2010 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2010 - 5/31/2011

HERD: PR202 - BIG HORN

HUNT AREAS: 79, 116 | PREPARED BY: TOM EASTERLY

	2005 - 2009 Average	2010	2011 Proposed
Population:	0	N/A	N/A
Harvest:	18	32	65
Hunters:	34	40	80
Hunter Success:	53%	80%	81%
Active Licenses:	34	40	80
Active License Percent:	53%	80%	81%
Recreation Days:	206	140	500
Days Per Animal:	11.4	4.4	7.7
Males per 100 Females	52	35	
Juveniles per 100 Females	60	50	

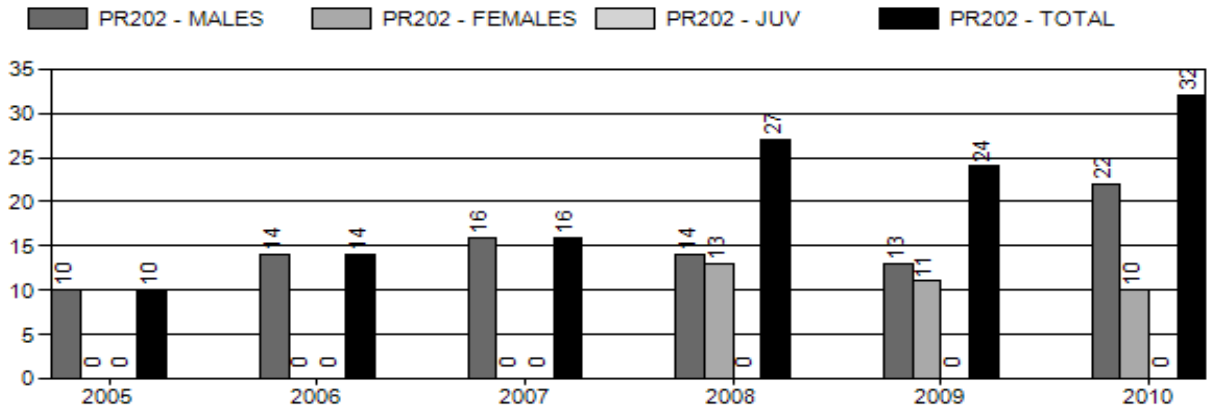
Population Objective:	N/A
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	N/A
Number of years population has been + or - objective in recent trend:	0
Model Date:	None

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

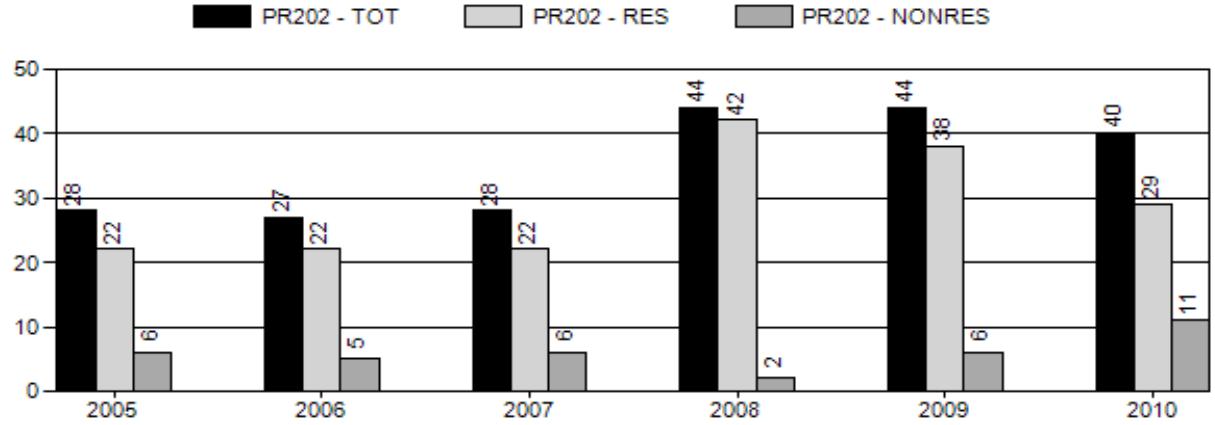
	JCR Year	Proposed
Females ≥ 1 year old:		
Males ≥ 1 year old:		
Juveniles (< 1 year old):	**There is no population objective or model for this herd unit.**	
Total:		
Proposed change in post-season population:		

Population Size - Postseason

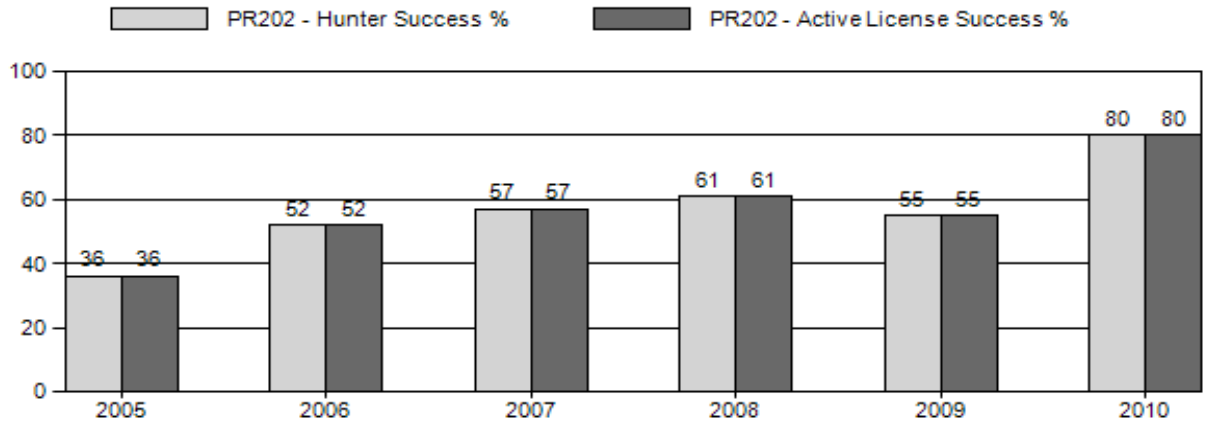
Harvest



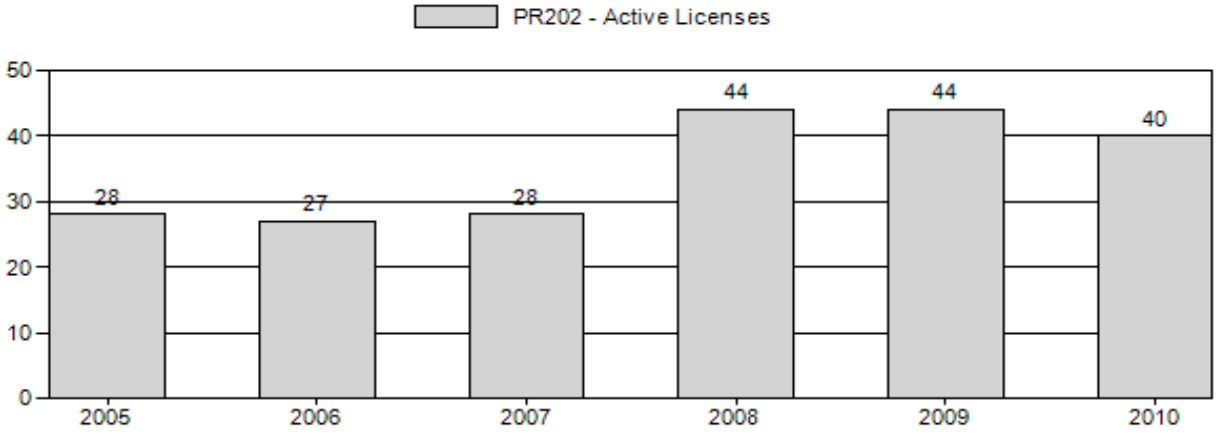
Number of Hunters



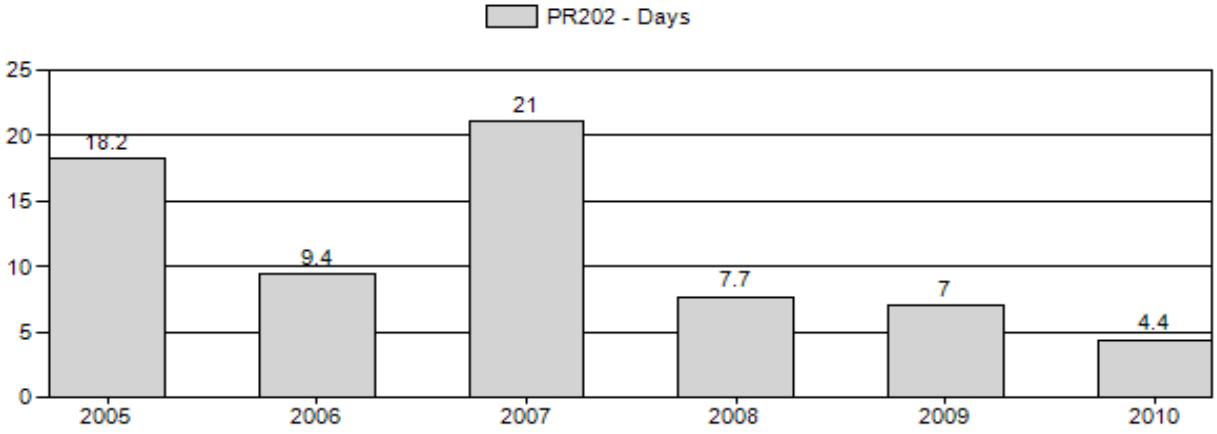
Harvest Success



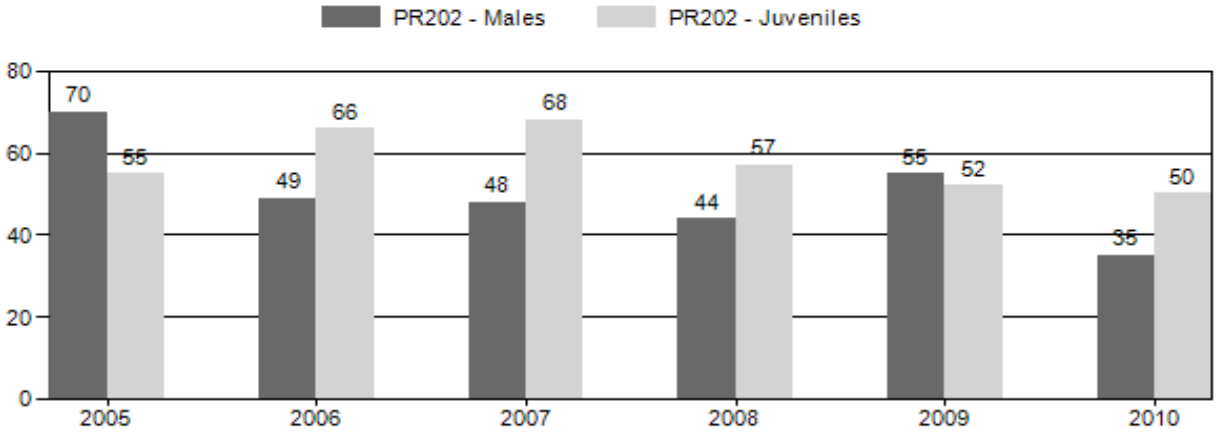
Active Licenses



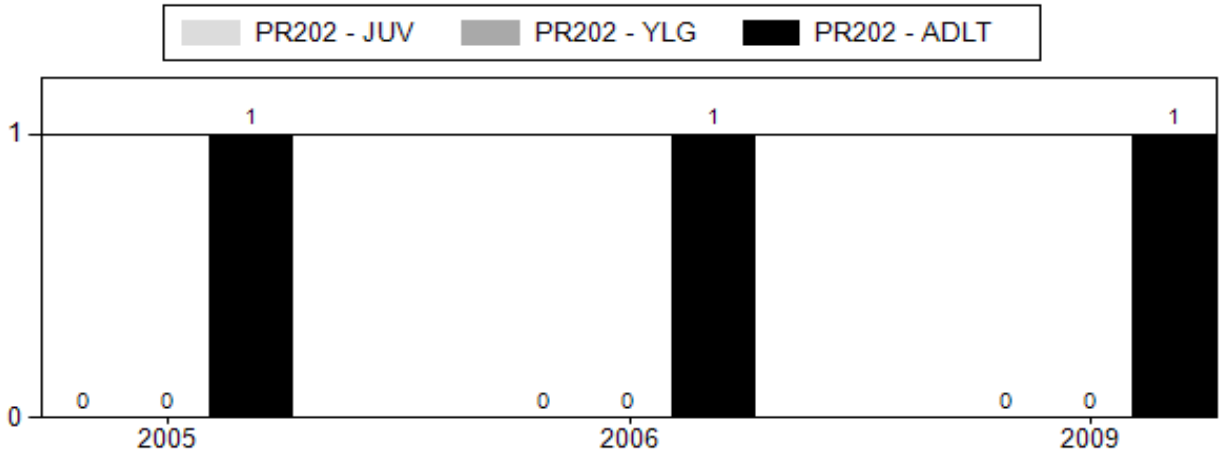
Days Per Animal Harvested



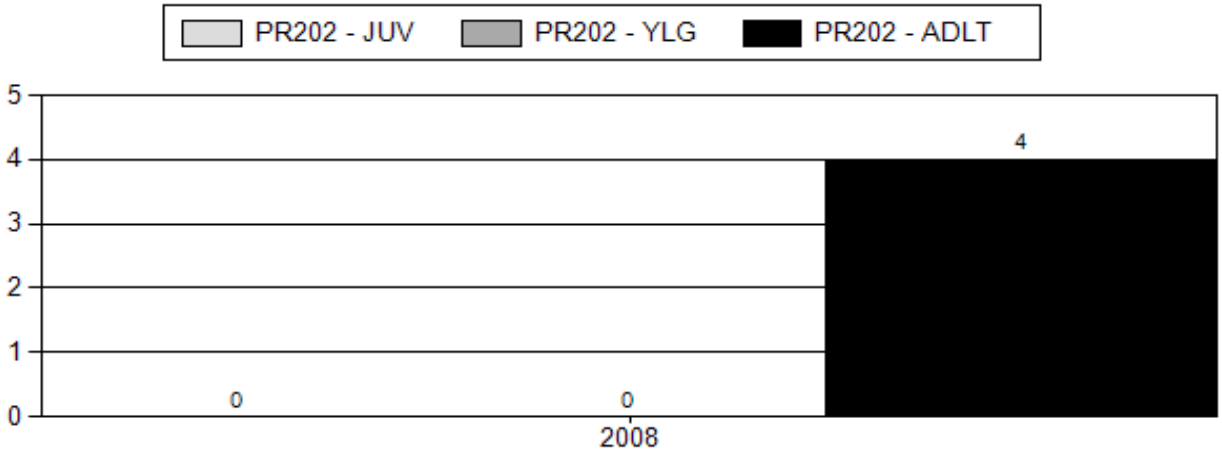
Preseason Animals per 100 Females



Age Structure Data (Field and Laboratory) - Male



Age Structure Data (Field and Laboratory) - Female



2011 Proposed HUNTING SEASONS
Big Horn Pronghorn Antelope Herd Unit (PR202)

HUNT AREA	TYPE	Season Dates OPENS	CLOSES	LIMITATIONS
79, 116	9	Aug 15	Sept 30	Limited Quota; 30 licenses any antelope, archery only
116	6	Sept. 1	Oct 31	Limited Quota; ~~30~~ 50 licenses doe or fawn valid in that portion of Area 116 north of the Shell Canal or south of Wyoming Highway 31

Summary of proposed changes:

Hunt Area	Type	Change from 2010
116	6	Increase by 20 licenses

JUSTIFICATION

An increase in doe/fawn licenses is proposed to address depredation to crops on private land. Landowners have experienced crop depredation for the last several years. Landowner concerns have not been adequately addressed with only 20 doe/fawn licenses offered since 2008. We hope an increase of 30 licenses will sufficiently decrease antelope numbers in crops. Antelope congregate on cropland north of the Shell Canal in Hunt Area 116. Those crop areas represent the best late summer habitat in Area 116. Antelope will always be drawn to those sites regardless of the population level. At higher populations, however, landowner tolerance may be exceeded. Limited rifle licenses for does/fawns were issued for this area in 1999, 2000, 2008-10.

Fawn:doe ratios have also been decreasing in recent years (2008-10). Lower recruitment and higher doe/fawn harvest will result in a lower population. We should maintain relatively constant effort to locate antelope during classification surveys so that changes in population may be detected.

There is no population model or estimate for this herd unit; thus, no population objective exists as a management goal. Insufficient data had been collected in the past for reliable buck:doe and fawn:doe ratios.

In recent years, more antelope have been observed during classification surveys, suggesting the population may be increasing. Between 2000 and '05, the number of antelope surveyed ranged 89-166. More recently (2006-2009), over 200 antelope were classified each year (range=232-266). In 2010, 133 antelope were classified in Area 116 (50 fawns:100 does:35 bucks). No survey was conducted in Area 79. Buck:doe ratios have been decreasing in this herd unit. In 2005, there were 70 bucks:100 does observed. Between 2006 and 2008, ratios decreased to 49, 48 and 44 per 100 does, respectively. In 2009, 55 bucks:100 does was observed.

These Hunt Areas are the only areas in the state with only archery hunting (Type 9 licenses) opportunities. Archery hunters in these areas are very successful (73% in 2010); almost as successful as rifle hunters in other hunt areas (96.5% statewide total). High hunter success may be impacting buck:doe ratios. We propose to remain conservative; offering only 30 licenses. If buck ratios continue to decline, license numbers may need to be decreased in the future.

2010 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2010 - 5/31/2011

HERD: PR203 - COPPER MOUNTAIN

HUNT AREAS: 76, 114-115 | PREPARED BY: BART KROGER

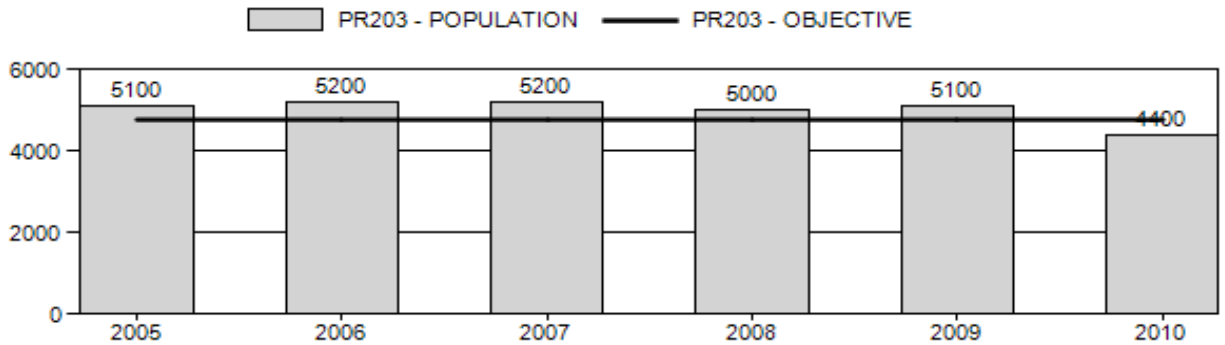
	2005 - 2009 Average	2010	2011 Proposed
Population:	5,120	4,400	4,000
Harvest:	376	731	725
Hunters:	398	755	750
Hunter Success:	94%	97%	97%
Active Licenses:	447	900	900
Active License Percent:	84%	81%	81%
Recreation Days:	1,586	3,172	3,100
Days Per Animal:	4.2	4.3	4.3
Males per 100 Females	44	48	
Juveniles per 100 Females	59	48	

Population Objective:	4,800
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-8.3%
Number of years population has been + or - objective in recent trend:	1
Model Date:	5/31/2011

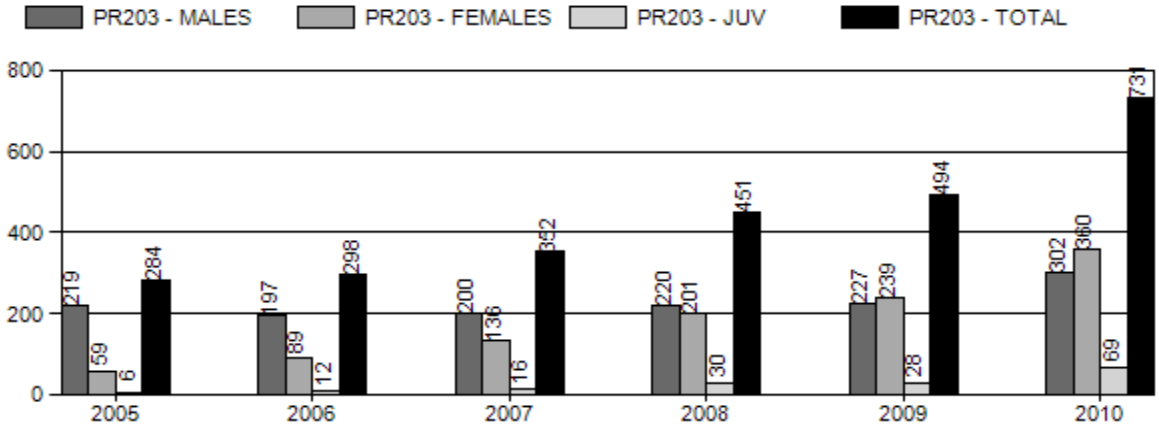
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	14.3%	16%
Males ≥ 1 year old:	21%	25%
Juveniles (< 1 year old):	5.7%	4%
Total:	14.1%	15%
Proposed change in post-season population:	-14%	-9%

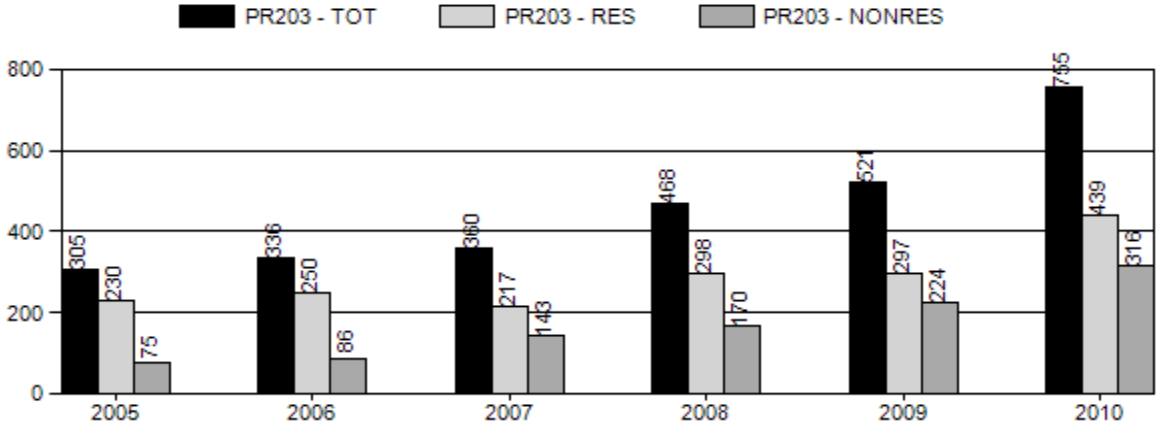
Population Size - Postseason



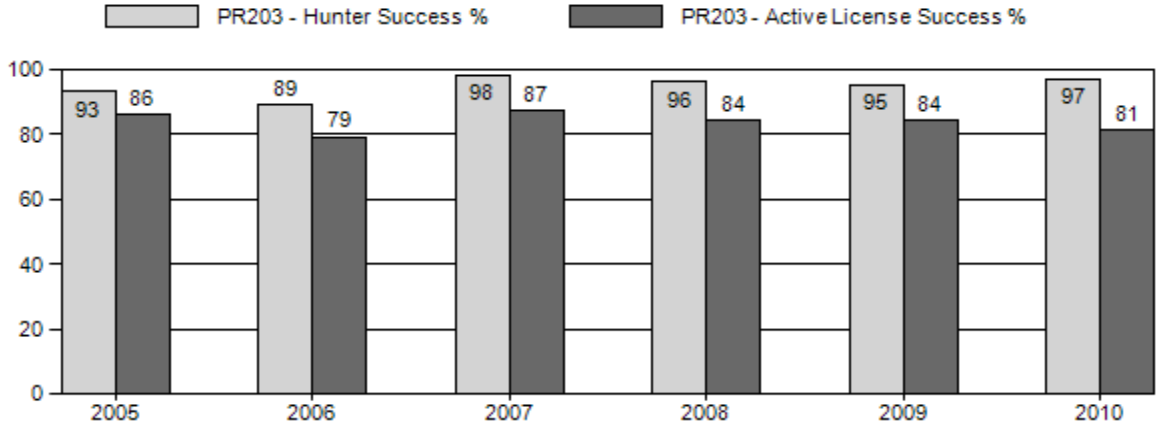
Harvest



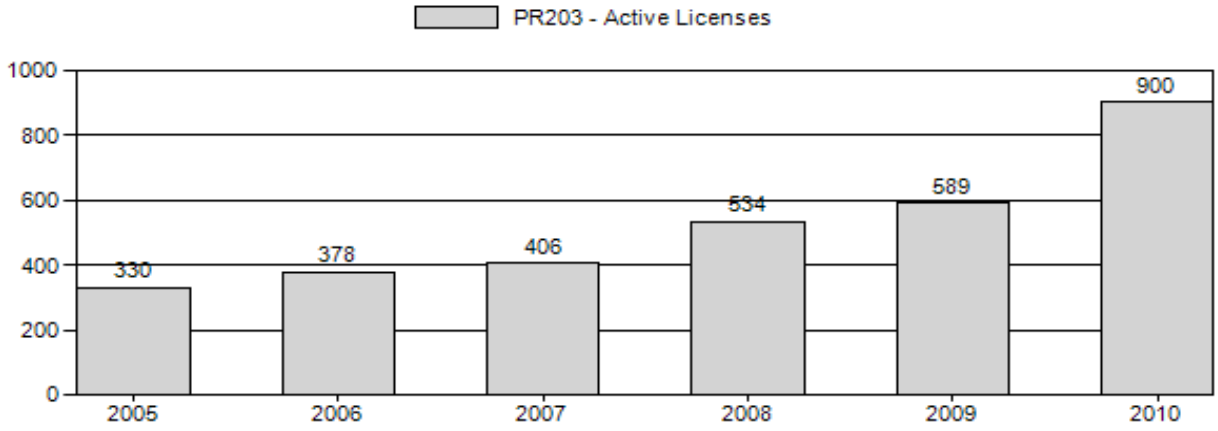
Number of Hunters



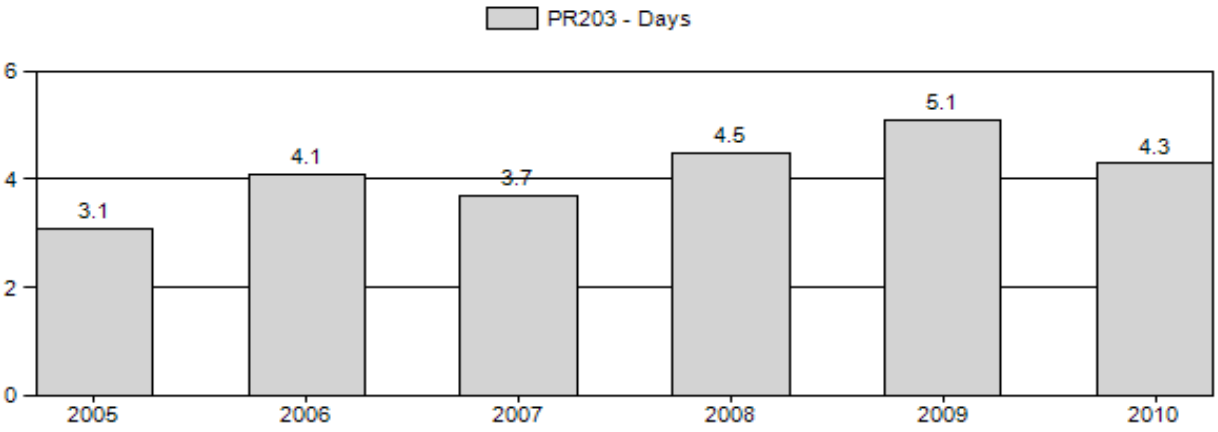
Harvest Success



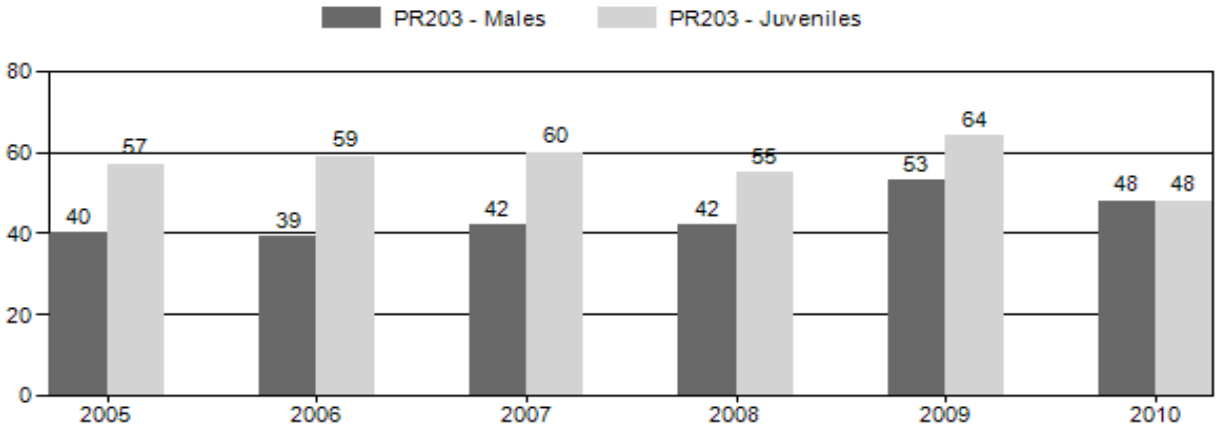
Active Licenses



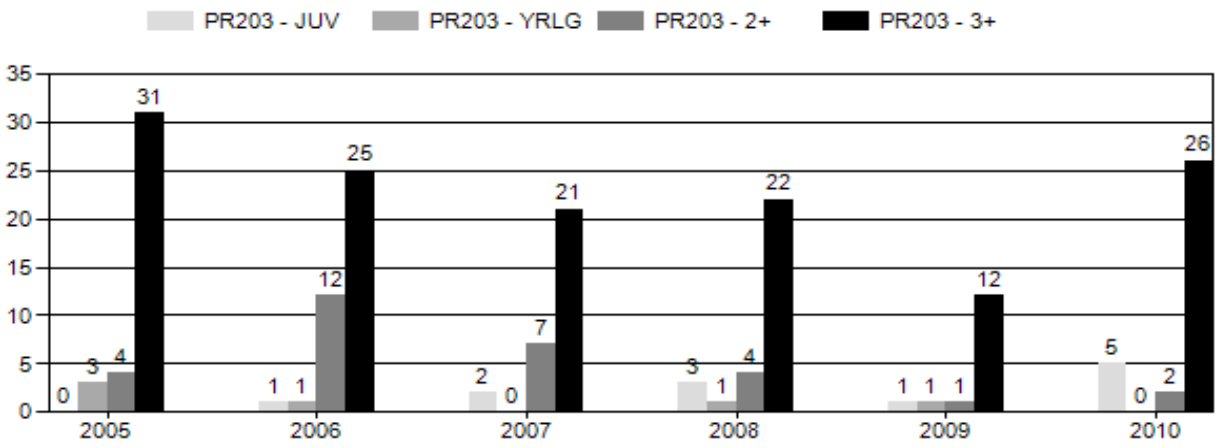
Days Per Animal Harvested



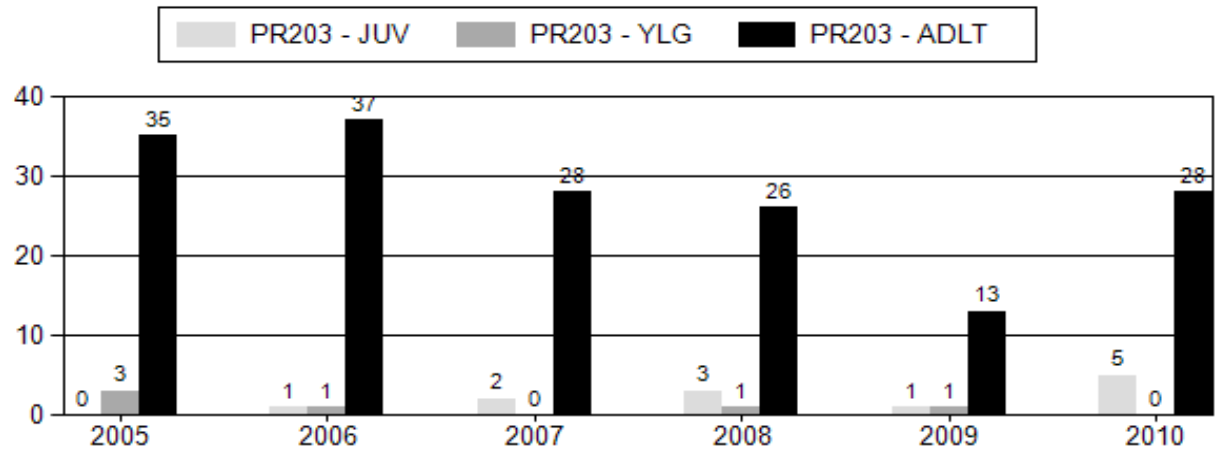
Preseason Animals per 100 Females



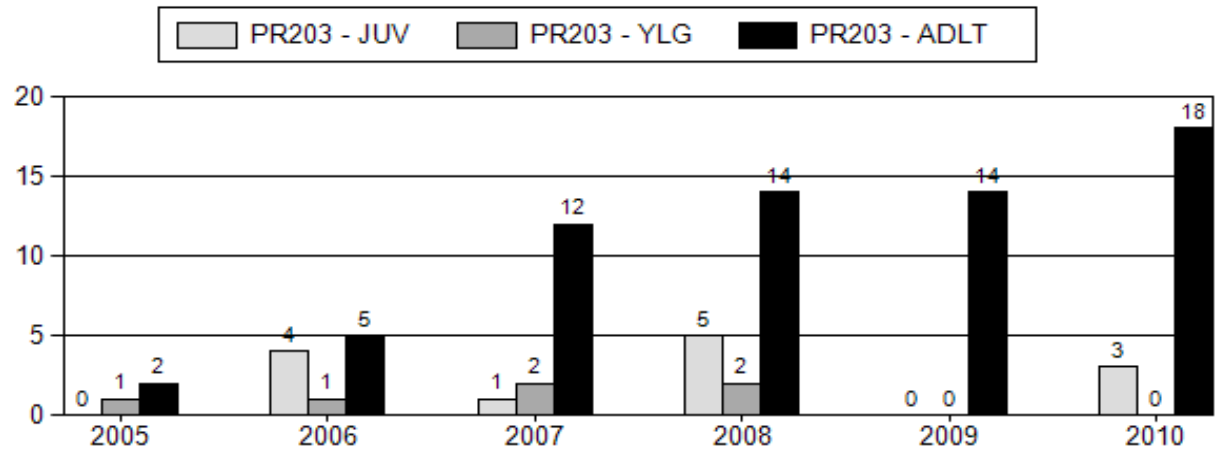
Age Structure of Field Checked Males



Age Structure Data (Field and Laboratory) - Male



Age Structure Data (Field and Laboratory) - Female



INTRODUCTION

This Copper Mountain herd unit consists of three hunt areas (76, 114 & 115) lying east of the Big Horn River, in the southeastern portion of the Big Horn Basin. The population objective for this herd is 4,800, which is managed under recreational management criteria. The 2010 post-season population estimate is 4,400 or slightly below (8%) objective. For the most part, this population has remained mostly stable the past few years, but declined slightly in 2010. These estimates and trends reflect both field personnel perceptions and harvest statistics trends. Higher densities of pronghorn occur is the southern portion of herd unit along the upper slopes of Copper Mountain and the upper Nowood area. Pronghorn utilizing the low elevation desert country are at low densities, and in some cases are struggling to maintain current numbers. Nearly the entire herd unit is considered occupied habitat. Approximately 120,000 acres of sagebrush/grass communities burned in the herd unit in August 1996, which has now resulted in monotypic stands of cheatgrass. Declines in habitat due to cheat grass invasion along with increasing private land damage concerns appear to be the main management issues with this pronghorn herd.

