

2018 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2018 - 5/31/2019

HERD: EL531 - IRON MOUNTAIN

HUNT AREAS: 6

PREPARED BY: LEE KNOX

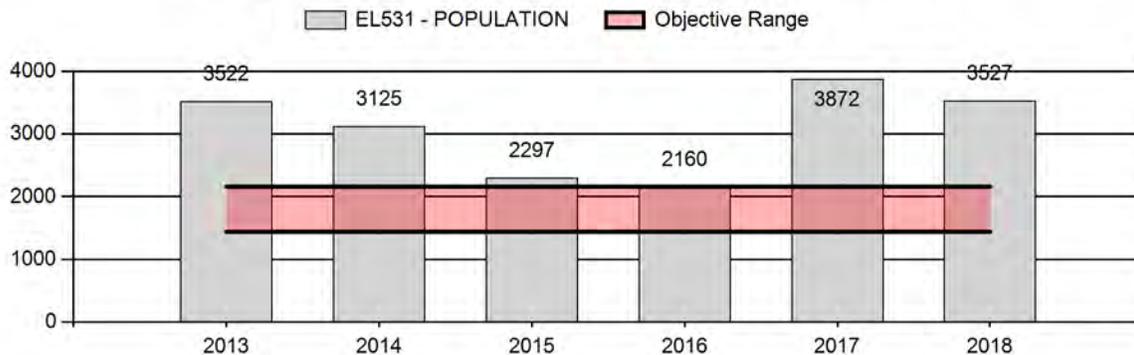
	<u>2013 - 2017 Average</u>	<u>2018</u>	<u>2019 Proposed</u>
Population:	2,995	3,527	3,400
Harvest:	653	650	650
Hunters:	1,571	1,331	1,300
Hunter Success:	42%	49%	50%
Active Licenses:	1,627	1,391	1,400
Active License Success:	40%	47%	46%
Recreation Days:	10,725	7,953	8,000
Days Per Animal:	16.4	12.2	12.3
Males per 100 Females	29	24	
Juveniles per 100 Females	51	45	

Population Objective (± 20%) :	1800 (1440 - 2160)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	96%
Number of years population has been + or - objective in recent trend:	0
Model Date:	2/28/2019

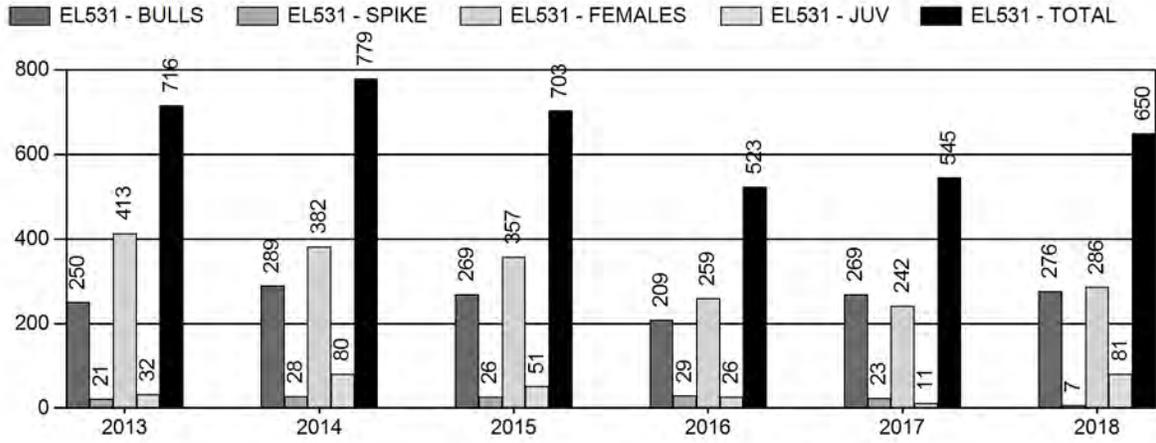
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	15%	15%
Males ≥ 1 year old:	30%	30%
Total:	17%	17%
Proposed change in post-season population:	5%	5%

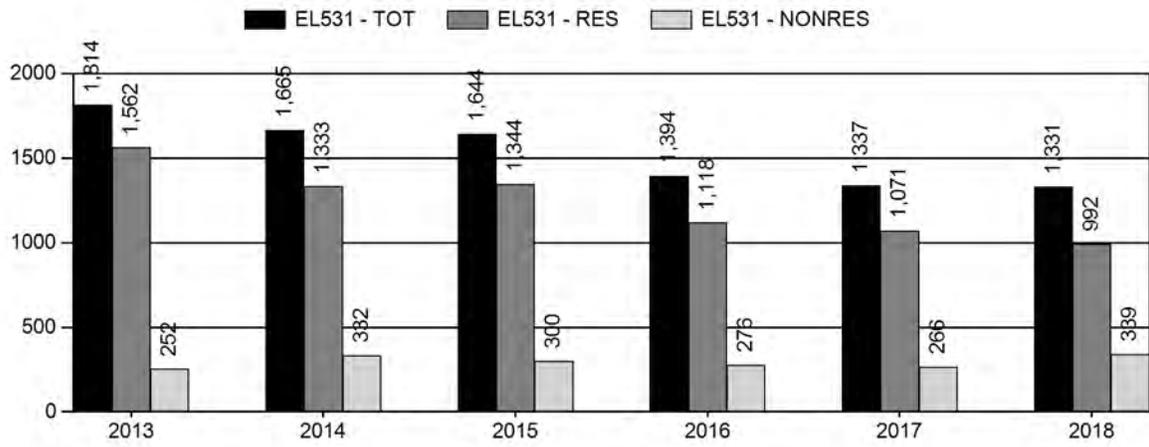
Population Size - Postseason



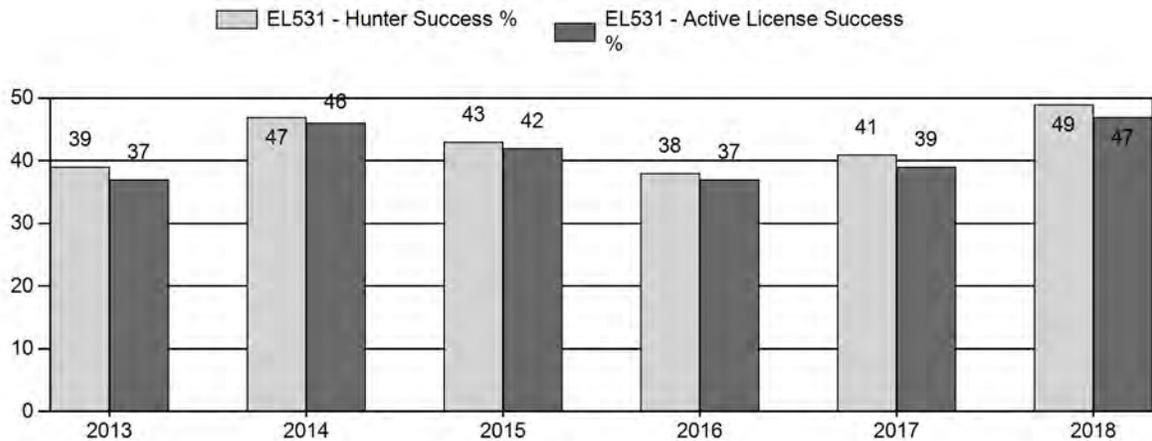
Harvest



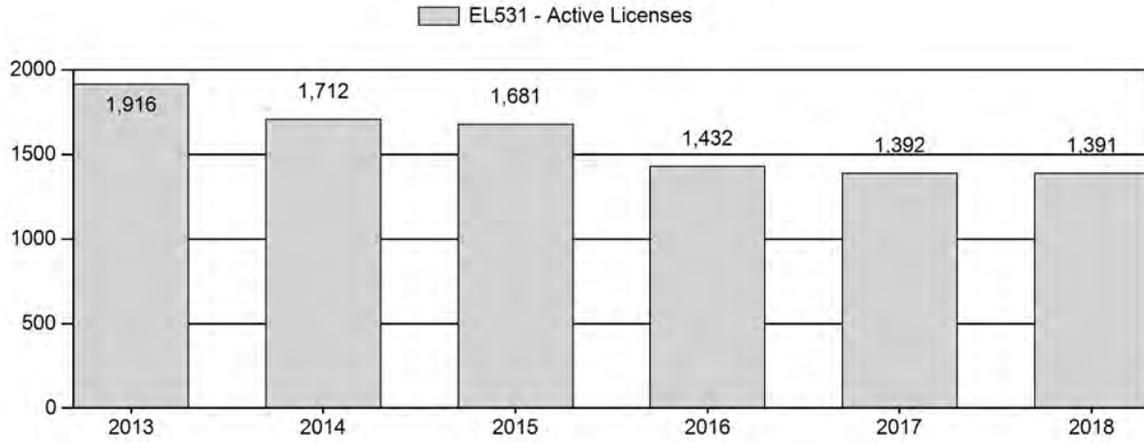
Number of Hunters



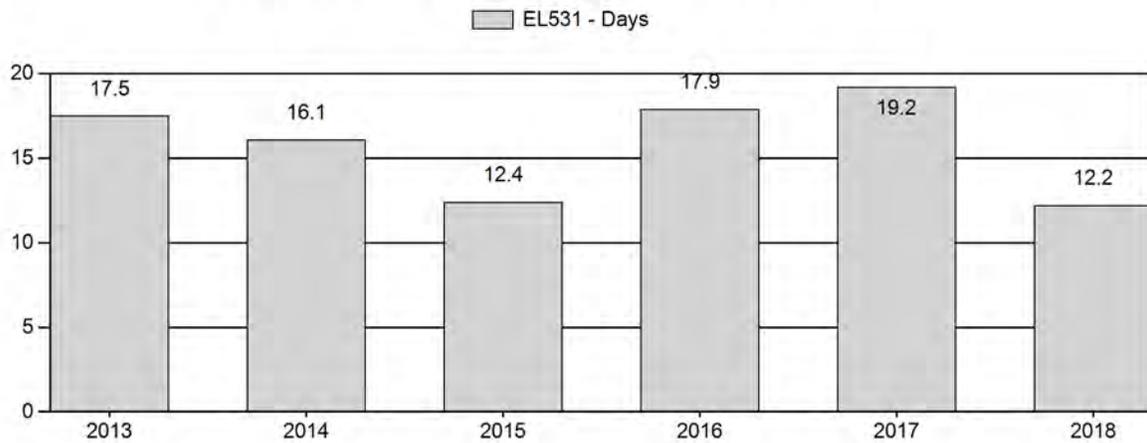
Harvest Success



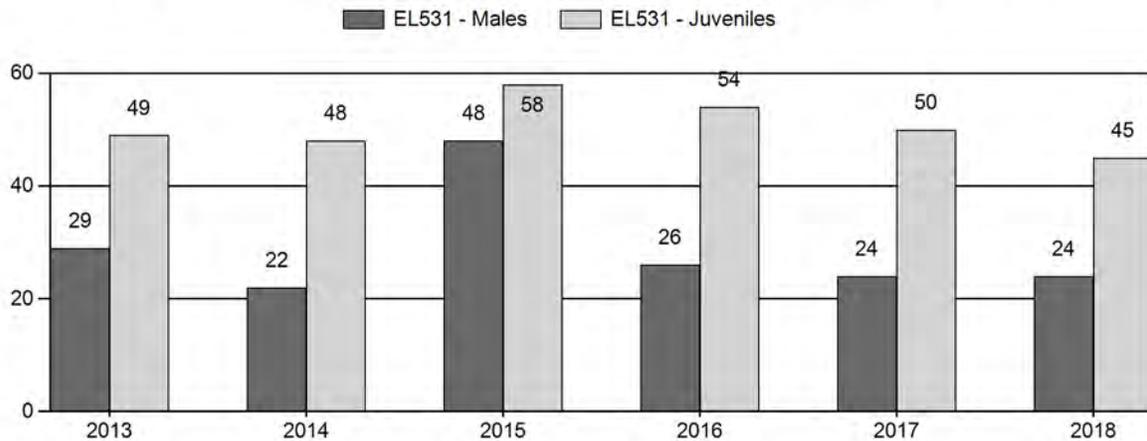
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2013 - 2018 Postseason Classification Summary

for Elk Herd EL531 - IRON MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2013	3,522	75	86	161	16%	557	56%	273	28%	991	707	13	15	29	± 3	49	± 4	38
2014	3,125	44	67	111	13%	499	59%	238	28%	848	671	9	13	22	± 3	48	± 4	39
2015	2,297	152	142	294	23%	616	49%	355	28%	1,265	743	25	23	48	± 3	58	± 3	39
2016	2,160	123	50	173	15%	657	55%	357	30%	1,187	631	19	8	26	± 2	54	± 3	43
2017	3,872	155	150	305	14%	1,269	58%	629	29%	2,203	614	12	12	24	± 1	50	± 2	40
2018	3,527	116	106	222	14%	919	59%	409	26%	1,550	636	13	12	24	± 2	45	± 3	36

**2019 HUNTING SEASONS
IRON MOUNTAIN ELK (EL531)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
6		Oct. 1	Oct. 31		General	Any elk valid off national forest
6		Nov. 1	Nov. 30		General	Antlerless elk valid off national forest
6	1	Oct. 15	Oct. 31	75	Limited Quota	Any elk
6	1	Nov. 1	Jan. 31			Antlerless elk
6	4	Nov. 1	Jan. 31	50	Limited Quota	Antlerless elk
6	6	Aug. 15	Jan. 31	1100	Limited Quota	Cow or calf valid off national forest
6	Archery					Refer to Section 3 in Elk Regulations

Hunt Area	License Type	Changes from 2018
6	1	0
	4	0
	6	0
Herd Unit Totals		0

MANAGEMENT EVALUATION

Current Postseason Population Management Objective: 1,800 (1,440-2,160)

Management Strategy: Recreational

2018 Postseason Population Estimate: ~3,500

2019 Proposed Postseason Population Estimate: 3,400

2018 Hunter Satisfaction:, 68% Satisfied, 18% Neutral, 14% Dissatisfied

The management objective for the Iron Mountain Elk herd unit is a post-season population objective of 1,800 elk. The management strategy is recreational, which requires maintaining a post-hunt bull ratio of 15 to 29:100 cows. The population management objective and management strategy were reviewed in 2016.

