

2013 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2013 - 5/31/2014

HERD: EL320 - FORTIFICATION

HUNT AREAS: 2

PREPARED BY: ERIKA PECKHAM

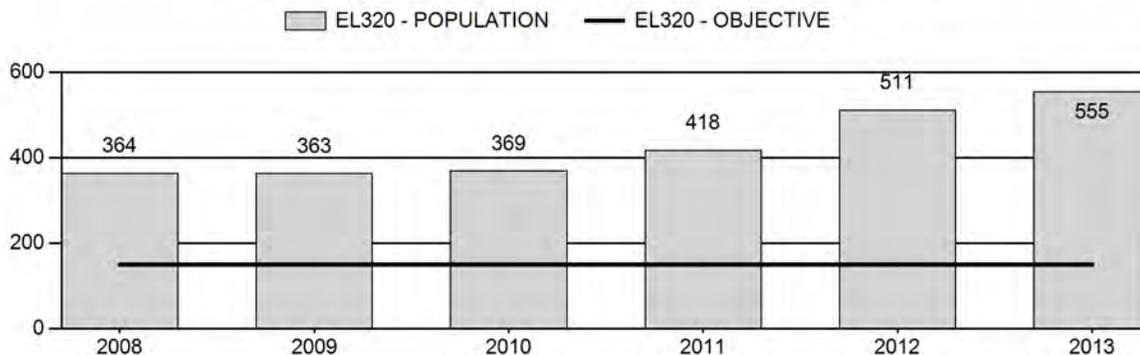
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	405	555	558
Harvest:	51	71	112
Hunters:	75	91	150
Hunter Success:	68%	78%	75%
Active Licenses:	75	91	150
Active License Percent:	68%	78%	75%
Recreation Days:	263	361	575
Days Per Animal:	5.2	5.1	5.1
Males per 100 Females	52	75	
Juveniles per 100 Females	58	66	

Population Objective:	150
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	270%
Number of years population has been + or - objective in recent trend:	5
Model Date:	03/03/2014

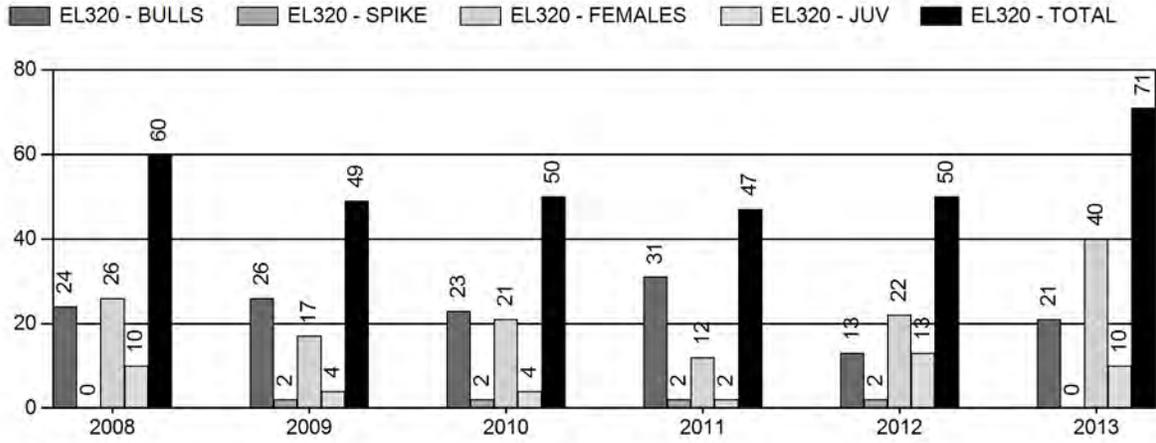
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:		11.6%
Males ≥ 1 year old:	9.5%	34.3%
Juveniles (< 1 year old):	0%	0%
Total:	9.1%	16.4%
Proposed change in post-season population:	11.3%	.5%

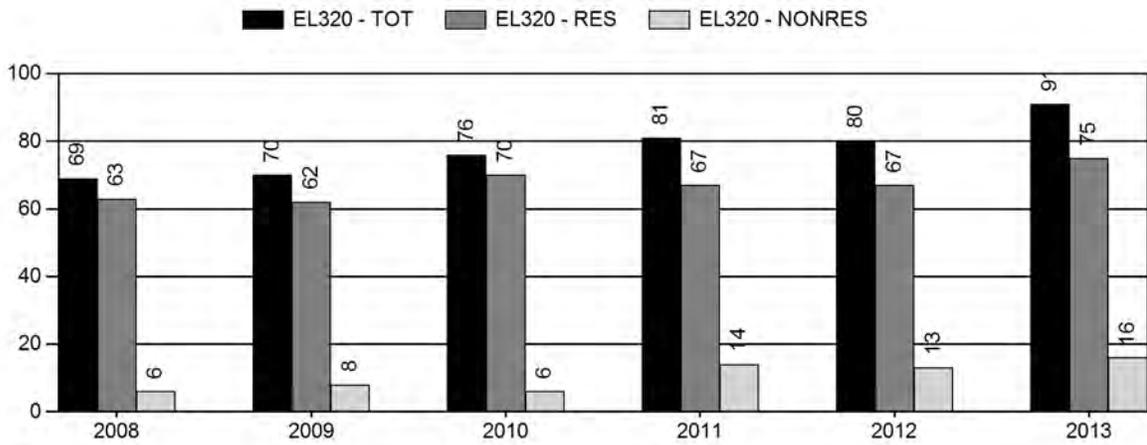
Population Size - Postseason



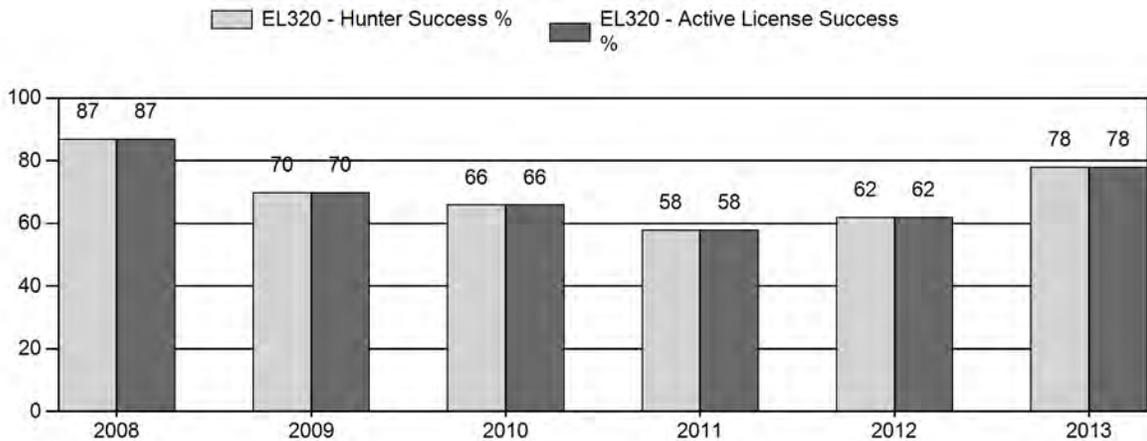
Harvest



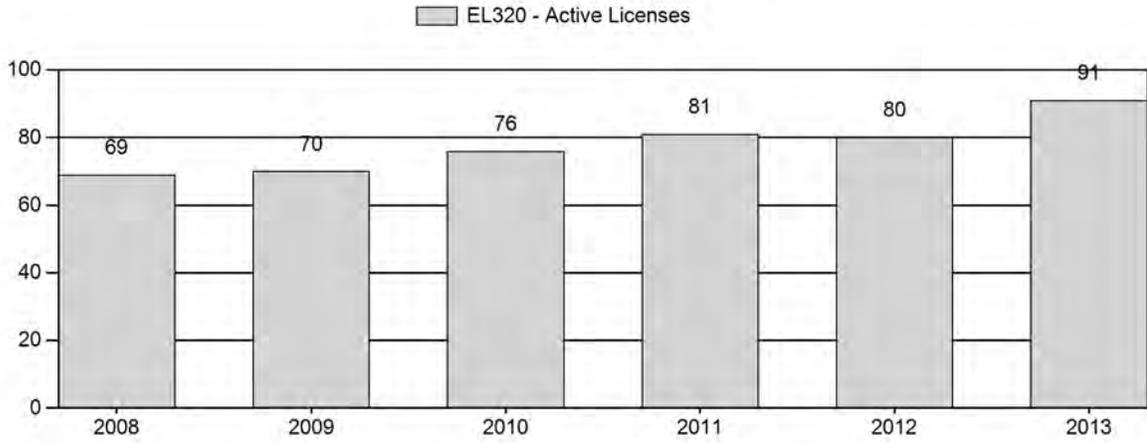
Number of Hunters



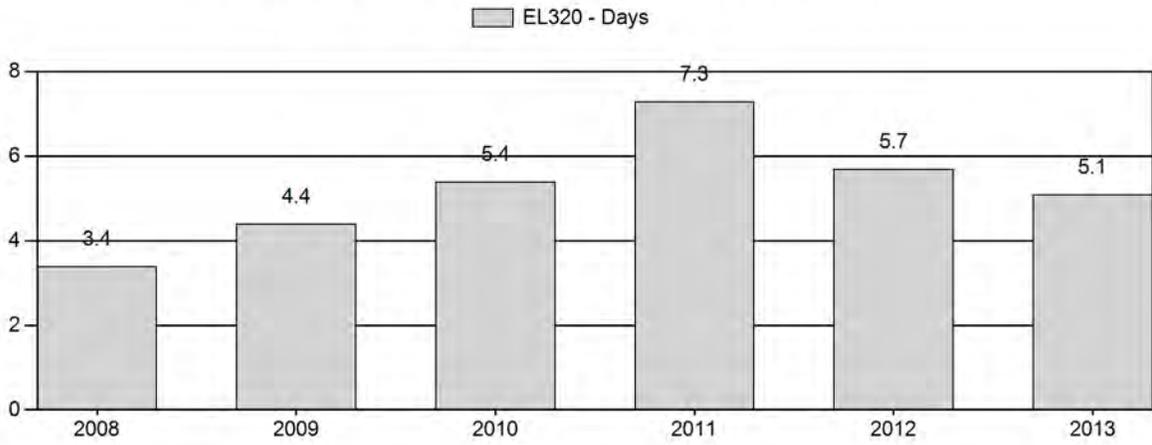
Harvest Success



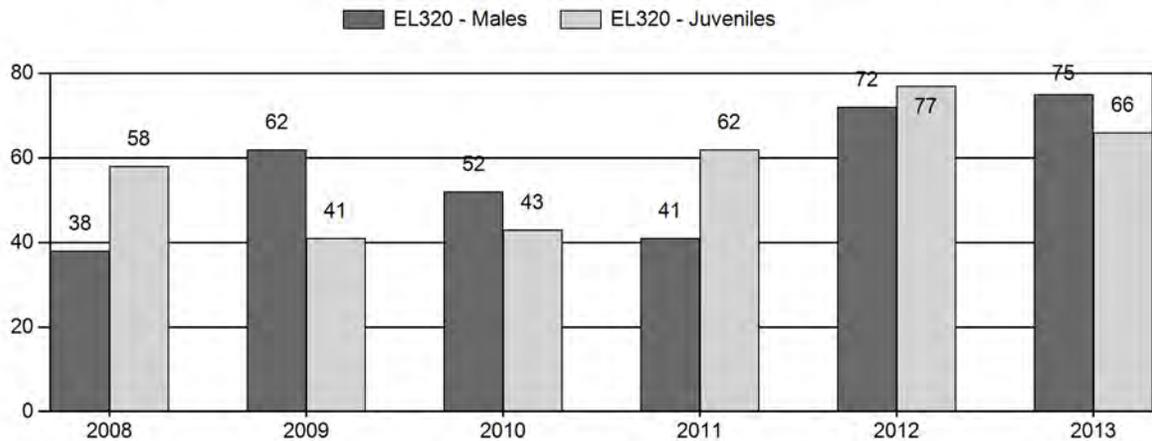
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 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	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	364	12	14	26	19%	69	51%	40	30%	135	162	17	20	38	± 9	58	± 12	42
2009	363	1	17	18	31%	29	49%	12	20%	59	188	3	59	62	± 22	41	± 17	26
2010	369	13	31	44	27%	84	51%	36	22%	164	160	15	37	52	± 9	43	± 8	28
2011	418	18	18	36	20%	87	49%	54	31%	177	197	21	21	41	± 8	62	± 10	44
2012	511	32	27	59	29%	82	40%	63	31%	204	215	39	33	72	± 12	77	± 13	45
2013	555	23	63	86	31%	114	41%	75	27%	275	438	20	55	75	± 10	66	± 9	38

**2014 HUNTING SEASONS
FORTIFICATION ELK HERD (EL320)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
2	1	Oct. 21	Nov. 3	130	Limited quota licenses; any elk
	4	Oct. 21	Nov. 3	20	Limited quota licenses; antlerless elk

Hunt Area	Type	Quota change from 2013
2	1	+100
	4	-40
Herd Unit Total	1	+100
	4	-40

Management Evaluation

Current Postseason Population Management Objective: 150

Management Strategy: Recreational

2013 Postseason Population Estimate: ~550

2014 Proposed Postseason Population Estimate: ~560

Herd Unit Issues

The management objective for the Fortification Elk Herd Unit is a post-season population objective of 150 elk. The management strategy is recreational management. The objective and management strategy were last reviewed in 2009.

This herd has great potential for continued growth if access cannot be somewhat improved. Much of the occupied range for this herd includes land administrated by the Bureau of Land Management. Private land is scattered, but also surrounds the herd unit, 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. Currently, some landowners allowing access to this elk herd seem to be relatively happy with the management direction for this elk herd, and have allowed access to the current number of license-holding hunters.

The 2013 post-season population estimate was around 550 elk. It is probable that this number is inflated, however the herd is most likely trending upwards. Since 2002 the population has been steadily increasing. Both aerial classifications and increasing calf:cow ratios support this observation.

Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal. The winter of 2012-13 was mild and did not see much for snow accumulation. The spring and summer of 2013 experienced excellent range conditions, with good amounts of moisture at optimal times. Although the winter of 2013-2014 experienced periods of sub-zero temperatures, it was not combined with heavy snowfall and would typically experience a melt, leaving bare ground in areas, allowing for forage. During the majority of these two winters, the ground was open, with minimal snowpack.

Habitat

There are no herbaceous or shrub habitat transects located within in this herd unit. The nearest transect is the SA creek sagebrush transect. The utilization is typically very light on this transect. In the fall of 2013, the transect survey showed the average leader growth to be 16mm, which is somewhat lower than anticipated, given the favorable growing season of 2013.

Field Data

This herd is classified aerially, and with the exception of 2009, the number of animals observed has increased each year since 2007. In 2013, 275 elk were classified, which is the highest number detected since this herd has been monitored. It should however be noted that more time was spent classifying elk in this area in 2013 than is typical. The time normally spent classifying elk in this Herd Unit is ~4 hours. In 2013 ~ 6 hours were spent searching for elk. In addition to surveying the traditional areas where the elk are highly concentrated, outlying areas were scoured, and likely more individuals were detected due to the increased effort. In 2013 the calf to cow ratio was 66, somewhat lower than the 77 observed in 2012.

