

State of California  
Department of Fish and Wildlife

## Memorandum

Date: March 8, 2013

To: Eric R. Loft, PhD, Chief  
Wildlife Program Branch  
Department of Fish and Wildlife  
1812 9<sup>th</sup> Street  
Sacramento, CA 95814

From: NEIL MANJI, Regional Manager  
Region 1 – Northern

*K Kovacs for N. Manji*

Subject: **Western Siskiyou Black-tailed Deer Capture Plan**

The purpose of this memorandum is to request approval of our plan (attached) to capture black-tailed deer in western Siskiyou County.

Our prospectus titled "*Investigating factors that limit black-tailed deer populations in western Siskiyou County*" has been approved by the Large Mammal and the Big Game advisory committees. Approval of the subject plan will allow us to commence work on this study.

Capture operations are planned for this spring in western Siskiyou County and will occur for five consecutive years. This project will investigate factors limiting black-tailed deer populations and collect additional data to better understand the ecology of this species across a wide geographic region in the County.

Up to 50 adult female and 50 neonatal deer will be captured annually by helicopter net-gunning, drive netting, or chemical immobilization from the ground. No capture operations involving the use of a helicopter are proposed this year. Capture activities will be coordinated with the Wildlife Investigations Laboratory, and all provisions for personnel and animal safety will be implemented as described in the subject plan.

If we can provide additional information to assist you with processing our request, please contact Senior Environmental Scientist Richard Callas at (530) 340-5977.

### Attachments

ec: Messrs: Steve Torres, Craig Stowers, Richard Callas, and Robert Schaefer  
Ms. Karen Kovacs and Dr. Pam Swift  
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**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE  
NORTHERN REGION TERRESTRIAL WILDLIFE PROGRAM**

**BLACK-TAILED DEER CAPTURE PLAN  
SISKIYOU COUNTY**

**Prepared by: Robert Schaefer**

**MARCH 2013 – MARCH 2017**

**INVESTIGATING FACTORS THAT LIMIT BLACK-TAILED DEER POPULATIONS IN  
WESTERN SISKIYOU COUNTY**

**I. INTRODUCTION**

Black-tailed deer will be captured and monitored for five consecutive years on public and private lands to assess causal mechanisms responsible for regulating population growth, and for improving the management of this species across a wide geographic region. This study will impart fine scale knowledge on the habitat ecology of deer in the Klamath Mountain Ecoregion and increase understanding of conservation values for deer in western Siskiyou County.

A maximum of 50 adult female and 50 neonatal black-tailed deer will be captured annually for sampling and will be equipped with biotelemetry. Multiple aerial and ground-based techniques will be used to capture deer including helicopter net-gunning and ground darting as the primary techniques. Helicopter drive-netting and clover trapping may be used as alternative techniques for reaching sampling objectives. Helicopter capture operations are planned for March 2014 – 2017. If California Department of Fish and Wildlife (CDFW) policy on the use of helicopters is revised during the tenure of this plan, an addendum to this capture plan will be provided in accordance with any changes in CDFW policy.

**II. BACKGROUND**

Range-wide declines in black-tailed deer populations have raised awareness and concern over the health and persistence of this socio-economically important species. In 2010, the Siskiyou County Board of Supervisors passed a resolution to actively encourage, develop, and help implement cooperative strategies and projects geared toward research, restoration, and sustainability of abundant, healthy deer herds in the County (Siskiyou County 2009). This project will increase CDFW's understanding of the population dynamics for this species and provide science-based information for management and conservation.

**Primary Study Objectives**

1. Establish reliable techniques for monitoring trends in abundance.
2. Monitor annual patterns of survival and causes of mortality.
3. Monitor nutritional and reproductive status.

4. Monitor reproductive phenology.
5. Identify fine-scale habitat use of reproductive areas, critical ranges, migration corridors, and temporal-spatial patterns in distributions.

### III. CAPTURE LOCATION / STUDY AREA

All captures will occur in western Siskiyou County on the Klamath National Forest and the private lands of Scott Valley (Appendix I).

### IV. ANNUAL CAPTURE OBJECTIVES

1. 50 adult female black-tailed deer
2. 50 neonatal black-tailed deer

### Capture Methods

Deer will be captured on two distinct study areas categorized as public and private lands. Primary capture methods will be helicopter net-gunning and free-range darting, with clover trapping and helicopter drive-netting used as potential alternative techniques. Deer captured by net-gunning will be hobbled and blind-folded, ferried to base camps, monitored for stress and temperature, and an NSAID or sedative administered if temperatures exceed 105° or deer become highly agitated. Deer captured by helicopter drive-netting or chemical immobilization will be processed on site. Helicopter operations will fully comply with provisions specified in CDFW's Departmental Bulletin 2010-07 (Appendix II).

### Chemical Immobilization

Free-range darting will use a cocktail consisting of a cyclohexamine and  $\alpha_2$  agonist following guidelines established by the lead veterinarian. Darting conducted at night may use transmitter darts for locating deer post-induction. Anesthetic drugs will include combinations of Telazol® (tiletamine HCl and zolazepam; 4.4 mg/kg) and xylazine (2.2 mg/kg) or medetomidine HCl (0.1-0.2 mg/kg) and antagonized intramuscularly with tolazoline (2 mg/kg) or atipamezole (0.5 mg/kg).

