DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 30
(Pine Valley)
February 2015

BOUNDARY DESCRIPTION

Iron and Washington counties - Boundary begins at I-15 and the Utah-Arizona state line; north on I-15 to SR-56; west on SR-56 to the Lund Highway; northwest along the Lund Highway to the Union Pacific railroad tracks at Lund; southwest on the Union Pacific railroad tracks to the Utah-Nevada state line; south on this state line to the Utah-Arizona state line; west on this state line to I-15.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

	Year-long range		Summer Range		Winter Range	
Ownership	**Area (acres)**	**%**	**Area (acres)**	**%**	**Area (acres)**	**%**
Forest Service	15557	23%	212454	67%	182357	38%
Bureau of Land Management	47018	70%	36143	11%	210905	44%
Utah State Institutional Trust Lands	830	1%	1446	<1%	22429	5%
Native American Trust Lands	0	0%	5859	2%	141	<1%
Private	3422	5%	13944	4%	64236	13%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	309	<1%
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%
Wilderness (USFS & BLM)	0	0%	47881	15%	2350	<1%
TOTAL	66827	99%	317727	100%	482727	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 - Manage for a 5-year target population of 16,000 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels. Change to the population objective is based on this population's performance, improved range conditions, the amount of available habitat and the lack of range damage from deer. The population objective is being restored from its pre 2002 DCI reduction.

Unit 30 Population Objective History
1994-2001 Objective: 16,000
2002-2014 Objective: 12,800
2015-2020 Objective: 16,000
Change from last plan +3,200

- Herd Composition – This is a General Season unit and will be managed to maintain a three year average postseason buck to doe ratio of 18-20 according to the statewide plan. Caution will be use when adjusting permits and trends will be considered.

- General Buck Deer hunt regulations, using archery, Rifle, and Muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and mortality estimates, a computer model has been developed to estimate winter population size. The 2014 model estimates the population at 13,500 deer.

- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, statewide harvest survey data and bag checks.

- Harvest - The primary means of monitoring harvest will be through the statewide harvest survey and the use of checking stations.

Year	Buck harvest	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2012	1130	60.0	23.9	12,500	12,800	97.7%
2013	1327	59.3	20.6	13,000	12,800	101.6%
2014	1305	57.8	20.1	13,500	12,800	105.5%
3 Year Avg	1254	59.0	21.5			

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation - Strategies will be implemented to mitigate crop depredation as prescribed by state law and DWR policy.

- Habitat - Public land winter range availability, landowner acceptance and winter range forage conditions will determine herd size. Excessive habitat utilization will be addressed with hunting.

- Predation - Follow DWR predator management policy:
  - If the population estimate is less than 90% of objective and fawn to doe ratio drops below 70 for 2 of the last 3 years or if the fawn survival rate drops below 50% for one year, then a Predator Management Plan targeting coyotes may be implemented on that subunit.
  - If the population estimate is less than 90% of objective and the doe survival rate drops below 85% for 2 of the last 3 years or below 80% for one year, then a Predator Management Plan targeting cougar could be implemented on that subunit.
  - The southern and eastern portion of this unit is currently under a Harvest Objective cougar management plan with the recent bighorn sheep transplants and the planned additional bighorn sheep transplants. Deer in the Browse and Beaver Dam mountain area will also benefit from this cougar management strategy.

- Highway Mortality - DWR will Cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures and warning signs etc if needed. Mortality along I-15, SR-56, SR-18 has been significant. At several locations on SR-56, SR-18, New Harmony and Newcastle bench roads flashing deer crossing signs have been installed in cooperation with the Utah Dept. Of Transportation, Iron and Washington County road departments. Deer fencing has been installed along I-15 between Cedar City and New Harmony. Highway mortality will be monitored and additional highway fences, passage structures and warning signs will be added if needed.

- Illegal Harvest - If illegal harvest is identified as a limiting factor, a unit specific action plan will be develop in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain or enhance forage production through direct range improvements on winter and summer deer range throughout the unit to achieve population management objectives.

- Maintain critical fawning habitat in good condition. Fawn recruitment is a major concern on this unit and may be the single greatest factor limiting the population.

- Work with federal and state partners in fire rehabilitation and prevention on crucial deer habitat through the WRI process

- Manage public lands adjacent to areas with heavy agricultural depredation to promote deer use during late summer.

- Maintain and protect critical winter range from future losses. Acquire critical winter range when the opportunity arises.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.

- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range desirable component index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. However, the relationship between DCI and the changes in deer carrying capacity is difficult to quantify.