Herd Unit Issues

The Iron Mountain Elk herd unit includes Hunt Area 6, which is comprised of mostly private lands, except for the Pole Mountain Unit of the Medicine Bow National Forest and several sections of Bureau of Land Management and State of Wyoming lands. Urban sprawl and non-traditional land owners are increasing in the herd unit, adding to the already limited hunter access within the hunt area. The Iron Mountain elk herd continues to be a concern to many landowners due to large wintering herds, sometimes exceeding 1,000 elk (during the 2017 classification flight, a herd of 1,600 elk were observed together). Many of the landowners in the herd unit offer bull elk hunts to clients, therefore bull quality and quantity are a concern. Some, but not all, landowners have expressed concerns about the length of the overall elk season in Hunt Area 6 and have expressed interest in eliminating the January portion of the season. The lengthy season (August 15th-January 31st) is a result of damage issues and an effort to reduce the overall population to the population management objective (1,800). The 2018 post-season population estimate was 3,500 elk, with the population slowly trending downward from a high of 5,500 in 2011.

Weather

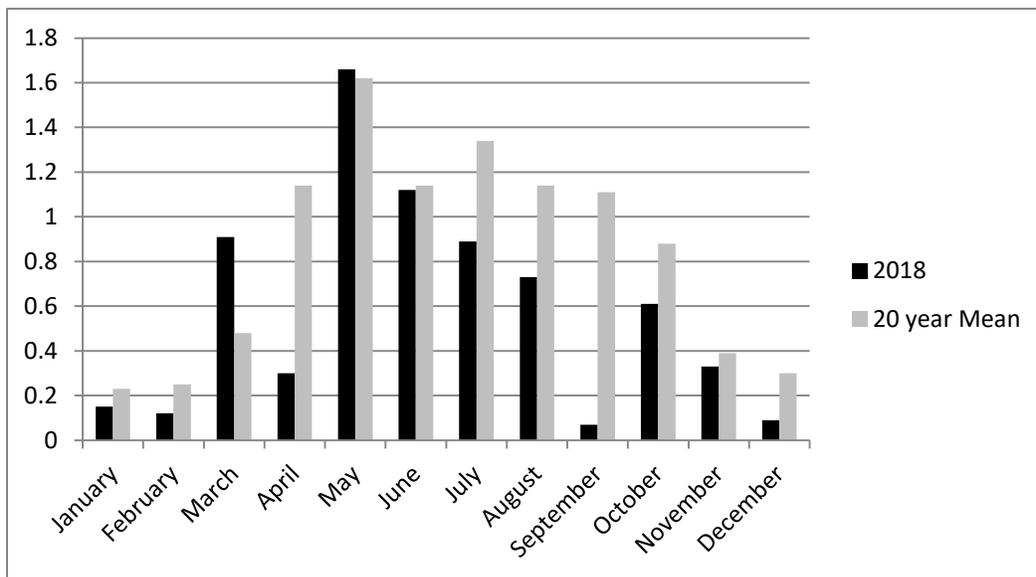


Figure 1. Monthly precipitation totals in inches for 2018 and the 20 year mean (1999-2019). Report was created at <https://w2.weather.gov/climate/xmacis.php?wfo=cys> using data collected at the Laramie Regional Airport.

Precipitation was similar to the 20 year mean during key growth periods for cool season grasses and preferred transitional range and winter range shrub species. While early season growing conditions were optimal, late summer and fall precipitation was lacking. The extreme cold and high winds experienced in early winter, as well as hot dry conditions in midsummer, likely increased the mortality in the younger cohort.

Habitat

Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant species.

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently should not heavily influence population management for any particular big game species.

Field Data

A total of 1,550 elk were classified in 2018, exceeding the estimated classification objective of 636 elk. Bull ratios in 2018 remain near the 3 year average at 25 Bulls: 100 cows but significantly lower than 2015 (48:100). This reduction is more than likely an effect of survey effort and weather, rather than an actual decline in the overall number of bulls in the herd. This herd has historically been very productive and continues to be with 45 calves per 100 cows. After changing the license issuance from limited quota to general in 2012, the number of active licenses has been on a steady decline from a high of 2,480 in 2012 to 1,391 in 2018.

Harvest Data

Harvest increased from 550 elk in 2017 to 650 elk in 2018. Bull harvest remained similar to 2017 (290 elk) while cow/calf harvest made up the increase of 100 harvest elk. At best we are keeping up with calf production each year, but it is more likely that we are not harvesting enough elk to maintain or decrease the total population. Both the Type 1 and Type 4 licenses remain very popular with the public. Type 1 license drawing odds are less than 15% for residents, and non-residents require 6 or more preference points to be successful in drawing this license. Hunter success decreased on the Type 1 license to 25% in 2018, compared to 35% in 2017, and well below the 5 year average of 52%. The Type 4 license hunt has always been more difficult, but this is the first year that no elk were harvested. Counter to what we would expect with low hunter success, hunter satisfaction remained relatively high, with 68% of hunters being either very satisfied or satisfied. The decline in harvest and low success with some license types in 2018 suggests a continued issue with hunters not being able to find adequate access to the large herds of elk that are able to find refuge within the Iron Mountain elk herd unit. Without increased landowner willingness and cooperation in providing access to hunters, managers will continue to struggle to reach the desired population management objective (1,800).

Population

This is the fifth year that we have collected adequate classification data to allow the population model to perform. The "Constant Juvenile and Adult Survival" (CJ, AS) model was selected as the most biologically reasonable model for the Iron Mountain herd, and produced an AIC score

of 449 and a Fit score of 476. This model did not have the lowest AIC score, but the lower scoring models (TSJ, CA and TSJ, CA, MSC) do not appropriately describe this herd (i.e. there are not factors (predation or weather events) that would lead to large variations with juvenile survival) and the post-season population estimates for these models were below the total number of elk classified, which is not realistic. Although AIC and Fit scores are provided herein, using AIC ranking is not recommended as the best model selection method because we have no sample-based population estimates or survival estimates incorporated into the models. The CJ, CA model predicts the Iron Mountain population declining from a high of 5,500 in 2011 to the current population estimate of 3,500 in 2018. While this model is ranked “Poor” due to a lack of inclusion of juvenile and adult survival rates and inadequate samples of historical classification data, the population estimate provided seems biologically reasonable.

Management Summary

The Iron Mountain Elk Herd continues to be a very productive herd, but also a difficult herd to reach an adequate harvest as a result of access issues. The 2018 hunting saw an increase in harvest, but still below an estimated minimum of around 700 annually needed to reduce the overall population closer to the population management objective (1,800). Currently the season structure is as liberal as the public or the landowners will tolerate. We issued 1,100 type 6 licenses in 2018, 837 were purchased, 591 were active, leaving plenty of opportunity if needed. Currently with the lack of public land, Hunter Management Areas, and consistent landowner cooperation, the Iron Mountain Elk Herd will continue to present challenges to managers into the future.

2018 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2018 - 5/31/2019

HERD: EL533 - SNOWY RANGE

HUNT AREAS: 8-12, 110, 114, 125

PREPARED BY: TEAL CUFAUDE

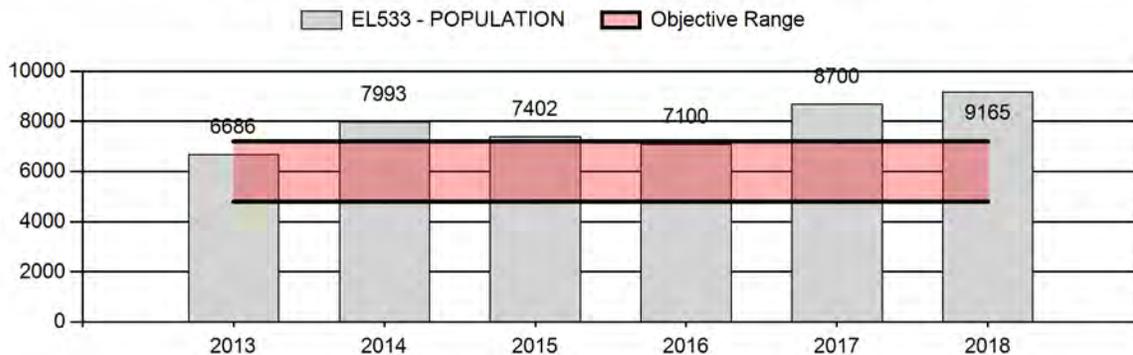
	<u>2013 - 2017 Average</u>	<u>2018</u>	<u>2019 Proposed</u>
Population:	7,576	9,165	8,300
Harvest:	2,018	2,072	2,150
Hunters:	5,975	5,603	5,600
Hunter Success:	34%	37%	38%
Active Licenses:	6,269	5,941	6,000
Active License Success:	32%	35%	36%
Recreation Days:	48,423	43,839	47,500
Days Per Animal:	24.0	21.2	22.1
Males per 100 Females	27	30	
Juveniles per 100 Females	45	39	

Population Objective (\pm 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	53%
Number of years population has been + or - objective in recent trend:	5
Model Date:	03/08/2019

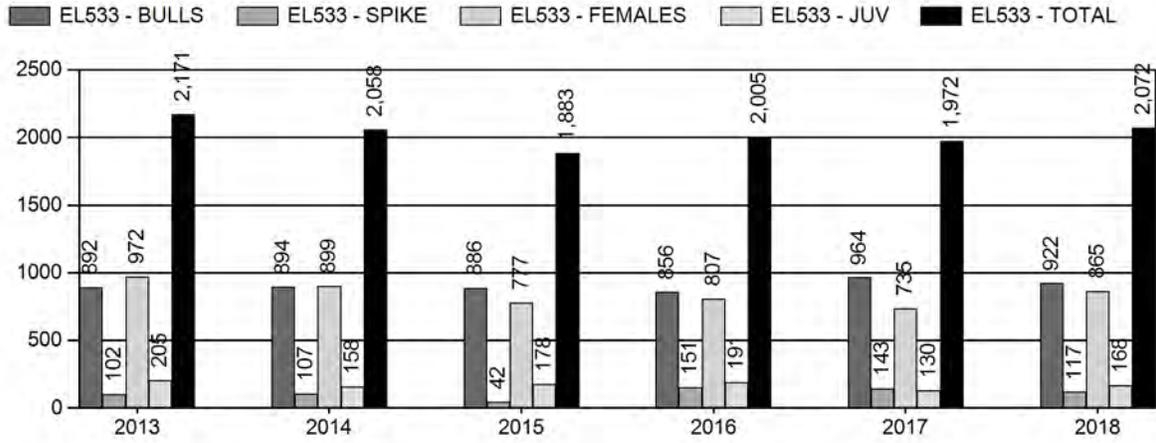
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	15%	17%
Males \geq 1 year old:	45%	54%
Total:	25%	22%
Proposed change in post-season population:	-8%	-9%