Upon induction, deer will be hobbled and blindfolded and placed in a position to reduce the risk of bloat. An ophthalmic ointment will be applied to prevent corneal drying. Deer vital rates including temperature, respiration, heart rate, and blood oxygen saturation (SpO<sub>2</sub>) will be monitored. A portable oxygen delivery system will be available for artificial ventilation if SpO<sub>2</sub> falls to critical levels. The  $\alpha_2$  agonist will be immediately reversed in deer showing apnea, severe respiratory depression, extreme bloat, or other potential complications of anesthesia. If rectal temperature exceeds 105°F, water will be applied to the head, axillary region, and groin to facilitate cooling. At 60+ minutes post-induction, the corneal, palpebral, and swallow reflexes will be used to assess the plane of anesthesia and timing of antagonist administration. Each capture team will have a binder with emergency contacts, Material Safety Data Sheets for all drugs, and standard procedures for deer immobilization and processing.

A satellite and VHF collar will be attached to each adult female deer, and a vaginal implant transmitter (VITs) inserted in adult females using methods described by Bishop et al.

2007. Mortality collars will be colorized to distinguish individuals by year of capture. Neonatal black-tailed deer will be captured by monitoring adult VITs and behaviors of collared females, or through opportunistic field observations. Captures of neonates will be attempted by hand when they are from 2-10 days old. Their sex, approximate age (Brinkman et al. 2004), weights, and location of capture will be recorded. Neonates will be photographed and equipped with VHF transmitters using expandable collars, ear tags, or skin or fur adhesive platforms.

## **V. SUPPLEMENTAL CAPTURE NEEDS**

This is a multi-year investigation that will annually require captures primarily during winter from 2013-2017. All capture operations will generally follow the same capture and safety procedures described in this plan.

## **VI. DATA AND BIOLOGICAL SAMPLE COLLECTION**

The weights of all adult deer captured will be recorded with a scale, and an incisiform canine tooth will be extracted for aging (Swift et al. 2002). Chest and neck girth circumference, total body length and metatarsal gland length will be measured, and a body condition score using the three landmarks described by Audige et al. (1998) will be recorded (Appendix III). Prophylactic medications including antibiotics, vitamin E, and selenium will be administered.

This study will participate in the *Statewide Assessment of Disease and Environmental Factors Affecting Deer Herd Population Demographics and Health* coordinated through CDFW Wildlife Investigations Lab (WIL). The standard sampling protocol for that project includes collection of whole blood, serum, tail hair, body hair, and ectoparasites.

Blood samples will be drawn by jugular venipuncture and collected in EDTA (lavender top tubes-LTT) and serum separator tubes (red/gray top tubes). The whole blood in LTT will be used for complete blood cell counts (CBC) and selenium concentration. A microhematocrit tube will be used to collect whole blood and determine packed cell volume.

Serum separator tubes will be used to collect blood and allowed to clot for several hours at room temperature. The clotted blood will be centrifuged and the serum harvested. This serum will be used for the following analyses:

1. Serum chemistry analysis – albumin, alkaline phosphatase, alanine transaminase, amylase, blood urea nitrogen, calcium, cholesterol, globulin, glucose, phosphorous, total bilirubin, and total protein.
2. Trace element screen – copper, iron, magnesium, molybdenum, zinc, calcium, phosphorus, sodium, and potassium concentrations.
3. Serology – antibody detection for *Brucella*, *Leptospira*, *Anaplasma*, bluetongue virus (BTV), epizootic hemorrhagic disease virus (EHD), respiratory syncytial virus (RSV), parainfluenza virus type 3 (PI3), infectious bovine rhinotracheitis virus (IBR), and bovine viral diarrhea virus (BVD).
4. Serum thyroid hormone testing will be completed for throxine (T4), total triiodothyronine (T3), free thyroxine (FT4), and free triiodothyronine (FT3).

Fecal samples will be collected and assessed by fecal flotation where eggs (EPG) or oocysts (OPG) per gram of feces will be determined. Fecal nitrogen will be determined as an index to protein intake, and microhistological analysis will be used to estimate diet composition through microscopic identification of epidermal fragments of plant species (Stewart et al. 2003).

Neonatal deer will be captured by hand, placed in cotton bags, and protected to reduce scent transfer. The weight, sex, and approximate age will be determined, a photograph taken, and a VHF transmitter will be attached. Each capture site will be described and photographed, and a GPS location recorded. All fawns will be processed quickly to reduce risk of handling induced mortality.

Metagenomics is the genomic analysis of microorganisms by direct extraction and cloning of DNA from an assemblage of microorganisms (Handlesman 2004). Viral metagenomics provide a powerful technology to deepen knowledge of viruses circulating in nature and the complex interaction between virus and host (Blomstrom 2010). Samples from this project will be available for testing using this technique in hopes of further unlocking the role of disease processes in deer.