- Continue existing monitoring studies, and coordinate with BLM on additional riparian monitoring.

- Seek opportunities to partner with Universities to coordinate research in areas of need.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.

- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to oil and gas development, wind energy, solar energy, and transmission line construction.

- Coordinate with federal and state partners in designing projects that will improve fire resiliency and protect areas of crucial habitat.

- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands. Continue working toward blocking up UDWR properties through land exchange.

- Manage vehicle access on Division of Wildlife Resources land to limit human disturbance during times of high stress, such as winter and fawning.

- Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid- to late summer.

- Protect riparian areas to furnish cover, water and succulent forage adjacent to areas with historic agricultural damage.

- Provide guzzlers or other water sources where needed on critical summer fawning areas or in times of severe drought.

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects.

- Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by Cheat grass with desirable perennial vegetation.

- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.

- Seek opportunities to increase browse in burned areas of critical winter range.

- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.

- Seek out opportunities to improve fawning habitat across the unit. Consider summer range habitat improvement projects that remove encroaching trees, improves succulent vegetation and wet meadow habitat, increases aspen recruitment, enhances and/or protects riparian areas, use prescribed fire to promote early succession habitats where appropriate.

- Future habitat work should be concentrated on the following areas.

    - Landscape level watershed improvements on the Pine Valley Ranger District of the Dixie National Forest with a focus on transitional ranges

    - Water developments for Mule Deer on federal and state land.

    - Retreatment of older treatments (>10years) to protect investment through maintenance.

    - Continued habitat improvements in the Swett Hills/Duncan Creek.

    - Look for opportunities to implement projects that reduce highway mortality to Mule Deer on highway 56 and 18.

RANGE TREND SUMMARY

The following is a summary of the Pine Valley Unit range trend report that is found in the *Utah Big Game Range Trend Unit Summaries 2013 Wildlife Management Units 22, 24, 25A, 25B, 25C, 27, 28, 29, 30 . Publication # 14-16. Utah Division of Wildlife Resources. 2013*. The full report can be viewed at the UDWR's regional office in Cedar City Utah or at the UDWR Headquarters in Salt Lake City Utah. An online version of the report will become available and currently you can access most of the results online at: http://wildlife.utah.gov/range/statewide%20management%20units.htm

PINE VALLEY RANGE TREND SUMMARY

Management Unit Description

Geography

The Pine Valley wildlife management unit is located in the southwest corner of Utah. It includes three physiographic regions: Mojave Desert, Great Basin, and Colorado Plateau. The Mojave Desert is located in the southern portion of the unit. The Great Basin is located in the central and northern sections of the unit. The eastern section of the unit, mainly the Pine Valley Mountains and Harmony Mountains, are on the western edge of the Colorado Plateau. These physiographic regions have a diverse array of vegetation communities and transitional communities that are important areas for wildlife.

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 7 inches on the southern part of the unit to 35 inches on the high elevation peaks of the Pine Valley Mountains. All of the Range Trend and WRI monitoring studies on the unit occur within the 11-31 inch precipitation zone (Map 9.1) (PRISM Climate Group, Oregon State University, 2013).
Vegetation trends are dependent upon annual and seasonal precipitation patterns. 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 Western (Division 1), Dixie (Division 2), and South Central (Division 4) divisions. This data is summarized in **Figure 9.1** on the following page.

Big Game Habitat

Summer Range

Summer range is confined to elevations above 6,000 to 6,500 feet on the New Harmony and Pine Valley Mountains. The summer range consists of dense conifers with a few aspen clones and dry meadows at higher elevations and mixed oak brush, mountain brush, southern desert shrub, and sagebrush-grass at lower elevations. Part of the summer range is within the officially designated wilderness area. The vegetation characteristics of the Harmony Mountain and lower slopes of Pine Valley are principally oak brush and mountain brush. Aspen and conifer are common on the higher portions of the Pine Valley Mountains, but much less prevalent on the Harmony Mountains. Sagebrush-grasslands and meadows can be found at the summit of the Harmony Mountains. These areas are important for deer during a short period in the summer months. However, these areas have been heavily impacted by cattle. Many similar sagebrush grasslands and meadows occur on the northern end of the Pine Valley Mountains. Summer deer concentrations are primarily on Harmony Mountain and the north end of the Pine Valleys.

