

South Central Oregon Mule Deer Study Preliminary Results Summary – October 2011

Background

- Initiated in 2005 in Fort Rock, Silver Lake, Upper Deschutes, Paulina, Sprague, & Wagontire Wildlife Management Units (WMUs)
- In 2010, Interstate, Klamath Falls, & Metolius WMUs added
- Highway mortality study conducted on 100 mi of Hwy 97 & 50 mi of Hwy 31 (October 2005-December 2010)

Objectives

- Identify biological parameters (survival, causes of mortality, age structure)
- Identify seasonal distribution and migration routes (detailed habitat use & resource selection functions: e.g. vegetation, slope, aspect, precipitation, distance to water, distance to human dimensions, etc.)
- Calculate statistically valid population estimates
- Evaluate impacts of human-associated changes to mule deer habitat (e.g. land & highway development)

Methods

- 591 deer radio-collared (2005-2011) in 9 WMUs using helicopter, dart gun, & trapping methods (Fig 1)
- 95 bucks & 496 does
- Collar types: GPS store-on-board (SOB), Remote GPS, Standard VHF, Kydex
- GPS collars collect locations every 4 hours for 14-17 months (nearly 1.5 million deer locations recorded since 2005)
- Currently 108 deer “on the air” (94 does, 14 bucks)

Findings to Date

- Migration Timing
 - Average fall migration: Oct 8 – Nov 17
 - Average spring migration: May 9 – Jun 24
- Mortality Factors (Fig 2)
- Annual Survival Estimates (Table 1)

Wildlife Management Unit	Annual Survival Estimate	Year
Fort Rock, Silver Lake, Sprague, Upper Deschutes, Paulina & Wagontire (combined)	86%	2005-06
	72%	2006-07
	78%	2007-08
	73%	2008-09
	81%	2009-10

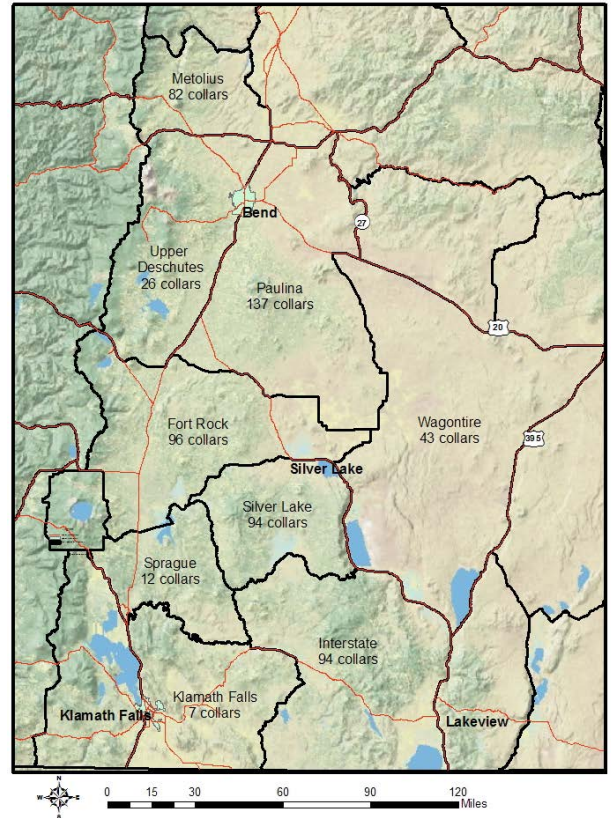


Figure 1. Distribution of 591 radio-collared mule deer based on capture location among south central Oregon wildlife management units (2005-2011).

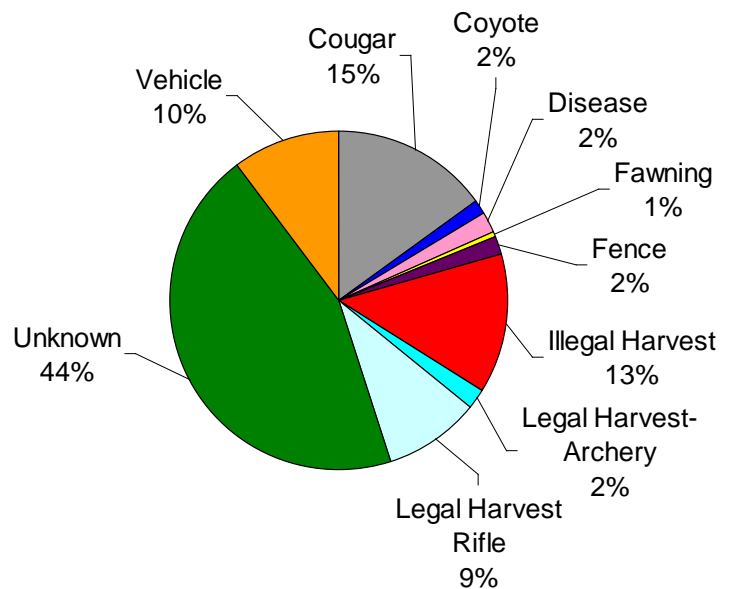


Figure 2. Causes of mortality for adult radio-collared mule deer in south central Oregon (October 2005-2011) (n=195 mortalities).