One difficulty associated with the management of this herd is achieving adequate sample sizes during classification 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, sightability is likely decreased and it is probable that there are a fair number of animals that are not detected during classification.

Harvest

In 2013 there were 90 licenses available, 30 Type 1 and 60 Type 4. The last two seasons the focus has been on cow harvest in an effort to keep the continued growth that this herd seems to be experiencing in check. The traditional season in this hunt area has been from October 21 to October 31. This season time and length seems to be adequate to allow a reasonable harvest and works well for the private landowners who allow public access. Hunter success in this herd unit has averaged 69% over the last 5 years, with similar success in preceding years as well. 2013 had an overall success rate of 78%, up from the 2012 success rate of 62%.

Population

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 (103) and appears to depict the trend that is occurring. It is possible that the population estimate of ~550 is slightly inflated (fair model), although the increasing trend is likely accurate. Based on landowner input and classification surveys, it estimated that the population is likely between 350-450 elk.

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 March of 2011, 35 cow elk were fitted with GPS collars. In addition to that collaring effort, in January of 2014 another 35 cow elk were also fitted with GPS collars. Currently there are 56 collared individuals. The collaring of the elk was funded in part by Anadarko Petroleum. Going forward, the continued data collected will be analyzed by a private consultant to assess the movements of the elk in relation to on-going energy 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 be more protected within the herd unit. Coal bed methane development in the herd unit has reduced the total amount of effective elk habitat. Conventional oil development is on the rise in the Powder River Basin and this could be a factor in the Fortification Elk Herd Unit. However, even with past and current development, the population is well over the management objective. Harvesting elk towards objective should 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 herd of elk after energy development has ceased.

If we attain the projected harvest of 112 elk, it is likely that the population will essentially remain unchanged. Based on the population model, we predict a 2014 post-season population of around 560 elk. Typically, the degree of hunter access has been sufficient to allow for around 90 licenses. However, during the latter portion of the 2013 season, an additional landowner felt that numbers of elk warranted further access. During the annual meeting held in January, it was determined that with the additional access the area could support 150 licenses. It was also felt that providing three additional days would perhaps give hunters more opportunity to harvest an animal. Due to the past harvests focusing on cows, the bull ratio has become quite high at 75 bulls: 100 cows. It is hoped that the substantial increase in access, and therefore Type 1 licenses, will bring this ratio down into a more appropriate range.

INPUT	
Species:	Elk
Biologist:	Erika Peckham
Herd Unit & No.:	Fortification
Model date:	03/03/14

MODELS SUMMARY		Relative AICc	Fit	Notes
CJ,CA	Constant Juvenile & Adult Survival	103	94	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	103	94	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	297	165	
TS,J,CA,MSC	Time-Specific Juv, Constant Adult Survival, Male survival coefficient	217	71	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count		Predicted Prehunt Population			Predicted Posthunt Population			Objective	
	Field Est	Field SE	Juveniles	Total	Juveniles	Total Males	Females	Juveniles	Total Males	Females		Total
1993			63	71	190	324	56	18	161	150	235	150
1994			61	40	180	281	55	12	158	150	225	150
1995			91	34	177	302	90	34	162	150	286	150
1996			120	69	195	385	120	69	195	150	385	150
1997			84	116	239	440	84	116	239	150	440	150
1998			90	147	268	505	63	114	217	150	394	150
1999			137	137	238	512	118	82	186	150	387	150
2000			81	128	230	438	72	70	180	150	322	150
2001			63	97	205	366	59	77	171	150	307	150
2002			67	99	191	358	51	81	127	150	259	150
2003			73	99	145	318	72	84	137	150	294	150
2004			49	103	164	324	49	85	155	150	289	150
2005			66	171	171	340	61	86	158	150	305	150
2006			123	109	180	411	110	91	160	150	361	150
2007			53	134	201	388	52	117	172	150	342	150
2008			104	136	190	430	93	109	161	150	364	150
2009			77	144	195	417	73	114	176	150	363	150
2010			81	141	202	424	77	113	179	150	369	150
2011			122	141	206	469	120	105	193	150	418	150
2012			178	151	237	566	163	134	213	150	511	150
2013			162	197	274	633	151	174	230	150	555	150
2014			165	231	286	681	154	152	253	150	558	150
2015										150		150
2016										150		150
2017										150		150
2018										150		150
2019										150		150
2020										150		150
2021										150		150
2022										150		150
2023										150		150
2024										150		150
2025										150		150

Survival and Initial Population Estimates

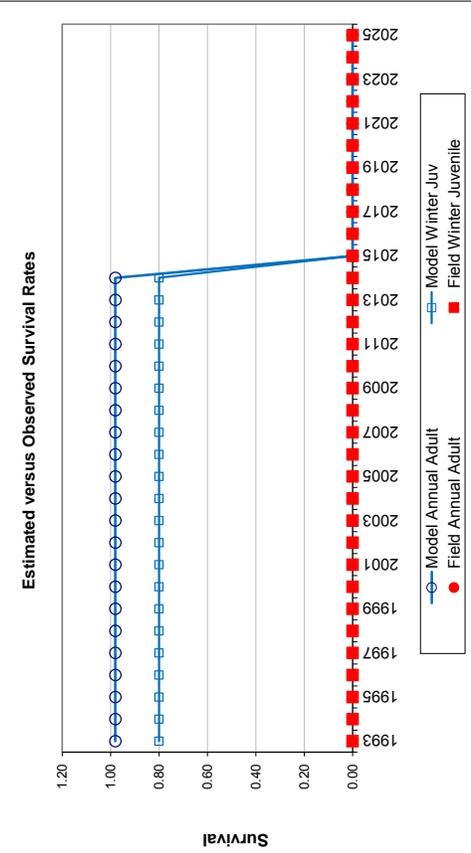
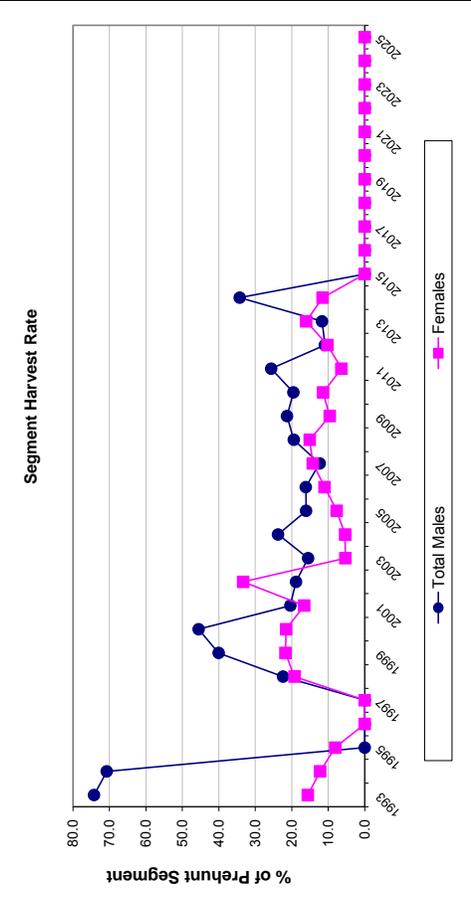
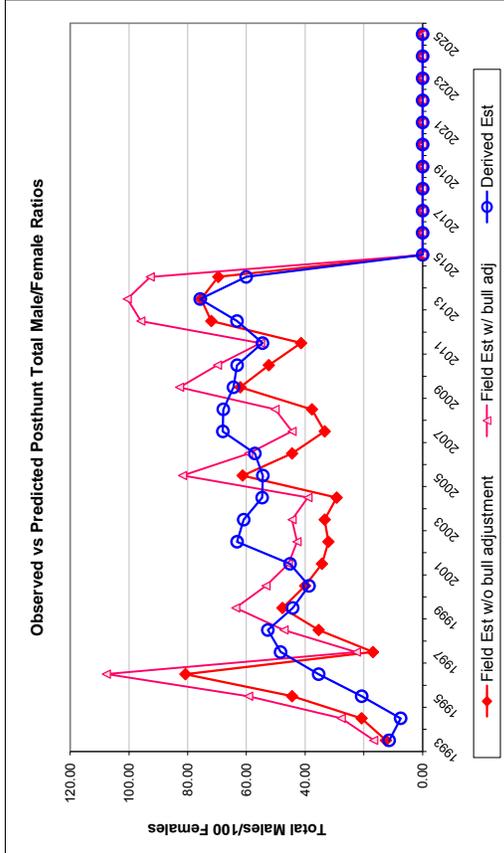
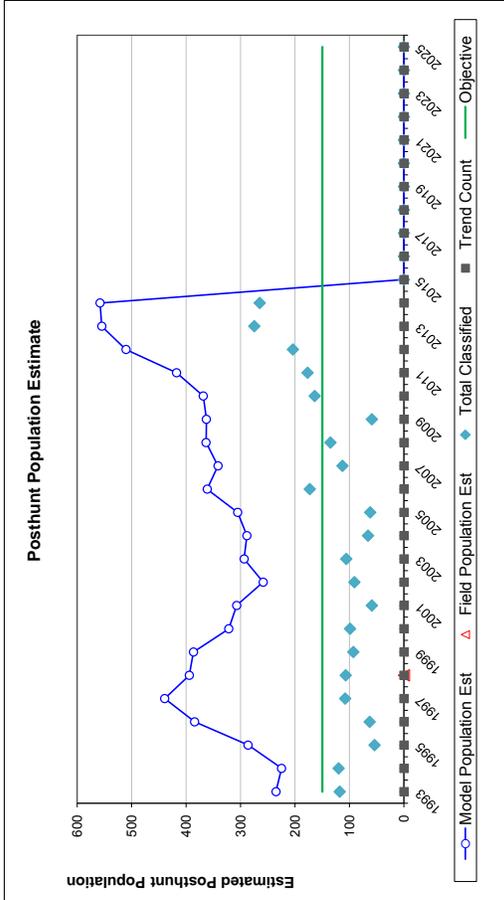
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Field Est	SE	Model Est	SE
1993	0.80	0.98	0.98	0.98
1994	0.80	0.98	0.98	0.98
1995	0.80	0.98	0.98	0.98
1996	0.80	0.98	0.98	0.98
1997	0.80	0.98	0.98	0.98
1998	0.80	0.98	0.98	0.98
1999	0.80	0.98	0.98	0.98
2000	0.80	0.98	0.98	0.98
2001	0.80	0.98	0.98	0.98
2002	0.80	0.98	0.98	0.98
2003	0.80	0.98	0.98	0.98
2004	0.80	0.98	0.98	0.98
2005	0.80	0.98	0.98	0.98
2006	0.80	0.98	0.98	0.98
2007	0.80	0.98	0.98	0.98
2008	0.80	0.98	0.98	0.98
2009	0.80	0.98	0.98	0.98
2010	0.80	0.98	0.98	0.98
2011	0.80	0.98	0.98	0.98
2012	0.80	0.98	0.98	0.98
2013	0.80	0.98	0.98	0.98
2014	0.80	0.98	0.98	0.98
2015	0.80	0.98	0.98	0.98
2016	0.80	0.98	0.98	0.98
2017	0.80	0.98	0.98	0.98
2018	0.80	0.98	0.98	0.98
2019	0.80	0.98	0.98	0.98
2020	0.80	0.98	0.98	0.98
2021	0.80	0.98	0.98	0.98
2022	0.80	0.98	0.98	0.98
2023	0.80	0.98	0.98	0.98
2024	0.80	0.98	0.98	0.98
2025	0.80	0.98	0.98	0.98

Parameters:	Optim cells
Juvenile Survival =	0.800
Adult Survival =	0.980
Initial Total Male Pop/10,000 =	0.002
Initial Female Pop/10,000 =	0.016

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Total Bulls Adjustment Factor	75%

