MULE DEER HERD UNIT MANAGEMENT PLAN
Herd Unit #21A
Oak Creek, Limited Entry Unit
2020

BOUNDARY DESCRIPTION

Juab and Millard counties - Boundary begins at SR-50 and I-15 near Holden; north on I-15 to the Mills road; west on this road to the railroad tracks; west on these tracks to the Sevier River; north along this river to SR-132; west on SR-132 to SR-125 (300 East in Leamington); south on SR-125 to McCormick Road (CR-4549); south on this road to Whiskey Creek Road; southeast on this road to SR-50 in Holden; north on SR-50 to I-15. Excludes all CWMUs.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

	Year-Long Range		Summer Range		Winter Range	
OWNERSHIP	**AREA** (acres)	**%**	**AREA** (acres)	**%**	**AREA** (acres)	**%**
Forest Service	0	0%	111,072	86%	0	0%
Bureau of Land Management	3,106	50%	7,283	11%	10,931	25%
Utah State Institutional Trust Lands	42	1%	242	2%	10,839	25%
Native American Trust Lands	0	0%	0	0%	0	0%
Private	2,487	49%	867	2%	29,382	50%
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%	0	0%
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%
TOTALS	5,635	100%	119,462	100%	51,152	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 **2,000** wintering deer (modeled number) during the five-year planning period; unless range conditions become unsuitable as evaluated by DWR. This is a decrease from the 2015 plan which was 2,500. The 10-year average is 1,980. 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.

Herd Composition – This is a Limited Entry unit and will be managed to maintain a three year average postseason buck to doe ratio of **25-35** according to the statewide plan.

Harvest – Limited Entry Buck Deer hunt regulations will be used to maintain and work towards objectives on this unit. Hunting strategies will include 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 classification and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 model estimates the population at 1,500 deer.
- Buck Age Structure - Monitor age class structure of the buck population through the use of, mandatory reporting requirements, 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.

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 – The amount and condition of summer habitat on public lands, landowner acceptance and winter forage conditions will determine herd size. Excessive habitat utilization will be addressed through antlerless removal.
- Predation - If predation is determined to be a limiting factor, efforts to limit predation will be taken according to DWR predator management policy.
- Highway Mortality – DWR will cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures and warning signs etc if needed. Currently, highway mortality is not a limiting factor on this unit.
- 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

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.

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 agreements with land management agencies and local governments, the use of conservation easements, etc. on private lands and working toward blocking up UDWR properties through land exchanges with willing partners.

- Manage vehicle access on Division of Wildlife Resources land to limit disturbance critical times such as winter and fawning.

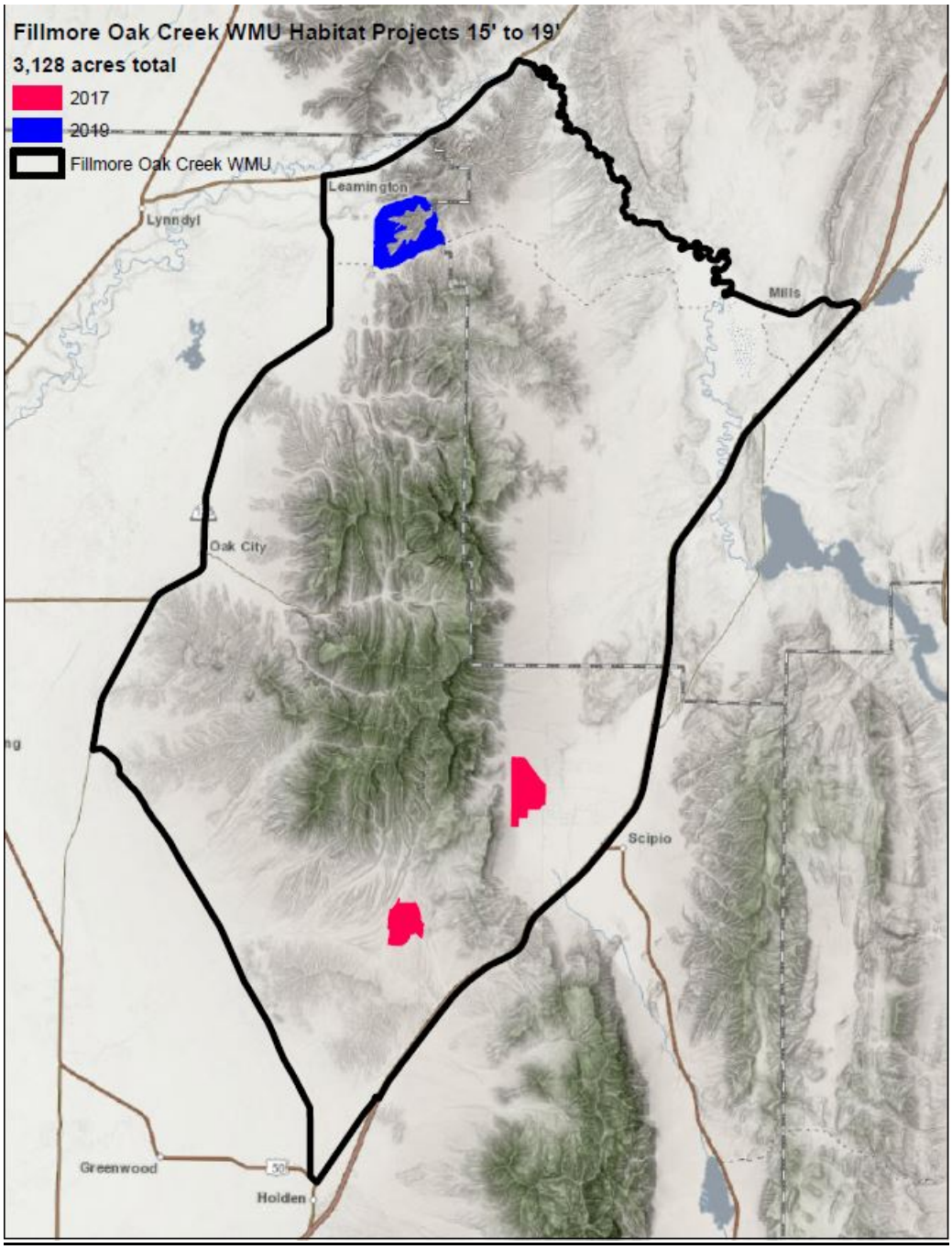
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects.

- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and to provide refuges.

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

    - Seek to increase browse in burned areas of critical winter range.
    - Summer range improvement and expansion.

Habitat Improvement Projects



PERMANENT RANGE TREND SUMMARIES

DWR Winter Range Trend Assessment

The condition of deer winter range within the Fillmore - Oak Creek management unit has continually changed on the sites sampled since 1997. The active Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2017 sample year. It is possible given more time and continual monitoring that these sites will (continue to) improve.