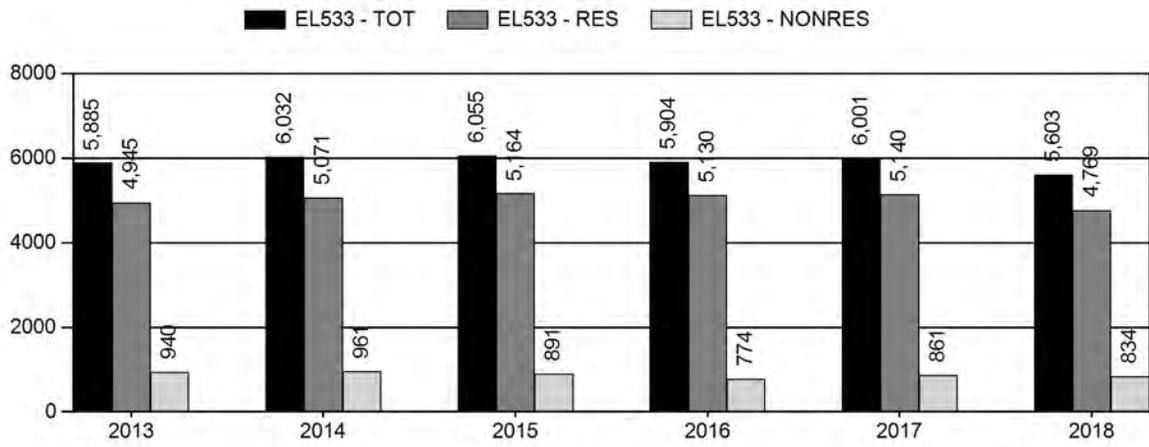
Population Size - Postseason



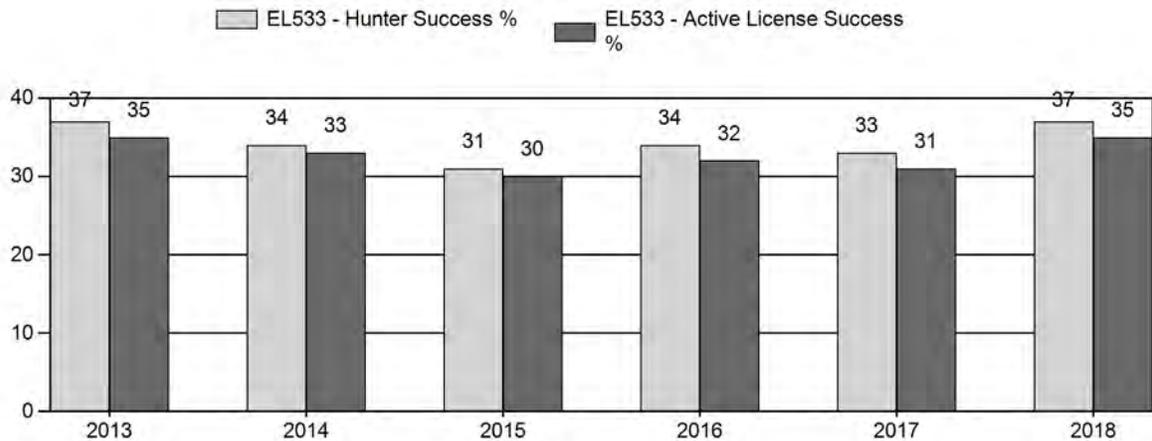
Harvest



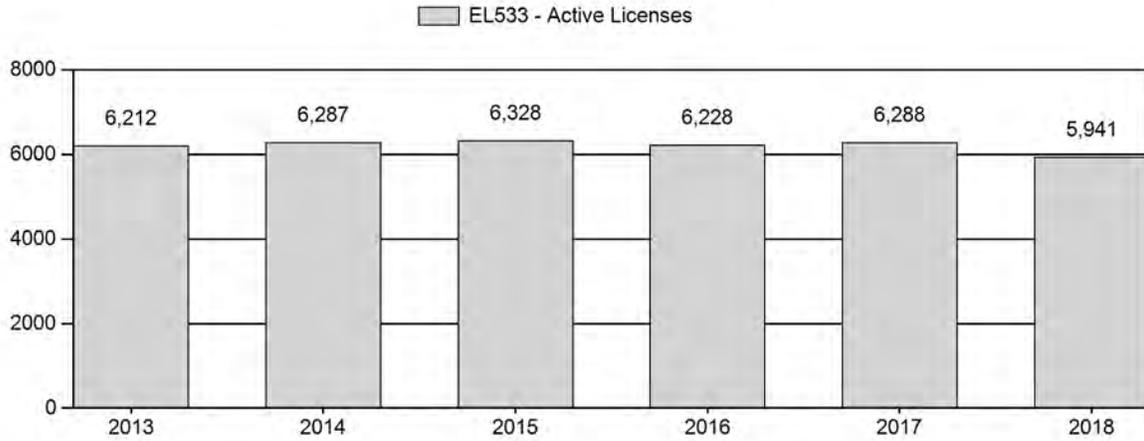
Number of Hunters



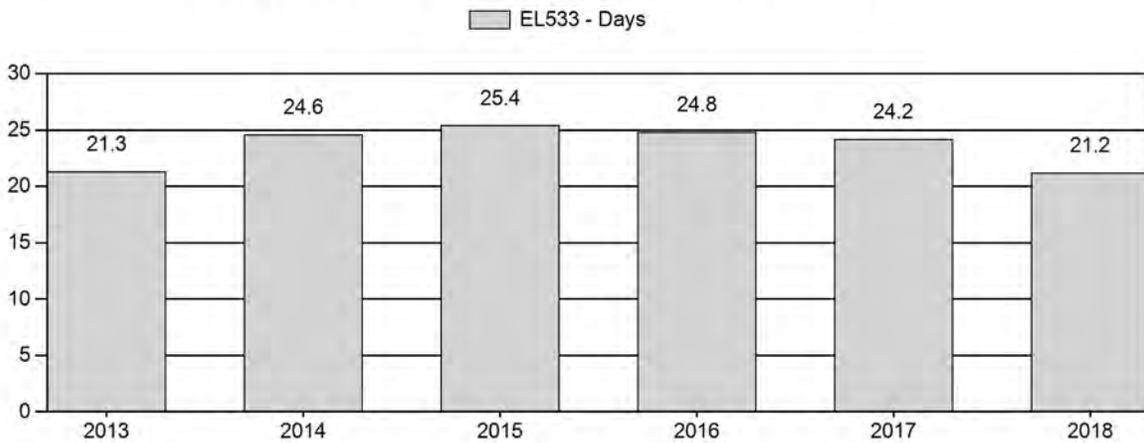
Harvest Success



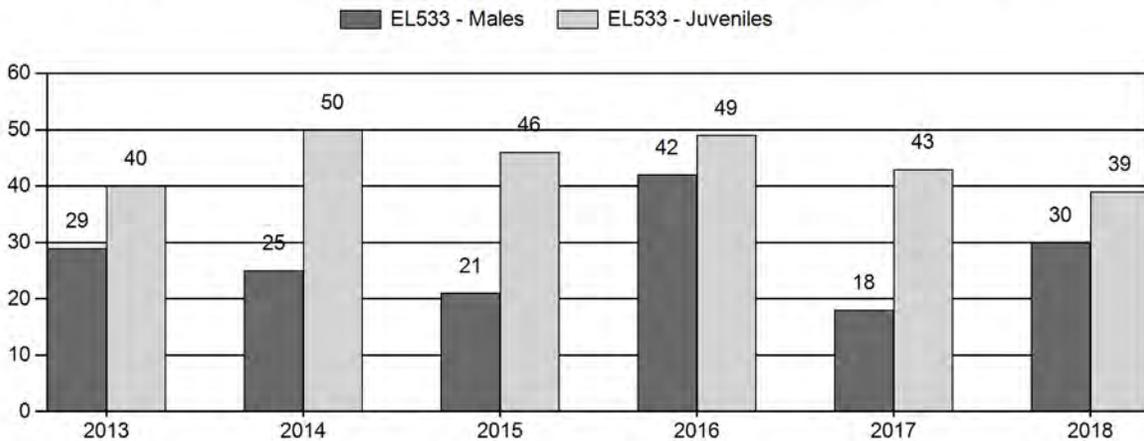
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2013 - 2018 Postseason Classification Summary

for Elk Herd EL533 - SNOWY RANGE

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2013	6,686	292	456	748	17%	2,539	59%	1,023	24%	4,310	646	12	18	29	± 1	40	± 1	31
2014	7,993	259	148	407	14%	1,609	57%	800	28%	2,816	640	16	9	25	± 1	50	± 2	40
2015	7,402	206	190	396	13%	1,885	60%	876	28%	3,157	693	11	10	21	± 1	46	± 2	38
2016	7,100	242	470	712	22%	1,697	52%	837	26%	3,246	657	14	28	42	± 2	49	± 2	35
2017	8,700	182	146	328	11%	1,778	62%	768	27%	2,874	707	10	8	18	± 1	43	± 2	36
2018	9,165	187	278	465	18%	1,574	59%	608	23%	2,647	585	12	18	30	± 2	39	± 2	30

**2019 HUNTING SEASON RECOMMENDATIONS
SNOWY RANGE ELK (EL533)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
8	1	Oct. 1	Jan. 31	100 150	Limited quota	Any elk
	6	Aug. 15	Jan. 31	100 200	Limited quota	Cow or calf
9		Oct. 15	Oct. 31		General	Any elk
	6	Aug. 15	Sep. 30	150	Limited quota CLOSED	Cow or calf valid on private land
		Oct. 1	Dec. 31		Limited quota	Cow or calf
		Jan. 1	Jan. 31		Limited Quota CLOSED	Cow or calf valid off national forest
9, 10	7	Aug. 15	Jan. 31	50 150	Limited quota	Cow or calf valid off national forest
10		Oct. 15	Oct. 31		General	Any elk
	6	Aug. 15	Sep. 30	200 100	Limited quota CLOSED	Cow or calf valid on private land
		Oct. 1	Nov. 30 Dec. 31		Limited Quota	Cow or calf
		Dec. 1	Jan. 31		Limited quota CLOSED	Cow or calf valid off national forest
11	1	Oct. 1	Nov. 14	150	Limited quota	Any elk
	4	Oct. 1	Nov. 14	300	Limited quota	Antlerless elk
	6	Aug. 15	Jan. 31	50	Limited quota	Cow or calf valid off national forest and off the Wyoming Game and Fish Commission's Wick Wildlife Habitat Management Area
	9	Sep. 1	Sep. 30	50	Limited quota	Any elk, archery only
12		Oct. 15	Oct. 31		General	Any elk
	6	Oct. 1	Nov. 14	150 200	Limited quota	Cow or calf
		Nov. 15	Jan. 31			Cow or calf valid west of Wyoming Highway 130
12, 13, 15, 110	7	Aug. 15	Jan. 31	100 125	Limited quota	Cow or calf valid on private land
110		Oct. 15	Oct. 31		General	Any elk
	6	Oct. 1	Nov. 14	50 100	Limited quota	Cow or calf
114	1	Oct. 1	Nov. 30	50	Limited quota	Any elk
	6	Aug. 15	Jan. 31	200	Limited quota	Cow or calf
125	1	Oct. 1	Dec. 31	200 250	Limited quota	Any elk
		Jan. 1	Jan. 31			Valid for antlerless elk
	6	Oct. 1	Jan. 31	200 300	Limited quota	Cow or calf

Hunt Area	License Type	Quota change from 2018
8	1	+50
8	6	+100
9,10	7	+100
10	6	-100
12	6	+50
12,13,15,110	7	+25
110	6	+50
125	1	+50
125	6	+100
Herd Unit Total	1	+100
	6	+200
	7	+125

Management Evaluation

Current Management Objective: 6,000 (4,800 – 7,200)

Management Strategy: Recreational

2018 Postseason Population Estimate: ~ 9,100

2019 Proposed Postseason Population Estimate: ~ 8,300

2018 Hunter Satisfaction: 66% Satisfied, 20% Neutral, 14% Dissatisfied

Elk in the Snowy Range Herd Unit are managed toward a postseason population objective of 6,000. The objective was last reviewed in 2018. A recreational management strategy has been prescribed for the Snowy Range Elk Herd Unit. The recreational strategy directs Wyoming Game and Fish Department (WGFD) to manage for an annual post-season bull to cow ratio within the parameters of 15-29:100 at the herd unit level. The population was estimated using a spreadsheet model developed in 2012 and updated in 2018.

Herd Unit Issues

The Snowy Range Elk Herd Unit includes elk Hunt Areas 8, 9, 10, 11, 12, 110, 114, and 125 in south central Wyoming. The herd unit contains 1,922 mi² of delineated elk range which includes the Snowy Range of the Medicine Bow Mountains and the peripheral sagebrush grasslands located in the North Platte, Medicine Bow, and Laramie River watersheds. Landownership of the delineated elk range consists of 42% US Forest Service (USFS), 27% private, 18% Wyoming Game and Fish Department, 8% Bureau of Land Management, and 5% other ownership. Issues in this herd unit include agricultural and residential development, invasive and noxious plants, and travel management in important elk habitat.

Weather

- *Compiled by WGFD Terrestrial Habitat Biologist, Katie Cheesbrough*

Annual bio-year precipitation from October 2017 through September 2018 is notably below the 30 year average and approaching precipitation levels seen in the 2012 drought year. Similarly, the growing season precipitation across the herd unit (April-June 2018) and the later growing season precipitation for high elevation spring/summer/fall ranges (May-July 2018) were also

well below the 30 year averages. As illustrated by the PRISM data (Fig. 1) and the 2017-2018 water year SNOTEL data (Fig. 2), the majority of precipitation in the Platte Valley occurs outside of the primary growing season, generally in the form of snow. However, winter 2017-2018 was relatively mild with, what seemed like, very little snow in the lower elevations. USDA-Snotel site data from February 2018 showed that snow water equivalent (SWE) was within 81-103% of normal on the west slope of the Snowy Range (8,440-10,130 ft). However, high sustained winds in early 2018 may have contributed to significant evaporative losses of moisture from that snowpack, further decreasing precipitation for the year. Due to a lack of snow in the lower elevations, relatively mild temperatures, and early snowmelt, the 2017-2018 winter conditions may have been favorable for big game.

Figure 1. Parameter-Elevation Relationships on Independent Slopes Model (PRISM) was utilized to estimate precipitation by calculating a climate-elevation regressions for each Digital Elevation Model grid cell (4km resolution) for the Platte Valley in Carbon County, Wyoming.

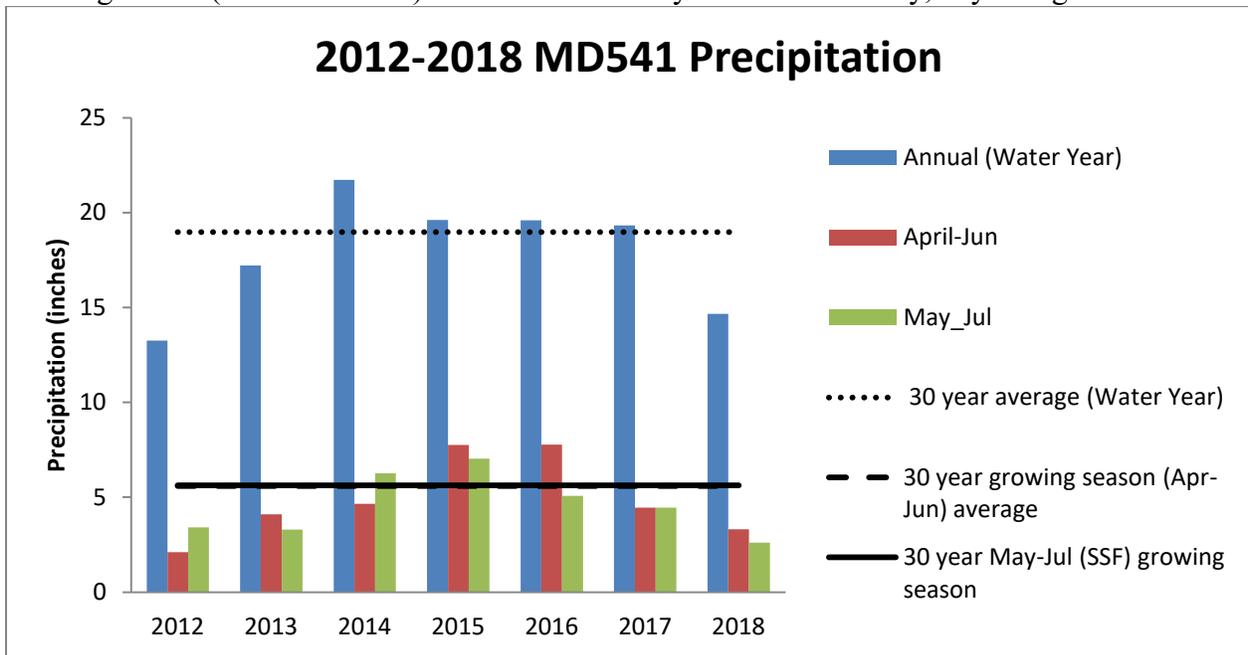
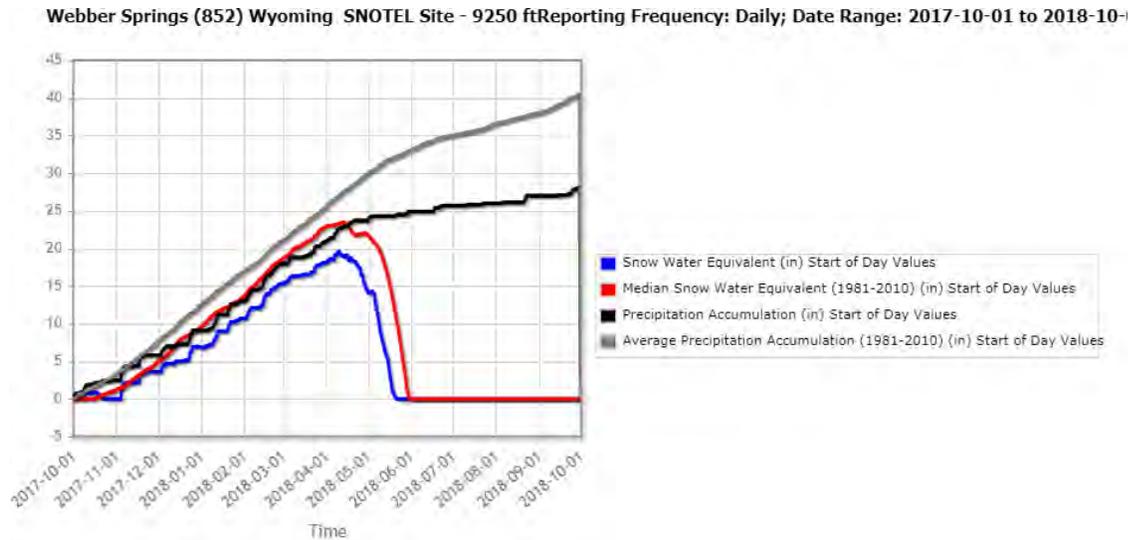