Winter Range

Herd unit 30 winter range varies greatly, depending upon elevation. North of the Great Basin-Colorado River divide, pinion-juniper and sagebrush-grass predominate. South of the divide, pinion-juniper is still prevalent but there are increasing amounts of desert shrub dominated by shrub live oak (*Quercus turbinella*) and other browse species not often found in the north. Both areas possess important acreages of seeded range, most notably east of Pinto at Page Ranch, Woolsey Ranch, New Harmony and Pintura Bench. Deer tend to congregate in these

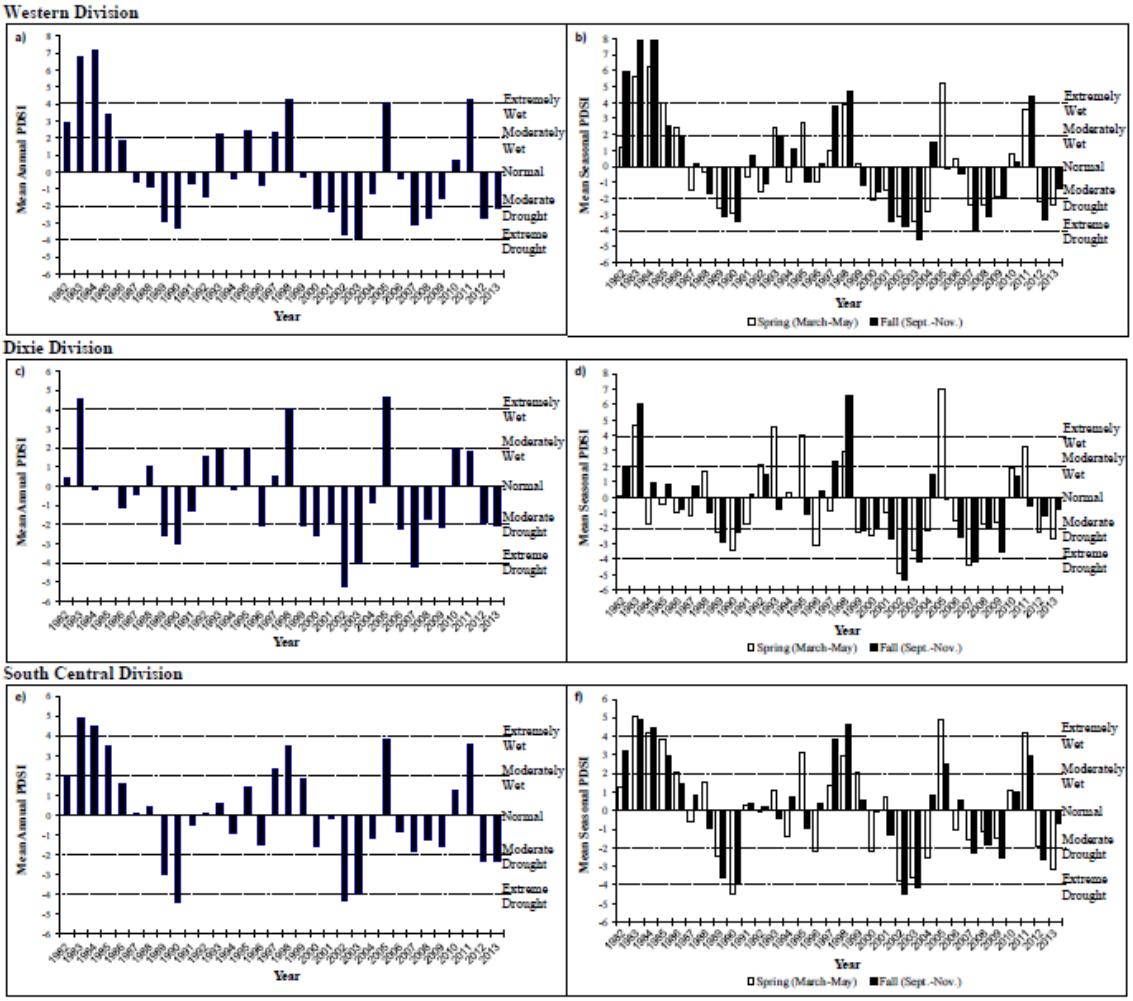


Figure 9.1: The 1982-2014 Palmer Drought Severity Index (PDSI) for the Western, Dixie, and South Central division (Divisions 1, 2, and 4). The PDSI is based on climate data gathered from 1895 to 2013. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations 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 2014). a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2014).

areas, especially the latter three. Additional winter range in the Pine Valley unit can be found south of Pintura, but currently supports few deer. Winter range is extensive, but not uniformly utilized. Pinion-juniper is the dominant vegetation type, but there are also other vegetation types that include large areas of sagebrush-grass, southern desert shrub, oak brush, and mountain brush. Important critical winter concentration areas include the area east of Central, the lower Pinto Creek drainage, the Antelope Range, Iron Mountain, the Shoal Creek drainage, Moody Creek, Tobin Bench, and the middle portion of the East Fork of Beaver Dam Wash. Only during the most severe winters do deer utilize the lower portions of the winter range, especially the Mojave Desert areas. During the spring, summer, and fall, crucial concentration areas include the higher elevations of the Bull Valley Mountains, Lost Peak, Maple Ridge, the slopes surrounding Pine Valley Reservoir, the meadows of the Whipple Valley area, and Flattop Mountains.

