

**ELK**

For formatting purposes,  
this page left blank intentionally.

## 2017 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2017 - 5/31/2018

HERD: EL320 - FORTIFICATION

HUNT AREAS: 2

PREPARED BY: ERIKA PECKHAM

	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Trend Count:	274	332	300
Harvest:	84	80	135
Hunters:	112	110	160
Hunter Success:	75%	73%	84 %
Active Licenses:	114	110	155
Active License Success	74%	73%	87%
Recreation Days:	439	283	400
Days Per Animal:	5.2	3.5	3.0
Males per 100 Females:	52	47	
Juveniles per 100 Females	70	64	

Trend Based Objective (± 20%)

150 (120 - 180)

Management Strategy:

Private Land

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

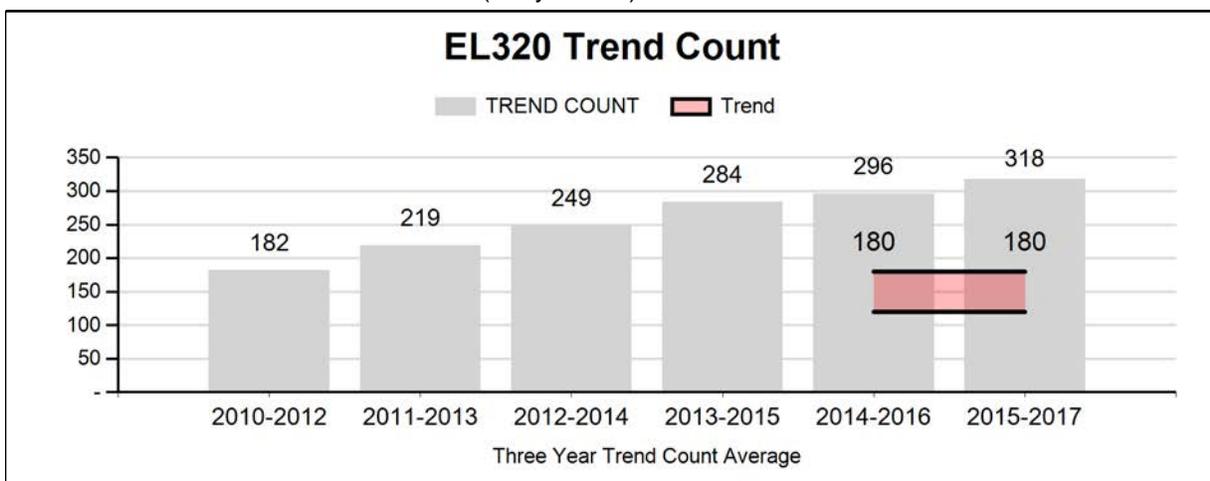
121%

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

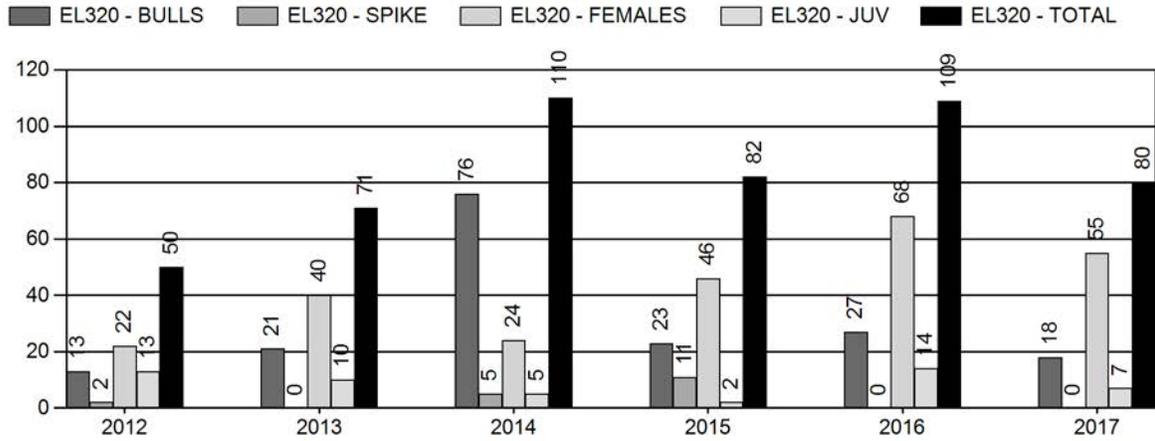
8

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

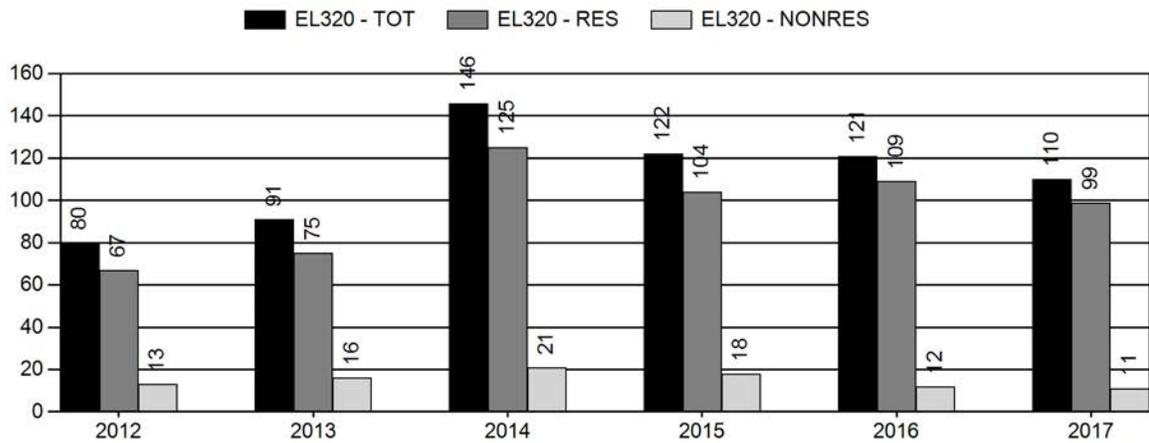
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	20%	30%
Males ≥ 1 year old:	9%	8%
Juveniles (< 1 year old):	1%	1%



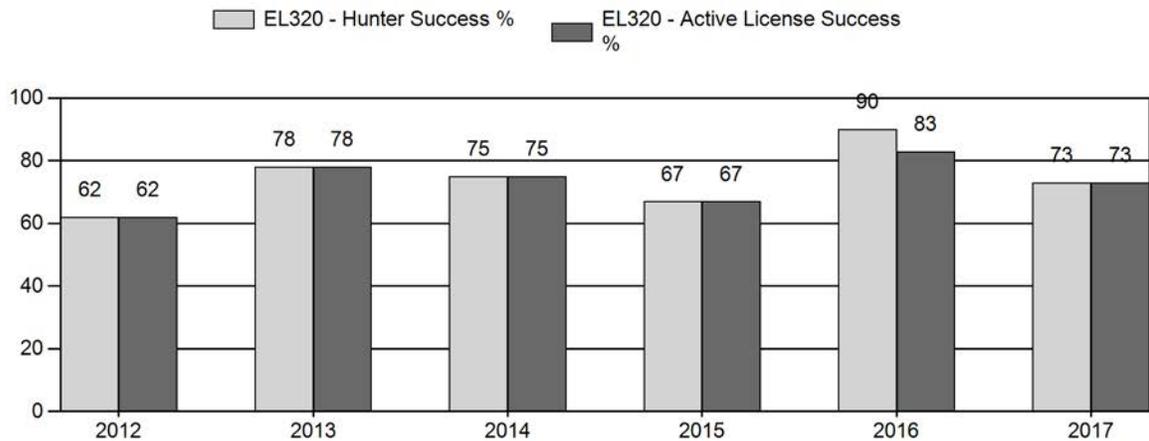
# Harvest



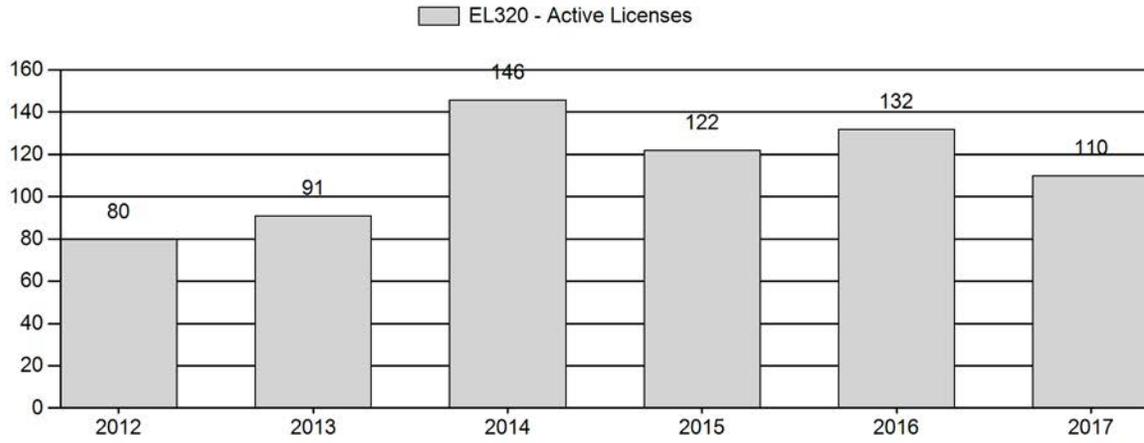
# Number of Hunters



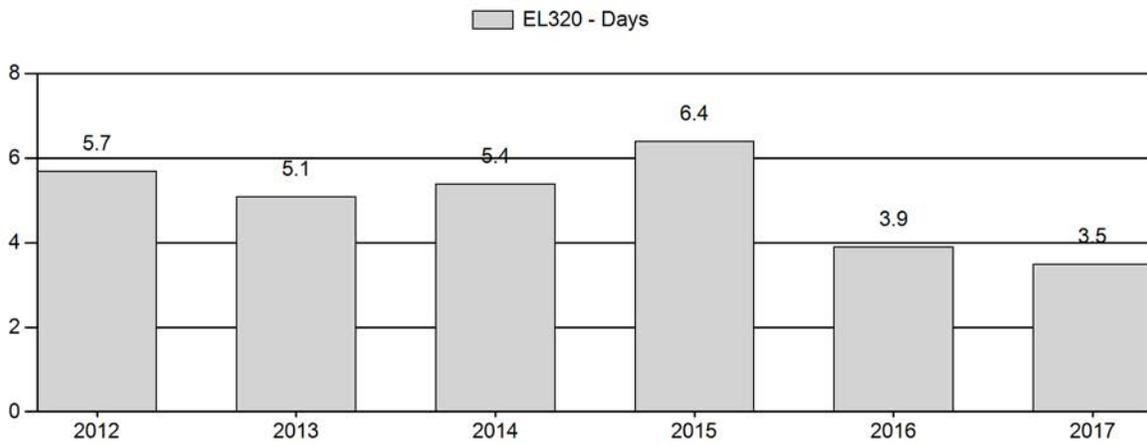
# Harvest Success



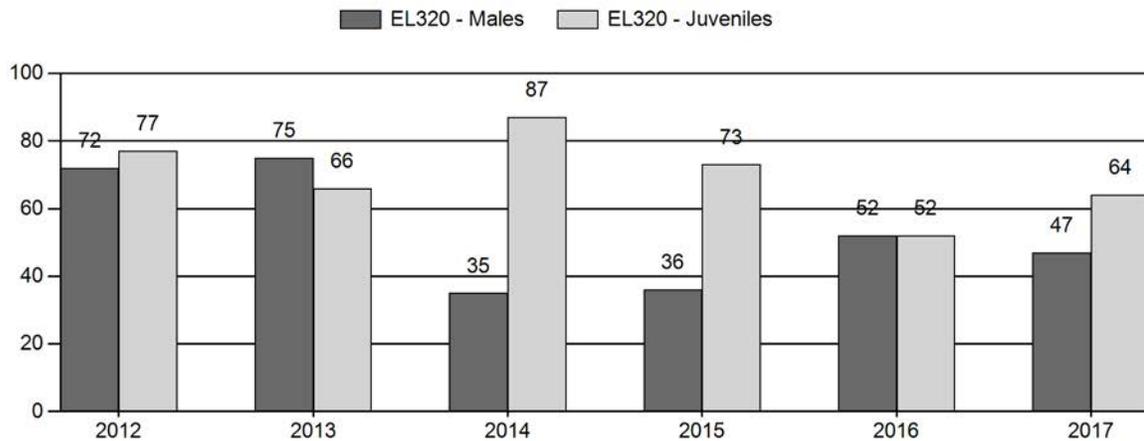
# Active Licenses



# Days per Animal Harvested



# Postseason Animals per 100 Females



### 2012 - 2017 Postseason Classification Summary

for Elk Herd EL320 - FORTIFICATION

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	0	32	27	59	29%	82	40%	63	31%	204	215	39	33	72	± 12	77	± 13	45
2013	0	23	63	86	31%	114	41%	75	27%	275	438	20	55	75	± 10	66	± 9	38
2014	0	25	17	42	16%	121	45%	105	39%	268	0	21	14	35	± 6	87	± 11	64
2015	0	31	22	53	17%	148	48%	108	35%	309	0	21	15	36	± 6	73	± 9	54
2016	0	43	36	79	25%	153	49%	80	26%	312	517	28	24	52	± 7	52	± 7	34
2017	0	29	45	74	22%	157	47%	101	30%	332	483	18	29	47	± 0	64	± 0	44

**2018 HUNTING SEASONS  
FORTIFICATION ELK HERD (EL320)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
2	1	Oct. 21	Oct. 31	35	Limited quota	Any elk
2	4	Oct. 21	Oct. 31	40	Limited quota	Antlerless elk
2	6	Oct. 21	Oct. 31	40	Limited quota	Cow or calf
2	7	Dec. 1	Dec. 10	50	Limited quota	Cow or calf

Hunt Area	Type	Quota change from 2017
2	1	0
2	4	0
2	6	0
2	7	+50
<b>Herd Unit Total</b>	<b>1</b>	<b>0</b>
	<b>4</b>	<b>0</b>
	<b>6</b>	<b>0</b>
	<b>7</b>	<b>+50</b>

**Management Evaluation**

**Current Trend Count Objective: 150**

**Management Strategy: Private Land**

**2017 Trend Count: 332**

**2018 Proposed Trend Count: 300**

**2017 Hunter Satisfaction: 84% Satisfied, 10% Neutral, 6% Dissatisfied**

**Herd Unit Issues**

The Fortification Elk Herd Unit has a mid-winter trend count objective of 150 elk. The management strategy is private land management. The objective and management strategy were last reviewed and revised in 2017. Prior to this change, this herd had a population objective of 150 animals. This was not realistic to attain, as this herd is likely over 600 elk and increasing, and with limited hunter access. The mid-winter trend count objective of 150 elk was correlated with a time period when landowners were satisfied with the number of elk they were seeing. During the time period when satisfaction with the number of elk was high, there were around 150 elk being detected in the postseason survey. As hunter access to this herd is dependent on private landowner willingness and ability to accommodate hunters, the private land management strategy is appropriate.

This herd has great potential for growth if hunter access cannot be improved. Much of the occupied range includes lands administrated by the Bureau of Land Management. Private land

is scattered, but also surrounds the occupied habitat, resulting in a tightly controlled access situation. The opinions of landowners controlling hunting access thus have a great impact on how this herd is managed. At this time, several landowners allowing access to this elk herd seem to be relatively satisfied with the management direction, and have allowed access to the current number of license-holding hunters. However, some landowners do not take any hunters providing refuge areas for elk during hunting season.