WEATHER

Based on Palmer Severity Indices, drought conditions have persisted over most of the Big Horn Basin from the late 1990's through the mid 2000's (Appendix A). Starting in 2008, these drought conditions moderated, with mostly normal annual temperatures and moisture levels. Spring moisture levels in 2009 and 2010 where about 75% above normal. This increased moisture has provided needed water to help fill stock ponds, guzzlers, replenish depleted water tables and restore vigor growth on shrub communities.

Winter conditions during 2008 and 2009 were mostly favorable for pronghorn, with higher than normal winter temperatures and below normal winter snow fall. However, the winter 2010 supported normal snow fall, and below normal temperatures. This resulted in deep snows persisting through most of the winter period. Periodic melting and freezing of snow produced a hard crust layer, which made for difficult travel and foraging. Because of these harsh winter conditions in 2010/11, pronghorn survival declined, but no major winter die-offs occurred.

HABITAT CONDITIONS/ASSESSMENT

Overall, long-term drought conditions have affected habitat conditions in this herd unit. Most sagebrush communities continue to lack vigor, reproduction, and leader growth. Lack of precipitation has also affected available water in many stock reservoirs and perennial streams. Cheatgrass continues to dominate the understory in most shrub communities. Until considerable moisture regimes return, herd growth and survival will continue to be adversely affected by reduced habitat conditions caused by drought. However, in recent years above normal spring moisture has favored both herbaceous and shrub growth within the herd unit. Water availability in stock ponds and some streams has improved, along with increased health of some sagebrush stands.

Two sagebrush transects were established in this herd unit in September 2004, including Denver Jake Creek and Lightning Ridge (Appendix B). These transects are read annually, with leader growth, hedging and age class of sagebrush plants recorded during late summer, and percent leaders browsed and pellet groups per acre recorded in April. Overall, annual production (leader growth) has increased by about 50% the past three years, compared to the previous three years. Sagebrush leader growth is averaging about 2 cm/leader for these two transects. Winter utilization of sagebrush has also increased since 2007, yet the overall use is still quite low, averaging about 10%. Although not statistically adequate and representative of the entire herd unit, these transect data at least give some perspective as to sagebrush condition and use on an annual basis.

POPULATION

Aerial preseason classification flights are conducted annually within the herd unit during the month of August. On average, about 1,600 pronghorn are classified (Figure 1), and in most years adequate sample sizes are achieved. Relative trends for both fawn and buck ratios appear mostly stable over the past 6 years, with 2010 having the lowest fawn ratio, and 2006 having the lowest buck ratio. Good spring moisture in 2010 helped improve overall habitat conditions, but a late spring snow storm in June 2010, (9 inches of snow on Copper Mtn.), likely caused some fawn mortality, thus resulting in a lower than normal fawn ratio. Buck ratios have remained adequate for this herd, but fluctuate due to some large buck groups either being detected or undetected during classification flights.

2005 - 2010 Preseason Classification Summary

for Pronghorn Herd PR203 - COPPER MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2005	5,400	0	0	346	20%	858	51%	485	29%	1,689	1,394	0	0	40	± 4	57	± 4	40
2006	5,600	0	0	244	20%	628	51%	369	30%	1,241	1,462	0	0	39	± 4	59	± 6	42
2007	5,500	0	0	350	21%	825	49%	499	30%	1,674	1,525	0	0	42	± 0	60	± 0	42
2008	5,500	0	0	403	21%	969	51%	534	28%	1,906	1,364	0	0	42	± 3	55	± 4	39
2009	5,700	0	0	509	24%	961	46%	613	29%	2,083	1,686	0	0	53	± 4	64	± 4	42
2010	5,200	0	0	358	24%	752	51%	362	25%	1,472	1,172	0	0	48	± 4	48	± 4	33

Figure 1. Preseason sex and age ratio of the Copper Mountain Pronghorn herd, 2005-2010

The post-season population objective for this herd is 4,800 pronghorn. The current POP-II model estimates a 2010 post-season population of 4,400 pronghorn, or 8% below objective. The model is considered reliable since it mimics observed values and is anchored to an end-of-year line transect estimate of 4,089 pronghorn in 2007. Based on these estimates and model simulations, this population has remained mostly stable the past few years. However, in 2010 the population declined by about 14%, because of a lower than normal fawn ratio.

In May 2008, a line-transect (LT) survey was conducted in this pronghorn herd unit at the end of biological year 2007. The 2008 end-of-biological year line transect estimating a population of 4,089 pronghorn (95% CI= 3,110 – 5,377), which was nearly identical to the POP-II model estimate of 4,072. This LT estimate is consistent with field personnel perception of pronghorn densities and trends in recent years. The POP-II model was slightly revised utilizing the 2007 LT estimate and continues to reflect observed population trends.

Based on field personnel perceptions, pronghorn densities are low over much of HA 114 and the northern portions of HA 115. Persistent drought, poor forage conditions and availability of water have affected population growth for these segments of the herd. However, pronghorn numbers in the upper Nowood drainage of HA 115, and along the foothills of Copper Mountain in HA 76 seem to be slightly increasing. Until long-term habitat and moisture conditions improve in this herd unit, pronghorn numbers will likely remain near objective levels. Thus, hunting seasons will be structured to optimize buck hunting opportunities, with female harvest occurring in those areas where private land damage issues are a concern, or where localized increases in pronghorn numbers warrant doe/fawn harvest.

HUNTING SEASON

Hunting seasons for this herd unit have changed drastically in recent years (Figure 2). Because of increased damage concerns on private lands, quotas for type 6 licenses have increased, earlier opening dates have been enacted, type 2 licenses have been employed, and area limitation have been used to force hunters to private lands. Because of long-term drought conditions, more pronghorn are now utilizing private crop fields where vegetation and water are more readily available. Damage concerns on private lands will likely continue influencing annual hunting season structures, while pronghorn that utilize native ranges will be managed for recreational opportunities.

2010 HUNTING SEASONS

PR203 - COPPER MOUNTAIN

Hunt Area	Add'l Hunt Areas	Type	Quota	Season Dates	Limitations
76		ARCH		08/15 - 10/08	Refer to Section 3 of this Chapter
76		Type 1	125	10/09 - 10/31	Any
76		Type 2	25	08/15 - 10/15	Any
76		Type 6	50	09/01 - 10/31	Reduced Price doe/fawn
76		Type 7	150	08/15 - 11/15	Reduced Price doe/fawn
114		ARCH		08/15 - 09/30	Refer to Section 3 of this Chapter
114		Type 1	50	10/01 - 10/31	Any
114		Type 6	150	09/01 - 11/15	Reduced Price doe/fawn
115		ARCH		08/15 - 10/08	Refer to Section 3 of this Chapter
115		Type 1	200	10/09 - 10/31	Any
115		Type 6	225	10/09 - 10/31	Reduced Price doe/fawn

Figure 2. Hunting Season for the Copper Mountain Pronghorn herd unit, 2010.

The 2010 hunting season resulted in a harvest of 731 pronghorn, including 302 bucks, 360 does and 69 fawns, with a hunter success of 97% (Figure 3). Days/animal harvested was 4.3, with 755 hunters participating in 2010. Overall, hunter success and days/animal have remained mostly stable over the years, while hunter numbers and harvest have increased dramatically. Total harvest in 2010 increased by over 200% compared to 2005 harvest figures. These improving harvest trends since 2005 are mainly the result of increased availability of doe/fawn licenses and hunter access. It appears hunters are gaining easier access to deeded lands for doe/fawn harvest, especially where damage issues are a concern. Based on recent year harvest statistics, population growth of this pronghorn herd has likely been occurring annually. However, with increased license quotas and improved harvest the past few years, it appears we have been able to control these annual increases.

2010 Harvest Summary by Hunt Area

PR203 - Copper Mtn. Pronghorn Herd Unit

Area	Type	Active Lic/Htrs		Buck	Doe	Fawn	Total	Success		Days/ Harvest	Days	Lic. Sold
76 COPPER MOUNTAIN												
	Type 1	105		90	0	0	90	85.7%		5.3	473	124
	Type 2	25		25	0	0	25	100.0%		3	75	25
	Type 6	50		0	44	4	48	96.0%		4.8	232	50
	Type 7	128		0	64	17	81	63.3%		5	408	138
Pooled Total		241	(308)*	115	108	21	244	101.2%	(79.2%)*	4.9	1188	
Pooled Resident		157		89	67	6	162	103.2%		5.8	939	
Pooled Nonresident		84		26	41	15	82	97.6%		3	249	
114 NOWATER												
	Type 1	49		44	0	0	44	89.8%		4.5	199	50
	Type 6	144		0	116	14	130	90.3%		4.2	541	150
Pooled Total		151	(193)*	44	116	14	174	115.2%	(90.2%)*	4.3	740	
Pooled Resident		93		36	58	11	105	112.9%		4.8	502	
Pooled Nonresident		58		8	58	3	69	119.0%		3.4	238	
115 UPPER NOWOOD												
	Type 1	191		143	0	0	143	74.9%		3.6	517	204
	Type 6	208		0	136	34	170	81.7%		4.3	727	225
Pooled Total		364	(399)*	143	136	34	313	86.0%	(78.4%)*	4	1244	
Pooled Resident		189		104	50	9	163	86.2%		3.8	613	
Pooled Nonresident		175		39	86	25	150	85.7%		4.2	631	
2010 Hunt Area Total		756	(900)*	302	360	69	731	96.7%	(81.2%)*	4.3	3172	966
2010 Herd Total		755	(900)*	302	360	69	731	96.8%	(81.2%)*	4.3	3172	966

*Active Licenses

Figure 3. Harvest Summary for the Cooper Mountain Pronghorn herd unit, 2010.

Field checked pronghorn from the Copper Mtn. herd unit typically represents about 5-10% of the total harvest. Both female and male field checks have decreased since 2005, but increased slightly in 2010. The decline in field checks is likely due to fewer personnel working these areas during the hunting season. Bucks ≥2 years of age, along with adult aged does, represent about 90% of the male and female harvest.

OTHER MANAGEMENT ISSUES

Outbreaks of Epizootic Hemorrhagic Disease (EHD) are an annual concern in this herd unit. In 2007, EHD was detected in the western portion of hunt area 114 during the late summer/early fall. In total, about 30 pronghorn were found dead during this period. Based on field personnel perceptions and

observations, annual outbreaks of EHD occur in this herd unit, but to date, no major die-offs have occurred.

Modifications to ROW fences, and other range fences, have and will continue to be an issue for daily and seasonal pronghorn movements. Some woven wire ROW fences have been modified to 4-wire "wildlife friendly" fences along Hwy 16, between Worland and Tensleep. Coordination with BLM, WYDOT and local permittees will continue to help address these issues.

The wildfires of 1996, which burned approximately 120,000 acres in mostly hunt area 114, will continue to have a long-term impact due to the vast areas of cheatgrass which has taken over most of these burn areas. Management to help restore sagebrush to these burn areas continues to be a priority.

HABITAT

Generally speaking, habitat conditions in this herd unit have been impacted by 10 years of drought, with only slight improvements incurring in recent years. Many waterholes have dried up, forage production (both herbaceous and woody) has declined and sagebrush vigor has been reduced. In all hunt areas, pronghorn use of private, irrigated meadows has increased due to availability of water and lush vegetation. Hunting seasons, with doe/fawn harvest, will likely continue in these areas to address potential damage concerns. A sagebrush beating/mowing project was completed by the BLM near South Butte in area 114 in the early 2000's. Approximately 300 acres of dense decadent sagebrush was treated. Six wildlife guzzlers have been installed since 2007. Based on casual observations, pronghorn are using these water sources.

MANAGEMENT RECOMMENDATIONS

1) Continue working with BLM and local permittees to identify range fences which may inhibit daily and/or seasonal movements of pronghorn. Cooperate with on-the-ground modification work if possible.

2) Continue addressing potential damage issues with increased doe/fawn harvest, and continue encouraging landowners to allow hunter access to address these concerns.

3) Continue working with BLM and livestock permittees to develop reliable water sources and implement sagebrush improvement projects for pronghorn in this herd unit.

4) Continue implementing hunt area and season simplification changes within the herd unit, and adjoining herd units.

Completed Studies and Projects List

Hayes, R. 1994. Castle Gardens Pronghorn Distribution Study. USDI-BLM, Worland District unpubl. report, 30pp.

USDI-BLM. 1998. Worland District Fire Restoration, Phase II Environmental Assessment. 17pp.

2011 Proposed HUNTING SEASON
Copper Mountain Antelope (PR203)

Hunt Area	Type	Date of Seasons Opens	Closes	Limitations
76	1	Oct. 9	Oct. 31	Limited quota; 125 licenses any antelope
	2	Aug. 15	~~Oct. 15~~ Sept. 15	Limited quota; 25 licenses any antelope valid in that portion of Area 76 within two (2) miles of the Bighorn River
	6	Sept. 1	Oct. 31	Limited quota; ~~50~~ 25 licenses doe or fawn
	7	Aug. 15	Nov. 15	Limited quota; 150 licenses doe or fawn valid in that portion of Area 76 within two (2) miles of the Bighorn River
114	1	Oct. 1	Oct. 31	Limited quota; 50 licenses any antelope
	2	Sept. 1	Sept.30	Limited quota; 50 licenses any antelope valid on private land or State Trust Land
	6	Sept. 1	Nov. 15	Limited quota; 150 licenses doe or fawn valid on private land or State Trust land
115	1	Oct. 9	Oct. 31	Limited quota; 200 licenses any antelope
	6	Oct. 9	Oct. 31	Limited quota; 225 licenses doe or fawn valid in that portion of Area 115 east of the Nowood River, or south and west of Cornell Gulch or Nowater Stock Trail (BLM Road 1404)

ARCHERY:
76, 114, 115 Aug. 15 Refer to Section 4

Summary of Proposed Changes in License Number

Area	Type	Change from 2010
76	6	-25
114	2	+50
Total PR203	**6**	**-25**
	2	**+50**

SEASON JUSTIFICATION

Because of current harsh winter conditions, a decline in fawn ratios and that this population is below objective, only slight changes for the 2011 season are being proposed. In area 76 it's being proposed to shorten the season length for the Type 2 licenses, which should help force harvest during the time when damage is occurring. The other proposed change is to reduce the Type 6 quota by 25 licenses. For area 114, the only change is to add a Type 2 license to help attract more harvest on private lands with damage concerns. No changes are proposed for area 115.

For the herd unit, a net loss of 25 doe/fawn licenses, and a net gain of 50 Type 2 licenses will occur with the 2011 season proposal, compared to 2010. Based on this season structure, approximately 725 antelope, including 325 bucks and 400 does and fawns should be harvested in 2011, a total of 15% of the 2011 pre-season population. The 2011 post-season population estimate is 4,000 antelope, or 17% below objective.

The population objective for this herd unit is 4,800 antelope. The current POP-II model estimates a 2010 post-season population of about 4,400 antelope, or 8% below objective. The model is considered reliable since it tracks well with observed data and is aligned to the 2004

and 2007 line transect estimate of 3,992 and 4,089 antelope, respectively. Private land damage issues continue to be a major concern along the Bighorn River in area 76 and 114, and along the lower Nowood River in area 114. Persistent snow cover (crusted) and below normal winter temperatures from December 2010 through February 2011 are likely causing some winter kill to occur.

The 2010 pre-season buck ratio was 48:100 does, slightly higher the 5-year average of 45:100. The pre-season fawn ratio in 2010 was 48:100 does, the lowest in the past 5 years. Harvest in 2010 was 730 antelope, consisting of 303 bucks, 364 does and 63 fawns. This harvest was about a 48% increase over the 2009 harvest. Since 2006, doe/fawn harvest has increased about 300%, while buck harvest has increased 50%.

2010 Copper Mountain Pronghorn (PR203)
Data from 1995 to 2011 Simulation from 2006 to 2011

Age Class	Init Pop. Male	Init Pop. Female	Presn Prop. Male	Presn Prop. Female	Mort% Male	Mort% Female	Postsn Mort% Male	Postsn Mort% Female	Effort Set 1 Male	Effort Set 1 Female	Effort Set 2 Male	Effort Set 2 Female
0	1358.0	1358.0	50.0	50.0	38.0	36.0	0.05	0.05	0.05	0.05		
1	500.0	648.0	2.0	2.0	7.0	5.0	0.20	1.00	0.20	1.00		
2	350.0	609.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
3	300.0	381.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
4	150.0	491.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
5	28.0	142.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
6	14.0	140.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
7	6.0	136.0	2.0	2.0	5.0	5.0	1.00	1.00	1.00	1.00		
8	2.0	127.0	2.0	2.0	8.0	6.0	1.00	1.00	1.00	1.00		
9	1.0	116.0	2.0	2.0	15.0	10.0	1.00	1.00	1.00	1.00		
10	2.0	100.0	2.0	2.0	30.0	20.0	1.00	1.00	1.00	1.00		
11	0.0	76.0	2.0	2.0	60.0	40.0	1.00	1.00	1.00	1.00		
12	0.0	43.0	2.0	2.0	80.0	60.0	1.00	1.00	1.00	1.00		
13	0.0	17.0	2.0	2.0	100.0	100.0	1.00	1.00	1.00	1.00		

Sum = 7095.0 Estimated Sum = 6510 Subadults: Ages 0 to 0

MSI Function is Linear

Bio-Year	Preseason MSI	Harvest // Des. Pop Size in NA Subadults#	Males#	Females#	Postseason MSI	Effort & Wound Set Used
1995	1.13	15	260	117	1.00	1
1996	1.14	0	213	59	1.00	1
1997	1.38	5	231	41	1.16	1
1998	1.10	9	257	34	0.80	1
1999	1.15	22	260	108	0.80	1
2000	1.36	13	239	152	1.21	1
2001	1.64	6	213	77	1.20	1
2002	1.61	5	212	67	1.20	1
2003	1.00	2	211	50	1.30	1
2004	1.31	10	213	62	1.30	1
2005	0.75	7	219	60	1.36	1
2006	0.71	12	197	89	1.45	1
2007	1.24	16	200	136	1.33	1
2008	1.29	30	220	201	1.15	1
2009	1.17	28	227	239	1.30	1
2010	1.37	69	302	360	1.30	1
2011	1.25	50	325	350	1.30	1
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	

Bio-Year	Young/100 Fems Age 1 - 1	Young/100 Fems Age 2 - 12	Young/100 Fems Age 13 - 13	Sex Ratio: 50 : 50

Bio-Year	Young/100 Fems Age 1 - 1	Young/100 Fems Age 2 - 12	Young/100 Fems Age 13 - 13	Sex Ratio: 50 : 50
1996	0.0	180.0	0.0	
1997	0.0	180.0	0.0	
1998	0.0	180.0	0.0	
1999	0.0	180.0	0.0	
2000	0.0	180.0	0.0	
2001	0.0	180.0	0.0	
2002	0.0	180.0	0.0	
2003	0.0	180.0	0.0	
2004	0.0	180.0	0.0	
2005	0.0	180.0	0.0	
2006	0.0	180.0	0.0	
2007	0.0	180.0	0.0	
2008	0.0	180.0	0.0	
2009	0.0	180.0	0.0	
2010	0.0	180.0	0.0	
2011	0.0	180.0	0.0	
2012	0.0	0.0	0.0	

POP-II (V1.2.5) Simulation Output Tables for A203b.GN1, 05/31/2011 08:52 am

Table 1. Population Size During Bio-Year for A203b.GN1 05/31/2011 08:52 am

Bio-Year	Start	Pre-Season	Post Season	End	%Growth
2006	6510	5568	5240	4033	27.2
2007	8281	5547	5160	4087	-0.6
2008	8235	5454	4958	4102	-1.1
2009	8148	5685	5142	4074	-2.6
2010	7939	5180	4376	3577	-10.8
2011	7079	4801	4003	3183	-55.0

Table 3. Harvest Mortality for A203b.GN1 05/31/2011 08:52 am

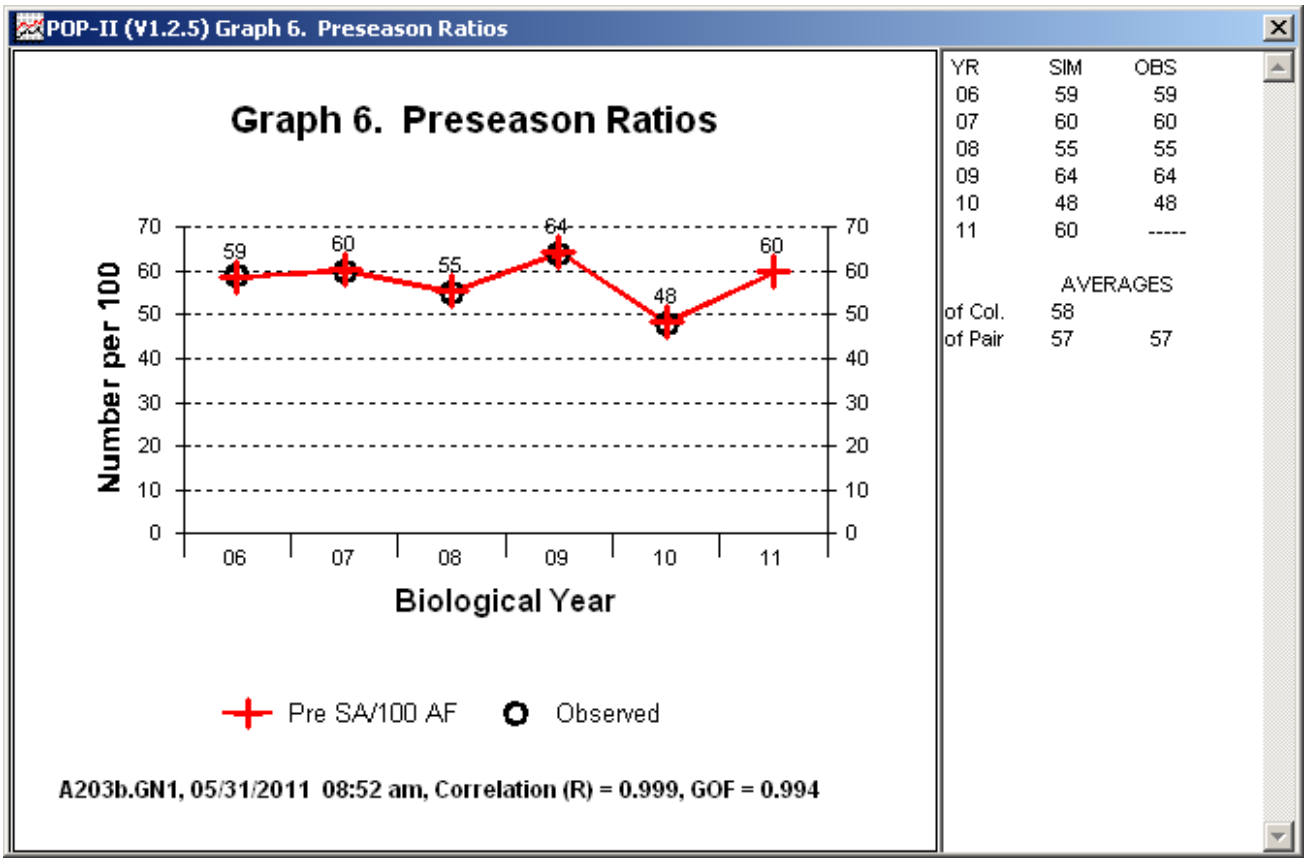
Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2006	12	197	89	298	5.4
2007	16	200	136	352	6.3
2008	30	220	201	451	8.3
2009	28	227	239	494	8.7
2010	69	302	360	731	14.1
2011	50	325	350	725	15.1

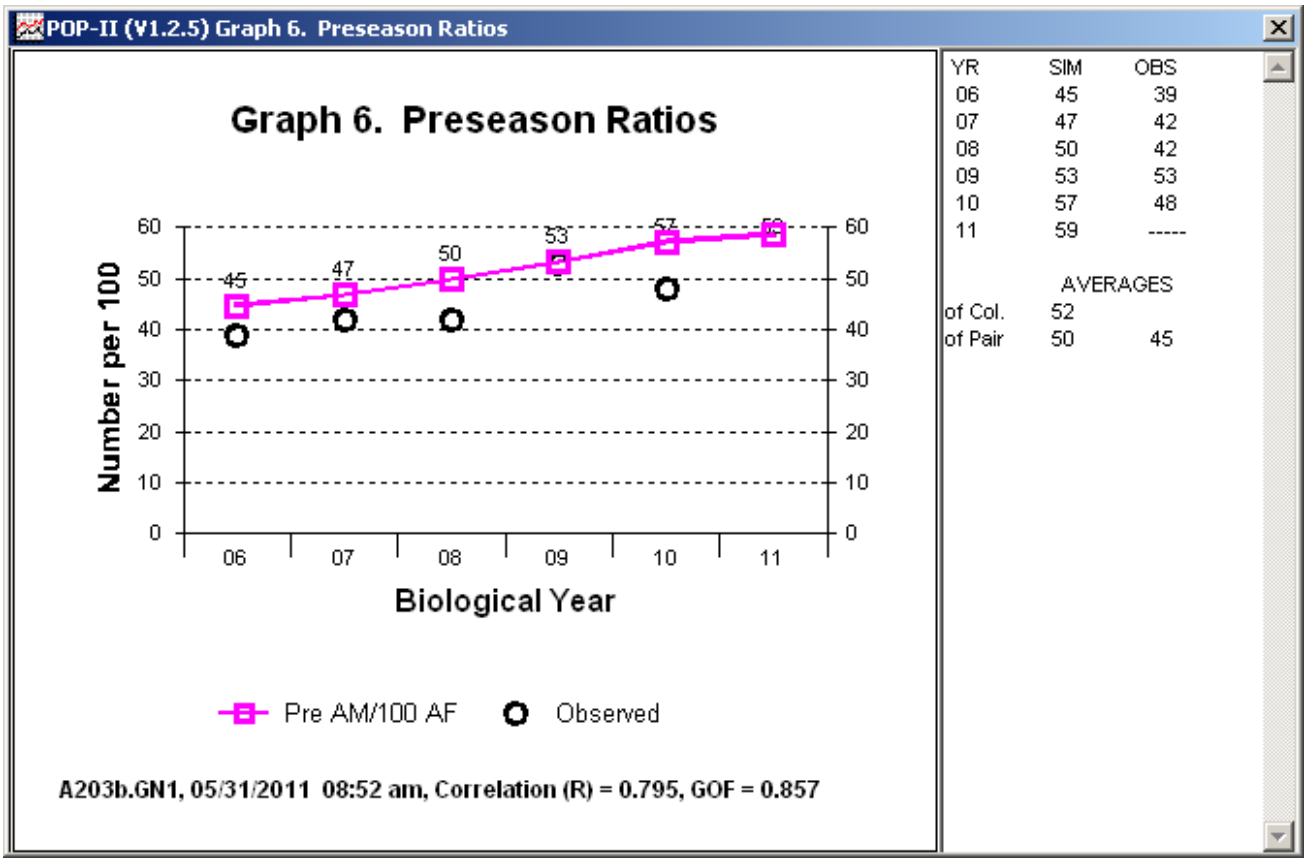
Table 4. Harvest Percentages for A203b.GN1 05/31/2011 08:52 am

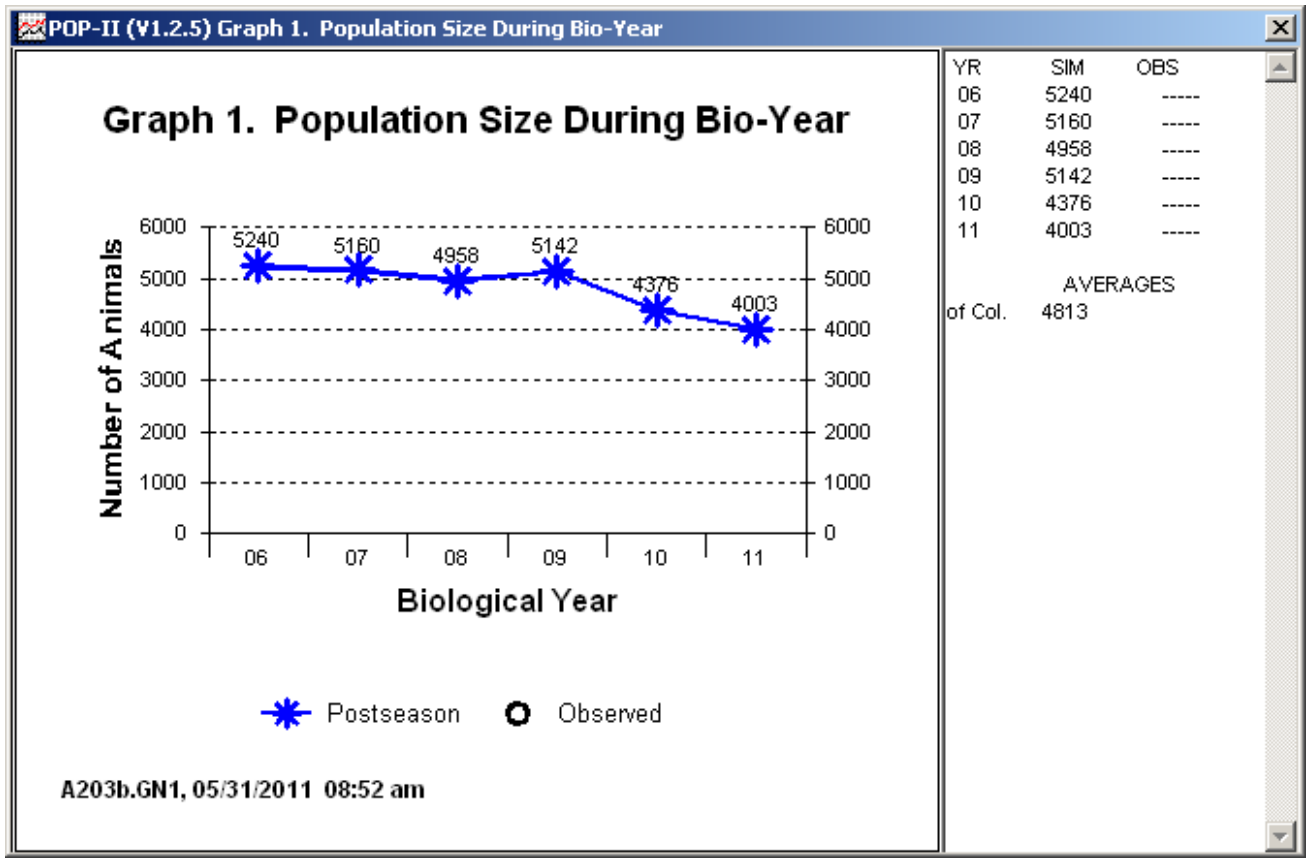
Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	Yearling Males
2006	0.7	16.1	3.3	5.35	10.5
2007	1.0	15.9	5.1	6.35	7.2
2008	2.0	16.6	7.6	8.27	7.6
2009	1.7	16.3	9.1	8.69	7.4
2010	5.7	20.9	14.3	14.11	7.3
2011	3.8	25.2	15.9	15.10	5.3

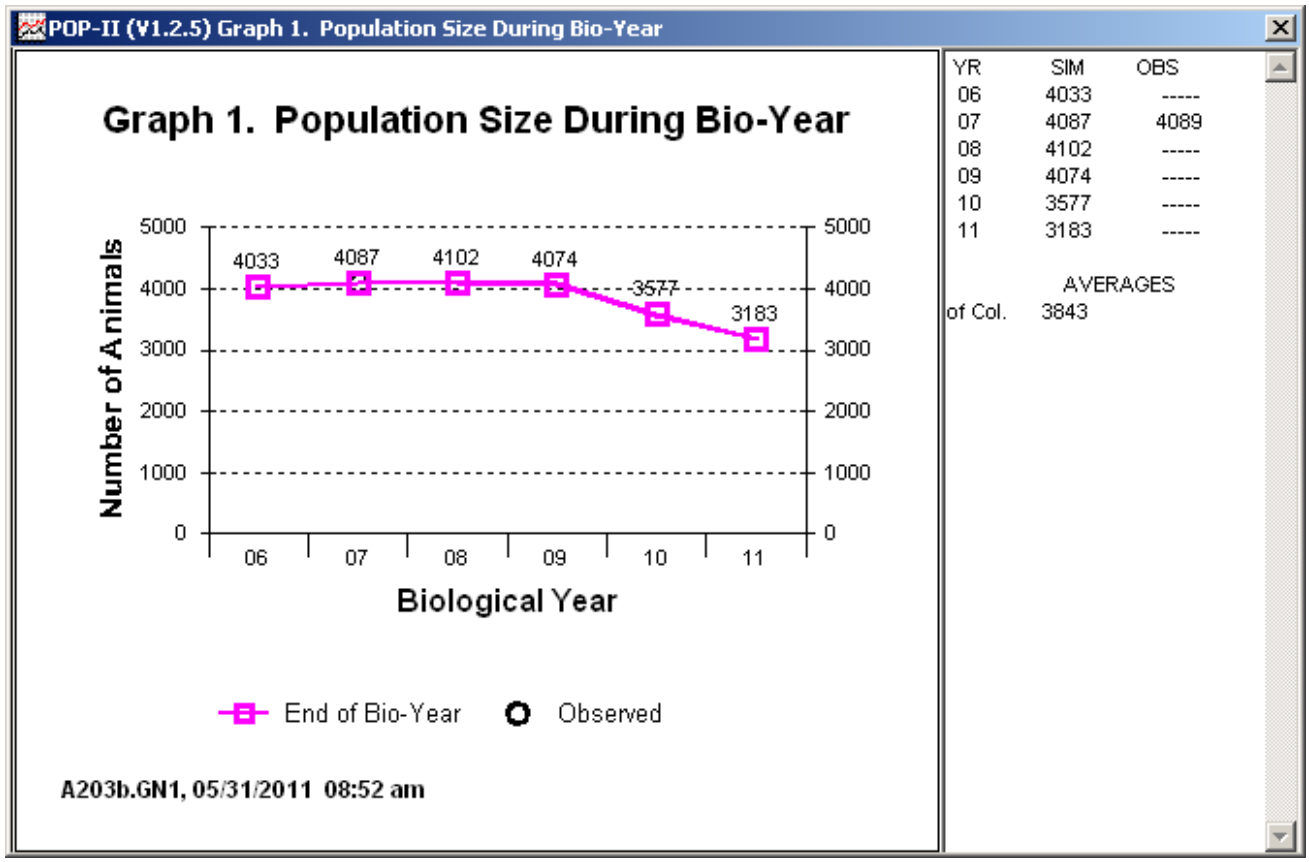
Table 7. Postseason Ratios for A203b.GN1 05/31/2011 08:52 am