Limiting Factors to Big Game Habitat

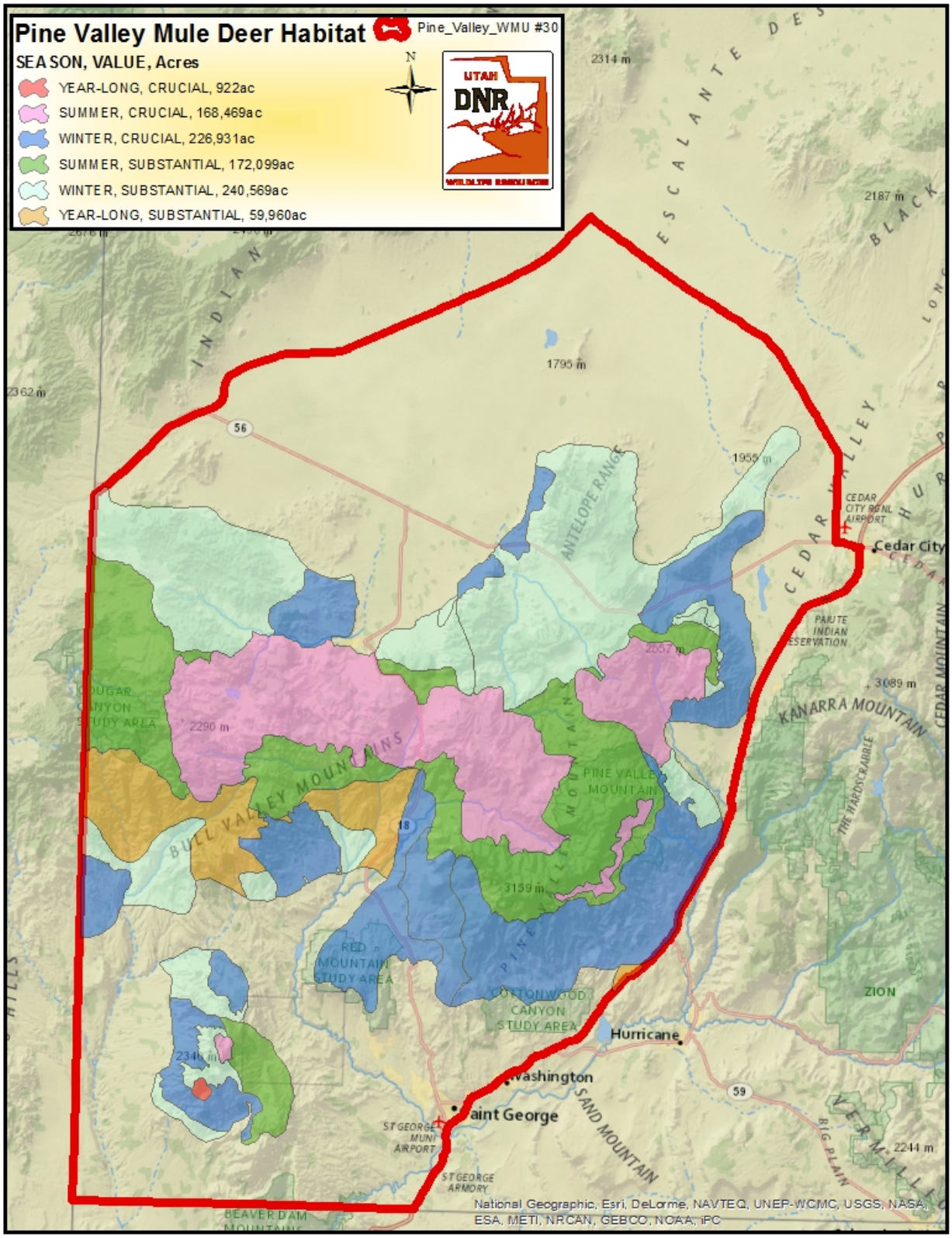
Mortality of deer has been significant along I-15, SR-56, and SR-18. Deer proof fencing has been erected along I-15, impeding deer movement. Fencing may pose some barrier to deer migration to the wintering grounds.