Coal bed methane (CBM) development has occurred in the herd unit and has resulted in a network of roads and other development associated with the infrastructure required to support CBM extraction. The phased development plan was designed when it was projected there was going to be extensive CBM development in core elk habitat. This reduced impacts on the Fortification Elk Herd. The increased traffic was an issue with hunting in the past, however in recent years, development and activity have tapered off substantially. There has been increased conventional oil drilling activity, however, at this time it also has slowed, with little development planned in the immediate future.

The mid-winter trend count resulted in 332 elk being spotted. This is well above the objective of 150 and is also the highest on record. The 2017 post-season population estimate from the spreadsheet model was about 740 elk. Field data and observations indicate that this herd has steadily trended upwards. This upwards trend has been occurring since around 2003. The field estimate is currently around 600 elk.

## **Weather**

Weather throughout 2017 and into 2018 was not optimal for rangeland conditions in this area. Moderate drought conditions were experienced in much of this herd unit in this time span. The winter of 2016-2017 started out with extremely low temperatures, coupled with several snowstorms, however, as January 2017 approached, much milder conditions were experienced. Additionally, looking at historic temperature information for November and December of 2017 and January of 2018, records indicate that the mean temperatures were very close to the 30-year mean temperatures in Gillette. February 2018 experienced a -12 degree difference from the mean temperature, which resulted in persistent snowcover over much of the area. The snowcover and weather were likely not severe enough to impact the herd.

The Palmer Drought Index indicates that half of the months within the biological year 2017 experienced “moderate” drought conditions in the Powder River drainage and the other half were estimated to be in the “normal” range.

## **Habitat**

There is currently no formal habitat monitoring occurring in this herd unit. It should be noted that various stands of sagebrush in this area appeared to be stressed with overall low vigor. It is unknown what caused this but prolonged drought is suspected as stressed sagebrush has been noted throughout the general area. These areas are being monitored to see if die-off is imminent or if the plants will recover. The BLM has plans to conduct targeted timber thinning

within this area. Game and Fish has also been involved in this effort and treatments will continue over the next few years.

### Field Data

This herd is classified aurally via helicopter. Typically around four hours are spent in this area. Usually the elk are found in their preferred locations and these areas are systematically searched. If there is additional time, outlying areas are searched. The extensive juniper cover in the area significantly limits elk detection during the survey contributing uncertainty to the population estimate.

In general, the numbers of elk observed has been increasing since 2005. The day of the November 2017 classification flight, conditions were moderate for a survey with poor snow cover but cool temperatures. The elk were scattered throughout the area with most found in their preferred locations. A total 332 elk were observed and classified. The numbers from the November flight indicate that the post season 2017 calf to cow ratio was 64:100, up from the 2016 ratio of 52:100. The 2017 bull ratio was 47:100, slightly down from the 52:100 observed in 2016. It should also be noted that beginning a few years ago elk have been sighted increasingly in the areas adjacent to this herd unit. They are regularly spotted south of I-90, west of the Powder River and also east of Echeta Road. This is likely indicating that they have exceeded the capacity of their preferred range and are expanding outwards.

### Classifications of Fortification Elk Herd 2004-2017

	Total	Juv	YrlgMale	AdultMale	Female
2004	66	13	3	9	41
2005	62	12	7	12	31
2006	173	56	21	15	81
2007	113	21	17	6	69
2008	135	40	12	14	69
2009	59	12	1	17	29
2010	164	36	13	31	84
2011	177	54	18	18	87
2012	204	63	32	27	82
2013	275	75	23	63	114
2014	268	105	25	17	121
2015	331*	108	31	22	148
2016	312	80	43	36	153
2017	332	101	29	45	157

\*Total is different, as there were 22 that were not classified

As this is a small herd, the ratios can very quickly become skewed when harvest emphasis is placed on either males or females. Historically, harvest strategies alternate with a focus on cows to keep the herd in check, and bulls the following year to keep the bull ratio in a healthy range.

However, the past few years more emphasis has been placed on cow harvest. Although there were some bull licenses available in 2017, cow harvest was again emphasized, as it has been noted that the herd was continuing to grow.

One difficulty associated with the management of this herd is achieving adequate sample sizes during trend-count surveys. The elk can be difficult to locate under dense juniper cover and frequently they do not run when disturbed by survey flights. With these habitat factors, siteability is compromised and it is probable that a significant percentage of the elk are not detected during the survey. Additionally, weather conditions are also a factor. Lack of snow cover and warm temperatures can make it difficult to spot elk. The Fortification Herd Unit might be a candidate to attempt using infra-red survey techniques to find out if more elk can be located.

## **Harvest**

In 2017 there were 115 licenses available, 35 Type 1 any elk, 40 Type 4 antlerless elk licenses and 40 Type 6, cow or calf licenses. This number of licenses was in line with what the landowners allowing access were willing and able to accommodate. The season time and length seemed to be adequate to allow a reasonable harvest and worked well for the private landowners who allowed public access. It should be noted that the conditions during this time span were very favorable to hunting. In years when moisture is received it results in many roads being closed and decreased access to elk. In 2017, the overall success rate was 73% which is the right in line with the preceding 5 year average of 74%. Days per harvest was estimated at 3.5 which is fairly low when compared to prior years and far below the statewide average of 17.6 days per harvest. Such a high harvest rate and low days per harvest indicates that elk are readily available and the season length is sufficient for hunters to be successful.

## **Population**

Although this herd has moved away from management by population objective, the model for this herd does seem to capture the trend and provides an population estimate. The “Constant Juvenile – Constant Adult Mortality Rate” (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd. This model equals the SCA-CJ model with the lowest AIC value (102) and appears to depict the trend that is occurring. It is likely that the population estimate of ~740 is inflated (poor model), although the increasing trend is probably accurate. The efficacy of the spreadsheet model can be affected by several factors. One factor that comes into play is the herd size. These models work better with larger herds. The Fortification Herd is a relatively small herd, and therefore the accuracy of the model likely decreases. None of the other models for this herd appeared to be accurate, and due to the hardiness of elk, it is unlikely that they were substantially negatively impacted in some of the more difficult winters from 2008 - 2010. Other methods of estimating population may be considered in the future. Observations on the ground indicate that elk numbers are increasing within the herd unit boundaries and are expanding their distribution.

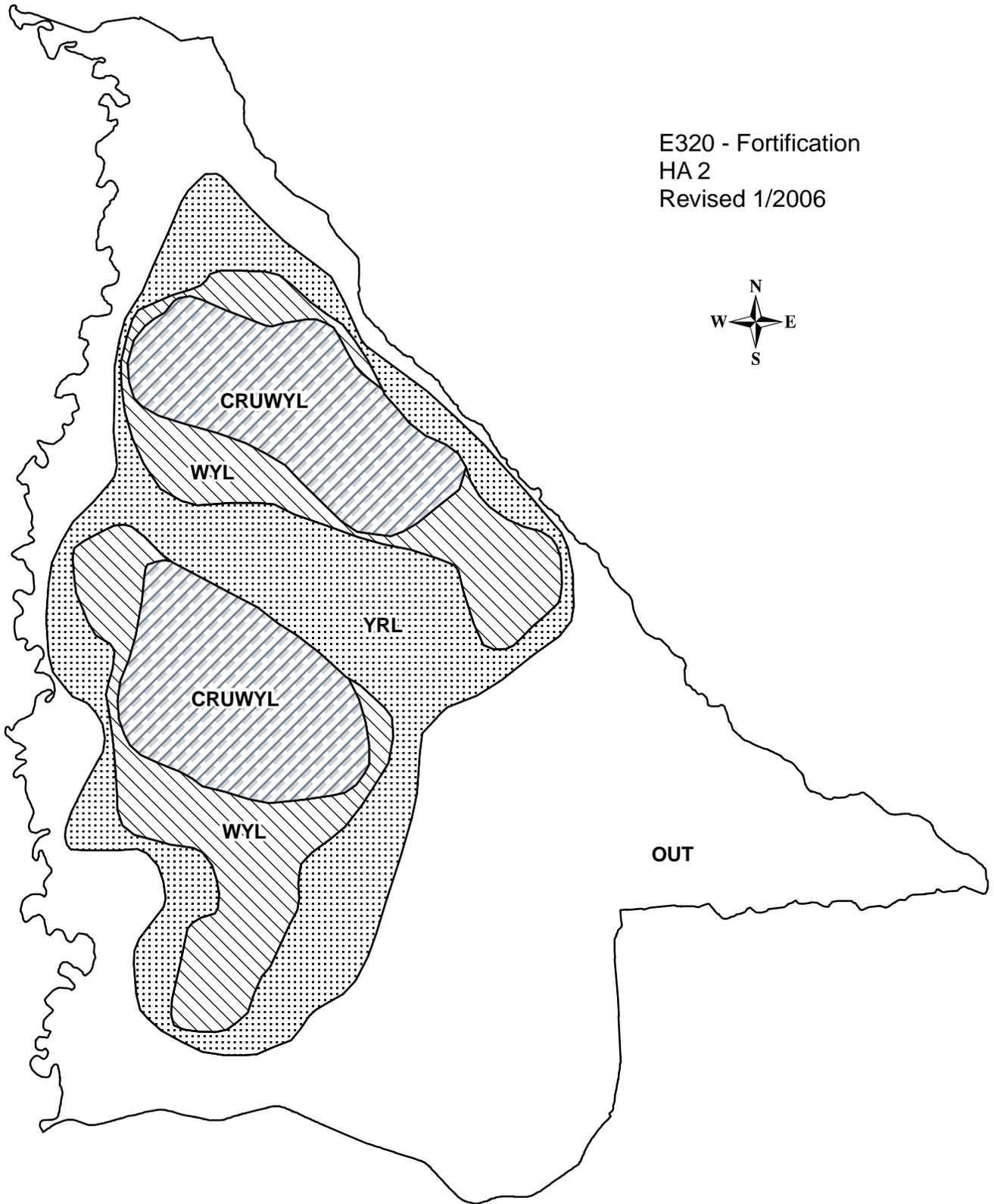
## Management Summary

Both BLM and Game and Fish staff have dedicated efforts to studying the behavior and movements of elk with an ongoing radio-collar study. In January 2014, 35 cow elk were fitted with GPS collars. These collars are no longer functioning and currently there are no individuals with working collars. In the past, collaring efforts were funded in part by Anadarko Petroleum. Future radio-collaring efforts will depend on oil and gas development and BLM's requirement to monitor this population as part of the plan of development.

Several nongovernmental organizations have taken a keen interest in the area and the elk herd in particular. The viewpoint of many of these groups is that elk should receive increased protection. Coal bed methane development has reduced the total amount of effective elk habitat. Conventional oil development is anticipated to increase at some point in the Powder River Basin and could be a factor in this herd unit. However, even with past and current development, the population is well over the management objective. Reducing elk numbers to objective would help reduce risks of overcrowding and degradation of suitable remaining habitat. A high priority is being placed upon maintaining habitat quality during development so that the area can continue to support a healthy elk herd after energy development has ceased.

In 2017 there were 115 licenses issued. During the annual landowner meeting held in January 2018, continued concern was expressed regarding the increasing number of elk. It was felt that the number of hunters in 2017 was optimal, however it was brought up that current harvest was inadequate in reducing elk numbers. After discussion, a late season cow hunt from December 1<sup>st</sup> to December 10<sup>th</sup>, was added. It was felt that this late season could accommodate 50 Type 7, cow or calf licenses. If we attain the projected harvest of 135 elk, the population is projected to decrease slightly.

E320 - Fortification  
HA 2  
Revised 1/2006



## 2017 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2017 - 5/31/2018

HERD: EL321 - NORTH BIGHORN

HUNT AREAS: 35-40

PREPARED BY: TIM THOMAS

	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Trend Count:	5,679	5,849	5,600
Harvest:	1,432	1,694	1,600
Hunters:	4,339	4,638	4,700
Hunter Success:	33%	37%	34 %
Active Licenses:	4,534	4,890	5,000
Active License Success	32%	35%	32 %
Recreation Days:	32,875	34,266	34,500
Days Per Animal:	23.0	20.2	21.6
Males per 100 Females:	24	15	
Juveniles per 100 Females	48	37	

Trend Based Objective (± 20%) 4,350 (3480 - 5220)

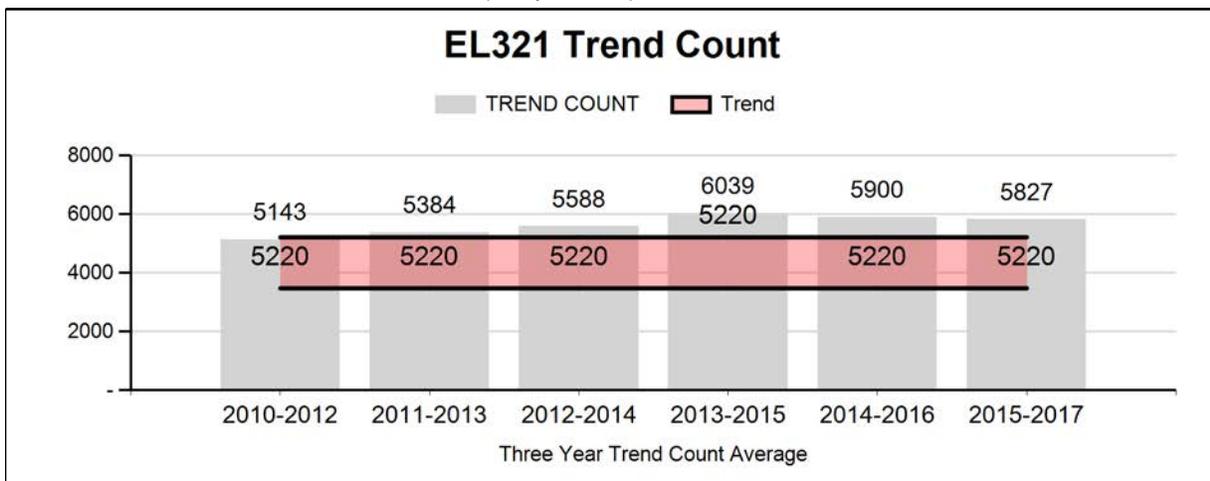
Management Strategy: Special

Percent population is above (+) or (-) objective: 34%

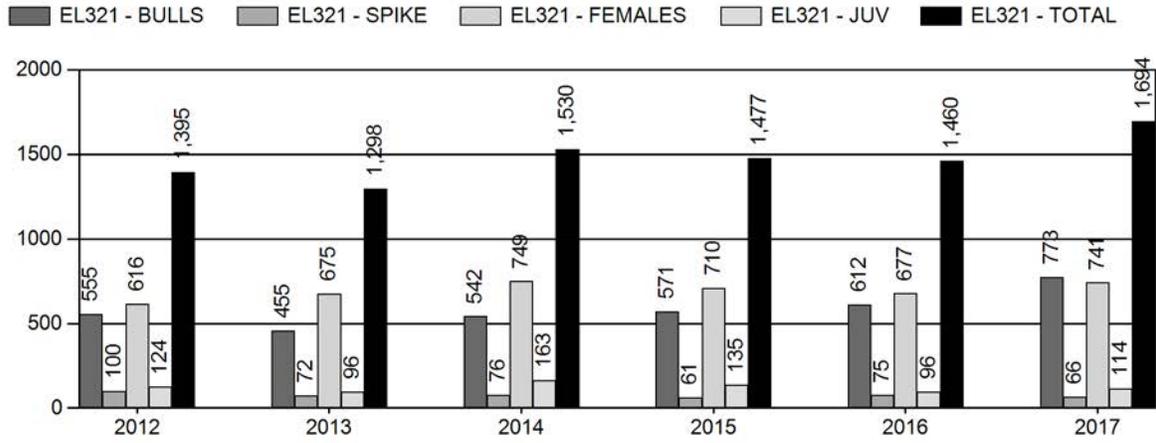
Number of years population has been + or - objective in recent trend: 8