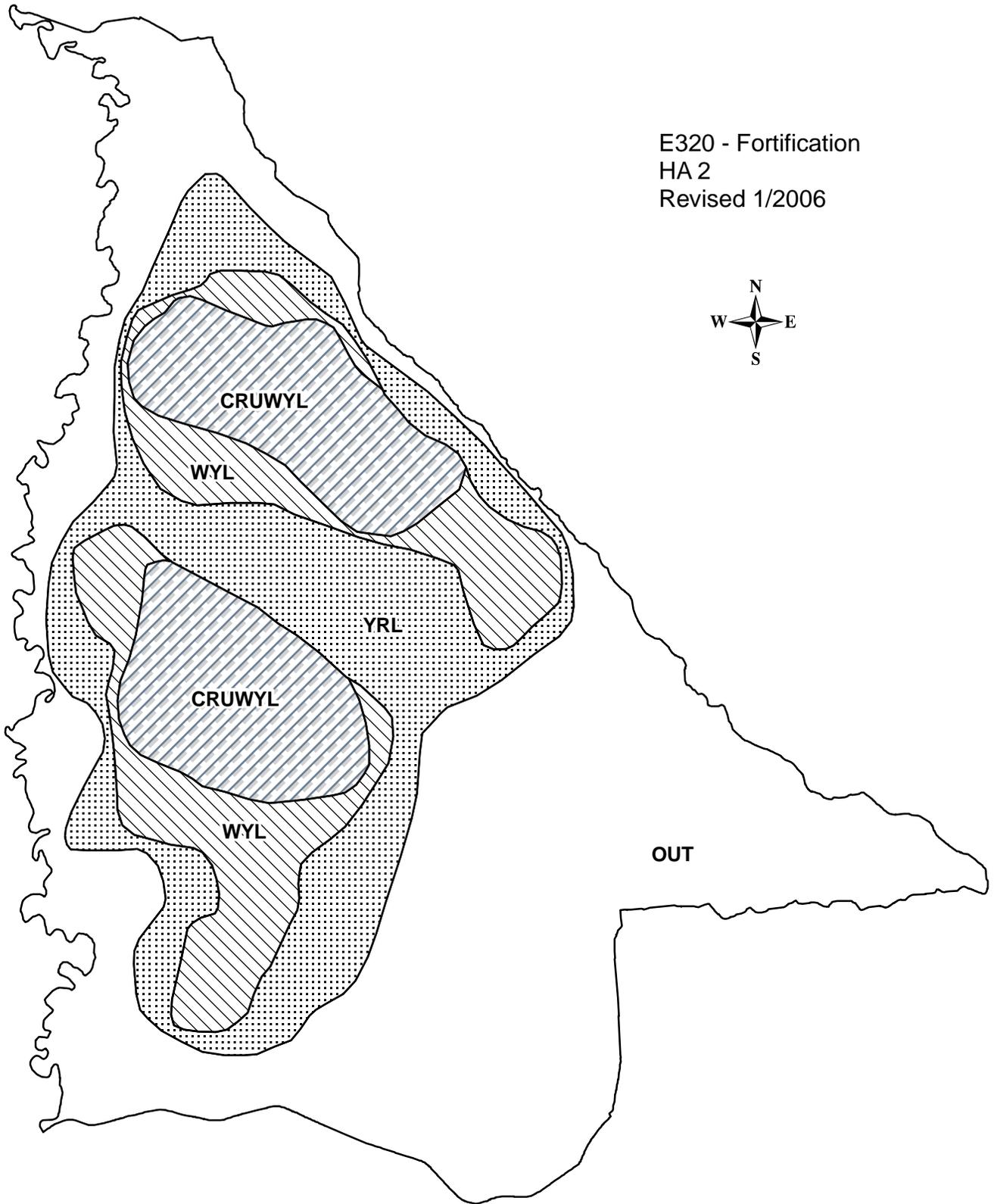
Year	Classification Counts										Harvest					Segment Harvest Rate (% of Prehunt Segment)	
	Juvenile/Female Ratio					Total Male/Female Ratio					Juv	Yr1 males	2+ Males	Females	Total Harvest	Total Males	Females
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/ bull adj	Field Est w/o bull adj	Field SE										
1993											6	23	25	27	81	74.3	15.6
1994		35.00	7.89	11.41	16.67	12.50	4.19	7.49	27.71	20.78	5.71	12	14	20	51	70.8	12.2
1995		35.06	7.84	7.49	59.26	44.44	15.42	20.75	44.44	44.44	1	0	0	13	14	0.0	8.1
1996		61.54	17.89	20.75	107.69	80.77	23.70	35.40	80.77	80.77	0	0	0	0	0	0.0	0.0
1997		35.21	8.19	48.37	22.54	16.90	5.28	48.37	47.18	35.38	0	0	0	0	0	0.0	0.0
1998		29.23	7.62	52.71	63.64	47.73	12.66	44.24	63.64	47.73	24	30	30	47	101	22.4	19.3
1999		63.64	15.38	44.24	44.24	40.00	10.09	44.24	63.64	47.73	17	3	47	47	114	40.1	21.8
2000		40.00	10.09	38.68	53.33	40.00	10.09	38.68	53.33	40.00	8	9	44	45	106	45.6	21.6
2001		34.29	11.47	45.14	45.14	34.29	11.47	45.14	45.14	34.29	4	5	13	31	53	20.4	16.6
2002		39.62	10.22	63.17	42.77	32.08	8.94	63.17	42.77	32.08	15	4	13	58	90	18.8	33.4
2003		52.63	11.87	60.92	44.44	33.33	8.83	60.92	44.44	33.33	1	0	14	7	22	15.5	5.3
2004		31.71	10.09	54.64	39.02	29.27	9.61	54.64	39.02	29.27	0	3	21	8	32	23.8	5.4
2005		38.71	13.16	54.40	81.72	61.29	17.86	54.40	81.72	61.29	4	2	13	12	31	16.1	7.7
2006		69.14	12.02	57.11	59.26	44.44	8.90	57.11	59.26	44.44	11	1	15	18	45	16.2	11.0
2007		30.43	7.59	68.02	44.44	33.33	8.03	68.02	44.44	33.33	1	2	13	26	42	12.4	14.3
2008		57.97	11.52	67.87	50.24	37.68	8.67	67.87	50.24	37.68	10	0	24	26	60	19.5	15.1
2009		41.38	14.20	64.41	82.76	62.07	18.62	64.41	82.76	62.07	4	2	26	17	49	21.3	9.6
2010		42.86	8.54	63.16	69.84	52.38	9.75	63.16	69.84	52.38	4	2	23	21	50	19.6	11.4
2011		62.07	10.75	54.52	55.17	41.38	8.20	54.52	55.17	41.38	2	2	31	12	47	25.7	6.4
2012		76.83	12.87	63.21	95.93	71.95	12.28	63.21	95.93	71.95	13	2	13	22	50	10.9	10.2
2013		65.79	9.78	75.72	100.58	75.44	10.77	75.72	100.58	75.44	10	0	21	40	71	11.7	16.1
2014		60.87	9.23	60.08	92.75	69.57	10.13	60.08	92.75	69.57	10	2	70	30	112	34.3	11.6
2015																	
2016																	
2017																	
2018																	
2019																	
2020																	
2021																	
2022																	
2023																	
2024																	
2025																	

FIGURES



Comments:

E320 - Fortification
HA 2
Revised 1/2006



2013 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2013 - 5/31/2014

HERD: EL321 - NORTH BIGHORN

HUNT AREAS: 35-40

PREPARED BY: TIM THOMAS

	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Trend Count:	4,540	5,437	5,300
Harvest:	1,169	1,371	1,450
Hunters:	3,959	4,331	4,500
Hunter Success:	30%	32%	32%
Active Licenses:	4,053	31%	4,750
Active License Percentage:	29%	31%	31%
Recreation Days:	28,962	29,785	32,500
Days Per Animal:	24.8	21.7	22.4
Males per 100 Females:	23	23	
Juveniles per 100 Females	51	49	

Trend Based Objective ($\pm 20\%$) 4,350 (3480 - 5220)

Management Strategy: Special

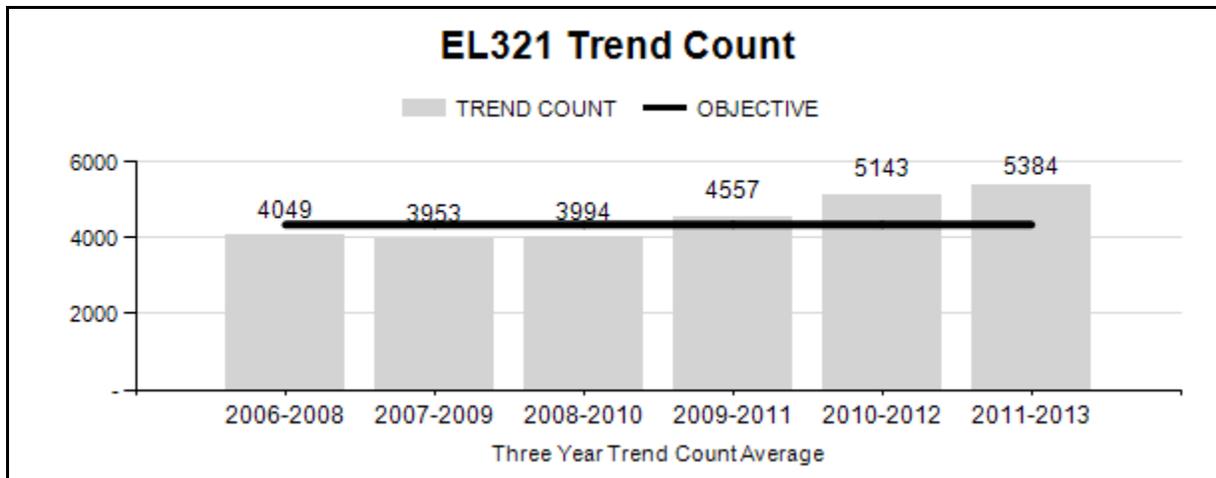
Percent population is above (+) or (-) objective: 25%

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

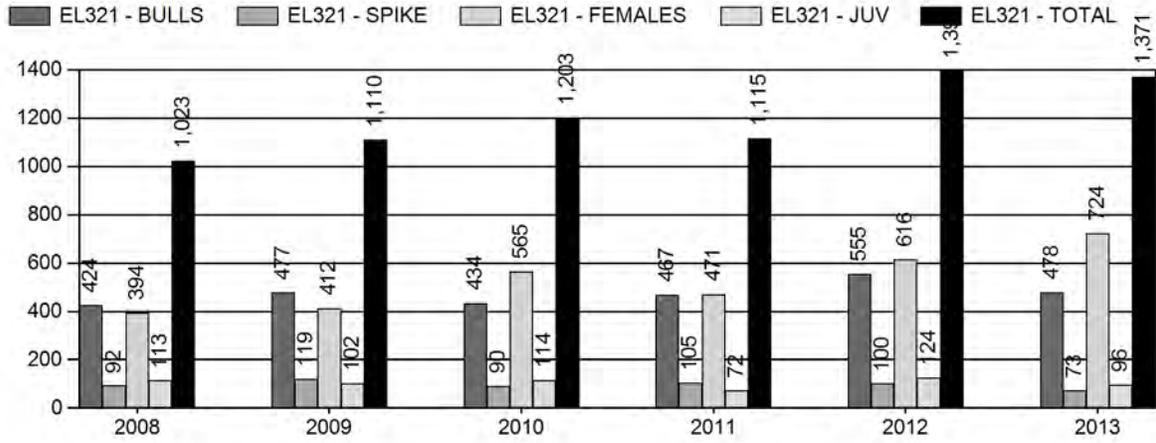
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	18%	18%
Males ≥ 1 year old:	34%	35%
Juveniles (< 1 year old):	6%	6%
Total:	20%	6%

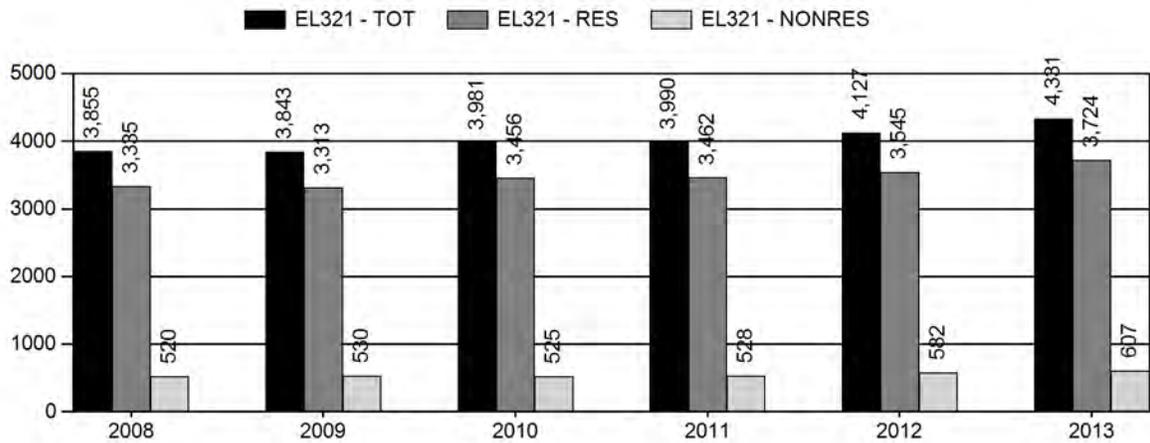
Proposed change in post-season population: -2% -2%



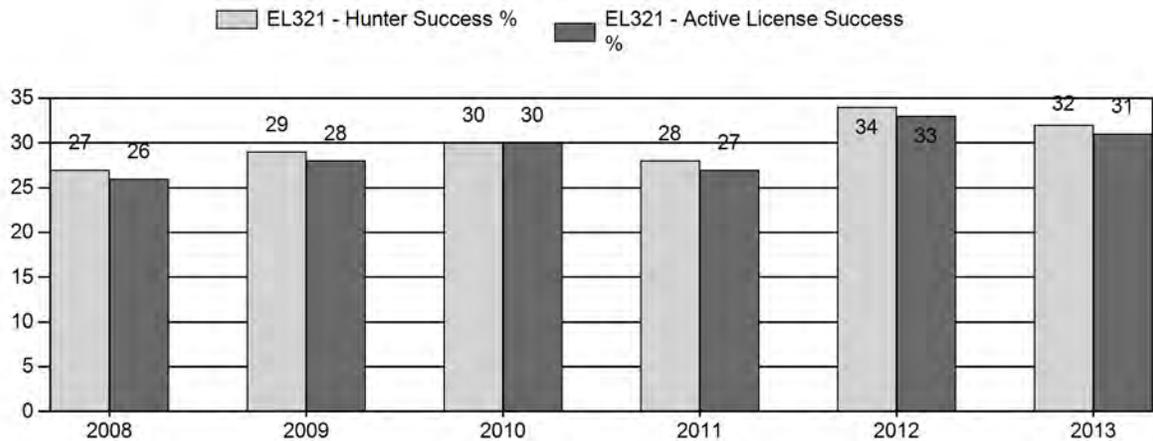
Harvest



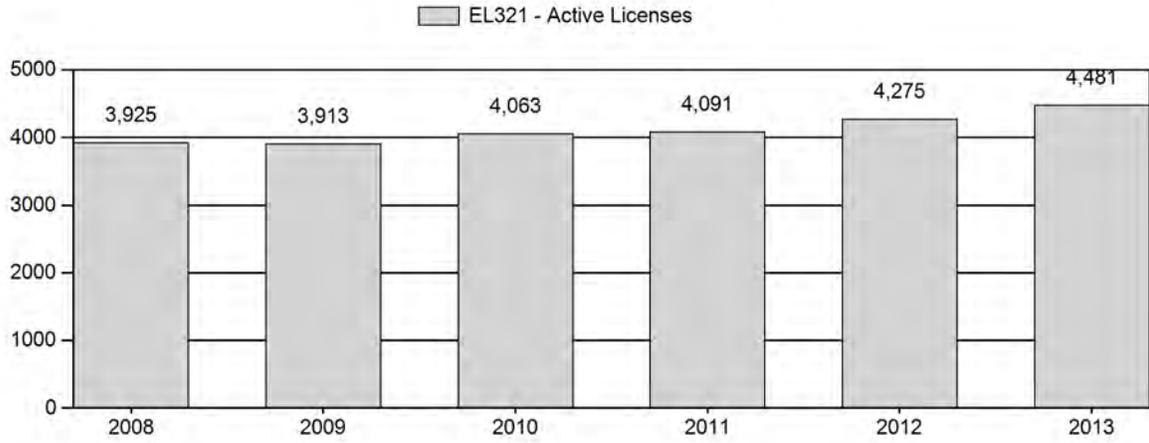
Number of Hunters



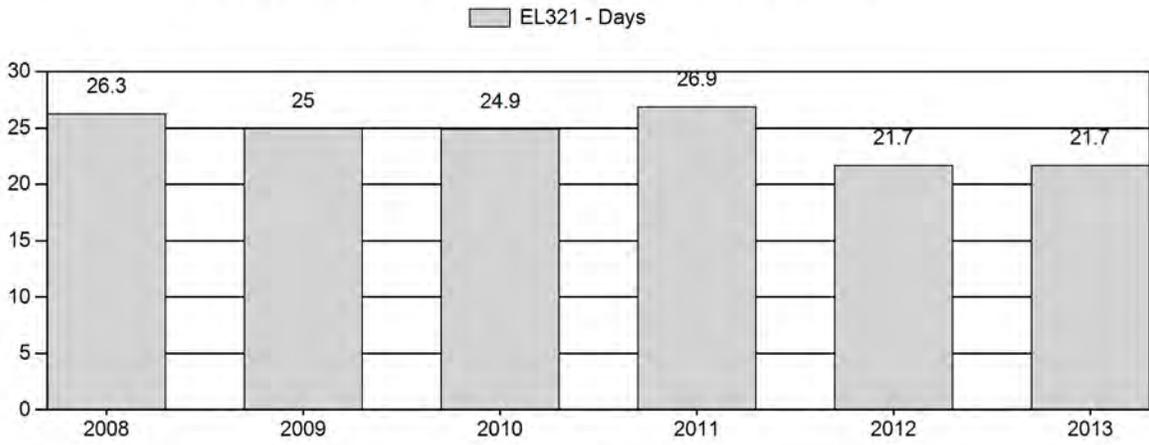
Harvest Success



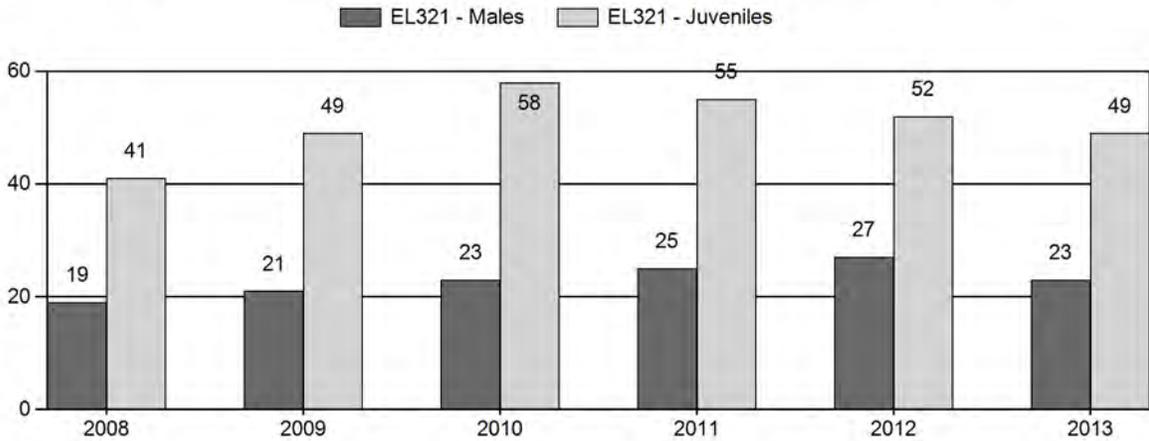
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Elk Herd EL321 - NORTH BIGHORN