## **VII. ENVIRONMENTAL DOCUMENTATION AND PERMITTING**

This project has been reviewed and recommended by the Large Mammal Advisory Committee and the Big Game Advisory Council. Coordination with public land agencies will be conducted prior to any capture event. Private land owners will be contacted for permission to access and capture deer.

## **VIII. FUNDING SOURCES**

This project is funded by the Big Game Account and the Northern Region Wildlife Program.

## **IX. MEDIA COVERAGE**

Coverage of this project is anticipated during the course of the study at a local level. In the event media inquiries occur, Mr. Richard Callas or Mr. Robert Schaefer will represent CDFW. Office of Communications, Education, and Outreach (OCEO) will be notified of the capture in the event the media requests information.

## **X. KEY PERSONNEL AND PERSONNEL NEEDS**

Flight and capture crew will be provided by the helicopter contractor. Personnel assisting with animal handling will include: Robert Schaefer, Pam Swift, Ben Gonzales, Craig Stowers, Richard Shinn, Brian Ehler, Dave Lancaster, Scott Hill, Pete Figura, Brett Furnas, Richard Callas, Karen Kovacs, Ken Morefield, Scott Koller, Jennifer Carlson, David Casady, Mary Sommers, and Russ Mohr (all CDFW personnel). Individual personnel assignments are listed in Appendix IV.

## **XI. PERSONNEL AND ANIMAL SAFETY**

Planning and safety meetings will be held prior to each capture effort and/or when new personnel arrive to assist (Appendix V). At these meetings, task assignments, dart gun and drug safety, helicopter safety, animal safety, animal handling and sampling

protocols, communication procedures, and other pertinent aspects of the operation will be discussed (Appendix VI and VII). Presentations will be made by appropriate personnel relative to their respective areas of expertise.

## **XII. TRAINING**

All CDFW personnel participating in the capture and handling of deer will be certified in "Animal Handling and Restraint." The use of immobilization drugs will be conducted by personnel with current certification in "Advanced Chemical Restraint" and/or with experience in free-range darting.

## **XIII. REPORTING OF RESULTS**

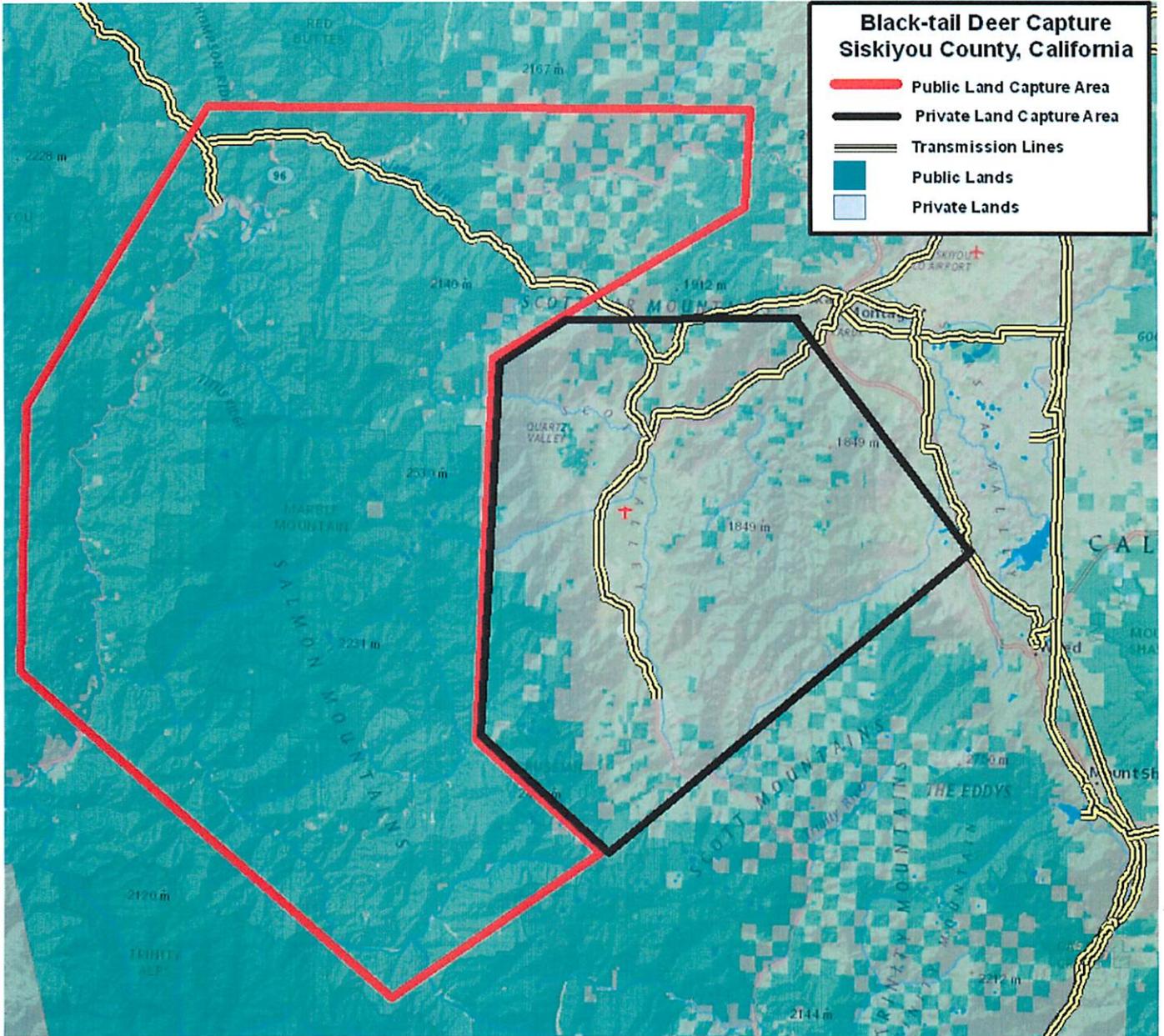
All capture and laboratory results will be maintained by the Northern Region Environmental Resource Information Services and summarized in annual progress reports.