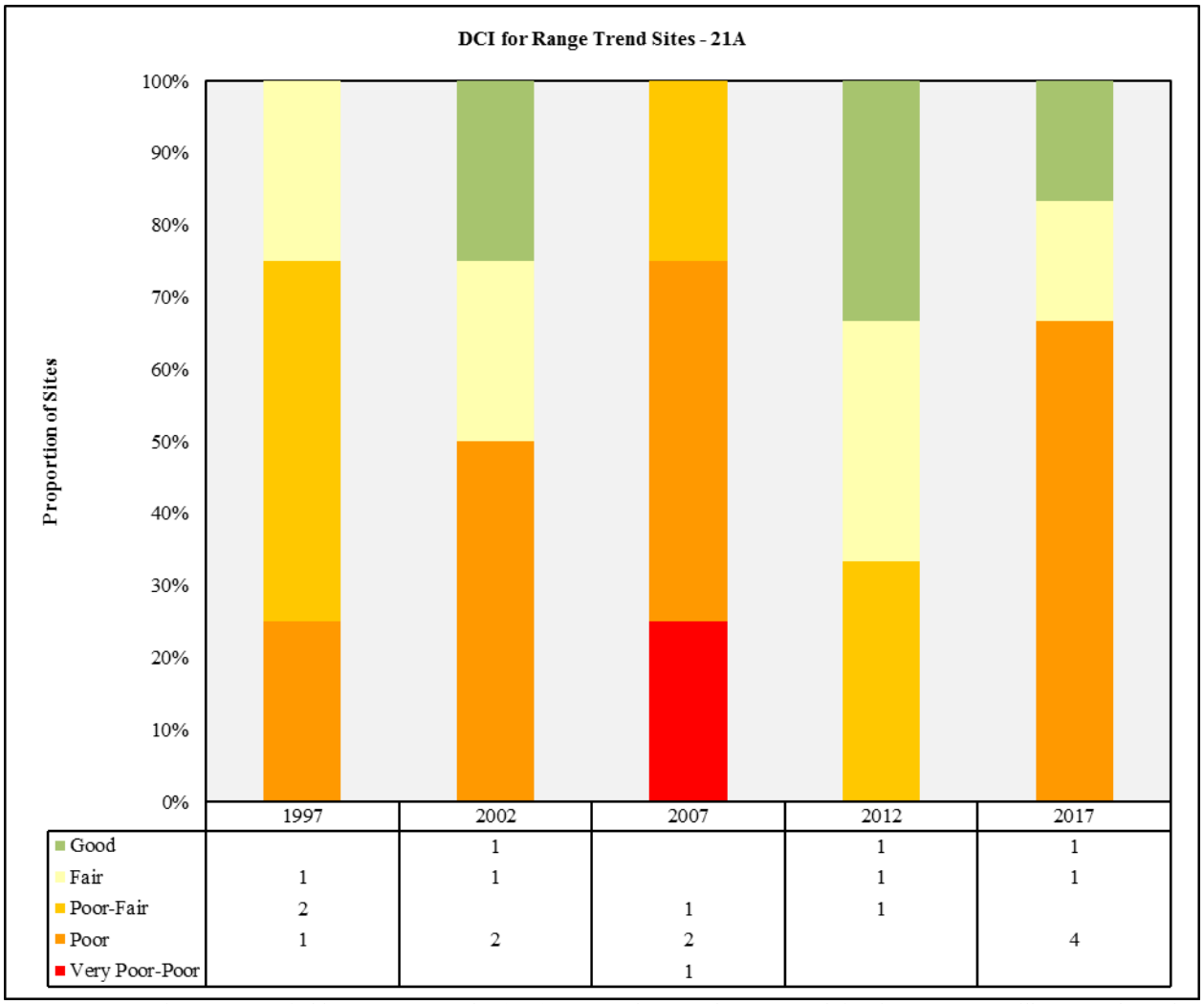


Figure 7.1: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 21A, Fillmore - Oak Creek.

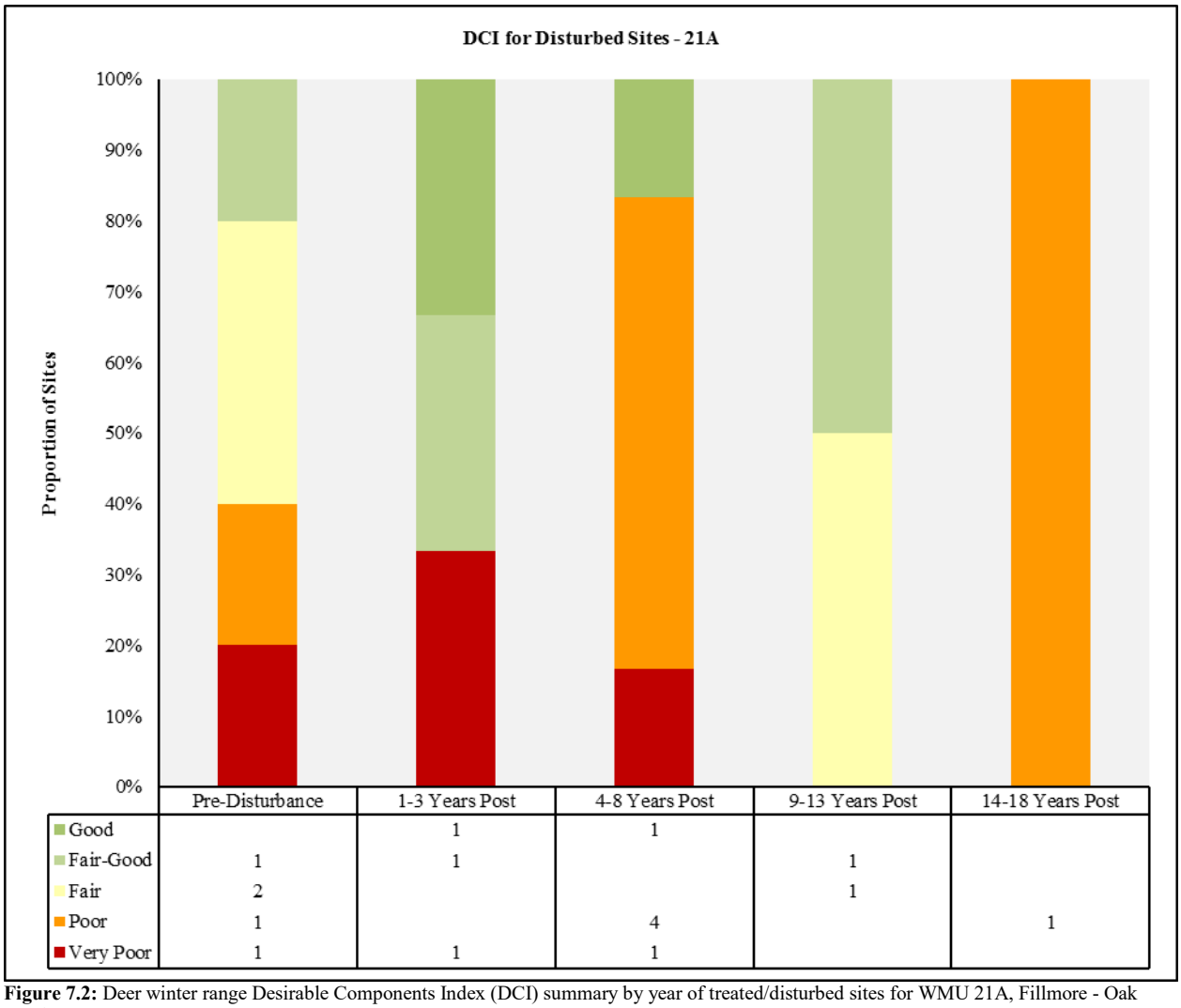


Figure 7.2: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 21A, Fillmore - Oak Creek.