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

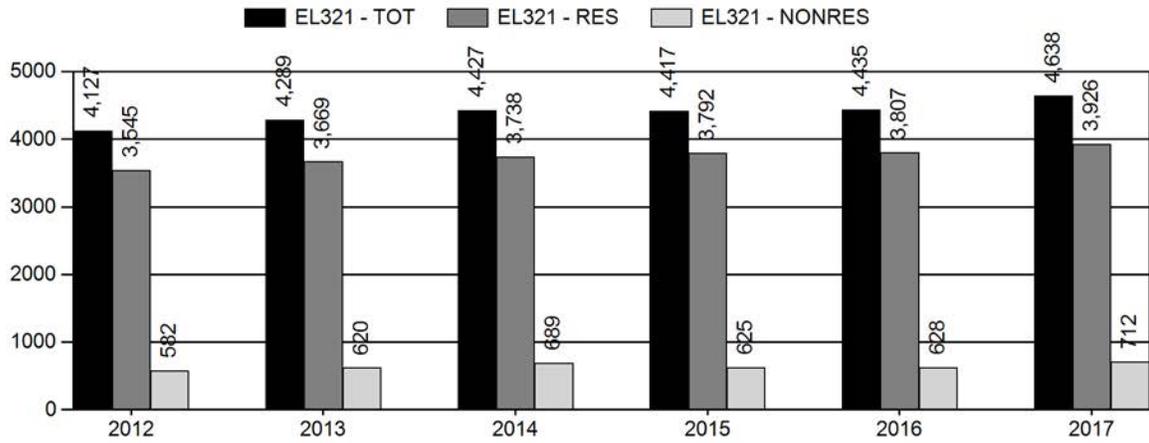
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	22%	20%
Males ≥ 1 year old:	36%	38%
Juveniles (< 1 year old):	5%	5%



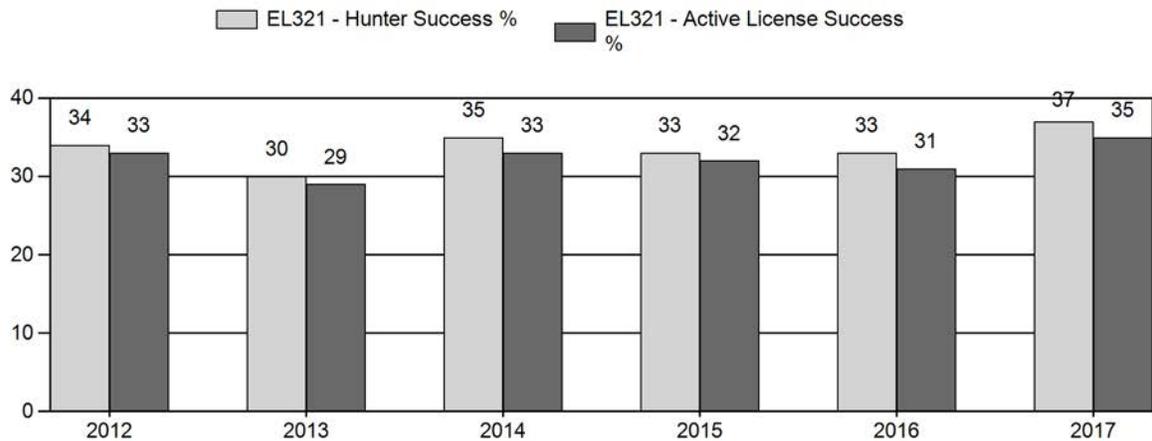
# Harvest



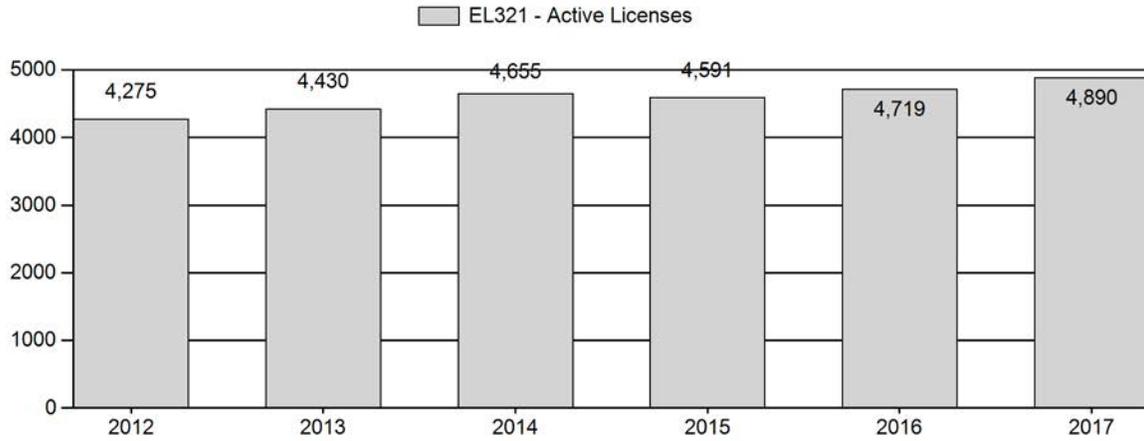
# Number of Hunters



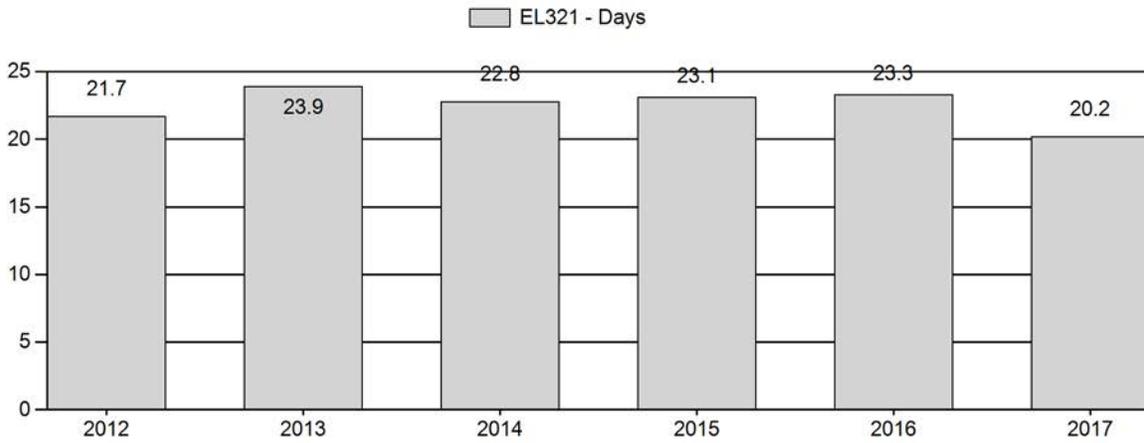
# Harvest Success



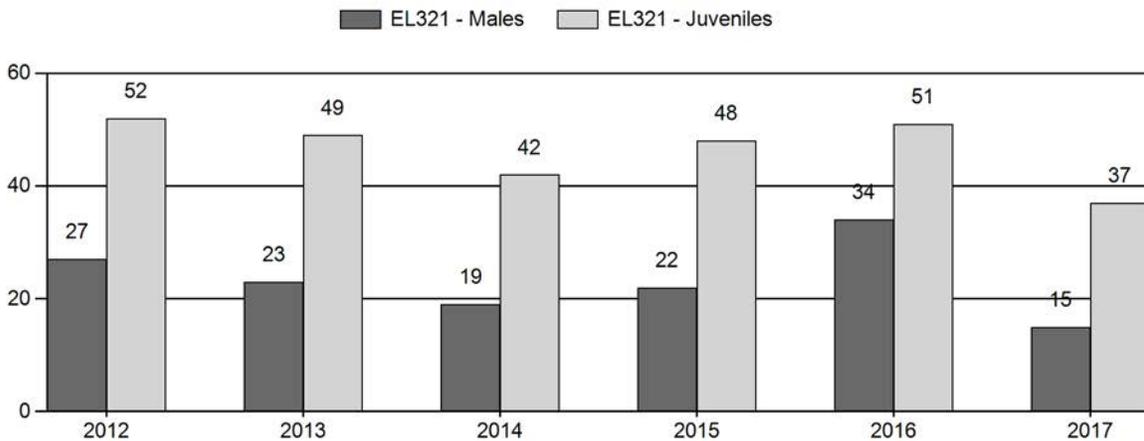
# Active Licenses



# Days per Animal Harvested



# Postseason Animals per 100 Females



**2012 - 2017 Postseason Classification Summary**

for Elk Herd EL321 - NORTH BIGHORN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	5,400	148	111	259	15%	977	56%	509	29%	1,745	791	15	11	27	± 2	52	± 3	41
2013	0	103	43	146	13%	643	58%	312	28%	1,101	736	16	7	23	± 0	49	± 0	40
2014	0	146	88	234	12%	1,221	62%	514	26%	1,969	504	12	7	19	± 0	42	± 0	35
2015	0	74	101	175	13%	787	59%	377	28%	1,339	709	9	13	22	± 0	48	± 0	39
2016	0	137	115	252	19%	734	54%	372	27%	1,358	801	19	16	34	± 0	51	± 0	38
2017	0	105	30	135	10%	871	66%	319	24%	1,325	474	12	3	15	± 0	37	± 0	32

**2018 HUNTING SEASONS  
NORTH BIGHORN ELK HERD (EL321)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
35	1	Oct. 15	Nov. 5	150	Limited quota	Any elk
	4	Oct. 15	Dec. 31	250	Limited quota	Antlerless elk
	6	Oct. 15	Dec. 31	250	Limited quota	Cow or calf elk valid off national forest
	9	Sep. 1	Sep. 30	75	Limited quota	Any elk, archery only
36		Oct. 15	Nov. 5		General	Antlered elk
	4	Oct. 15	Dec. 31	300	Limited quota	Antlerless elk
	6	Oct. 15	Nov. 5	250	Limited quota	Cow or calf
	9	Sep. 1	Sep. 30	50	Limited quota	Any elk, archery only
37		Oct. 15	Nov. 5		General	Any elk
	6	Sep. 1	Sep. 30	700	Limited quota	Cow or calf valid off national forest
	6	Oct. 1	Dec. 31			Cow or calf valid in the entire area
	9	Sep. 1	Sep. 30	150	Limited quota	Any elk, archery only
38	1	Oct. 15	Nov. 5	350	Limited quota	Any elk
	1	Nov. 6	Nov. 15			Antlerless elk
	4	Oct. 1	Oct. 10	550	Limited quota	Antlerless elk
	4	Oct. 15	Nov. 15			Antlerless elk
	6	Nov. 16	Dec. 31	50	Limited quota	Cow or calf valid off national forest; the Wyoming Game and Fish Commission's Kerns and Amsden Creek Wildlife Habitat Management Areas shall be closed
	9	Sep. 1	Sep. 30	200	Limited quota	Any elk, archery only
39	1	Oct. 15	Nov. 4	200	Limited quota	Any elk
	1	Nov. 5	Nov. 15			Antlerless elk
	4	Oct. 1	Oct. 10	75	Limited quota	Antlerless elk
	4	Oct. 15	Nov. 15			Antlerless elk
	9	Sep. 1	Sep. 30	75	Limited quota	Any elk, archery only

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
40	1	Oct. 15	Nov. 4	225	Limited quota	Any elk
	4	Oct. 15	Nov. 30	200	Limited quota	Antlerless elk
	5	Oct. 1	Oct. 10	50	Limited quota	Antlerless elk
	5	Oct. 15	Nov. 30			Antlerless elk
	6	Sep. 1	Oct. 14	100	Limited quota	Cow or calf valid off national forest
	6	Oct. 15	Nov. 30			Cow or calf valid in the entire area
	9	Sep. 1	Sep. 30	100	Limited quota	Any elk, archery only

Special Archery Season Hunt Areas	Type	Season Dates		Limitations
		Opens	Closes	
36, 37	All	Sep. 15	Sep. 30	Valid in the entire area(s)
35	1, 4	Sep. 15	Sep. 30	Valid in the entire area(s)
35	6	Sep. 15	Sep. 30	Valid off National Forest

Hunt Area	Type	Quota change from 2017
35	4	+ 50
	6	+ 50
	9	+ 25
36	6	+ 50
37	6	+300
	7	-100
38	4	+ 50
Herd Unit Total	Type	Quota change from 2017
	1	No Change
	4	+ 100
	5	No Change
	6	+ 400
	7	- 100
	9	+ 25

**Management Evaluation**

**Current Mid-Winter Trend Management Objective:** 4,350

**Management Strategy:** Special

**2017 Winter Trend Count:** 5,849

**Most Recent 3-year Running Average Winter Trend Count:** ~ 5,800

**2017 Hunter Satisfaction:** 64% Satisfied; 19% Neutral; 17% Dissatisfied

## **Herd Unit Issues**

The North Bighorn Elk Herd Unit is located in north central Wyoming. It covers the northern portion of the Bighorn Mountains and associated foothills. Management is shared between the Sheridan and Cody Regions, with the Sheridan wildlife biologist having herd unit reporting responsibility. This herd unit contains six elk hunt areas, specifically Hunt Areas 35-40.

The management objective for the North Bighorn Elk Herd Unit is a mid-winter trend count of 4,350 elk ( $\pm 20\%$ ). The management strategy is special management overall, with special management emphasis in limited quota hunt areas (Areas 35, 38, 39 and 40) and recreational management emphasis in general license hunt areas (Areas 36 and 37). The management objective and strategy were last revised in 2012. The objective and management strategy 5-year evaluation was conducted in 2017 with no changes recommended.

There are several areas, consisting primarily of private lands, within the various hunt areas of this herd unit that act as refuge for elk, providing a safe harbor from harvest. This limits managers' ability to maintain these groups within desired population levels, leading to frustration for the general hunting public as elk move from publically accessible areas to these refuge areas. Landowners are also frustrated as elk move off these refuge areas once hunting season is closed and cause damage to stored and standing crops. This problem has grown over the past 25+ years, especially on the eastside of this herd unit - specifically Hunt Areas 35, 36 and 37 - as larger ranches have changed ownership and views on elk management and hunter access have changed.

During four of the last six hunting seasons (2012, 2013, 2014 and 2016), hunters harvested elk from this herd unit that tested seropositive for exposure to the bacterium *Brucella abortus*. *B. abortus* is the bacterium that causes the disease brucellosis in livestock, elk and bison, and undulant fever in humans. In 2012, blood samples were collected from hunter harvested elk in Hunt Area 40 on the west side of the Bighorn Mountains during routine statewide monitoring for brucellosis. Two of these samples tested seropositive. In response, an enhanced brucellosis surveillance effort was initiated in all elk hunt areas in the Bighorn Mountains in 2013 and has occurred every year since then.

## **Weather**

Temperature and precipitation data referenced in this section were collected at the Burgess Junction (#481220), Shell (#488124) and Sheridan Airport (#488155) weather stations located within this herd unit. These data were reported by the Western Region Climate Center on their website ([www.wrcc.dri.edu](http://www.wrcc.dri.edu)).

Spring 2017 was cool and wet, with near normal temperatures and above normal precipitation, resulting in a good start for forage production in the Bighorn Mountains. May, June and August saw below average precipitation, with July receiving over double the normal precipitation. Temperatures through the summer were near or above normal. During the fall of 2017, precipitation was significantly above normal (September), well below normal (October) or near normal (November), with temperatures slightly above (September-October) to well above (November) normal. Temperatures were above average in December and January, turning cold in February. Precipitation was near normal for December through February. Adult elk appeared to have entered the winter in good condition, allowing them to survive the winter fairly well.