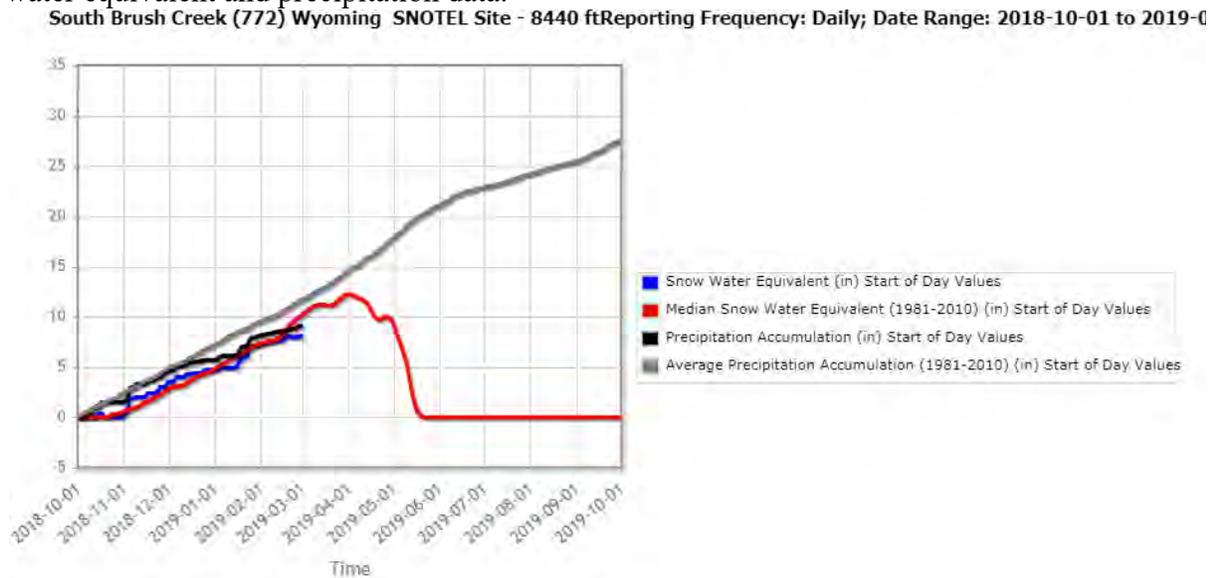
Figure 2. October – September bio-year 2017 Webber Springs USDA-SNOTEL Site snow water equivalent and precipitation data.



The early snowmelt at high elevations can be attributed to relatively high temperatures in early spring. The only significant spring moisture came in the last week of May with little to no precipitation until mid June. Extremely dry, hot, and windy weather throughout the spring, summer, and into the fall contributed.

Winter 2018-2017 SNOTEL data indicate just below normal snowpack on the west slope of the Snowy Range (Fig. 3). Colder weather and snow in early to mid-October may have caused elk to move more quickly into lower elevations, which may have resulted in harvest impacts.

Figure 3. October – February bio-year 2018 South Brush Creek USDA- SNOTEL Site snow water equivalent and precipitation data.



Habitat

- Compiled by WGF D Terrestrial Habitat Biologist, Katie Cheesbrough

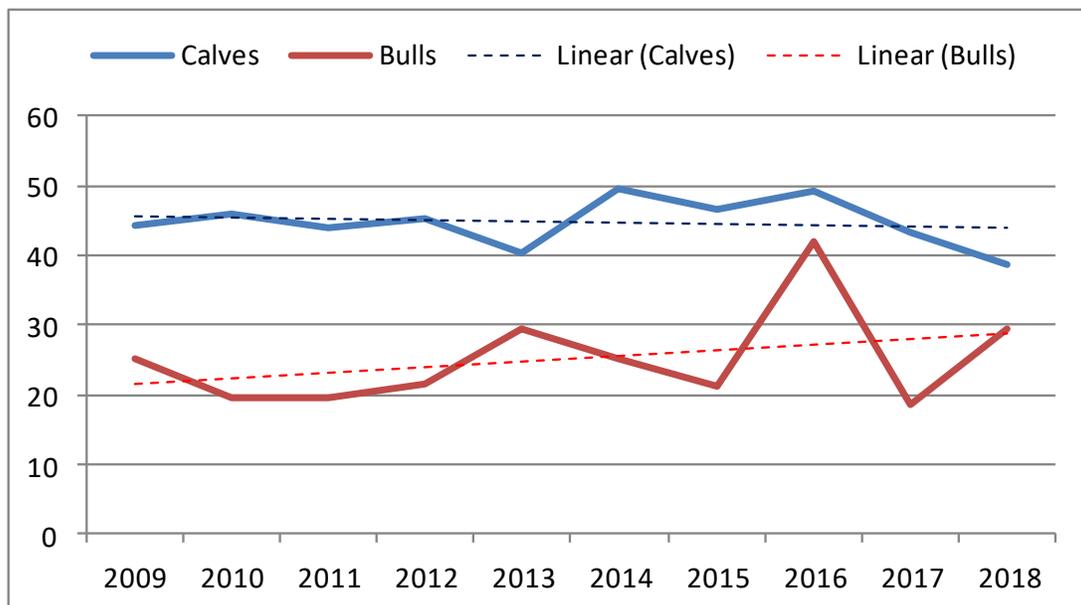
Growing season precipitation was below normal across the herd unit in 2018, resulting in slower and less growth of cool season grasses, forbs, and shrubs, particularly in lower elevation seasonal ranges. Vegetation production sampling conducted on the Pennock Wildlife Habitat Management Area showed a continued trend of lower production during the 2018 growing season (373.68 lbs/acre) than seen in the past 4 years (539.53 lbs/ac average). However, these production values were still high enough to cover the previous year's wildlife utilization estimates (340 lbs/acre). Sustained hot and dry conditions throughout the summer decreased shrub leader production throughout the herd unit and likely had impacts on browse availability in transition and winter ranges in 2018. Rapid Habitat Assessments conducted throughout the herd unit in from 2015-2018 suggest that many important shrub habitats continue to underperform due to maturity and decadence caused by a lack of disturbance.

Field Data

In 2018, elk in this herd unit were classified in conjunction with mule deer classification aerial surveys. A total of 2,647 elk were counted and classified. This classification effort produced ratios of 30 bulls and 38 calves per 100 cows in this herd unit.

Calf production decreased slightly from 43 calves: 100 cows in 2017, to 38 calves: 100 cows in 2018. This bull ratio was 38% greater than the 2017 ratio and 7% greater than the average for the last five years. The past 10 years of bull and calf ratio data indicates the calf ratio is stable to declining (Figure 3). Calf ratios continued to provide for an excellent recruitment rate in this herd unit. Bull ratios are experiencing an increasing trend over the past 10 years.

Figure 3. Bull and calf ratios per 100 cows in the Snowy Range elk herd unit, 2009 - 2018, Wyoming.



Harvest Data

The 2018 harvest survey data indicated 5,603 active licensed hunters harvested 2,072 elk, which was a 5% increase in harvest from 2017. The total harvest success rate of 37% was a 4% increase from 2017. Branch antlered bulls accounted for 89% of the male harvest in 2018 and 44% of the overall harvest. The proportion of spikes in the male harvest for the entire herd unit decreased to 11% in 2018 from 13% in 2017. Antlerless elk accounted for 50% of the total 2018 elk harvest. Harvest rates, days per harvest (21.2), and harvest success rates under the current liberal hunting season structure continued to be considered acceptable. In 2018, 23% of the branch antlered bull harvest was attributed to archery; while 27% of the branch antlered bull harvest was attributed to archery in 2017.

Chronic wasting disease (CWD) was first observed in the Snowy Range herd unit in 2004. Since 1997, a total of 1,351 elk in this herd unit have been tested and 14 have tested positive for CWD. In 2018, surveillance efforts for CWD in this herd unit continued. Results of the 2018 samples (n=117) collected from hunter harvested elk indicated an annual prevalence of 4.3% CWD positive. Annual CWD prevalence can be under or over represented due to small sample sizes. The five-year estimated hunter harvested elk CWD prevalence in this herd unit was >0-5%.

Population

In 2018, the “Constant Juvenile and Constant Adult” (CJ, CA) spreadsheet model was used to simulate Snowy Range Herd Unit population dynamics. The other models in the spreadsheet model suite had either higher AIC scores or were not biologically realistic. Without other important information such as an independent abundance estimate or historical survival data to incorporate into the model, accuracy of estimates will continue to be unknown. This model was rated as poor, and not biologically defensible in our evaluation. This rating was based on criteria identified in the user’s guide for the WGFD spreadsheet model (Morrison 2012).

The 2018 postseason population estimate for the Snowy Range herd unit was 9,100 elk. A decreasing trend in the annual estimate continued with CJ, CA model and was considered to be consistent with the observations by field managers. We considered the 2018 postseason population estimate produced by the CJ, CA spreadsheet model to be somewhat plausible.

Management Summary

The hunting seasons in the Snowy Range Herd Unit continue to provide recreational elk hunting opportunities while reducing the overall elk population towards the objective. Hunt Areas 8, 114, and 125 will continue to have limited quota hunting seasons in 2019. WGFD will provide additional opportunities (more licenses) for both bull and antlerless elk harvest in Hunt Areas 8 and 125. Landownership in Hunt Area 125 is predominately private. Many of the landowners in this hunt area are either directly engaged in outfitting elk hunts or lease their property to outfitters, however there are several landowners who do allow public hunting access in this hunt area because they are experiencing significant damage to growing or stored hay crops.

Hunt Area 11 will also remain a limited quota hunting season area in 2019. Hunt Area 11 contains a substantial amount of accessible public land, including the Wyoming Game and Fish Commission’s Wick Wildlife Habitat Management Area and USFS lands. This hunt area

continues to provide a limited opportunity for hunters to experience a quality elk hunt on public land.

Hunt Areas 9, 10, 12, and 110 will continue to be general license hunting areas in 2019. Limited quota, reduced-price cow or calf licenses will continue to be available in each of these hunt areas as an additional effort to increase antlerless harvest. The majority of the Snowy Range Herd Unit's annual elk harvest occurs in these four hunt areas. Most of the occupied elk range in these hunt areas is public land and hunter access is very good. In Hunt Areas 9 and 10, the August-September Type 6 season was eliminated in 2019, but August-January Type 7 seasons continued to be offered to mitigate damage on private land. Additionally, many of the landowners do allow elk hunting, typically antlerless elk, in an effort to reduce the impacts from elk on their agricultural-based livelihoods.

Literature Cited

Morrison, T. 2012. User Guide: Spreadsheet Model for Ungulate Population data Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. USA. 41 pp.

Bibliography of Herd Specific Studies

Reeve, A.F., F.G. Lindzey, and S.H. Anderson. 2003. Elk population in Wyoming: 1978-2001. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, Wyoming. USA. 138pp.

2018 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2018 - 5/31/2019

HERD: EL534 - SHIRLEY MOUNTAIN

HUNT AREAS: 16

PREPARED BY: TEAL CUFAUDE

	<u>2013 - 2017 Average</u>	<u>2018</u>	<u>2019 Proposed</u>
Trend Count:	1,174	2,131	2,000
Harvest:	349	408	450
Hunters:	628	703	750
Hunter Success:	56%	58%	60%
Active Licenses:	656	722	775
Active License Success	53%	57%	58%
Recreation Days:	4,850	5,717	5,500
Days Per Animal:	13.9	14.0	12.2
Males per 100 Females:	42	30	
Juveniles per 100 Females	42	53	

Trend Based Objective (± 20%) 800 (640 - 960)