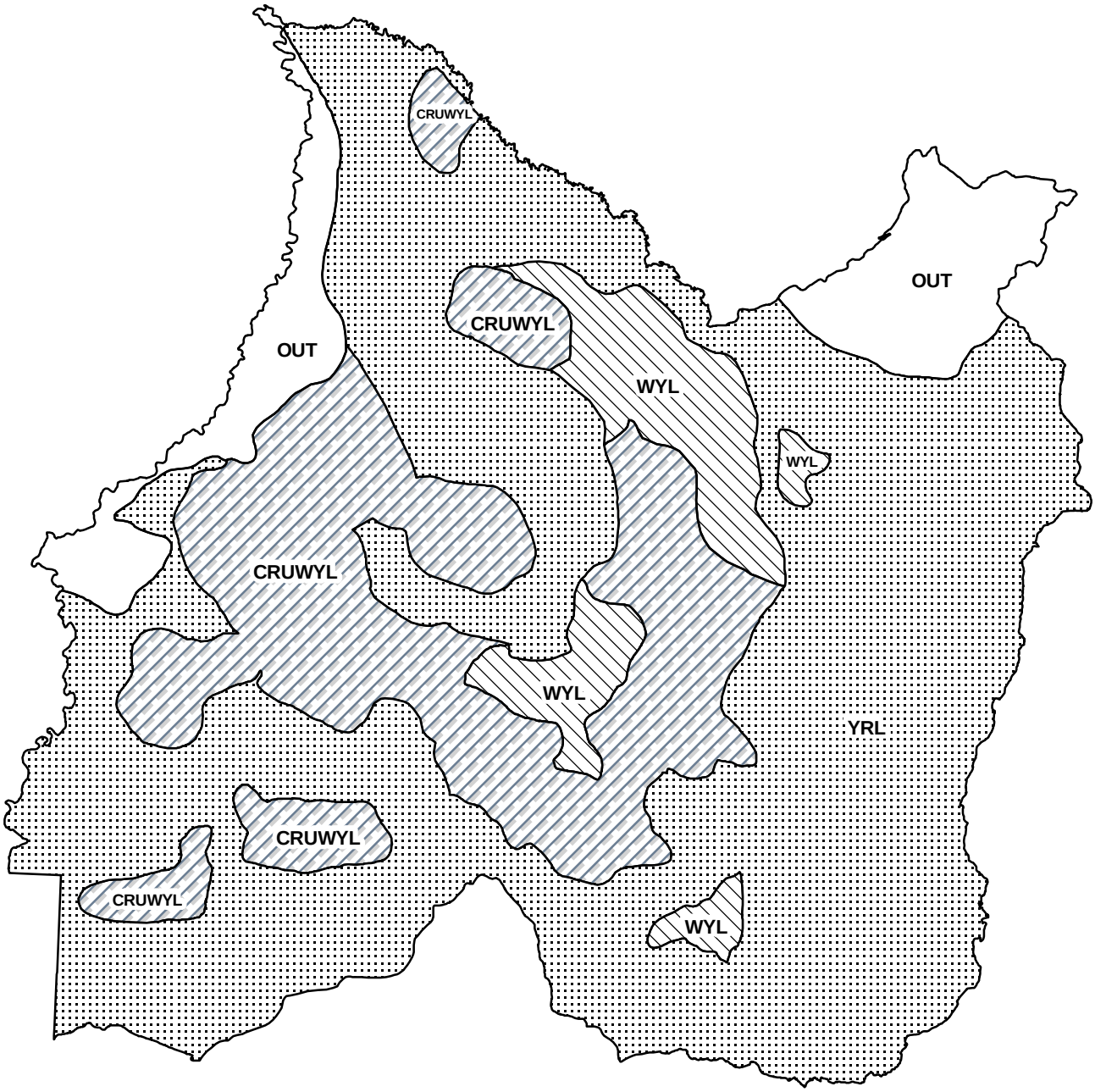
Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2006	60.4	21.9	16.3	38.2
2007	63.2	27.8	13.2	40.9
2008	59.1	29.5	15.0	44.5
2009	70.1	32.5	16.1	48.6
2010	53.7	34.3	18.0	52.3
2011	69.4	37.0	14.5	51.5


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
Biological Year
06
07
08
09
10
11
59
60
55
64
48
60
Pre SA/100 AF
Observed
A203b.GN1, 05/31/2011 08:52 am, Correlation (R) = 0.999, GOF = 0.994
YR SIM OBS
06 59 59
07 60 60
08 55 55
09 64 64
10 48 48
11 60 -----
AVERAGES
of Col. 58
of Pair 57 57


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
Biological Year
06
07
08
09
10
11
45
47
50
53
57
59
Pre AM/100 AF
Observed
A203b.GN1, 05/31/2011 08:52 am, Correlation (R) = 0.795, GOF = 0.857
YR SIM OBS
06 45 39
07 47 42
08 50 42
09 53 53
10 57 48
11 59 -----
AVERAGES
of Col. 52
of Pair 50 45


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
6000
5000
4000
3000
2000
1000
0
5240
5160
4958
5142
4376
4003
06
07
08
09
10
11
Biological Year
Postseason
Observed
A203b.GN1, 05/31/2011 08:52 am
YR SIM OBS
06 5240 -----
07 5160 -----
08 4958 -----
09 5142 -----
10 4376 -----
11 4003 -----
AVERAGES
of Col. 4813


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
5000
4000
3000
2000
1000
0
4033
4087
4102
4074
3577
3183
06
07
08
09
10
11
Biological Year
End of Bio-Year
Observed
A203b.GN1, 05/31/2011 08:52 am
YR SIM OBS
06 4033 -----
07 4087 4089
08 4102 -----
09 4074 -----
10 3577 -----
11 3183 -----
AVERAGES
of Col. 3843



Pronghorn (A203) - Copper Mountain
HA 76, 114, 115
Revised 4/2006

2010 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2010 - 5/31/2011

HERD: PR204 - FIFTEENMILE

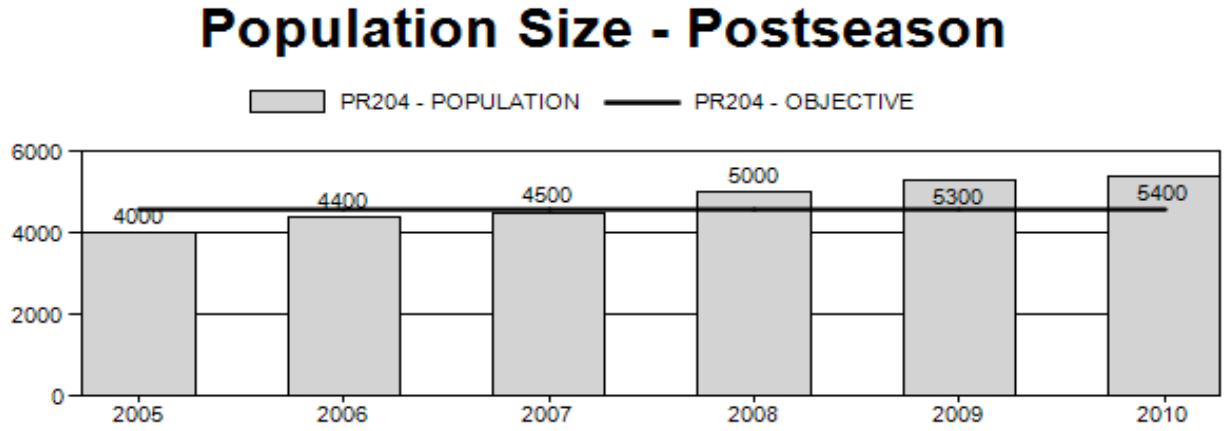
HUNT AREAS: 77, 83, 110 | PREPARED BY: BART KROGER

	2005 - 2009 Average	2010	2011 Proposed
Population:	4,640	5,400	5,100
Harvest:	275	731	765
Hunters:	271	686	720
Hunter Success:	101%	107%	106%
Active Licenses:	306	797	830
Active License Percent:	90%	92%	92%
Recreation Days:	862	2,136	2,200
Days Per Animal:	3.1	2.9	2.9
Males per 100 Females	40	44	
Juveniles per 100 Females	56	57	

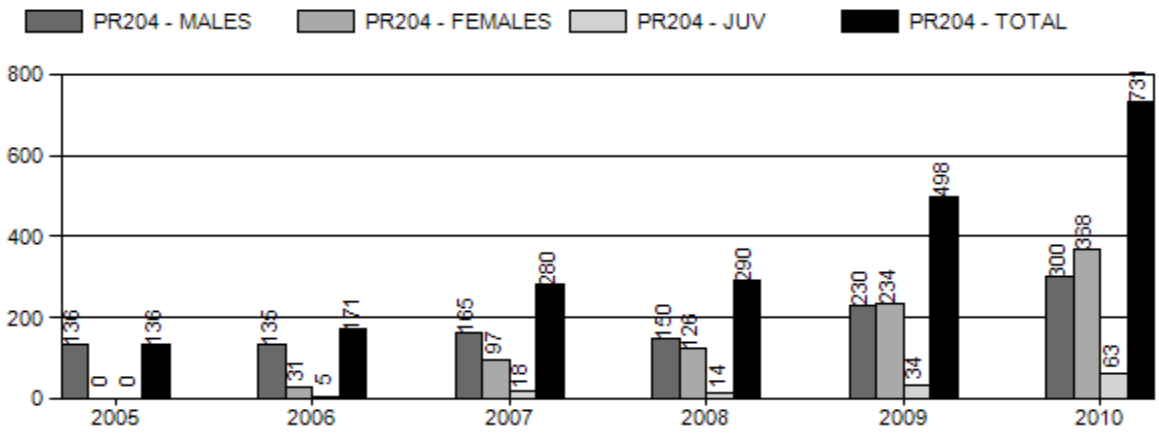
Population Objective:	4,600
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	17%
Number of years population has been + or - objective in recent trend:	3
Model Date:	6/6/2010

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

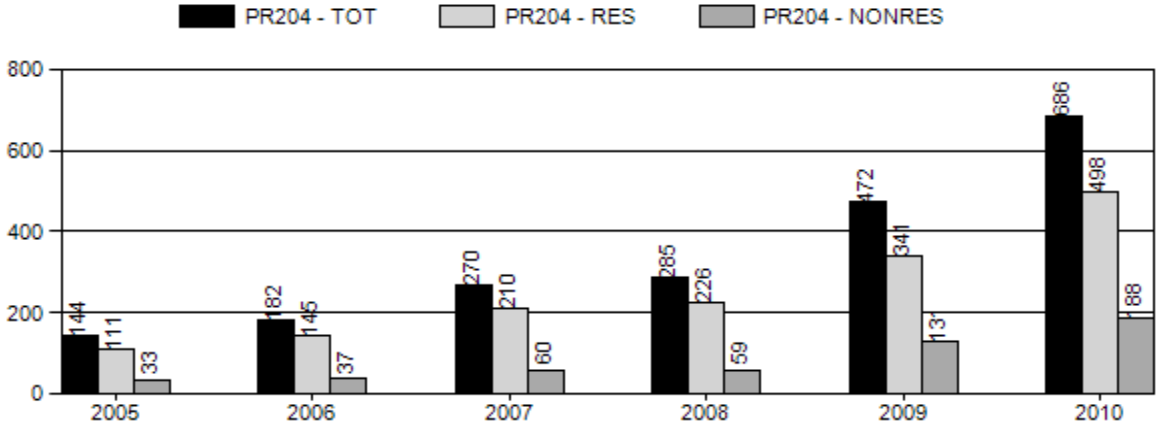
	JCR Year	Proposed
Females ≥ 1 year old:	12.8%	14.2%
Males ≥ 1 year old:	17.3%	18.4%
Juveniles (< 1 year old):	3.8%	4.0%
Total:	11.7%	12.9%
Proposed change in post-season population:	+1%	-6%



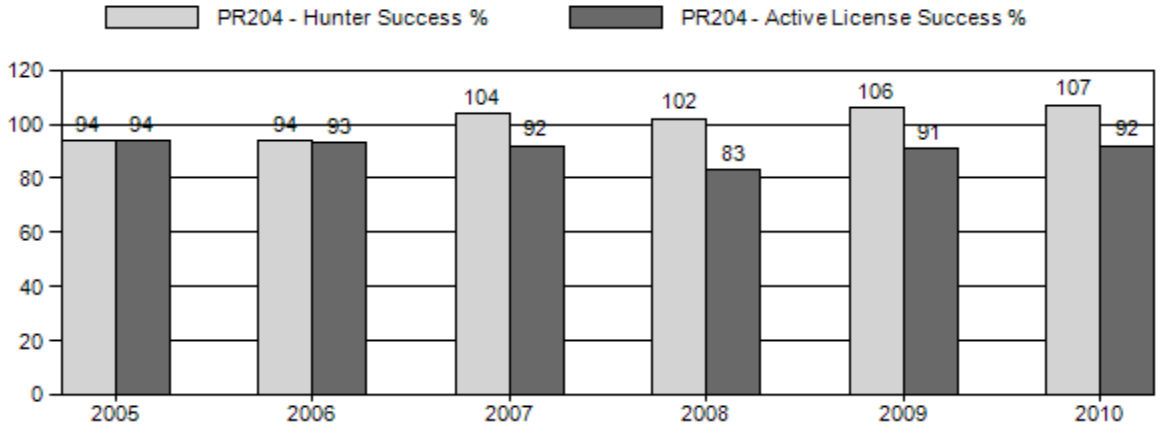
Harvest



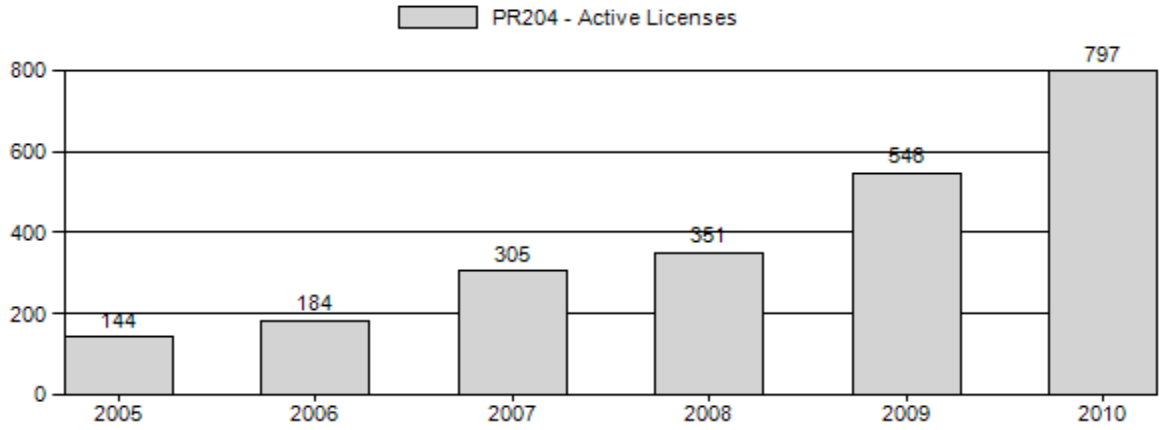
Number of Hunters



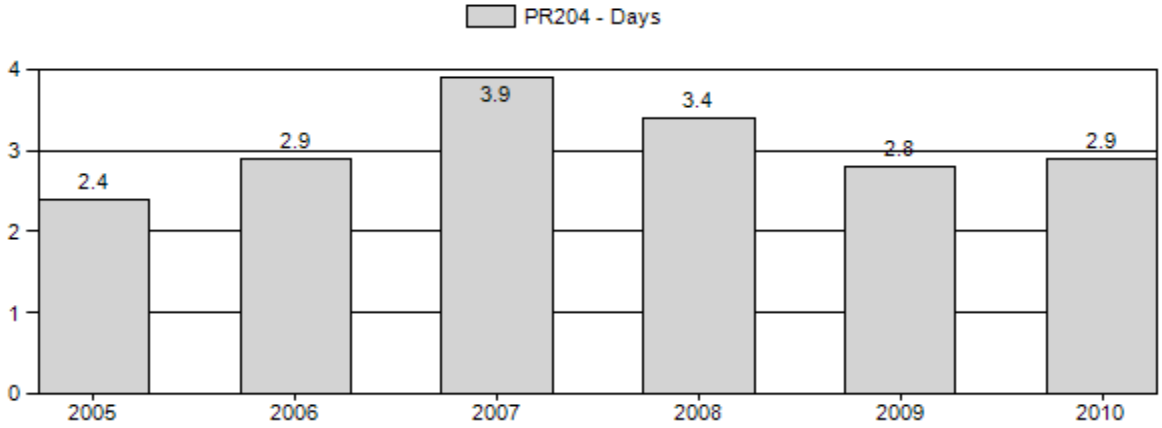
Harvest Success



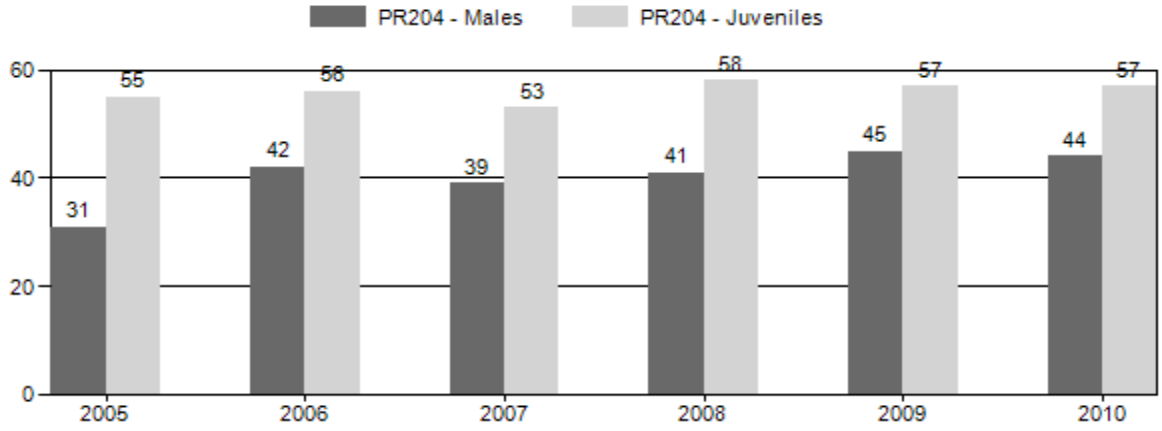
Active Licenses



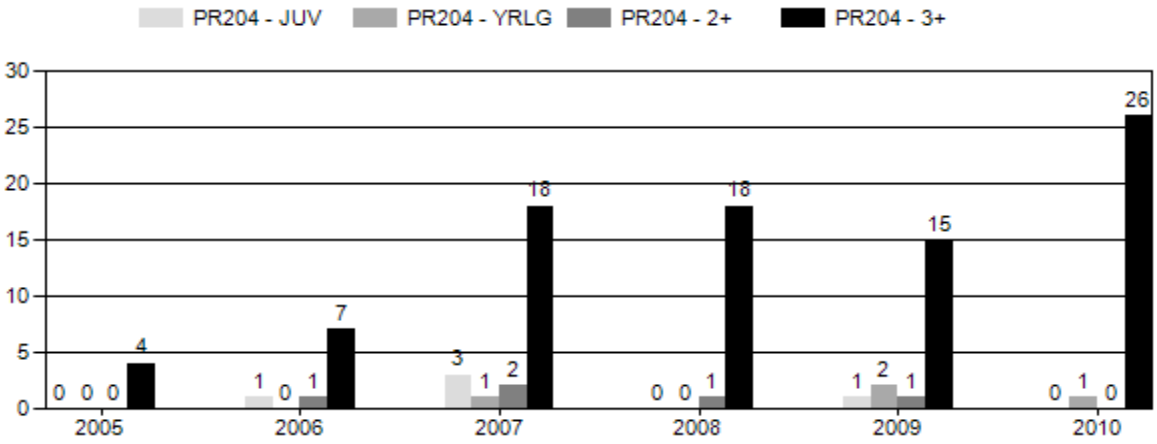
Days Per Animal Harvested



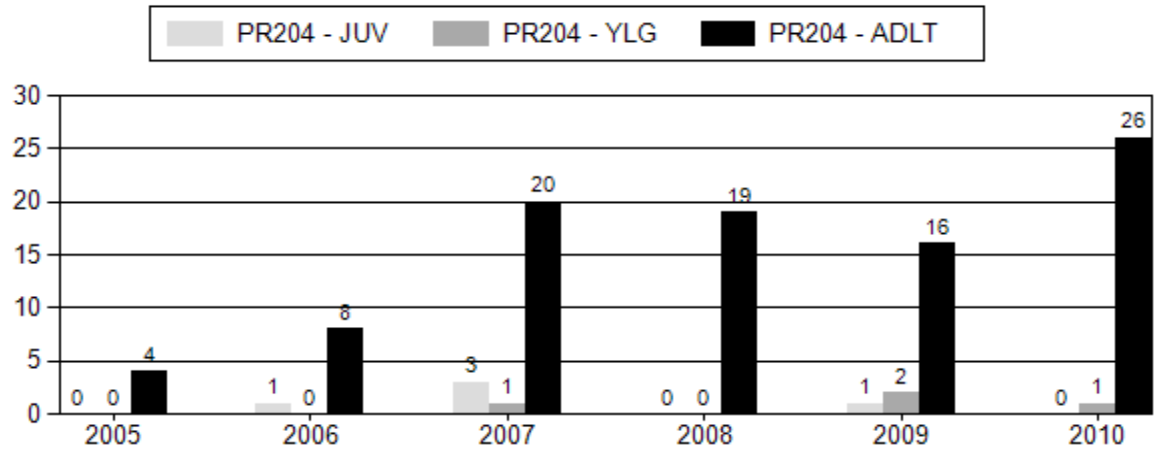
Preseason Animals per 100 Females



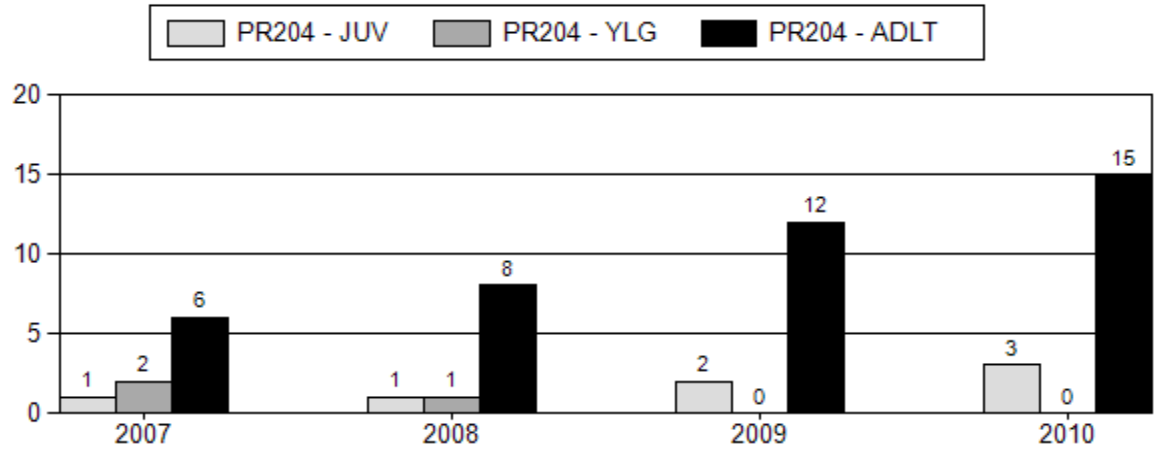
Age Structure of Field Checked Males



Age Structure Data (Field and Laboratory) - Male



Age Structure Data (Field and Laboratory) - Female



INTRODUCTION

This herd unit consists of three hunt areas (77, 83 & 110) lying west of the Big Horn River and south of the Greybull River in the southwestern portion of the Big Horn Basin. Hunt area 77 consists mostly of public land (BLM) with a dominant low-desert shrub habitat type. Both hunt areas 83 and 110 have intermixed public and private lands, and vary in habitat types and elevation. Because of dominating drought conditions over the past decade, pronghorn utilizing mostly native ranges are at low densities, whereas those utilizing mostly private (irrigated) areas appear to be increasing and are at high densities. This has led to increased damage concerns on some private lands. Overall, hunt areas 83 and 110 have experienced increasing numbers of pronghorn in recent years, whereas in area 77, pronghorn remain at low densities with no apparent increase in numbers. The population objective for this herd is 4,600 pronghorn, with a 2010 postseason population estimate of about 5,400 pronghorn. The current POP-II model is aligned to the 2010 line transect estimate of 4,600 pronghorn, and the 2006 line transect estimate of 3,600 pronghorn. Harvest has increased significantly in recent years to accommodate this increasing population. Since current population data appears reliable and reflects field personnel perceptions of herd trends, no revisions to the herd objective are warranted at this time. This herd is managed under recreational management criteria.

WEATHER

Based on Palmer Severity Indices, drought conditions have persisted over most of the Big Horn Basin from the late 1990's through the mid 2000's (Appendix A). Starting in 2008, these drought conditions moderated, with mostly normal annual temperatures and moisture levels. Spring moisture levels in 2009 and 2010 where about 75% above normal. This increased moisture has provided needed water to help fill stock ponds, guzzlers, replenish depleted water tables and restore vigor growth on some shrub communities.

Winter conditions during 2008 and 2009 were mostly favorable for pronghorn, with higher than normal winter temperatures and below normal winter snow fall. However, the winter 2010 supported normal snow fall, and below normal temperatures. This resulted in deep snows persisting through most of the winter period. Periodic melting and freezing of snow produced a hard crust layer, which made for difficult travel and foraging. Because of these harsh winter conditions in 2010/11, pronghorn survival declined, but no major winter die-offs occurred.

Specifically for this herd unit, BLM rain gauges showed above average precipitation, both annual and spring moisture (April-June), in 2008 and 2009. Light winter snows between 2007 and 2009 have made favorable conditions for wintering pronghorn. These, improved conditions have allowed pronghorn numbers to increase.

HABITAT CONDITIONS/ASSESSMENT

Overall, long-term drought conditions have affected habitat conditions in this herd unit. Most sagebrush communities continue to lack vigor, reproduction, and leader growth. Lack of precipitation has also affected available water in many stock reservoirs and perennial streams. Until considerable moisture regimes return, herd growth and survival will continue to be adversely affected by reduced habitat conditions caused by drought. However, in recent years above normal spring moisture has favored both herbaceous and shrub growth within the herd unit. Water availability in stock ponds and some streams has improved, along with increased health of some sagebrush stands.

Three sagebrush transects were established in this herd unit in 2004. Transect locations include 5-mile Creek, Grass Creek and Wagonhound Bench (Appendix B). These transects are read annually, with leader growth, hedging and age class of sagebrush plants recorded during late summer, and percent leaders browsed and pellet groups per acre recorded in early April. Overall, annual production of

sagebrush (leader growth), compared to the 7-year average of 2.7 cm, was 4.5 cm in 2008, 2.1 cm in 2009 and 2.4 cm. in 2010. Winter utilization of these three sagebrush transects was similar to slightly below the 6-year average of 11.2%. The Grass Creek and Wagonhound site also support winter mule deer use, while the 5-mile site supports domestic sheep use. Although not statistically adequate and representative of the entire herd unit, these transect data at least give some perspective as to sagebrush condition and use on an annual basis. Detailed descriptions of methods, data and locations of each transect are kept with the Regional Terrestrial Habitat Biologist and Worland Wildlife Biologist.

POPULATION

Aerial preseason classification flights are conducted annually during the month of August in hunt areas 77 and 83, while hunt area 110 classifications are conducted from the ground. Based on a 6-year trend, about 1,900 pronghorn are classified annually (Figure 1), with adequate sample sizes being achieved yearly. The number of pronghorn classified has increased annually, which further supports an increasing population. Relative trends for fawn ratios appear mostly stable over the past 6 years, while buck ratios show a slight increase. Both hunt areas 77 and 83 continue to have relatively low buck ratios, ranging from the high 20's:100 does to the mid 30's:100 does. The buck ratio in area 110 however, continues to remain high with a 6-year average of about 50:100.

2005 - 2010 Preseason Classification Summary

for Pronghorn Herd PR204 - FIFTEENMILE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2005	4,300	0	0	250	17%	809	54%	445	30%	1,504	1,172	0	0	31	± 3	55	± 4	42
2006	4,600	0	0	352	21%	843	51%	473	28%	1,668	1,326	0	0	42	± 3	56	± 4	40
2007	4,800	0	0	387	20%	999	52%	531	28%	1,917	1,248	0	0	39	± 3	53	± 4	38
2008	5,300	0	0	428	20%	1,053	50%	611	29%	2,092	1,413	0	0	41	± 3	58	± 4	41
2009	5,900	0	0	480	22%	1,069	49%	611	28%	2,160	1,406	0	0	45	± 3	57	± 4	39
2010	6,200	0	0	439	22%	1,008	50%	572	28%	2,019	1,411	0	0	44	± 3	57	± 4	40

Figure 1. Preseason sex and age ratio of the Fifteen Mile Pronghorn herd, 2005-2010

The postseason population objective for this herd is 4,600 pronghorn. The current POP-II model estimates a 2010 post-season population of 5,400 pronghorn, or 17% over. The model is considered reliable since it mimics observed values and is anchored to end-of-biological year 2006 and 2010 line transect estimates of 3,594 and 4,559 pronghorn, respectively. Based on these LT estimates and model simulations, this population has increased by about 7% annually since 2006.

In May 2010, a line transect survey was conducted in this herd unit (Figure 2). Sixty-six (66) north/south lines were flown at 1.5 minute intervals. Roughly 2100 km were flown during a 16 hour survey period. Weather conditions were favorable, except for some high thin cloud cover during afternoon flights. Line-transect data was analyzed using DISTANCE (v5.0). The Half-normal/Cosine model was selected based on its detection curve fitting the observed histogram (GOF chi-square = 2.01) as well as having the lowest AIC value (522.7). The model also produced the lowest coefficient of variation (10.7%). The 2010 end-of-biological year line transect estimates a population of 4,559 pronghorn (95% CI= 2,979 – 6,975). This 2010 LT estimate was roughly 900 pronghorn higher than the 2010 POP-II estimate, prior to aligning the model to this LT estimate.

Much of this herd increase has occurred adjacent to or on private irrigated crop fields in all three hunt areas. These increases have lead to more doe/fawn harvest being needed to help hold this population

near objective levels and assist with damage issues on private land. However, those pronghorn using native rangelands have remained mostly at stable levels. Field personnel perceptions and management direction in recent years has been to continue controlling population growth near private lands while allowing pronghorn numbers to increase on native range.

2010 PR204 - FIFTEENMILE Pronghorn Line-Transect Summary

Survey Dates:	5/24/2011 - 5/25/2011
Survey Cost:	$ 4,200.00
Flight Service:	SKY AVIATION CORP.
Aircraft:	SCOUT
Observers:	Bart Kroger - Worland Biologist and Mark Dehart - Game Warden Trainee
Weather Conditions:	
Temperature (Degrees Fahrenheit):	50-65
Cloud Cover (%):	50-75
Wind Speed (MPH):	0 - 10
Transect Limits:	107 58 to 109.15
Transect Direction:	North/South
Transect Interval (Minutes of Longitude):	1.5
Transect Length: (Mi.):	1,307
Transect Altitude (AGL):	306 ft.
Occupied Habitat (mi^2):	2,069
Density Estimate (Animals/mi^2 with Confidence Intervals):	2.2 (1.4 - 3.3)
Population Estimate (with Confidence Intervals):	4,559 (2,979 - 6,975)

Figure 2. 2010 line transect summary for the Fifteen Mile pronghorn herd.

HUNTING SEASON

Hunting season structures for this pronghorn herd have been designed to allow for recreational/quality buck hunting (Type 1 licenses), while maximizing Type 6 & 7 doe/fawn quotas and seasons lengths to control population growth (Figure 3). All three hunt areas support Type 6 licenses with varying quotas and season dates.

2010 HUNTING SEASONS

PR204 - FIFTEENMILE

Hunt Area	Add'l Hunt Areas	Type	Quota	Season Dates	Limitations
77		ARCH		08/15 - 09/19	Refer to Section 3 of this Chapter
77		Type 1	75	09/20 - 10/14	Any
77		Type 6	50	09/01 - 10/14	Reduced Price doe/fawn
77		Type 7	75	09/01 - 11/15	Reduced Price doe/fawn
83		ARCH		08/15 - 10/08	Refer to Section 3 of this Chapter
83		Type 1	100	10/09 - 10/31	Any
83		Type 6	250	08/15 - 10/31	Reduced Price doe/fawn
110		ARCH		08/15 - 09/19	Refer to Section 3 of this Chapter
110		Type 1	175	09/20 - 10/14	Any
110		Type 6	175	09/20 - 10/14	Reduced Price doe/fawn

Figure 3. Hunting Season for the Fifteen Mile pronghorn herd unit, 2010.

The 2010 hunting season resulted in a harvest of 731 pronghorn, including 300 bucks, 368 does and 63 fawns, with a hunter success of 106% (Figure 3). Days/animal harvested was 2.9, with 668 hunters participating in 2010. Overall, hunter success and days/animal have shown slightly improving trends the past 4 years, while hunter numbers and harvest have increased dramatically. Total harvest and hunter numbers in 2010 was roughly a 500% increase over 2006 figures. These improving harvest trends since 2006 are mainly the result of an increased population. Based on recent year harvest statistics, population growth of this pronghorn herd has likely been occurring annually. However, with increased license quotas and improved harvest the past few years, it appears pronghorn numbers have stabilized, with a slight reduction projected for 2011.

