

## Large Mammal Advisory Committee

### Approved Project

## QUARTERLY PROGRESS REPORT

Project Name: Estimation of Abundance of the Pacific Deer Herd Using Fecal DNA

Quarter: 4th: April through June 2015/ FY 14/15

### **Summary of cumulative 2013—2014 Lab Work**

Total # 2013 DNA Samples collected: 480

Total # 2014 DNA Samples collected: 415

Total project samples collected: 895

No. of samples processed in lab to date\*: 895 samples

No. of samples available for analysis\*\*: 414

\*Lab processing of a fecal sample involves DNA extraction, followed by duplicate attempts at polymerase chain reaction (PCR), electrophoresis, and fragment analysis.

\*\*These samples represent successful DNA extraction and PCR, followed by comparison of duplicate allele calls and formation of a consensus genotype.

### **Progress and preliminary results**

All samples from 2013 and 2014 have been processed. Genotype success for 2013 was 33% and 62% for 2014. The difference in success between the two years was likely due to sample storage in 2013. Samples were kept in a cooler but were subject to high temperatures. In 2014, samples were returned to the UC Davis lab nearly daily which protected the integrity of the samples. The total number of individuals sampled in 2013 was 106, and 133 individuals were sampled in 2014.

The Huggins closed-capture models (1989, 1991) were used in Program MARK by transect, using sex and linear time as covariates. Preliminary results suggest that a simple, constant rate of capture model is the optimal model for estimating abundance.

### **Work Anticipated for Next Quarter:**

Continue analysis of 2013 and 2014 data. Further models that incorporate spatial environmental variables will be explored.

Habitat photos were taken every 100 meters along the 1 and ½ km transects. A photo was taken in each cardinal direction. We will use these photos to assign Wildlife Habitat Relationship (WHR) classifications and evaluate location and number of edge habitats per transect. These habitat covariates, along with other spatial environmental variables (e.g. elevation, slope) will be incorporated into further capture-mark-recapture models. We will use Akaike's Information Criterion to compare

these models for best fit against the current optimal model of constant capture rates with no covariates. Simulations will also be completed in Program MARK to inform recommendations on sampling effort.

Once a final model is selected and analyses are complete, we will begin writing the final report, for completion in December 2015.

**Funds Expended:**

	<u>This quarter</u>	<u>Total to date</u>
Personnel:	\$7,250.00	\$ 57,972.00
UC Davis Contract	\$0	\$ 78,508.35
Operating Expense:	\$0	\$
Total:	\$7,250.00	\$136,480.35

Huggins R. M. 1989. *On the statistical analysis of capture experiments. Biometrika* 76:133–140.

Huggins, R.m. 1991. Some practical aspects of a conditional likelihood approach to capture experiments. *Biometrics* 47:725-732