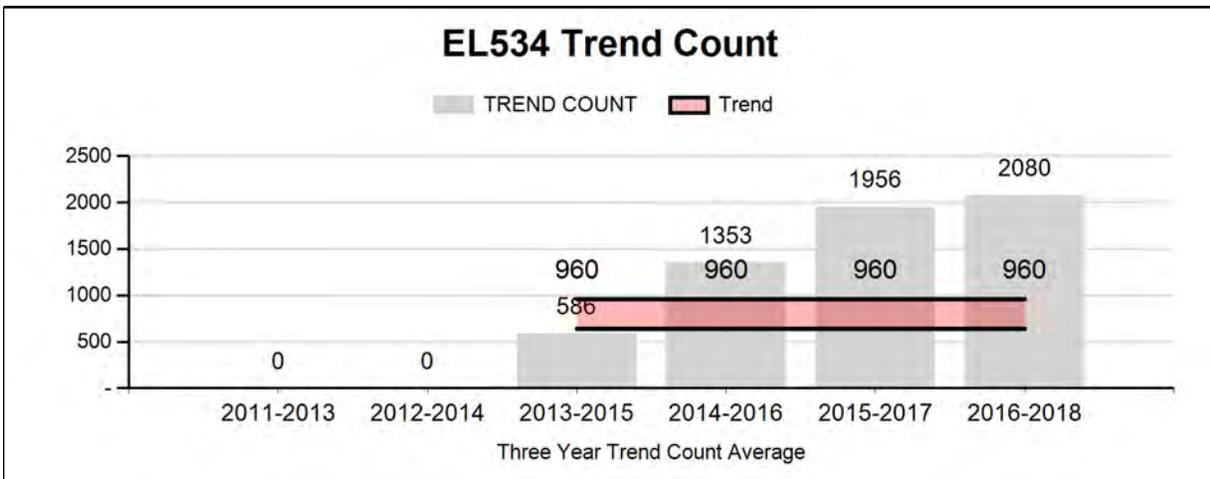
Management Strategy: Special

Percent population is above (+) or (-) objective: 166%

Number of years population has been + or - objective in recent trend: 4

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

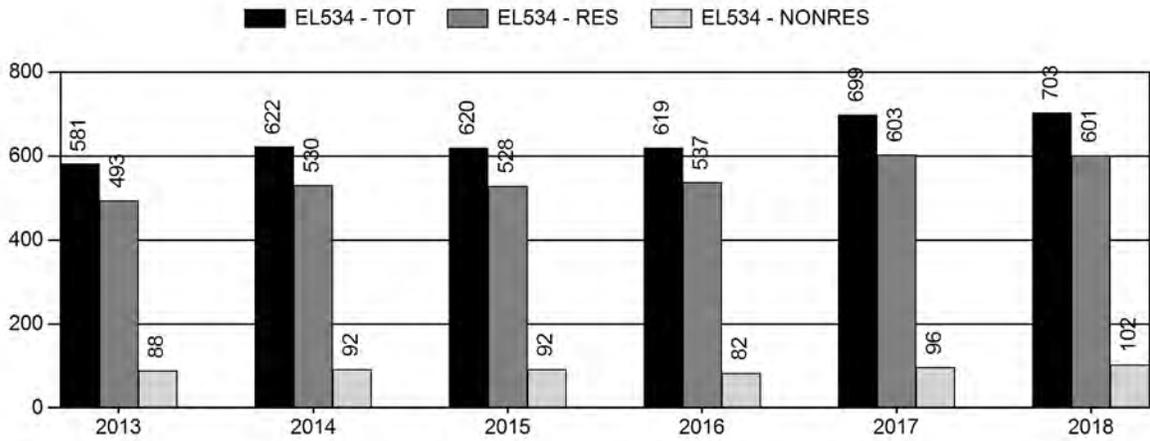
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	NA%	N/A%
Males ≥ 1 year old:	NA%	N/A%
Juveniles (< 1 year old):	NA%	N/A%



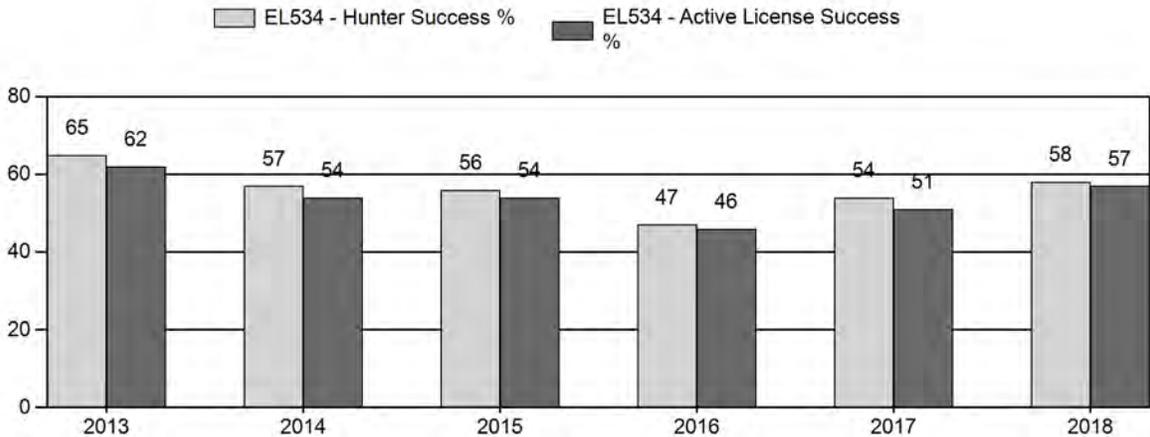
Harvest



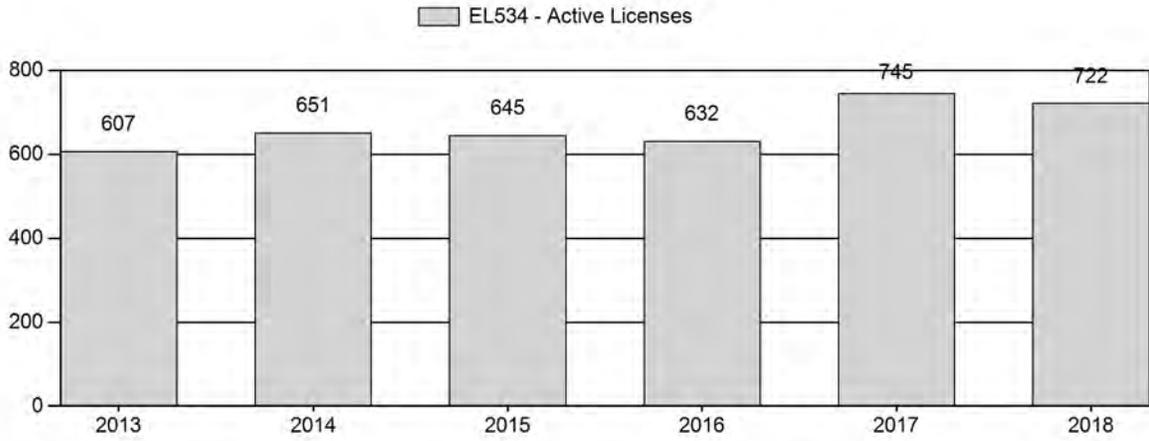
Number of Hunters



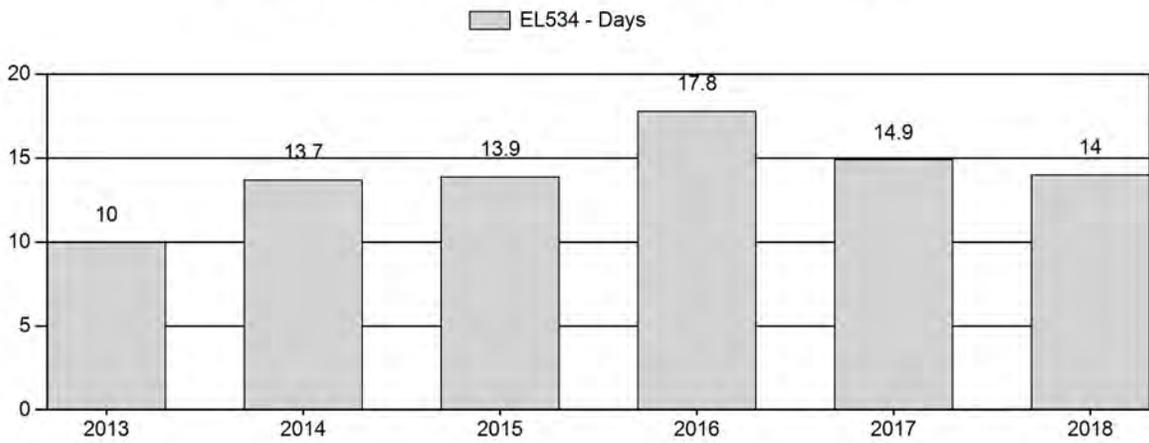
Harvest Success



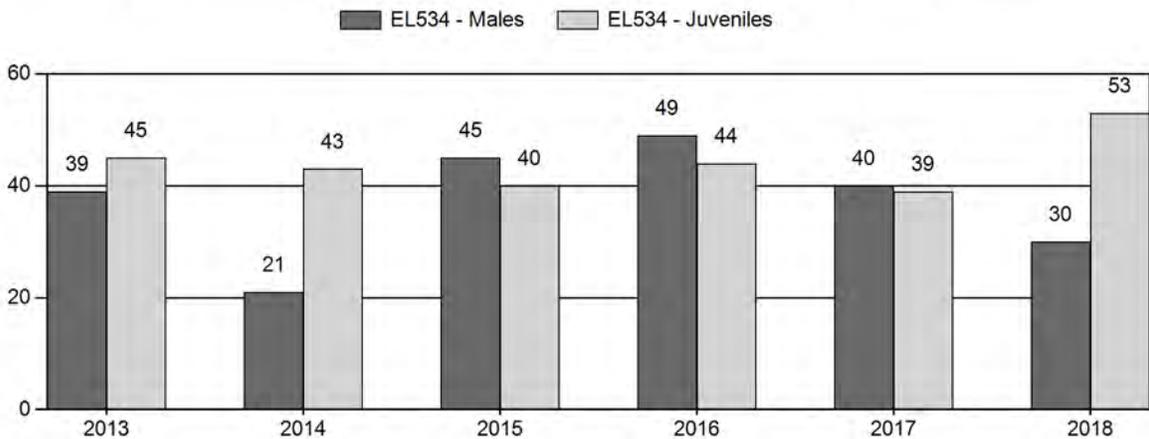
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2013 - 2018 Postseason Classification Summary

for Elk Herd EL534 - SHIRLEY MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylg	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2013	1,462	52	90	142	21%	365	54%	165	25%	672	568	14	25	39	± 4	45	± 4	33
2014	767	14	47	61	13%	294	61%	127	26%	482	395	5	16	21	± 2	43	± 4	36
2015	0	86	342	428	24%	948	54%	383	22%	1,759	596	9	36	45	± 0	40	± 0	28
2016	0	160	422	582	25%	1,196	52%	523	23%	2,301	634	13	35	49	± 0	44	± 0	29
2017	0	99	301	400	22%	1,012	56%	396	22%	1,808	581	10	30	40	± 0	39	± 0	28
2018	0	127	228	355	17%	1,164	55%	612	29%	2,131	463	11	20	30	± 0	53	± 0	40

**2019 HUNTING SEASON RECOMMENDATIONS
SHIRLEY MOUNTAIN ELK (EL534)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
16	1	Oct. 1	Oct. 31	150	Limited quota	Any elk
	1	Dec. 1	Jan. 31			Antlerless elk
	2	Nov. 1	Nov. 30	50	Limited quota	Any elk
	2	Dec. 1	Jan. 31			Antlerless elk
	4	Sep. 1	Sep. 30	300	Limited quota	Antlerless elk valid on the Hanna Draw Hunter Management Area (HMA permission slip required)
	4	Oct. 1	Jan. 31			Antlerless elk valid in the entire area
	6	Aug. 15	Sep. 30	300	Limited quota	Cow or calf valid on private land or the Hanna Draw Hunter Management Area (HMA permission slip required) Cow or calf valid on private land or the Hanna Draw Hunter Management Area (HMA permission slip required) or within ½ mile of irrigated land
	6	Oct. 1	Jan. 31			Cow or calf valid in the entire area
	Archery	Sep. 1	Sep. 30			Refer to license type and limitations in Section 3 of Chapter 7

Hunt Area	License Type	Quota change from 2018
Herd Unit Total		None

Management Evaluation

Current Mid-Winter Trend Count Management Objective: 800 (640-960)

Management Strategy: Special

2018 Trend Count: 2,131

Most Recent 3-year Running Average Trend Count: 2,080

2018 Hunter Satisfaction: 80% Satisfied, 12% Neutral, 8% Dissatisfied

Elk in the Shirley Mountain herd unit are managed toward a mid-winter trend count of 800. The management objective was reviewed in 2015 and changed from a postseason population objective of 800 elk to a mid-winter trend count of 800 elk. The management strategy was changed in 2015 from recreational management to special management. Under special management, bull ratios are allowed to exceed 30 bulls: 100 cows and the proportion of branch-antlered bulls are expected to exceed 66% of the antlered elk harvest.

Herd Unit Issues

The Shirley Mountain herd unit encompasses 4,548 km² of occupied elk habitat. Land ownership consists of 55% mixed federal lands, primarily Bureau of Land Management, 35% private ownership, and 10% Wyoming Office of State Land and Investments land. The southern half of the herd unit is mostly a checkerboard of private, state, and BLM lands as a result of land grants to railroads in the 19th century. The northern half contains more single owner blocks of land with large areas of accessible public land. Wind energy developments are a relatively new land use in this herd unit. There are currently two wind farms in this herd unit and there is interest in developing more wind farms. Wyoming Game and Fish Department's (WGFD) ability to manage elk numbers through harvest is difficult because a large portion of the elk habitat in this herd unit is owned by one landowner who provides a very limited amount of access. Interchange of elk with adjacent herd units may compromise the closed population assumption for this herd unit. Annual population monitoring efforts and results have been highly variable.

Weather

The 2017-18 winter had numerous periods of bitter cold, continuing through February, but much of the winter range was open and available. Winter losses were expected to be near average leading into bio-year 2018. The spring of 2018 was dry, resulting in slow plant growth and green-up of rangelands. The majority of the summer and fall were extremely dry, causing much of the available forage to cure. Fortunately, precipitation in October resulted in a late surge of plant growth, which may have provided elk with a valuable boost in nutrition prior to the winter of 2018-19. While there have been several notable snow storms and cold snaps during the winter of 2018-19, there were also periods of warm weather and high winds that melted and drifted snow to expose forage. Average elk survival is expected for the winter of 2018-19.

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration (NOAA), <https://w2.weather.gov/climate/xmacis.php?wfo=cys> to illustrate

weather conditions thus far, during bio-year 2018 (Figures 1 and 2). These figures also include data from January-May of bio-year 2017 to describe the weather conditions immediately preceding bio-year 2018.

Figure 1. January 2018 - January 2019 mean monthly temperatures and 20-year monthly means for Rawlins, Wyoming.