Cold temperatures, as low as -20<sup>0</sup> F, and hard, crusted snow in late January through early March resulted in elk moving to areas they have not occurred in recent memory such as east of Interstate 90 near Prairie Dog Creek. Elk damage to stored crops also increased significantly during this time period. Calves are more susceptible to adverse effects of cold temperatures due to limited body reserves and small body size. As such, they may have experienced higher winter mortality this year compared to the previous several winters which were generally more open.

## Field Data

Biologists and wardens conduct winter trend counts in this herd unit during January – February using aerial survey techniques with rotary and fixed-wing aircraft. Good snow cover and favorable flying conditions dictate the survey time period annually. Managers on the west side (Areas 39 and 40) usually classify elk during these surveys.

We counted 5,849 elk on winter ranges during January-February 2017, which is ~34% above the established mid-winter count objective of 4,350 (Table 1). This is the third highest winter count in this herd unit and is above the five year (2012-2016) average of 5,679 elk.

Table 1. Desired elk distribution and actual winter trend counts in North Bighorn Elk Herd Unit.

Hunt Area	Winter Count Objective	2015 Winter Count	2016 Winter Count	2017 Winter Count	2017 # Over / Under Objective	3-year (2015-16) Running Mean
35	400	1,179	148	360	-40	562
36	800	1,074	905	652	-148	877
37	800	1,752	1,668	2,108	+1,308	1,843
38	1,000	1,560	942	1,404	+404	1,302
39	500	718	452	451	-49	540
40	850	327	906	874	+24	702
	4,350	6,610	5,021	5,849	+1,499	5,827 (+34%)

Significant increases in Hunt Areas 37 and 38 account for the majority of increased elk numbers this year. Increased elk numbers in Area 35 were basically offset by a decrease in Area 36. Counts in Areas 39 and 40 were similar to 2016. Elk that historically wintered in Area 35 have started wintering in the northern portion of Area 34. Three groups of elk counted in the northern most portion of Area 34 ( $n=674$ ) likely spend the majority of the year in Area 35 and would bring the Area 35 trend count up to 1,034, similar to most years from 2003-2015. Upwards of 1,500 elk winter in Garvin Basin and return to Wyoming during the summer months. Seasons have been liberalized and harvest increased in recent years to reduce elk populations to more desired levels. Limited access to private lands along the foothills of the Bighorns makes attaining harvest goals difficult.

We classified 1,325 elk during January 2017, similar to recent years. All elk classified were on the west side (Areas 39 and 40) of the Bighorn Mountains. We observed 37 calves:100 cows, the lowest calf:cow ratio since 2002. This could be a function of unfavorable environmental conditions during parts of the last winter. It could also be a density dependent response to high elk numbers.

We observed 15 bulls (12 yearling; 3 adult):100 cows, the lowest bull to cow ratio since 2000. The observed yearling bull to cow ratio suggests average recruitment of bulls in 2017. This level

of recruitment should be sufficient to maintain current levels of bull harvest. The observed adult bull to cow ratio is not representative of the true population. Mature bulls (> 2 yrs old) tend to winter away from cow/calf/young bull groups, often making them more difficult to find during surveys. This winter was fairly open prior to February and mature bulls likely were still secluded at higher elevations at the time of these surveys. We did locate several wintering bulls groups in some hunt areas that are not included in the above ratio because the corresponding cow/calf groups weren't classified. In 2017, 92% of the harvested bulls were branch antlered, suggesting adequate bulls in the population well above the observed ratio.

According to the 2017 hunter satisfaction survey, 64% of 1,158 hunters were satisfied with their elk hunting experience in this herd unit, 17% were dissatisfied, with the balance ( $n=19\%$ ) being neutral. Satisfaction increased slightly compared to the 2016 season. Hunters were more satisfied in the limited quota hunt areas (73%) compared to the general license areas (55%) which is expected. Limited quotas areas tend to be less crowded, have higher success and generally have better quality bulls, factors that likely influence hunter satisfaction levels. Nonresident hunters ( $n=233$ ) tended to be more satisfied (73%) than resident hunters (62%,  $n=925$ ), although the difference is not as pronounced as it has been in previous years. Hunter satisfaction is subjective and based on individual values, perceptions and success.

### **Harvest Data**

An estimated 4,638 hunters harvested an estimated 1,694 elk in 2017, a 16% increase over the 2016 harvest. This is the highest estimated harvest ever in this herd unit. All categories of harvest increased in 2017 except for yearling (spike) bull harvest. The adult bull (>1 year old) harvest was the highest ever in this herd unit and the adult cow ( $\geq 1$  year old) harvest was the second highest ever.

During 2008-2012, hunters harvested an average of 573 total bulls compared to an average of 661 bull elk during 2013-2017. Adult bull harvest averaged 471 during 2008-2012 compared to an average 491 during 2013-2017. Estimated branched antlered bull harvest was over 500 bulls five of the past six years. With an emphasis on special management in the limited quota hunt areas of this herd unit, we are concerned with the level of bull harvest in recent years. We plan to monitor bull quality in these areas. Yearling bull harvest has remained relatively stable over the past five years, ranging from 61 to 76. This is actually a decline from the previous decade, suggesting a shift in hunter selection for branched antlered bulls. This could be a result of more branched antlered bulls being available for harvest.

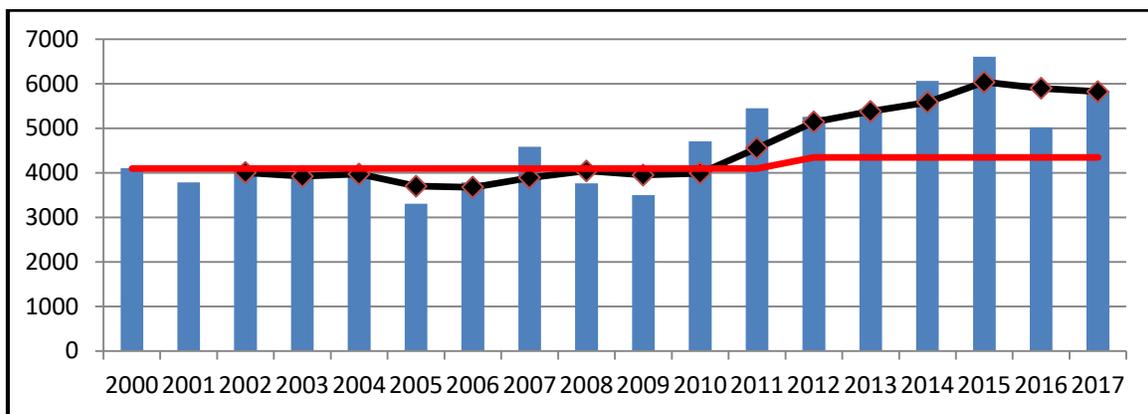
Hunter success was estimated at 37%, the highest success rate since 1997. Effort, as measured by the number of days hunted to harvest an elk, was 20.2 days/harvest, a decrease from 2016. Relatively open weather conditions during much of October and early November kept elk scattered across most of the herd unit. The open conditions allowed good access to most of the herd unit, resulting in good success. Extended hunting season strategies helped provide opportunity for antlerless harvest.

Archery hunters harvested an estimated 251 elk in this herd unit, a 36% increase from the 2016 archery harvest ( $n=184$ ) and 15% of the total harvest. Statewide, archery hunts harvested ~11% of the elk harvested in 2017. Archers are particularly successful on bull elk, harvesting an estimated 219 bulls (26% of total bull harvest), consisting of 205 adult bulls ( $\geq 2$  years old) and

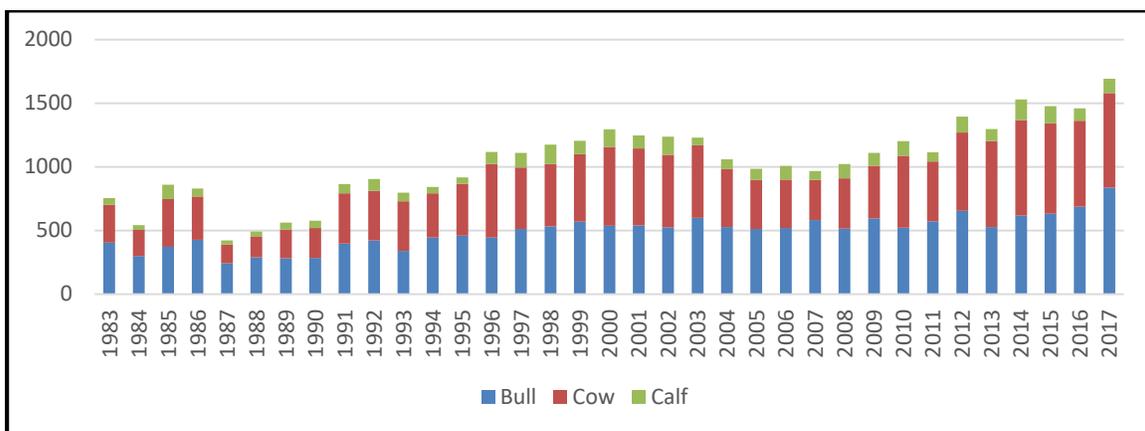
14 yearling bulls. Several hunt areas in this herd unit are generally considered some of the best opportunities for trophy elk archery hunting in Wyoming. This level of bull harvest, by either archery or firearm hunters, may not be sustainable over time to maintain special management objectives and will be monitored.

## Population

We do not have a spreadsheet model developed for this herd unit because: 1) we do not manage this herd based on a post-season population objective; 2) this is an interstate elk herd; and 3) up to 25% of this herd migrates onto the Crow Indian Reservation in Montana each fall, where harvest is unregulated and unmonitored. We manage this herd based on mid-winter trend counts. Elk generally winter in traditional areas within this herd unit and we likely count 70-90% of wintering elk in any given year.



**Figure 1.** Elk numbers, with 3-year running average (black line), observed during trend and classification surveys compared to the management objective (red line).



**Figure 2.** Estimated elk harvest from 1983 – 2017 by bull, cow and calf.

Based on elk winter trend counts, it appears this population has increased in recent years (Fig. 1). It is difficult to know how much of this is an actual increase in the population and how much a shift of elk wintering in Wyoming versus Montana due to varying winter conditions. Efforts are being made, through liberalized hunting season strategies, to reduce this population towards

objective. Harvest the past six years has been the highest six years ever, averaging over 1,400 elk harvested each year (Fig. 2).

### **Management Summary**

In general, bull elk hunting runs from October 15<sup>th</sup> thru November 4<sup>th</sup> or 5<sup>th</sup> in this herd unit. With four of the six hunt areas in this herd unit managed under limited quota strategies, we have been successful to date in maintaining trophy quality hunting opportunities throughout the herd unit. Recent increases in bull harvest may reduce bull quality and will be closely monitored. Antlerless harvest, either on full price antlerless licenses or reduced price cow or calf licenses, varies among hunt areas based on local management desires and concerns.

Archery hunting is allowed during the month of September. In Hunt Areas 35, 36, and 37, Type 9 (archery only) license holders can hunt the entire month, while other license holders (i.e. General, Type 1, Type 4 or Type 6 license holders) can hunt starting September 15. In Hunt Areas 38, 39, and 40, archery hunting is by Type 9 license only. These areas are extremely popular, with draw odds of around 31% for residents in these three areas (2017 resident draw odds for Type 9 license: Area 38 = 25%; Area 39 = 31%; Area 40 = 53%). Non-resident hunters needed 8+ preference points to draw an Area 38 or 39 Type 9 license and six preference points to draw an Area 40 Type 9 license in 2017 (regular preference points draw).

A significant number of elk in Area 35 move to private lands south of U.S. Highway 16 in September to forage on alfalfa meadows. The Area 35 Type 6 season was implemented to target these private land elk, which may account for 75% of the winter count for this hunt area. In 2016, the Wyoming Office of State Land and Investments completed the Bull Creek Ranch #1 exchange which secured 5,235 deeded acres into State ownership with managed public access. This acquisition, along with existing BLM and State leases, provided access for significant public hunting opportunity which resulted in numerous elk being harvested. The Bull Creek Ranch #2 land exchange, completed in February 2018, secured acquisition of the remaining 3,200 deeded acres of the Bull Creek Ranch into State ownership. Once completed, the Bull Creek Ranch will total 8,435 acres. The property provides crucial elk and deer winter range, and provides an opportunity to increase elk harvest to manage this sub-population. Type 4 (antlerless elk), Type 6 (cow or calf elk) and Type 9 (any elk, archery only) were all increased slightly in Area 35 for the 2018 to increase harvest and provide additional opportunity.

Type 6 (cow or calf elk) licenses in Area 36 were increased for the 2018 season to increase harvest.

We initiated a Type 7 (cow or calf elk) in Area 37 in 2016 valid only during December and off national forest. While hunters had high success on this license type in 2017 (75%), it created unnecessary complexity to the regulations and caused confusion among some landowners and hunters. We eliminated the Type 7 license for the 2018 season. We increased Type 6 (cow or calf elk) licenses and extended the season through December to accommodate harvest during that time period.

Mid-winter counts have exceeded the desired level in Area 38 the past three years. We increased Type 4 (antlerless elk) licenses to increase harvest and provide additional opportunity.

There is a split in the antlerless elk seasons in Hunt Areas 38, 39, and 40. These seasons run for 10 days, are closed for four days, and reopen in conjunction with other license types. This split is in response to feedback from antlered elk hunters worried that hunting pressure up to the opening day of their season could impact harvest opportunities. This split has seemed to pacify most hunters while providing opportunity to increase antlerless harvest. Based on reported day of harvest in 2017, an estimated 35% of the cow harvest in these hunt areas occurred during this early October season.

A late season Type 6 (cow or calf) license was created in 2015 in Area 38 to address damage issues on private lands. This season was designed to harvest elk that have become habituated to leaving the WHMAs and feeding on stored hay crops. Weather conditions were fairly mild during the 2015 season and hunters harvested only five elk. In 2016, hunters harvested 11 elk on this license and in 2017 hunters harvested 12 elk. We will use this season strategy again in 2018. While harvest is relatively low, it is focused on nuisance elk. Landowners like the limited number of hunters available to address problems as they arise during the season.

The existing season structure seems to be working well in Areas 39 and 40, and will be maintained for the 2018 season.

With liberal seasons and favorable hunting conditions, we anticipate a similar harvest (~1,600 elk) during 2018. Continued harvest, especially on cows, should help bring some segments of this herd where winter counts exceed management objectives down to desired levels. Until access to key private lands improve in some areas, our ability to reach desired harvest will be limited. We continue to investigate any possible access agreement to facilitate harvest.

Since brucellosis was first detected from a hunter harvested elk in the Bighorn Mountains in 2012, we have tested 3,090 blood samples primarily from hunter harvested elk, and have had 11 seropositives. In 2017, we collected and tested 708 blood samples, 301 samples from the North Bighorn Elk Herd Unit (Table 2). Our lab was able to increase the useable sample rate in 2017 to ~93% by testing more hemolyzed samples. We will continue enhanced brucellosis surveillance during the 2018 season.