- Highway Mortality (Total mortalities 2005-2010 = 1900)
 - Approximately 400 deer vehicle collisions (DVCs) per year on 150 mi of highway studied (see Table 2 for distribution by highway, sex, & age)
 - Annually, 2.6 deer mortalities/mi on Hwy 97; 2 deer mortalities/mi on Hwy 31
 - Sex ratio of adults same for both highways; age distribution differed between highways
 - Fetus:doe ratio was 88:100; pregnant does averaged 1.42 fetuses; fetus sex ratio was male-biased (male:female ratio of 60:40)

Sex	Hwy 97 (n = 1362)	Hwy 31 (n = 538)	Total (n = 1900)
Female	644 (47%)	251 (47%)	895 (47%)
Male	368 (27%)	109 (20%)	477 (25%)
Unknown	350 (26%)	178 (33%)	528 (28%)
Age			
Adult	592 (43%)	186 (35%)	778 (41%)
Yearling	196 (14%)	60 (11%)	256 (14%)
Fawn	272 (20%)	167 (31%)	439 (23%)
Unknown	302 (22%)	125 (23%)	427 (22%)

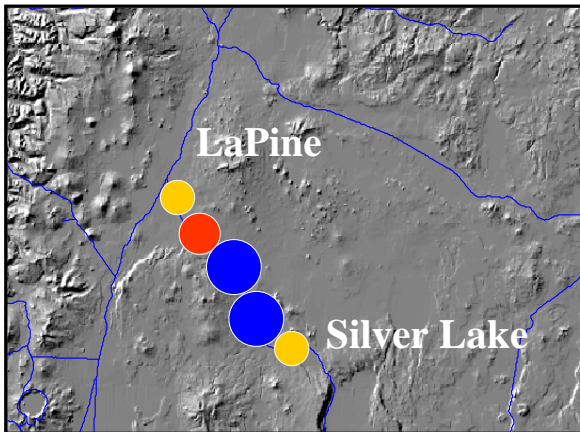


Figure 3. Representation of number of DVCs per 10 mile segments of Hwy 31 (Oct 2005 – Dec 2010). Larger circles represent greater number of DVCs.

- Critical crossing areas identified (Figs 3 and 4)
 - Hwy 31: MP 21-22, MP 33-34
 - Hwy 97: MP 174-175, MP 190-191, MP 206-207
- Hwy 97 DVCs appear to correlate with migration, while Hwy 31 DVCs are likely related to deer winter range which spans the highway
- Wednesdays had the highest number of deer killed (both highways combined)
- Negative correlation between average annual daily traffic (AADT) and location of DVCs
- Of 12 highway metrics measured, only slope of the “kill-side” was significant between areas with high and low DVCs (14° and 7°, respectively)
- Differences existed between DVC sites on Hwy 97 and those on Hwy 31 (Table 3)

Characteristic	Highway 97 (n=1362)	Highway 31 (n=538)
Avg. sight distance to/from DVC site approaching/heading direction *	851.2 m; 877.4 m	473.4 m ; 564.6 m
Avg. shoulder width *	1.57 m	.57 m
Avg. slope degree *	-17 ^o	11.7 ^o
Avg. slope length	6.46 m	6.36 m
Avg. distance to veg.	12.1 m	14.4 m
Major browse spp.	92.7% bitterbrush	57.6% bitterbrush 19.7% big sagebrush
Major cover spp.	73% lodgepole pine 19.4% pond. pine	43.9% lodgepole pine 11.9% pond. pine 9.7% western juniper
Avg. veg. density perpendicular to site *	58.8 %	49.4 %
Avg. veg. density 15m from site in approaching direction*	69.0 %	59.5 %
Avg. veg. density 15m from site in heading direction	66.6 %	62.3 %

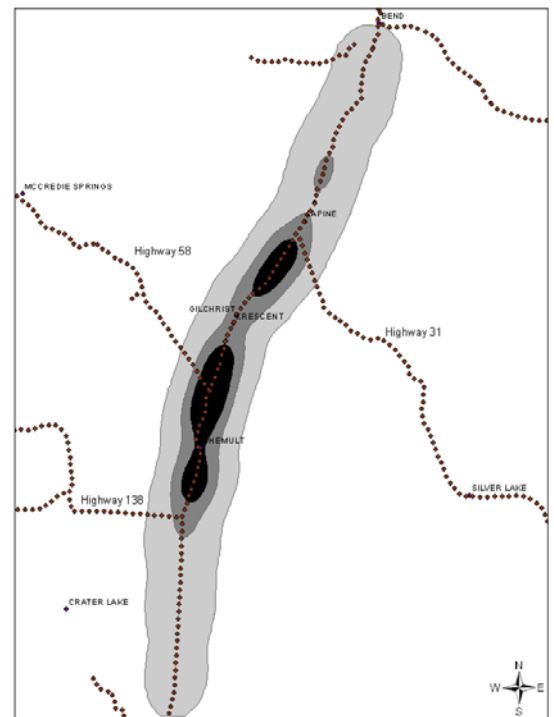


Figure 4. Density isopleths (25%, 50%, and 95%) of DVCs on Hwy 97 (Oct 2005 – Dec 2010). The darker the shading the denser the collisions.

Next Steps

- Continue to monitor collared deer
- Determine summer and winter allocation of collared mule deer to WMUs
- Preliminary planning for detailed habitat and resource selection functions has commenced

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