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
2008	4,650	168	66	234	12%	1,257	63%	513	26%	2,004	538	13	5	19	± 1	41	± 2	34
2009	5,530	154	79	233	13%	1,092	59%	538	29%	1,863	694	14	7	21				
2010	5,250	157	76	233	13%	1,027	55%	595	32%	1,855	907	15	7	23	± 0	58	± 0	47
2011	5,500	160	103	263	14%	1,059	55%	587	31%	1,909	853	15	10	25	± 2	55	± 3	44
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 HUNTING SEASONS
NORTH BIGHORN ELK HERD (EL321)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
35	1	Oct. 15	Nov. 5	150	Limited quota licenses; antlered elk
	4	Oct. 15	Dec. 15	150	Limited quota licenses; antlerless elk
	6	Oct. 15	Dec. 15	150	Limited quota licenses; cow or calf elk valid off national forest
	9	Sep. 1	Sep. 30	50	Limited quota licenses; any elk, archery only
36		Oct. 15	Nov. 5		General license; antlered elk
	4	Oct. 15	Nov. 30	200	Limited quota licenses; antlerless elk
	6	Oct. 15	Nov. 5	200	Limited quota licenses; cow or calf
	9	Sep. 1	Sep. 30	50	Limited quota licenses; any elk, archery only
37	6	Oct. 15			General license; any elk
		Sep. 1	Sep. 30	400	Limited quota licenses; cow or calf valid off national forest or north of Wolf Creek Trail (U.S.F.S. Trail 001) on national forest
		Oct. 1	Dec. 21		Unused Area 37 Type 6 licenses valid in the entire area
	9	Sep. 1	Sep. 30	150	Limited quota licenses; any elk valid off national forest or south of Wolf Creek Trail (U.S.F.S. Trail 001), archery only
38	1	Oct. 15	Nov. 5	400	Limited quota licenses; any elk
		Nov. 6	Nov. 15		Unused Area 38 Type 1 licenses valid for antlerless elk
	4	Oct. 1	Oct. 10	500	Limited quota licenses; antlerless elk
		Oct. 15	Nov. 15		Unused Area 38 Type 4 licenses valid on private land or north of Columbus Creek, the Fools Creek Road (U.S.F.S. Road 168), the Burgess Road (U.S.F.S. 15) to Burgess Junction, and U.S. Highway 14A

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
38	4	Nov. 16	Dec. 21		Unused Area 38, Type 4 licenses valid off national forest and off the Wyoming Game and Fish Commission's Amsden and Kerns Wildlife Habitat Management Areas
	9	Sep. 1	Sep. 30	250	Limited quota licenses; any elk, archery only
39	1	Oct. 15 Nov. 5	Nov. 4 Nov. 15	100	Limited quota licenses; any elk Unused Area 39 Type 1 licenses valid for antlerless elk
	2	Oct. 15	Nov. 4	75	Limited quota licenses; antlered elk
	4	Oct. 1	Nov. 15	75	Limited quota licenses; antlerless elk
	9	Sep. 1	Sep. 30	70	Limited quota licenses; any elk, archery only
40	1	Oct. 15	Nov. 4	175	Limited quota licenses; any elk
	4	Oct. 15	Dec. 21	200	Limited quota licenses; antlerless elk
	5	Oct. 1	Dec. 21	100	Limited quota licenses; antlerless elk
	6	Sep. 1	Oct. 14	250	Limited quota licenses; cow or calf valid off national forest
			Oct. 15	Dec. 21	
	9	Sep. 1	Sep. 30	75	Limited quota licenses; any elk, archery only
Archery 35, 36, 37		Sep. 15	Sep. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
All Areas		No Changes
Herd Unit Total		No Changes

Management Evaluation

Current Mid-Winter Trend Management Objective: 4,350

Management Strategy: Special

2013 Winter Trend Count: 5,437

Most Recent 3-year Running Average Winter Trend Count: ~ 5,400

Herd Unit Issues

The management objective for the North Bighorn Elk Herd Unit is a mid-winter trend count objective of 4,350 elk. 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 objective and management strategy were last revised in 2012.

There are several areas within hunt areas of this herd unit that act as refugia for elk, protecting them from harvest. This limits manager's ability to maintain these groups within desired population levels, and leads to frustration with the general hunting public as elk move from publically accessible areas to these refuge areas, which are private lands. This problem has grown over the past 25+ years, especially in the eastside hunt areas (Areas 35, 36, 37, and 38), as larger ranches have changed ownership and views on elk management and hunter access have changed.

During the 2012 and 2013 seasons, four hunter harvested elk from Hunt Area 40 tested seropositive for exposure to the bacterium *Brucella abortus*, 2 in each year. *B. abortus* is the bacterium that cause the disease brucellosis in livestock, elk and bison. In 2012, only 25 usable blood samples were collect from hunter harvested elk on the west side of the Bighorn Mountains during routine wildlife testing to monitor for brucellosis. An enhanced brucellosis surveillance effort was initiated in 2013. Over 750 samples were collect, with 437 usable samples (~58%). Within this herd unit, we collected 229 usable samples (Table 1). We plan to continue the enhanced brucellosis surveillance during the 2014 season. As such, antlerless elk seasons were opened earlier than traditionally in Hunt Areas 37, 38, 39 and 40 to accommodate antlerless harvest and sample collection.

Table 1. Usable blood samples collected for enhanced Brucellosis surveillance in Bighorn Mountains during 2013 hunting season. The North Bighorn Elk Herd Unit hunt areas (Areas 35-40) are in bold.

Hunt Area		Seropositive
033	20	0
034	25	0
035	39	0
036	17	0
037	16	0
038	79	0
039	32	0
040	46	2
041	46	0
045	52	0
047	0	0
048	6	0
049	45	0
120	14	0
Total	437	2

Weather

The spring and summer of 2013 was generally cool and wet, resulting in good conditions for forage production throughout the region. The winter of 2013-14 was more severe than recent winters, with snow fall starting in late September and continuing through the winter. There were several significant snow events during the hunting season, which limited the ability of hunters to access large portions of this herd unit and moved elk towards winter ranges earlier than normal. There were several bouts of extreme cold temperatures lasting up to a week in duration. Temperatures reached ~30° F below zero, something not seen since the 1990s. The above average snowfall combined with the below average temperatures induced elk to move onto private lands and raid stored hay crops, creating numerous damage situations this winter. Weather does not seem to be having an adverse affect on individual elk at this time, but it does influence forage production, and hence elk distribution, during all seasons.

Field Data

We counted 5,437 elk on winter ranges during January-February 2014, which is ~24% above the established mid-winter count objective of 4,350. Seasons have been liberalized in recent years to bring elk populations down to more desired levels. Distribution of elk counted is as follow:

Hunt Area	Winter Count Obj.	2011 Winter count	2012 Winter Count	2013 Winter Count	2013 # Over / Under Objective	3-year (2011-13) Running Mean
35	400	847	841	928	+528	872 (+118%)
36	800	824	914	905	+105	881 (+10%)
37	800	1,319	1,175	1,598	+798	1,364 (+70%)
38	1,000	955	1,255	924	-76	1,044 (+4%)
39	500	519	307	290	-210	372 (-26%)
40	850	992	767	792	-58	850 (+0%)
	4,350	5,456	5,259	5,437	+1,087	5,384 (+24%)

We classified over 1,100 elk during January – February 2014, all on the west side of the Bighorn Mountains. We observed 49 calves:100 cows, similar to recent years and the 10-year average of 48 calves:100 cows. This is more than sufficient production to maintain or grow this population.

We observed 23 bulls (16 yearling; 7 adult):100 cows. The observed yearling bull to cow ratio appears to be slowly increasing over the past 10 years, from 12 yearling bulls:100 cows to 16 yearling bulls:100 cows. This suggests sufficient recruitment of bulls into the population to maintain current levels of bull harvest. The total bull to cow ratio is a minimum bull:cow ratio as adult bulls (> 2 yrs old) tend to winter away from cow/calf/young bull groups, making them more difficult to find during surveys. The observed adult bull to cow ratio has remained steady over the past 10 years, averaging 8 adult bulls:100 cows.

While we did not collect classification data from the eastside hunt areas, we did observe over 200 branched antlers bulls in Area 37 and over 100 branched antlered bulls on the Kerns WHMA in Area 38.

According to the hunter satisfaction survey, 62% of 973 hunters were satisfied with their elk hunting experience in this herd unit, 19.2% were dissatisfied, with the balance being neutral. Hunters were more satisfied in the limited quota hunt areas (67%) compared to the general license areas (56%). Nonresident hunters (n=187) tended to be more satisfied (72%) than resident hunters (59%, n=786). Hunter satisfaction is based on an individual values and perceptions and is therefore subjective.

Estimated hunter harvest decreased 2% from 2012, which was the highest harvest ever in this herd unit. Even with the slight decrease in harvest, it was the second highest harvest ever. Bull harvest decreased 16% (n=99 elk) while cow harvest increased 18% (n=108 elk) and calf harvest decreased 23% (n=28 elk) compared to 2012. Hunter success was estimated at 32%, a slight decrease from the 2012 season. Effort stayed at 21.7 days of hunting per elk harvested, the same as in 2012. This is surprising because of adverse winter weather conditions, especially during much of October. Extended seasons helped provide the opportunity for increased antlerless harvest when conditions moderated later in November and December. Bull harvest was most affected by the adverse weather conditions as most of that harvest occurs during September (archery season) and October.

Population

We do not have a spreadsheet model developed for this herd unit because: 1) we do not manage this herd based on a population objective; and 2) up to 20% 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 80-90% of wintering elk in any given year.

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 verses Montana. Efforts are being made, through liberalized hunting season strategies, to reduce this population towards objective.

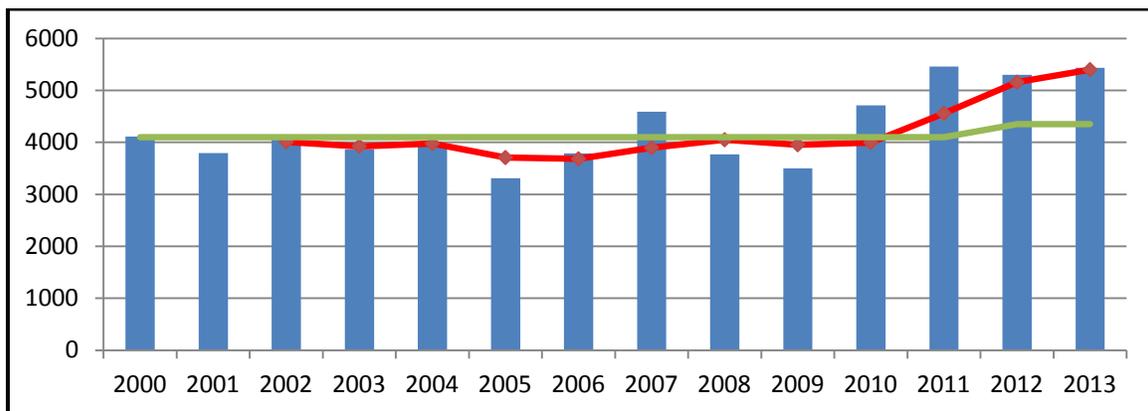


Figure 1. Elk numbers, with 3-year running average (red line), observed during trend and classification surveys from 2000 – 2013 compared to the management objective (green line).