2010 Harvest Summary by Hunt Area
PR204 – Fifteen Mile Pronghorn Herd Unit

Area Type 2010	Active Lic/Htrs	Buck	Doe	Fawn	Total	Success	Days/ Harvest	Days	Licenses Sold
77 FIFTEEN MILE									
Type 1	70	61	0	0	61	87.10%	4	246	76
Type 6	44	0	34	3	37	84.10%	5.1	187	50
Type 7	64	0	44	9	53	82.80%	2.8	149	75
Pooled Total	144 (178)*	61	78	12	151	104.90% (84.8%)*	3.9	582	
Pooled Resident	101	49	56	6	111	109.90%	4	448	
Pooled Nonresident	43	12	22	6	40	93.00%	3.4	134	

83 OWL CREEK									
Type 1	90	77	0	0	77	85.60%	4.4	339	100
Type 6	231	0	171	45	216	93.50%	2.8	602	250
Pooled Total	292 (321)*	77	171	45	293	100.30% (91.3%)*	3.2	941	
Pooled Resident	207	59	106	33	198	95.70%	3.5	697	
Pooled Nonresident	85	18	65	12	95	111.80%	2.6	244	
110 SOUTH GREYBULL RIVER									
Type 1	165	162	0	3	165	100%	2.3	377	175
Type 6	133	0	119	3	122	91.70%	1.9	236	175
Pooled Total	252 (298)*	162	119	6	287	113.90% (96.3%)*	2.1	613	
Pooled Resident	190	133	75	0	208	109.50%	2.2	456	
Pooled Nonresident	62	29	44	6	79	127.40%	2	157	
2010 Hunt Area Total	688 (797)*	300	368	63	731	106.20% (91.7%)*	2.9	2136	901
2010 Herd Total	686 (797)*	300	368	63	731	106.60% (91.7%)*	2.9	2136	901

*Active Licenses

Figure 3. Harvest Summary for the Fifteen Mile Pronghorn herd unit, 2010.

Field checked pronghorn from the 15-Mile herd unit typically represents about 5% of the total harvest. Both female and male harvest checks have increased since 2005. The increase in female harvest checks is recent years is due to an increase in female harvest, which was a result of more available doe/fawn licenses. Since 2005, field checked yearling females have represented about 11% percent of the female harvest, which gives some indication that good fawn survival through the previous winter is occurring. Bucks $\geq$2 years of age represent about 95% of the male harvest.

OTHER MANAGEMENT ISSUES

The Westside Irrigation Project Record of Decision was signed in 2010. This project involves a Congressionally-mandated sale of approximately 15,600 acres of BLM land in the easternmost portion of this herd unit. Plans are to convert suitable acres to agricultural production (i.e., sugar beets, barley, alfalfa, etc.) under low-pressure overhead sprinkler systems. A north-south trending belt of big sagebrush provides crucial winter range for 75-125 pronghorn within the proposed land purchase area. Mitigation for loss of crucial pronghorn winter range has been identified as a high priority issue in this proposed land purchase.

Relative outbreaks of Epizootic Hemorrhagic Disease (EHD) are an annual concern in this herd unit. EHD was detected in the eastern portion of hunt area 77 during the late summer/early fall of 2007. EHD was first confirmed in a female pronghorn in October. In total about 30 pronghorn were found dead during this period. Surveillance of EHD and/or bluetongue will occur annually in this pronghorn herd.

The BLM Cody/Worland Resource Management Plan is currently under revision. Coordination efforts with the BLM have been initiated which should help improve management practices to improve pronghorn habitat within the herd unit.

Seasons and management for the next 3 years should be designed to control population growth of the herd, while addressing damage concerns and pronghorn concentrations on or near private land. Landowner tolerance for pronghorn numbers along major drainages (e.g., Owl Creek, Cottonwood Creek and Big Horn River) will continue to be an important consideration. This population should be

intentionally managed to reduce pronghorn numbers on most private land areas, while trying to increase numbers on native ranges.

HABITAT

Generally speaking, habitat conditions in this herd unit have been impacted by 10 years of drought, with only slight improvements incurring in recent years. Many waterholes have dried up, forage production (both herbaceous and woody) has declined and sagebrush vigor has been reduced. In all hunt areas, pronghorn use of private, irrigated meadows has increased due to availability of water and lush vegetation. Hunting seasons, with doe/fawn harvest, will likely continue in these areas to address potential damage concerns.

Since 2009, the BLM in cooperation with the WGFD have installed 7 guzzlers within the native desert country of hunt areas 83 and 77. All these new water sources have been documented being used by pronghorn. A sagebrush beating/mowing project has been completed on crucial pronghorn winter range in both hunt areas 77 and 83 along US Hwy. 120. Approximately 300 acres of decadent sagebrush was treated. General observations of these treatment sites indicate fair response and stimulation of new sagebrush growth.

MANAGEMENT RECOMMENDATIONS

1) Continue working with BLM and livestock permittees to develop reliable water sources and implement sagebrush improvement projects for pronghorn in this herd unit

2) Continue active involvement with the Worland BLM RMP revision.

3) Continue to work with the BLM and the Westside Irrigation District to adequately mitigate loss of crucial winter range for pronghorn on the eastern edge of the herd unit.

4) Continue implementing hunt area and season simplification changes within the herd unit, and adjoining herd units.

SPECIAL STUDIES

Reeve, A. F. 1989. Pronghorn productivity studies in the Fifteen Mile Herd Unit, July 17 to August 19, 1988. Prepared for the School for Field Studies, Bureau of Land Management, and Wyoming Game and Fish Department. 84pp.

2011 Proposed HUNTING SEASON
Fifteen Mile Antelope (PR204)

Hunt Area	Type	Date of Seasons Opens	Closes	Limitations
77	1	Sept. 20	Oct. 14	Limited quota; 75 licenses any antelope
	2	Sept. 1	Sept. 30	Limited quota; 25 licenses any antelope valid on private land
	6	Sept. 1	Oct 14	Limited quota; ~~50~~ 100 licenses doe or fawn valid on private land ~~in that portion of Area 77 in Big Horn County~~
	~~7~~	~~Sept. 1~~	~~Nov. 15~~	~~Limited quota; 75 licenses doe or fawn valid on private land in that portion of Area 77 in Washakie County~~
83	1	Oct. 9	Oct. 31	Limited quota; ~~100~~ 125 licenses any antelope
	6	Aug. 15	Oct. 31	Limited quota; ~~250~~ 300 licenses doe or fawn valid on private land
110	1	Sept. 20	Oct. 14	Limited quota; 175 licenses any antelope
	6	Sept. 20	Oct. 14	Limited quota; 175 licenses doe or fawn

ARCHERY:
77, 83, 110 Aug. 15 Refer to Section 4

Summary of Proposed Changes in License Number

Area	Type	Change from 2010
77	2	+25
	6	+50
	7	-75 (eliminated)
83	1	+25
	6	+50
	1	**+25**
Total PR204	**2**	**+25**
	6	**+50**
	7	**-75**

SEASON JUSTIFICATION

There are no proposed changes for hunt area 110. The current season structure allows for optimal buck harvest along with some doe/fawn harvest to control localized population growth. In area 77, it's being proposed to add a Type 2 (any antelope) license, valid on private lands, in order to attract additional hunters to private lands where damage issues are a concern. The Type 6 quota is proposed to increase by 50 licenses, whereas the Type 7 licenses will be eliminated to help simplify season structure. For area 83, it's proposed to increase the Type 1 license quota by 25, and the Type 6 quota by 50 licenses.

The 2011 season proposals will result in a net gain of 75 licenses for the herd unit. The 2011 harvest should be about 765 antelope, including 325 bucks, 380 does and 60 fawns, or approximately 13% of the pre-season population estimate. The 2011 post-season population estimate is 5,100 antelope, or 11% above objective.

The post-season population objective for this herd is 4,600 antelope. The current POP-II model estimates a 2010 post-season population of about 5,400 antelope. The model is considered

reliable since it mimics observed values and is anchored to the 2006 and 2010 line transect estimate of 3,594 and 4,559 antelope, respectively. Hunting seasons have and will likely continue to be structured to optimize buck hunting opportunities, with doe/fawn harvest occurring in those areas where private land damage issues persist, or where localized increases in antelope numbers warrant some additional harvest. Persistent snow cover (crusted) and below normal winter temperatures from December 2010 through February 2011 are likely causing some winter kill to occur in this herd unit.

The 2010 pre-season buck:doe ratio was 44:100. Hunt area 110 continues to support the highest buck ratio of all three hunt areas, with a 5-year average of about 63:100, whereas, areas 77 and 83 continue to have relatively low buck ratios, with a 5-year average of 33:100 and 37:100, respectively. For the herd unit, the 2010 pre-season fawn:doe ratio was 57:100, which is about average for the herd unit.

The 2010 total harvest for this herd unit was 731 antelope, consisting of 300 bucks and 431 does and fawns. The 2010 harvest was about 46% higher than the 2009. Since 2006, buck harvest has increased by 220%, and the doe/fawn harvest has significantly increased by over 1000%. The increase in doe/fawn harvest has been mainly used to stabilize local numbers of antelope and to address potential damage issues in each hunt area.

2010 FIFTEENMILE Pronghorn (PR204)
Data from 1995 to 2011 Simulation from 2006 to 2011

Age Class	Init Pop. Male	Init Pop. Female	Presn Prop. Male	Presn Prop. Female	Mort% Male	Mort% Female	Postsn Mort% Male	Postsn Mort% Female	Effort Set 1 Male	Effort Set 1 Female	Effort Set 2 Male	Effort Set 2 Female
0	1030.0	1030.0	50.0	50.0	38.0	36.0	0.05	0.05	0.05	0.05		
1	350.0	356.0	2.0	2.0	7.0	5.0	0.20	1.00	0.20	1.00		
2	225.0	334.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
3	200.0	324.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
4	100.0	310.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
5	80.0	284.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
6	25.0	244.0	2.0	2.0	4.0	4.0	1.00	1.00	1.00	1.00		
7	4.0	208.0	2.0	2.0	5.0	4.0	1.00	1.00	1.00	1.00		
8	2.0	144.0	2.0	2.0	8.0	6.0	1.00	1.00	1.00	1.00		
9	1.0	72.0	2.0	2.0	15.0	10.0	1.00	1.00	1.00	1.00		
10	0.0	28.0	2.0	2.0	30.0	20.0	1.00	1.00	1.00	1.00		
11	0.0	10.0	2.0	2.0	60.0	40.0	1.00	1.00	1.00	1.00		
12	0.0	4.0	2.0	2.0	80.0	60.0	1.00	1.00	1.00	1.00		
13	0.0	1.0	2.0	2.0	100.0	100.0	1.00	1.00	1.00	1.00		

Sum = 5366.0 Estimated Sum = 5400 Subadults: Ages 0 to 0

MSI Function is Linear

Bio-Year	Preseason MSI	Harvest // Des. Pop Size in NA Subadults#	Males#	Females#	Postseason MSI	Effort & Wound Set Used
1995	0.99	19	288	194	1.10	1
1996	1.31	15	287	206	1.10	1
1997	1.33	19	275	190	1.20	1
1998	1.29	20	256	161	1.15	1
1999	1.49	26	242	174	1.26	1
2000	1.52	11	220	105	0.50	1
2001	1.59	3	194	22	0.54	1
2002	1.59	0	150	34	1.12	1
2003	1.15	2	144	24	1.00	1
2004	1.34	0	120	7	1.00	1
2005	0.79	0	135	0	0.25	1
2006	0.76	5	135	31	1.25	1
2007	1.33	18	165	97	0.85	1
2008	1.25	14	150	126	0.75	1
2009	1.24	34	230	234	0.75	1
2010	1.23	63	300	368	1.02	1
2011	1.25	60	325	380	1.00	1
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	

Bio-Year	Young/100 Fems Age 1 - 1	Young/100 Fems Age 2 - 12	Young/100 Fems Age 13 - 13	Sex Ratio: 50 : 50

Bio-Year	Young/100 Fems Age 1 - 1	Young/100 Fems Age 2 - 12	Young/100 Fems Age 13 - 13	Sex Ratio: 50 : 50
1996	0.0	180.0	0.0	
1997	0.0	180.0	0.0	
1998	0.0	180.0	0.0	
1999	0.0	180.0	0.0	
2000	0.0	180.0	0.0	
2001	0.0	180.0	0.0	
2002	0.0	180.0	0.0	
2003	0.0	180.0	0.0	
2004	0.0	180.0	0.0	
2005	0.0	180.0	0.0	
2006	0.0	180.0	0.0	
2007	0.0	180.0	0.0	
2008	0.0	180.0	0.0	
2009	0.0	180.0	0.0	
2010	0.0	180.0	0.0	
2011	0.0	180.0	0.0	
2012	0.0	0.0	0.0	

POP-II (V1.2.5) Simulation Output Tables for A204a.GN1, 06/06/2011 04:05 pm

Table 1. Population Size During Bio-Year for A204a.GN1 06/06/2011 04:05 pm

Bio-Year	Start	Pre-Season	Post Season	End	%Growth
2006	5400	4562	4374	3588	37.2
2007	7410	4773	4465	3922	6.2
2008	7872	5305	4986	4420	8.9
2009	8572	5888	5340	4719	4.7
2010	8972	6241	5436	4557	-4.3
2011	8582	5953	5111	4310	-49.8

Table 3. Harvest Mortality for A204a.GN1 06/06/2011 04:05 pm

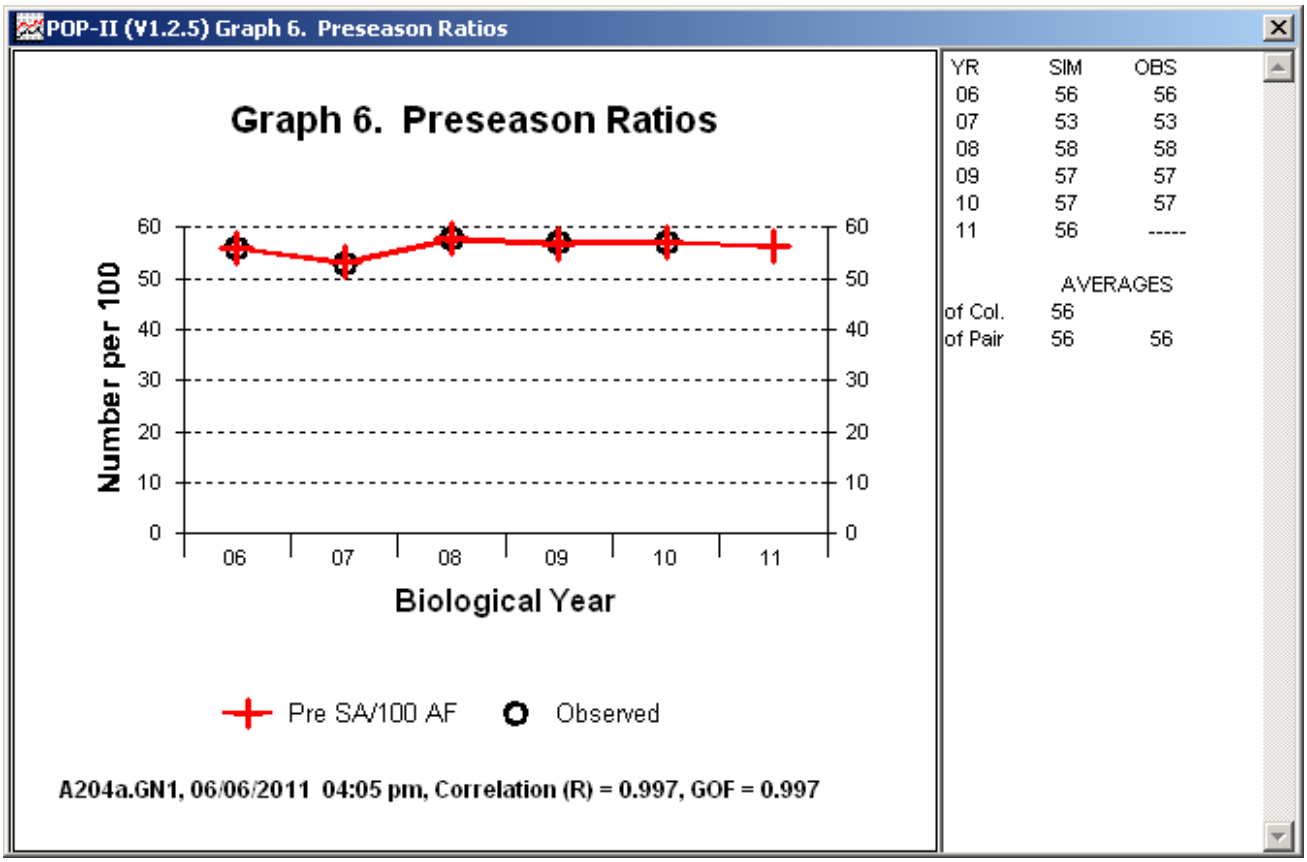
Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2006	5	135	31	171	3.7
2007	18	165	97	280	5.9
2008	14	150	126	290	5.5
2009	34	230	234	498	8.5
2010	63	300	368	731	11.7
2011	60	325	380	765	12.9

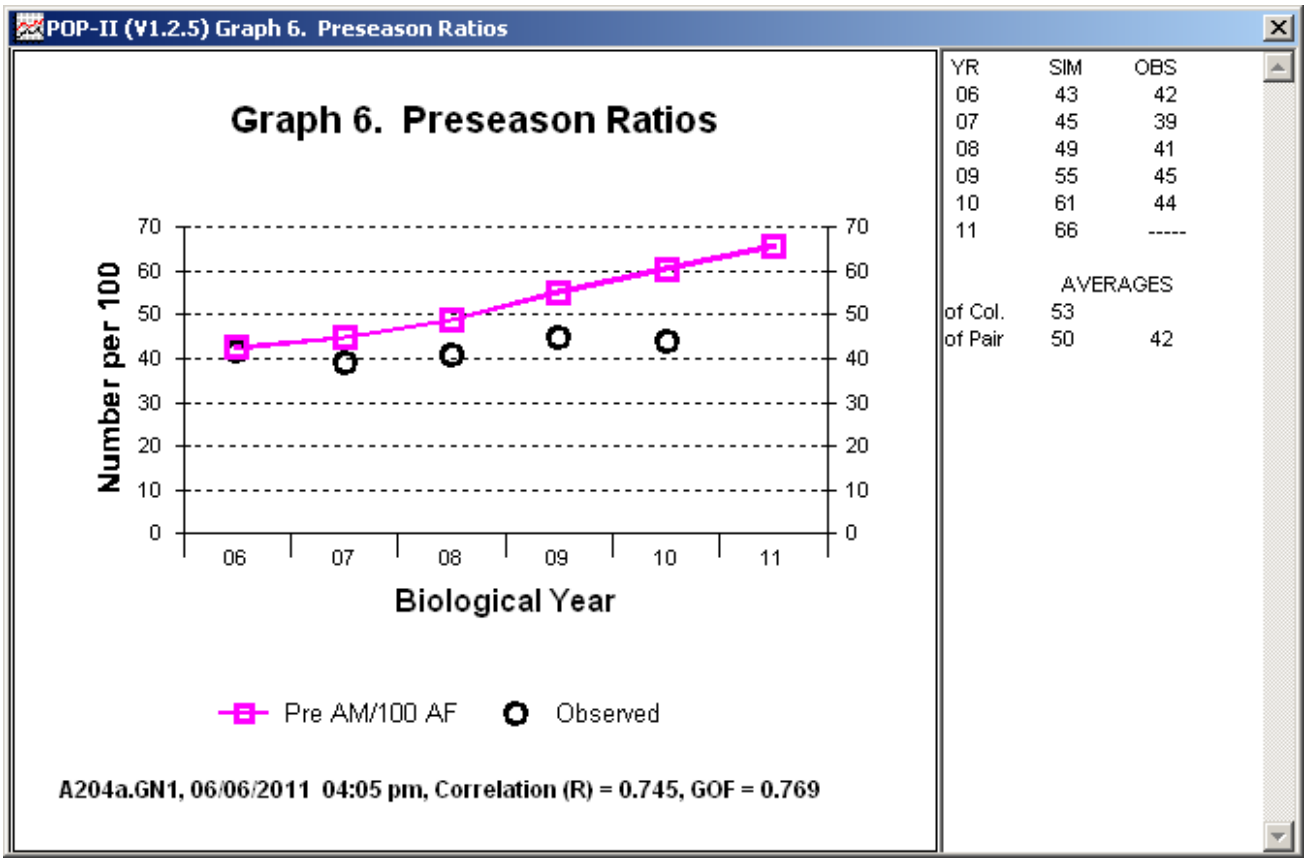
Table 4. Harvest Percentages for A204a.GN1 06/06/2011 04:05 pm

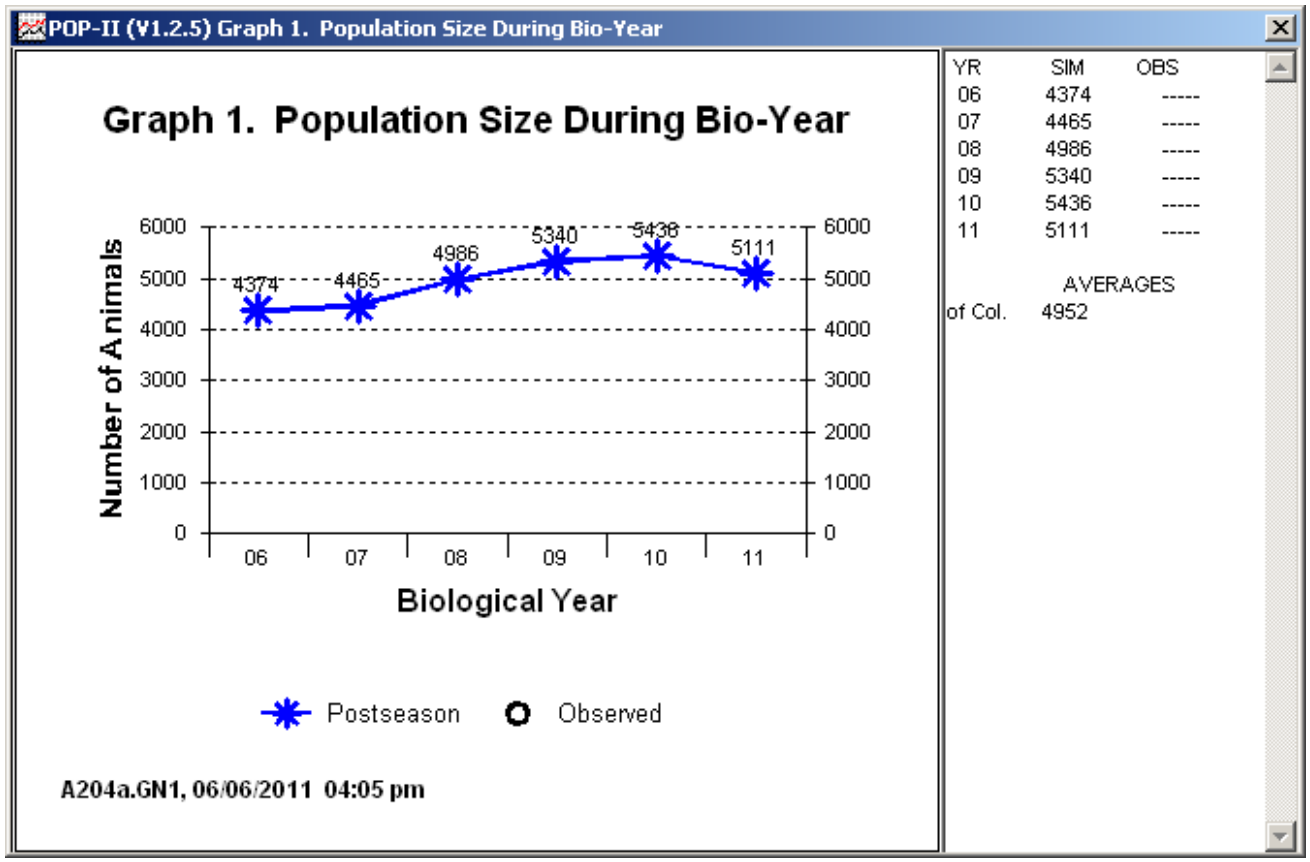
Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	Yearling Males
2006	0.4	13.8	1.3	3.75	9.9
2007	1.4	15.3	4.0	5.87	8.0
2008	0.9	11.9	4.9	5.47	9.0
2009	2.2	15.0	8.4	8.46	9.1
2010	3.8	17.3	12.8	11.71	8.2
2011	4.0	18.4	14.2	12.85	6.7

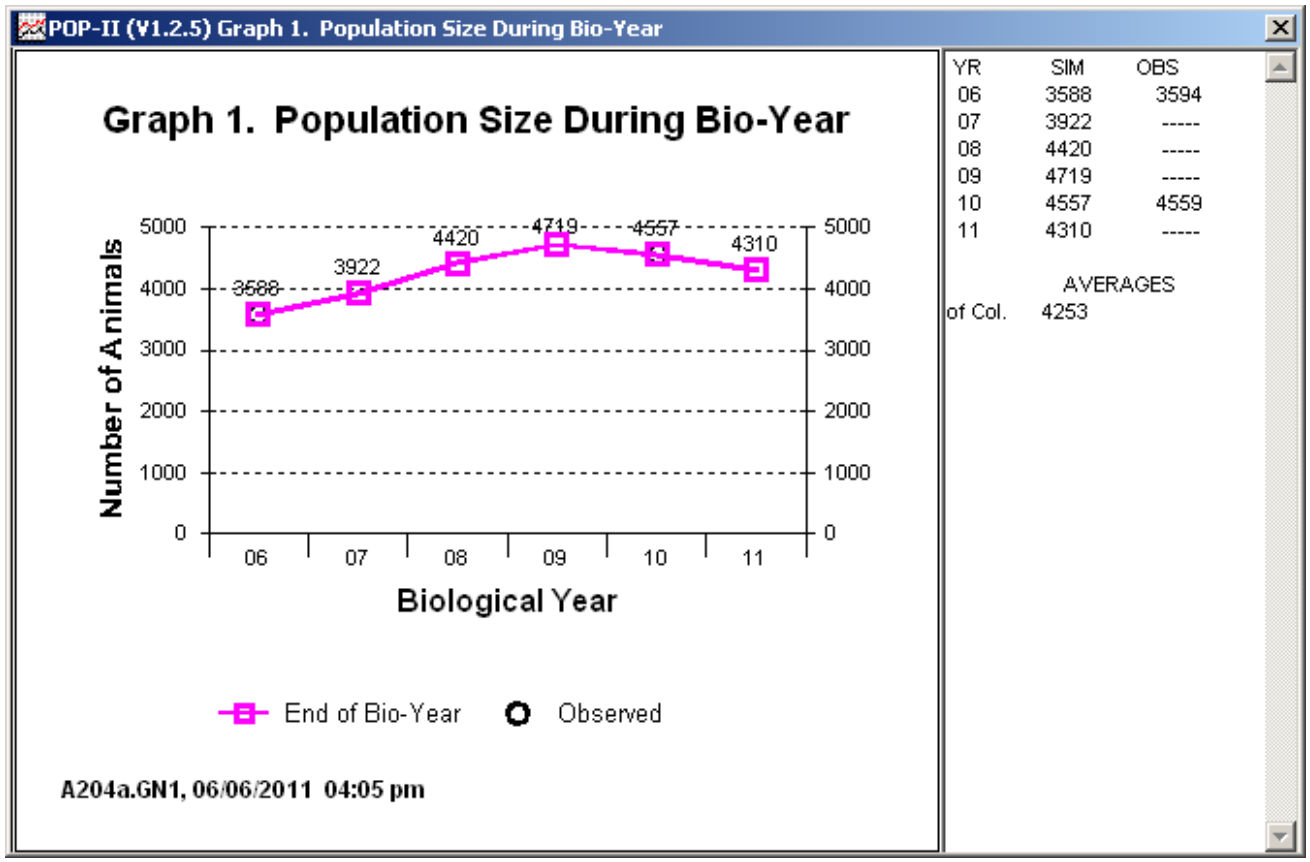
Table 7. Postseason Ratios for A204a.GN1 06/06/2011 04:05 pm

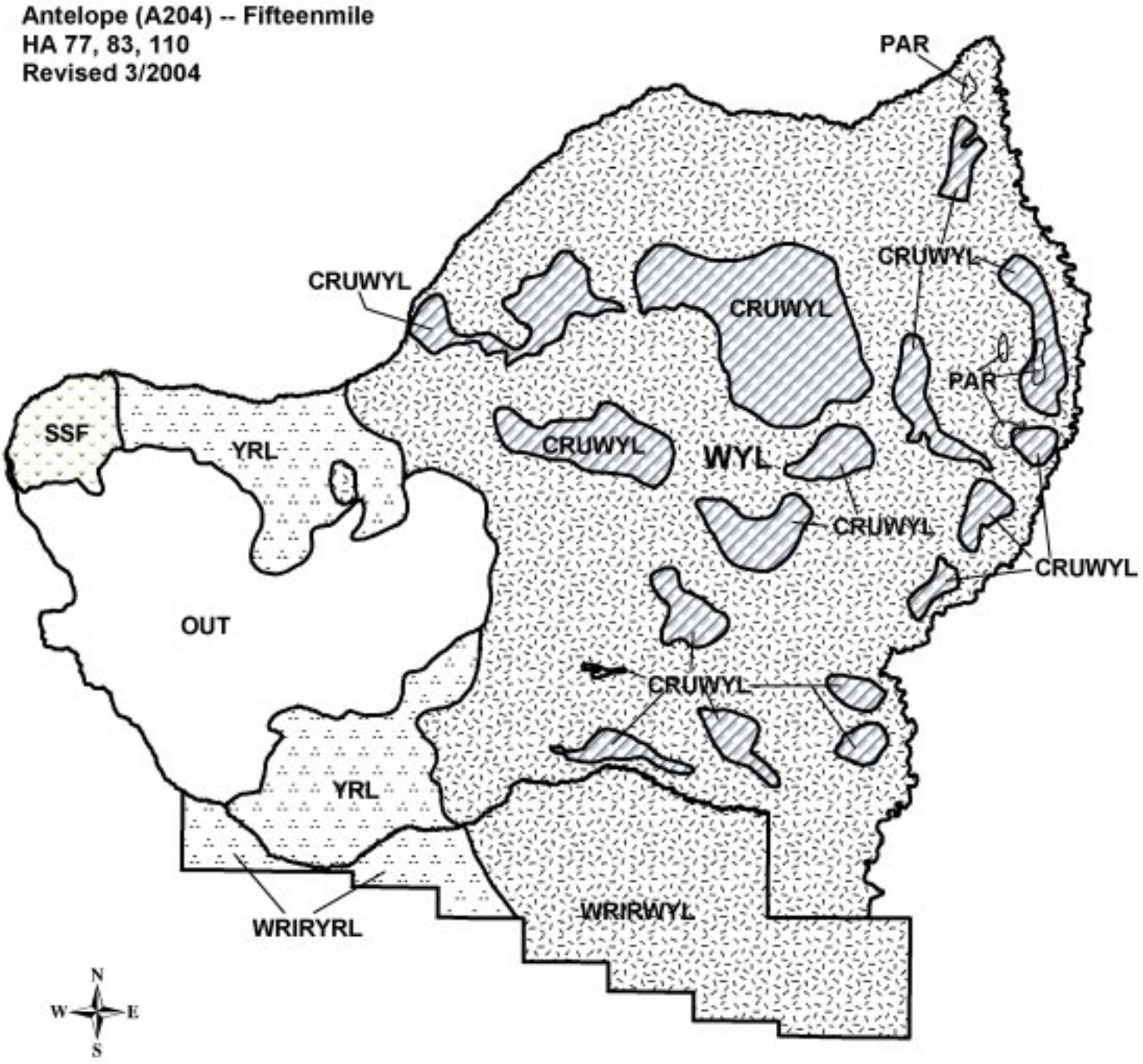
Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2006	56.5	22.0	14.7	36.6
2007	54.7	25.5	13.6	39.1
2008	60.3	28.4	16.5	44.9
2009	61.1	31.4	19.4	50.8
2010	63.7	36.4	20.7	57.1
2011	63.8	42.5	19.6	62.1


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
Biological Year
06
07
08
09
10
11
Pre SA/100 AF
Observed
A204a.GN1, 06/06/2011 04:05 pm, Correlation (R) = 0.997, GOF = 0.997
YR SIM OBS
06 56 56
07 53 53
08 58 58
09 57 57
10 57 57
11 56 -----
AVERAGES
of Col. 56
of Pair 56 56


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
Biological Year
06
07
08
09
10
11
Pre AM/100 AF
Observed
A204a.GN1, 06/06/2011 04:05 pm, Correlation (R) = 0.745, GOF = 0.769
YR SIM OBS
06 43 42
07 45 39
08 49 41
09 55 45
10 61 44
11 66 -----
AVERAGES
of Col. 53
of Pair 50 42


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
Biological Year
06
07
08
09
10
11
4374
4465
4986
5340
5436
5111
Postseason
Observed
A204a.GN1, 06/06/2011 04:05 pm
YR SIM OBS
06 4374 -----
07 4465 -----
08 4986 -----
09 5340 -----
10 5436 -----
11 5111 -----
AVERAGES
of Col. 4952


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
Biological Year
06
07
08
09
10
11
3588
3922
4420
4719
4557
4310
End of Bio-Year
Observed
A204a.GN1, 06/06/2011 04:05 pm
YR SIM OBS
06 3588 3594
07 3922 -----
08 4420 -----
09 4719 -----
10 4557 4559
11 4310 -----
AVERAGES
of Col. 4253


Antelope (A204) -- Fifteenmile
HA 77, 83, 110
Revised 3/2004
PAR
CRUWYL
CRUWYL
CRUWYL
PAR
SSF
YRL
CRUWYL
WYL
CRUWYL
CRUWYL
OUT
CRUWYL
YRL
WRIRYRL
WRIRWYL
N
W
E
S