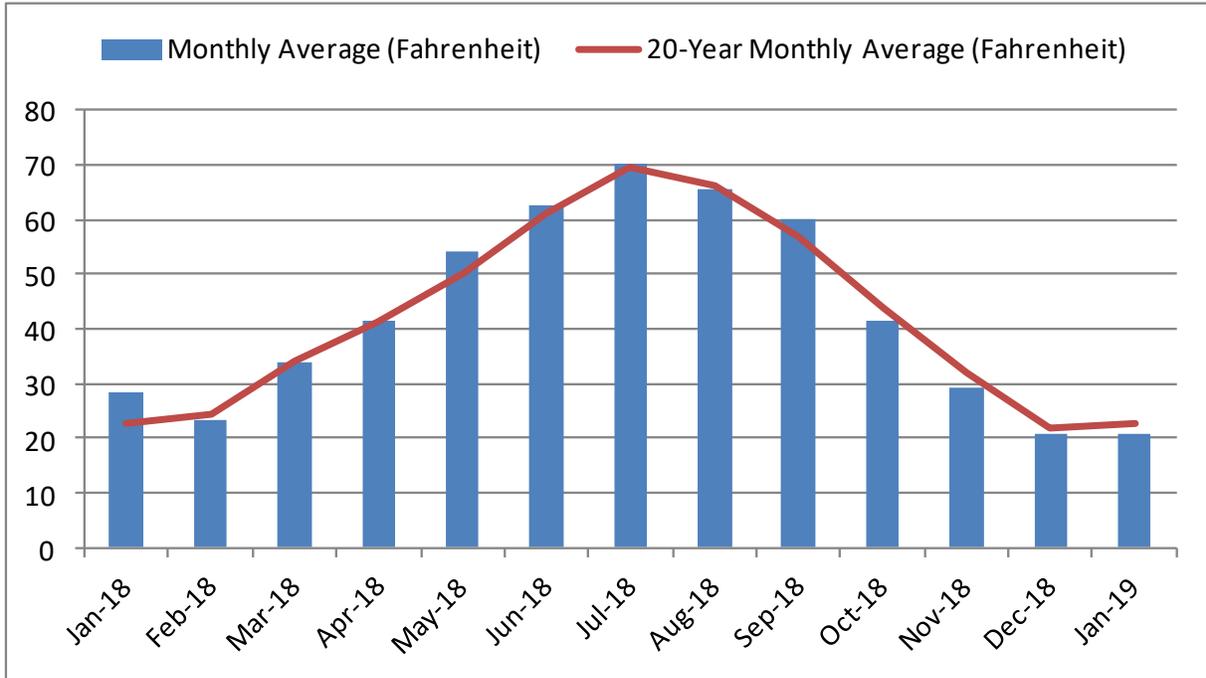
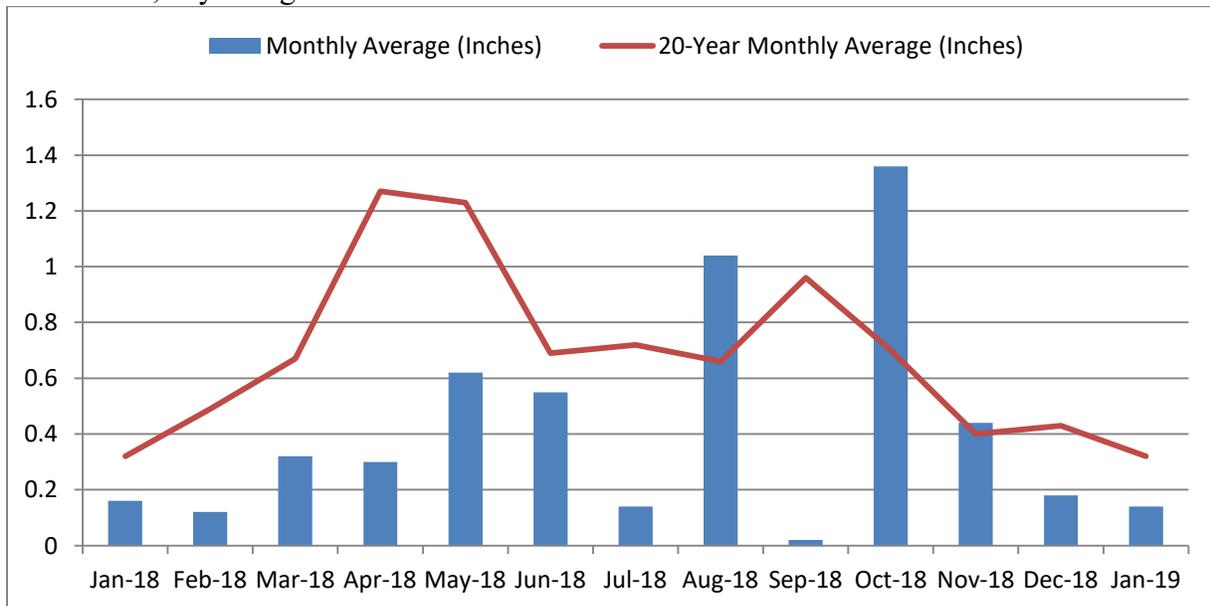


Figure 2. January 2018 - January 2019 mean monthly precipitation and 20-year monthly means for Rawlins, Wyoming.



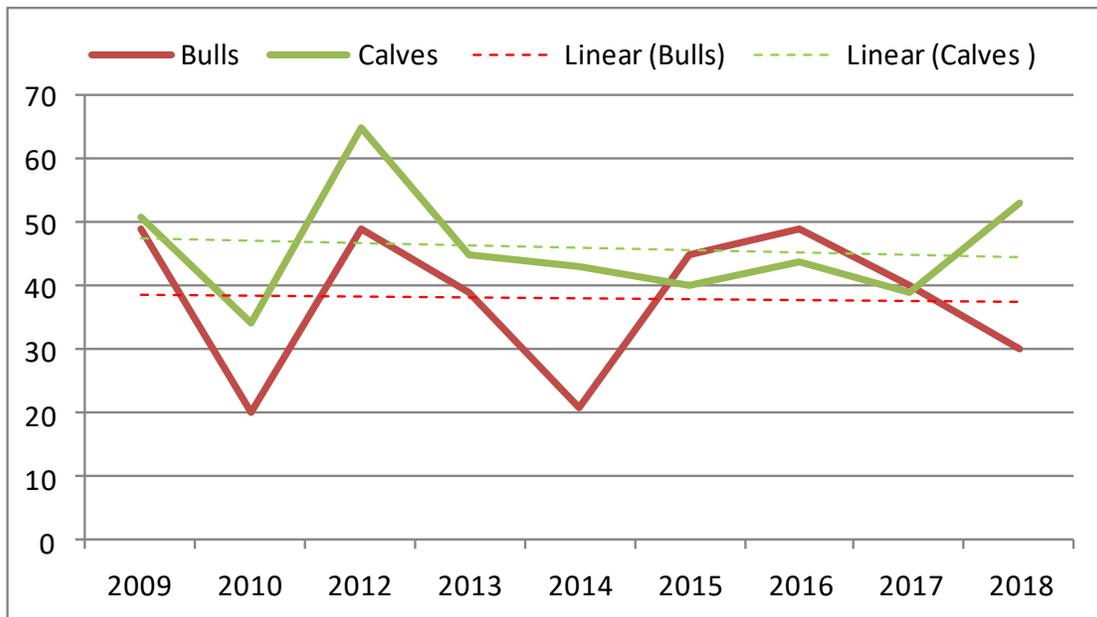
Habitat

The limited number of habitat transects that have been established within this herd unit do not provide sufficient data to make reliable inferences about habitat quantity or quality. Most shrub-steppe habitat in this herd unit is decadent and in need of treatments designed to improve the nutritional value of sagebrush and other plants.

Field Data

The mid-winter trend count to estimate the wintering population of elk in the herd unit was conducted in January 2019. Postseason sex and age classifications were conducted in conjunction with a mid-winter trend survey. The results were a total of 30 bulls and 53 calves per 100 cows, from a sample of 2,131 elk. Figure 3 illustrates how the 2018 postseason ratios compared to previous classification results during the past 10 years.

Figure 3. Shirley Mountain Elk Herd Unit bull and calf ratios per 100 cows, 2009 - 2018, Wyoming.



Previously the collection of classification data varied annually in methodology, primarily due to no dedicated survey flight budget for this herd. With the change in management objective type from a postseason population objective, to a mid-winter trend count objective, a dedicated budget for annual helicopter surveys has been established. This has resulted in more consistent sampling for trend, sex, and age data collection.

Harvest Data

2018 elk harvest survey data indicated 703 hunters harvested 408 elk in 2018, with an overall success rate of 58%. The 2018 harvest success increased 5% from 2017. The 2018 branch antlered bull harvest (n=130) decreased 11% from 2017. Antlerless harvest (n=278) increased 16% in 2018. Overall, harvest in 2018 was relatively more successful with more elk being harvested and less days being expended for each elk harvested.

Chronic wasting disease (CWD) was first observed in the Shirley Mountain herd unit in 2006. In 2018, surveillance efforts for CWD continued in this herd unit. Since 1997, a total of 160 elk have been tested in this herd unit. A total of four tested elk have been positive for CWD. Results of the 2018 samples (n=19) collected from hunter harvested elk indicated an annual prevalence of 10.5% CWD positive. Annual CWD prevalence can be under or over represented due to small sample sizes. The five-year estimated hunter harvested elk CWD prevalence in this herd unit was 0%.

Population

In 2015, the management objective was reviewed and converted from a population management objective of 800 elk postseason, to a mid-winter trend count objective of 800 elk. The spreadsheet model which was previously used to develop the annual population estimate for elk in this herd unit did not function adequately enough to provide managers with a reliable estimate and was the primary reason for changing from a population based management objective to a mid-winter trend count objective. Maintaining sustainable numbers of elk in the Shirley Mountain herd unit, while also maintaining bull ratios within the special management parameters, is the ultimate management objective. Improving population monitoring techniques is keystone to insuring these management objectives are met. Replacing the spreadsheet model derived population estimate with the mid-winter trend count as the management benchmark will provide for a more accurate assessment of annual elk numbers in the is herd unit.

A mid-winter trend count survey was completed in January of 2019 (Figure 4). A total of 2,131 elk were observed in the herd unit. This sample size was relatively similar to the sample (n=1,800) observed last year. The most recent surveys' sample sizes are substantially greater when compared to previous helicopter surveys, covering relatively the same area in the herd unit. In 2010, 691 elk were observed and in 2013, 672 elk were observed during helicopter classification surveys. It would appear the number of elk wintering in this herd unit has been significantly under estimated.

Management Summary

The 2019 hunting season recommendations were prescribed with the objectives of maintaining bull ratios within the special management parameters and reducing elk numbers. Access in the Beer Mug Hunter Management Area (HMA) was anticipated to change in 2019. A significant number of elk harvested during the Type 2 season have historically been harvested on the HMA. With less private property enrolled in the HMA it is probable that Type 2 licensed hunter success may decrease in 2019. Access in the Hanna Draw HMA continued in 2019 with August, September, and November periods for Type 4 and Type 6 licensed hunters. The 50 Hanna Draw HMA permission slips that have been allocated in October during past hunting seasons were instead allocated in August for 2019. There are several elk damage situations that were addressed by liberalizing the Type 6 August 15-September 30 season limitation to include "within ½ mile of irrigated land."

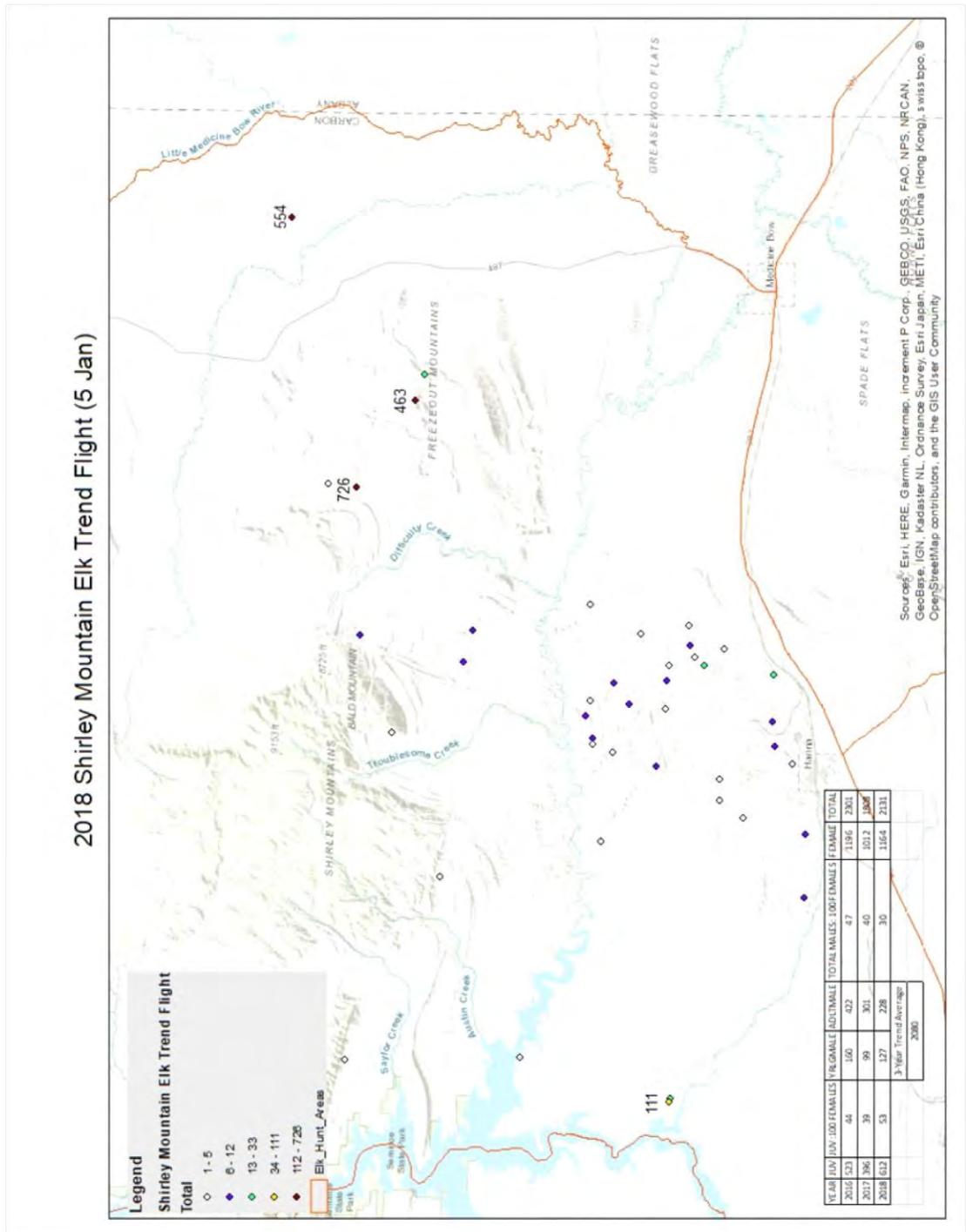
Literature Cited

None

Bibliography of Herd Specific Studies

None

Figure 4. 2018 Mid-winter trend count observations in the Shirley Mountain Elk Herd Unit, Wyoming.