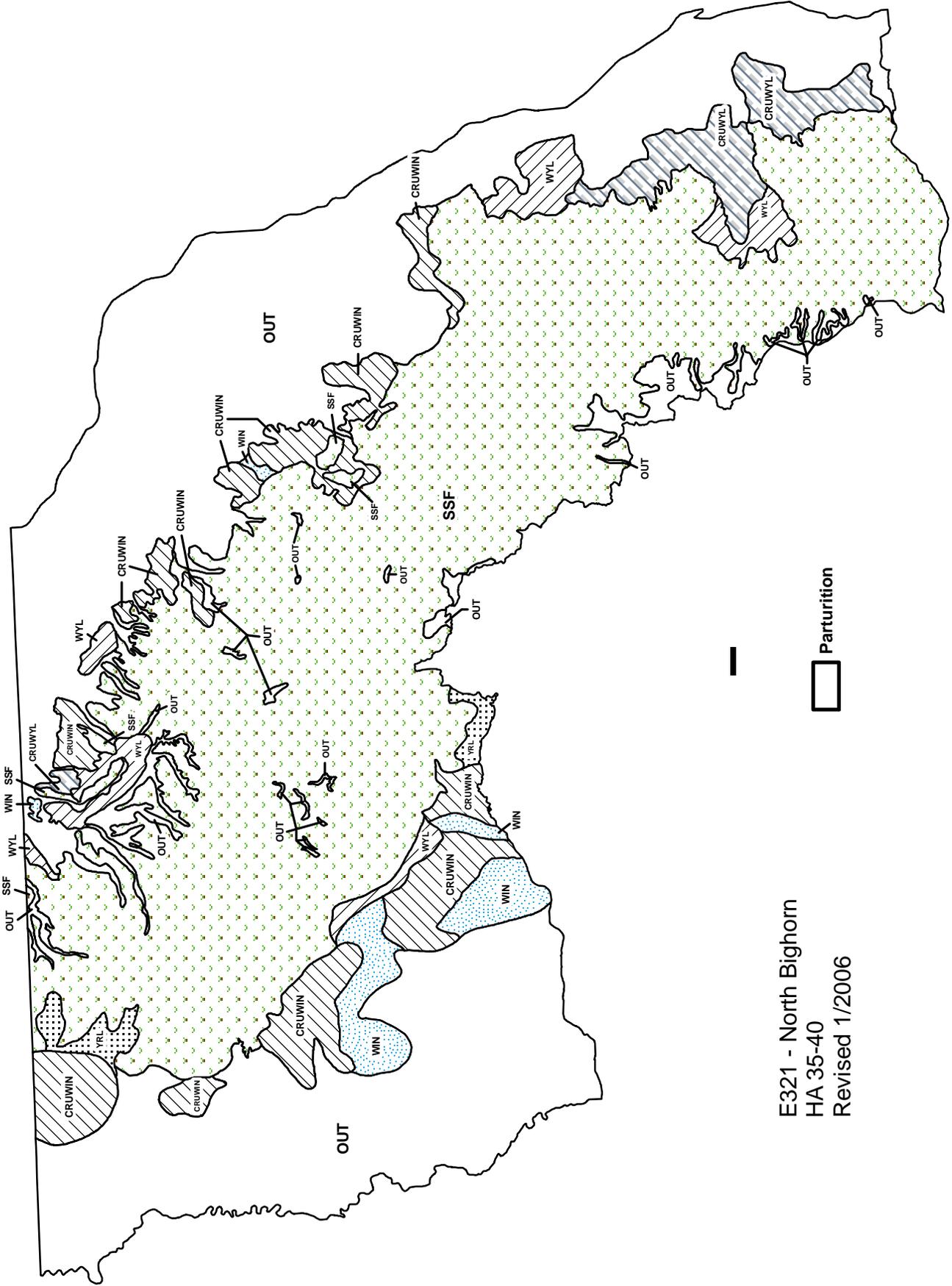
Management Summary

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 account for about 50% of the winter count for this hunt area. A Type 6 license was added to Area 36 to encourage increased elk harvest in that area also.

A special early firearm season is open during September in a portion of Area 37. This season strategy is designed to increase harvest as well as block a migration route to private lands, keeping elk on public lands longer. This season has been popular with most hunters and appears to have had at least limited success. This season strategy is being expanded off national forest in anticipation of a major land exchange with the Office of State Lands that would provide opportunities to address high elk numbers north of Wolf Creek in this hunt area as well as potential harvest opportunities near PK Lane and Moncreiffe Ridge.

An extended antlerless season was added in Area 38 address damage issues on private lands. During the 2013-14 winter, about half the elk in this hunt area wintered off of the Amsden and Kerns WHMA, causing significant damage to stored hay on private lands. This season is designed to harvest elk that have become habituated to leaving the WHMAs and feeding on stored hay crops.

With liberal seasons and favorable hunting conditions, we anticipate an increased harvest in 2014 (~1,450 elk) compared to 2013. Continued harvest, especially on cows, should help bring segments of this herd where winter counts exceed management objectives down to desired levels.



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

2013 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2013 - 5/31/2014

HERD: EL322 - SOUTH BIGHORN

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

PREPARED BY: DAN THIELE

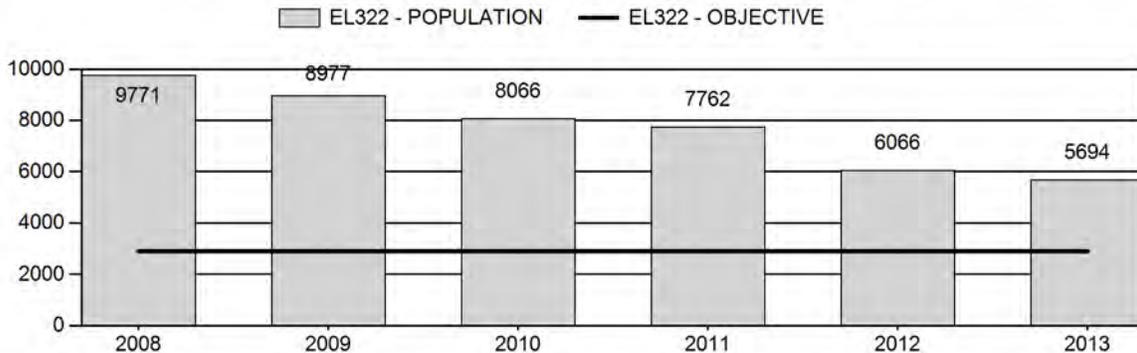
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	8,128	5,694	3,750
Harvest:	1,444	1,393	1,900
Hunters:	2,914	3,419	3,800
Hunter Success:	50%	41%	50%
Active Licenses:	3,031	3,592	3,900
Active License Percent:	48%	39%	49 %
Recreation Days:	20,336	23,261	28,000
Days Per Animal:	14.1	16.7	14.7
Males per 100 Females	27	22	
Juveniles per 100 Females	38	39	

Population Objective:	2,900
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	96%
Number of years population has been + or - objective in recent trend:	10
Model Date:	03/04/2014

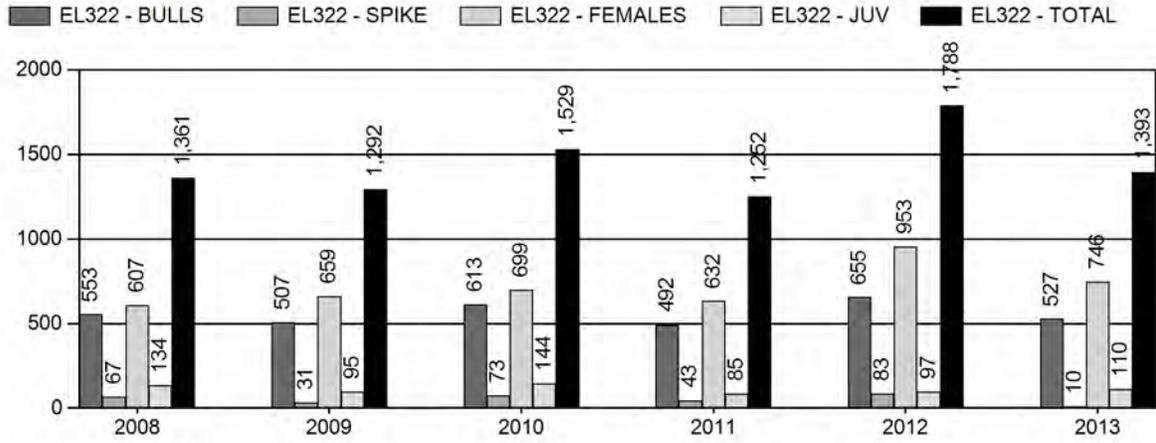
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	18%	33%
Males ≥ 1 year old:	33%	50%
Juveniles (< 1 year old):	8%	11%
Total:	19%	33%
Proposed change in post-season population:	-13%	-34%

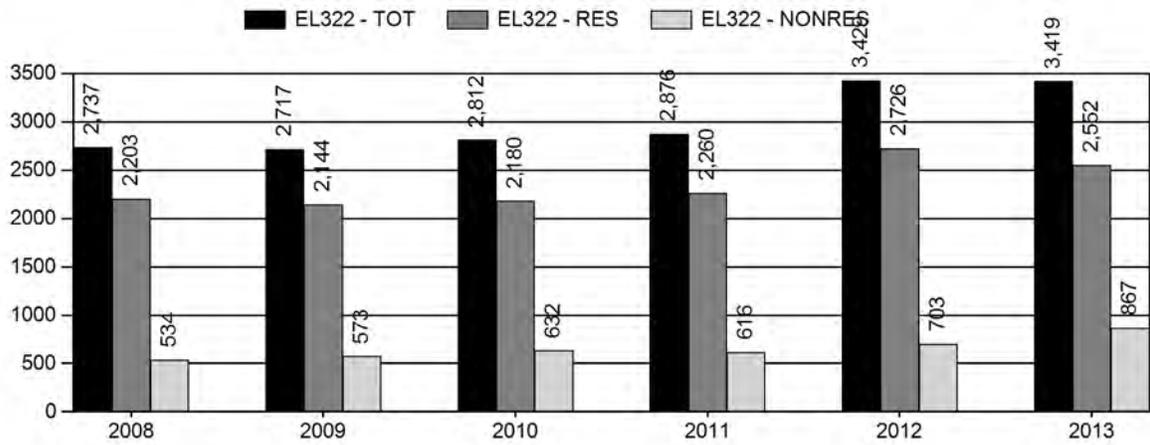
Population Size - Postseason



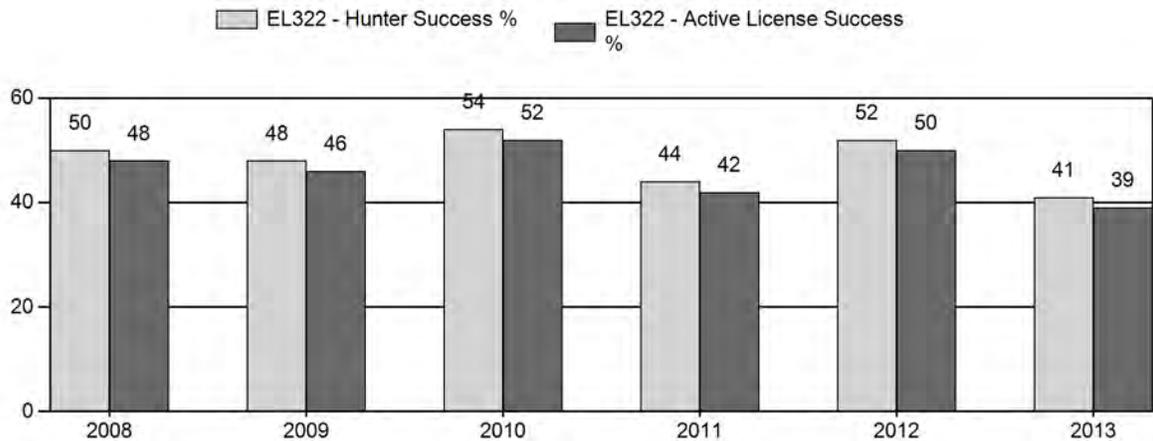
Harvest



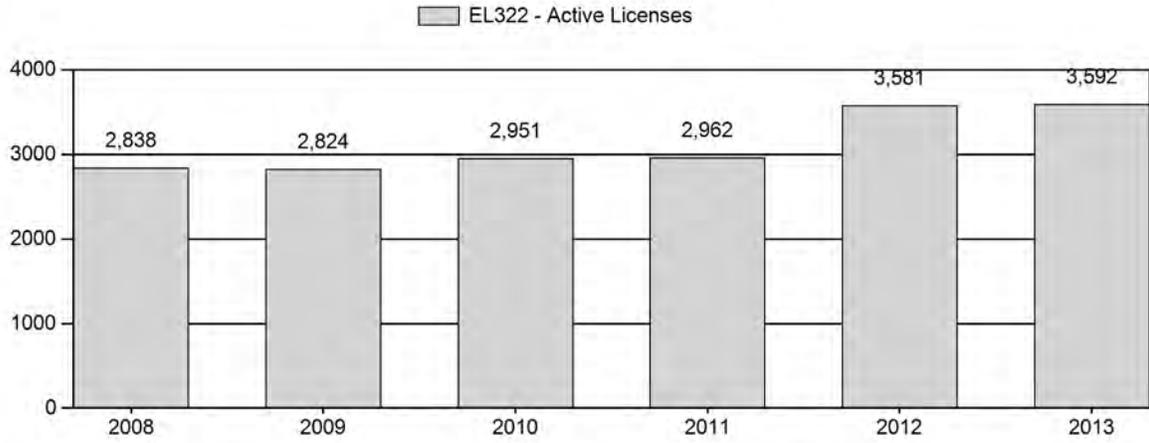
Number of Hunters



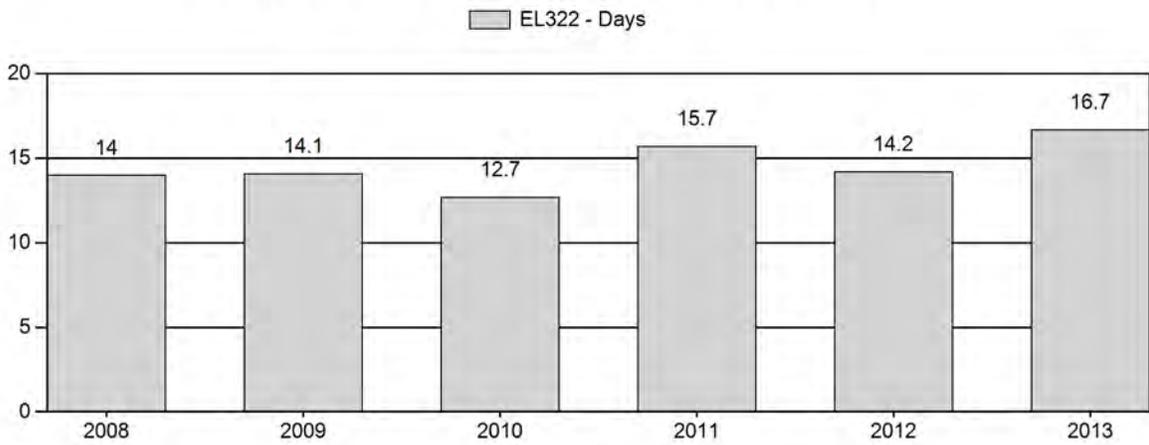
Harvest Success



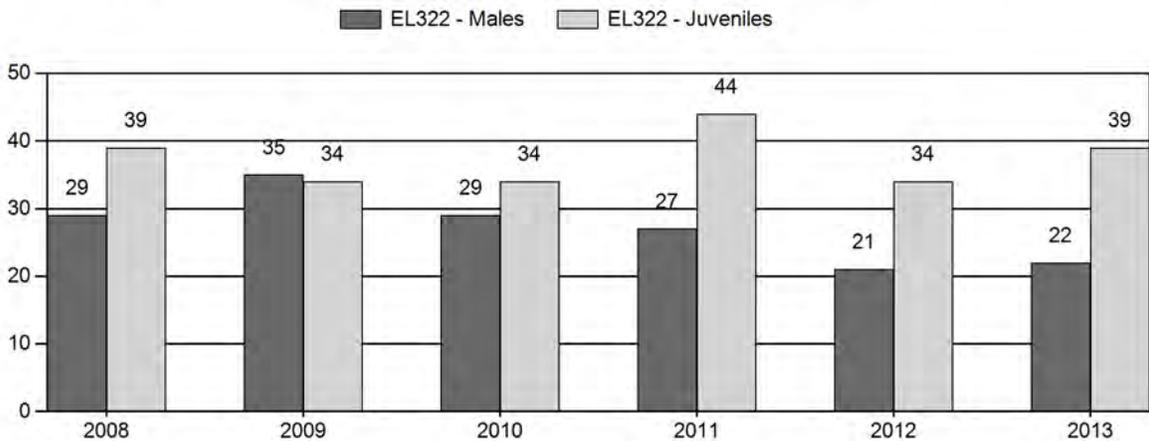
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2013 Postseason Classification Report
for Elk Herd EL322 - SOUTH BIGHORN

