perennial forbs, cover of annual grasses and cover of noxious weeds). Although the index may be useful for assessing habitat for other species (ie. sage grouse and elk), the rating system was devised to specifically address mule deer winter range requirements.

This index is used primarily to determine if a particular site has the vegetation components necessary to be a good winter range for mule deer. It can also be used to identify areas where habitat restoration projects may be needed and assist land managers in determining possible rehabilitation options. Because it does not take into account factors such as soil stability, hydrologic function, and other environmental factors, it should not be used to assess a sites function and/or condition as typically used by the Federal land management agencies. Desirable mule deer winter range provides 12-20% of preferred browse cover, 20% or less shrub decadency, and 10% or more of the shrub population is young. The herbaceous understory contains 8-15% perennial grasses cover, 5% perennial forb cover, and less than 5% annual grass cover.

**Condition of deer winter range on Unit 1, as indicated by DWR range trend surveys.**

Year	Mean DCI score for Unit	Classification	Unit-specific DCI score range: Poor	Unit-specific DCI score range: Fair	Unit-specific DCI score range: Good
2001	53	Fair-Good	27 - 41	42 – 58	59 - 74
2006	47	Fair			
2011	54	Fair-Good			

**CURRENT POPULATION STATUS**

Year	Buck Harvest	Post-Season F/100 D	Post-Season Buck/100 D	Post-Season Population	Objective	% of Objective
2010	1,115	64	21	17,100	20,000	85.5%
2011	1,101	70	20	15,000	20,000	75%
2012	1299	56	15	13,000	20,000	65%

**Duration of Plan**

This unit management plan was approved by the Wildlife Board on \_\_\_\_\_ and will be in effect for five years from that date, or until amended.