Climate data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches in the Sevier Desert near Delta to 25 inches on the peaks of Blue Mountain and Partridge Mountain. All of the Range Trend and WRI monitoring studies on the unit occur within 9-22 inches of precipitation (**Map 7.1**) (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 was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the Western, South Central and North Central Mountains divisions (Divisions 1, 3, and 4).

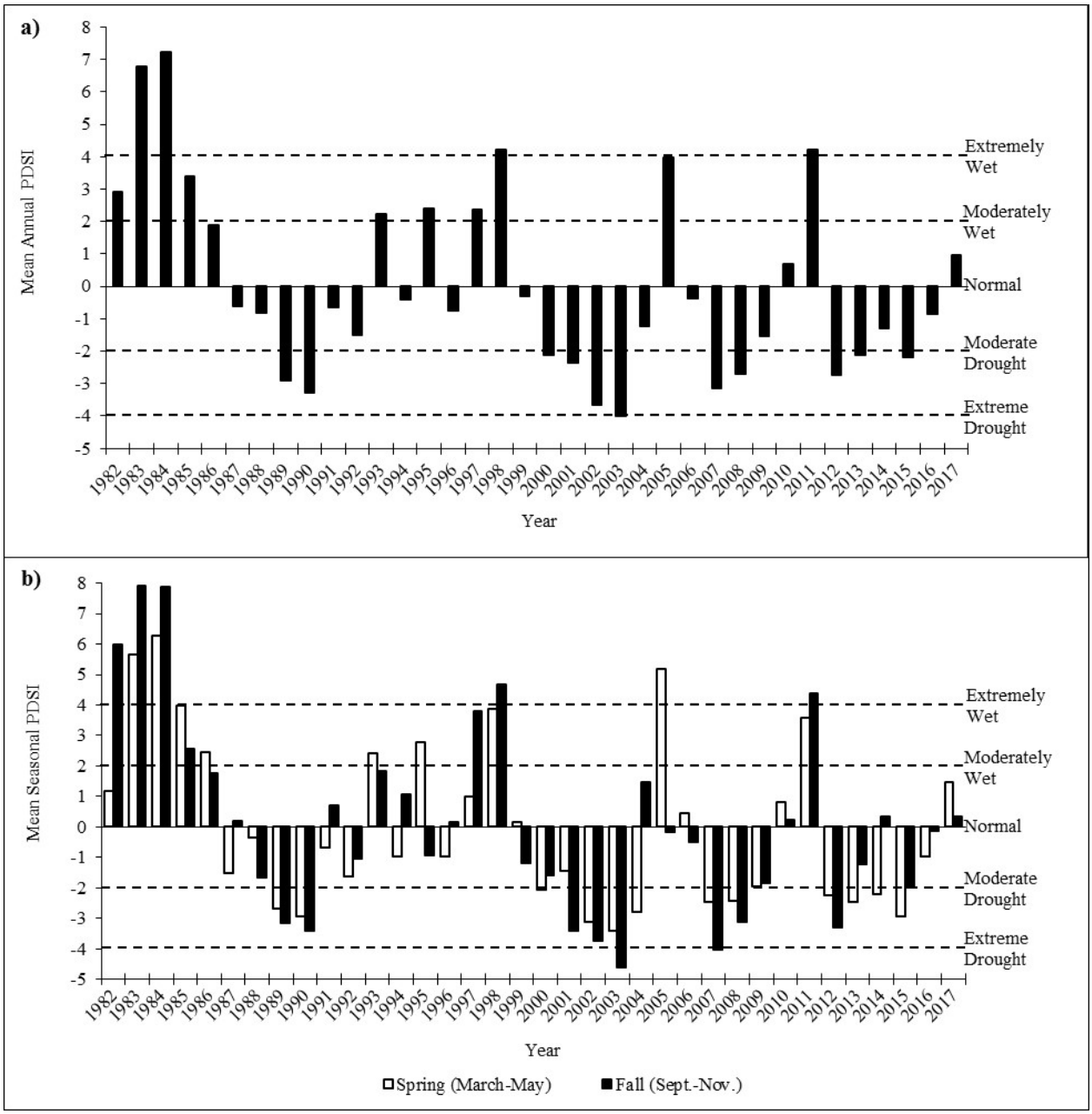
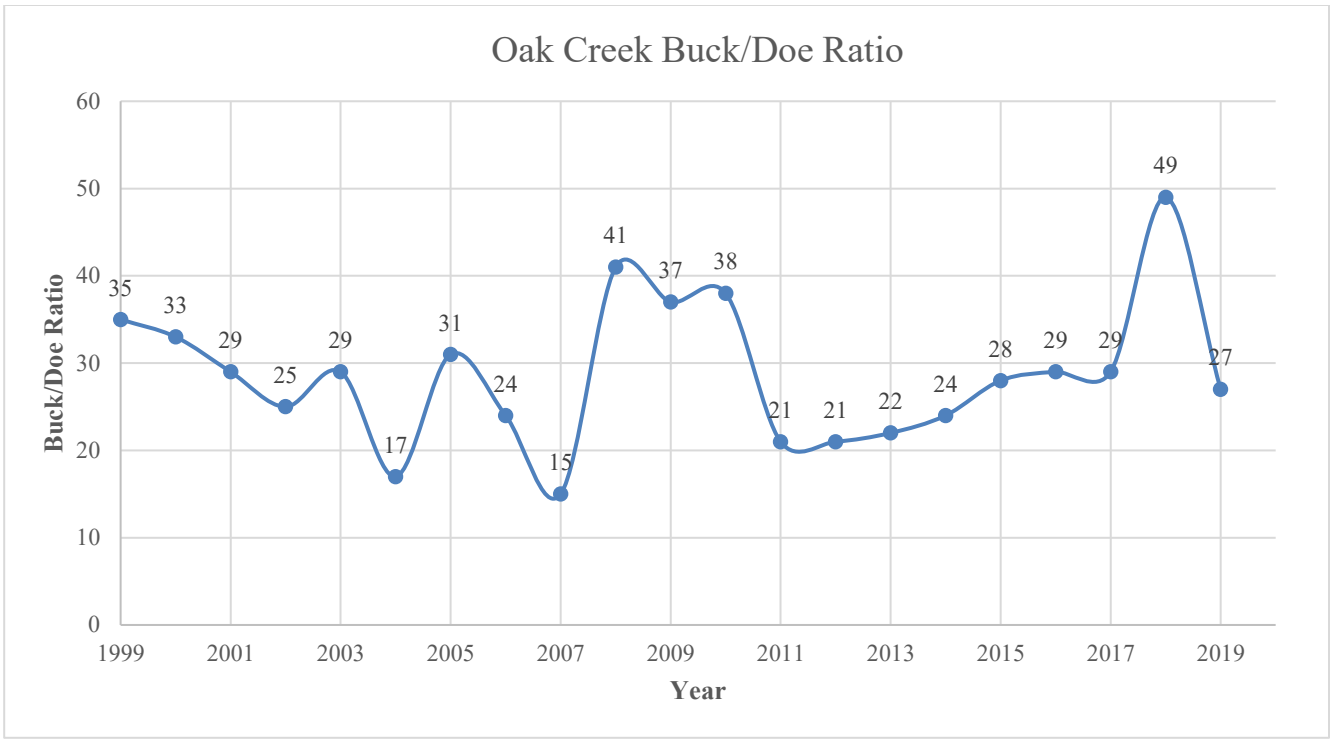
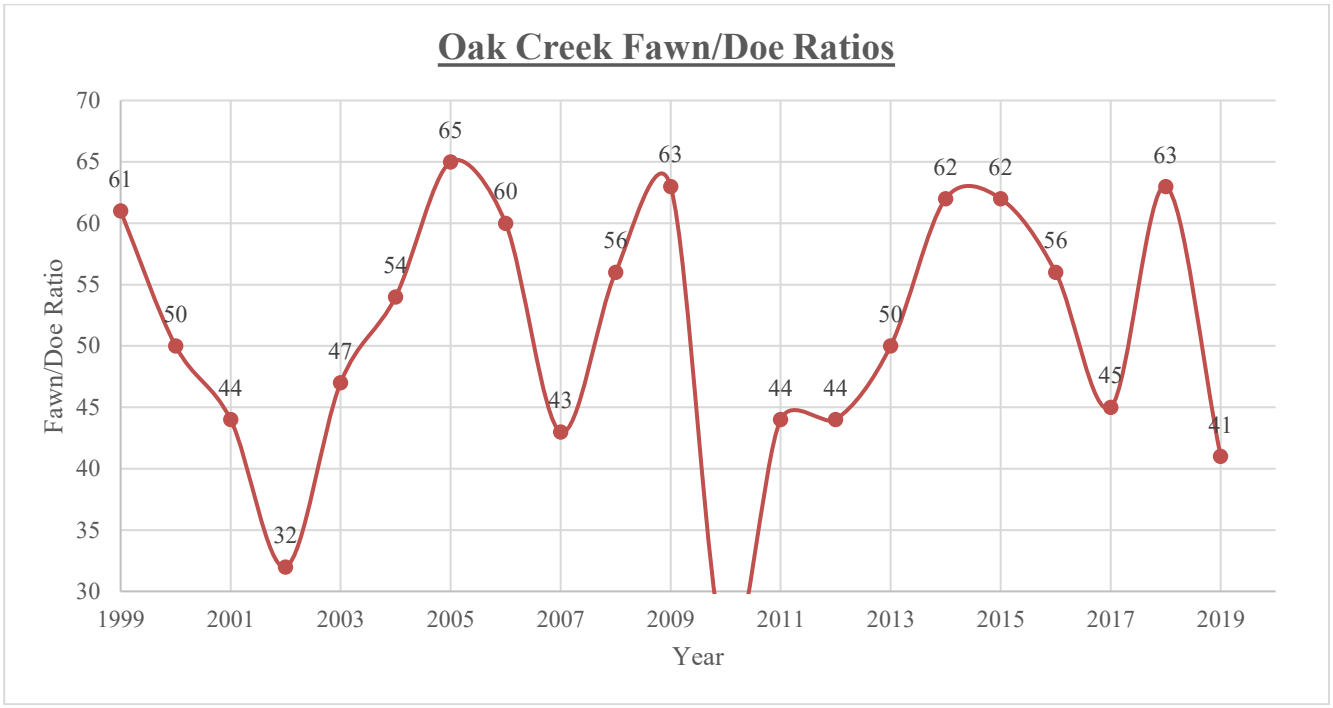