2010 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2010 - 5/31/2011

HERD: PR205 - CARTER MOUNTAIN

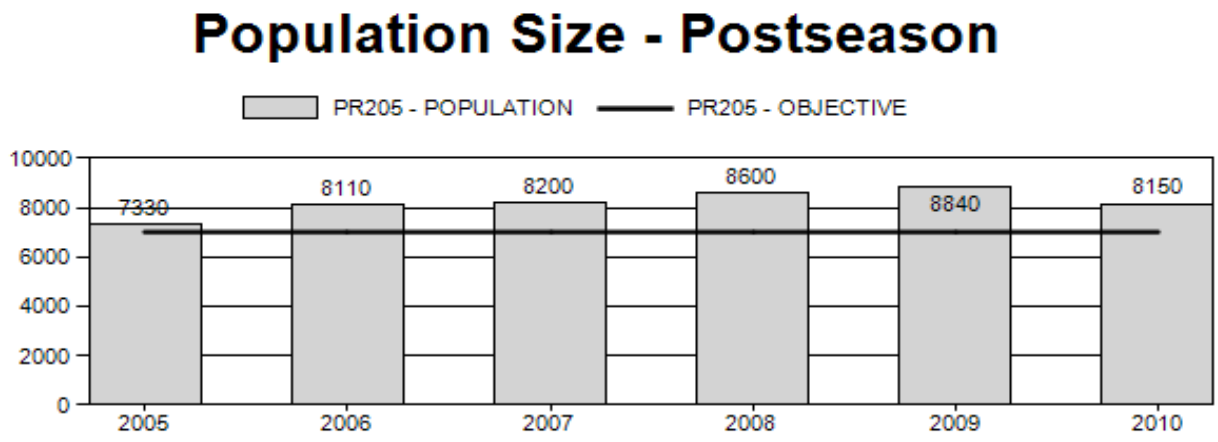
HUNT AREAS: 78, 81-82 | PREPARED BY: TOM EASTERLY

	2005 - 2009 Average	2010	2011 Proposed
Population:	8,216	8,150	7,900
Harvest:	235	457	825
Hunters:	247	437	925
Hunter Success:	95%	105%	89%
Active Licenses:	268	505	925
Active License Percent:	88%	90%	89%
Recreation Days:	798	1,807	1,900
Days Per Animal:	3.4	4	2.3
Males per 100 Females	44	55	
Juveniles per 100 Females	56	43	

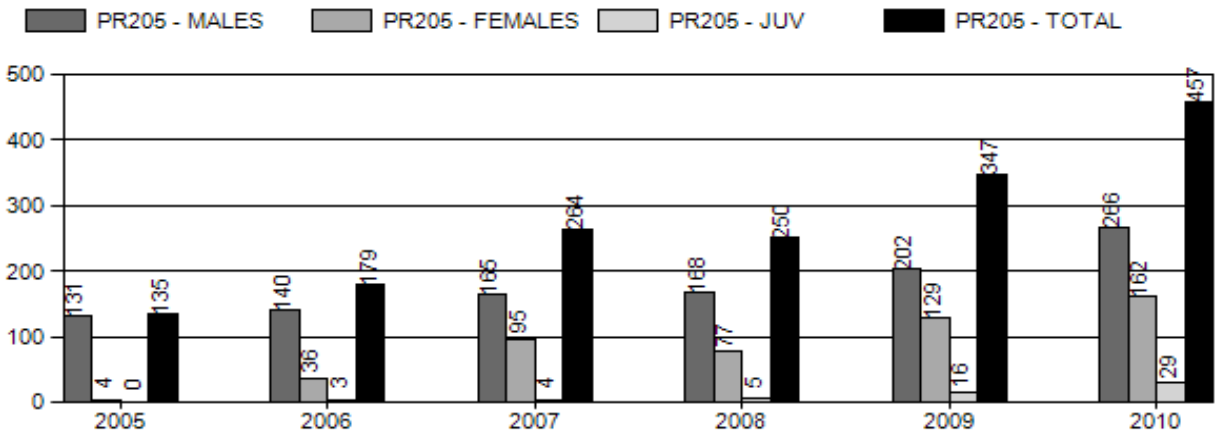
Population Objective:	7,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	16%
Number of years population has been + or - objective in recent trend:	5
Model Date:	5/20/2011

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

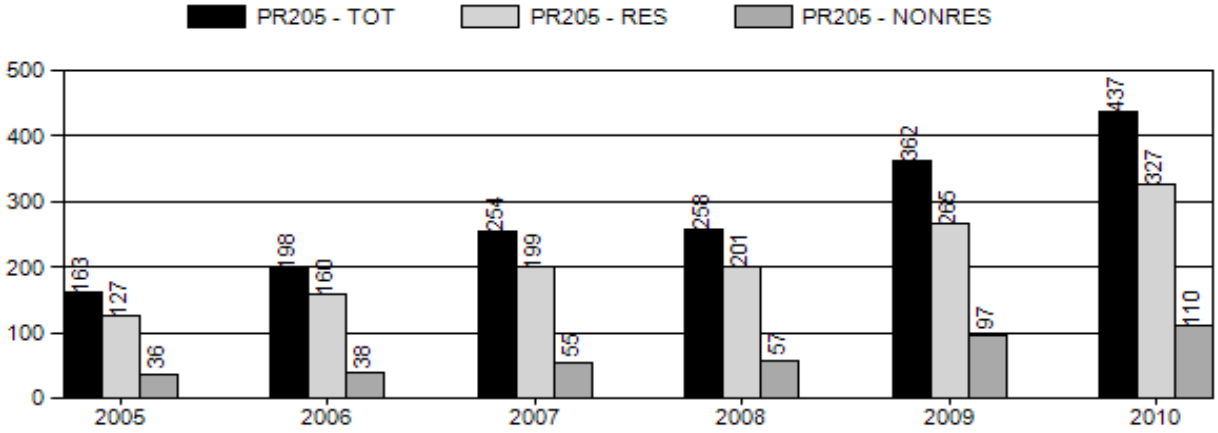
	JCR Year	Proposed
Females ≥ 1 year old:	4.1%	13.4%
Males ≥ 1 year old:	8.9%	10.6%
Juveniles (< 1 year old):	1.7%	1.1%
Total:	5.3%	9.4%
Proposed change in post-season population:	-3.2%	-6.4%



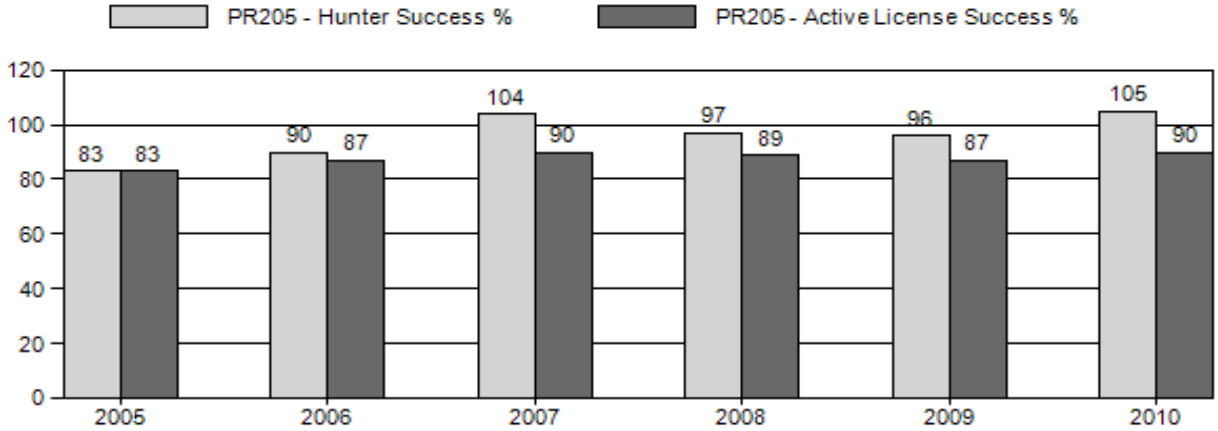
Harvest



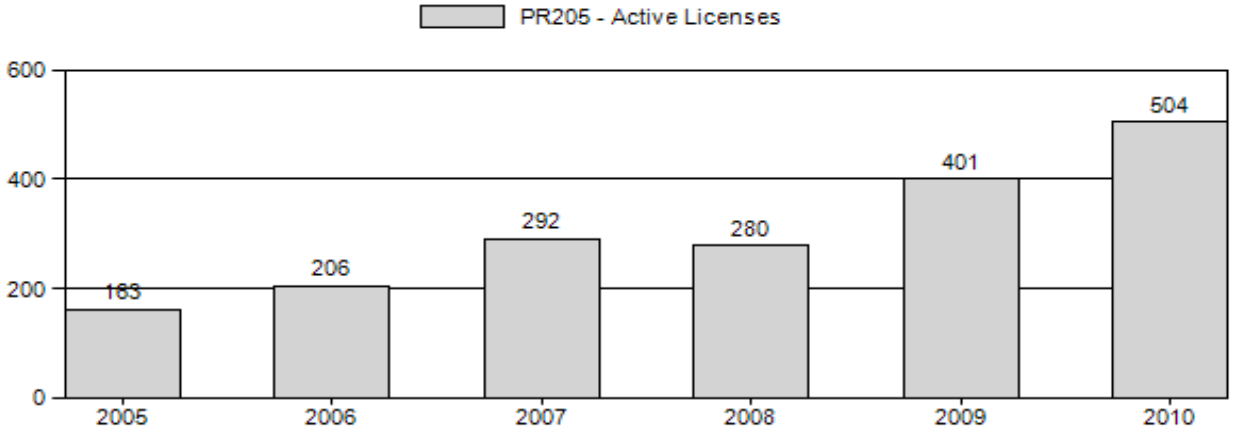
Number of Hunters



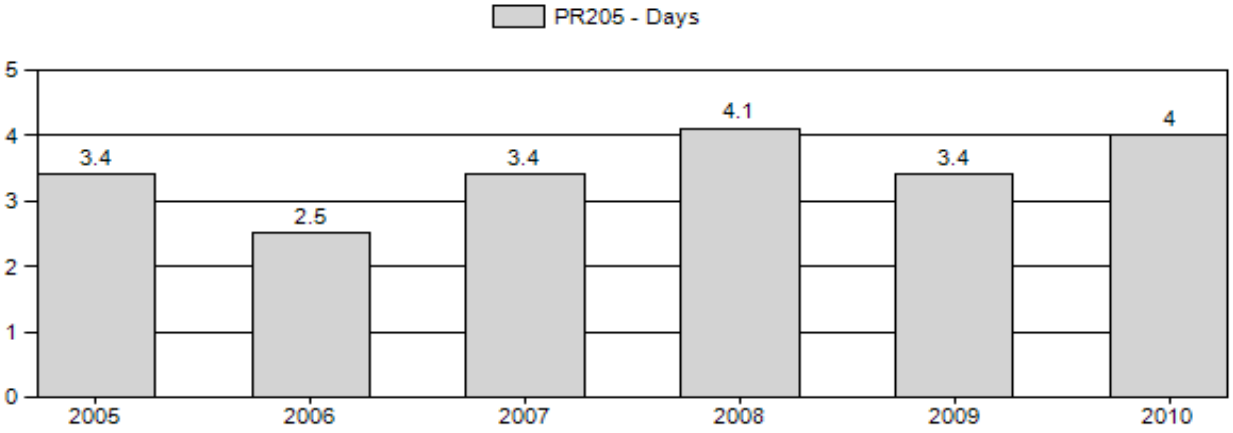
Harvest Success



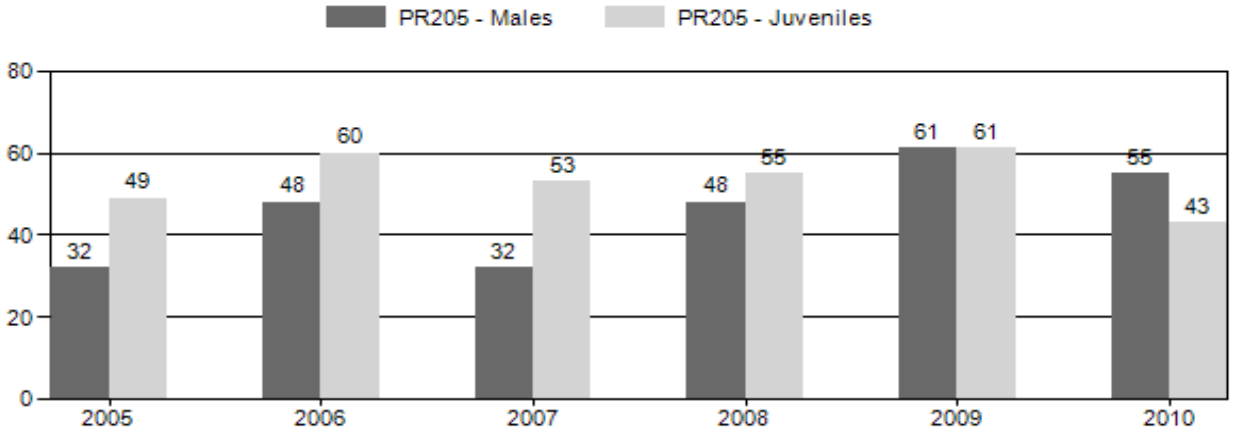
Active Licenses



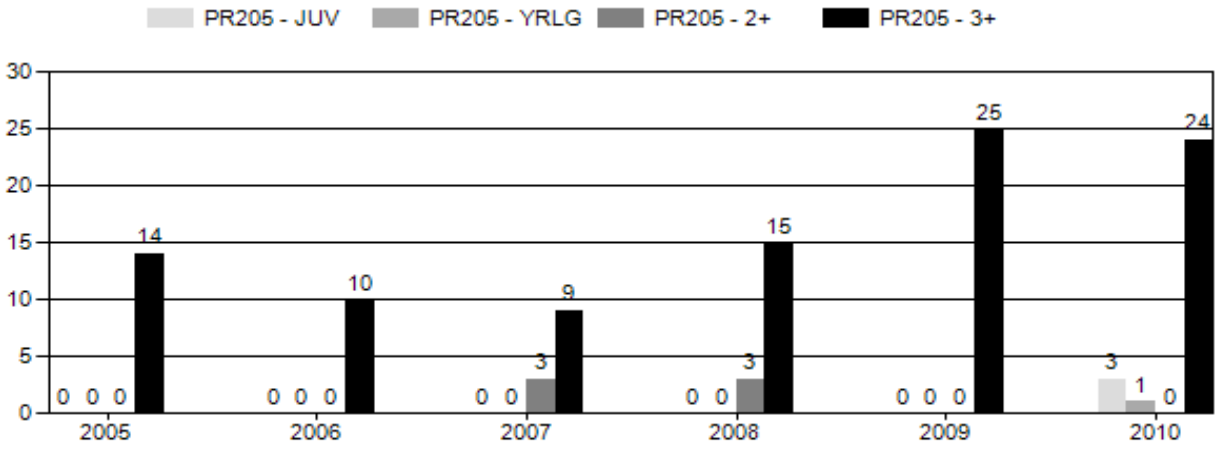
Days Per Animal Harvested



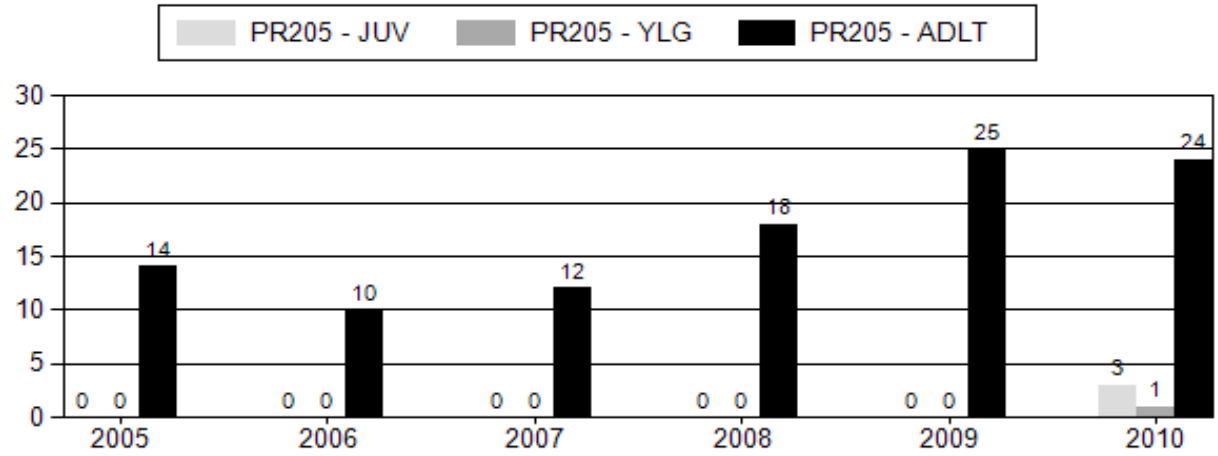
Preseason Animals per 100 Females



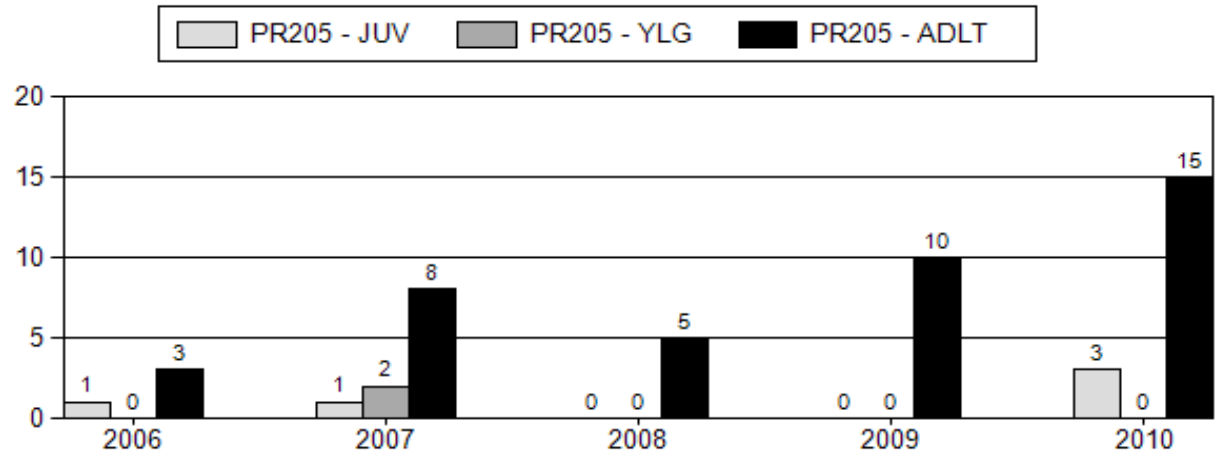
Age Structure of Field Checked Males



Age Structure Data (Field and Laboratory) - Male



Age Structure Data (Field and Laboratory) - Female



Narrative Report

SPECIES: **Pronghorn** HERD UNIT: **Carter Mountain**
YEAR: **2010** HUNT AREAS: **78, 81, 82**

Introduction

Hunt areas 78, 81, and 82 were combined to create the Carter Mountain Herd Unit (HU) after a marking study in 1982-84. Pronghorn migrate seasonally between these Hunt Areas. Hunt Area boundaries were realigned in 1985, 1987, and 1994 to better reflect pronghorn distribution and migration. The population objective (7,000) and other management parameters were first adopted in 1984 and were considered adequate after formal reviews in 1988, 2001, and 2007. Seasonal overlays were updated in spring 2008.

This HU ranges across the entire Bighorn Basin, over 60 miles east-to-west, encompassing approximately 2,100mi^2 (1,695mi^2 of occupied habitat). The major habitat type is sagebrush-saltbush-grasslands. Private agricultural lands occur along all major rivers and streams. Portions of summer range on the west side of the HU consist of alpine grasslands and mountain meadows on Carter Mountain.

Weather

Between 1999 and 2007, drought conditions prevailed across the Big Horn pronghorn herd unit, with less than 30% of average annual precipitation falling in several years (2000, 2001, and 2006). By 2008, drought conditions were subsiding and in spring of 2011 greater than 200% of average annual precipitation had been received in the area. Temperatures were typically greater than average during drought and generally normal (to below normal) during 2008 and 2010.

Habitat Conditions

Drought conditions that prevailed throughout much of the last decade have subsided. Production of herbaceous vegetation increased in 2009, 2010 and 2011 in response to increased precipitation. During spring 2011, much of this HU received above average precipitation.

Population

This population was affected by drought through decreased survival and recruitment of pronghorn fawns. Fawn survival reversed quickly as precipitation levels returned to "normal". Increased recruitment allowed the population to also increase.

There is no doubt this population increased; however, the magnitude of that increase may be exaggerated when comparing population estimates from the 1990s and 2000s with the recently developed estimates presented in this report. Changes to line transect sampling and Distance® software analysis resulted in a much higher population estimate than previous years (discussed in 2007 JCR report for this HU). We do not feel the population increased as quickly or dramatically as suggested by changes in these various population estimates. Line transects/Distance® sampling conducted in

2007 and 2010 suggested a population of 9,400 pronghorn and 12,000 pronghorn, respectively. Previous line transect surveys suggested population levels were 4,000 pronghorn in May 2004, 5,000 pronghorn in May 2001. Again, this pronghorn population did not increase from 4,000 to 12,000 over the six-year interval; however line transect methodology and data analysis changed. (Refer to Trend Surveys section below). The POP-II model was also revised to reflect results of line transect surveys.

The current population objective is 7,000 pronghorn. This objective has not been re-evaluated since changes in line transect/Distance® sampling were instituted. There are currently too many pronghorn using private cropland. We will be addressing crop depredation through increased harvest. When number of pronghorn using private land is satisfactory to landowners, we will evaluate the population objective in light of line transect estimates.

Classification data. The Carter Mountain pronghorn population is monitored using pre-season classification surveys conducted annually in August. Standardized routes for classification surveys were begun in 2001 to provide for an estimate of trend in number of pronghorn observed. The minimum sample size required for 90% confidence intervals around sex and age ratios are usually exceeded in most years during classification surveys (Table 1). Samples from all portions of each Hunt Area are needed to obtain accurate ratios for the entire HU. Minimum sample sizes will probably be exceeded while standardized routes are used for classification surveys.

The number of pronghorn classified has steadily increased over the past four years (Table 1), suggesting this population has increased. During drought (2000-05), fawn:doe ratios averaged 37 fawns:100 does. Between 2006 and 2009 fawn recruitment improved (57 fawns:100 does) allowing the population to increase. In 2010, however, fawn:doe ratios were unexpectedly low for all Hunt Areas in the Carter Mountain HU (Table 2); averaging 43 fawns:100 does. Timing of cool, wet weather during late May-early June 2010 may have resulted in higher than normal fawn mortality. Spring 2011 was wetter than 2010, so similar low fawn ratios should be expected for the upcoming classification survey.

Table 1. Classification data for the Carter Mountain pronghorn herd, 2005-10.

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylg	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2005	7,480	105	151	256	17%	810	55%	399	27%	1,465	1,108	13	19	32	± 3	49	±4	37
2006	8,300	124	206	330	23%	682	48%	407	29%	1,419	1,519	18	30	48	± 5	60	±5	40
2007	8,490	110	174	284	17%	895	54%	475	29%	1,654	1,243	12	19	32	± 3	53	±4	40
2008	8,880	161	264	425	24%	880	49%	485	27%	1,790	1,870	18	30	48	± 4	55	±4	37
2009	9,230	156	273	568*	28%	925	45%	568	28%	2,061	1,634	17	30	61	± 4	61	±4	38
2010	8,650	198	410	608	28%	1,098	50%	473	22%	2,179	1,344	18	37	55	± 4	43	±3	28

* 139 males of unknown age were also observed in Hunt Area 82

Table 2. Classification data for Carter Mountain pronghorn herd unit by hunt area, 2010.

Hunt Area	Males			% of sample	Female	% of sample	Juv	% of sample	Total sample	Herd Ratios per 100			
	Yrling	Adult	Total							Juv/ Fem	Male/ Fem	Yrlg Male/ Fem	Juv/ Adult
78	53	92	145	24%	333	55%	127	21%	605	38	44	16	27
81	53	89	142	24%	324	55%	129	22%	595	40	44	16	28
82	92	229	321	33%	441	45%	217	22%	979	49	73	21	28
TOTAL	**198**	**410**	**608**	**28%**	**1,098**	**50%**	**473**	**22%**	**2,179**	**43**	**55**	**18**	**31**

One management goal for this pronghorn population has been to maintain approximately 50 bucks (total) per 100 does during classification surveys. Low fawn survival limited buck numbers during the latter half of the last decade (Table 1). As recruitment improved, buck ratios have begun to improve. In 2009, 568 bucks (156 yearling, 273 adult, and 139 of unknown age) were classified for a ratio of 61 bucks:100 does. The ratio dropped to 55 bucks (18 yearling, 37 adult) per 100 does in August of 2010. The buck ratio in Area 82 was exceptionally high (73:100, Table 2), while ratios in the other two areas were low (44:100).

Trend surveys. Line transect surveys are conducted in this HU every third year. A survey was conducted at the end of 2009 biological year (actually occurred 2-6 June 2010). Weather conditions were variable from fair (partly cloudy, calm winds) to marginal (100% cloud cover, strong wind, light rain) for flying this survey. A total of 1160 miles of transect line were flown across 1421mi^2 of the Carter Mountain HU resulting in observations of 264 groups of pronghorn (498 individuals). Area surveyed, total transect length, number of groups observed and number of pronghorn observed were similar to previous line transect surveys conducted in this HU (Table 3).

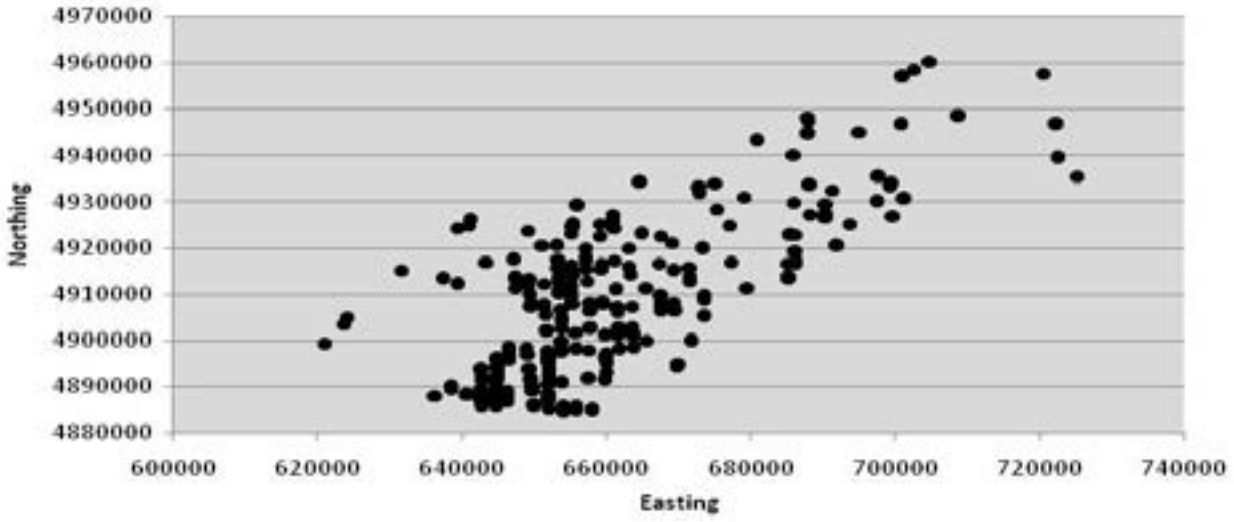
Distance® software, however, produced different population estimates between the survey conducted in 2003 versus surveys conducted in 2006 and 2009 (Table 3). Between those years, survey protocols were changed to using one observer (2006 and 2009) instead of two observers (2003). Distance® software required a sampling fraction to adjust calculations for only one observer (transects were half as wide). Using a sampling fraction (multiply by 2, or divide by 0.5) almost tripled the population estimate. For end of year 2009, the population was estimated at approximately 12,000 pronghorn.

Table 3. Comparison of line transect surveys in the Carter Mountain pronghorn herd unit conducted at end of biological years 2003, 2006, 2009.

	2003	2006	2009
Transect width (meters), adjusted for mean AGL	218	197	194
Distance flown for all transect lines (miles)	1212	1173	1160
Area (mi^2)	1450	1384	1421
Number of clusters (groups) observed	263	212	264
Number of individuals observed	569	476	498
Average cluster size	2.2	2.2	1.9
Density estimate (pronghorn/mi^2)	1.72	6.82	8.45
Population estimate	2489	9433	12000

Similar to the biological year 2006 survey, the line transect survey conducted at the end of biological year 2009 was not very robust. The 95% confidence intervals around the new population estimate are wide: 7973 – 18084 pronghorn. Precision of the estimate was fairly poor overall with coefficient of variation about the herd total being over 20%. Several assumptions of line transect methodology may have been violated (Johnson et. al. 1991). The histogram generated from observations of pronghorn across distance bands indicated that animals on the transect line (A band) may have been missed. The detection curve overestimated actual observations in the A band. With only one observer in the plane's backseat, animal movements may not have been detected and those groups may have been placed in the incorrect distance band. Figure 1 indicates that pronghorn in the Carter Mountain herd were not uniformly distributed across the area surveyed. This again violates an assumption of line transect sampling (equal distribution across the survey area) and may also bias resulting population estimates.

Figure 1. Distribution of pronghorn observed during line transect survey conducted in the Carter Mountain Herd Unit, 2-6 June 2010.



As stated above, personnel do not believe this pronghorn population increased by over 9,000 individuals between biological years 2003 and 2009; however, we do agree that this population did increase. Differences in population estimates between 2003 and 2006 (and 2009) are mainly due to changes in survey methodology and statistical analysis. Refer to the 2007 annual completion report for this Herd Unit for a more detailed discussion of those changes.

Population modeling. Following the 2009 line transect and analysis, the POP-II model was adjusted to be more in line with the population estimate produced by Distance®. Other minor changes to the model were needed to align simulated data with observed data (e.g., years of simulation, initial population). POP-II was intentionally set to provide a population estimate lower than the line transect surveys since there is still doubt that this population has reached 12,000 animals. If the initial population was set to provide an estimate closer to 12,000 pronghorn simulated buck:doe ratios began diverging from

observed ratios at a much greater rate. This version of the POP-II model predicted there were over 7,100 pronghorn end-of-year 2009 (when line transect survey was conducted). The post-hunting season population was estimated at 8,800 pronghorn in 2009 and then down slightly post-hunting 2010 (8,100 pronghorn).

Hunting season

Hunting seasons during most of last decade were conservative to reflect low fawn recruitment. Most of these Hunt Areas were decreased to 50-75 any antelope licenses. As the population began to increase, complaints of crop depredation also increased, as did buck:doe ratios. Hunting seasons are beginning to become more liberal.

2010 Hunting season. For the 2010 hunting season, the number of licenses offered was increased from the 2009 hunting season (Table 4). More bucks observed during classification surveys resulted in more opportunity for hunters (any antelope licenses). Doe/fawn licenses were also liberalized to address complaints of crop depredation. The restriction on "portion of the area" was removed from Type 6 (doe/fawn) licenses in Area 78, but it was still restricted to private land. The Area 82 Type 6 licenses were opened 15 August rather than 1 September. The 2010 season was not drastically changed to reflect the population estimate produced by line transect/Distance®.

Table 4. Hunting seasons held in the Carter Mountain pronghorn herd unit, 2010.

HUNT AREA	TYPE	SEASON DATES	LIMITATIONS
78	1	Sept 1-Sept 30	Limited quota; **75** licenses any antelope
	6	Sept 1-Oct 31	Limited quota; **100** licenses doe or fawn valid **on private land**
81	1	Oct 1-Nov 15	Limited quota; 25 licenses any antelope valid in that portion of Area 81 east of Wyoming Highway 120
	2	Nov 1-Nov 15	Limited quota; **75** licenses any antelope
82	1	Sept 20-Oct 14	Limited quota; **150** licenses any antelope
	6	**Aug 15**-Oct 31	Limited quota; 50 licenses doe or fawn valid on private land **east of Wyoming Highway 120**
	7	Sept 20-Oct 14	Limited quota; **100** licenses doe or fawn valid in that portion of Area 82 west of Wyoming Highway 120
ARCHERY:			
78, 81, 82		Aug 15	Refer to Section 4 of this Chapter

Bold font indicates a change from the 2009 hunting seasons.

Harvest and hunter statistics. Table 5 provides harvest statistics for the 2010 hunting season. The number of active licenses and hunters increased (by approximately 100 and 70, respectively) over the 2009 hunting season; a trend that has continued since 2005 (refer to harvest trend graphs earlier in this report). Harvest levels and hunter success also increased across all sex and age classes of harvested animals. Almost 60 more bucks and 30 more does were harvested in 2010 over the 2009 harvest levels. Increased harvest was mainly due to increased number of licenses available.

Table 5. Number of hunters, harvested pronghorn, and other harvest statistics for Carter Mountain pronghorn herd unit, 2010.

Area	Type	Active Lic/Htrs	Buck	Doe	Fawn	Total	Success	Days/ Harvest	Days	Licenses Sold
78 McCULLOUGH PEAKS										
	Type 1	79	75	0	0	75	94.9%	3.1	235	79
	Type 6	84	0	62	11	73	86.9%	7.4	541	100
Pooled Total		135 (163)*	75	62	11	148	109.6% (90.8%)*	5.2	776	
Pooled Resident		107	56	47	7	110	102.8%	5.4	594	
Pooled Nonresident		28	19	15	4	38	135.7%	4.8	182	
81 SOUTH FORK										
	Type 1	23	17	0	0	17	73.9%	3.5	60	26
	Type 2	74	65	3	3	71	95.9%	3.3	236	77
Pooled Total		97 (97)*	82	3	3	88	90.7% (90.7%)*	3.4	296	
Pooled Resident		75	61	3	3	67	89.3%	4.0	265	
Pooled Nonresident		22	21	0	0	21	95.5%	1.5	31	
82 NORTH GREYBULL RIVER										
	Type 1	129	109	4	0	113	87.6%	4.6	516	151
	Type 6	27	0	19	3	22	81.5%	2.8	61	36
	Type 7	89	0	74	12	86	96.6%	1.8	158	100
Pooled Total		204 (245)*	109	97	15	221	108.3% (90.2%)*	3.3	735	
Pooled Resident		144	80	52	3	135	93.8%	4.1	550	
Pooled Nonresident		60	29	45	12	86	143.3%	2.2	185	
2010 Hunt Area Total		436 (505)*	266	162	29	457	104.8% (90.5%)*	4.0	1807	569
2010 Herd Total		437 (505)*	266	162	29	457	104.6% (90.5%)*	4.0	1807	569

*Active Licenses

Hunter field checks. With so few licenses offered and long hunting seasons (30+ days), few pronghorn hunters are checked by Game & Fish personnel in the field. In most years, only approximately 10% of the estimated harvest was checked in the field (Table 6). In 2010, 48 of the estimated 457 harvested pronghorn were aged (10.5%). Since sample sizes are low, age structure of the field checked pronghorn should not be extrapolated across all harvested animals.

Table 6. Age structure of field checked animals taken from the Carter Mountain pronghorn herd unit during the 2005-10 hunting seasons.