## **XIV. LITERATURE CITED**

- Audige, L., P. Wilson, and R. Morris. 1998. A Body Condition Score System And Its Use For Farmed Red Deer Hinds. *New Zealand Journal Of Agricultural Research*, Vol. 41: 545-553.
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- Brinkman, T. J., K. L. Monteith, J. A. Jenks, and C. S. DePerno. 2004. Predicting neonatal age of white-tailed deer in the Northern Great Plains. *The Prairie Naturalist* 36: 75-81.
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- Wildlife Investigations Laboratory. 2010. Wildlife Restraint Handbook. State of California Department of Fish and Game. Wildlife Branch : 198 p.

APPENDICES

Appendix I  
GIS BASED CAPTURE AREA MAPS WITH TRANSMISSION LINES



**Appendix II  
Helicopter Air Operation Procedures**

**CDFW Departmental Bulletin 2010-07**

The requirements and procedures identified in this document are in addition to those identified in Section 2487.8 of the CDFW's Operations Manual. It is each crew member's responsibility to be thoroughly familiar with the information in both documents prior to commencing any flight operations. In addition to the requirements below, specific training that must be taken by personnel prior to flying includes "Flying in the Wire Environment" (or equivalent course).

- A. No helicopter flight operations to survey or conduct reconnaissance for fish, wildlife, habitat, waterbody, or vegetation (hereafter called "survey") shall be approved or commence without prior approval by the appropriate Regional Manager and appropriate Headquarters program Branch Chief. Helicopter flights related to animal capture and other uses shall abide by these requirements to the extent they apply, and will also implement specific requirements tailored to the type of flight operation.
- B. At minimum, each survey flight plan will contain the following elements:
1. Justification for the use of the helicopter over other data collection means;
  2. GIS based map(s) of the survey polygon(s) that identify survey routes, individual transect start/stop waypoints, potential flight hazards, and methods to avoid them (for example, **Standard Operating Procedure for any power line crossing is as follows: "Pilots shall transition power lines by directly over-flying a tower or flying at least 500 feet above the highest tower immediately adjacent to the flight path"**);
  3. Current contact information for emergency responders and on-board CDFW personnel;
  4. Current emergency notification procedures;
  5. Flight following procedures and personnel assigned to flight-monitoring duties; and
  6. Identification of personnel certified to fly and their flight duties.
- C. The daily safety meeting shall at minimum consist of the following elements:
1. Identification of the area and routes or transects that are to be flown;
  2. Identification of potential hazards, and methods/actions used to avoid them;
  3. Review of flight following and emergency notification procedures; and
  4. Review of any other flight or safety issues that any crew member believes needs to be addressed.

**Flight crew roles and responsibilities:**

- A. A "flight safety lead" (the pilot) shall be identified for each survey effort. The flight safety lead shall be responsible for the following duties:
1. Compiling information for and conducting the daily pre-flight safety meeting;
  2. In conjunction with the pilot, reviewing with all other flight-crew members basic

helicopter safety procedures including how to approach and board the helicopter, seatbelt and radio equipment use, and any other safety issues as identified in the daily pre-flight safety meeting;

3. Conducting a pre-flight safety check with an emphasis on flight crew preparedness and ensuring all requirements are met; and
4. Preparing a post-flight report to summarize daily effort and identify any flight or survey issues that need to be resolved. Report to be submitted to Project Leader at conclusion of each flight effort.

**D. Data recorder responsibilities for data collection flights:**

1. Ensure data recording equipment is operational prior to flight;
2. Coordinate with pilot to maintain correct flight path; and
3. Record all required/appropriate data.

**E. Observer(s) responsibilities for survey efforts:**

1. Implement species-specific survey protocols;
2. Collect accurate information required of survey or reconnaissance; and
3. Transmit information to data recorder (if used) and ensure it is recorded accurately.