Figure 7.3: The 1982-2017 Palmer Drought Severity Index (PDSI) for the Western division (Division 1). The PDSI is based on climate data gathered from 1895 to 2017. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -.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. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2018).





Works Cited

Time Series Data. (2015). *National Oceanic and Atmospheric Administration Earth System Research Laboratory Physical Science Division*. Retrieved January 2015, from http://www.esrl.noaa.gov/psd/data/timeseries/

DEER HERD UNIT MANAGEMENT PLAN
Herd Unit #21B
Fillmore, Pahvant
2020

BOUNDARY DESCRIPTION

Juab, Millard and Sevier counties - Boundary begins at SR-132 and SR-125 (300 E in Leamington); west on SR-132 to US-6; south on US-6 to SR-257; south on SR-257 to the Black Rock road; east on this road to I-15; south on I-15 to I-70; east and north on I-70 to US-89; north on US-89 to US-50 in Salina; north on US-50 to I-15 near Scipio; south on I-15 to Exit 178 and US-50; south on US-50 to Whiskey Creek Road; north on this road to McCormick Road (CR-4549); north on this road to SR-125; north on SR-125 to SR-132 in Leamington. Excludes all Native American trust lands within this boundary. Excludes all CWMUs.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

	Year-Long Range		Summer Range		Winter Range	
OWNERSHIP	**AREA** (acres)	**%**	**AREA** (acres)	**%**	**AREA** (acres)	**%**
Forest Service	0	0%	325,288	85%	140,100	24%
Bureau of Land Management	2,995	1%	15,470	4%	188,601	32%
Utah State Institutional Trust Lands	17	82%	2,367	1%	34,616	6%
Native American Trust Lands	0	0%	0	0%	1,357	0%
Private	662	18%	40,623	11%	202,590	35%
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%	0	0%
Utah Division of Wildlife Resources	0	0%	119	0%	14977	3%
TOTALS	3,674	100%	383,867	100%	582,241	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.
- Continue to review habitat boundaries and look for ways to improve boundaries that provide for better social and biological needs on the unit.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Manage for a 5-year target population of **7,600** wintering deer (modeled number) during the five-year planning period; unless range conditions become unsuitable as evaluated by DWR. This is a decrease from the 2015 plan which was 12,000. The 10-year population estimate is 6,900. 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.

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

Harvest – General season hunting will be used to maintain and work towards objectives on this unit. Hunting strategies will include 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.

A Limited Entry muzzleloader hunt will also be offered on this unit in early November. Permits will be recommended up to 0.5% of the general-season draw permit total with a minimum of 5 permits on the unit.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size – Utilizing harvest data, postseason and mortality estimates, a computer model will be used to estimate winter population size. The 2019 model estimates the population at 6,700 deer.

- Buck Age Structure – Monitor age class structure of the buck population through the use of 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 when needed.

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 – The amount and condition of summer habitat on public lands, landowner acceptance and winter forage conditions will determine herd size. Excessive habitat utilization will be addressed through antlerless removal.

- Predation – If predation is determined to be a limiting factor, efforts to limit predation will be taken according to DWR predator management policy.

- Highway Mortality – DWR will cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures, warning signs, etc. if needed. Currently, highway mortality is not a limiting factor on this unit.

- 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

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.

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 agreements with land management agencies and local governments, the use of conservation easements, etc. on private lands and working toward blocking up UDWR properties through land exchanges with willing partners.

- Manage vehicle access on Division of Wildlife Resources land to limit disturbance critical times such as winter and fawning.

- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects.

- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and to provide refuges.