Wildfire has had a significant impact on deer habitat in the southern and western portions of this unit in recent years. From 2000-2012, over 700,000 acres have burned in unit 30 in a variety of vegetative types. The abundance of cheat grass, primarily within the lower elevation sagebrush communities, increases the threat of catastrophic wildfires within the unit.

In addition to wildfire, severe flooding in January 2005 likely impacted deer habitat that drastically altered riparian communities along Moody Wash, Mogatsu Creek, Beaver Dam Wash, Santa Clara River, Virgin River, and neighboring drainages. Results of these events will likely impact deer use of these areas for several years.

Encroachment by pinion-juniper woodland communities also poses a substantial threat to important sagebrush rangelands. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease the sagebrush and herbaceous components, and therefore decreases available forage for wildlife.

Overview Map of Pine Valley Unit Mule Deer Habitat



Range Trend Studies

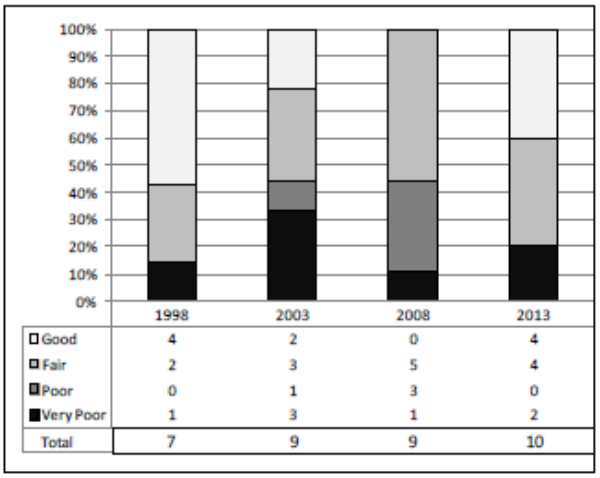
Range Trend studies have been sampled within WMU 30 on a regular basis since 1982, with studies being added or suspended as was deemed necessary (see full report or online report for a comprehensive list of study areas). Several of the range trend studies have been suspended over the sample years. Due to changes in sampling methodologies, only data sampled following the 1998 sample year are included in this summary. Monitoring studies of WRI projects have been sampled since 2004. When possible, WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment.

Range Trend studies that have not had recent disturbance or treatments are summarized in this report by ecological site or potential. Range Trend and WRI studies that have a disturbance or treatment during the reported sample period are summarized by the disturbance or treatment type. For a comprehensive report for each treatment type associated with the range trend site please refer to the full report. The full report can be viewed at the UDWR's regional office in Cedar City, Utah or at the UDWR Headquarters in Salt Lake City. An online version of the report will become available and currently you can access most of the results online at:

http://wildlife.utah.gov/range/statewide%20management%20units.htm

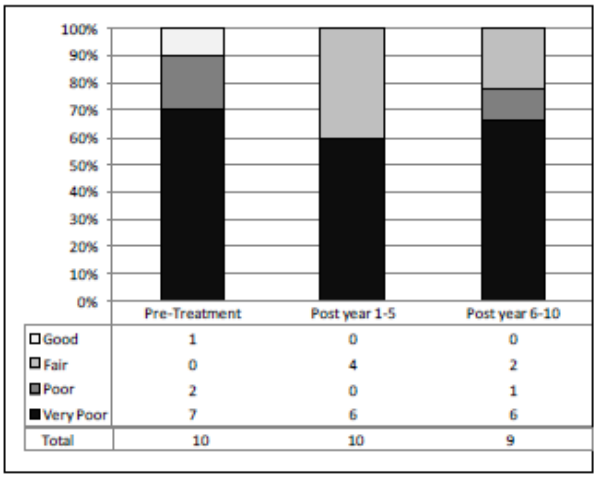
Deer Winter Range Condition Assessment

The condition of deer winter range on the untreated sites within the Pine Valley management unit has generally improved on the study sites sampled since 2003. The majority of sites sampled within the unit are considered to be in fair to good condition based on the most current sample data (Figure 9.33 and Figure 9.34 below). The two undisturbed study sites that are currently considered to be in very poor condition is the North Hills and Wide Canyon 2 studies, which have a poor herbaceous understory and are dominated by cheat grass. The majority of disturbed or treated study sites ranked as being in poor or very poor condition after disturbance are those burned by wildfire or sites with high amounts of cheat grass being sampled. These study sites generally are still lacking in available browse species, and/or typically have increased amounts of cheat grass.