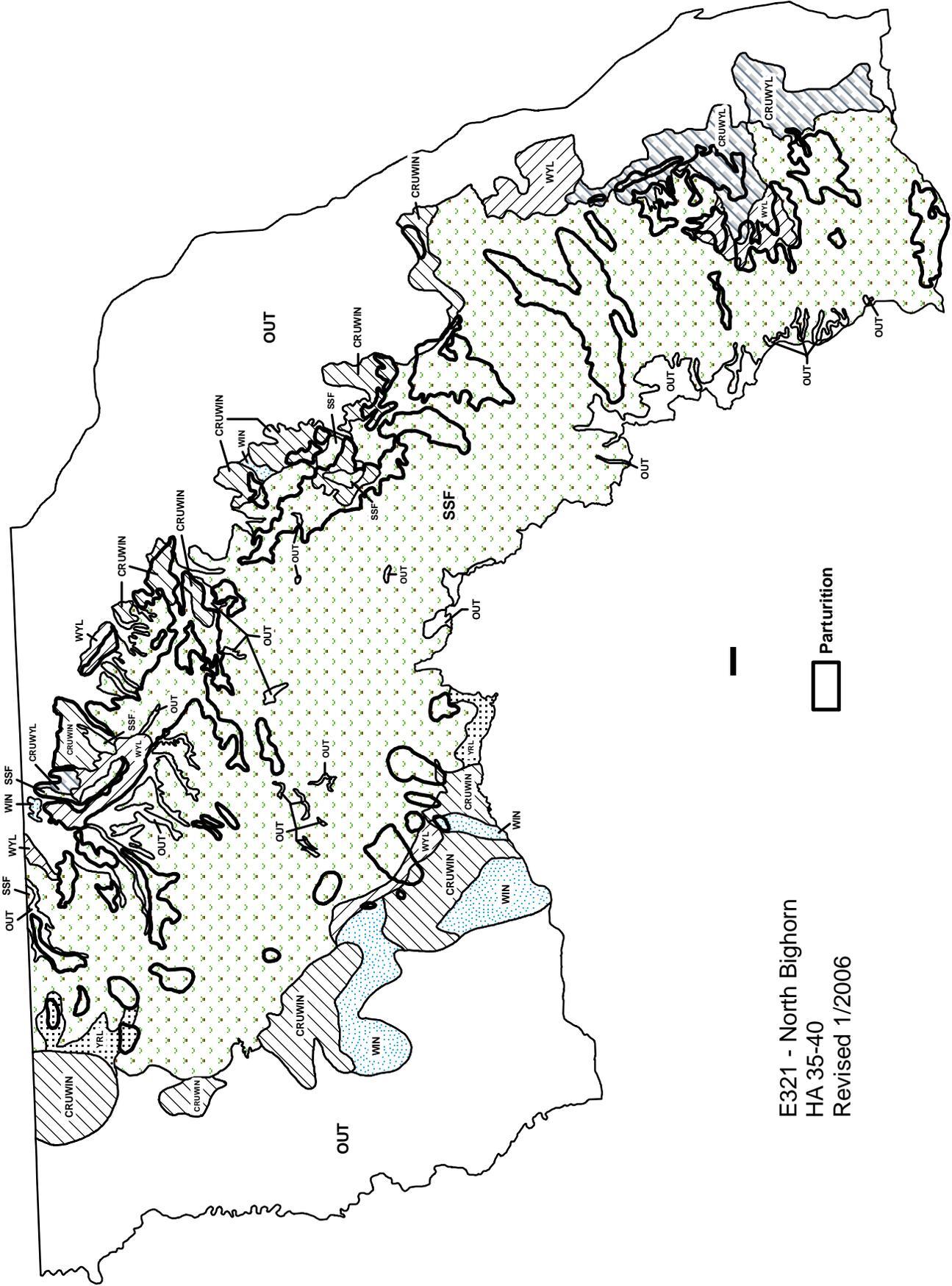
Table 2. Usable blood samples collected during enhanced Brucellosis surveillance in Bighorn Mountains during 2017 hunting season. The North Bighorn Elk Herd Unit hunt areas (Areas 35-40) are in bold. There were no seropositives samples in 2017.

Hunt Area	Usable Samples	Seropositive	Hunt Area	Usable Samples	Seropositive
033	31	0	<b>040</b>	<b>76</b>	<b>0</b>
034	36	0	041	80	0
<b>035</b>	<b>25</b>	<b>0</b>	045	79	0
<b>036</b>	<b>19</b>	<b>0</b>	047	4	0
<b>037</b>	<b>41</b>	<b>0</b>	048	46	0
<b>038</b>	<b>93</b>	<b>0</b>	049	94	0
<b>039</b>	<b>47</b>	<b>0</b>	120	27	0
			<b>Total</b>	<b>708</b>	<b>0</b>

In response to finding seropositive elk in the Bighorn Mountains, we developed a research proposal and solicited funding from the U.S. Department of Agriculture Animal and Plant Health Inspection Service (APHIS). The study objectives are:

1. Evaluate movement of possible source herds to determine if elk are migrating into/near the Bighorn Mountains.
2. Evaluate movement/dispersal of migratory elk in the Bighorn Mountains with a focus on Hunt Area 40.
3. Evaluate movement and interactions of elk herds in the northern Bighorns to determine how brucellosis may spread if it becomes established.
4. Perform a landscape genetics study to further evaluate relatedness of elk herds in and around the Bighorns.

Using Native Range Capture Service, we captured 58 elk in February, 2016. Elk were captured via a net-gun fired from a helicopter. Once entangled, elk were hobbled, blood samples were taken, ear tags attached, and an Advanced Telemetry System's (ATS) GPS collar attached. Elk were then released on-site. Of the 58 captured, 46 were within this herd unit. We captured another 53 elk in February, 2017, with 29 of those elk in this herd unit. We captured another 61 elk in February, 2018, with 20 of those elk in this herd unit. We currently have ~104 elk with active satellite collars in the Bighorn Mountains. This project is managed by the Cody brucellosis biologist.



E321 - North Bighorn  
 HA 35-40  
 Revised 1/2006

## 2017 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2017 - 5/31/2018

HERD: EL322 - SOUTH BIGHORN

HUNT AREAS: 33-34, 47-49, 120

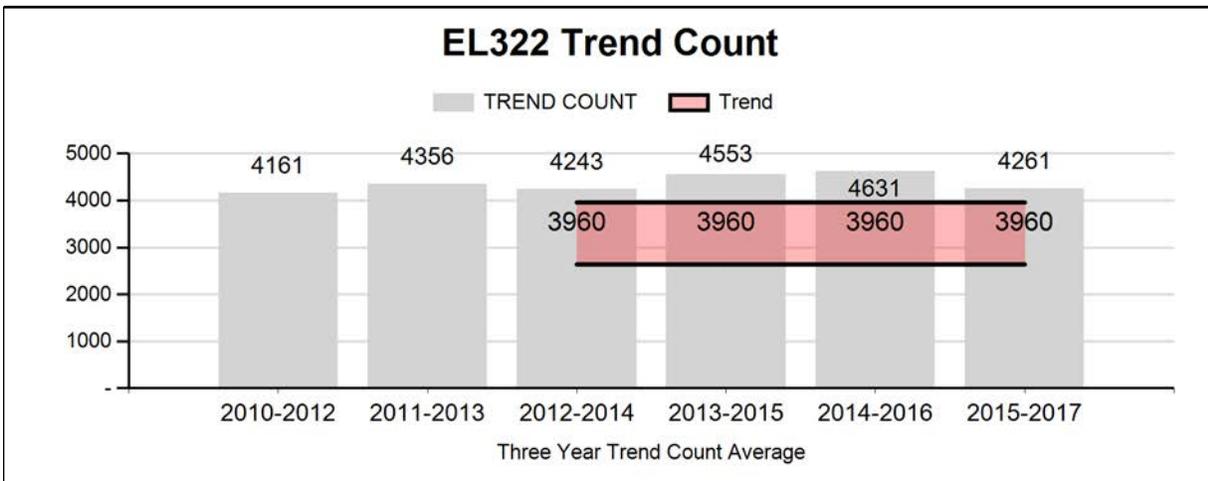
PREPARED BY: CHEYENNE STEWART

	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Trend Count:	4,515	2,935	4,500
Harvest:	1,729	1,932	1,800
Hunters:	3,606	3,741	3,700
Hunter Success:	48%	52%	49%
Active Licenses:	3,752	3,875	3,800
Active License Success	46%	50%	47%
Recreation Days:	26,878	23,451	27,000
Days Per Animal:	15.5	12.1	15
Males per 100 Females:	23	34	
Juveniles per 100 Females	35	29	

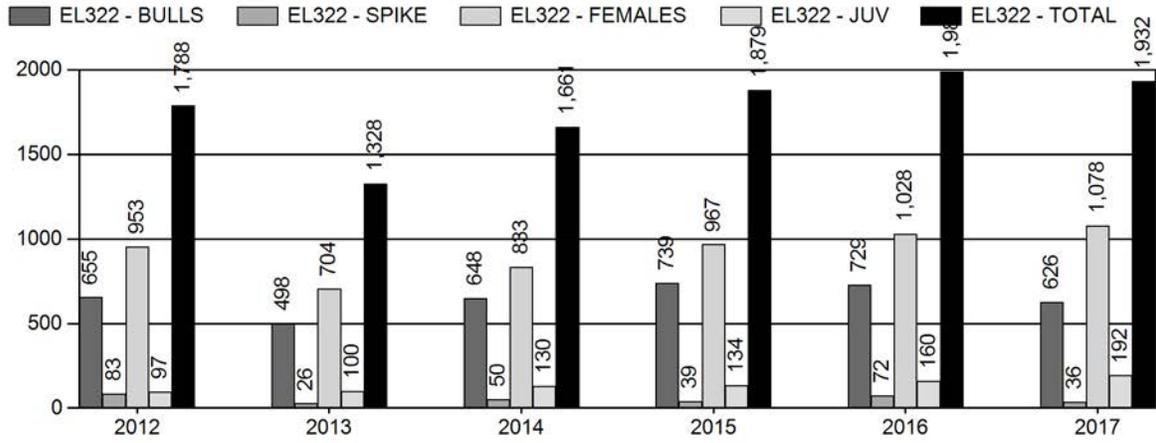
Trend Based Objective (± 20%) 3,300 (2640 - 3960)  
 Management Strategy: Private Land  
 Percent population is above (+) or (-) objective: -11.1%  
 Number of years population has been + or - objective in recent trend: 1

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

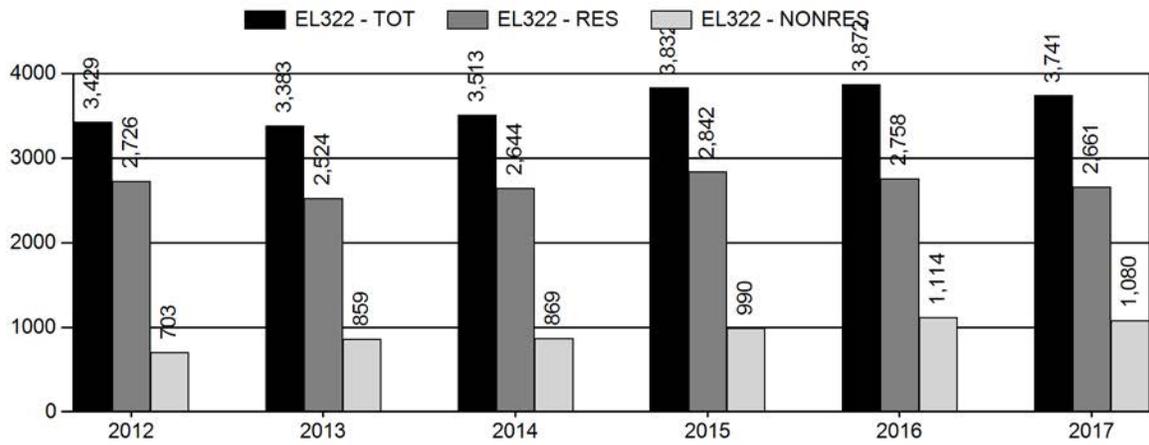
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	na%	na%
Males ≥ 1 year old:	na%	na%
Juveniles (< 1 year old):	na%	na%