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

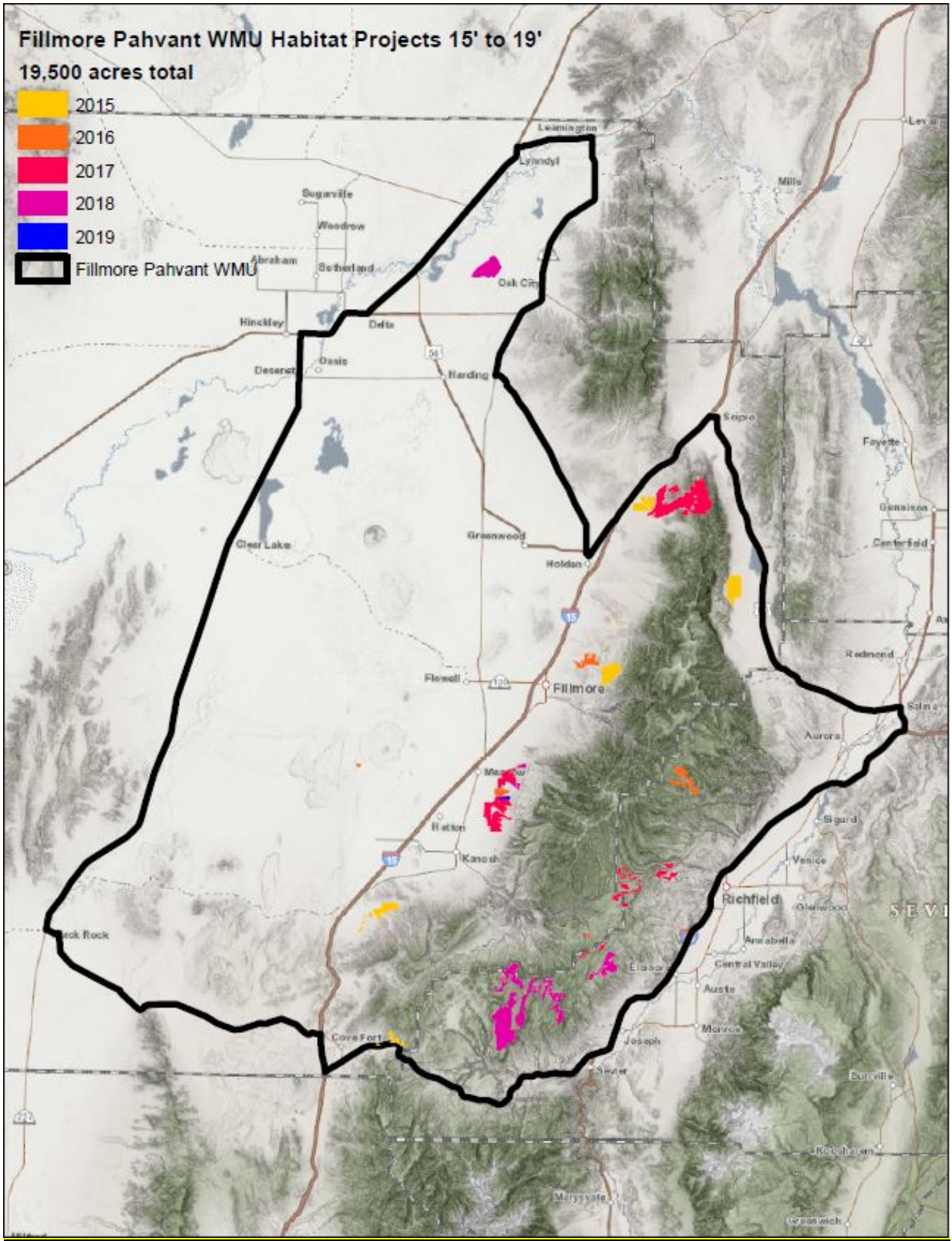
    - WMA's.

- Winter range along east side of unit.
- Quaking Aspen forests unit wide.

Habitat Project Summary

Type	Completed Acreage	Current Acreage	Proposed Acreage	Total Acreage
Anchor Chain	**8,792**	**0**	**1,047**	**9,839**
Ely (One-Way)	3,031	0	471	3,501
Ely (Two-Way)	5,143	0	577	5,719
Smooth (One-Way)	618	0	0	618
Bullhog	**5,223**	**1,195**	**0**	**6,418**
Full Size	488	0	0	488
Skid Steer	4,735	1,195	0	5,930
Chain Harrow	**0**	**6,067**	**0**	**6,067**
> 15 ft. (Two-Way)	0	6,067	0	6,067
Disk	**72**	**0**	**0**	**72**
Off-Set (One-Way)	72	0	0	72
Harrow	**338**	**0**	**0**	**338**
> 15 ft. (One-Way)	338	0	0	338
Herbicide Application	**2,181**	**0**	**0**	**2,181**
Aerial (Fixed-Wing)	1,793	0	0	1,793
Aerial (Helicopter)	359	0	0	359
Ground	29	0	0	29
Prescribed Fire	**631**	**0**	**0**	**631**
Road Decommissioning	**62**	**0**	**0**	**62**
Road/Parking Area Improvements	**0**	**0**	**6**	**6**
Seeding (Primary)	**10,972**	**451**	**131**	**11,553**
Broadcast (Aerial-Fixed Wing)	8,949	0	0	8,949
Broadcast (Aerial-Helicopter)	651	0	0	651
Drill (Rangeland)	1,372	0	0	1,372
Ground (Mechanical Application)	0	451	131	581
Spring Development	**1**	**0**	**0**	**1**
Vegetation Removal/Hand Crew	**4,214**	**244**	**899**	**5,357**
Lop and Scatter	3,979	0	899	4,878
Lop-Pile-Burn	235	244	0	478
Total Treatment Acres	**32,484**	**7,956**	**2,083**	**42,524**
***Total Land Area Treated**	**28,525**	**7,518**	**2,083**	**38,126**

Table 8.1: WRI treatment action size (acres) for completed, current, and proposed projects for WMU 21B, Fillmore – Pahvant. Data accessed on 02/09/2018. *Does not include overlapping treatments.