	1998	2003	2008	2013
Good	4	2	0	4
Fair	2	3	5	4
Poor	0	1	3	0
Very Poor	1	3	1	2
Total	7	9	9	10

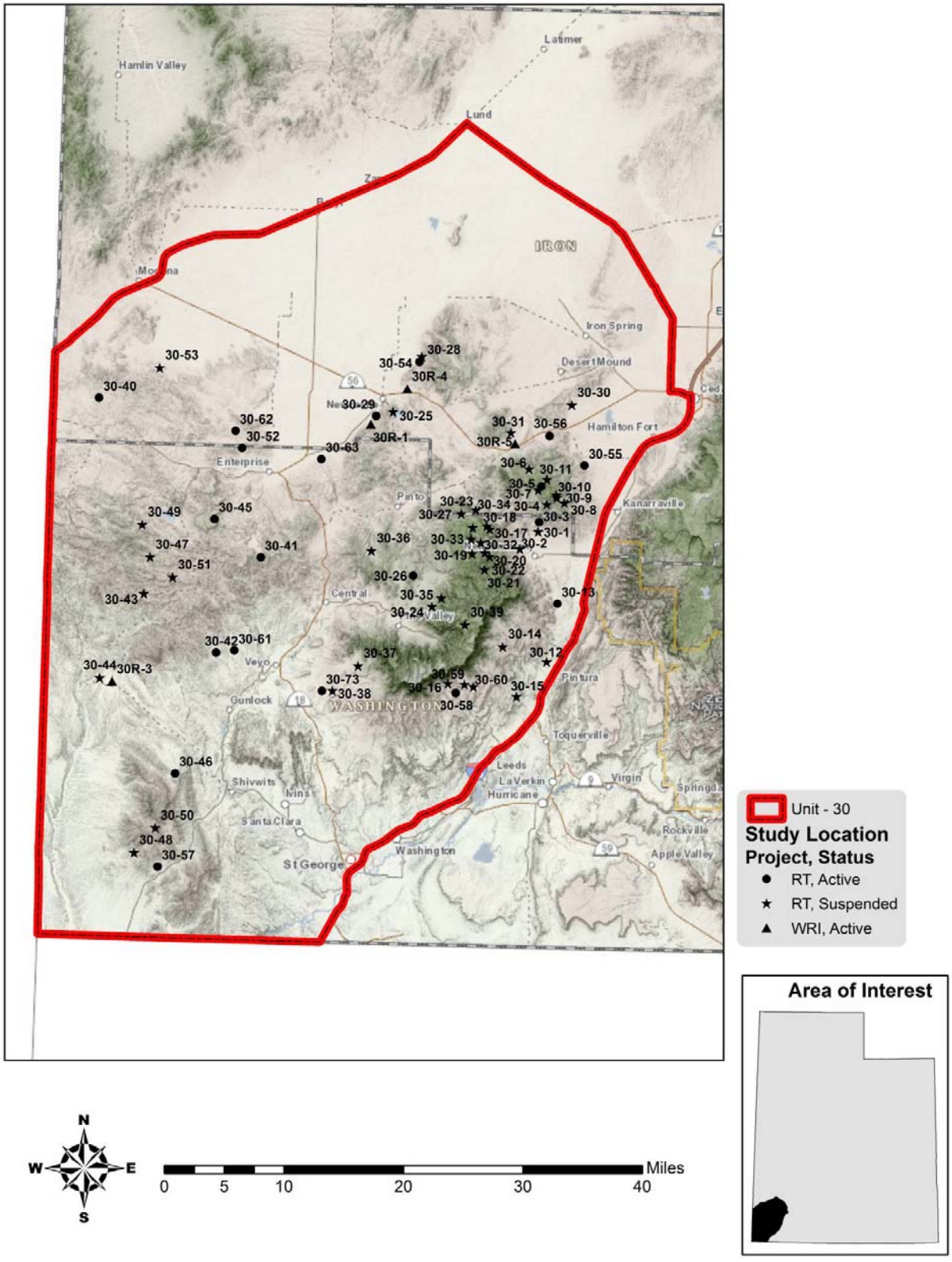
Figure 9.33: Deer winter range Desirable Components Index (DCI) summary by year of undisturbed sites for WMU 30, Pine Valley.



	Pre-Treatment	Post year 1-5	Post year 6-10
Good	1	0	0
Fair	0	4	2
Poor	2	0	1
Very Poor	7	6	6
Total	10	10	9

Figure 9.34: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 30, Pine Valley.