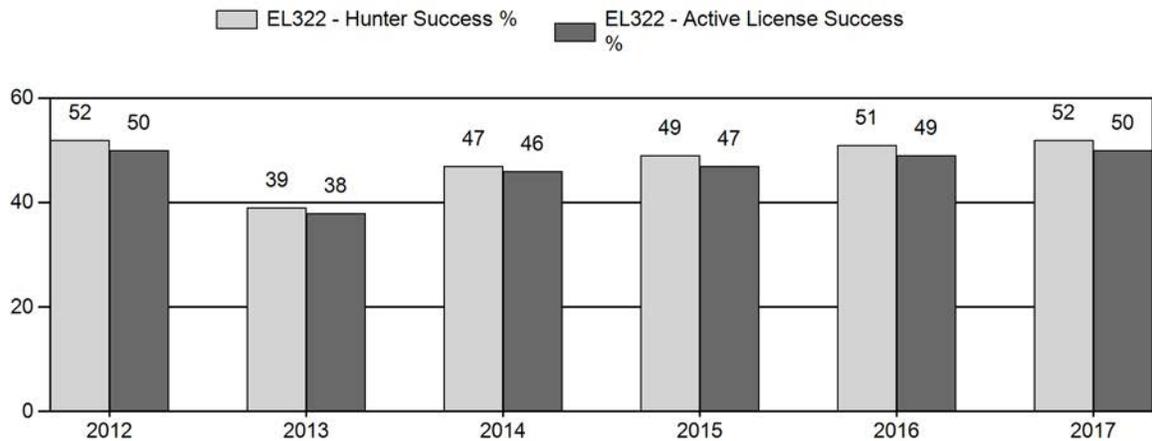
# Harvest



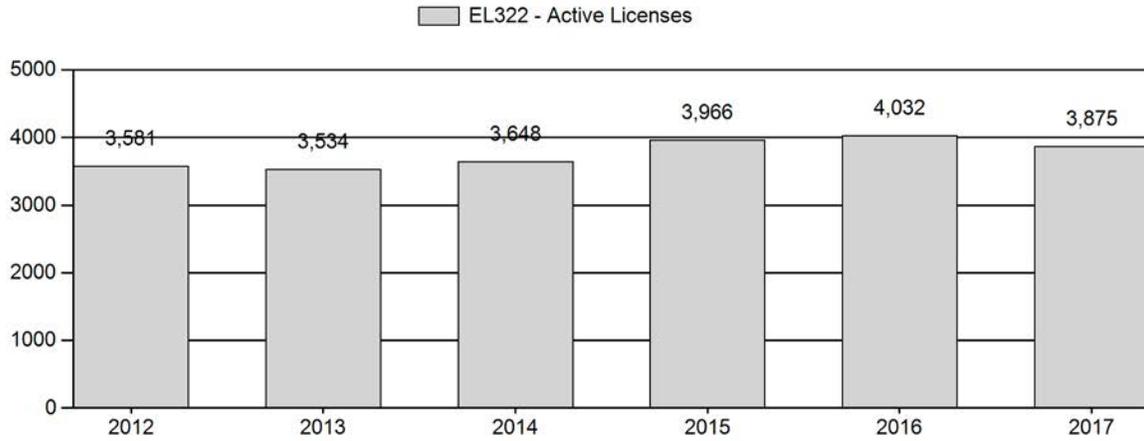
# Number of Hunters



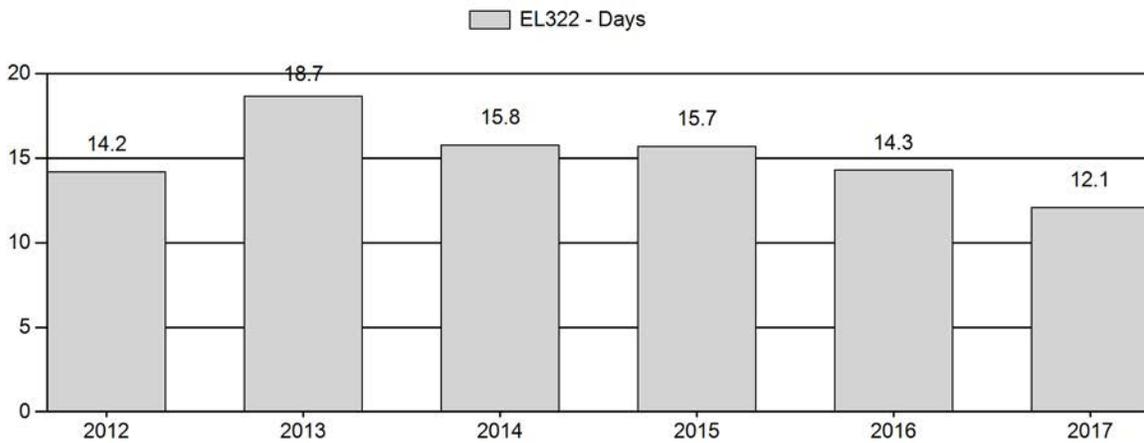
# Harvest Success



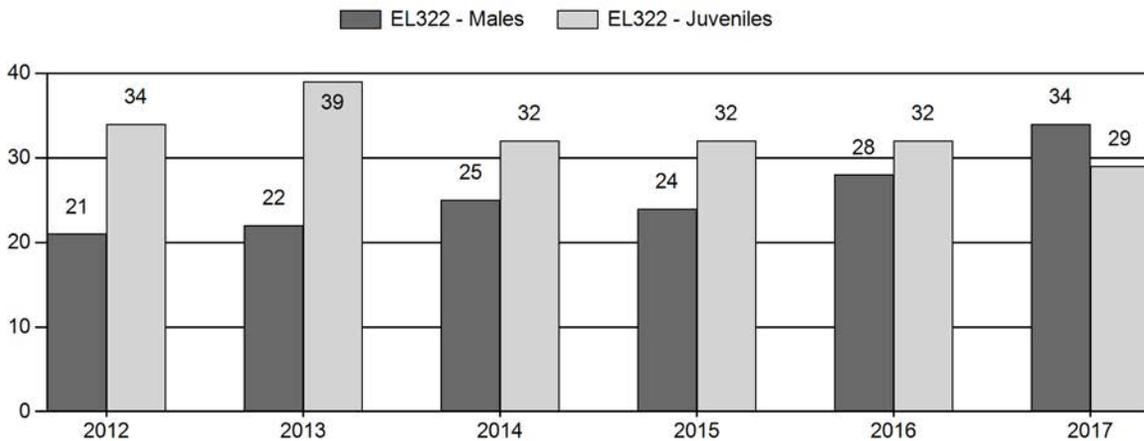
# Active Licenses



# Days per Animal Harvested



# Postseason Animals per 100 Females



**2012 - 2017 Postseason Classification Summary**

for Elk Herd EL322 - SOUTH BIGHORN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	5,360	215	167	382	14%	1,814	65%	612	22%	2,808	438	12	9	21	± 1	34	± 1	28
2013	5,490	290	207	497	14%	2,224	62%	878	24%	3,599	521	13	9	22	± 1	39	± 1	32
2014	5,060	104	114	218	16%	887	64%	281	20%	1,386	403	12	13	25	± 2	32	± 2	25
2015	6,525	125	137	262	16%	1,071	64%	345	21%	1,678	405	12	13	24	± 2	32	± 2	26
2016	6,000	164	128	292	17%	1,054	63%	338	20%	1,684	415	16	12	28	± 2	32	± 2	25
2017	0	92	165	257	21%	754	61%	222	18%	1,233	449	12	22	34	± 0	29	± 0	22

**2018 HUNTING SEASONS**  
**SOUTH BIGHORN ELK HERD (EL322)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
33	1	Oct. 9	Oct. 31	200	Limited quota	Any elk
33	1	Nov. 1	Dec. 31			Antlerless elk
33	4	Aug. 15	Sept. 30	150	Limited quota	Antlerless elk valid on private land east of Buffalo Creek and the Bar C Road (BLM Road 6214)
33	4	Oct. 9	Dec. 31			Antlerless elk valid in the entire area
33	6	Nov. 1	Dec. 31	300	Limited quota	Cow or calf
34	1	Oct. 15	Nov. 15	800	Limited quota	Any elk
34	1	Nov. 16	Dec. 31			Antlerless elk
34	6	Aug. 15	Sep. 30	700	Limited quota	Cow or calf valid on private land north of the North Fork Powder River
34	6	Oct. 15	Dec. 31		Limited quota	Cow or calf valid off National Forest
47	1	Oct. 9	Oct. 31	200	Limited quota	Any elk
47	1	Nov. 1	Nov. 30			Antlerless elk
47	6	Oct. 9	Nov. 30	150	Limited quota	Cow or calf
48	1	Oct. 9	Oct. 31	350	Limited quota	Any elk
48	1	Nov. 7	Dec. 15			Antlerless elk
48	4	Oct. 9	Oct. 31	50	Limited quota	Antlerless elk
48	4	Nov. 7	Dec. 15			Antlerless elk
48	6	Oct. 9	Oct. 31	600	Limited quota	Cow or calf
48	6	Nov. 7	Dec. 15			Cow or calf
49	1	Oct. 9	Oct. 31	350	Limited quota	Any elk
49	1	Nov. 7	Dec. 21			Antlerless elk
49	4	Oct. 9	Oct. 31	50	Limited quota	Antlerless elk
49	4	Nov. 7	Dec. 21			Antlerless elk
49	6	Aug. 15	Oct. 31	900	Limited quota	Cow or calf
49	6	Nov. 7	Dec. 21			Cow or calf
120	1	Oct. 9	Oct. 31	100	Limited quota	Any elk
120	1	Nov. 1	Dec. 15			Antlerless elk

120	4	Oct. 9	Dec. 15	75	Limited quota	Antlerless elk
120	6	Oct. 9	Dec. 15	75	Limited quota	Cow or calf

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
33, 34, 47, 48, 49, 120	Sep. 1	Sep. 30

### SUMMARY OF CHANGES IN LICENSES NUMBERS

Hunt Area	Type	Quota change from 2017
34	6	+100
47	1	-100
47	6	-50
<b>Herd Unit Total</b>	<b>1</b>	<b>-100</b>
	<b>4</b>	<b>No change</b>
	<b>6</b>	<b>+50</b>

#### Management Evaluation

**Current Winter Trend Count Objective:** 3,300

**Management Strategy:** Private Lands

**2017 Postseason Population Estimate:** ~5,000 (based on 2016 population estimate)

**2015-17 Winter Trend Count Average (3 Yr):** 4,261

**2018 Proposed Postseason Population Estimate:** ~5,500

**2016 Hunter Satisfaction:** 68% Satisfied, 17% Neutral, 15% Dissatisfied

#### **Herd Unit Issues**

The South Bighorn Elk Herd objective and management strategy were reviewed in 2016 with the objective changed to a mid-winter trend count based on a three year running average and a private land management strategy adopted. The objective is most appropriate for this herd as winter trend counts are flown annually and a reliable population model has not been developed. Hunt area sub-objectives were established to address elk distribution across the herd unit with 1,100 elk for Area 33, 1000 elk for Area 34, 200 elk for Area 47, 400 elk for Area 48, 300 elk for Area 49 and 300 elk for Area 120. A private lands management strategy is well adapted to this herd as hunting access is largely dependent on private land access.

Since 1997, hunting seasons have been liberalized with increased any elk and antlerless elk license quotas, the addition of cow/calf licenses and extended hunting seasons. Harvest has increased significantly, although at less than desired levels because of the inability to sell antlerless and cow/calf licenses in some hunt areas. Last year, 5,100 total licenses were allocated for the six hunt areas comprising this herd unit. Three-hundred licenses went unsold, one hundred more than in 2016. Restrictive private land access continues to hamper efforts to achieve harvest objectives.

## **Weather**

Precipitation, snow water equivalent, and temperature are reported from available data from the Kaycee, Bear Trap Meadow, and Grave Springs Natural Resources Conservation Science SNOTEL sites. Precipitation during the 2016/2017 water year (October 2016 through September 2017) ranged from 12.5 inches (Kaycee) to 19.3 inches (Middle Powder) and was 90%, 79%, and 102% of the 30-year average for Grave Springs, Bear Trap Meadow, and Kaycee, respectively. The majority of the precipitation came during April and was followed by hot and dry summer weather, including the highest average temperatures observed in July (63<sup>o</sup>F) since 2012. Water year precipitation to date (October 2017 through April 2018) show the Grave Springs and Middle Powder areas at below the 30-year average (54% and 56%, respectively).

The Palmer Drought Index (PDI) for Climate Division 5 (Powder, Little Missouri and Tongue drainages) recorded “moderate drought” from January through March 2018 and increasing to “mid-range” conditions in April and May 2017, coming into the 2017 biological year. For June 2017 “mid-range” conditions persisted but progressed to “moderate drought” through July, August, and September before improving to “mid-range” in October. In November, drought conditions returned to “moderate drought” before returning to “mid-range” from December 2017 through April 2018.

Winter (December 2017 – March 2018) weather has produced lower than average precipitation at (65% and 71% at Grave Springs and Middle Powder, respectively). Precipitation at Bear Trap Meadows and Kaycee predominantly came in November and February, whereas the precipitation at Grave springs has been more spread out between December and February. Temperatures in December 2017 and January 2018 have been comparable to long-term averages (air temperature averages of 23<sup>o</sup>F and 27<sup>o</sup>F, respectively), however colder temperatures were recorded in February which appear to be comparable to a three to four-year cycle of decreased monthly minimum temperatures (-18<sup>o</sup>F in 2003, -25<sup>o</sup>F in 2006, -25<sup>o</sup>F in 2011, -24<sup>o</sup>F in 2014, and -17<sup>o</sup>F in 2018). In general, winter 2017/2018 conditions have consisted of precipitation followed immediately by cold temperatures and later by multiple days of warmer weather allowing snow melt at lower elevations.

## **Habitat**

There are no habitat transects for grass production in this herd unit. The South Bighorn Herd Unit is primarily private, state and BLM lands with a limited amount of U.S. Forest Service in Area 34. Cattle and sheep grazing are common. The drought conditions of 2012 and early 2013 ended with above normal precipitation in 2014 and 2015. Precipitation was near normal in 2016. Timely spring moisture resulted in good herbaceous forage production. Precipitation in 2017 was considerably more variable with mild winter conditions, good April precipitation, and a very dry May – July. Fall 2017 precipitation was near normal, however dry winter 2017/2018 conditions may impact elk forage production and growing season.

## **Field Data**

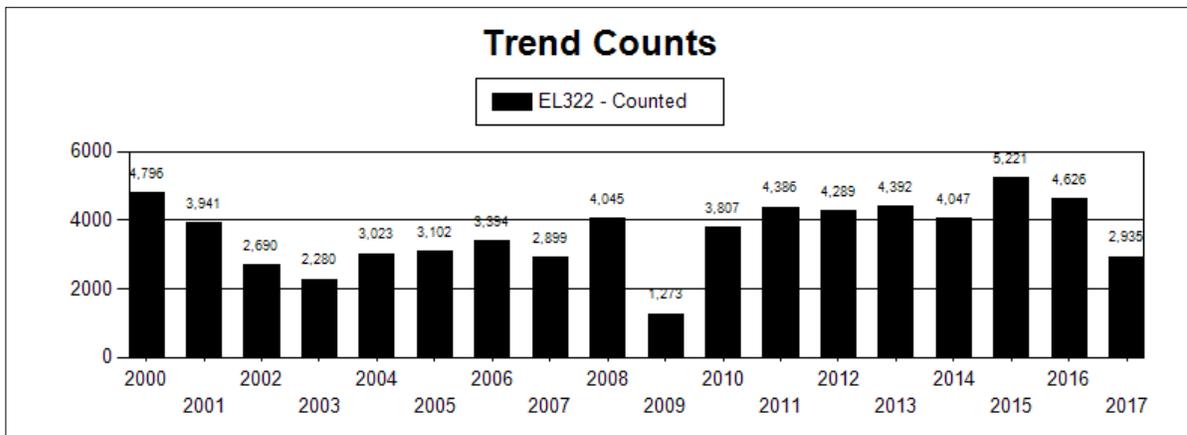
The 2017 post-season winter trend count totaled 2,935 elk, down 35% from the average over the previous five years (4,515 elk observed; Figure 1). Counts were notably reduced in Area 33 (*n*=101) due to new personnel, lack of sightability due to elk in thick timber, and elk moving further south in the Area (known because of GPS collar relocation data) than expected. Counts in

Area 34 are slightly misleading because 674 of the 1,394 elk counted are assumed to be elk that spend the majority of the year in Area 35, however a large known group of elk in the Gardiner Mountain area was known to be missed during the trend survey from GPS collar data, which would likely bring the count close to 1,000 elk. Area 47 appears to have reached its winter count goal of 200 elk, while Areas 48 and 49 are still over. Area 120 had reduced numbers counted in 2017 (207 elk) as compared to 2016 (342 elk), likely due to the elk being spread out and in small groups, therefore reducing the sightability. Overall, the low 2017 trend count is attributed to survey conditions and not population changes.

Given that license quotas and harvest have significantly increased in recent years and hunter success and hunter effort trends remain favorable, it is unreasonable to conclude this population is decreasing due to harvest pressure.

Postseason classifications were limited to Areas 47, 48, and 49 due to time constraints, limitations in fixed-wing aircraft, and inability to classify large herds in Areas 33, 34, and 120. Classifications resulted in herd ratios of 29 calves per 100 cows and 34 bulls per 100 cows. Productivity in this herd is relatively low with the calf ratio averaging 33 per 100 for the five-year average. Calf ratios tend to be higher in Areas 33 and 34, where classifications are not conducted. The bull ratio is believed to be higher based on hunter success and composition of the bull harvest (~90% adult bulls). Representative classifications are difficult to attain due to bulls wintering away from cow/calf herds.

Figure 1. South Bighorn Elk Herd Unit Winter Trend Counts, 2000-2017.



The annual postseason landowner survey was conducted in areas 33 and 34. Of the 25 respondents, 28% indicated the population was above desired levels while 64% thought the numbers were at desired levels. Two respondents thought there were too few elk. There was a discrepancy between the hunt areas, with 31% of Area 34 indicating the population was above desired levels, compared to 22% of Area 33 respondents. This difference could be due to more public land and more public land access in Area 33 compared to Area 34.

### Harvest Data

The harvest in 2017 remained high at 1,932 elk, following the record high of 1,989 elk in 2016. Bull harvest (662) was down from the previous three years, however antlerless harvest (1,270) reached a new high under liberal license quotas and season dates. Hunter success (52%) and active license success (50%) matched the six year highs. Harvest composition showed 95% of the bull

harvest was comprised of adult bulls indicating hunters could be selective and were successful in finding adult bulls.

Hunter numbers (3,741) and active license numbers (3,875) were slightly reduced from the previous two years, however do indicate continued hunter interest in these areas. Hunter effort (12.1 days/animal) decreased by 2.2 days for the third year in a row and was the lowest effort recorded in the previous six years. Hunter access to higher elevations was excellent due to mild fall weather, however concerns have been raised regarding the high rates at which elk move between hunt areas. Significant harvest occurred October 9<sup>th</sup> to October 15<sup>th</sup> and persisted at low but consistent rates through the remainder of the season. Hunter success at the hunt area level ranged from 27% in Area 47 to 71% in Area 49. Harvest objectives were not met due to low hunter success on some license types and 300 unsold antlerless and cow/calf licenses in three of the six hunt areas. The majority of the unsold licenses were in Area 33 and Area 34 where hunter access to private lands remains problematic. The remaining unsold licenses were in Area 47.