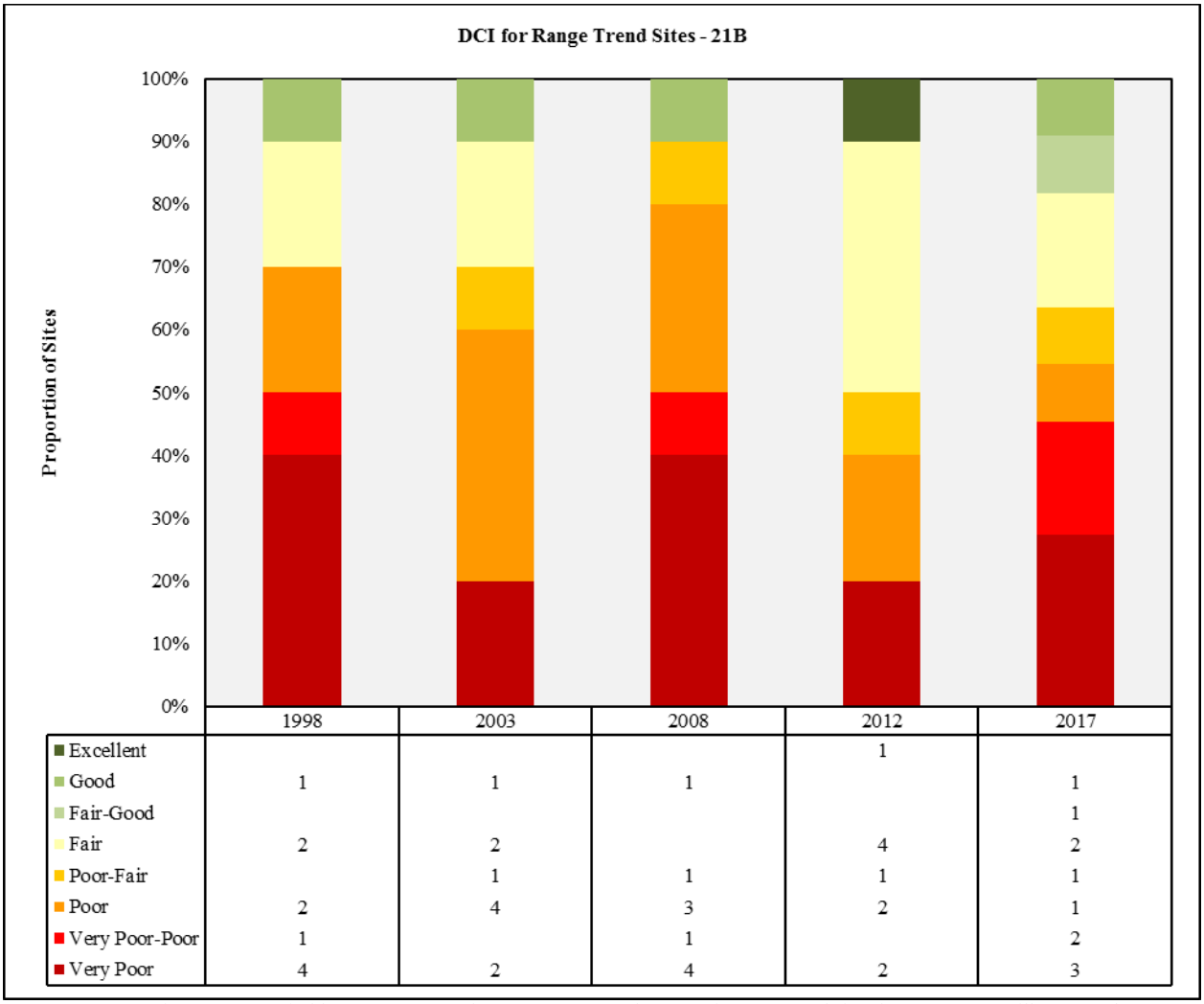

Fillmore Pahvant WMU Habitat Projects 15' to 19'
19,500 acres total
2015
2016
2017
2018
2019
Fillmore Pahvant WMU
Leamington
Lyndyl
Sugarville
Woodrow
Abraham
Sutherland
Oak City
Hinckley
Delta
Oasis
Deseret
Harding
Sepro
Fayette
Gunnison
Centerfield
Clear Lake
Greenwood
Holden
Redmond
Flowell
Fillmore
Aurora
Meadow
Hatton
Kanosh
Sigurd
Venice
Richfield
Glenwood
Annabella
Central Valley
Elsinore
Aurora
Monroe
Joseph
Cove Fort
Sevier
Burrville
Koosharem
Marysvale
Greenwich

RANGE TREND SUMMARIES

Units 21, Fillmore Pahvant units

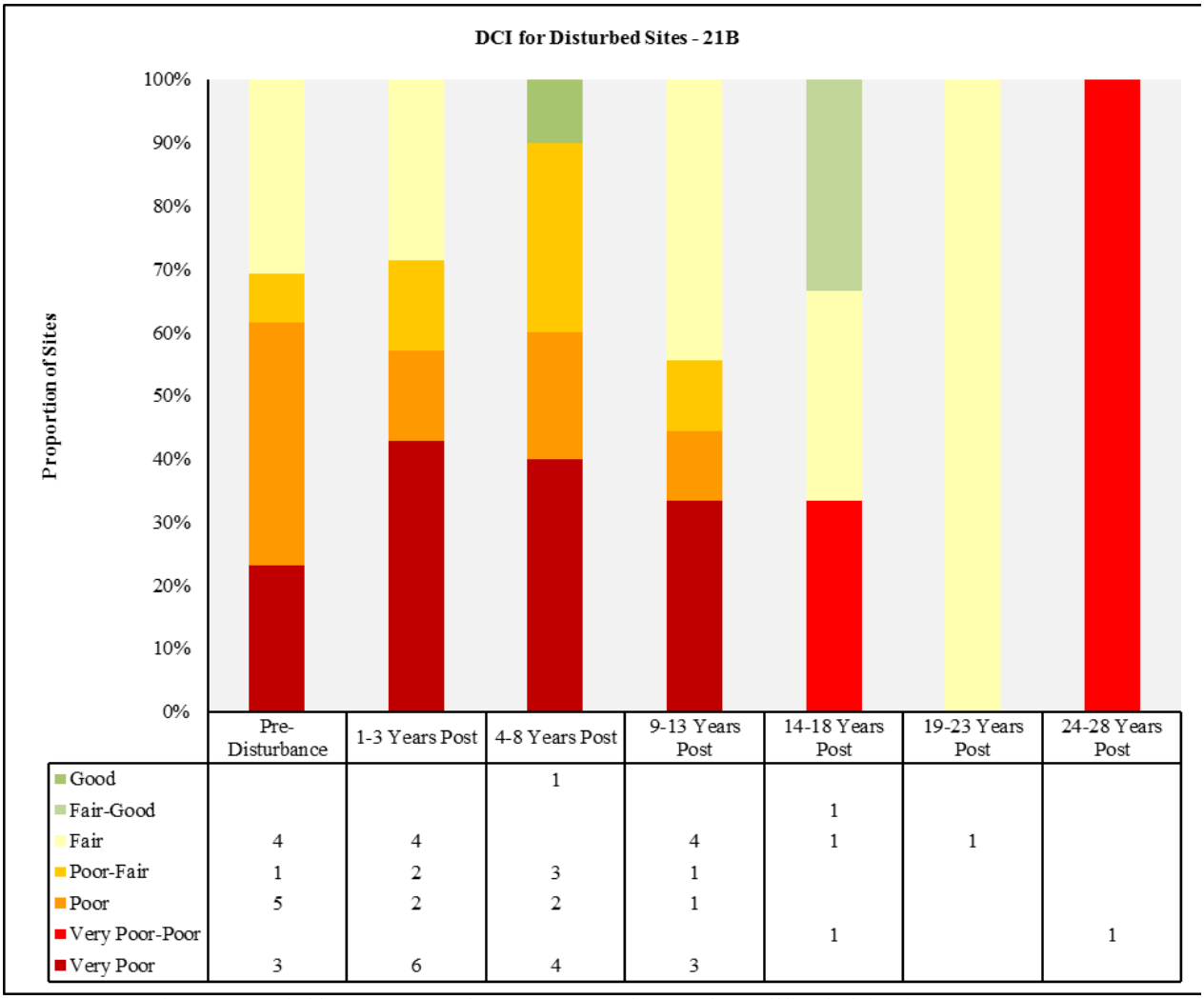
DWR Winter Range Trend Assessment

The condition of deer winter range within the Fillmore - Pahvant management unit has continually changed on the sites sampled since 1998. The active Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2017 sample year (**Figure 8.10**). M Hill has remained in good condition. Smith's Ridge improved from fair to fair-good. Wide Canyon DWR and Dog Valley Creek are considered to be in fair condition, and Fillmore Cemetery East went from fair to poor-fair condition. Wide Canyon BLM remained in poor condition. Walker Creek deteriorated from fair to very poor-poor condition. Bennett Field moved from poor-fair to very poor-poor condition. Meadow Creek went from poor to very poor condition. Finally Dog Valley and Dameron Canyon remained in very poor condition. (**Figure 8.11**) The treated sites have generally shown an improvement or have remained in the same condition as time since treatment increased. The exception to this is Water Canyon, which moved from fair to very poor.