Hunt Area	----- Males -----				Female	% of Sample	Juv	% of Sample	Total Sample	Herd Ratios per 100			
	Yrling	Adult	Total Males	% of Sample						Juv to Female	Male to Female	Yearling to Female	Juv to Adult
33	62	64	126	15.9%	437	55.2%	228	28.8%	791	52	29	14	40
34	48	3	51	7.0%	418	57.6%	257	35.4%	726	61	12	11	55
47	24	46	70	40%	81	46.3%	24	13.7%	175	30	86	30	16
48	105	32	137	14.8%	607	65.6%	181	19.6%	925	30	23	17	24
49	21	19	40	7.2%	387	69.2%	132	23.6%	559	34	10	5	31
120	30	43	73	17.3%	294	69.5%	56	13.2%	423	19	25	10	15
TOTAL	290	207	497	13.8%	2,224	61.8%	878	24.4%	3,599	39	22	13	36

**2014 HUNTING SEASONS
SOUTH BIGHORN ELK HERD (EL322)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
33	1	Oct. 9 Nov. 1	Oct. 31 Dec. 15	200	Limited quota licenses; any elk Unused Area 33 Type 1 licenses valid for antlerless elk
	4	Aug. 15	Sep. 30	150	Limited quota licenses; antlerless elk valid on private lands east of Buffalo Creek and the Bar C Road
		Oct. 9	Dec. 15		Unused Area 33 Type 4 licenses valid in the entire area
	6	Oct. 9	Dec. 15	300	Limited quota licenses; cow or calf elk
34	1	Oct. 15 Nov. 16	Nov. 15 Dec. 15	800	Limited quota licenses; any elk Unused Area 34 Type 1 licenses valid for antlerless elk
	6	Oct. 15	Dec. 15	600	Limited quota licenses; cow or calf valid off National Forest
47	1	Oct. 9	Oct. 31	250	Limited quota licenses; any elk
	2	Oct. 9	Oct. 31	25	Limited quota licenses; any elk valid in Fremont County
		Nov. 1	Dec. 21		Unused Area 47 Type 1 and Type 2 licenses valid for antlerless elk
	6	Oct. 9	Dec. 21	300	Limited quota licenses; cow or calf
48	1	Oct. 9	Oct. 31	300	Limited quota licenses; any elk
	4	Oct. 9	Oct. 31	50	Limited quota licenses; antlerless elk
	6	Oct. 9	Oct. 31	500	Limited quota licenses; cow or calf
		Nov. 8	Dec. 14		Unused Area 48 Type 1, Type 4 and Type 6 licenses valid for antlerless elk
49	1	Oct. 9 Nov. 1	Oct. 31 Dec. 21	325	Limited quota licenses; any elk Unused Area 49 Type 1 licenses valid for antlerless elk
	4	Oct. 9	Dec. 21	50	Limited quota licenses; antlerless elk
	6	Aug. 15	Oct. 8	100	Limited quota licenses; cow or calf valid on private land
	7	Oct. 9	Dec. 21	550	Limited quota licenses; cow or calf
120	1	Oct. 9 Nov. 1	Oct. 31 Nov. 30	150	Limited quota licenses; any elk Unused Area 120 Type 1 licenses valid for antlerless elk
	4	Oct. 9	Nov. 30	75	Limited quota licenses; antlerless elk
	6	Oct. 9	Nov. 30	75	Limited quota licenses; cow or calf

Hunt Area	Type	Quota change from 2013
49	1	+25
	6	-50
	7	+50
Herd Unit Total	1	+25
	6	-50
	7	+50

Management Evaluation

Current Postseason Population Management Objective: 2,900

Management Strategy: Recreational

2013 Postseason Population Estimate: ~5,700

2014 Proposed Postseason Population Estimate: ~3,750

Herd Unit Issues

The South Bighorn Elk Herd Unit has a post-season population objective of 2,900 elk with a recreational management strategy. The objective and management strategy were last revised in 1998 when Areas 33 and 34 from the Southeast Bighorn Herd Unit were combined with Areas 47, 48, 49 and 120 from the Upper Nowood-Copper Mountain Herd Unit. The herd has exceeded the population objective since it was created.

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, 4,775 total licenses were issued for the five hunt areas comprising this herd unit. Lack of access continues to hamper efforts to achieve harvest objectives.

Weather

Weather in the South Bighorn Herd Unit turned extremely warm and dry after several good moisture years. The January 2012 Palmer Drought Index for Climate Divisions 4 (Bighorn drainage) and 5 (Powder, Little Missouri and Tongue drainages) showed “extremely moist” and “very moist” conditions, respectively. By January 2013 conditions had progressed to “moderate drought” in Climate Division 4 and “extreme drought” in Climate Division 5. Fall moisture and early snowfall improved conditions by January 2014 when both climate divisions were rated as moderately moist. As of May 20, 2014, total precipitation reported at the Bighorn Basin and Powder River drainage snowtel sites since October 1st was 113% and 117% of normal, respectively.

Habitat

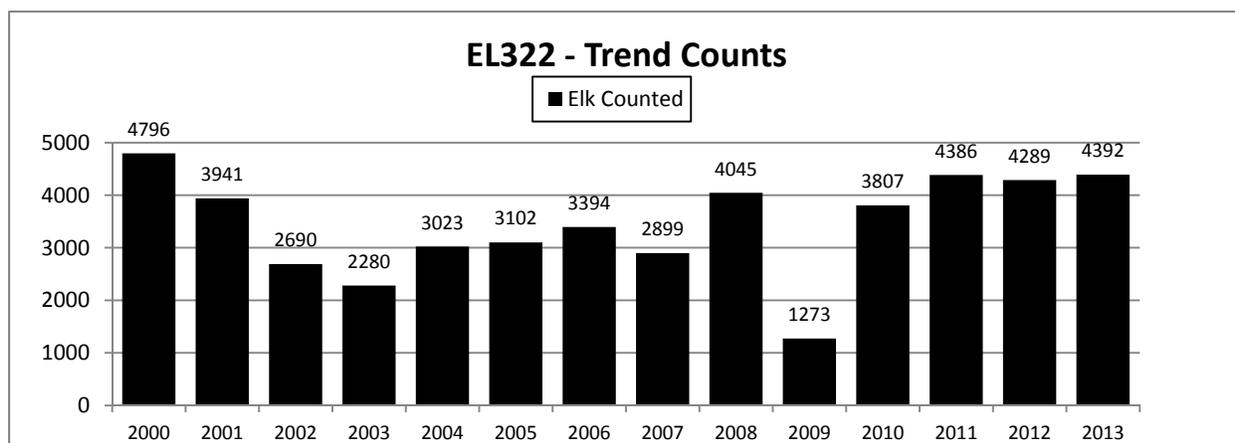
There are no habitat transects for grass production in this herd unit. The South Bighorn Herd Unit is primarily private, state and BLM lands with a limited amount of U.S. Forest Service in Area 34. Cattle and sheep grazing is common. With drought conditions developing in 2012 and

early 2013, heavy utilization occurred. If drought conditions return, landowners may have less tolerance for high elk numbers.

Field Data

Winter trend counts remained relatively stable with 4,392 elk observed in 2013. The count was up from 4,289 elk in 2012 and compares to a high of 4,796 elk observed in 2000 (Figure 1). 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 to the extent predicted by the model. It is anticipated an alternative objective will be selected during the next objective review.

Figure 1. South Bighorn Elk Herd Unit Winter Trend Counts, 2000-2013.



Postseason classifications resulted in herd ratios of 39 calves per 100 cows and 22 bulls per 100 cows. Productivity in this herd is relatively low with the calf ratio averaging 38 per 100 for the five year average. 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.

Harvest Data

Harvest data does not indicate bull numbers, or total elk numbers, are significantly decreasing. Limited license (Type 1 and Type 4) hunter success (41%) remained favorable in 2013 and harvest composition showed 98% of the bull harvest was comprised of adult bulls indicating hunters could be selective and were successful in finding adult bulls.

Active license numbers (~3,600) reached a new high indicating continued hunter interest in these areas. However, harvest and hunter success decreased 22% and 9%, respectively, while hunter effort reached a six year high. More difficult hunting conditions were due in part to a major snowstorm that occurred just prior to the October 9th hunting season opening date, restricting access to upper elevation areas. The slow opener contributed to lower harvest and hunter success. Therefore, harvest objectives were not met due to lower hunter success and 533 unsold antlerless and cow/calf licenses in the five hunt areas. Nearly 40% of the unsold licenses were in Area 34 where hunter access to private lands remains problematic.

Hunter satisfaction responses were very positive reflecting decent hunter success, quality bulls and long seasons. At the herd unit scale, 66% of hunters responded positively about their

hunting experience whereas 19% responded negatively and 15% provided a neutral response. The positive response was down from 77% in 2012, likely due to tougher hunting conditions which resulted in lower hunter success. At the hunt area level, positive responses ranged from 56% in Area 120 to 75% in Area 49.

Hunter access is largely contingent on private land access. Six Walk-in Areas provide access to more than 37,000 acres of private lands and adjacent BLM and state lands, most of which are located in Area 120. In addition, two Hunter Management Areas (HMA) provide hunter opportunity in Areas 47 and 48.

Population

The 2013 post-season population is estimated at about 5,700 elk with the population exhibiting a steep decline from more than 10,000 elk in 2007. This population estimate is generated using an EXCEL spreadsheet model. The Semi-Constant Juvenile/Semi-Constant Adult model (SCJ/SCA) was chosen over the other options because it was the only model that produced a 2013 population estimate above the trend count (63% observed). This population estimate and trend are considered questionable due to poor model alignment (AIC score 734) based on harvest data, postseason classifications and winter trend counts. It is more likely this population is stable to slightly decreasing. Fluctuating bull ratios are contributing to the model's poor performance. Representative bull ratios are difficult to determine because adult bulls are segregated from wintering cow/calf herds with detection varying year to year.

Management Summary

Changes for the 2014 season included extending the Areas 33 and 34 closing dates to mid-December to correspond with Area 48. Running the season later targeted elk that migrate into Area 33 to winter. In addition, an early Area 33 Type 4 season opening was added for private lands in the eastern one-half of the area to address depredation concerns on irrigated hay meadows. The Area 33 Type 4 and Type 6 quotas were increased by 100 and 200 licenses, respectively. The changes resulted in a 39% increase in antlerless harvest. No changes will be made for 2014.

No changes were made for Area 34 where an extended season was implemented last year. License sales, harvest and hunter success decreased, probably due to early snows creating access problems.

In Area 47, increased license quotas resulted in reduced bull harvest and similar antlerless harvest as hunter success fell 24%. Landowners continue to express interest in increasing harvest and have been very involved in the Copper Mountain HMA. Since the Copper Mountain HMA was initiated in 2010, harvest has increased by over 100%. A minor closing date change was made for 2014.

In Area 48, nearly 60 Type 6 licenses went unsold in 2013. Therefore no quota changes were made for 2014. Harvest decreased 34% due to only 35% hunter success (five year average 52%). Type 6 hunters experienced 27% hunter success, primarily because the elk were on inaccessible private land during the hunting season.

In Area 49 an increased Type 6 license quota did not increase harvest as antlerless harvest fell over 20% due to lower hunter success. Quotas have been adjusted for 2014 with earlier Type 6 season opening and closing dates to address private land damage situations.

The liberal season in Area 120 provided for fewer harvested elk as hunter success fell to 43% due to weather related access issues. The same season will be implemented in 2014.

This population is over 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 are minimal this year after notable increases in 2013. For 2014, license quotas totaling 2,025 any elk 2,750 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 2013 total resulting in a questionable postseason population model estimate of 3,750 elk.

INPUT	
Species:	Elk
Biologist:	Dan Thiele
Herd Unit & No.:	South Bighorn Elk
Model date:	03/04/14

Clear form

MODELS SUMMARY		Fit	Relative AICc	Notes
C/J,CA	Constant Juvenile & Adult Survival	714	723	<input type="checkbox"/> C/J,CA Model <input checked="" type="checkbox"/> SCJ,SCA Mod <input type="checkbox"/> TSJ,CA Model <input type="checkbox"/> TSJ,CA,MSC Model
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	723	734	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	383	494	
TSJ,CA,MSC	Time-Specific Juv, Constant Adult Survival, Male survival coefficient	499	588	

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population		Predicted Posthunt Population		Total	Objective			
	Field Est	Field SE		Juveniles	Total Males	Females	Total			Juveniles	Total Males	Females
1996			4246	2798	1706	7193	11697	2688	1487	6797	10872	2900
1997			3616	2723	2398	7602	12723	2665	2011	7038	11714	2900
1998			3484	3493	2637	7563	13693	3392	2251	7151	12794	2900
1999			4383	2411	3054	7856	13320	2233		7307	12052	2900
2000			4796	3060	3020	7719	13799	2885	2508	7012	12405	2900
2001			3941	2320	3179	7593	13092	2157	2664	6902	11724	2900
2002			2690	3386	3151	7303	13840	3226	2658	6655	12540	2900
2003			2280	2488	3411	7329	13228	2318	2866	6601	11784	2900
2004			3023	2780	3388	7048	13216	2642	2687	6504	11833	2900
2005			3102	2292	3294	7034	12620	2180	2719	6395	11293	2900
2006			3394	2235	3209	6812	12257	2129	2644	6172	10944	2900
2007			2899	2086	3123	6581	11789	1973	2532	5938	10443	2900
2008			4045	2325	2975	6313	11612	2177	2293	5645	10115	2900
2009			1273	1900	2791	6076	10768	1796	2199	5351	9346	2900
2010			3807	1853	2604	5693	10150	1694	1850	4924	8468	2900
2011			4386	2110	2236	5249	9596	2017	1648	4554	8219	2900
2012			4289	1429	2119	4967	8515	1322	1307	3919	6549	2900
2013			3599	1444	1612	4171	7227	1323	1021	3351	5694	2900
2014				971	1331	3614	5916	850	605	2294	3749	2900
2015												2900
2016												2900
2017												2900
2018												2900
2019												2900
2020												2900
2021												2900
2022												2900
2023												2900
2024												2900
2025												2900