Pine Valley Range Trend Study Locations – Long Term and WRI



Summary of Conditions and Recommendations for Pine Valley Ecological Sites

Mountain (Oak)

The higher elevation mountain sites, which support Gambel oak communities, are generally considered to be in good condition for deer winter range habitat on the Pine Valley management unit. These communities support robust shrub populations that provide valuable browse in mild winters. While in generally good condition, these sites appear to be prone to wildfire with both of these sites having burned over the course of the sample years. In addition, introduced perennial grass is the dominant herbaceous component on the Spirit Creek South Burn site, which was seeded with introduced grass where as the Flat Top Mountain site was not seeded. While providing valuable forage, these grass species can often be aggressive at higher elevation and precipitation, and can reduce the abundance of other more desirable native grass and forb species.

It is recommended these communities be managed to maintain healthy browse and diverse herbaceous components. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

Mountain and Upland (Mountain Big Sagebrush)

The higher elevation upland and mountain sites, which support mountain big sagebrush communities, are generally considered to be in good condition for deer winter range habitat on the Pine Valley management unit. With the exception being those sites that have been burned or have high abundance of cheat grass with depleted herbaceous understory. These communities support robust shrub populations that provide valuable browse in mild and moderate winters. While in generally good condition, these sites appear to be prone to encroachment from pinion-juniper trees, which can reduce understory shrub and herbaceous health if not addressed. In addition, introduced perennial grasses are often the dominant herbaceous component on these study sites. While providing valuable forage, these grass species can often be aggressive at higher elevation and precipitation and can reduce the abundance of other more desirable native grass and forb species.

It is recommended that work to reduce pinion-juniper encroachment (e.g. bullhog, chaining, lop and scatter, etc.) should continue in these communities. When reseeding is necessary to restore the herbaceous understory, care should be taken in species selection and preference should be given to native grass species when possible.

Upland (Wyoming Big Sagebrush, Shrub, and, Shrub Liveoak)

The mid elevation upland Wyoming big sagebrush and shrub communities that have not been disturbed are generally considered to be in fair condition for deer winter range habitat on the unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters. However, these communities are prone to wildfire and the study, which burned in 2006, is in very poor condition. If wildfire occurs within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. These communities are prone to encroachment from pinion-juniper trees, which can reduce understory shrub and herbaceous health if not addressed. Annual grass, primarily cheat grass, can also be an issue within these communities. Increased amounts of cheat grass can increase fuel loads and the threat of wildfire within these communities.
It is recommended that work to reduce pinion-juniper encroachment should continue in these communities. Care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites. Work to diminish fuel loads and create firebreaks should continue in order to reduce the threat of catastrophic fire.

Semidesert (Wyoming Big Sagebrush and other browse)

The lower elevation semidesert Wyoming big sagebrush and other browse communities that have not been disturbed are generally considered to be in fair condition for deer winter range habitat on the unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters. However, these communities are prone to wildfire and those studies, which have burned since 1998, are in poor to very poor condition. If wildfire occurs within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. These communities are susceptible to invasion from annual grass, primarily cheat grass. Increased amounts of cheat grass can increase fuel loads and increase the threat of wildfire on within these communities. Encroachment from pinion-juniper trees is not typically an issue within these communities.

It is recommended that work to diminish fuel loads and create firebreaks should continue within these communities in order to reduce the threat of catastrophic fire. Treatments to establish and increase browse species more rapidly following wildfire should also be implemented, and treatments to increase browse species on historic fires should be considered. If a treatment to rejuvenate sagebrush occurs, care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites.