Year	Males										Females									Herd Total
	Juv	1	%1*	2	3 ^	%3**	Total Aged ++	Not Aged +++	Unk	Total Chkd	Juv	1	%1*	2	3 ^	%3**	Total Aged ++	Not Aged +++	Unk	Total Chkd	
2005	0	0	0%	0	12	100%	12	2	0	14	0	0	0%	0	0	0%	0	0	0	0	14
2006	0	0	0%	0	6	100%	6	4	0	10	1	0	0%	0	3	100%	4	0	0	4	14
2007	0	0	0%	3	8	73%	11	1	0	12	1	2	20%	1	4	57%	8	3	0	11	23
2008	0	0	0%	3	15	83%	18	0	1	19	0	0	0%	1	2	67%	3	2	0	5	24
2009	0	0	0%	0	25	100%	25	0	0	25	0	0	0%	2	8	80%	10	0	1	11	36
2010	3	1	4%	0	16	94%	20	8	0	28	3	0	0%	1	5	83%	9	9	2	20	48

* Percent of aged animals (including unaged adults but excluding juveniles) 1 1/2 years old

^ Number of animals three years old and older. Animals aged older than three (excluding unaged adults) are lumped into this three plus category

** Percent of aged animals (not including juveniles or unaged adults) three years old or older

++ includes juveniles

+++ Unaged adults - unaged animals older than yearlings

2011 Proposed HUNTING SEASONS
Carter Mountain Pronghorn Antelope Herd Unit (PR205)

HUNT AREA	TYPE	Season Dates OPENS	CLOSES	LIMITATIONS
78	1	~~Sept. 1~~	~~Sept. 30~~	Limited Quota; ~~75~~ **100** licenses any antelope
		Sept. 20	**Oct. 31**	
	6	Sept. 1	Oct 31	Limited Quota; 100 licenses doe or fawn ~~valid on private land~~
	7	**Sept. 20**	**Nov 30**	**Limited Quota; 250 licenses doe or fawn valid in that portion of Area 78 in the Shoshone River drainage**
81	1	Oct. 1	Nov. 15	Limited Quota; 25 licenses any antelope valid in that portion of Area 81 east of Wyoming Highway 120
	2	Nov. 1	Nov. 15	Limited Quota; ~~75~~ **100** licenses any antelope
	6	**Oct. 1**	**Nov. 15**	**Limited Quota; 50 licenses doe or fawn valid in that portion of Area 81 west of Wyoming Highway 120**
82	1	Sept. 20	Oct. 14	Limited Quota; 150 licenses any antelope
	6	~~Aug 15~~	~~Oct. 31~~	Limited Quota; 50 licenses doe or fawn
		Sept. 1	**Oct. 31**	valid in that portion of Area 82 on private land east of Wyoming Highway 120
	7	Sept. 20	Oct. 14	Limited Quota; 100 licenses doe or fawn valid in that portion of Area 82 west of Wyoming Highway 120

Summary of proposed changes:

Hunt Area	Type	Change from 2010
78	1	dates changed; increase by 25 licenses
	6	removed private land limitation
	7	new licenses type
81	2	increased by 25 licenses
	6	new license type
82	6	dates changed

JUSTIFICATION

We propose to provide more opportunity to harvest antelope in these areas. Type 1 (any antelope) licenses in Areas 78 and 81 are proposed to increase by 25 licenses each. Type 6 (doe/fawn) hunters in Area 78 will no longer be restricted to private land. The Area 78 Type 7 and Area 81 Type 6 licenses were not previously advertised in the application packet but are needed to address depredation. The season for Area 82 Type 6 license is proposed to be shortened by 15 days; opening September 1 instead of August 15.

Line transect surveys are conducted in this herd unit every three years. Beginning in 2006, the line transect technique was modified to use only one observer. That change resulted in a modification in analysis with Distance software. Resulting population estimates have been considerably higher than previous line transect estimates. In 2006, there were an estimated 9,400 antelope in the herd unit. Following the survey in May 2010 (end of biological year 2009), the population estimate was 12,000 antelope. Previous estimates (line transect/Distance and POP-II) had placed this population below 6000 antelope.

The POP-II model was adjusted this year to more closely reflect line transect estimates; however, we still believe there are less antelope in this population than estimated by line transect/Distance. The 2010 post-season estimate was 8,150 antelope. The population objective for this herd unit is 7,000 antelope.

The higher population estimate and good buck:doe ratios allow for an increase in Type 1 (any antelope) licenses. Buck:doe ratios were increasing until 2010 (32:100 in 2007 to 61:100 in 2009). Despite a slight drop in the buck ratios observed in 2010 (55 bucks:100 does), there were still enough bucks in the population to allow for increased harvest. We propose to slightly increase Type 1 licenses in Areas 78 and 81. License numbers were increased in Area 82 last year.

Fawn:doe ratios have increased since drought has subsided in the late 2000s. Increased recruitment has allowed the population to increase, as suggested by both the line transect surveys and the POP-II model. The fawn:doe ratio observed in 2010, however, was lower than expected. Last winter was not too stressful; last spring and summer were warm with good precipitation. Does and fawns should have been in good physical condition. We will continue to monitor this population and recruitment.

Antelope in this herd tend to congregate on private agricultural land. Landowner tolerance for antelope on crops has been exceeded, especially along the Shoshone River. Doe/fawn licenses were created to specifically address that area of concern. Doe/fawn licenses for other hunt areas are proposed to increase to address other areas with depredation. These doe/fawn licenses will also address reducing the population toward objective.

Other management issues

Crop depredation will always have a major influence over hunting seasons, especially doe/fawn licenses. For the 2011 season, 300 more doe/fawn licenses will be offered, mostly (250 licenses) in Hunt Area 78. Depredation hunts and kill permits have also been offered in problem areas in some years. Landowners refuse to take measures to keep pronghorn out of crop fields (fence), thus the only management option available is to remove those animals from the population. WGFD should investigate options of providing fencing materials for those fields versus the continued and annual cost of paying for depredation to crops.

Hunters have been questioning the need for a late (1 November) opening date for any antelope in Hunt Area 81 (Type 2 licenses). By early November, some bucks are shedding horn sheaths. One major landowner does not want pronghorn hunters on his property until late; however, elk and mule deer hunters have enjoyed earlier opening dates (1 October for elk Area 58, 15 October for deer Area 113 Type 6 licenses). For 2011, there will be a doe/fawn pronghorn license opening 1 October. Type 2 license hunters, however, are still restricted to hunting late.

Habitat projects

Brush transects were established in 2004 to give personnel an opportunity to monitor browsing pressure. There is one sagebrush utilization transect within this herd unit, located approximately 14.5 miles southeast of Cody. Mostly, this transect has been of limited utility in gauging habitat use since production has been limited (Fig. 2). Even after drought subsided production of sagebrush has not increased. Utilization of the previous year's production (measured in early spring before annual growth begins) was highest (25%) during winter 2005-06 following "good" moisture and growing season in 2005 (Fig. 3). Use of sagebrush along this transect declined from 2006 to 2009, but increased in 2010 as did the number of pellet groups observed along that transect. Pronghorn may have been in this area more due to snow levels across the winter range. In addition to pronghorn, the area contains mule deer (few), cottontail, jack rabbits and livestock.

Figure 2. Sagebrush production (Dry Creek Basin) and growing season precipitation (Oregon Basin), 2004-10.

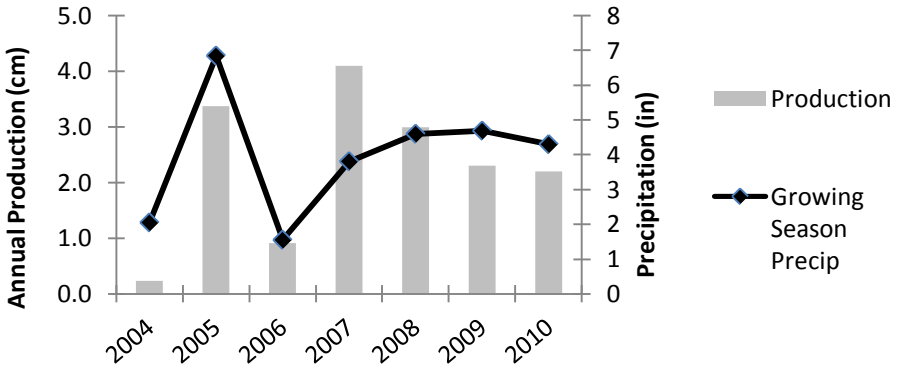
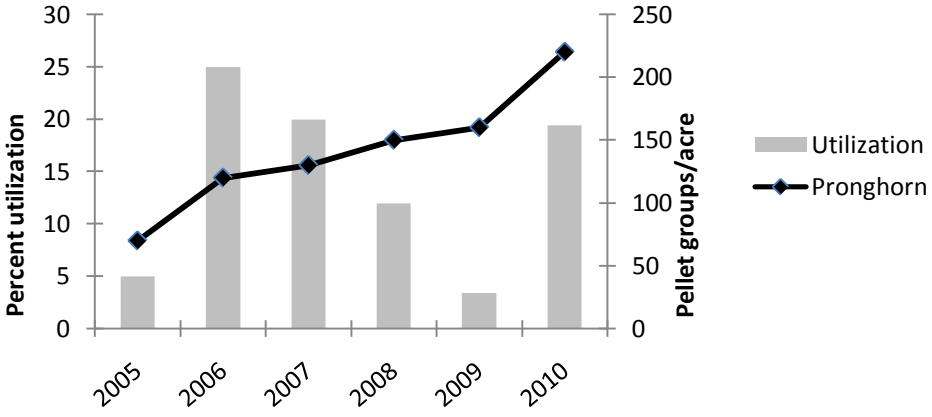


Figure 3. Sagebrush utilization and count of pellet groups observed along production/utilization transect in Dry Creek Basin, 2005-10.



Management recommendations

Line transect sampling and Distance® analysis of data should be tested using a known population. A known number of inanimate objects or livestock could be placed in an area to be surveyed to test detectability during aerial surveys and to test data analysis. Past line transect data for the Carter Mountain herd unit may need to be re-analyzed by someone familiar with the Distance® program to determine if there were errors made in those surveys or the analysis.

The decline in buck:doe ratios noted in 2010 were probably not related to increased buck harvest in 2009. Pre-season classification surveys do not detect hunter harvest as readily as post-season surveys may. Overwinter mortality and other factors may also influence buck numbers. Last year buck numbers declined in all but one Area (Hunt Area 82). We need to continue monitoring buck:doe ratios to ensure an adequate amount of older age bucks are maintained in this population and distributed across all Hunt Areas.

LITERATURE CITED

Johnson, B.K., F.G. Lindzey, and R.J. Guenzel. Use of aerial line transect surveys to estimate pronghorn populations in Wyoming. Wildl. Soc. Bull. 19:315.321.

AERIAL LINE TRANSECT REPORT

Herd Unit: **Carter Mountain**
Biological Year: **2009** Date(s) of Survey: **2-6 June 2010**

Survey Conduct, Design, and Costs

Observers: Tom Easterly

Pilot/Aircraft Information: Dave Stinson, Plane: Scout, Sky Aviation, Worland, WY

Special Equipment: GPS, laser range finder, handheld computer with CyberTracker Program

Set-up: Both sides of plane marked to define line offset 65m from beneath the plane and distance bands of 0-20m, 21-45m, 46-80m, 81-145m, and 146-200m from the line (total of 265m from beneath the plane) when the plane is at 300 feet AGL. Observer sat in rear seat behind pilot.

Design: The study area was flown with north-south transect lines flown at 1.5 minutes intervals starting at 108 10 11. Map datum: NAD27 CONUS

Mean height AGL: Based on 264 groups observed, mean AGL was 291 feet

Total transect length: A total of 63 transect lines were flown, totaling 1160 statute miles.

Area surveyed: The density estimate was applied across all occupied habitat (1421 mi^2).

Weather/visibility: Weather conditions were fair to marginal for all flights. Skies were partial to complete cloud cover. Some rain and strong winds were experienced. Temperatures ranged from 50^o to 70^o. Background was fairly green to patchy brown due to poor vegetation types (saltbush desert).

SUMMARY BY DISTANCE BAND						
Distance Band	**A**	**B**	**C**	**D**	**E**	**Total**
Outer Distance Limit (meters) Adjusted for Mean AGL	19.7	43.7	77.6	140.7	197.0	194.0
Number of Clusters Observed Prior to Adjustment	56	70	48	60	30	264
Number of Individuals Observed Prior to Adjustment	90	131	101	122	54	498
Average Cluster Size	1.6	1.9	2.1	2.0	1.8	1.9

SURVEY COSTS			
ITEM	AMOUNT	UNIT COST	TOTAL COST
Mission Time	19.5 hours	$230/hour	$4488.00
Ferry Time	0 hours	$230/hour	$0
Per Diem	0 nights	$110/night	$0
		TOTAL COST:	$4488.00

AERIAL LINE TRANSECT REPORT

Herd Name: **Carter Mountain** Herd Number: **205**
Biological Year: **2009** Date(s) of Survey: **2-6 June 2010**

Transect Listing

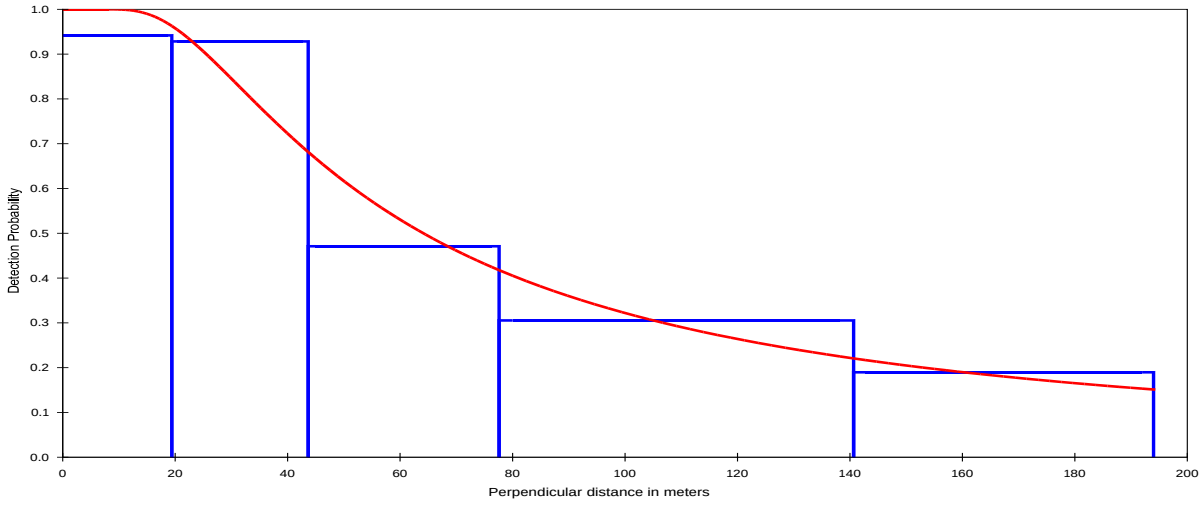
Transect Number	Line* (DDD MM)	Direction	Number of Clusters						Length (Miles)	Height AGL (ft)
			A	B	C	D	E	Total		
1	108 10.0	S	1					1	13.6	372
2	108 11.5	N		2		1		3	21.8	229
3	108 13.0	S		1				1	24.7	300
4	108 14.5	N						0	28.4	
5	108 16.0	S						0	29.6	
6	108 17.5	N						0	27.0	
7	108 19.0	S						0	26.9	
8	108 20.5	N						0	25.9	
9	108 22.0	S			1			1	24.2	244
10	108 23.5	N						0	25.0	
11	108 25.0	S				1		1	22.7	311
12	108 26.5	N		1				1	24.2	362
13	108 28.0	S	3	1				4	26.2	249
14	108 29.5	N	1			2		3	27.4	220
15	108 31.0	S	1		1			2	24.6	313
16	108 32.5	N			1			1	24.9	268
17	108 34.0	S	1					1	24.8	356
18	108 35.5	N		1	1			2	24.2	279
19	108 36.5	S	1	1		1		3	25.2	265
20	108 38.0	N		1	1	3		5	23.9	291
21	108 39.5	S	1	2		4		7	24.7	304
22	108 40.5	N		1	3			4	24.4	366
63	108 43.0	S	1					1	24.9	291
62	108 44.0	N		1		1		3	27.1	291
61	108 46.5	S		1	1			2	28.8	291
60	108 48.0	N		2				2	30.5	291
59	108 49.5	S	1	3	1	1	1	7	32.4	291
58	108 51.0	N		2		2	1	5	34.0	291
57	108 52.5	S	1	3		2	1	7	28.4	291
56	108 54.0	N	1	3	3			7	30.6	291
55	108 55.5	S		1		3		4	33.0	291
54	108 57.0	N	2	1	1	3	1	8	32.5	291
53	108 58.5	S	6	1	2	4	2	1	27.8	291
52	109 00.0	S	2	4	4	2	2	14	27.4	291
51	109 01.5	N	6	1	2	4	1	14	27.8	291
50	109 03.0	S	2	5	5	3	2	17	28.7	291
49	109 04.5	N	4	5	4	4	1	18	25.7	291
48	109 06.0	S	5	6	5	3	4	23	26.2	291
40	109 07.5	S	6	3	3	4	2	18	25.5	291

Transect Listing (cont.)

Transect Number	Line* (DDD MM)	Direction	Number of Clusters A	B	C	D	E	Total	Length (Miles)	Height AGL (ft)
39	109 9.0	S		2		1	1	4	8.4	291
47	109 10.0	N	1	5	4	1		11	12.0	291
46	109 11.5	N	2	2	3	5	4	16	8.9	291
37	109 12.0	S				1		1	5.4	291
45	109 13.0	N	4	3	2	1	4	14	6.0	291
36	109 13.5	S	1	1				2	9.2	291
44	109 14.5	N	1	1				2	5.2	291
35	109 15.0	S				1	1	2	9.1	291
43	109 16.0	N	1			1		2	3.6	291
34	109 16.5	S					1	1	7.7	291
42	109 18.0	N					1	1	2.3	291
31	109 21.0			1				1	6.2	328
28	109 26.5			1		1		2	3.9	217
27	109 29.0			1				1	4.2	459
TOTALS			56	70	48	60	30	264	1160	291

* Some lines were not separated by 1.5 minutes longitude due to line layout in North versus South Forks of the Shoshone River.

Detection probability function generated by DISTANCE software from half normal analysis using simple hazard rate adjustment for Carter Mountain antelope herd line transects survey conducted June 2010.



Carter Mountain herd unit
Data from 2005 to 2011 Simulation from 2005 to 2011

Age Class	Init Pop. Male	Init Pop. Female	Prop. Presn Male	Prop. Presn Female	Mort% Postsn Male	Mort% Postsn Female	Effort Set 1 Male	Effort Set 1 Female	Effort Set 2 Male	Effort Set 2 Female
0	2042.0	2042.0	50.0	50.0	30.0	30.0	0.20	0.20	0.20	0.20
1	302.0	370.0	2.0	2.0	6.0	4.0	0.50	1.00	0.10	1.00
2	259.0	331.0	2.0	2.0	6.0	4.0	1.00	1.00	1.00	1.00
3	113.0	239.0	2.0	2.0	6.0	4.0	1.00	1.00	1.00	1.00
4	107.0	252.0	2.0	2.0	6.0	4.0	1.00	1.00	1.00	1.00
5	84.0	320.0	2.0	2.0	6.0	4.0	1.00	1.00	1.00	1.00
6	84.0	374.0	2.0	2.0	20.0	10.0	1.00	1.00	1.00	1.00
7	42.0	317.0	2.0	2.0	35.0	20.0	1.00	1.00	1.00	1.00
8	14.0	190.0	2.0	2.0	50.0	35.0	1.00	1.00	1.00	1.00
9	10.0	181.0	2.0	2.0	50.0	50.0	1.00	1.00	1.00	1.00
10	1.0	51.0	2.0	2.0	70.0	70.0	1.00	1.00	1.00	1.00
11	0.0	13.0	2.0	2.0	90.0	90.0	1.00	1.00	1.00	1.00
12	0.0	2.0	2.0	2.0	100.0	100.0	1.00	1.00	1.00	1.00

Sum = 7740.0 Estimated Sum = 12000 Subadults: Ages 0 to 0

Bio-Year	Preseason MSI	MSI Function is Linear Harvest // Des. Pop Size in NA Subadults#	Males#	Females#	Postseason MSI	Effort & Wound Set Used
2005	1.38	0	131	4	1.00	2
2006	1.22	3	140	36	1.10	2
2007	1.29	4	165	95	1.00	2
2008	1.28	5	168	78	1.20	2
2009	1.20	16	202	129	1.25	2
2010	1.43	29	266	162	1.30	2
2011	1.25	25	300	500	1.00	2
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	

Bio-Year	Young/100 Fems Age 1 - 1	Young/100 Fems Age 2 - 11	Young/100 Fems Age 12 - 12	Sex Ratio: 50 : 50
2006	0.0	180.0	0.0	
2007	0.0	180.0	0.0	
2008	0.0	180.0	0.0	
2009	0.0	180.0	0.0	
2010	0.0	180.0	0.0	
2011	0.0	180.0	0.0	
2012	0.0	180.0	0.0	

POP-II (V1.2.5) Simulation Output Tables for A205.GN1, 05/20/2011 02:28 pm

Table 1. Population Size During Bio-Year for A205.GN1 05/20/2011 02:28 pm

Bio-Year	Start	Pre-Season	Post Season	End	%Growth
2005	12000	7475	7326	6054	1.8
2006	12210	8307	8110	6518	2.7
2007	12536	8486	8196	6848	3.6
2008	12984	8882	8605	6969	0.4
2009	13029	9226	8844	7156	0.8
2010	13128	8654	8151	6737	-3.3
2011	12700	8805	7897	6703	-6.4

Table 3. Harvest Mortality for A205.GN1 05/20/2011 02:28 pm

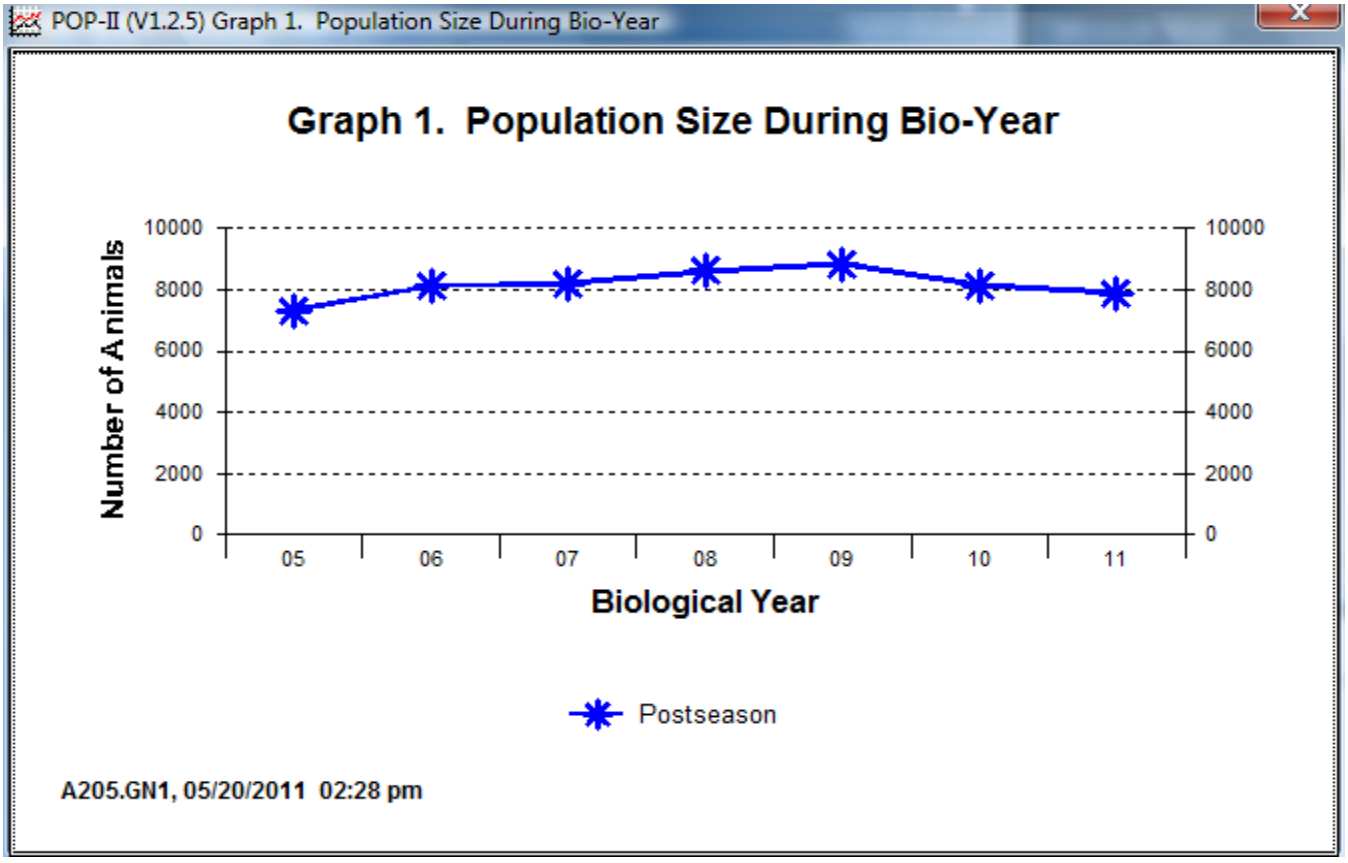
Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2005	0	131	4	135	1.8
2006	3	140	36	179	2.2
2007	4	165	95	264	3.1
2008	5	168	78	251	2.8
2009	16	202	129	347	3.8
2010	29	266	162	457	5.3
2011	25	300	500	825	9.4

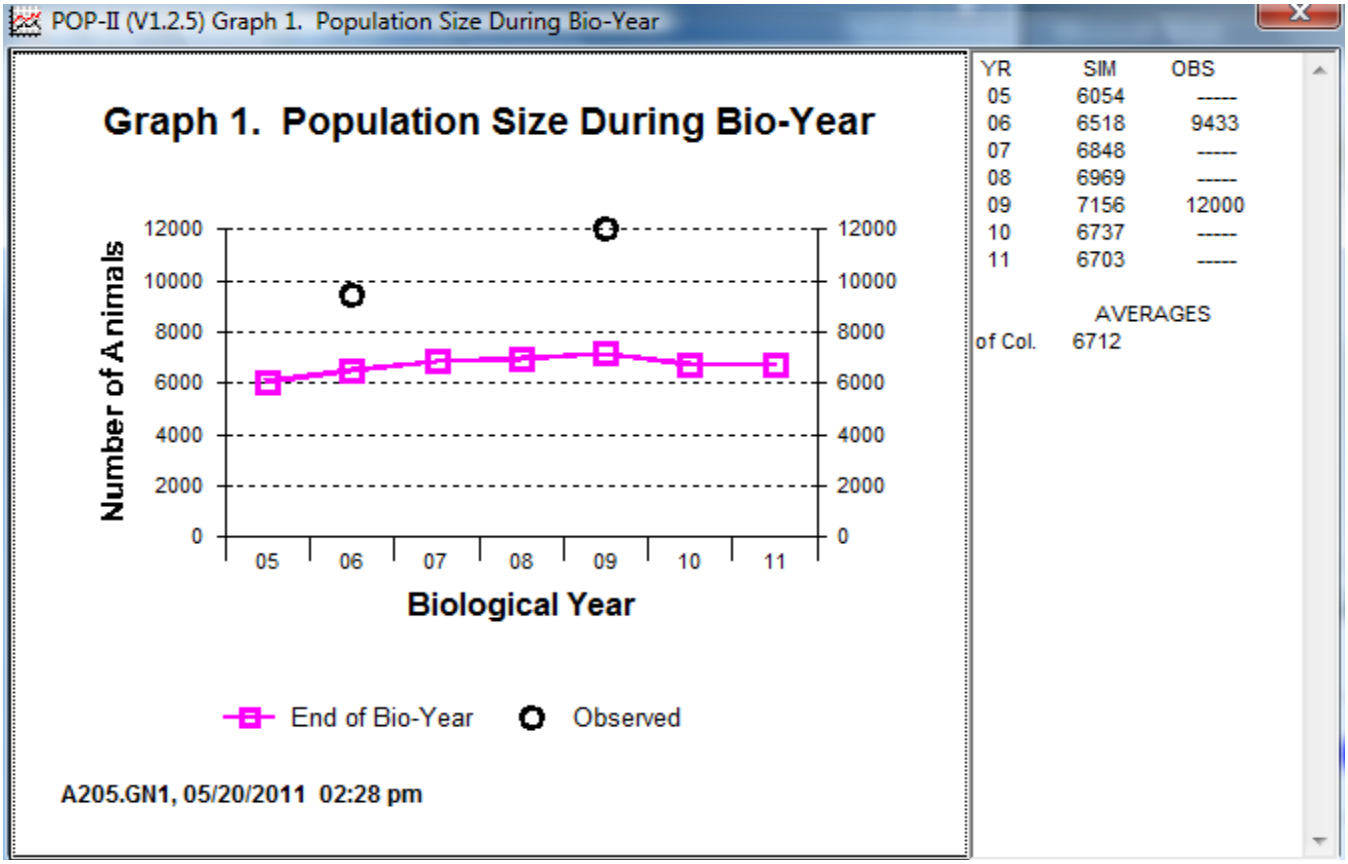
Table 4. Harvest Percentages for A205.GN1 05/20/2011 02:28 pm

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	Yearling Males
2005	0.0	8.6	0.1	1.81	4.1
2006	0.1	7.4	0.9	2.15	5.2
2007	0.2	7.1	2.4	3.11	4.9
2008	0.2	6.4	1.9	2.83	3.7
2009	0.7	7.1	3.2	3.76	3.1
2010	1.7	8.9	4.1	5.28	3.1
2011	1.1	10.6	13.4	9.37	2.1

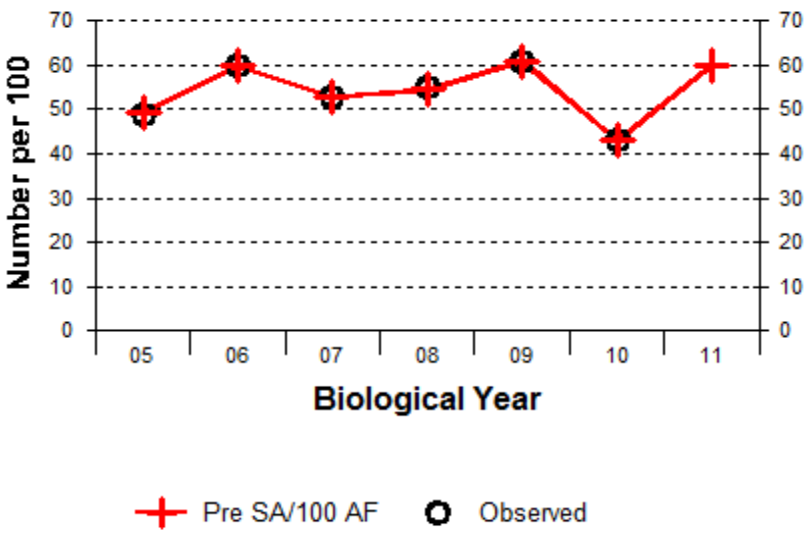
Table 6. Preseason Ratios for A205.GN1 05/20/2011 02:28 pm

Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2005	49.3	27.0	11.4	38.5
2006	59.9	30.6	16.7	47.3
2007	52.9	37.8	19.4	57.2
2008	54.5	46.8	17.9	64.7
2009	61.0	53.9	17.3	71.2
2010	43.1	57.4	18.5	75.8
2011	60.0	62.9	13.3	76.3


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
10000
8000
6000
4000
2000
0
05
06
07
08
09
10
11
Biological Year
Postseason
A205.GN1, 05/20/2011 02:28 pm


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
12000
10000
8000
6000
4000
2000
0
05
06
07
08
09
10
11
Biological Year
End of Bio-Year
Observed
A205.GN1, 05/20/2011 02:28 pm
YR SIM OBS
05 6054 -----
06 6518 9433
07 6848 -----
08 6969 -----
09 7156 12000
10 6737 -----
11 6703 -----
AVERAGES
of Col. 6712

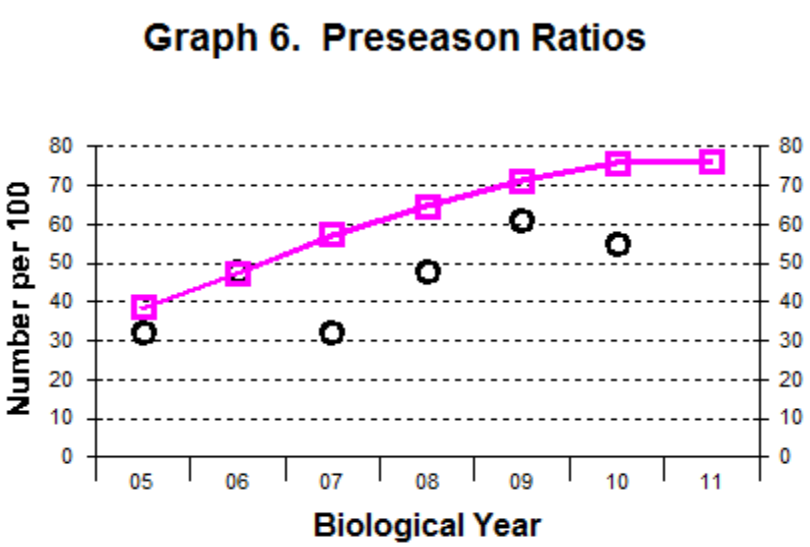
POP-II (V1.2.5) Graph 6. Preseason Ratios



A205.GN1, 05/20/2011 02:28 pm, Correlation (R) = 0.999, GOF = 0.995

YR	SIM	OBS
05	49	49
06	60	60
07	53	53
08	55	55
09	61	61
10	43	43
11	60	-----
	AVERAGES	
of Col.	54	
of Pair	53	54