Survival and Initial Population Estimates

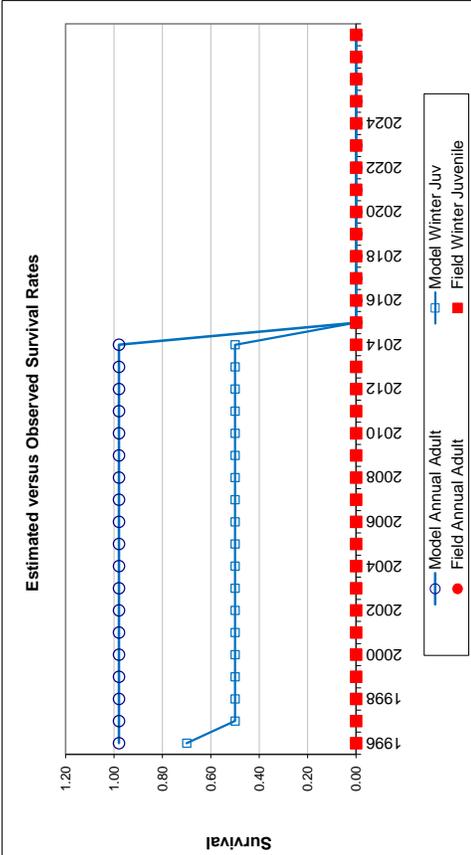
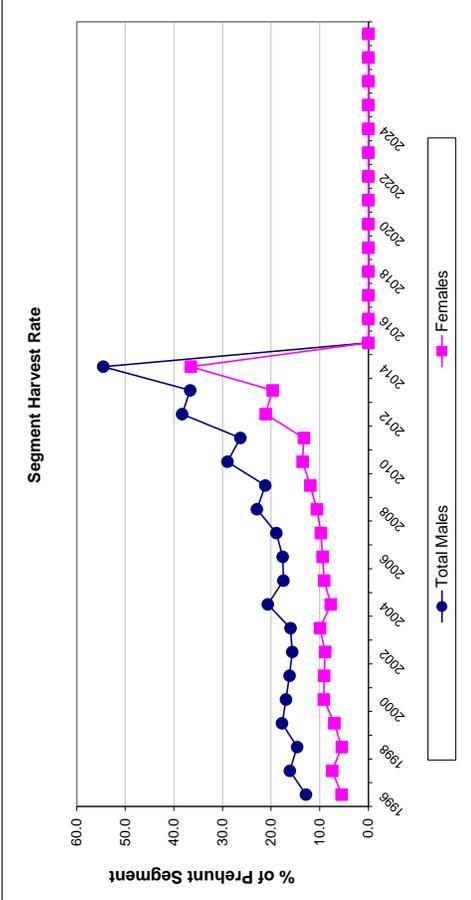
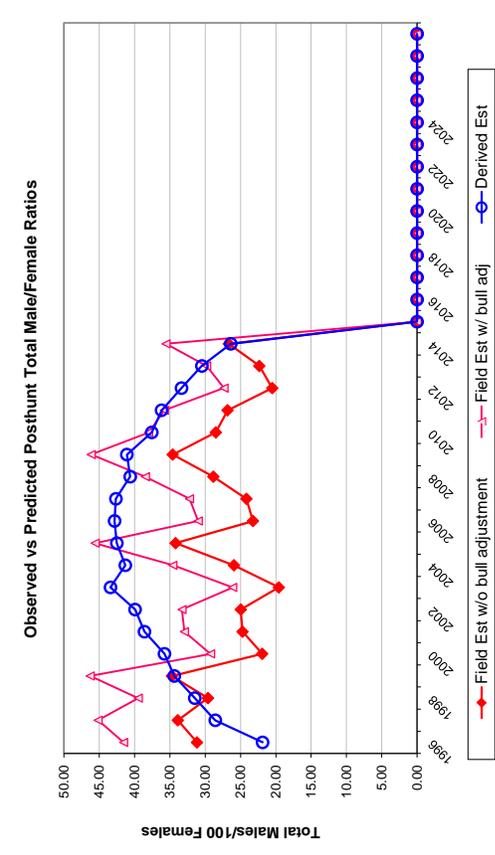
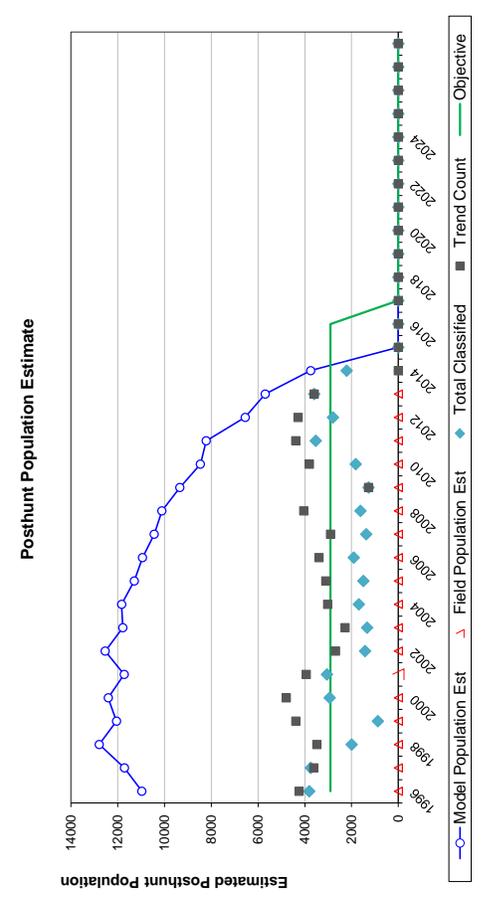
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1996	0.70		0.98	
1997	0.50		0.98	
1998	0.50		0.98	
1999	0.50		0.98	
2000	0.50		0.98	
2001	0.50		0.98	
2002	0.50		0.98	
2003	0.50		0.98	
2004	0.50		0.98	
2005	0.50		0.98	
2006	0.50		0.98	
2007	0.50		0.98	
2008	0.50		0.98	
2009	0.50		0.98	
2010	0.50		0.98	
2011	0.50		0.98	
2012	0.50		0.98	
2013	0.50		0.98	
2014	0.50		0.98	
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.500
Adult Survival =		0.980
Initial Total Male Pop/10,000 =		0.149
Initial Female Pop/10,000 =		0.680

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Total Bulls Adjustment Factor	75%

Year	Classification Counts										Harvest				Segment Harvest Rate (% of Prehunt Segment)		
	Juvenile/Female Ratio					Total Male/Female Ratio					Juv	Yrl males	2+ Males	Females	Total Harvest	Total Males	Females
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/ bull adj	Field Est w/o bull adj	Field SE										
1996											100	37	162	360	659	12.8	5.5
1997		39.54	1.57	21.88	41.56	31.17	1.35	28.57	45.18	33.88	52	80	272	513	917	16.1	7.4
1998		37.87	1.55	28.57	45.18	33.88	1.44	31.48	39.48	29.61	92	57	294	375	818	14.6	5.5
1999		47.43	2.49	31.48	39.48	29.61	1.84	34.37	46.29	34.72	161	97	396	499	1153	17.8	7.0
2000		30.57	2.74	34.37	46.29	34.72	2.97	35.77	29.24	21.93	159	48	417	643	1267	16.9	9.2
2001		41.14	1.80	35.77	29.24	21.93	1.22	38.60	32.96	24.72	148	83	385	628	1244	16.2	9.1
2002		31.26	1.45	38.60	32.96	24.72	1.25	39.93	33.29	24.97	145	17	431	569	1182	15.6	8.9
2003		48.48	2.96	39.93	33.29	24.97	1.95	43.41	26.11	19.58	155	33	463	662	1313	16.0	9.9
2004		35.11	2.34	43.41	26.11	19.58	1.65	41.31	34.58	25.94	125	48	589	495	1257	20.7	7.7
2005		40.63	2.37	41.31	34.58	25.94	1.79	42.51	45.59	34.20	102	78	445	581	1206	17.5	9.1
2006		34.08	2.27	42.51	45.59	34.20	2.27	42.83	30.99	23.24	97	31	483	582	1193	17.6	9.4
2007		34.49	1.96	42.83	30.99	23.24	1.54	42.64	32.23	24.17	103	47	490	584	1224	18.9	9.8
2008		33.22	2.25	42.64	32.23	24.17	1.85	40.62	38.47	28.85	134	67	553	607	1361	22.9	10.6
2009		38.57	2.35	40.62	38.47	28.85	1.96	41.10	46.15	34.61	95	31	507	659	1292	21.2	11.9
2010		33.55	2.43	41.10	46.15	34.61	2.48	37.56	38.01	28.51	144	73	613	699	1529	29.0	13.5
2011		34.41	1.81	37.56	38.01	28.51	1.81	36.18	35.79	26.84	85	43	492	632	1252	26.3	13.2
2012		44.28	1.76	36.18	35.79	26.84	1.28	33.36	27.34	20.51	97	83	655	953	1788	38.3	21.1
2013		33.74	1.58	33.36	27.34	20.51	1.17	30.47	29.80	22.35	110	10	527	746	1393	36.7	19.7
2014		39.48	1.57	30.47	29.80	22.35	1.11	26.67	35.56	26.67	110	60	600	1200	1970	54.5	36.5
2015		37.04	1.94	26.67	35.56	26.67	1.58										
2016																	
2017																	
2018																	
2019																	
2020																	
2021																	
2022																	
2023																	
2024																	
2025																	

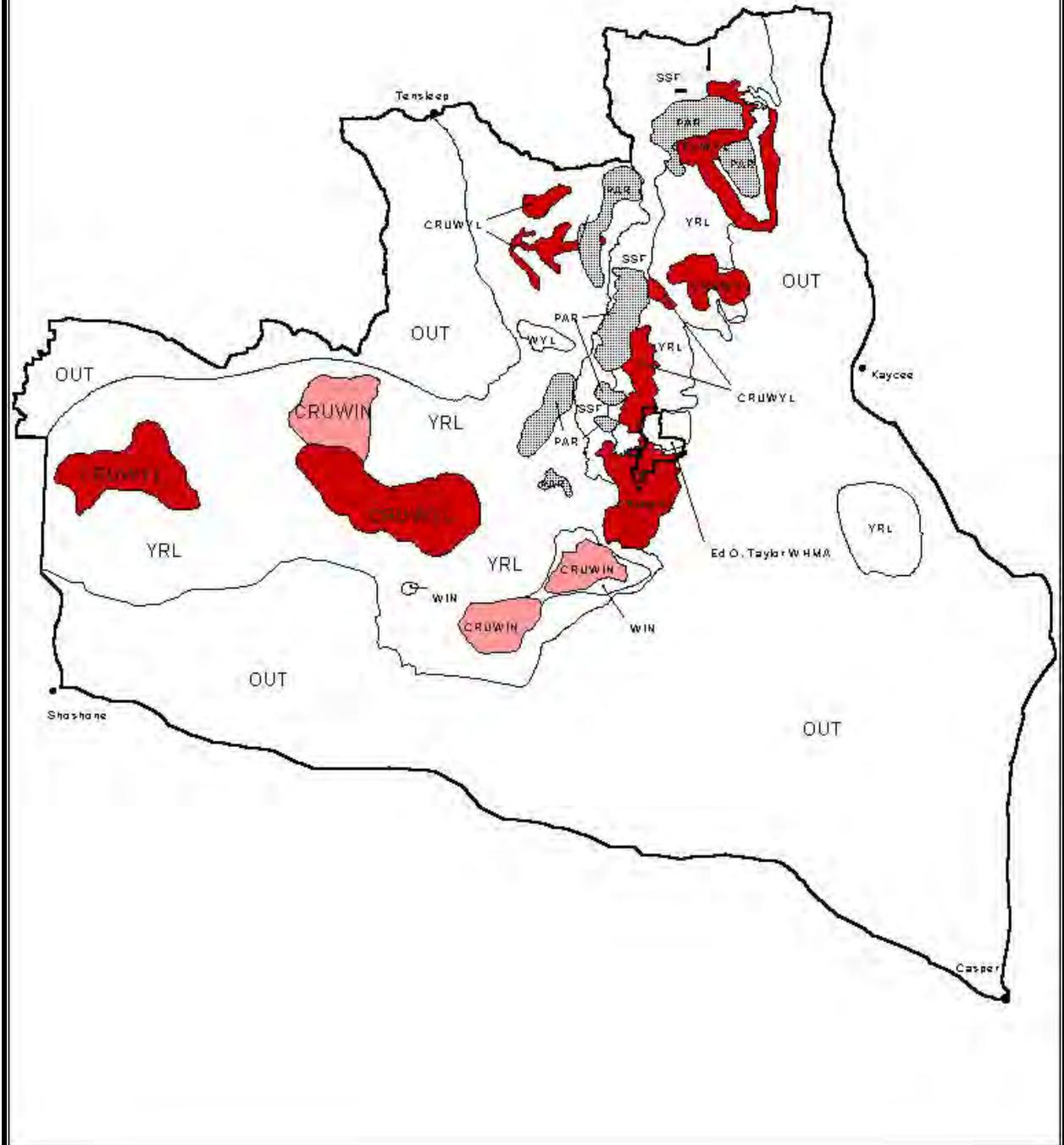
FIGURES



Comments: Unreliable model output possibly due to widely fluctuating bull cow ratios.