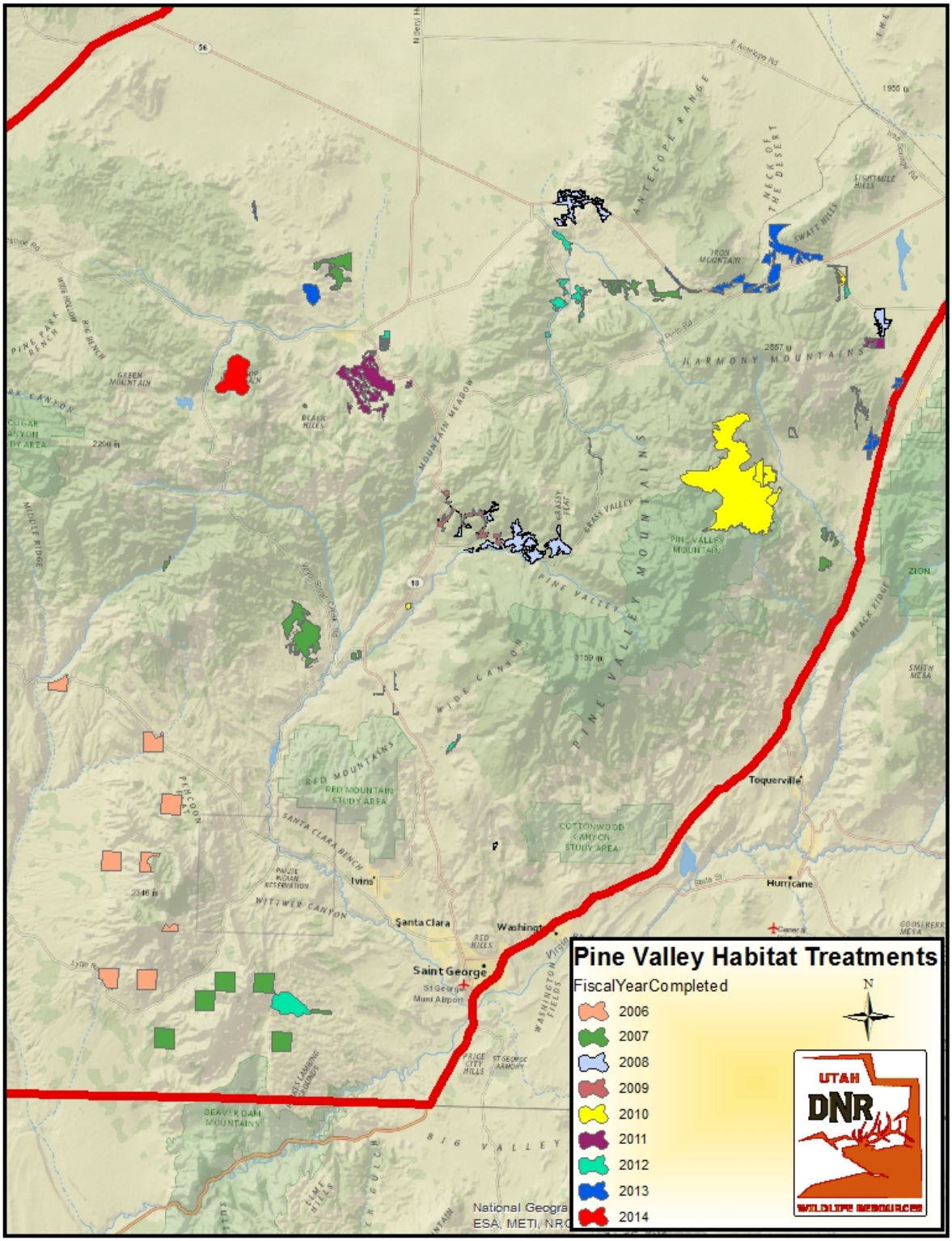
Habitat Treatments

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 40,535 acres have been treated within the Pine Valley unit since the WRI was implemented in 2004 (See Map on Following Page). Treatments frequently overlap one another bringing the total treatment acres to 40,535 acres for this unit (see Table 9.4 below). 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 majority of treatment acreage, especially seeding, was done in conjunction with restoration efforts of wildfires within the unit. Treatments to reduce pinion-juniper woodlands such as bullhog, chaining, and lop-and-scatter are the next most common management practices. Other common management treatments are those to rejuvenate sagebrush stands such as chaining and harrow treatments are common. Herbicide treatments within the unit are primarily used to control cheat grass and restore other more desirable species.

Treatment Action	Acres
Bullhog	8,186
Chaining	1,123
Greenstripping	264
Harrow	526
Herbicide application	816
PJ push	41
Road decommissioning	11
Seeding (primary)	26,406
Seeding (secondary/shrub)	1,933
Lop and Scatter	1,230
***Total Land Area Treated**	**22,566**
Total Treatment Acres	**40,535**

Table 9.4: WRI treatment action size (acres) for WMU 30, Pine Valley.
*Does not include overlapping treatments.


Pine Valley Habitat Treatments
FiscalYearCompleted
2006
2007
2008
2009
2010
2011
2012
2013
2014
N
UTAH
DNR
WILDLIFE RESOURCES
Saint George
Santa Clara
Ivins
Hurricane
Toquerville
ANTELOPE RANGE
HARMONY MOUNTAINS
PINE VALLEY MOUNTAIN
RED MOUNTAIN
COTTONWOOD CANYON STUDY AREA
BEAVER DAM MOUNTAINS
ESA, METI, NRC