

**Factors explaining the decline of black-tailed deer:  
A comparative study on public and private lands  
in northern California**

**Agreement #: P0880013 between the University of California and the  
California Department of Fish and Game**

**Second Quarter Fiscal Year 2010/2011 Progress report  
Submitted January 2011**

(Note: results presented here should be considered preliminary and are not  
intended for wide dissemination)

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## **Progress report until January 1<sup>st</sup>, 2011**

### **1) Adult deer**

#### a) Status of collared deer 2009/2010

Since captures began in June 2009, we have successfully captured 29 female deer older than 1 year of age (Table 1). No captures have been conducted since the last progress report, and no mortalities of adult deer have been detected. As of December 2010, 21 deer are alive with active GPS collars (Table 1).

No mortalities of collared deer have been detected since October, and a total of 8 mortalities of collared deer have been recorded during the project (Table 1). The preliminary cause of mortality has been assigned to all deer based on mortality site assessment, and will be confirmed with DNA analysis. DNA analysis to determine predator species identity is currently being conducted, and preliminary results should be available during 2011.

#### b) Monitoring:

Based on our experience the previous year, monitoring during the winter will be challenging. Winter monitoring this year will use a combination of fixed-wing telemetry flights through DFG and monitoring using snowmobiles on loan from DFG. All deer will be monitored every 10 days by one of these two methods, although ultimately this is dependent on weather conditions. Mortalities will be investigated as soon as possible while ensuring the safety of personnel.

The project is currently using one functional truck from DFG, and one truck is currently being repaired. Access to most of the study area by truck has been closed by early snowstorms in late November, and the study area is likely snowed in for the winter season. All winter access will now require flights or snowmobile use.

#### d) Summary

No mortalities have been detected and no additional adult deer have been captured since the previous progress report. Deer capture will resume in the spring when the animals return to summer range. The total number of collared individuals over the duration of the current project and the previous study by David Casady (DFG) remains at 51 female deer older than 1 year of age (note that 1 individual (ID 5740) collared during the first project was recaptured and re-collared during the second phase of the project). All deer have been collared on public land.

Table 1: Status of adult black-tailed deer Mendocino black-tailed deer project; update September 30, 2010.

No	ID	Group	Capture Date	Sex	Age (Est) <sup>1</sup>	Weight	Last Date Observed	Status	Comments <sup>2</sup>
1	8796	M1	8-Jun-09	F	3	115	10-Oct-09	dead	predation (unknown)
2	5740	M1	9-Jun-09	F	7	98	16-Nov-09	dead	unknown
3	8805	M1	9-Jun-09	F	2	95	18-Mar-10	dead	unknown
4	8809	M1	9-Jun-09	F	3	123	09-Oct-10	alive	
5	8810	M1	9-Jun-09	F	5	115	09-Oct-10	alive	
6	8801	M1	10-Jun-09	F	4	104	06-Dec-10	alive	
7	8808	FH7	10-Jun-09	F	2	72	8-Aug-09	dead	predation (unknown)
8	8798	FH7	10-Jun-09	F	4	115	06-Dec-10	alive	
9	8803	FH7	11-Jun-09	F	2	82	07-Dec-10	alive	
10	8804	FH7	11-Jun-09	F	4	105	12-Feb-10	dead	predation (bear)
11	8800	FH7	11-Jun-09	F	5	132	07-Dec-10	alive	
12	8802	M1	8-Aug-09	F	2	106	3-Jun-10	dead	predation (mtn. lion)
13	8835	M1	13-Aug-09	F	2	101	18-Mar-10	dead	unknown
14	8817	FH7	14-Aug-09	F	1	92	07-Dec-10	alive	
15	8834	M1	21-Dec-09	F	5.5	150	18-Nov-10	alive	
16	8815	FH7	20-Jun-10	F	4	108	07-Dec-10	alive	
17	7584	FH7	21-Jun-10	F	3	90	07-Dec-10	alive	
18	8820	FH7	21-Jun-10	F	3	115	07-Dec-10	alive	
19	7586	M1	22-Jun-10	F	3	80	18-Nov-10	alive	
20	8821	FH7	22-Jun-10	F	2	75	07-Dec-10	alive	
21	7597	FH7	23-Jun-10	F	4	95	07-Dec-10	alive	
22	8823	FH7	24-Jun-10	F	4	85	07-Dec-10	alive	
23	7588	FH7	24-Jun-10	F	6	105	07-Dec-10	alive	
24	8826	FH7	25-Jun-10	F	7	114	07-Dec-10	alive	
25	7585	M1	16-Jul-10	F	6	112	07-Dec-10	alive	
26	7583	FH7	28-Jul-10	F	4	96	17-Nov-10	alive	
27	8811	FH7	24-Aug-10	F	6	109	24-Aug-10	dead	capture related
28	8819	FH7	24-Aug-10	F	5	106	07-Dec-10	alive	
29	7885	FH7	26-Aug-10	F	3	88	17-Nov-10	alive	

<sup>1</sup> Age at capture estimated from tooth wear and replacement; confirmation using cement-annuli from extracted tooth pending

<sup>2</sup> Cause of mortality preliminary until verified using DNA evidence collected at kill/mortality site

## **2) Fawns**

As of December 2010, 15 of 26 fawns captured in 2010 have been confirmed dead. No mortalities have been detected since the previous progress report, and all fawns have now moved down to winter range.