Hunter satisfaction responses were generally positive reflecting very good hunter success, quality bulls and long seasons. At the herd unit scale, 68% of hunters responded positively about their hunting experience whereas 15% responded negatively and 17% provided a neutral response. The positive response was similar to those reported in 2015 and 2016. At the hunt area scale, satisfaction response varied significantly with only 49% of Hunt Area 47 and 102 hunters reporting positive responses and Hunt Areas 33 and 34 where 68% and 64% of hunters reported positive responses, respectively. Hunters in Hunt Areas 48 and 49 reported 72% and 71% positive responses, respectively. Hunt Area 120 had the highest hunter satisfaction with a 90% positive response.

Hunter access is largely contingent on private land access. Ten Walk-in Areas provided access to more than 45,045 acres of private lands plus adjacent BLM and state lands, most of which are located in Area 120. In addition, five Hunter Management Areas provide hunter opportunity in Areas 47 and 48.

## **Population**

This population has been modeled with four model types using the excel spreadsheet, but produced suspect results showing a population crash resulting in less than zero animals. Based on harvest data and winter trend counts there is no evidence that this population is crashing. Because of this, a management change was made during the objective review to adopt a mid-winter trend count management objective.

This population is now managed to a mid-winter trend count objective of 3,300 elk based on a three year running average. A ball park population estimate can be made using the mid-winter trend count total adjusted for 80% sightability resulting in a postseason estimate, however the 2017 mid-winter trend count results are unreliable. The low trend count resulted in the population appearing to be 11.1% below the 3,300 trend based objective, however all of our data indicates that this is unlikely. In order to provide a general population estimate, the 80% sightability was applied to the five-year average trend count (4,515) for a result of approximately 5,500 elk. The 2016 trend count (4,626 elk) and the 2015 trend count (5,221 elk) were two of the three highest observed since this herd unit was formed, and counteract the low 2017 trend count (2,935) for the three-year average. The high 2016 and 2015 trend counts also suggest that the current estimate of 5,500 elk based on the 2012-2016 trend count average is an appropriate estimation. The 2016 and

2015 counts suggest this population is not showing a significant decrease in numbers given the record harvest, high success and low hunter effort. The three year running trend count average shows a slight decrease in the population trend due to the low 2017 trend count, with the most recent three-year average at 4,261 elk. Even with the low 2017 count, the three-year average still places the herd well above the new objective. Based on landowner and public input received during the objective review, the objective was established below the estimated population to emphasize the need to decrease elk numbers.

### **Management Summary**

In Area 33, hunters experienced relatively good success averaging 53% for the three license types. The winter trend count was not effective in 2017, however harvest success, hunter satisfaction, and landowner responses indicate that continued liberal seasons to decrease this segment of the herd to its sub-objective of 1,100 elk is still required. The liberal quota for Type 6 licenses to encourage cow/calf harvest did not sell out in 2016. Seasons are unchanged for 2017.

In Area 34, hunter success was very good reaching 32%. In previous years, about 50% of Type 6 licenses sold. In 2016 and 2017, however, 94% and 97% sold out, respectively. The increase in sales is attributed to the longer hunting season and the ability to purchase multiple licenses. The early Type 6 season for the northern portion of the hunt area was not very successful but did provide landowners along the North Fork Powder River an option to address elk depredation. The winter trend count resulted in 1,394 elk observed. The count was complicated by Area 35 elk moving into the area due to extreme winter conditions in 2016/2017 and continuing that movement in 2017/2018. The three-year average of 1,440 elk is above the sub-objective of 1,000 elk and landowner surveys corroborate that elk numbers are greater than desired. A quota increase of 100 Type 6 licenses to make 700 available will ensure leftover licenses for cow/calf harvest.

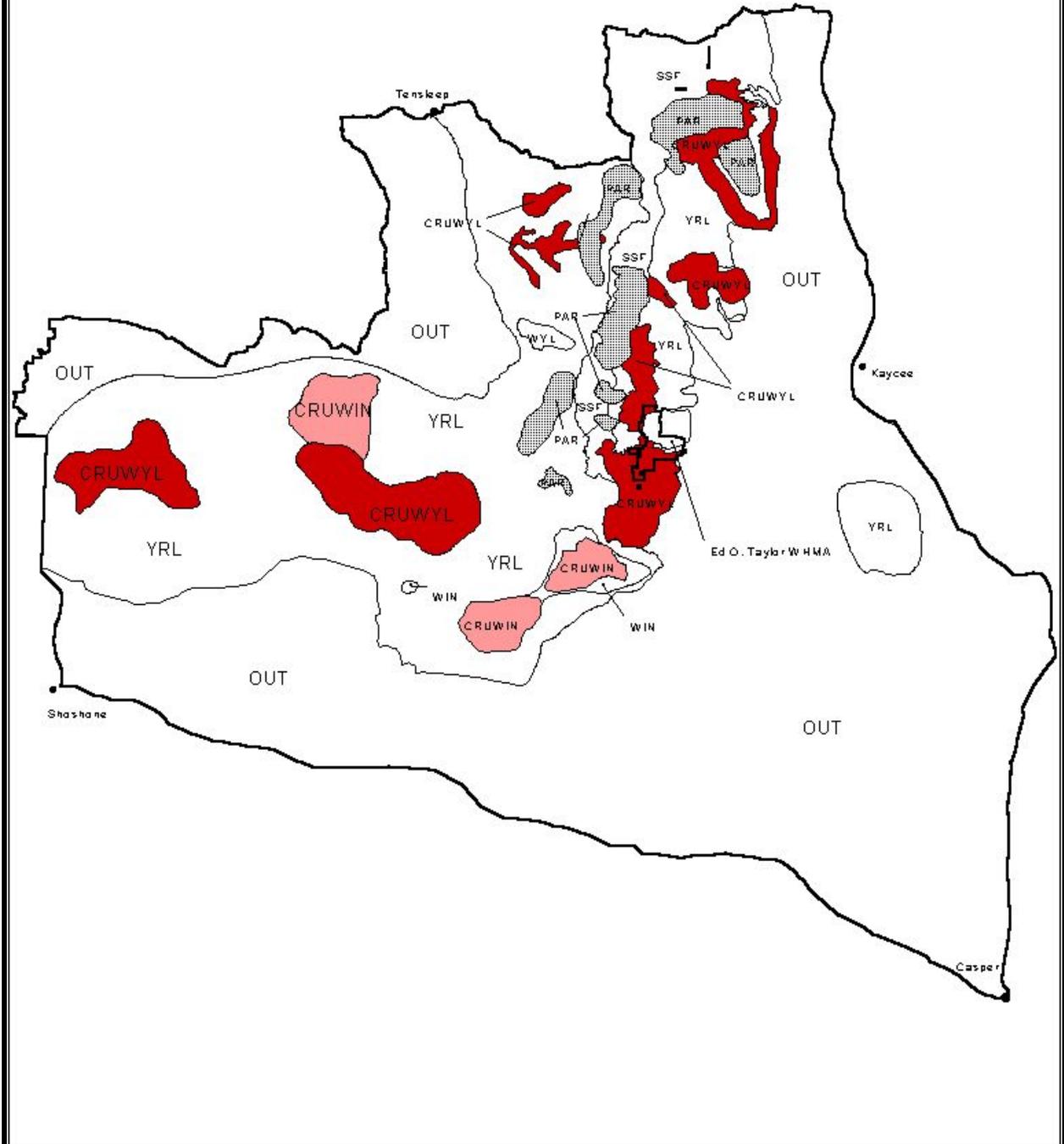
For the 2017 hunting season, over 1,200 elk were harvested from areas 47, 48 and 49. The 2017 winter trend count resulted in 1,233 elk being observed from areas 47, 48 and 49. Area 47 appears to have reached its winter count goal of 200 elk, while areas 48 and 49 are still over the sub-objectives. The 2017 harvest in area 47 resulted in a hunter success of only 31% for type 1 hunters and 9% for type 6 hunters. Both type 1 and type 6 licenses quotas for area 47 will be reduced since the winter count goal is being achieved, and the fact landowners involved in the Copper Mountain HMA in area 47 have elected not to participate in the program for the 2018 hunting season, thus making hunter access in area 47 very difficult. Both hunt areas 48 and 49 will have no change to license quotas because current license quotas appear sufficient to achieve adequate harvest. Current and future management strategies will continue to focus on reducing elk numbers in this segment of the population.

The Area 120 season resulted in a harvest of 144 elk and a hunter success rate of 69%. License quotas currently result in hunter densities that are approaching a level unacceptable to hunters, however success rates increased in 2016 and 2017. The three-year winter trend count is averaging 254 elk, just below the hunt area sub-objective of 300 elk. No changes were made for the 2017 hunting season.

Despite a low 2017 post-season mid-winter trend count, this population is over the current objective and seasons are designed to maintain hunting pressure on the female segment of the herd with liberal quotas and extended seasons. License quota changes for 2017 include an increase of

100 Area 34 Type 6 licenses. For 2017, license quotas totaling 2,100 any elk and 3,100 antlerless and cow/calf licenses will be available. History suggests that a number of antlerless and cow/calf licenses will not sell. Should available licenses sell, harvest may increase over the 2017 total resulting in a stable to slightly decreasing population.

Elk - South Bighorn (E322)  
Areas 33, 34, 47, 48, 49, 120  
Region 3  
Revised - 2001



## 2017 - JCR Evaluation Form

SPECIES: Elk

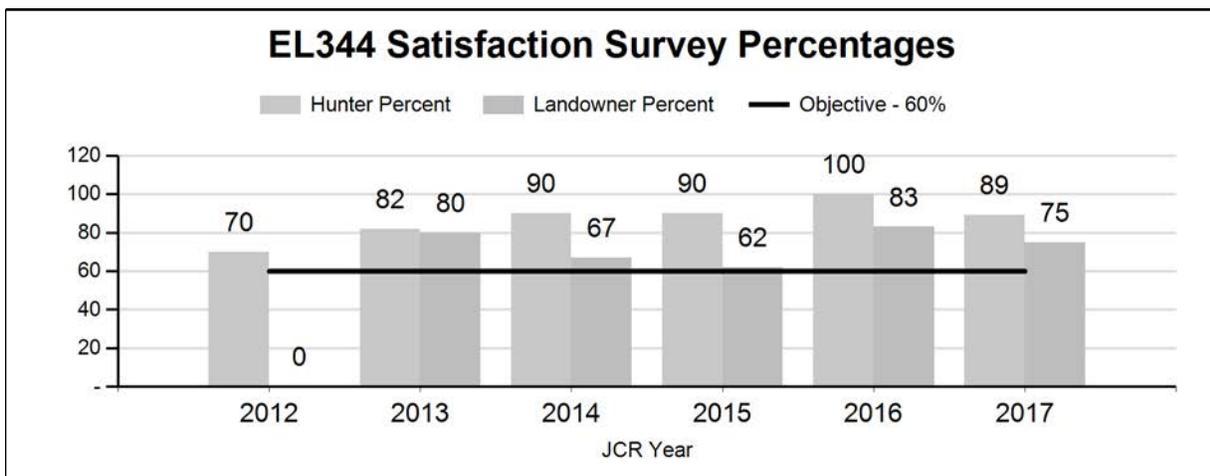
PERIOD: 6/1/2017 - 5/31/2018

HERD: EL344 - ROCHELLE HILLS

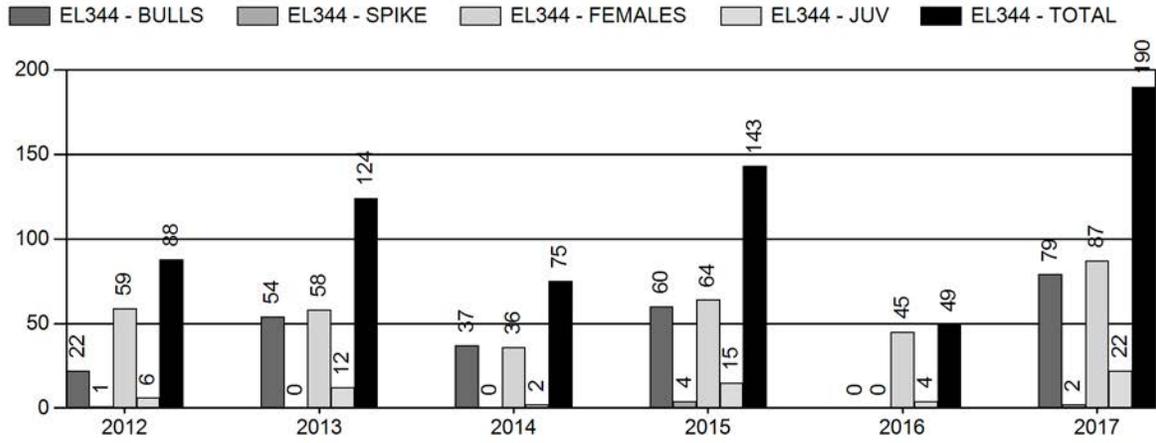
HUNT AREAS: 113, 123

PREPARED BY: ERIKA PECKHAM

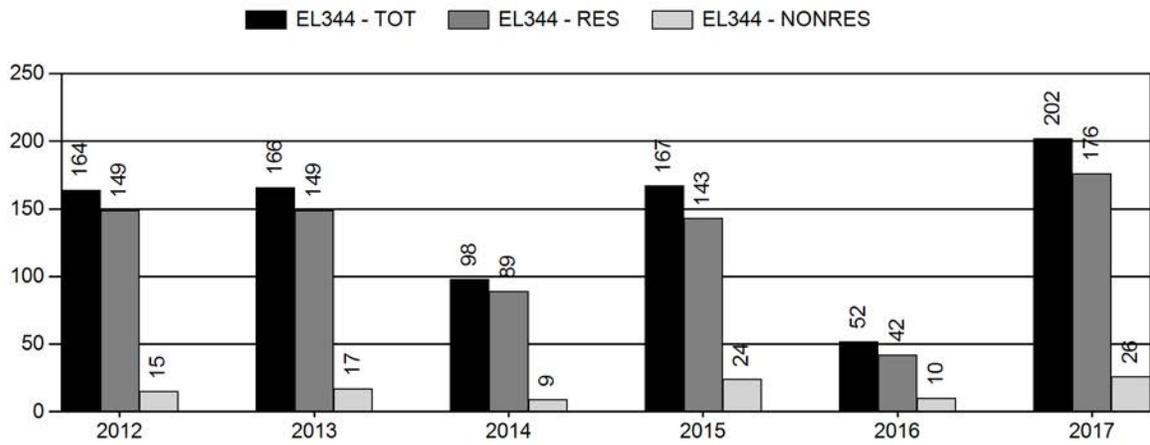
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Hunter Satisfaction Percent	83%	89%	60%
Landowner Satisfaction Percent	69%	75%	60%
Harvest:	96	189	80
Hunters:	129	202	100
Hunter Success:	74%	94%	80%
Active Licenses:	135	214	95
Active License Success:	71%	88%	84%
Recreation Days:	636	831	400
Days Per Animal:	6.6	4.4	5
Males per 100 Females:	68	62	
Juveniles per 100 Females	54	33	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			22%
Number of years population has been + or - objective in recent trend:			5