**D. In addition to data collection efforts, all crew members are responsible for:**

1. Attending all safety meetings;
2. Searching for potential flight hazards and immediately transmitting necessary information to the pilot to avoid any detected;
3. Maintaining a state of awareness necessary to collect survey information and detect flight hazards; and
4. Ensuring all members of the crew also maintain the necessary state of awareness; and terminating a flight if, in their judgment, any condition warrants termination.



**Siskiyou County Deer Capture and Sample Data Sheet**

WIL Accession \_\_\_\_\_

\_\_\_\_\_ Permanent id# \_\_\_\_\_  
 Date \_\_\_\_\_ Capture # \_\_\_\_\_ Species \_\_\_\_\_ County \_\_\_\_\_  
 Recorder \_\_\_\_\_ Crew \_\_\_\_\_

**CAPTURE INFORMATION**

Capture Method:  Dart  Net Gun  Drive net  Clover  Calm  Excited  Agitated  
 Capture Location \_\_\_\_\_ Release Location \_\_\_\_\_ Lat \_\_\_\_\_ Long \_\_\_\_\_  
 Time: Dart \_\_\_\_\_ Down \_\_\_\_\_ Antagonist time \_\_\_\_\_ Initial Response \_\_\_\_\_ Recovered \_\_\_\_\_

Vial ID#	Dart or Injection #	Drug	Mg	Route	Result

Measures	Time	Temp	%O2	Heart Rate	Respiration	Palpebral ref	Corneal ref	Ear ref	Tongue ref
Processing:	Initial					Y N	Y N	Y N	Y N
	During					Y N	Y N	Y N	Y N
	Release					Y N	Y N	Y N	Y N

**PROCESSING**

- Process Start Time \_\_\_\_\_  Release Time \_\_\_\_\_
- Estimated Age \_\_\_\_\_ years  Tooth Extracted – (place in envelope)
- Male  Female  Actual Body Weight (kg or lbs – circle one) \_\_\_\_\_
- Length cm (nose to tail base) \_\_\_\_\_ Girth cm \_\_\_\_\_ Metatarsal Length cm \_\_\_\_\_
- Neck: Behind Jaw cm \_\_\_\_\_ Mid-cervical cm \_\_\_\_\_ Base Neck cm \_\_\_\_\_
- Body Condition Scores (1-5): Pelvic Wing \_\_\_\_\_ Spinous Processes \_\_\_\_\_ Tuber Coxae \_\_\_\_\_
- Apply Ear Tag: Tag # \_\_\_\_\_ Color \_\_\_\_\_
- Apply SAT Collar-Freq \_\_\_\_\_ Best Heard \_\_\_\_\_ Serial# \_\_\_\_\_ Color \_\_\_\_\_ Make \_\_\_\_\_
- Apply VHF Collar-Freq \_\_\_\_\_ Best Heard \_\_\_\_\_ Serial# \_\_\_\_\_ Color \_\_\_\_\_ Make \_\_\_\_\_
- Blood – (fill 2 lavender top tube and 4 red top tubes)
- Fecal Pellets - (place 10 pellets each in 3 whirlpaks)
- Body Hair/Tail Hair – (place in whirlpak)
- Ectoparasites - (plastic vial containing alcohol)
- Right Side Hair Loss Score: Score \_\_\_\_\_ Core (%) \_\_\_\_\_ Intensity:  Worn  Thin  Bald
- Right Side Photograph  Photograph # from camera \_\_\_\_\_
- Left Side Hair Loss Score: Score \_\_\_\_\_ Core (%) \_\_\_\_\_ Intensity:  Worn  Thin  Bald
- Left Side Photograph  Photograph # from camera \_\_\_\_\_
- Lice Present:  Yes  No  Louse Score Sheet
- Administer Prophylactic Drugs (Vitamin E - 5 ml SQ; MuSe - 1 ml SQ; 3 ml penicillin SQ)

Other Drugs Administered: Name \_\_\_\_\_ Mg \_\_\_\_\_ Time \_\_\_\_\_

**Body Condition Scoring:**

Description of Scores: 1= lowest / 5= highest.

1 = Wings of pelvis are extremely prominent and sharp. Sacral spinous processes are very sharp. There is little muscle in the rump and no fat cover; the rump areas are very concave at palpation.

2 = Wings of pelvis are prominent, but rounded and can be easily felt by palpation with slight finger pressure. Sacral spinous processes are slightly enveloped and not prominent. The rump areas are flat.

3 = Wings of pelvis are prominent, but rounded and can be easily felt by palpation with slight finger pressure. Sacral spinous processes are slightly enveloped and not prominent. The rump areas are flat.

4 = Wings of pelvis are rounded and can be felt by palpation under a thin layer of fat. Sacral spinous processes are enveloped and are felt by palpation only with firm finger pressure. The rump areas are slightly convex.

5 = Wings of pelvis are concealed under a thick layer of fat and cannot be felt by palpation with firm finger pressure. Sacral spinous processes are well enveloped and not felt at palpation. The rump areas are convex.