	1998	2003	2008	2012	2017
Excellent				1	
Good	1	1	1		1
Fair-Good					1
Fair	2	2		4	2
Poor-Fair		1	1	1	1
Poor	2	4	3	2	1
Very Poor-Poor	1		1		2
Very Poor	4	2	4	2	3

Figure 8.1: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 21B, Fillmore - Pahvant.



	Pre-Disturbance	1-3 Years Post	4-8 Years Post	9-13 Years Post	14-18 Years Post	19-23 Years Post	24-28 Years Post
Good			1				
Fair-Good					1		
Fair	4	4		4	1	1	
Poor-Fair	1	2	3	1			
Poor	5	2	2	1			
Very Poor-Poor					1		1
Very Poor	3	6	4	3			

Figure 8.2: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 21B, Fillmore - Pahvant.

Mule Deer Habitat

There are 480,510 acres estimated as mule deer range on Unit 21B with 44% designated as winter range and 56% classified as summer range. The United States Forest Service manages 51% of the winter range, 30% is privately owned, 10% is managed by the Bureau of Land Management, The Utah Division of Wildlife Resources (UDWR) manages 7%, the Utah School and Institutional Trust Lands Administration (SITLA) manages another 2%, Utah Department of Transportation (UDOT) and Utah State Parks (USP) manage <1%, and there is another <1% that is tribally owned. This unit has significant amounts of winter range that are privately owned, which can present management issues with crop depredation.

Deer winter range roughly follows the base of the Pahvant range at elevations between approximately 5100 and 7500 feet. It is bordered on the west by I-15, on the east by I-70, and on the north by US-50. There are still good amounts of winter habitat at the lower elevations of the unit. The Milford Flat fire

burned significant areas of former winter range and I-15 acts as a barrier to migration into previously-used desert wintering areas.

Much of the winter range on this unit is host to shrub communities composed of a mix of Stansbury cliffrose, mountain big sagebrush, and other browse species. While many of the range trend sites show good populations of browse species, many of these sites have depleted understories with both cheatgrass and bulbous bluegrass being very common across the range. On the higher elevation summer sites, there are significant amounts of aspen-timber and subalpine meadow plant communities that are used for summer range.

Precipitation

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches in areas near Joseph up to 35 inches on the top of the Pahvant range. All of the Range Trend and WRI monitoring studies on the unit occur within 13-35 inches of precipitation (**Map 8.1**) (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 was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South-Central division (Division 4).

The mean annual PDSI of the South-Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2014. The mean annual PDSI displayed moderately to extremely wet years from 1983-1985, 1997-1998, 2005, and 2011 (Figure 8.1a). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 2000, 2002-2004, 2007-2008, and 2012-2015; moderately to extremely wet years were displayed in 1983-1986, 1993, 1995, 1998, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009, and 2012; moderately to extremely wet years were displayed in 1982-1985, 1997-1998, 2005, and 2011 (**Figure 8.1b**).