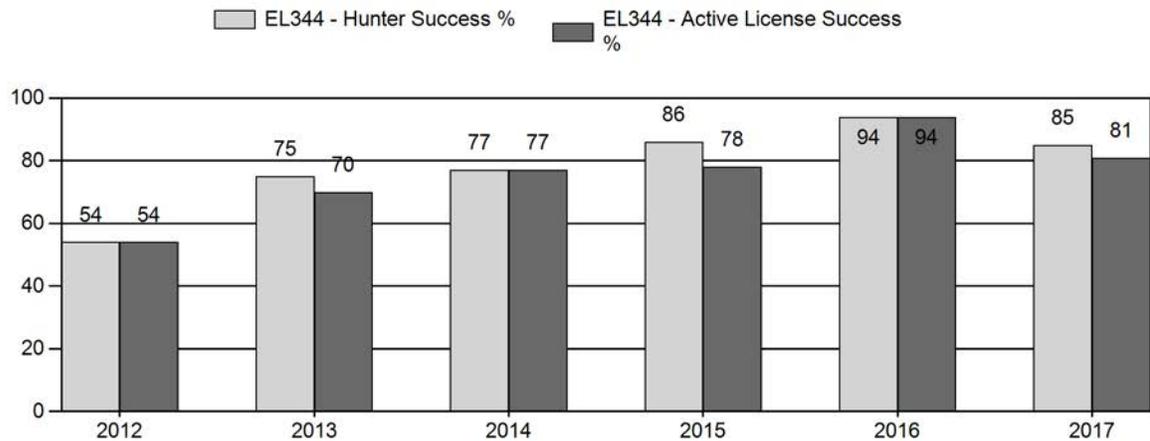
# Harvest



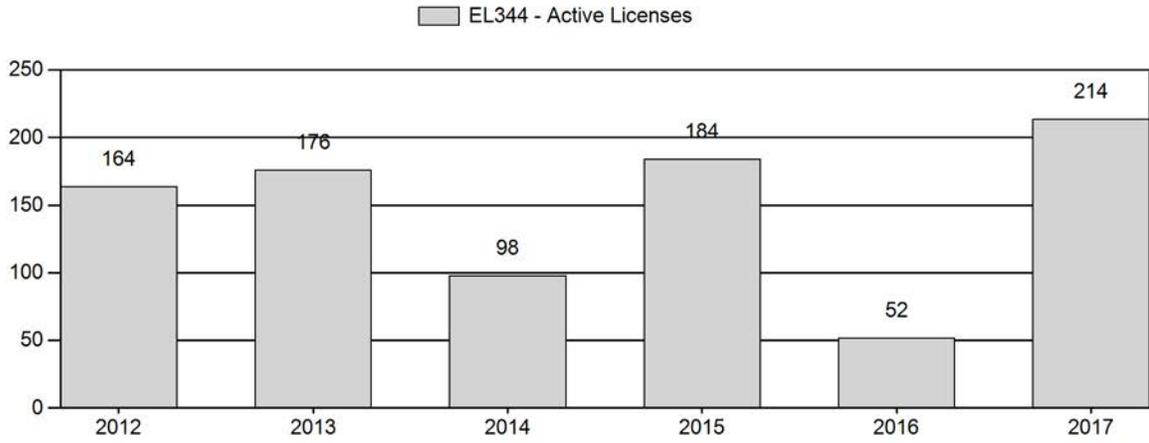
# Number of Hunters



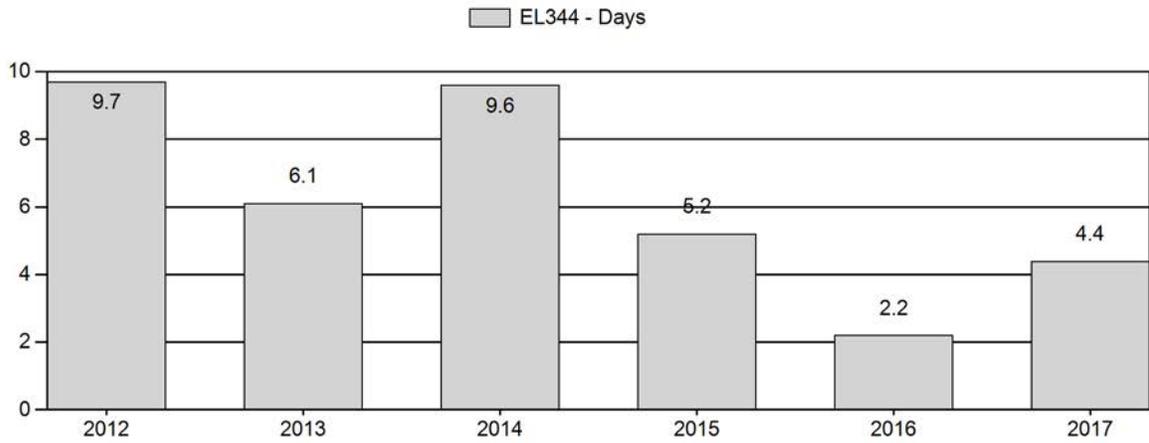
# Harvest Success



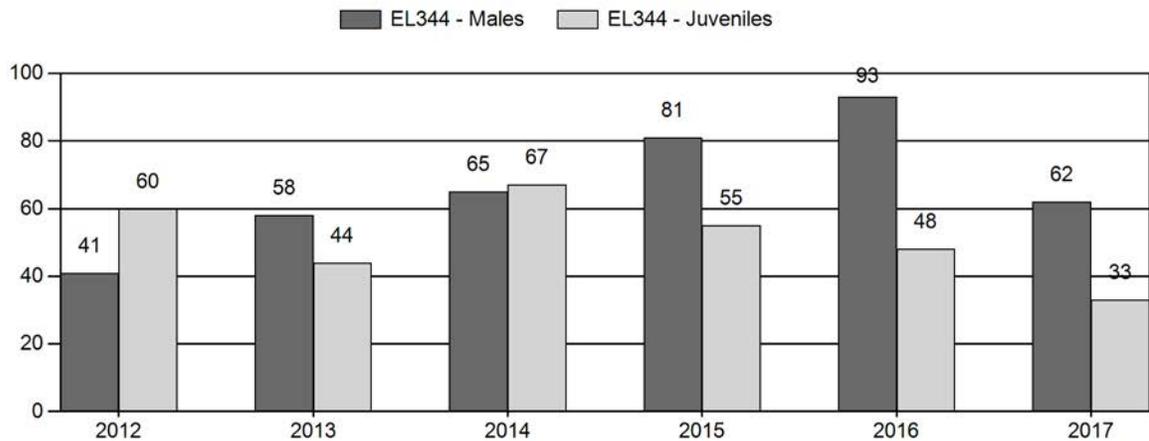
# Active Licenses



# Days per Animal Harvested



# Postseason Animals per 100 Females



**2012 - 2017 Postseason Classification Summary**

for Elk Herd EL344 - ROCHELLE HILLS

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	0	32	20	52	20%	128	50%	77	30%	257	0	25	16	41	± 0	60	± 0	43
2013	0	26	30	56	29%	96	49%	42	22%	194	464	27	31	58	± 0	44	± 0	28
2014	0	22	29	51	28%	79	43%	53	29%	183	0	28	37	65	± 0	67	± 0	41
2015	0	61	47	108	34%	133	42%	73	23%	314	0	46	35	81	± 0	55	± 0	30
2016	0	43	72	115	38%	124	41%	60	20%	299	0	35	58	93	± 0	48	± 0	25
2017	0	20	18	48	32%	78	51%	26	17%	152	0	26	23	62	± 0	33	± 0	21

**2018 HUNTING SEASONS  
ROCHELLE HILLS ELK HERD (EL344)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
123	4	Oct. 20	Nov. 12	50	Limited quota	Antlerless elk
123	6	Oct. 20	Nov. 12	50	Limited quota	Cow or calf

Hunt Special Archery Season Hunt	Opening Date	Limitations
123	Sep. 1-Sep. 9	Refer to Section 2 of this Chapter

**SUMMARY OF CHANGES IN LICENSE NUMBERS**

Hunt Area	Type	Quota change from 2017
113	1	-40
113	4	-40
123	1	-50
123	4	No Change
123	6	No Change
<b>Herd Unit Total</b>	<b>1</b>	<b>-90</b>
	<b>4</b>	<b>-40</b>
	<b>6</b>	<b>No Change</b>

**Management Evaluation**

**Current Landowner/Hunter Satisfaction Management Objective: 60%**

**Management Strategy: Private Land**

**2017 Landowner Satisfaction Estimate: 89%**

**2017 Hunter Satisfaction: 89% Satisfied, 6% Neutral, 5% Dissatisfied**

**Herd Unit Issues**

The management objective for the Rochelle Hills Elk Herd Unit is based on landowner and hunter satisfaction. The management strategy is private land. The objective and management strategy were last revised in 2012 and were reviewed in 2017.

A major difficulty with managing this herd is hunter access. The majority of the elk in Area 123 are found on private land and the opinions of landowners on the desired number of elk are varied. Elk tend to concentrate in certain areas at particular times of the year so landowner perceptions differ on the number of licenses needed to manage harvest. Several landowners desire to keep large mature bulls on their property resulting in tightly controlled access. Those landowners who want more harvest often have the majority of the elk utilizing their lands outside of the hunting season.

Hunt Area 113 has significant amounts of publically accessible lands, especially on the Thunder Basin National Grasslands, and is a coveted elk hunt in this area of the state. However, when under pressure, elk in this hunt area move to private lands where access to hunt is limited. Balancing hunter numbers with the amount of elk available on public lands, while attempting to get adequate harvest in the entire hunt area is challenging when designing hunting seasons.

### **Weather**

Drought conditions were experienced in much of this herd unit throughout the growing seasons of both 2016 and 2017. This did not result in favorable conditions going into the last two winters. The winter of 2016-2017 was fairly severe at times, likely more along lines of “normal” winters for this area. The winter of 2017-2018 started out fairly average and then progressed to periods of extended cold spells with fair amounts of snow. Snow depth and cover was not likely to be severe enough to heavily impact elk. Although the Palmer Drought Index indicates that overall moisture conditions were average (reported as mid-range) in the Cheyenne-Niobrara drainage, this information is compiled at a drainage-wide basis and in reality drought conditions were experienced throughout this area.

### **Habitat**

There is no formal habitat monitoring occurring in this herd unit. Observations in 2016 and 2017 showed that there was limited cool season grass and forb production. Reduced leader growth was noted on shrubs. This seems a likely outcome considering the observed drought conditions throughout this area.

### **Field Data**

During the aerial classification survey in December of 2017 there were ~670 elk observed. There was one large herd observed in Hunt Area 123 in a location where they are typically found this time of year. Due to fences and the location of this herd, these elk were not classified and instead the number of elk was estimated based on photographs. During the classification flight there were only a couple of other small groups of elk classified (n=18) which were included in the classification results. The distribution of elk seemed to be typical for the time of year. The number of elk classified in Hunt Area 113 totaled 119 elk located in small groups throughout the area. The classification results for Hunt Area 113 indicated 64 calves per 100 cows, essentially unchanged from the 2016 ratio of 54 calves per 100 cows. The number of animals classified or counted has fluctuated over the past several years in Area 113.

One problem associated with the management of this herd is achieving meaningful sample sizes during classification surveys. This is a large geographical area, with steep, forested terrain, which makes it difficult to locate elk in the budgeted flight time. Additionally, the location where the large herd of elk is typically congregated in Hunt Area 123 makes it very difficult to classify. It is possible that there is a better time of year to survey these elk before they are in a large herd. Overall, elk numbers are believed to be increasing in Hunt Area 123, while harvest and range conditions in Hunt Area 113 have resulted in lower numbers.

As this herd is managed based upon landowner and hunter satisfaction, we are aiming for at least 60% of landowners and 60% of hunters to be satisfied. The harvest survey indicated that 89% of hunters were either “very satisfied” or “satisfied” with the 2017 hunting season. The annual landowner meeting was held in January 2018 for Hunt Area 123. As this hunt area is predominantly private, it is crucial that a meeting is held to acquire feedback from landowners. At this meeting the majority were in favor of the season and were satisfied with management of the herd. A common theme from landowners present at the meeting is that this area is known for trophy bulls and they are not seeing the quality of bulls observed in past years. In Hunt Area 123, 80% of respondents were satisfied with elk numbers. Hunt Area 113 had a total of 9 respondents to a mailed survey with 89% expressing satisfaction.

## **Harvest**

Historically, this herd has been hunted conservatively, with Hunt Areas 113 and 123 being closed for up to two years at a time to produce trophy bulls. Additionally, when bulls are hunted, it is important to provide enough licenses so that it is not just a landowner hunt, but an opportunity for the hunting public. While this regimen of hunting seasons has had the potential to produce large mature bulls, it has also resulted in very high bull to cow ratios. In 2017, there were 40 Type 1 and 40 Type 4 licenses available in Hunt Area 113. In Hunt Area 123, there were 50 Type 1, 50 Type 4 and 50 Type 6 licenses available. The harvest survey indicates an overall success rate of 94% with an average of 4.4 days to harvest an animal, indicating that elk were plentiful and accessible. This is notably higher than the overall statewide success of 44%.

This herd has great potential for continued growth if hunter access cannot be improved, particularly in Hunt Area 123. In portions of Hunt Area 113 there is a fair amount of public land which allows for a reasonable harvest. Additionally, with the re-routing of county roads due to shifts in coal mining activity, some areas of public land are even more accessible than they have been in the past. The potential negative impact of the increased vehicle access is that elk may be displaced from public lands in this portion of the hunt area.

## **Population**

The 2017 field estimate is around 850 elk. This field estimate is based on the trend surveys, historic population model and estimates, field observations and landowner observations of elk herds throughout the year. The herd appears to have increased in recent years, particularly in Hunt Area 123. There is no working population model for this herd. Various factors contribute to not having a reliable model. First, there is known immigration and emigration to and from this

herd because elk are not geographically or otherwise constrained to the herd unit boundaries. Secondly, this is a small population, relatively speaking, which also contributes to inaccuracies within the model. Although it would be preferable to have a working model, because the herd objective is non-numerical, it is less critical. Landowner cooperation is critical to managing this herd and some major landowners have indicated they are satisfied with the number of elk, or want even more.

Although this population seems to be slowly increasing, it should be noted that the majority of the increase has been observed in Hunt Area 123. The numbers of elk counted and classified in this portion of the herd have trended upward and 2017 was no exception. It appears that elk numbers in Hunt Area 113 declined and then recovered in recent years. In 2008, the number of elk observed peaked at 286 elk. In 2012, a decline became very apparent with the number of observed elk dropping to 91. This coincided with periods of extreme drought. In some areas there was very little vegetation available and elk likely left due to lack of forage. The number of elk observed during the 2017 classification flight was 119, down from 159 in 2016. However, it should be noted that there were weather and aircraft scheduling issues that limited the number of elk classified in the southern portion of the hunt area.

### **Management Summary**

In 2017, in Hunt Area 123 there were 50 Type 1, 50 Type 4 and 50 Type 6 licenses available. Hunting seasons in this hunt area are coordinated closely with landowners as hunter access is critical to achieving harvest objectives. There were 40 Type 1 and 40 Type 4 licenses issued in Hunt Area 113. For 2018, Hunt Area 113 will be closed. This is the typical alternating season pattern that seems to work with the limited number of elk in this hunt area. The number of elk available for harvest within this hunt area is fairly limited. This season structure has allowed for a reasonable harvest in years when there is a season and allows for the building of the elk herd in years when the season is closed. Hunt Area 123 will have an emphasis on antlerless harvest in 2018, with 50 Type 4 and 50 Type 6 licenses and a shorter season. This will address landowner concerns about harboring a growing herd throughout the year. At the Hunt Area 123 landowner meeting, there was discussion of converting to a general license hunting season strategy. Pro's and Con's of this type of season were discussed with the possible change occurring in 2019 if landowners are agreeable.

EL344 - Rochelle Hills  
HA 113, 123  
Revised 9/1995