**Biological Sampling and Specimen Storage:**

(All samples include date, VHF frequency, county, species, test requested, and submitter)

- Serum Thyroid Hormones----- freeze serum in plastic vial
- Serum Chemistry----- freeze serum in plastic vial
- Serology/trace element----- freeze serum in plastic vial
- CBC/Selenium-----Refrigerate whole blood in LTT
- Packed Cell Volume (PCV) -----Refrigerate whole blood in LTT
- Fecal nitrogen-----Freeze 10 fecal pellets in whirlpak
- Fecal Float-----Freeze 10 fecal pellets in whirlpak
- Microhisto diet analysis-----Freeze 10 fecal pellets in whirlpak
- Ectoparasites-----Fix in 70% isopropyl alcohol
- Incisiform tooth-----Freeze in envelope
- Trace Element Screen-----Hair in whirlpak

**Capture and Processing Comments or Notes:** *(Observed injuries or abnormalities, reversal status, etc.)*

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**WIL Submission Form**

Submission Date \_\_\_\_\_ Submitter Name \_\_\_\_\_ Sample # \_\_\_\_\_

Project Name \_\_\_\_\_

Collector Phone Number \_\_\_\_\_

Sample Location \_\_\_\_\_ Lat/Long \_\_\_\_\_

County \_\_\_\_\_ Deer Herd \_\_\_\_\_

WIL Receiver Name \_\_\_\_\_

Comments or Special Instructions \_\_\_\_\_

**SAMPLES SUBMITTED**

Sample	Amt/Number	Test Requested	Diagnostic Lab	Archived (Y/N)

**Appendix IV  
Helicopter Capture Personnel and Assignments**

<b>Project Supervision:</b>	Richard Callas, CDFW
<b>Project Leader:</b>	Robert Schaefer, CDFW
<b>Capture/Veterinary Coordinators:</b>	Dr. Pam Swift, CDFW/WIL Dr. Ben Gonzales, CDFW/WIL
<b>Equipment Coordinator:</b>	Robert Schaefer and WIL
<b>Laboratory Assistant:</b>	WIL
<b>Helicopter Radio Communication:</b>	Project lead will assign personnel at capture site
<b>Automated Flight Following (AFF) Monitor:</b>	Project lead will assign personnel at capture site and/or regional office.

**Helicopter Base Camp Processing Personnel:**

Base Camp Processing Team Leaders will include but are not limited to: Dave Lancaster, Scott Koller, Richard Shinn, Scott Hill, and David Casady.

Base Camp Processing Participants (in addition to those listed above) will include but are not limited to: Pam Swift, Ben Gonzales, Brian Ehler, Mary Sommers, Craig Stowers, Richard Callas, Pete Figura, Brett Furnas, Jennifer Carlson, Scott Koller, Ken Morefield, Scott Koller, Jennifer Carlson, Russ Mohr, and Karen Kovacs.

Additional volunteers from USFS, California Deer Association, Rocky Mountain Elk Foundation, and the public may also participate, and those names will be added at the briefing meeting to the final personnel roster for the capture. No CDFW personnel or volunteers will assist with any in-flight helicopter activities.

**Chemical Immobilization Personnel:**

Robert Schaefer, David Casady, and Richard Callas are experienced free-range darters with certification in "Advanced Chemical Restraint." Other personnel with experience in free-range darting who may assist on this project include David Lancaster, Scott Koller, Scott Hill, Richard Shinn, and Brian Ehler.

## **Appendix V Helicopter Capture Itinerary**

### **Day 1**

All personnel travel from HQ's to lodging in Yreka or Etna. Helicopter to base at Scott Valley Airport, with Montague airport an alternative site. At 1800, Project Leader and veterinarian will meet with Helicopter Contractor for preliminary meeting. At 1900, all participants will attend a project orientation meeting. Tasks for the following day will be assigned at this meeting, and an intensive safety meeting will be held for CDFW and helicopter crew. In this meeting, animal and personnel safety will be reviewed.

### **Days 2-5**

Initiate capture efforts until private land project objectives are achieved (25 females) or operations are terminated due to safety concerns or a determination is made that continued efforts to capture deer are not cost effective. Base camp and fuel truck will be located near capture sites.

### **Day 6**

Preparation and net construction for drive-netting on public lands will be completed. At 1800, a project orientation meeting between all participants and the helicopter contractor will review procedures, assignments, and animal and personnel safety.

### **Days 5-7**

Initiate capture efforts until project objectives are achieved, operations are terminated due to safety concerns, or a determination is made that continued efforts to capture deer are not cost effective. Base camp and fuel truck will be located near capture sites.

## **Chemical Immobilization Itinerary**

The capture of deer using chemical immobilization will occur on an opportunistic basis when suitable conditions and availability of deer are present. Prior to each capture event, personnel darting deer will meet for a safety meeting where protocols, driving routes, sampling procedures, dosages, and safety protocols will be discussed. All immobilization teams will have a binder with emergency protocols and contacts, and Material Safety Data Sheets for all drugs.