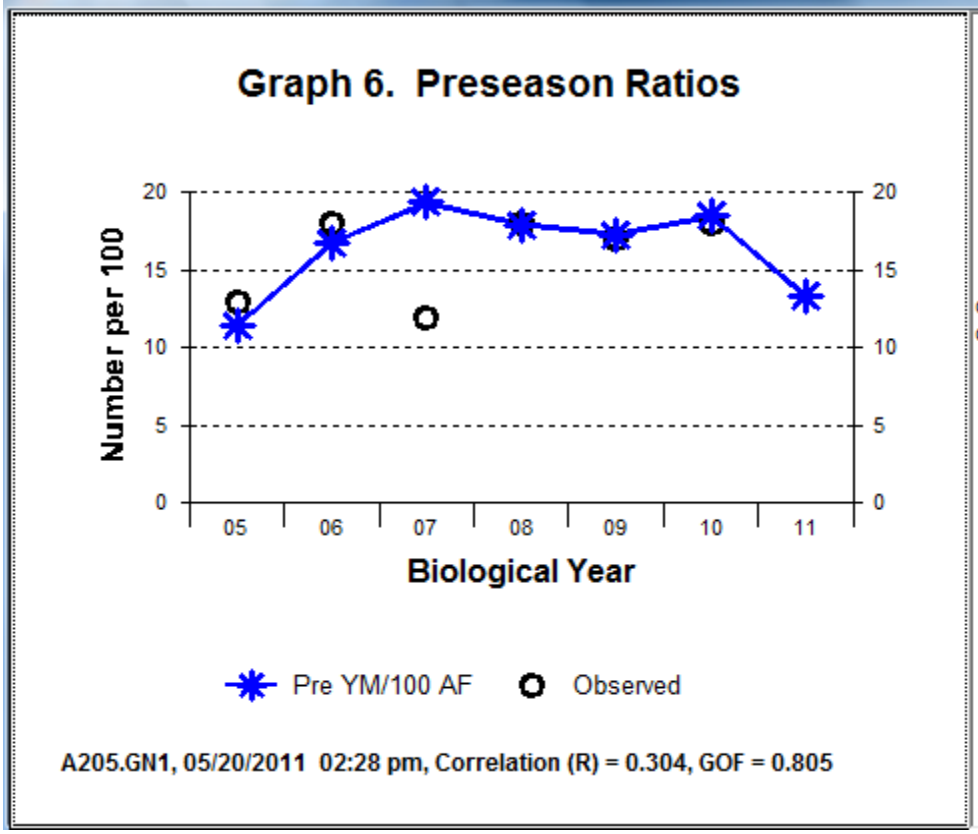
POP-II (V1.2.5) Graph 6. Preseason Ratios



A205.GN1, 05/20/2011 02:28 pm, Correlation (R) = 0.747, GOF = 0.657

YR	SIM	OBS
05	38	32
06	47	48
07	57	32
08	65	48
09	71	61
10	76	55
11	76	-----
	AVERAGES	
of Col.	62	
of Pair	59	46

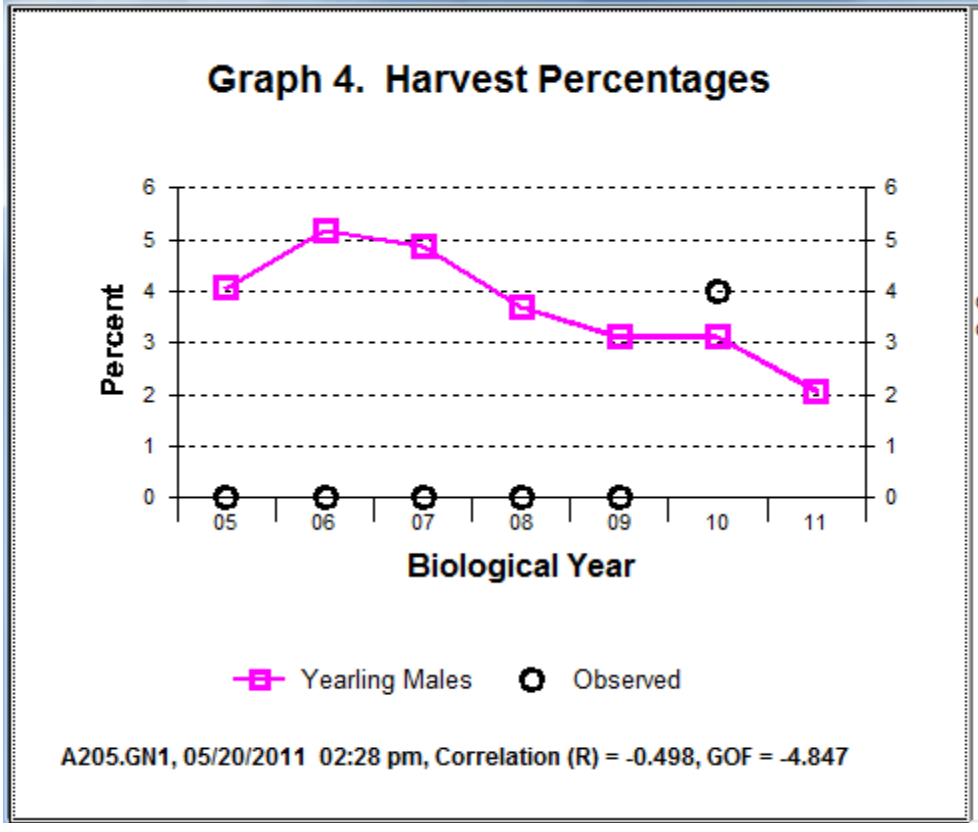
POP-II (V1.2.5) Graph 6. Preseason Ratios



YR	SIM	OBS
05	11	13
06	17	18
07	19	12
08	18	18
09	17	17
10	18	18
11	13	-----
	AVERAGES	
of Col.	16	
of Pair	17	16

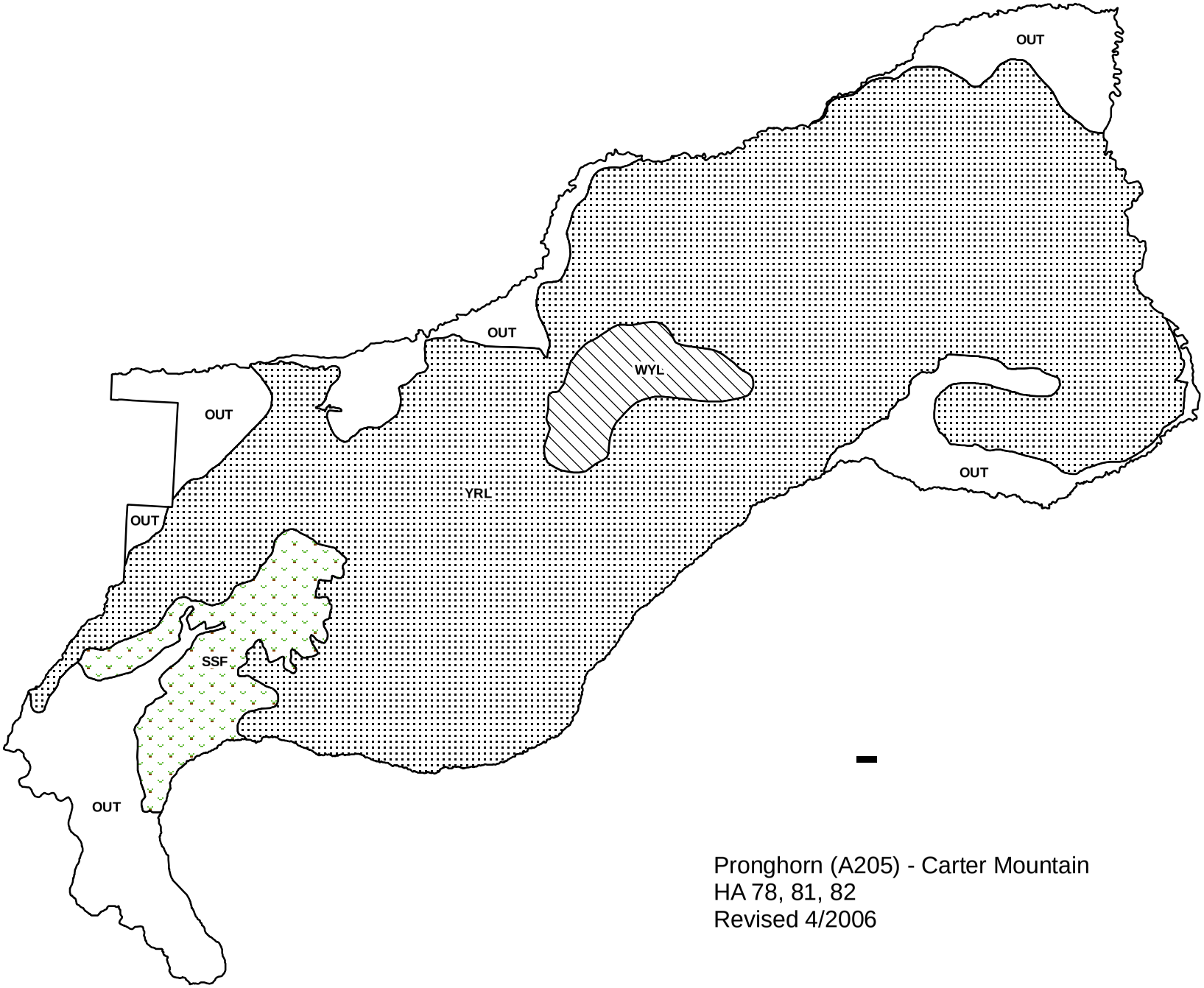
A205.GN1, 05/20/2011 02:28 pm, Correlation (R) = 0.304, GOF = 0.805

POP-II (V1.2.5) Graph 4. Harvest Percentages



YR	SIM	OBS
05	4	0
06	5	0
07	5	0
08	4	0
09	3	0
10	3	4
11	2	-----
	AVERAGES	
of Col.	4	
of Pair	4	1

A205.GN1, 05/20/2011 02:28 pm, Correlation (R) = -0.498, GOF = -4.847



Pronghorn (A205) - Carter Mountain
HA 78, 81, 82
Revised 4/2006

2010 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2010 - 5/31/2011
HERD: PR207 - BADGER BASIN
HUNT AREAS: 80
PREPARED BY: DOUG MCWHIRTER

	2005 - 2009 Average	2010	2011 Proposed
Population:	1,320	1,000	900
Harvest:	185	277	240
Hunters:	178	273	240
Hunter Success:	104%	101%	100 %
Active Licenses:	207	326	300
Active License Percent:	89%	85%	80 %
Recreation Days:	678	1,246	1,000
Days Per Animal:	3.7	4.5	4.2
Males per 100 Females	51	51	
Juveniles per 100 Females	40	32	

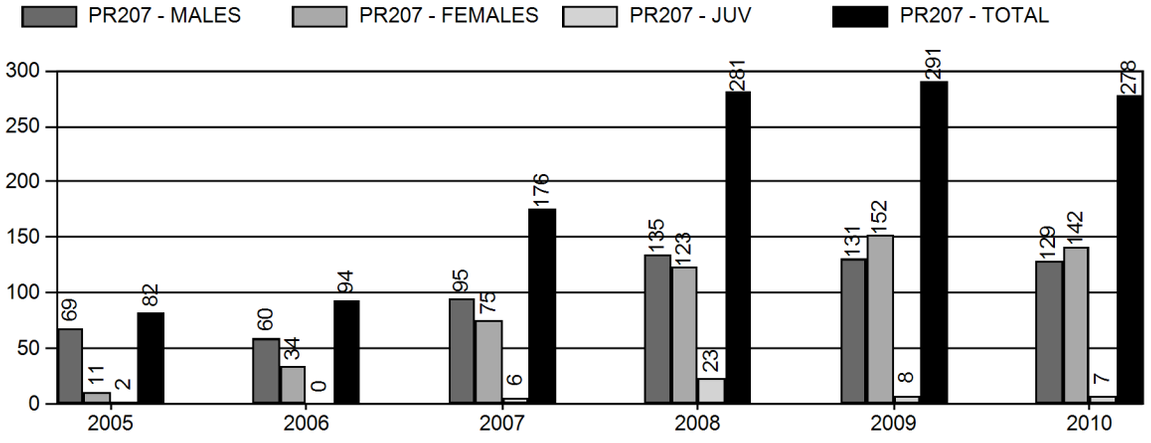
Population Objective:	1,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	0%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/16/2011

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

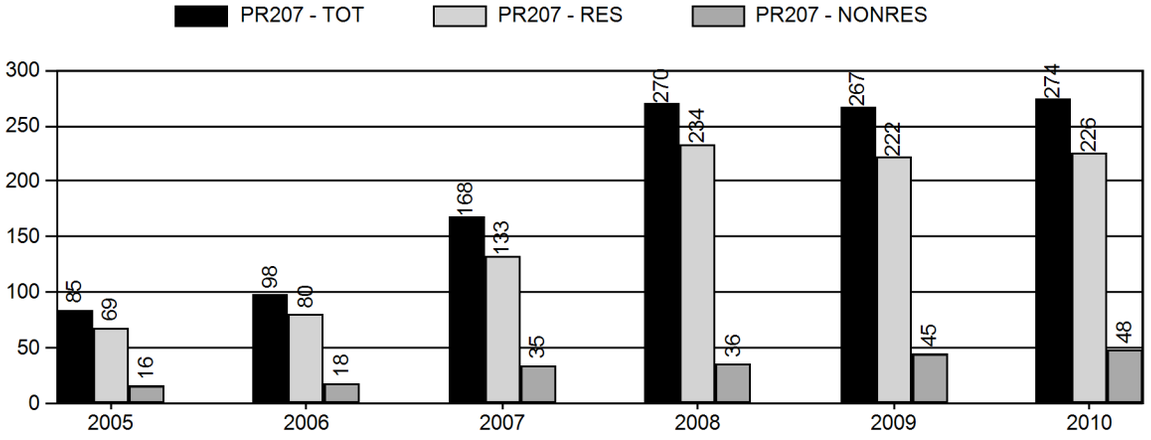
	JCR Year	Proposed
Females ≥ 1 year old:	19.8%	16.4%
Males ≥ 1 year old:	32.9%	38.9%
Juveniles (< 1 year old):	3.1%	4.1%
Total:	20.8%	20.2%
Proposed change in post-season population:	-16.3%	-10.5%

Population Size - Postseason

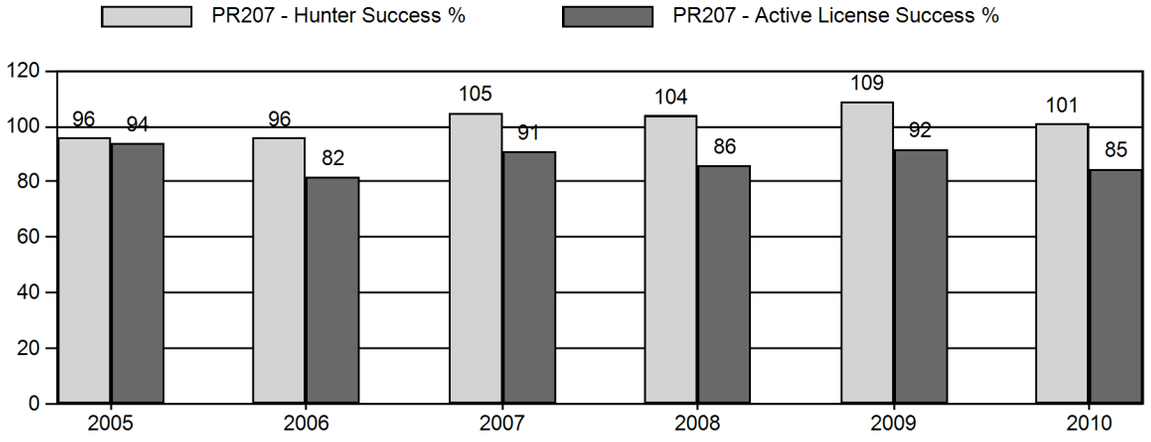
Harvest



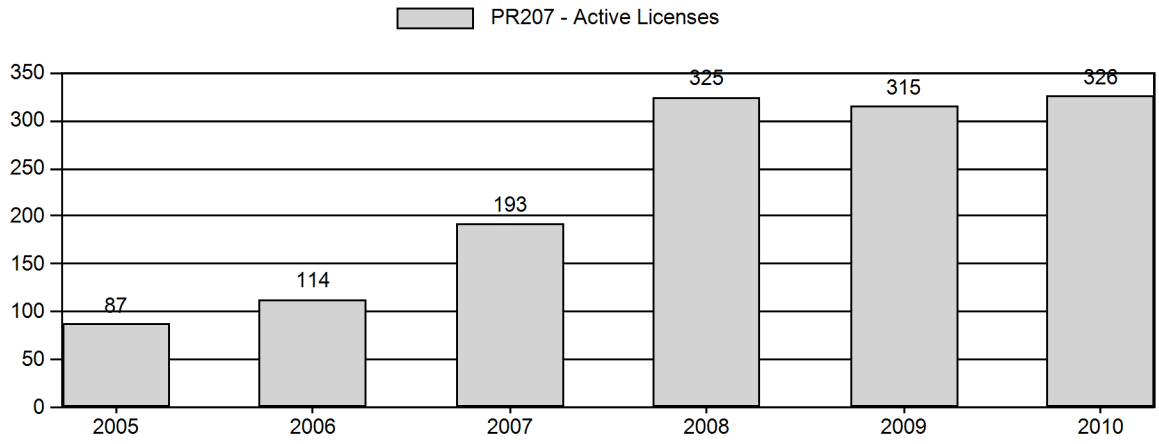
Number of Hunters



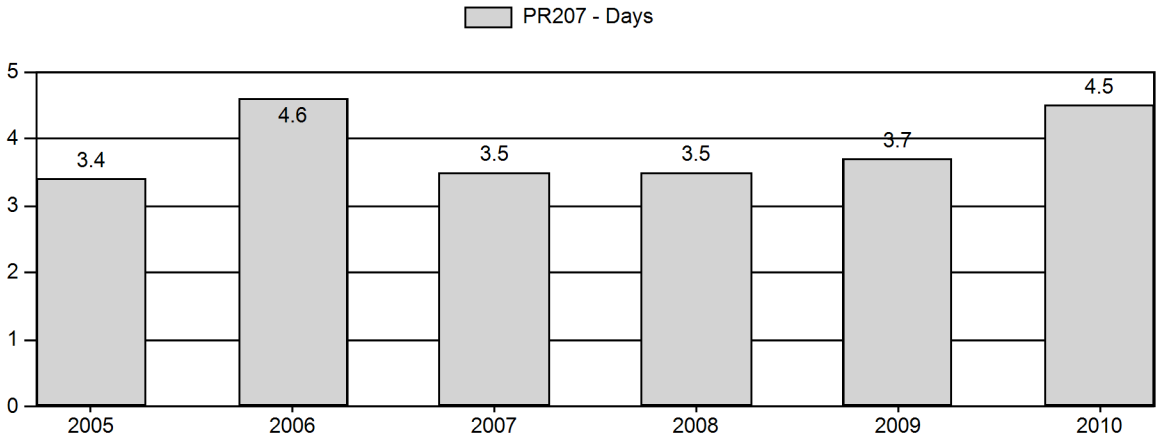
Harvest Success



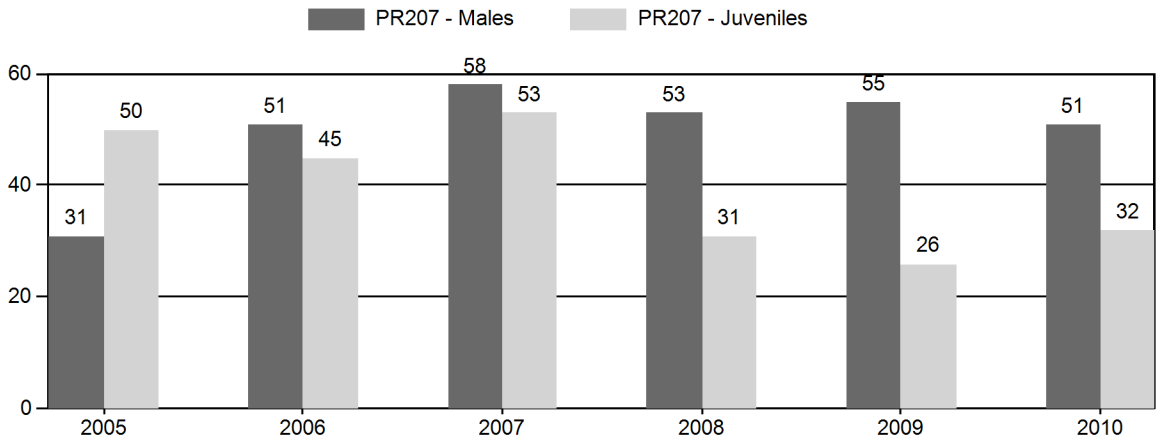
Active Licenses



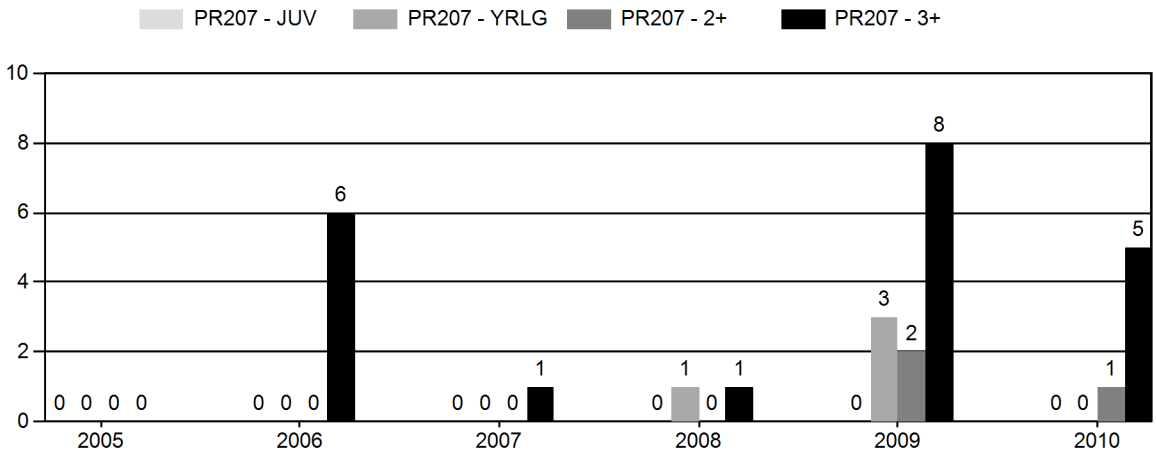
Days Per Animal Harvested



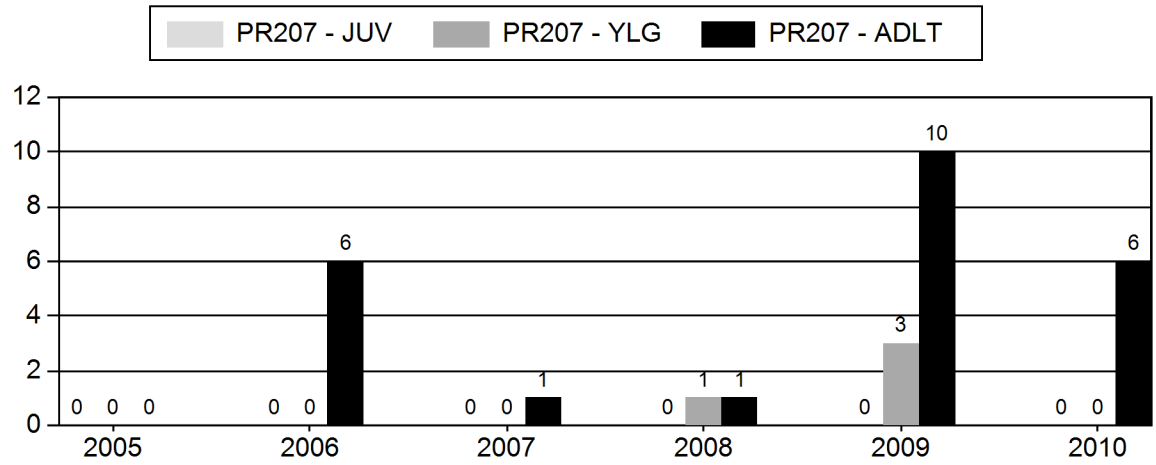
Preseason Animals per 100 Females



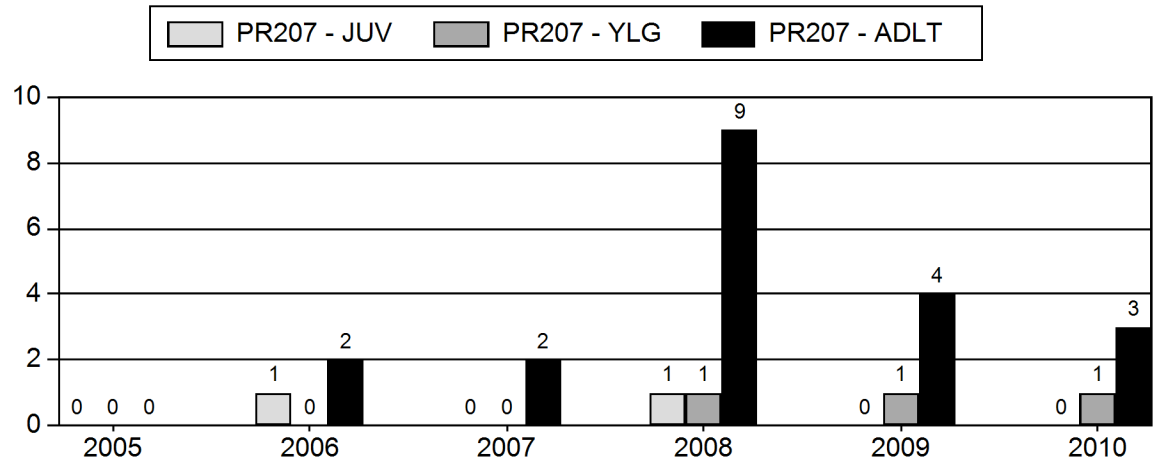
Age Structure of Field Checked Males



Age Structure Data (Field and Laboratory) - Male



Age Structure Data (Field and Laboratory) - Female



INTRODUCTION

The Badger Basin herd unit is predominantly semi-arid plateaus that graduate into windswept foothills of the Absaroka Mountains. Lands administered by BLM are interspersed with very large tracts of private land with a checkerboard land pattern, private landowners control access to portions of federal land, particularly along the mountains. Private irrigated lands along watercourses represent a small percentage of the land area but are a strong attraction to pronghorn due to arid conditions on surrounding rangelands. Rainfall is sparse or seasonally absent, therefore pronghorn on the large basins or plateaus are very dependent on reservoirs or water developments for livestock. Much of this herd unit is considered marginal pronghorn habitat, and pronghorn do not occur in large portions of the hunt area.

Access is generally good with public roads throughout most of the area. Limited access on some private lands has at times been a problem and causes the majority of hunters to hunt on public lands. The population objective for this herd was changed in 1994 from 650 pronghorn to the current objective of 1,000 pronghorn. Poor productivity and recruitment required conservative management and pronghorn numbers continued to grow from the late 1990s to the late 2000s, exceeding the population objective, and creating considerable damage situations in specific locations. Seasons were liberalized considerably from 2008-2010, and the population has been reduced to the objective of 1,000 antelope.

WEATHER

Based on Palmer Severity Indices, this area entered into a severe drought in 1998, becoming extreme from 2000-2009, and moderate from 2010-2011 (Appendix A). Temperatures were essentially normal during bio-years 2008-2010, but precipitation was generally below normal (Appendix A). Although overall precipitation was below normal, growing season (April-June) precipitation from 2008-2010 was near normal. Past analyses in this herd unit have correlated April-June (growing season) precipitation to preseason fawn:100 doe ratios sampled the following August. Improved growing season moisture from 2008-2010 however, did not improve fawn:doe ratios in these years.

Drought conditions are likely responsible for extremely low productivity of pronghorn without access to irrigated fields, and exacerbates damage situations for those pronghorn that do.

HABITAT CONDITIONS/ASSESSMENT

No habitat monitoring projects were conducted in this herd unit during the reporting period.

POPULATION

A total of 813, 582, and 766 pronghorn were classified during preseason surveys conducted in 2008, 2009, and 2010, respectively. These surveys produced fawn:100 doe ratios of 31, 26, and 32 and buck:100 doe ratios of 53, 56, and 51 (Table 1). Although fawn productivity in 2005-2007 represented some of the higher fawn:doe ratios observed in this herd unit recently, fawn:100 doe ratios from 2008-2010 represent some of the lowest. Increased fawn production from 2005-2007 (fawn:doe ratios of 50:100, 45:100, and 53:100, respectively), conservative harvests, and mild winters contributed to this increased numbers of antelope during these years. Fawn:100 doe ratios from 2008-2010, however, have been well below the long-term (1986-2007) average of 46:100, but is more similar to fawn:doe ratios seen during the drought cycle experienced from 1998-2004 (average 37:100).

Table 1. Preseason classification information for the Badger Basin pronghorn herd unit, 2005-2010.

2005 - 2010 Preseason Classification Summary

for Pronghorn Herd PR207 - BADGER BASIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2005	1,363	17	58	75	17%	244	55%	121	28%	440	604	7	24	31	± 5	50	± 7	38
2006	1,541	76	78	154	26%	304	51%	137	23%	595	659	25	26	51	± 6	45	± 5	30
2007	1,764	74	108	182	28%	312	47%	164	25%	658	812	24	35	58	± 6	53	± 6	33
2008	1,703	82	152	234	29%	442	54%	137	17%	813	685	19	34	53	± 0	31	± 0	20
2009	1,476	56	122	178	31%	321	55%	83	14%	582	784	17	38	55	± 6	26	± 4	17
2010	1,300	58	157	215	28%	419	55%	132	17%	766	617	14	37	51	± 0	32	± 0	21

Conditions during the 2008 surveys were characterized by favorable forage conditions and relatively good availability of water. Surprisingly, however, fawn:doe ratios were very low (31:100 overall). Fawn:100 doe ratios in areas where pronghorn have access to irrigated fields were generally higher (range 27:100-51:100) than more arid habitats (range 18:100-29:100).

Conditions in 2009 were 26:100 overall. Fawn:100 doe ratios in areas where pronghorn have access to irrigated fields were generally higher (range 29:100-54:100) than more arid habitats (range 4:100-33:100).

Conditions during the 2010 surveys were characterized by poor forage conditions and the relatively scarcity of water. Badger Basin and Chapman Bench experienced no green-up during the 2010 growing season. Fawn:does ratios for these areas were 6:100 in 2010. Fawn:100 doe ratios in areas where pronghorn have access to irrigated fields were generally higher (range 36:100 - 62:100) than more arid habitats (range 5:100-11:100).

Total buck:100 doe ratios have been increasing as the population has grown, with ratios observed in 2006-2010 (avg. 54:100) as high or higher than that seen the previous 26 years (Figure 3). Conservative buck harvests and good fawn production (for this herd) from 2005-2007 undoubtedly drove this increase. Both adult buck and yearling buck ratios are quite high, indicating maintenance of opportunities for buck harvest.

For the past 8 years, classification efforts have been broken out into classification count blocks (Table 2). Classification sample sizes from these count blocks reveal a stable trend in the Two Dot, Monument Hill, and Badger Basin West blocks. Sample sizes obtained in the Badger Basin East and Polecat Bench West count blocks indicate a return to sample sizes seen in previous years, and is presumably related to specific efforts to target areas of chronic damage within these two count blocks.

Heart Mountain North has seen a dramatic decline in antelope numbers, also due primarily to targeted hunting pressure and hunter access on the Heart Mountain Hunter Management Area (HMA). It is also possible that some of these antelope have moved into the Heart Mountain South count block, as numbers there have increased substantially in the recent past. The number of antelope observed in the Clark count block declined in 2010 as well, but whether this is due to harvest pressure or undetected movements is unknown at this time.

Table 2. Classification sample sizes by count blocks for the Badger Basin Herd Unit, 1980-2010.

	2003	2004	2005	2006	2007	2008	2009	2010
Polecat Bench East	28	28	22	29	31	42	30	59
Polecat Bench West	77	69	88	71	86	151	31	90
Badger Basin East	45	37	36	20	114	57	49	40
Badger Basin West	37	5	54	42	*	101	79	78
Heart Mtn North	57		72	79	82	101	79	21
Heart Mtn South	57	57	25	72	140	189	122	222
Monument Hill	31	42	22	49	30	9	25	23
Trail Creek West	-	-	-	-	-	-	-	134
Clark	105	128	121	144	69	111	167	49
Two Dot Ranch	30	46		89	106	52	**	50
Total	467	412	440	595	658	813	582	766

* Badger Basin East & West combined in 2007
** Clark & Two Dot combined in 2009

The most significant development is the increase in antelope numbers in the Heart Mountain South count block and the appearance of antelope in the Trail Creek West count block. Since 2006, antelope numbers in the Heart Mountain South count block have been quite high, increasing again in 2010. In the winter of 2009-2010, antelope were seen west of Highway 120 (in the newly established Trail Creek West count block), an area previously relatively unoccupied by antelope. In fact, this area was not surveyed prior to 2010, when 134 antelope were observed there. The center-pivot irrigation systems in these two count blocks are obvious attractants for these antelope. The relatively poor hunter access in the Heart Mountain South count block has also contributed to the growth of this segment of the population. It will be interesting to track the development of this situation.

Due to the very small and disjunct nature of this herd unit, line transect surveys have not been employed, but aerial trend counts are performed. Four trends counts have been conducted in the last 10 years (Figure 1), which have generally followed the estimated population size for this herd. A total of 295 antelope were seen during the May 2010 trend count, representing the lowest recorded count in this herd unit, but nearest those samples obtained in the late 1980's. From 1980-1990, approximately 300 antelope were classified each year, somewhat mimicking the trend counts during those years. To trend count fewer antelope than ever recorded and obtain the 3rd highest classification sample size recorded points to problems with inconsistent survey effort and/or misunderstood antelope movements in this herd unit.

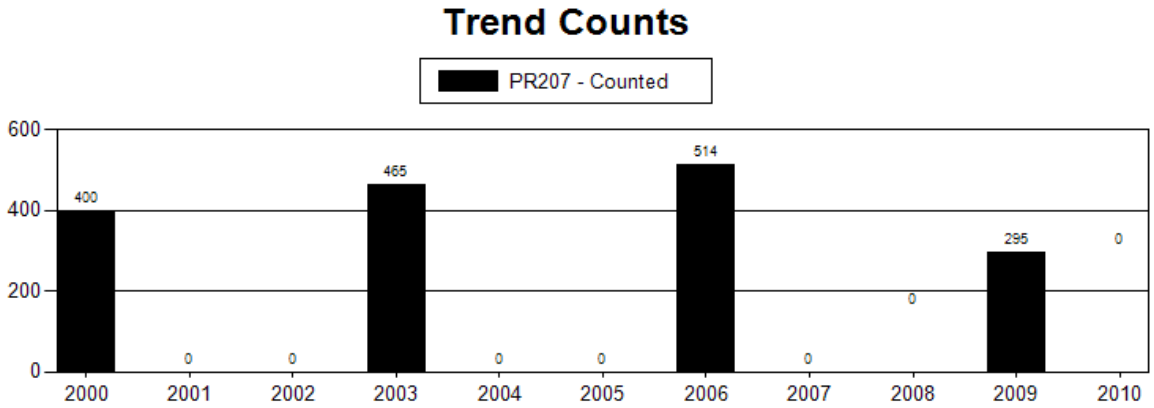


Figure 1. Trend counts, Badger Basin Pronghorn Herd Unit, 2000-2010.