2018 - JCR Evaluation Form

SPECIES: Elk

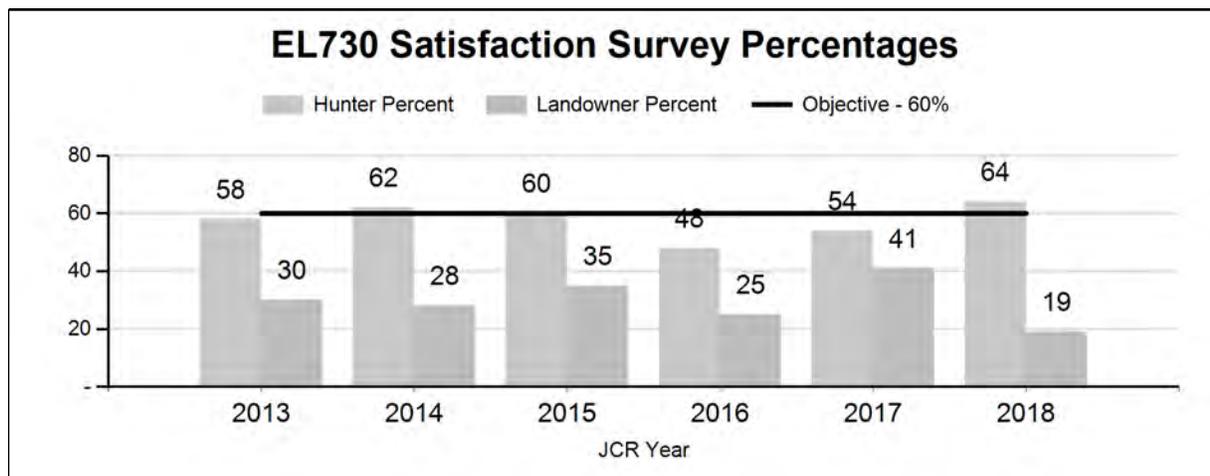
PERIOD: 6/1/2018 - 5/31/2019

HERD: EL730 - RAWHIDE

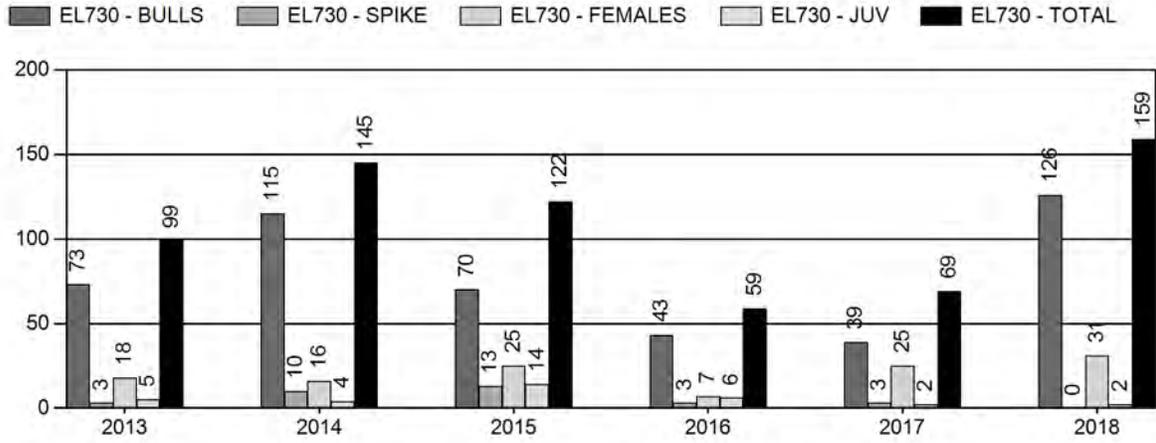
HUNT AREAS: 3

PREPARED BY: MARTIN HICKS

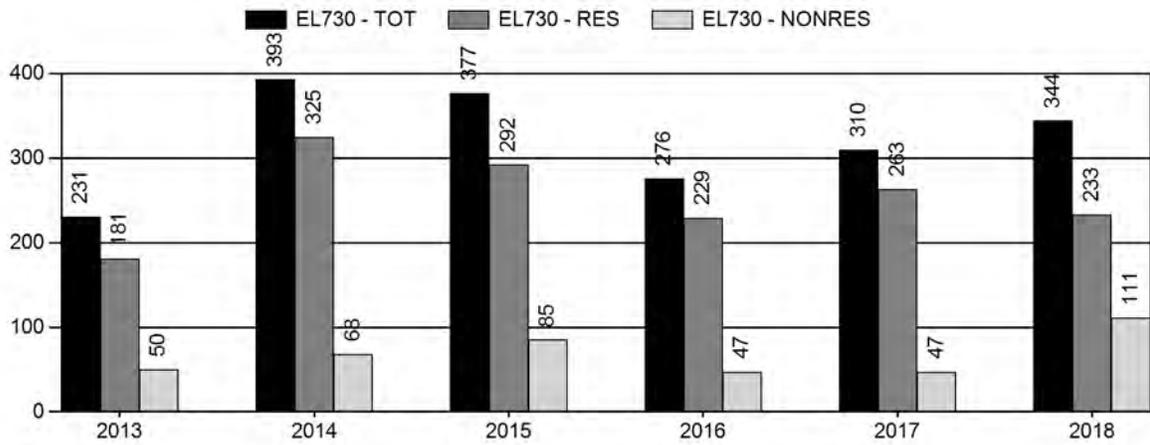
	<u>2013 - 2017 Average</u>	<u>2018</u>	<u>2019 Proposed</u>
Hunter Satisfaction Percent	57%	64%	60%
Landowner Satisfaction Percent	32%	19%	40%
Harvest:	99	159	150
Hunters:	317	344	300
Hunter Success:	31%	46%	50%
Active Licenses:	335	356	310
Active License Success:	30%	45%	48%
Recreation Days:	2,309	2,313	1,480
Days Per Animal:	23.3	14.5	9.9
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	
Satisfaction Based Objective			60%
Management Strategy:			Special
Percent population is above (+) or (-) objective:			-18%
Number of years population has been + or - objective in recent trend:			6



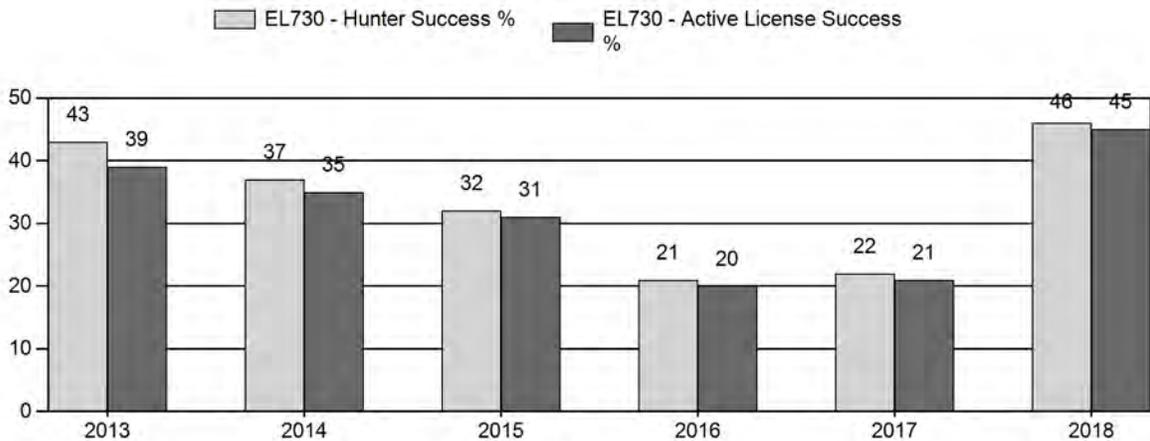
Harvest



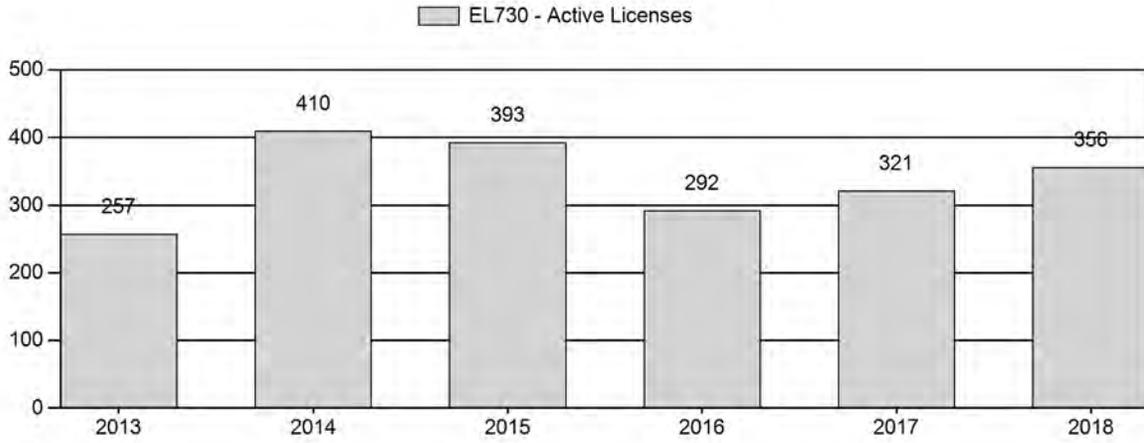
Number of Hunters



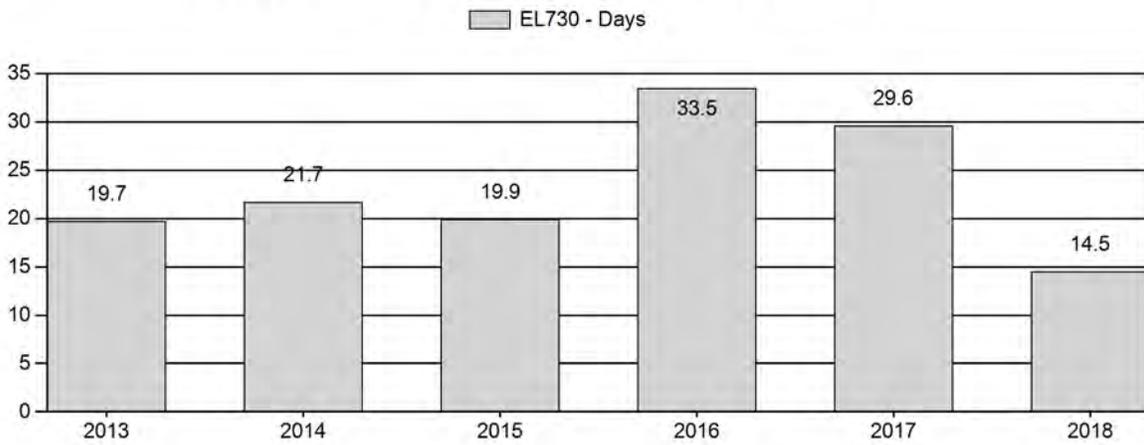
Harvest Success



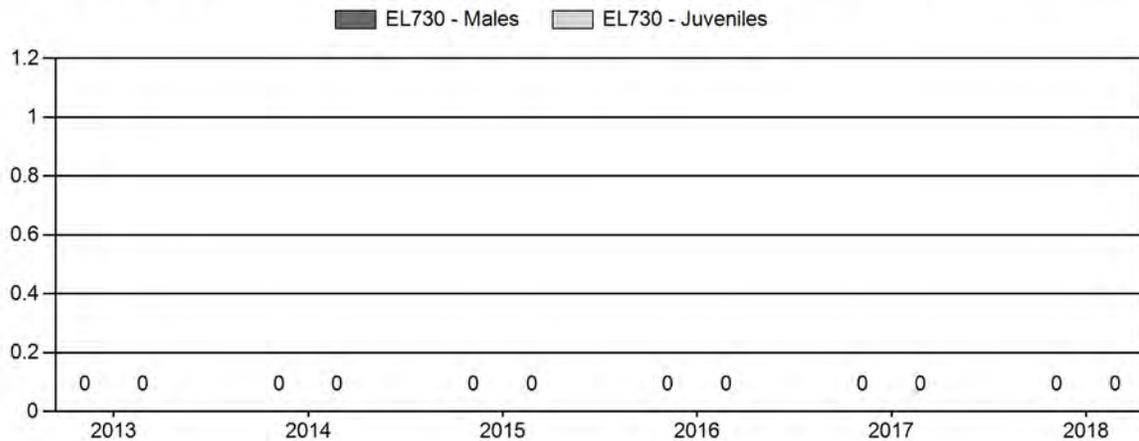
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



**RAWHIDE ELK HERD (730)
2019 HUNTING SEASONS**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
3	Gen	Sept. 15	Oct. 14		General	Any elk
		Oct. 15	Jan. 31			Any elk south of U.S. Highway 26
3	6	Aug. 15	Nov. 30	200	Limited quota	Cow or calf
3	6	Dec. 1	Jan. 31			Cow or calf elk south of U.S. Highway 26

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
3	Sept. 1	Sept. 14	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2018
3	6	0

Management Evaluation

Current Hunter/Landowner Satisfaction Management Objective: 60% landowner/hunter satisfaction

Management Strategy: Private Land Management

2018 Hunter Satisfaction Estimate: 64%

2018 Landowner Satisfaction Estimate: 13%

Most Recent 3-year Running Average Hunter Satisfaction Estimate: 55%

Most Recent 3-year Running Average Landowner Satisfaction Estimate: 26%

The management objective for this herd was changed in 2012 from a post-season population objective of 40 elk to a nonnumeric population objective based on landowner and hunter satisfaction and the percentage of branch antlered bulls in the harvest. In 2017 the percentage of branch antlered bulls in the harvest was removed and the management strategy changed to Private Land Management during the herd objective process. We will follow trends over time to make management decisions based on constituent satisfaction. There is not a working model for this herd unit due to our inability to collect adequate population data. The herd will be taken to the public in 2022 for the 5-year review.