Preliminary causes of mortality for all dead fawns have been determined by site investigation. DNA analysis to verify the cause of mortality and predator identity is currently being conducted by the lab of Dr. Ben Sacks at UC Davis. These results are not expected to be available until mid 2011. For the 2010 cohort, we refrain from reporting preliminary causes of mortality and will instead present these once DNA results become available.

The large number of surviving fawns will require additional efforts to monitor during winter, particularly since the smaller ear tags have a weaker radio signal than the adult collars. Several of the surviving fawns have not been located for some time due to snow blocking access to some listening posts and/or the fawns moving to a winter range that obstructs signals to higher elevation listening posts. Low elevation listening posts are impossible to use due to the lack of road access because of wilderness status or private land. Monitoring flights should greatly aid in detection of fawns during the winter.

Table 4: Status of black-tailed deer fawns Mendocino black-tailed deer project  
(2010 cohort)

Number	ID	Group	Capture date	Sex	Age (estimated)	Weight (kg)	Date last observed	Status
1	Y13	FH7	21-Jun-10	female	1-2 weeks	4.5	21-Jun-10	dead
2	Y14	FH7	22-Jun-10	male	4-7 days	3.6	22-Jun-10	dead
3	Y21	FH7	22-Jun-10	female	5-7 days	3.2	5-Jul-10	dead
4	Y15	FH7	22-Jun-10	male	1-2 weeks	5.4	9-Jul-10	dead
5	Y16	FH7	22-Jun-10	female	1-2 weeks	4.7	13-Jul-10	dead
6	Y71	FH7	23-Jun-10	male	2 days	2.2	9-Jul-10	dead
7	Y4	FH7	25-Jun-10	female	>1 week	2.4	9-Jul-10	dead
8	Y52	FH7	26-Jun-10	female	2 days	2.6	07-Dec-10	alive
9	Y5	FH7	26-Jun-10	male	3-4 days	3.3	07-Dec-10	alive
10	Y6	FH7	26-Jun-10	male	2-3 days	3.4	07-Dec-10	alive
11	Y7	M1	30-Jun-10	female	>1 day	2.7	9-Aug-10	dead
12	Y1	M1	30-Jun-10	female	>1 day	2.8	06-Dec-10	alive
13	Y8	M1	30-Jun-10	male	5-7 days	4.4	9-Jul-10	dead
14	Y9	M1	3-Jul-10	female	2-4 days	3.1	18-Oct-10	alive
15	Y12	M1	5-Jul-10	female	4-6 days	2.9	18-Nov-10	alive
16	Y10	M1	7-Jul-10	female	~1 week	4.1	23-Oct-10	alive
17	Y19	FH7	8-Jul-10	male	3-5 days	6.5	07-Dec-10	alive
18	Y11	FH7	8-Jul-10	female	2-4 days	2.8	10-Oct-10	alive
19	Y23	FH7	8-Jul-10	female	2-4 days	2.8	29-Jul-10	dead
20	Y20	FH7	9-Jul-10	female	~10 days	3.15	15-Jul-10	dead
21	Y24	FH7	9-Jul-10	male	~10 days	3.4	9-Jul-10	dead
22	Y22	FH7	10-Jul-10	male	3-5 days	3.9	18-Jul-10	dead
23	Y86	FH7	12-Jul-10	male	~5 days	3.6	12-Aug-10	dead
24	Y25	FH7	12-Jul-10	female	~5 days	3.2	08-Nov-10	alive
25	Y85	M1	15-Jul-10	male	5-8 days	5	18-Nov-10	alive
26	Y18	FH7	19-Jul-10	male	4-5 days	3.1	7-Aug-10	dead

### **3) Other Surveys**

Vegetation surveys and camera trap efforts have been completed and will resume during the 2011 field season. Samples collected for dietary and forage quality analysis will be submitted to the Wildlife Habitat Nutrition Laboratory at Washington State University for analysis this winter. Data from vegetation and camera trap surveys will be entered into a database this winter, and preliminary analysis will be conducted.

### **4) Mountain Lions**

#### a) Preliminary data from mountain lion F1

The collar accuracy of mountain lion F1 began getting worse in October, and the satellite-upload/GPS battery died as expected at the end of December. The overall fix rate dropped from 23.7% to 21.9% in the 7 months it was active. The satellite-upload/GPS battery was expected to run out on December 26th, and sent its last transmission on December 21<sup>st</sup>.