The current POP-II simulation model estimates the postseason 2010 population size to be approximately 1,000 pronghorn, or essentially at the postseason population objective for this herd unit. Until 2008, the model was mimicking observed buck:doe ratios quite well when reconciling observed buck:doe ratios became difficult. The model was then reconstructed with fewer years of data and less variation in observed ratios, which has improved alignment of observed and simulated yearling buck and adult buck ratios. Proposed harvest in 2011 should reduce the population to approximately 900 pronghorn, which is below the objective of 1,000 pronghorn, but is prudent with continuing drought and damage concerns.

HUNTING SEASON

Hunting seasons were liberalized slightly in 2007 and more significantly from 2008-2010 (Table 3). Harvest on both males and females increased as the population grew and buck:doe ratios were maintained. Total annual harvest from 2008-2010 was 281, 291, and 278 respectively, representing the three highest harvest years obtained in this herd unit. Buck harvests of 135, 131, and 129 and doe harvests of 123, 152, and 142 from 2008-2010 both represent the highest recorded harvests for these categories. Hunter success remained high and hunter effort low as harvest pressure has increased (Table 4).

Table 3. Hunting seasons for the Badger Basin antelope herd unit, 2010.

2010 HUNTING SEASONS

PR207 - BADGER BASIN

Hunt Area	Add'l Hunt Areas	Type	Quota	Season Dates	Limitations
80		Type 1	150	09/01 - 09/30	Any antelope
80		Type 6	125	09/01 - 09/30	Reduced Price doe/fawn
80		Type 7	75	09/01 - 09/30	Reduced Price doe/fawn

Table 4. Harvest Summary for the Badger Basin pronghorn herd unit, 2010.

2010 Harvest Summary by Hunt Area

PR207 - Badger Basin Pronghorn Herd Unit

Area	Type	Active Lic/Htrs		Buck	Doe	Fawn	Total	Success		Days/Harvest	Days	Lic Sold
80 BADGER BASIN												
	Type 1	148		129	0	0	129	87.20%		3.7	482	154
	Type 6	106		0	90	7	97	91.50%		5.2	503	125
	Type 7	72		0	52	0	52	72.20%		4.8	250	81
Pooled Total		274	(326)*	129	142	7	278	101.50%	(85.3%)*	4.4	1235	
Pooled Resident		226		102	114	7	223	98.70%		4.8	1062	
Pooled Nonresident		48		27	28	0	55	114.60%		3.1	173	
2010 Hunt Area Total		274	(326)*	129	142	7	278	101.50%	(85.3%)*	4.4	1235	360
2010 Herd Total		274	(326)*	129	142	7	278	101.50%	(85.3%)*	4.4	1235	360

*Active Licenses

Few animals are field checked in this herd unit due to the relatively few licenses, widely dispersed distribution of pronghorn, and numerous access points. Only 41 pronghorn (13 in 2008, 18 in 2009, 10 in 2010) were field checked in 2008-2010. As this represents only 4%-6% of the reported harvest, any analysis of this data is limited.

OTHER MANAGEMENT ISSUES

As pronghorn numbers grew in the late 1990s and early 2000s and drought conditions continued, damage to growing crops on private lands become chronic in some locations near Heart Mountain and Polecat Bench. Permit increases to specifically address these areas were initiated in 2007-2010 and significantly reduced antelope numbers in these areas. Poor fawn recruitment has hastened the overall decline of this population toward the population objective of 1,000 pronghorn. Still, some damage continues and must be addressed by continued hunting pressure.

HABITAT

The Badger Basin Herd Unit lies predominantly within a 5"-9" precipitation zone, with some isolated portions extending into a 10"-14" zone. As a result, habitat conditions, and therefore pronghorn population performance, are closely tied to precipitation trends. The extended drought affecting this area has undoubtedly impacted pronghorn populations, but it is important to recognize that this herd is generally not productive. In the last 27 years, only twice have preseason fawn:100 doe ratios exceeded 60:100 (1990 – 60:100, 1996 – 64:100). It is apparent that under normal conditions, this is a relatively slow growing herd capable of sporadic population increases driven by growing season moisture and favorable vegetation conditions.

MANAGEMENT RECOMMENDATIONS

1) Continue to conduct ground classifications annually along established routes.

2) Abandon aerial trend counts every three years in order to monitor population status and refine the population simulation model. Consistent effort applied to preseason classification surveys can yield equally useful information.

3) Monitor population trends and distribution changes in order to address damage situations. Work with affected landowners to reduce population segments causing damage.

4) The population objective was last evaluated in 1994 when it was changed from 650 to 1,000. Complete an evaluation prior to the revision of the Cody BLM Resource Management Plan.

PROPOSED HUNTING SEASON

2011 Proposed HUNTING SEASON
Badger Basin Pronghorn Herd Unit (PR207)

HUNT AREA	TYPE	Season Dates OPENS	CLOSES	LIMITATIONS
80	1	Sept 1	Sept 30	Limited quota; 150 licenses any antelope
	6	Sept 1	Sept 30	Limited quota; 125 75 licenses doe/fawn antelope
	7	Sept 1	Sept 30	Limited quota; 75 50 licenses doe/fawn antelope valid east of Wyoming Highway 294
80		Aug 15	Aug 31	Archery season; Refer to Section 3 of this Chapter

SUMMARY OF PROPOSED CHANGES IN LICENSE NUMBER

Area	Type	Change from 2010
80	6&7	-75
Total PR207	**6&7**	**-75**

JUSTIFICATION

This herd was over objective in the early to mid 1990s when trend counts were 800-900 pronghorn. Since then, however, trend counts have ranged from 400-600 pronghorn and the herd was thought to be near the objective of 1,000 animals. Conservative hunting seasons and good fawn production (for this herd) allowed this population to substantially exceed the objective by 2005. Measures were taken to increase harvest from 2008-2010, and the postseason 2010 population estimate was approximately 1,000 pronghorn.

Since the early 1990s, fawn:doe ratios have been quite low, averaging less than 40:100. Only three times in the last 15 years have fawn:doe ratios exceeded 50:100, with 2005 and 2007 being two of those years. Recent poor fawn crops (31:100 in 2008, 26:100 in 2009, 32:100 in 2010), coupled with increased female harvest, have reduced pronghorn numbers in this herd unit. The observed buck:doe ratio in 2010 was 51:100, the fifth year in a row they have exceeded 50:100.

A total of 273 hunters harvested 277 pronghorn (129 bucks, 141 does, 7 fawns) during the 2010 season. This is similar to harvest seen in 2009 (290 total, 131 bucks, 150 does, 9 fawns) and 2008 (292 total, 135 bucks, 131 does, 26 fawns), but dramatically greater than the 176 pronghorn taken during the 2007 season (95 bucks, 75 does, and 6 fawns). Overall hunter success in both 2007 and 2008 was 106.6%, was 109.4% in 2009, and was 101.5% in 2010.

Increasing buck ratios indicated this herd was capable of sustaining additional harvest. Therefore, Type 1 any licenses were increased to a total of 150 in 2008. Since buck ratios have been maintained, this level of harvest is recommended to continue.

Pronghorn damage in agricultural areas has been a chronic problem in this herd unit, but has increased recently, due in part to a building pronghorn population. To help limit damage and address landowner tolerance, a Type 6 doe/fawn season was proposed for portions of the herd unit where damage usually occurred. To enhance female harvest, this season was extended from September 1-15 to September 1-30 in 2004. In 2008, doe/fawn permits were increased to a total of 200, with a new Type 7 season directed at increasing pronghorn numbers causing crop damage east of Highway 294. These seasons were successful and caused the population to decrease. In addition, incidental observations of pronghorn in damage prone areas indicate numbers have been reduced. These reductions, coupled with recent poor fawn recruitment has lessened the need for doe/fawn harvest throughout the herd unit and therefore the area-wide Type 6 license will be reduced from 125 to 75 licenses for the 2011 season. Targeted doe/fawn harvest east of Wyoming Highway 294 will continue, but is proposed to be reduced from 75 licenses to 50 licenses. The result should be a population of approximately 900 pronghorn postseason 2011, that will continue to decline. Managing for less than to objective of 1,000 is probably prudent considering the impacts of long term drought on shrub condition and the current damage situation. However, further reductions in harvest (both doe/fawn and buck harvest) will be necessary if fawn recruitment remains below average in the near future.

Data Set: BadgerBasin_2010.GN1 02/16/2011 02:46 pm Page 1

Badger Basin Antelope - 2011 Season Setting Model
Data from 2005 to 2013 Simulation from 2005 to 2013

Age Class	Init Pop. Male	Prop. Female	Presn Mort% Male	Female	Postsn Mort% Male	Female	Effort Set 1 Male	Female	Effort Set 2 Male	Female
0	350.0	350.0	50.0	50.0	35.0	30.0	0.10	0.10	1.00	1.00
1	100.0	150.0	2.0	2.0	3.0	3.0	0.50	1.00	1.00	1.00
2	80.0	125.0	2.0	2.0	3.0	3.0	1.00	1.00	1.00	1.00
3	60.0	100.0	2.0	2.0	3.0	3.0	1.00	1.00	1.00	1.00
4	40.0	90.0	2.0	2.0	3.0	3.0	1.00	1.00	1.00	1.00
5	20.0	80.0	2.0	2.0	3.0	3.0	1.00	1.00	1.00	1.00
6	10.0	70.0	2.0	2.0	10.0	5.0	1.00	1.00	1.00	1.00
7	4.0	60.0	2.0	2.0	20.0	10.0	1.00	1.00	1.00	1.00
8	2.0	50.0	2.0	2.0	40.0	30.0	1.00	1.00	1.00	1.00
9	1.0	40.0	2.0	2.0	80.0	65.0	1.00	1.00	1.00	1.00
10	0.0	30.0	2.0	2.0	95.0	80.0	1.00	1.00	1.00	1.00
11	0.0	15.0	2.0	2.0	98.0	95.0	1.00	1.00	1.00	1.00
12	0.0	5.0	2.0	2.0	100.0	100.0	1.00	1.00	1.00	1.00

Sum = 1832.0 Estimated Sum = 1600 Subadults: Ages 0 to 0

Data Set: BadgerBasin_2010.GN1 02/16/2011 02:46 pm Page 2

Bio-Year	Preseason MSI	MSI Function is Linear: Harvest // Des. Pop Size in NA Subadults#	Males#	Females#	Postseason MSI	Effort & Wound Set Used
2005	0.85	2	69	14	0.30	1
2006	1.34	0	60	34	0.30	1
2007	1.28	6	95	75	0.30	1
2008	1.57	23	135	123	0.30	1
2009	1.68	9	131	150	0.30	1
2010	1.61	7	129	141	0.30	1
2011	1.49	10	130	100	0.30	1
2012	1.47	5	100	50	0.30	1
2013	1.47	5	100	50	0.30	1
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	
Set 1 Wounding Loss		10.%	10.%	10.%	Yearling Male 10.%	

Data Set: BadgerBasin_2010.GN1 02/16/2011 02:46 pm Page 3

Bio-Year	Young/100 Fems Age 1 - 1	Young/100 Fems Age 2 - 12	Young/100 Fems Disabled	Sex Ratio: 50 : 50
2006	0.0	180.0	0.0	
2007	0.0	180.0	0.0	
2008	0.0	180.0	0.0	
2009	0.0	180.0	0.0	
2010	0.0	180.0	0.0	
2011	0.0	180.0	0.0	
2012	0.0	180.0	0.0	
2013	0.0	180.0	0.0	
2014	0.0	180.0	0.0	

POP-II (V1.2.5) Simulation Output Tables for BadgerBasin_2010.GN1, 02/16/2011 02:46 pm

Table 1. Population Size During Bio-Year for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Start	Pre-Season	Post Season	End	%Growth
2005	1600	1323	1230	1163	46.2
2006	2339	1520	1417	1338	12.3
2007	2627	1768	1574	1485	7.7
2008	2829	1727	1418	1349	-4.5
2009	2701	1520	1201	1143	-14.8
2010	2301	1332	1027	973	-16.3
2011	1926	1187	923	872	-10.5
2012	1725	1072	901	851	-0.5
2013	1716	1055	885	833	-0.9

Table 2. Preseason Natural Mortality for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2005	260	5	12	277	17.3
2006	788	9	22	819	35.0
2007	825	11	23	859	32.7
2008	1055	17	30	1102	38.9
2009	1136	16	29	1181	43.7
2010	932	13	24	969	42.1
2011	710	10	19	739	38.4
2012	627	9	17	653	37.8
2013	636	8	17	661	38.5

Table 3. Harvest Mortality for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2005	2	69	14	85	6.4
2006	0	60	34	94	6.2
2007	6	95	75	176	10.0
2008	23	135	123	281	16.3
2009	9	131	150	290	19.1
2010	7	129	141	277	20.8
2011	10	130	100	240	20.2
2012	5	100	50	155	14.5
2013	5	100	50	155	14.7

Table 4. Harvest Percentages for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	Yearling Males
2005	0.6	25.4	2.0	6.42	18.7
2006	0.0	17.6	4.3	6.18	28.7
2007	1.3	21.9	8.6	9.96	24.2
2008	8.0	26.3	13.3	16.27	23.9
2009	4.2	28.4	17.8	19.08	14.1
2010	3.1	32.9	19.8	20.80	12.8
2011	4.1	38.9	16.4	20.21	16.5
2012	2.2	35.3	8.9	14.46	21.6
2013	2.2	38.2	8.9	14.69	22.4

Table 5. Postseason Natural Mortality for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2005	34	2	31	67	5.4
2006	38	3	37	79	5.6
2007	45	4	41	89	5.7
2008	26	5	38	69	4.8
2009	20	5	34	58	4.9
2010	21	4	29	54	5.3
2011	23	3	26	52	5.6
2012	22	3	26	51	5.6
2013	22	2	27	51	5.8

Table 6. Preseason Ratios for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2005	50.2	26.6	12.3	38.9
2006	49.1	23.9	19.2	43.1
2007	53.3	30.4	19.5	49.9
2008	31.2	34.1	21.4	55.5
2009	25.7	41.3	13.5	54.9
2010	31.6	42.5	12.5	55.0
2011	39.8	39.3	15.5	54.8
2012	40.2	32.5	17.9	50.4
2013	40.7	29.4	17.0	46.3

Table 7. Postseason Ratios for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2005	51.0	18.2	10.5	28.7
2006	51.5	18.8	17.7	36.5
2007	58.1	23.6	18.3	41.9
2008	33.4	25.6	20.6	46.2
2009	30.5	33.1	13.8	47.0
2010	39.1	32.2	12.7	44.9
2011	46.4	24.0	14.2	38.2
2012	43.5	19.0	15.2	34.2
2013	44.0	15.8	14.0	29.8

Table 8. End of Year Ratios for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

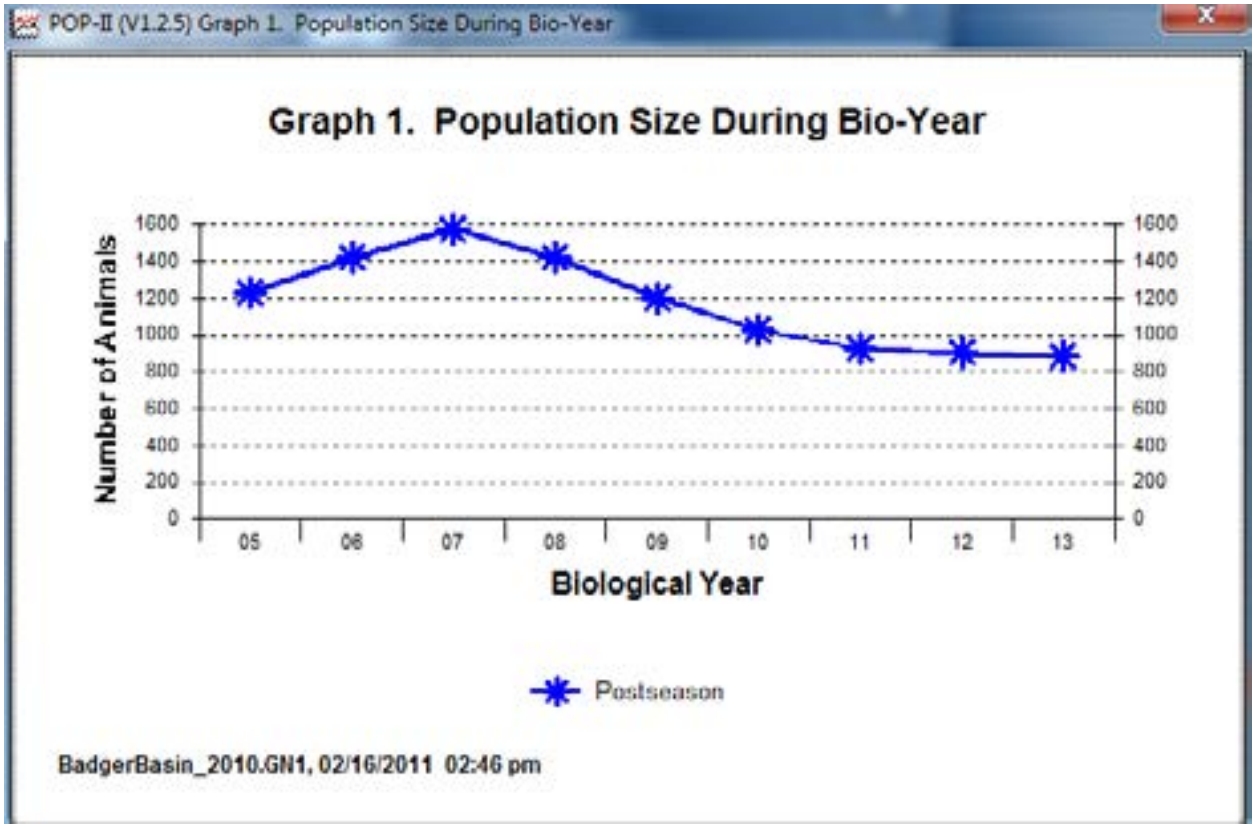
Bio-Year	Subadults /100 Adlts	Subadults /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2005	37.2	48.2	10.9	29.7
2006	35.5	48.9	18.4	37.9
2007	38.5	55.3	19.1	43.6
2008	21.4	31.7	21.5	47.9
2009	19.5	29.0	14.4	48.7
2010	25.3	37.2	13.3	46.6
2011	31.6	44.2	14.9	39.7
2012	30.5	41.4	15.9	35.5
2013	32.0	41.9	14.6	30.9

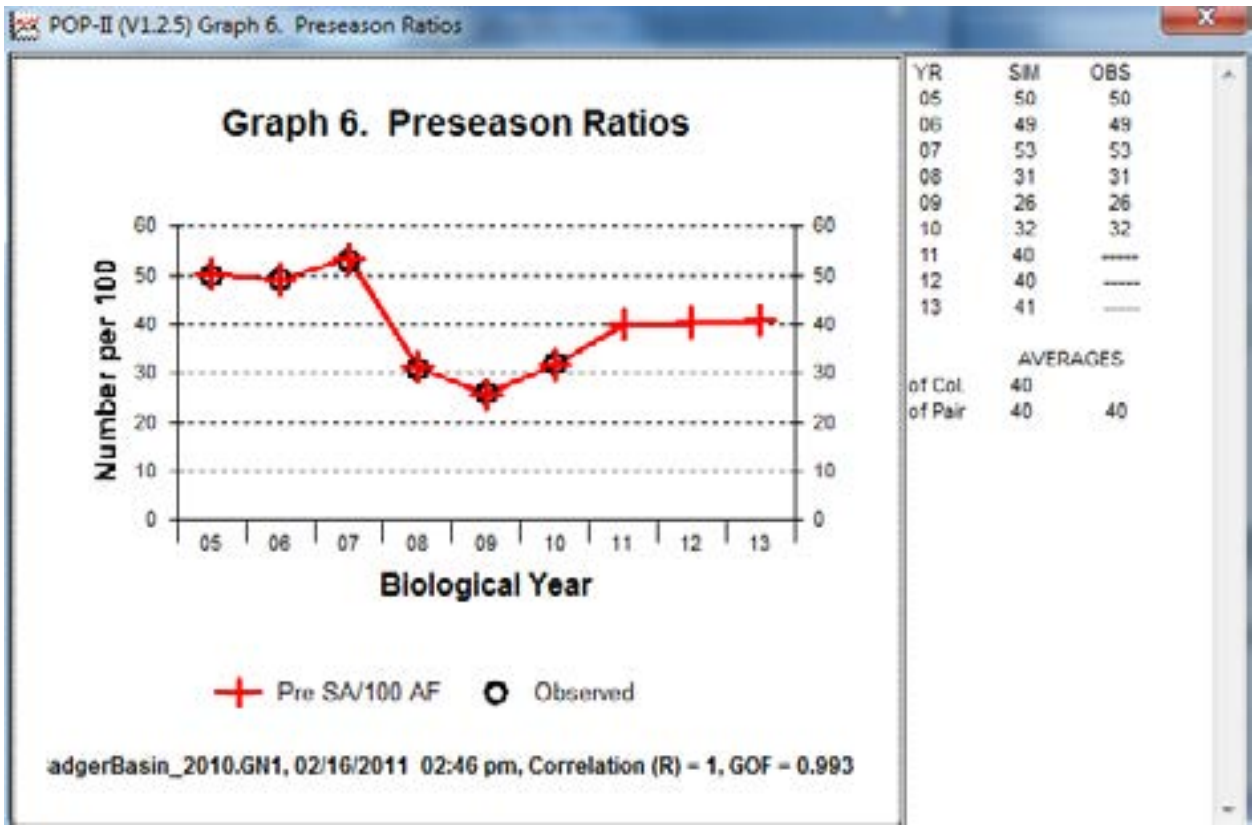
Table 9. Reproduction at Start of Bio-Year for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

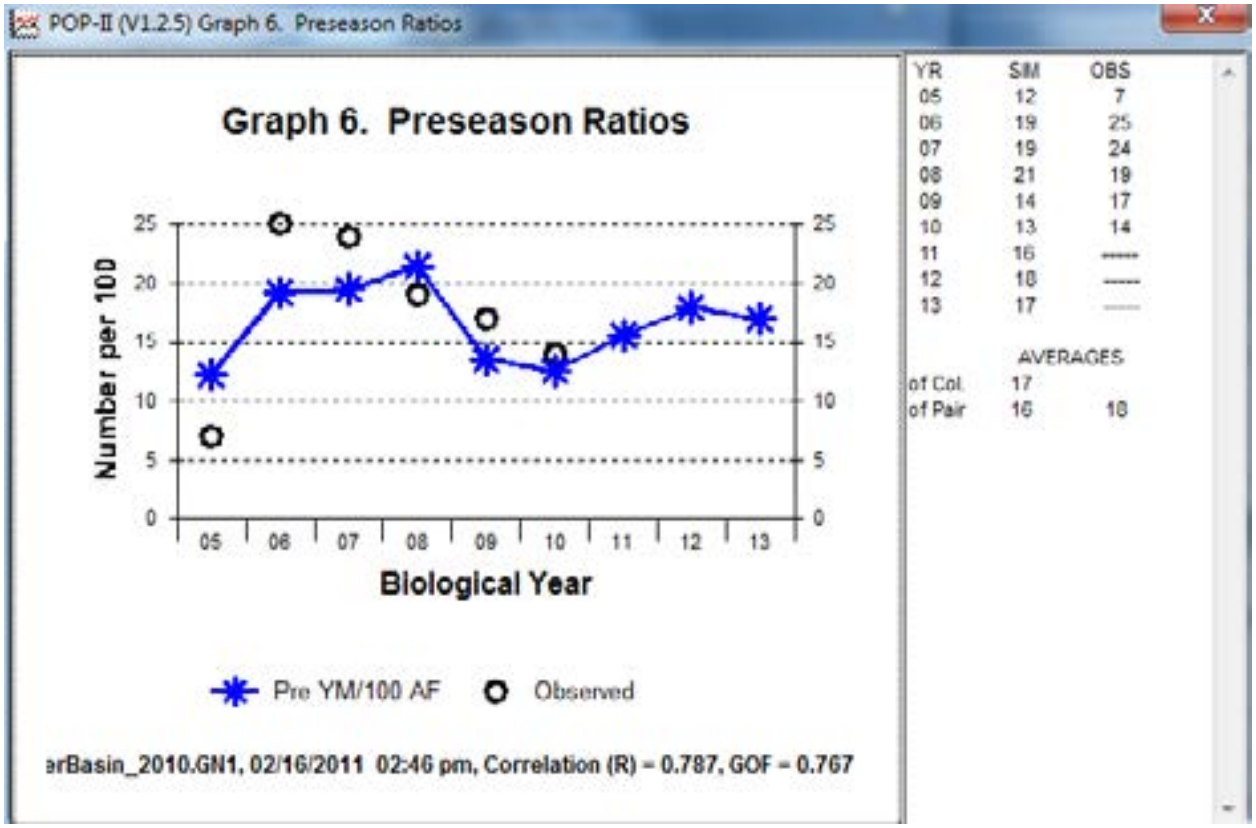
Bio-Year	Young / 100 AF 1 +	Sub-Ad. / 100 AF 1 +	Total Young	Total Sub-Adult	Total Females 1 +
2005	86	86	611	611	712
2006	145	145	1177	1177	813
2007	144	144	1289	1289	893
2008	141	141	1344	1344	955
2009	155	155	1352	1352	871
2010	157	157	1158	1158	737
2011	152	152	953	953	629
2012	147	147	853	853	579
2013	149	149	866	866	581

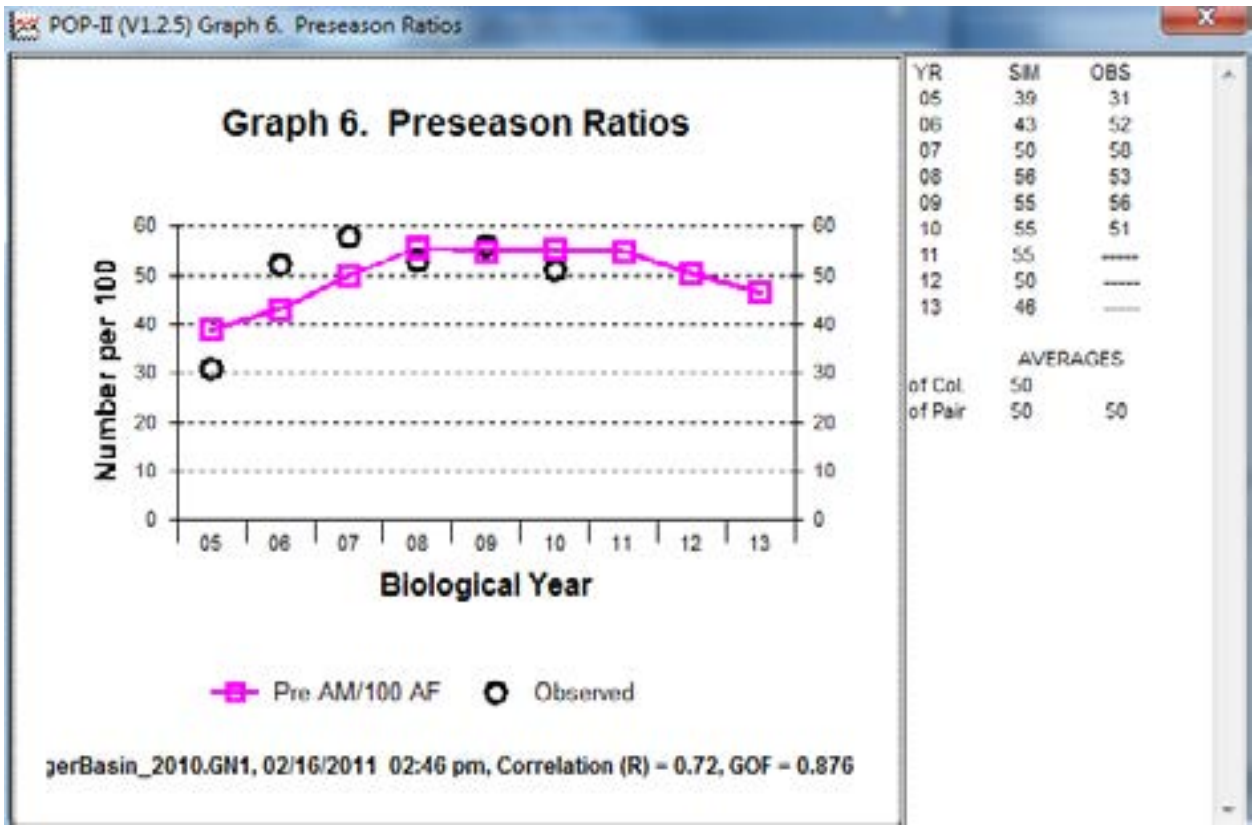
Table A. Intra-Annual Natural Survival(%) for BadgerBasin_2010.GN1 02/16/2011 02:46 pm

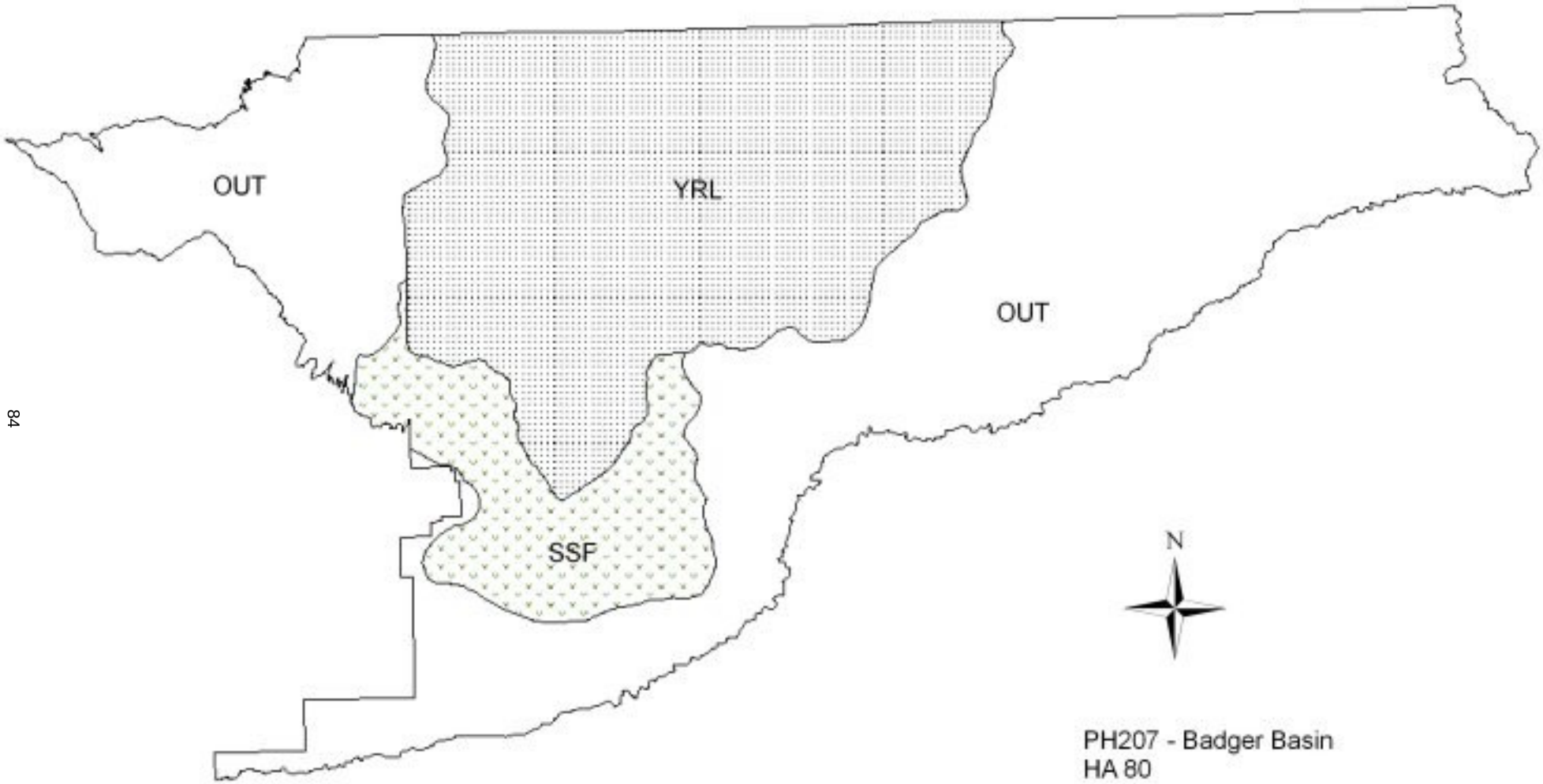
Bio-Years	Sub Adults	Adult Males	Adult Females	Overall Survival
2005-2006	87.83	96.20	92.96	92.02
2006-2007	87.94	96.27	92.59	92.03
2007-2008	87.42	95.64	91.86	91.36
2008-2009	87.22	95.38	91.97	91.96
2009-2010	87.34	95.40	91.97	92.09
2010-2011	87.56	95.52	92.01	91.92
2011-2012	87.60	95.51	91.99	91.61
2012-2013	87.60	95.55	91.99	91.60


POP-II (V1.2.5) Graph 1. Population Size During Bio-Year
Graph 1. Population Size During Bio-Year
Number of Animals
1600
1400
1200
1000
800
600
400
200
0
05
06
07
08
09
10
11
12
13
Biological Year
Postseason
BadgerBasin_2010.GN1, 02/16/2011 02:46 pm


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
60
50
40
30
20
10
0
05
06
07
08
09
10
11
12
13
Biological Year
Pre SA/100 AF
Observed
adgerBasin_2010.GN1, 02/16/2011 02:46 pm, Correlation (R) = 1, GOF = 0.993
YR SIM OBS
05 50 50
06 49 49
07 53 53
08 31 31
09 26 26
10 32 32
11 40 -----
12 40 -----
13 41 -----
AVERAGES
of Col. 40
of Pair 40 40


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
Biological Year
Pre YM/100 AF
Observed
erBasin_2010.GN1, 02/16/2011 02:46 pm, Correlation (R) = 0.787, GOF = 0.767
YR SIM OBS
05 12 7
06 19 25
07 19 24
08 21 19
09 14 17
10 13 14
11 16 -----
12 18 -----
13 17 -----
AVERAGES
of Col. 17
of Pair 16 18


POP-II (V1.2.5) Graph 6. Preseason Ratios
Graph 6. Preseason Ratios
Number per 100
Biological Year
Pre AM/100 AF
Observed
gerBasin_2010.GN1, 02/16/2011 02:46 pm, Correlation (R) = 0.72, GOF = 0.876
YR SIM OBS
05 39 31
06 43 52
07 50 50
08 56 53
09 55 56
10 55 51
11 55 -----
12 50 -----
13 46 -----
AVERAGES
of Col. 50
of Pair 50 50



PH207 - Badger Basin
HA 80
Revised - 8/94