## Appendix VI

### Safety of Personnel and Animals.

(taken from Wildlife Investigations Lab, 2010)

#### CHAPTER THREE

#### SAFETY CONSIDERATIONS

#### PERSONAL SAFETY

Before undertaking a capture a safety meeting is suggested. Safety hazards and plans of action can be discussed. Communications are always vital to personal safety. Always wear protective clothing (i.e., coveralls and leather gloves) regardless of the ambient temperature. Shorts and sandals are inappropriate when restraining wildlife. The clothing should suit the situation and can range from overalls and gloves to knee-pads and elastic back supports to prevent lifting injuries.

Remember that you are no match for wild animals when it comes to strength, quickness, or reactions. Don't place yourself in a position of vulnerability where you are relying on the animal *not* to make a move that may cause injury to you. Anticipate that the animal *will* bite down, kick its legs, or grab you with its talons. Know your physical limitations. You should condition yourself before undertaking strenuous exercise. If you plan to work with species of wildlife that may have exposure to rabies, vaccination is recommended. Experience gained from working with various species of wildlife will provide a basis for personal safety.

When you are going to handle wild animals, *always* work with someone, preferably someone with experience. When handling carnivores and hoofstock work should be done from the backside of the animal away from claws and hooves. One should secure the head while the other secures the legs. In addition to providing restraint, the person at the head and neck should ensure that the animal does not injure its head. The person nearest the rear should place his/her left knee behind the animal's leg just above the hock joint. This position will restrain the animal while preventing the handler from being kicked. Avoid straddling the animal as this could inhibit respiratory movements. An eye cover not only protects the animal's eyes from debris, it also has a calming effect that makes the animal easier to handle.

When approaching a drugged animal, be sure it is truly immobilized before handling it. A gentle poke with a snare pole or stick will give an indication of the state of the animal. One person checked the level of immobilization of a penned wolf by nudging the animal's muzzle with his shoe. The wolf bit though his Vibram sole narrowly missing his toes. The snare pole would have been safer.

## MEDICAL CONCERNS

Once the animal has been captured, proper handling, examination, and monitoring is of the utmost importance to ensure a successful outcome to the capture operation. All procedures must be done quickly, quietly, and efficiently. This requires that all necessary equipment and supplies are ready for use prior to the actual capture of the animal(s). A minimal amount of equipment is required to monitor the vital signs, to gather samples (blood collection, fecal collection, etc.), and to treat minor injuries. This equipment should as a minimum include a thermometer, a stethoscope, blood collection tubes, syringes with needles, whirl-pack bags, antibiotics, and suture material.

## VITAL SIGNS

The first procedure performed is a brief examination to determine the status of the animal's "vital signs" (this is referred to as ABC in emergency training courses):

1. *Airway* - check to make sure the animal's airway is clear; this is more important in sedated or anesthetized animals. The tongue may need to be pulled forward in the mouth and off to the side.
2. *Breathing* - look, feel and listen (your ear or hand placed to the nostril can detect the slightest air exchange); watch for the rise and fall of the chest.
3. *Circulation of blood* - see or feel the heartbeat or listen with a stethoscope; take the pulse at the femoral triangle located at the medial thigh in the groin area. The color of mucous membranes is a good indicator of the status of blood circulation (some animals have dark, pigmented membranes which cannot be used as an indicator).  
pink - normal  
blue - indicates oxygen deficiency  
pale pink to white - shock  
ashen gray - severe shock or approaching death

The capillary refill time (CRT) is another indicator of blood circulation status. To evaluate the CRT blanch an area of the animal's gums by pressing with your thumb. Upon release count the number of seconds required for the gums to return to its previous pink color. The normal CRT is less than 2 seconds. CRT greater than 2 seconds indicates a sluggish circulatory system.

## COMFORT OF THE ANIMAL

Once it is ascertained that the animal is in no immediate danger, its comfort can be evaluated and modifications can be made, if necessary. Consider the following factors:

- *Ambient temperature* - protect against temperature extremes; move animal to shade or create shade by using a tarp to prevent heat absorption; cover animal with a blanket to prevent heat loss.
- *Physical restraint* - ensure that the animal is suitably restrained; are ropes or nets cutting into skin or applying pressure to trachea or chest preventing breathing? Is snare pole too tight?
- *Capture surface* - is the ground rocky, wet or hot? Transfer the captured animal to a suitable area for processing, if possible, or place a carpet down to lay animal on.
- *Eye protection* - use eye covers and eye ointment to protect from direct sunlight and trauma.
- *Proper positioning* - for ruminants (i.e., deer, elk, antelope, bighorn sheep) sternal (placed on the brisket) or left lateral recumbency (left side down) will decrease the incidence of bloating. For all sedated animals, extend head and neck and make sure tongue is pulled forward to prevent it from obstructing the throat area.

## PHYSICAL EXAMINATION

After the vital signs and the animal's comfort have been evaluated, a thorough physical examination should be performed. Begin with taking a temperature by inserting a lubricated thermometer into the rectum (leave in for approximately one minute before reading). Be sure the mercury column is below the first numbered graduation of the thermometer before inserting it into the rectum. Then proceed to examine the animal from nose to tail noting any abnormalities:

*Nose* - blood, snotty, or clear discharge visible?

*Eyes* - injuries, lacerations, dirt or debris, unequal pupils, nystagmus (abnormal eye movements)?