We currently have 5 refurbished ARGOS collars with external antennas ready for deployment, with another 3 which will be ready in roughly two months. The external antenna is expected to increase the fix rate of the collars.

Mountain lion F1 currently uses a very large home range. The minimum convex polygon home range for the last six-month period is 322 km<sup>2</sup>. F1 does not currently have any young with her, and despite recorded interactions with males on remote cameras she has shown no denning behavior.

In the six months since capture we have documented 9 feeding/kill sites of black-tailed deer; as well as additional kills of rabbits, rodents and birds. Overall, detection of kill sites has been affected by the low fix success rate of the collars, and recently the large amounts of snow in the study area, covering the kills before they can be located. It is also important to note that at all nine deer feeding sites there was evidence of black bears feeding on the kill.

The fix rate for GPS data stored on the collar is expected to be >95%. These waypoints will be plotted upon collar retrieval, and the clusters will be searched for additional kills. It is unlikely we will find any evidence of smaller

animals, but based on methods used by Anderson and Lindzey (2003) deer carcasses should still be able to be located for up to a year.

#### b) Location of mountain lion sign

We continue to scout the study area for mountain lion sign. We have located the tracks and sign of at least 3 additional adult females and 2 adult males, as well as a sub-adult male. We have also captured over 30 photos/videos of mountain lions on remote trail cameras.



Photos of mountain lions from different locations in the study area

#### c) Capture Efforts

Capture efforts from October to December included one week of hound capture. No trapping was done due to DFG policy against using immobilization drugs on bears during black bear hunting season. The week of hound capture included the treeing of a 7 month old kitten twice, the adult mother, and an unsuccessful run of an adult male. The 7 month old kitten was too small to place a collar on, and was let go. The adult female was considered by the darter to be in an unsafe tree for drug immobilization, and was released.

## **5) Outlook**

### **a) Deer:**

We currently have 6 more GPS collars ready for deployment on adult deer. Three have never been deployed and 3 are from mortalities that need to be redeployed on new animals. Capture sessions will resume in the spring to deploy the remaining collars and to replace animals that die over the winter. Deer are being monitored every 10 days on the winter range.

Deer will be monitored this winter with a combination of snowmobile land-based monitoring and bi-monthly fixed-wing telemetry flights. This will enable faster response times to mortality sites since all deer should be located easily during telemetry flights.

Data entry and preliminary data analysis is currently ongoing and will be continuing throughout the winter.

### **b) Mountain Lions:**

The most important aspect of the mountain lion study in the next quarter is mountain lion capture. Captures which were planned for the winter months of November, December, and January have been delayed and/or cancelled. A re-capture of F1 was re-scheduled for late January, but no further capture efforts are currently planned.

For mountain lion captures to be successful, they need to be given a higher priority, and given a reasonable amount of time and effort.

November and December are considered the prime hound capture months in the study area. In prime months a hound capture of one lion a week is expected, while in non-prime months a hound capture is expected every 10-14 days. Based on these figures, at least 4 weeks of hound capture should be scheduled in the next quarter, or a larger 2 week effort including 2-3 capture teams. Trapping could also be used effectively in the winter months, and would be most effective if used in conjunction with hound captures.

Appendix 1: Spending report including expenses occurred until June 1, 2010. Total amount allocated for 2008-09 and 2009-2010 fiscal year = 227,616.

	<b>2008-09 4<sup>th</sup> quarter</b>	<b>2009-10 1<sup>st</sup> quarter</b>	<b>2009-10 2<sup>nd</sup> quarter</b>	<b>2009-10 3<sup>rd</sup> quarter</b>	<b>2009-10 4<sup>th</sup> quarter</b>	<b>2010-11 1<sup>st</sup> quarter</b>	<b>2010-11 2<sup>nd</sup> quarter</b>	<b>Total</b>
<b>Salary</b>	5,450.00	11,196.82	12,537.33	10,556.80	7,296.00	9,652.34	9,052.70	65,741.99
<b>Benefits</b>	1,734.29	2,078.80	3,870.55	2,945.41	3,342.93	667.75	3,976.75	18,616.48
<b>Supplies and Expenses</b>	69,389.91	7,447.19	30,074.58	2,325.73	13,743.40	7,542.15	3,531.29	134,054.25
<b>Travel</b>	0.00	0.00	0.00	1,701.73	873.10	1,241.00	1,016.89	4,832.72
<b>Indirect costs</b>	19,396.38	5,064.48	11,359.62	4,262.82	4,133.08	-207.72	3,473.89	47,482.55
<b>Total</b>	95,970.58	25,787.29	57,842.08	21,792.49	29,388.51	18,895.52	21,051.52	<b>270,727.99</b>