DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 1
(Box Elder)
October 2017

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.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

	Yearlong range		Summer Range		Winter Range	
Ownership	**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%
TOTAL	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 - Maintain a target population size of 20,000 wintering deer. This population objective remains both the short-term (5-year life of this plan) and long-term objective, barring significant changes in range conditions.

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

2006-2013 Objective: 20,000
2013-2018 Objective: 20,000
2018-2023 Objective: 20,000

Change from last plan 0

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size – Winter population size will be estimated using a model that was developed to utilize harvest data, postseason and spring classifications and radio collar based survival estimates. Over winter mortality estimates will be determined using radio-collar data from nearby units and 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 burned in 2001. Pinyon-juniper encroachment on summer and winter range in Unit 1 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.

Illegal Harvest, Crippling Loss, Disease and Parasites - 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 is often associated with malnutrition and 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.

Urban Deer - Continued development across this Unit has lead to an increase in nuisance deer complaints. The Urban Deer Control Rule, R657-65, will be used to help municipalities address urban deer issues. Additional hunting opportunities outside of municipal boundaries will also be used to address nuisance complaints.

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 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 unit. The upper limit of normal deer winter range varies from 6,000 to 8,000 feet over the 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 unit has a unique situation during severe winters. The limits for the crucial 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 increasing 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 western 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 – west of the Locomotive Springs Road; and on winter range portions of the southern Promontory peninsula on sub-unit 1B – east of the Locomotive Springs Road; 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.

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 106,845 acres of land have been treated within the Box Elder Unit since the WRI was implemented in 2004. An additional 23,756 acres are currently being treated and treatments have been proposed for an additional 32,672 acres. Treatments frequently overlap one another bringing the total completed treatment acres to 127,194 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

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 2016 Range Trend Result

Unit 1 Box Elder

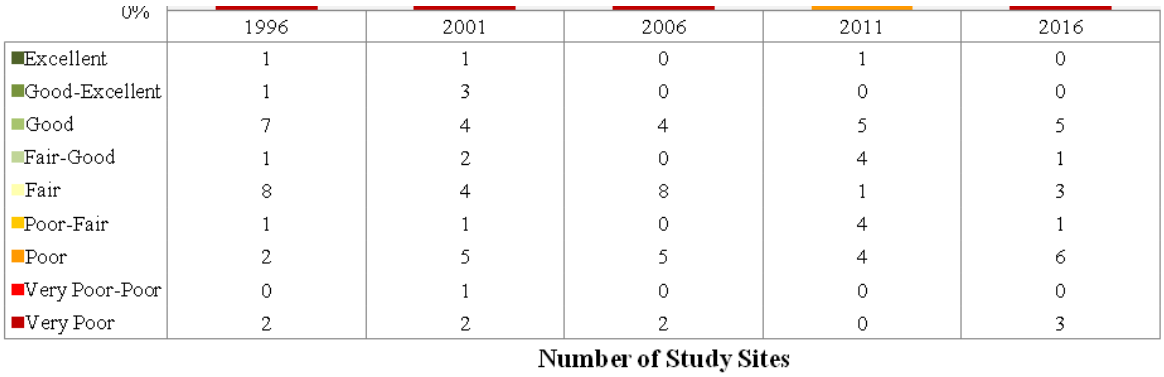
Deer Winter Range Condition Assessment
The condition of deer winter range within the Box Elder management unit has continually changed on the sites sampled since 1996. The active Range Trend sites sampled within the unit are considered to be in very poor to good-excellent condition as of the 2016 sample year. Kilgore Basin, Nut Pine Hills, Clarks Basin, Dake Pass, and Patterson Pass have remained in good condition, while Sheep Range Spring is considered to be in fair-good condition. Rosette, Bovine Exclosure, and Kimber Ranch are in fair condition, and Devils Playground is in poor-fair condition. Chokecherry Springs, South Side Emigrant Pass, Broad Hollow, Cedar Hills, Bedke Spring, and Bally Mountain are in poor condition. Finally, the Mud Springs Basin, Red Butte Exclosure, and Raft River Narrow studies are considered to be in very poor condition generally due to the presence of annual grasses and lack of preferred browse cover. The treated sites have generally improved as time since treatment has increased; the exceptions to this are the Kimbell Creek study, which went from excellent to fair-good, the Dairy Valley GIP 2 study, which remained in very poor condition, and the Hereford 2 site which remained in fair condition. The Rosette, Chokecherry Springs, Devils Playground, Mud Springs Basin, Raft River Narrows, Broad Hollow, Cedar Hills, Bedke Spring, and Bally Mountain studies are also considered to be Range Trend sites and are discussed above. Buckskin Spring, Etna Reservoir, Pine Creek, and Indian Creek were all sampled prior to treatment and were in very poor to good condition. The Coldwater 1 study went from very poor to poor, Morris GIP went from very poor to good, Dairy Valley GIP 1 improved from fair-good to good, and the Hereford 1 study improved from good to excellent condition. It is possible given more time and continual monitoring that these sites will (continue to) improve.

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.

Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU1, Box Elder



0%	1996	2001	2006	2011	2016
Excellent	1	1	0	1	0
Good-Excellent	1	3	0	0	0
Good	7	4	4	5	5
Fair-Good	1	2	0	4	1
Fair	8	4	8	1	3
Poor-Fair	1	1	0	4	1
Poor	2	5	5	4	6
Very Poor-Poor	0	1	0	0	0
Very Poor	2	2	2	0	3

Number of Study Sites

CURRENT POPULATION STATUS

Year	Buck Harvest	Post-Season F/100 D	Post-Season Buck/100 D	Post-Season Population	Population Objective	% of Objective
2014	1,072	63	18	11,600	20,000	58%
2015	1,311	65	21	12,850	20,000	64%
2016	1,497	58	19	14,000	20,000	70%

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.