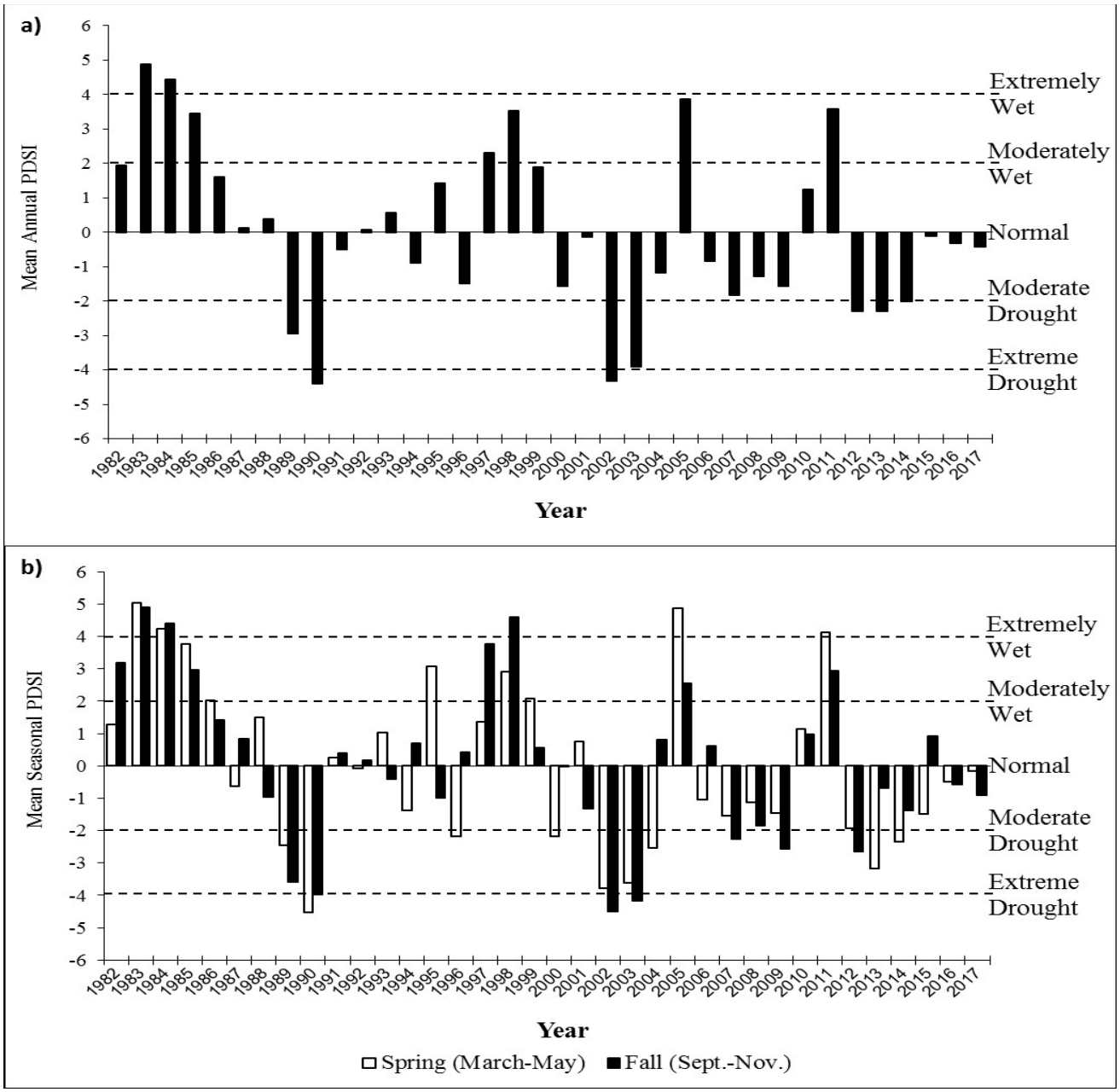
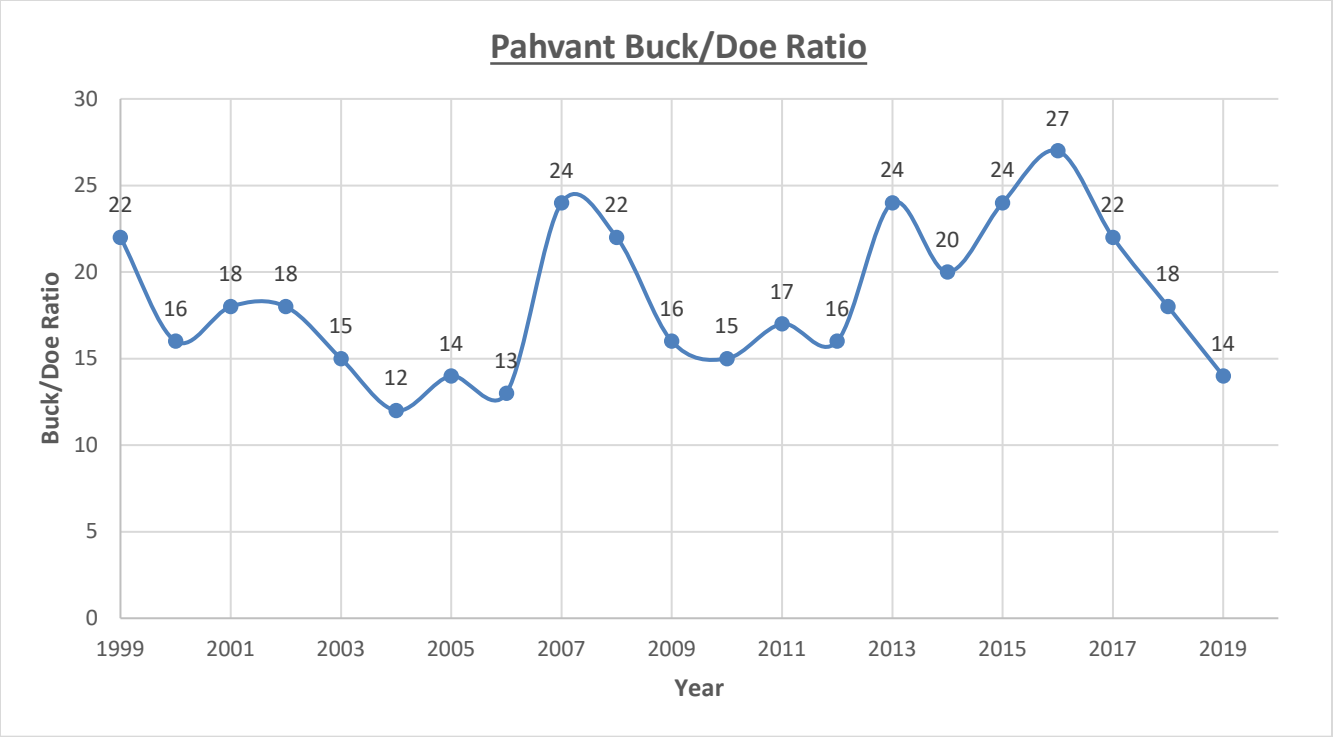
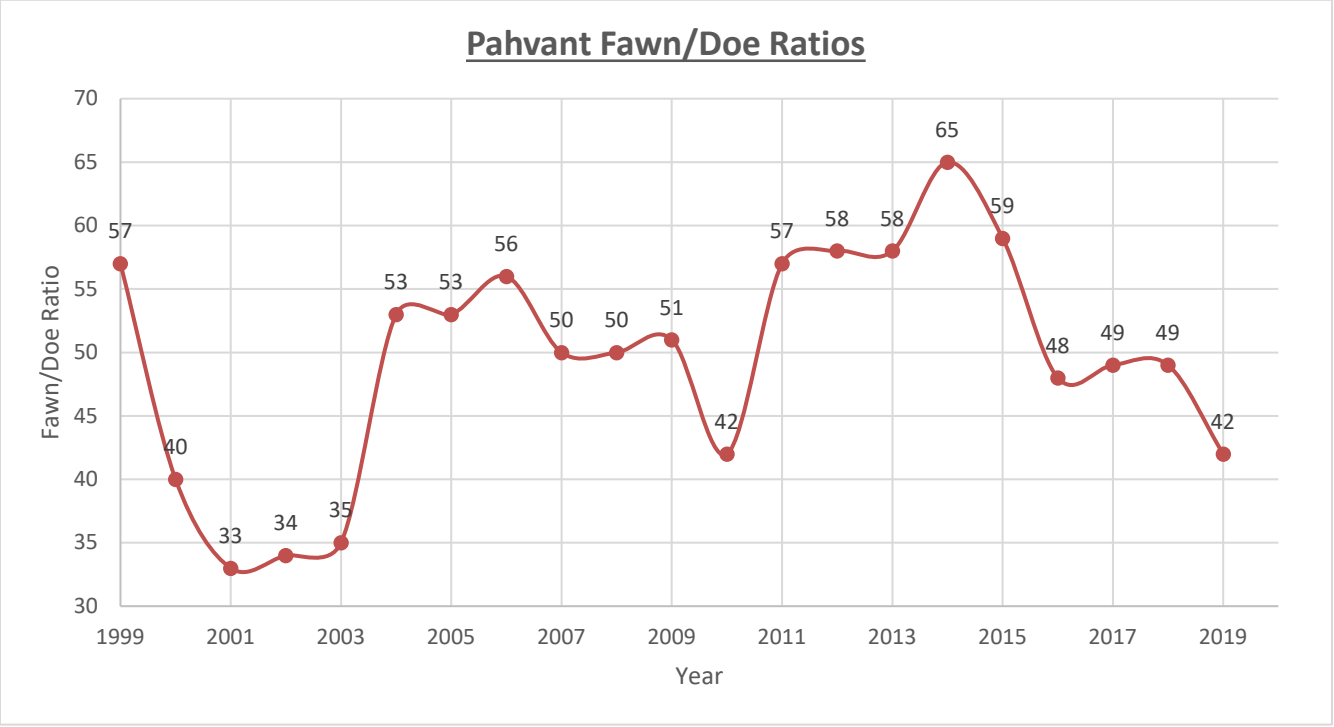


Figure 8.3: The 1982-2017 Palmer Drought Severity Index (PDSI) for the South Central division (Division 5). The PDSI is based on climate data gathered from 1895 to 2017. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -.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. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2018). .





Works Cited

Time Series Data. (2015). *National Oceanic and Atmospheric Administration Earth System Research Laboratory Physical Science Division*. Retrieved January 2015, from http://www.esrl.noaa.gov/psd/data/timeseries/