END

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



2013 - JCR Evaluation Form

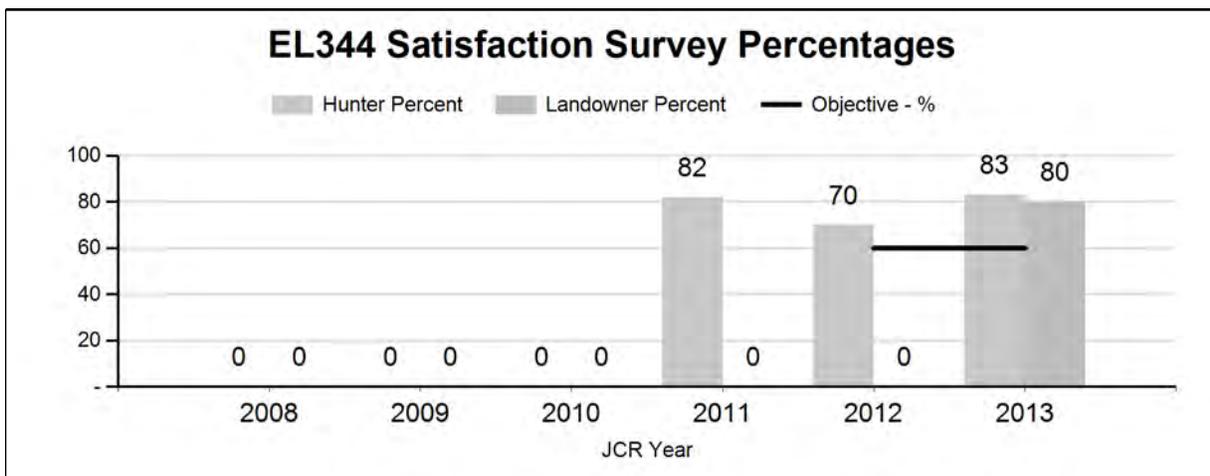
PERIOD: 6/1/2013 - 5/31/2014

HERD: EL344 - ROCHELLE HILLS

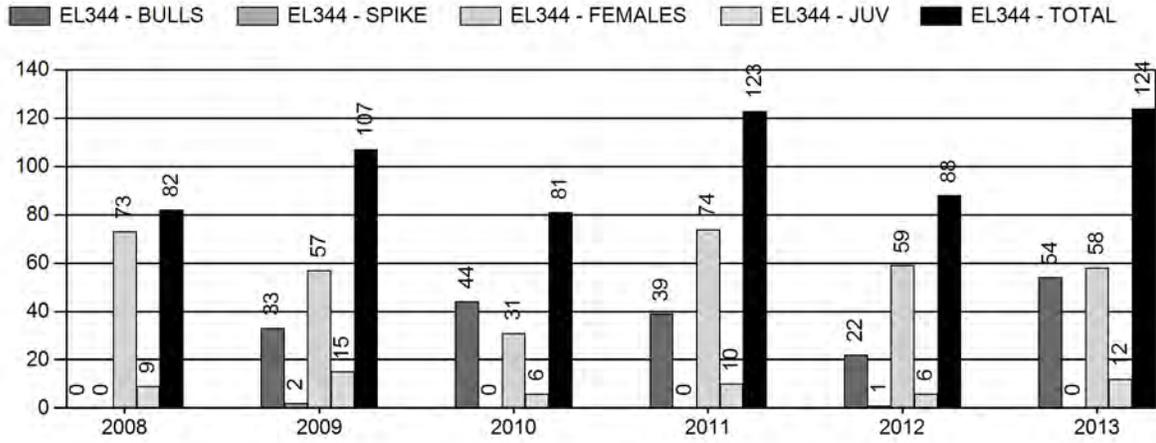
HUNT AREAS: 113, 123

PREPARED BY: ERIKA PECKHAM

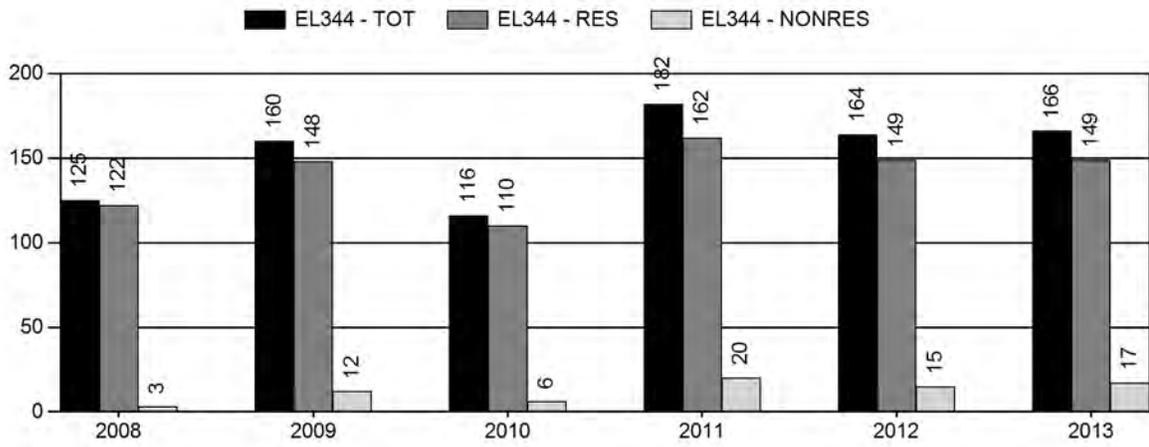
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Hunter Satisfaction Percent	76%	83%	60%
Landowner Satisfaction Percent	0%	80%	60%
Harvest:	96	127	60
Hunters:	149	170	85
Hunter Success:	64%	75%	71%
Active Licenses:	149	71%	85
Active License Percentage:	64%	71%	71%
Recreation Days:	620	780	400
Days Per Animal:	6.5	6.1	6.7
Males per 100 Females:	46	58	
Juveniles per 100 Females	43	44	
Satisfaction Based Objective			60%
Management Strategy:			Private
Percent population is above (+) or (-) objective:			22%
Number of years population has been + or - objective in recent trend:			0



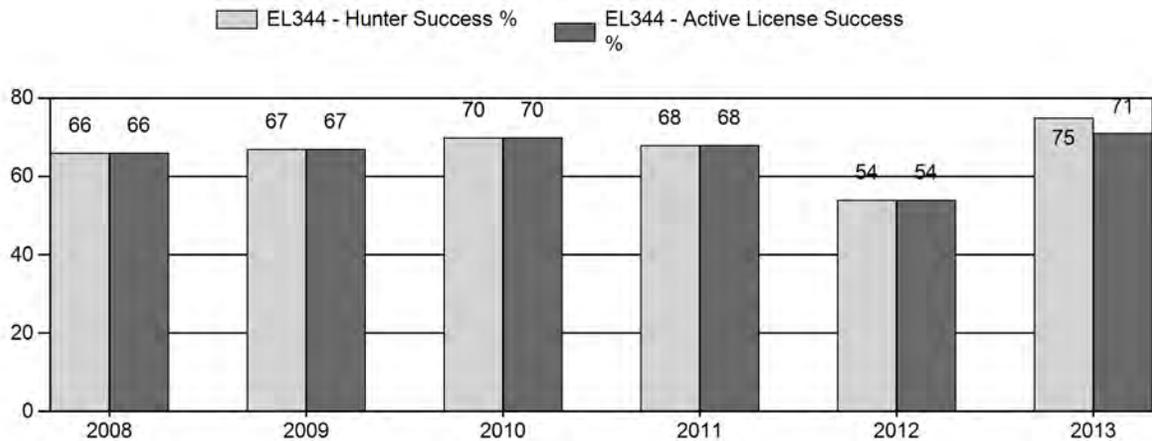
Harvest



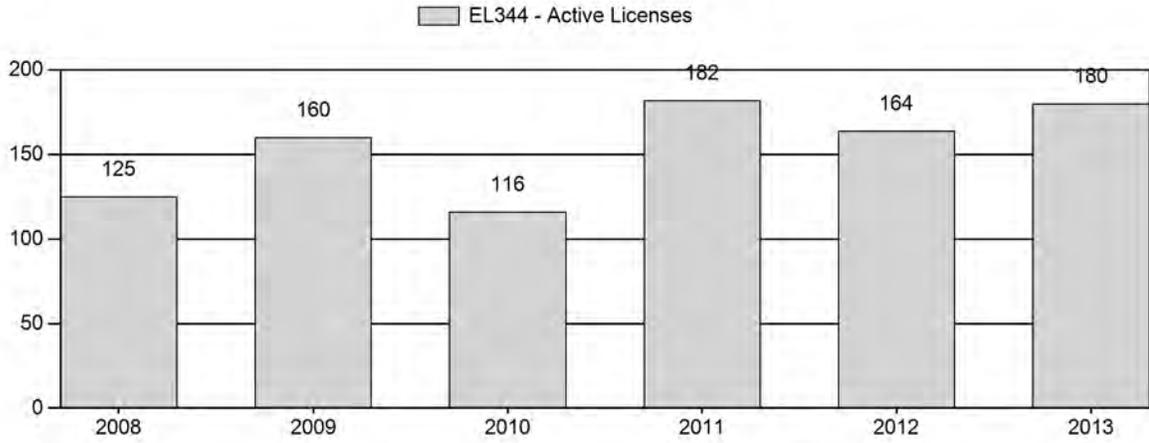
Number of Hunters



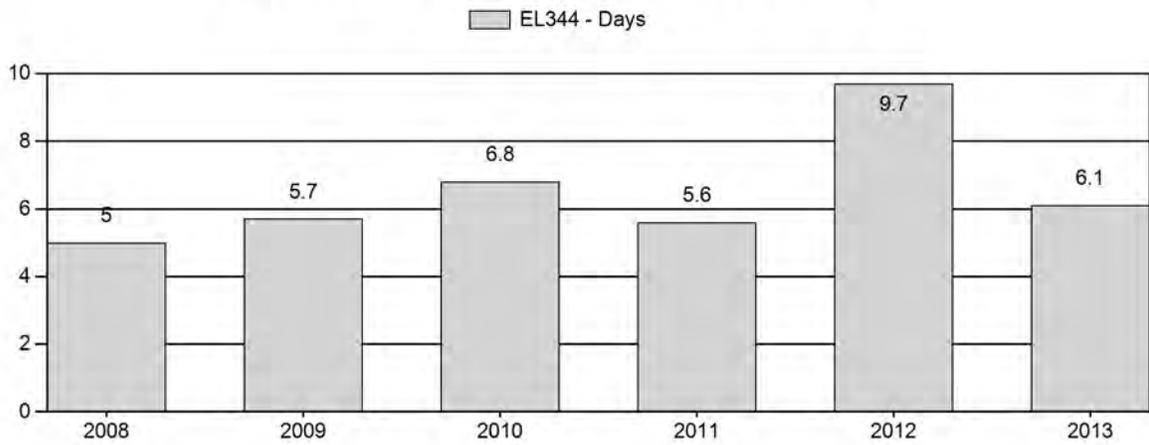
Harvest Success



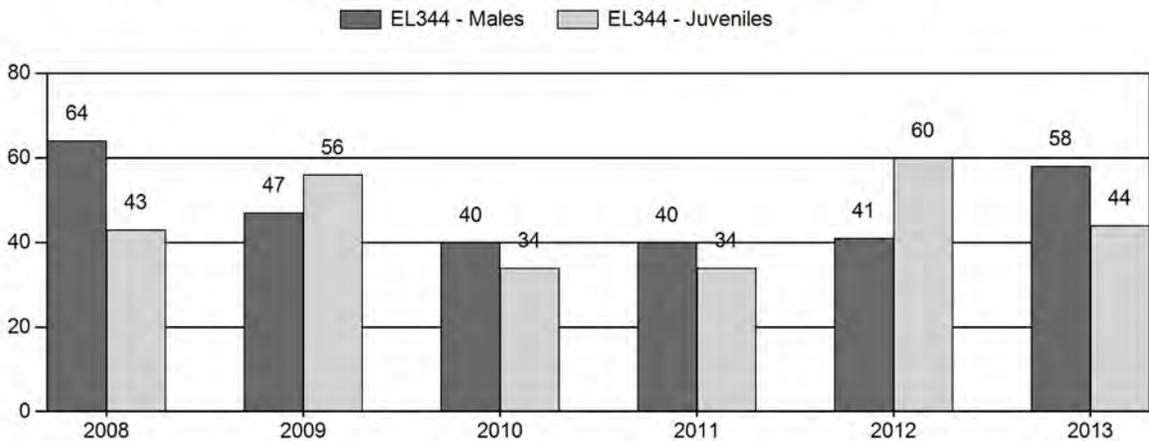
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Elk Herd EL344 - ROCHELLE HILLS

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	712	36	107	143	31%	223	48%	97	21%	463	313	16	48	64	± 4	43	± 3	27
2009	754	67	53	120	23%	254	49%	141	27%	515	443	26	21	47	± 0	56	± 0	38
2010	728	68	57	125	23%	316	58%	106	19%	547	350	22	18	40	± 1	34	± 1	24
2011	741	68	57	125	23%	316	58%	106	19%	547	329	22	18	40	± 3	34	± 2	24
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 HUNTING SEASONS

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
113	1	Nov. 5	Nov. 30	50	Limited quota licenses; any elk
123	4	Oct. 20	Nov. 30	50	Limited quota licenses; antlerless elk
Archery		Sep. 1	Sep. 30		

Hunt Area	Type	Quota change from 2013
113	1	+50
	4	-25
123	1	-75
	6	-50
Herd Unit Total	1	-25
	4	-25
	6	-50

Management Evaluation

Current Landowner/Hunter Satisfaction Management Objective: 60%

Management Strategy: Private Land

Hunter Satisfaction Estimate: 80%

Landowner Satisfaction Estimate: >60%

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 management strategy. The objective and management strategy were last revised in 2012.

A difficulty with managing this herd is 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 not always the same. The elk tend to concentrate in certain areas at particular times of the year so perceptions differ on the number of licenses needed to manage harvest.

Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal. The winter of 2012-2013 was mild and 2013-14 was moderate, though neither experienced much for snow accumulation nor prolonged snow cover. Early October 2013 produced a non-typical snowstorm in excess of two feet in certain areas. Although the winter of 2013-2014 experienced periods of sub-zero temperatures, it was not combined with heavy snowfall and would typically experience a melt, leaving bare ground in areas. During the majority of these two winters, the ground was open, with minimal snowpack. In general, during the spring and summer of 2013 the range conditions were favorable, although there were areas in this herd unit that experienced drier more drought-like conditions.

Habitat

There is no habitat transect located within in the herd unit. Observations from field personnel indicated that some portions of this herd unit received moderate rainfall throughout the growing season, resulting in excellent forage production. In general it was noted that the the southern portion of this herd unit experienced drier conditions with less forage production.

Field Data

During the aerial classification survey in December 2013 there were 194 individuals classified, however due to time constraints, it is likely that many more were missed. In 2013 the calf to cow ratio was 44 per 100, down from last year's observed ratio of 60. It should be noted that the sample size this year was the smallest in the last nine years. The number of animals classified has fluctuated over the past several years, however, in general has been on an upward trend. In 2013 the elk appeared to be spread out and in smaller groups than previously seen. Typically Hunt Area 123 has a large group of elk. During this classification survey this group was missed. With limited flight time, the best habitat that is known to contain elk was searched; in this case they were not located in these areas. One problem associated with the management of this herd is achieving adequate sample sizes during classification surveys. This is a large geographical area, with steep, forested terrain, which makes for difficulty in spotting elk in the budgeted flight time. A mid-winter trend count was flown on March 3, 2014 in Hunt Area 123. This flight allowed for detection of the large herd that was not found during the post-season classifications. Elk were scattered throughout the area in small groups, with one large group of around 200 elk. Overall, this population has likely been increasing over the years, based on field personnel and landowner observations.

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 83% of hunters were satisfied with the 2013 season. An annual landowner meeting is held in January for Hunt Area 123. As this hunt area is predominantly private, it is crucial that a meeting is held to acquire feedback from the landowners. At this meeting 50% of landowners were in favor of the season. As Hunt Area 113 has more public access, it was decided that personnel would meet individually with landowners. Of these, 80% were satisfied with the season. The overall landowner satisfaction for this herd unit was 62%.

Harvest

Historically, this herd has been hunted conservatively, with Hunt Areas 113 and 123 being closed for two years at a time to allow for trophy bull growth. While this regimen of hunting seasons had the potential to produce high quality bulls, it has also resulted in very high bull to cow ratios in the past. The classification of 2013 showed 58 bulls per 100 cows. This herd has great potential for continued growth if access cannot be somewhat improved, particularly in Area 123. In portions of Hunt Area 113 there is a fair amount of public land, which allows for a reasonable harvest. The overall harvest success was at 75% for this herd unit, which is notably higher than the statewide harvest success rate of 51%.

Population

The Rochelle Hills elk herd population appears to have increased in recent years. There is no working population model for this herd. Various factors contribute to not having a reliable model for this herd. Firstly, there is known immigration and emigration to and from this herd. The 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. The 2013 field estimate is around 750 elk.

Management Summary

In 2013 there were Type 1, Type 4 and Type 6 licenses issued in Hunt Area 123 and just Type 4 licenses issued for Hunt Area 113. For 2014, in Hunt Area 113, the Type 1 licenses issued will focus on attaining a reasonable bull harvest in a desirable public lands area, while the Type 4 licenses that are available in Hunt Area 123 will address concerns that landowners have with elk numbers continuing to expand.

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