Herd Unit Issues

This herd unit has been difficult to manage based on our inability to collect adequate herd composition data along with field harvest data. Based on field personnel and landowner

observations we estimate there are over 400 elk in the Rawhide Elk Herd, with the population expanding south of the North Platte River into Goshen, Platte and Laramie Counties. There have been several public meetings to address the increasing population, and as a result the herd boundary was expanded south to the Colorado border for the 2012 season. Additionally the portion of Area 3 north of U.S. Highway 26 was changed to a general season for the 2014 season (the southern portion was changed to a general in 2011).

Weather

Weather in this herd unit was relatively normal during the past bio-year. Weather patterns in this portion of Wyoming are typically never severe enough to affect elk survival. When heavy snow events do happen, then herds will move down to agricultural fields to seek out stored hay. For specific meteorological information for the Rawhide herd unit the reviewer is referred to the following link: <http://www.ncdc.noaa.gov/cag/>

Habitat

Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant specie. This herd unit is comprised of a mix of native rangelands, CRP, dryland and irrigated croplands and riparian areas.

Areas burned by wildfires (~20,000 acres) within the last 10 years have responded favorably due to reduction in conifers and enhancement of herbaceous plant communities. There are some portions of the burned areas are predominantly cheatgrass, and will likely remain in that state unless treated with herbicides but overall the burned areas appear to be progressing through their successional plant stages. At certain times of the year elk are observed in the burned areas, however based on elk collar data and landowner observations they are using more or the western portion of the Guard Camp that burned in 2010 (Tracer Fire) and spend less time in the Chicago Fire which burned in 2012.

Field/Harvest Data

Harvest success and effort has fluctuated around 31% and 24 days per harvest for the past five years. However, during the 2018 season elk hunters experienced an increase in harvest success (49%) and spent fewer days in the field (10 days/harvest). Harvest did increase on private land adjacent to the North Platte River and just southeast of Glendo, which based on collared elk locations (Figure 1) and harvest of collared elk (n=4) was an accurate assessment. This increase in harvest helped to re-distributed elk to more accessible places, particularly the Broom Creek Hunter Management Area. Harvest in this hunt area is driven by access; if the majority of hunters are limited to public land then success decreases and effort increases. Finding elk in this herd unit can be difficult due to landownership patterns and when it does open up, which was the case in 2018 there is an increase in harvest (63% increase in bull harvest in 2018 compared to 2017). The majority of access is restricted to the Broom Creek HMA north of US Hwy 26 and is also dependent on crop damage south of US Hwy 26. Based on the comments from the annual landowner survey, the majority of landowners the own property south of Hwy 26 want to see a decrease in the herd size so they are willing to allow access. In 2012 the severe drought displaced elk and they were not found in traditional places (i.e. alfalfa fields). In 2014, 2015 and

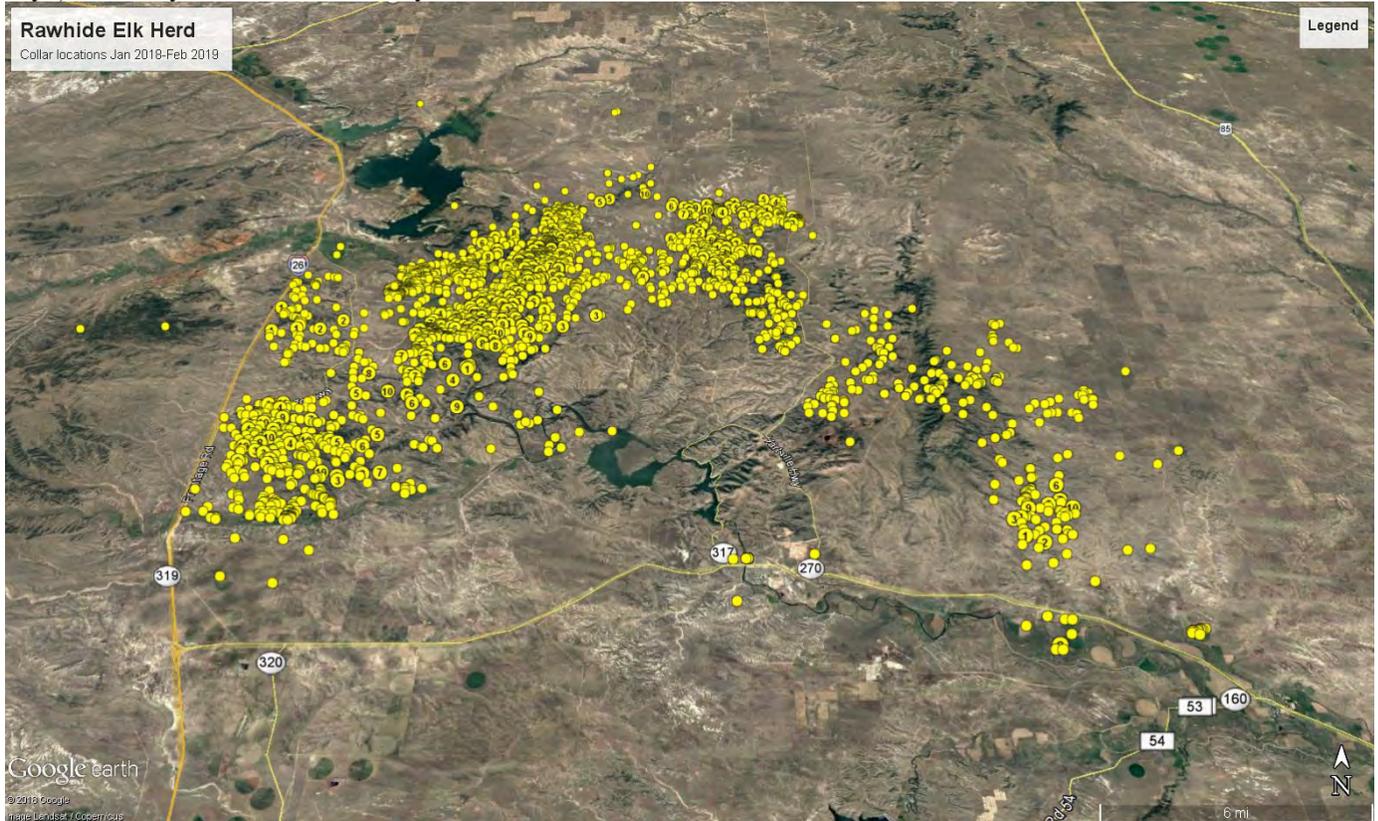
2016 above average spring and summer precipitation re-distributed elk which increased forage production and as a result elk were not dependent upon irrigated crops. In 2017 and 2018 spring precipitation decreased and elk were causing damage on irrigated croplands south of Hwy 26. Elk that were traditional found within Whalen Canyon appear to have re-distributed to other areas of the herd unit.

Active license numbers have fluctuated around 330 for the past five years. Starting in 2011 that portion of Hunt Area 3 south of U.S. Highway 26 became a general season. After several public meetings over the past three years coupled with a landowner survey it was decided to convert that portion of Area 3 north of US Hwy 26 from a limited quota area to a general hunt area. However, in 2015 and 2016 landowners north of U.S. Hwy 26 voiced their concern that elk were no longer in their traditional areas and therefore damage issues have decreased. There are now fewer active licenses as a general season then when this herd was managed under a limited quota regime.

Since this herd unit changed to a satisfaction management evaluation in 2012 and a private land management strategy in 2017 classification data is no longer collected.

During the 2017/18 winter 29 elk were captured and fitted with GPS radio collars that will be deployed for three years to look at habitat selection, identify seasonal ranges, document calving areas and map movement patterns. This is a cooperative study with the Wyoming Military Department. During the first year of collar deployment there were seven mortalities, four from hunting, one as a result of calving complications, one from a mountain lion predation and one unknown. It was expected to observe elk cross Interstate Hwy 25 (I-25) and head west based on the number of vehicle collisions just south of Glendo along I-25. However, only one elk did cross I-25, then decided to come back and has remained east of I-25. For the most part the 29 collared elk remained within or adjacent to the National Guard Camp, and were highly selective for the area within the North Platte River corridor between Glendo and Guernsey during their first year of deployment (Figure 1). On January 22, 2019 six of the collars were re-deployed; all on female elk. Elk routinely cross the North Platte River, which is the current boundary between Hunt Area 3 and Hunt Area 7. A closer examination on that boundary will be explored in the coming year.

Figure 1. Rawhide Elk Herd Unit elk locations from 29 different cow elk (1 location ever two days), January 28, 2018-February 26, 2019.



Landowner/Hunter Satisfaction Survey Results

The landowner satisfaction survey results (Appendix A) showed that only 13% of the landowners were satisfied the elk population is at or about at desired levels, which was significantly lower than the 2017 satisfaction level of 41%. Landowners appear to be split on what they want to see for elk numbers, 45% indicated the elk population is above desired levels and 42% indicated the elk population was below desired levels. There were 24 surveys returned for a 40% return rate, lower than 2017, which had a return rate of 45%, but still exceeded the 25% threshold required for the satisfaction survey. Based on the past six years of surveys landowners are still not pleased with the number of elk, which was more evident this year given the split in preferred elk densities. Landowners south of US Hwy 26 still prefer to have lower densities, particularly ones that are in irrigated crop production and landowners north of the highway wants to see more elk and manage for trophy bulls. Bringing their satisfaction up to 60% continues to be a challenge. The hunter satisfaction survey indicated that 64% were satisfied with their hunt, which was an increase from 2017. The increase in satisfaction appears plausible given there were more elk accessible to hunters and the significant increase in bull harvest.

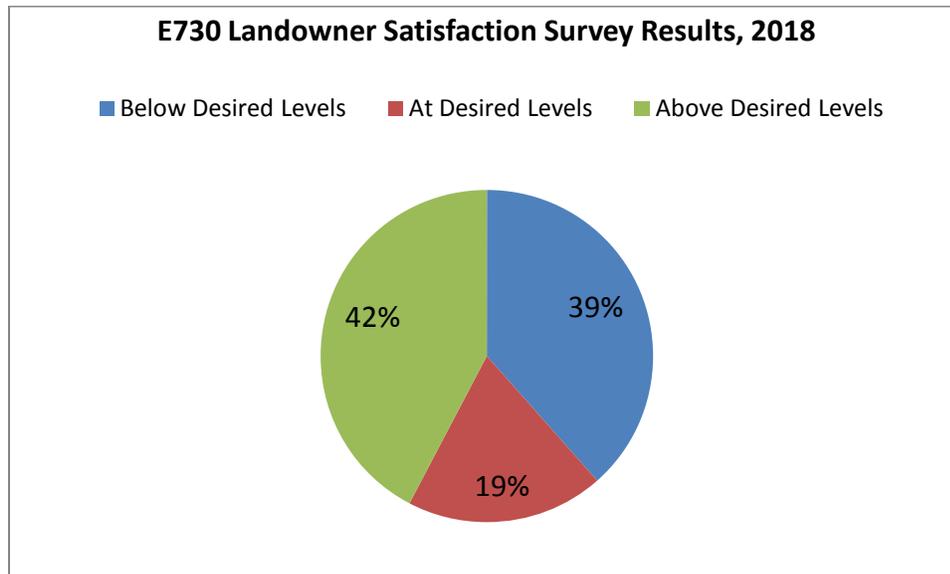
Management Summary

In summary, the 2019 season is designed to reduce elk numbers particularly in the southern portion of the herd unit. We hope to attain a harvest of 150 elk.

Appendix A

2018 Landowner survey results and comments for the Rawhide Elk Herd Unit

Sample size: 26



Comments:

- 1) Very destructive to fences and pastures. Would prefer they were not here at all
- 2) Making Area 3 a general area has made it difficult for us. We are dealing with a lot of local trespassers-sneaking in to shoot elk. If you must make this a general-tag-open it up to out of state hunters also so we can at least make some money off hunts. There is a HUGE antelope population here please give out more tags in this area! We are overrun!!
Glen Southwick 307-334-0911
- 3) We use to see elk on the 4J pasture between Hwy 270 and Waylen Canyon. Not since you opened up licenses north of Hwy 26 over the counter. Should be a draw with a higher percentage of success than before.
- 4) The elk don't bother me, I have none on my place. The antelope is what bothering me. Several hundred running on my place. Yes I let people hunt.
- 5) Way below. You wanted to get rid of elk in hunt area #3. You have nearly succeeded.
David A. Stenson
- 6) The elk in our area don't stay around. They just pass through. Friends to our north 15 miles where the elk do stay say they have to many.
- 7) I have little or no knowledge regarding this area. Gene Lenz PO Box 1200 Lusk 82225
- 8) Martin, I had my game camera on my pasture from October until New Years Day. I got many interesting pics including mountain lion, badger, coyotes, many mule deer but one pic of an elk. It was a 5 point and he was alone. Also, I hunt that pasture 15-20 times each elk season and have not harvested an elk since 2012. Thanks for what you do, Jaron Fredrick

- 9) Over here on the east side of the Rawhide Buttes section 12 Range 64 on the Brozovich Ranch, we have not had very many elk. We don't have irrigation or lots of free flowing water. West of us, in rougher and more rocky terrain and tree covered ground.
- 10) Seeing a few, but would like more. Thanks
- 11) We don't have very many come on our property
- 12) Current population does not allow hunting after deer season at the head of Deer Creek on Little Deer Creek
- 13) We really don't care to have all the elk here. Between the damage to crops, pivots and fences along with the risk of Brucellosis being transferred to cattle it's not worth the risk.
- 14) Sorry this is late, time got away from me. Saw more this year, but would still take more. May even get a tag this year. Thanks, Harold Stroh



1602 North Broken Arrow Trail
Lakeland, Florida 33813

Wyoming Game and Fish Department
5400 Bishop Blvd.
Cheyenne, WY 82006

ATTN: WGFD
Mr. Martin Hicks
1212 South Adams
Laramie, WY 82070

Thank you for your inquiry.

It is my understanding that the Northern portions of Unit 3 are 95% \pm privately owned, and that other "uses" (other than dedicated Elk hunting) are equally pursued, and accomplished.

For instance: If cattle is pursued, the private landowner has done a good job of balancing the grazing/hay/water/hunting resources to be acceptable to him/her.

Let us just say "This is a given".

If it was not, the private landowner would alter the balance of the mix over the years, because he is footing the "whole bill", unlike other lands.

Therefore, Answer/Question No. 2 is the current, most accurate answer.

The next question, to me, is: Does Wyoming want to enhance (or allow) the landowner to have a better elk experience?

If so, we can suggest some program changes.

Thank you for your initial interest.

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P.S. it is a pleasure to be an outdoors man in Wyoming.