*Mouth* - use caution when examining as a sedated animal can still bite. Observe the color of mucous membranes, condition of teeth (age of animal), any excessive salivation (excessive salivation can be controlled by administering atropine; however, atropine dilates pupils, so protect the eyes from sunlight); presence of any injuries or lesions should be noted.

*Ears* - any blood, ticks, mites, dirt? Are Pinnae (earflaps) lacerated?

*Chest* - abnormal chest movements or lac of movement? Gurgling or rattling sounds?

*Abdomen* - distended or bloated? Sternal recumbency or passing a stomach tube down the esophagus aids in relieving the gas pressure.

*Anus* - bleeding observed? Be gentle with the thermometer when inserting into rectum; loose feces indicate diarrhea and dry, hard feces indicate dehydration.

*Skin* - presence of parasites (ticks, fleas, lice, keds), abrasions, sores, and lacerations?

*Wounds* - evaluate severity; administer antibiotics (penicillin), clean wound and apply topical antibiotics; if wound(s) are deep or lacerations are longer than 3 inches, they will need to be cleaned, debrided (cut away any damaged tissue), and sutured.

## **MONITORING**

The body temperature, respiratory rate, and heart rate should be checked approximately every 5 minutes until the animal is released or until the immobilization drug is reversed (if applicable). One person should be assigned the responsibility of monitoring and recording the values to ensure that it is properly done. Prior to the capture operation normal values for the particular animal species to be captured should be memorized. Refer to page 9-14 for normal values found in a variety of domestic and wild species.





## MONITORING SCHEDULE

CHECK-IN INTERVALS (NOT TO EXCEED 30 MINUTES): 30 minutes  
***A written record of flight monitoring shall be maintained (Appendix 8 and 9).***

If a scheduled check-in is missed, wait 30 minutes. During this time period, the flight monitor shall attempt to determine location of aircraft via AFF procedures detailed below. If it is determined through AFF that the aircraft is not moving, immediately begin notification of prioritized emergency contacts listed below. If it is determined the aircraft is still moving, continue to attempt radio contact during this 30-minute interval. If AFF is not available on-site and no radio contact is established within 30 minutes, emergency notification procedures shall be implemented, and the prioritized list of emergency contacts will be notified. Provide CDFW Dispatch SURCOM with the time and position of the last check-in so they can attempt to reach the helicopter by radio.

If no communication is received from the helicopter within one hour, the Project Leader or Flight Monitor will initiate search and rescue operations by notifying appropriate personnel (See Appendix IV).

The Project Leader or Flight Monitor will assist search and rescue personnel as directed by the Search and Rescue Commander, the local County Sheriff.

The Project Leader or Flight Monitor will remain on site until relieved of duties by CDFW Search and Rescue Coordinator or other appropriate personnel.

The Project Leader or Flight Monitor will secure all equipment before leaving the scene, if required.

### **Automated Flight Following Procedures (AFF)**

To access AFF, follow the instructions below:

Go to: AFF website: AFF.gov or [apps3.trootrack.com/lead001/login.php](https://apps3.trootrack.com/lead001/login.php)

USFS Web Tracker

Click on "Launch Web Tracker 1.3"

Username: [Robert.Schaefer@wildlife.ca.gov](mailto:Robert.Schaefer@wildlife.ca.gov)

Password: Siskiyou

Zoom to NorthWest

In TOOLS, use PAN to move the map to the survey/capture area.

Helicopter number will be made available prior to capture from contractor and can be seen on map.



## Capture Plan Approval Form

**Project Title:** Investigating Factors that Limit Black-tailed Deer Populations in Western Siskiyou County

**Date(s) of Helicopter/Capture Activities:** March 2013 - 2017

**Capture/Project Location:** Siskiyou County

**Funding Source:** Big Game Funds

**Project Supervision:** Richard Callas

**Project Leader:** Robert Schaefer

**Helicopter Contractor:** Unknown at this time

**Pre-Capture Safety Meeting Date and Time:** Before commencement of scheduled capture operations.

**Capture Objectives:** 50 adult female and 50 neonatal black-tailed deer annually for 5 consecutive years.

### Capture Checklist:

- ✓ Prospectus/Proposal
- ✓ Capture Area Maps
- ✓ Capture Itinerary
- ✓ Capture Participants
- ✓ Pre-Capture Notification List
- ✓ Helicopter Air Operations Procedure
- ✓ Department Bulletin 2010-07
- ✓ Helicopter Flight Monitoring Duties
- ✓ Emergency Notification Numbers
- ✓ Personnel On-board Helicopter Form

**Approvals:**

\_\_\_\_\_ Date  
Regional Manager

\_\_\_\_\_ Date  
Chief, Wildlife Branch

\_\_\_\_\_ Date  
Deputy Director, WFD or ECD

**Initiation of Helicopter Capture activities are contingent upon receipt of scanned copy of proof of insurance (as verified by the Office of General Counsel) to the Deputy Director.**

**DD initials certifying proof of Insurance has been verified \_\_\_\_\_**