6.8 Mule Deer Study Plan

6.8.1 Pertinent Issue Questions

The mule deer study addresses Terrestrial Resource Issue Questions:

2. How and where does SMUD's infrastructure and operations affect wildlife movement?
3. How does SMUD's infrastructure and operations affect deer movement?
7(d). What are the relevant and known factors (limiting and beneficial) affecting deer populations in the Project area and how/where are those factors influenced by Project operation and maintenance?
10. What is the extent of wildlife drowning in Gerle Creek Canal or in the ditch below the outlet of the Rubicon-Rockbound Tunnel?
13. What are the impacts on terrestrial resources due to secondary use of project access roads (e.g., OHV use)?
30. Relative to effects on wildlife, what is the use of off-road vehicles by season? By month?

6.8.2 Background

Mule deer inhabit roughly 64 million acres in California and in nearly all habitats. Suitable habitat includes four distinctly different elements: fawning, foraging, cover, and winter range (USDA 2001). The California Department of Fish and Game (CDFG) has delineated distinct deer herds throughout California. The deer in the vicinity of the Project are considered to be part of the Pacific Deer Herd, with the exception of those deer in the westernmost portion of the Project. The Pacific Deer Herd Management Plan (Hinz 1981) defines long-standing, albeit in some cases outdated, management goals and objectives for this herd.

The Pacific deer herd encompasses all of the Pacific Ranger District of the Eldorado National Forest (ENF), and portions of the herd extend into the Georgetown and Placerville Ranger Districts. The herd occupies approximately 353 square miles of public and private lands within El Dorado County and that portion of Placer County south of the Rubicon River. The majority of deer in the herd are migratory and occur west of the Sierra Nevada crest. The herd is defined by the Rubicon River on the north, the South Fork American River (SFAR) on the south, and roughly a north-south line above 2,500 feet elevation, paralleling Highway 49 between Placerville and Georgetown.

Based on the deer herd plan, approximately 72 percent of the summer range for this herd was within the ENF in 1981, with the remainder on privately-owned lands. Intermediate range ownership in 1981 was split about equally between the ENF and private interests. About 64 percent of the winter range was on ENF land in 1981.

The winter range lies mainly on south facing slopes between 2,000 and 4,500 feet elevation. Intermediate range generally extends from 4,000 to about 6,000 feet elevation, and is used primarily during spring and fall migration. Most of this intermediate range consists of east-west parallel ridges used as migration routes, especially Peavine, Poho, and Telephone ridges. The summer range lies mainly above 5,000 feet.

The mule deer in the central Sierra Nevada typically reside on their summer ranges until they are stimulated to move downslope to their wintering areas (Loft et al. 1989). Habitat quality and quantity, temperature, day length and weather conditions all play a part in determining when these deer initiate and complete their fall migrations. Generally, from mid-October, or later, any significant winter storm has the potential to cause some migratory deer to move from summer range to lower elevations. If those storms are mild, some deer may delay in intermediate habitat, seeking acorns, leaf mast and other available fall forage. If severe enough, a single storm may result in the migration of a large percentage of the animals from the higher elevations downslope to winter range habitat. In contrast, spring migration usually occurs as a gradual upward drift that may span two months as deer delay in holding areas where cover and forage are abundant (Loft et al. 1989).

A variety of factors have resulted in long-term declines in the Pacific deer herd, including: 1) direct loss of habitat by construction of home sites, reservoirs, roads, etc.; 2) grazing by livestock (Loft et al. 1991); 3) extensive logging; 4) fire suppression; 5) recreation; 6) both legal and illegal kill; 7) predation (especially by mountain lions); and 8) diseases and parasites (USDA 2001). Direct loss of habitat through home construction and urban expansion has had the greatest effect on winter range. At high elevations, construction of Union Valley, Wrights Lake (non-Project),

Loon Lake, Ice House, and Gerle Creek reservoirs was estimated to have eliminated 8.1 square miles of fawning habitat (Hinz 1981). However, this acreage may over-estimate the amount and quality of meadow fawning habitat that existed in areas now inundated by these reservoirs. Aerial photos held by the ENF that depict the pre-inundation condition at Project reservoirs do not appear to support the meadow acreage estimates provided in the Pacific deer herd plan, based solely on a simple visual inspection, but no quantitative information is available.

Open-water conveyances, such as the 9,987-foot Gerle Canal, have the potential to adversely affect deer through entrapment and drowning depending on design and location, relative to deer movements. However, Gerle Canal has limited potential to entrap deer because it has three bridge crossings, low-velocity areas, and mostly unlined, gently-sloped sides (FERC 1998). Similarly, above ground penstocks (steel pipe) also have the potential to adversely affect deer, depending on the design and location of the conduit, by altering deer movement patterns. The Project has approximately 3 miles of aboveground penstock as follows: 1) Robbs Peak Powerhouse Penstock - 2,235 feet; 2) Jones Fork Powerhouse Penstock - 8,190 feet; 3) Jaybird Powerhouse Penstock - 2,620 feet; 4) Camino Powerhouse Penstock - 1,110 feet; and 5) White Rock Penstock - 1,675 feet. Of these, the Jones Fork Penstock was identified prior to its construction as a potential impediment to deer migration (Ecological Analysts, Inc. 1980). As a result, the penstock was constructed on pedestals to allow for animals to cross beneath the pipe (FERC 1998). On other Project penstocks, SMUD has excavated soil beneath the pipe at various locations to allow for opportunistic passage of deer and other wildlife (pers. comm, Lonn Maier, SMUD, April 2001).

Based on information provided by the ENF, the location of delineated critical winter, summer, and intermediate range, as well as critical fawning habitat and holding areas was presented in the UARP Initial Information Package (SMUD 2001; Figure E5-6 in Appendix to Exhibit E, Section 5). Designated critical fawning habitat, holding areas, and critical summer range occur on the north side of Loon Lake Reservoir, and to the north and east of Union Valley and Ice House reservoirs. Critical winter range occurs along the north side of the SFAR from just above White Hall to the western boundary of the ENF.

6.8.3 Study Objectives

The objectives of this study are as follows: 1) determine the spatial relationship between Project features and designated critical fawning habitat, holding areas, critical summer range, critical winter range, and primary migration corridors; 2) determine the extent and significance of deer fatalities due to drowning in the Gerle Creek Canal and the ditch below the outlet of the Rubicon-Rockbound Tunnel; 3) determine the availability of suitable crossing points for deer along Project penstocks that bisect a primary movement corridor; and 4) determine the extent and timing of deer road kills along the following primary access roads to Project facilities that receive heavy traffic: Ice House Road from Highway 50 to Loon Lake Reservoir and the access road from Ice House Road to Ice House Reservoir.

6.8.4 Study Area and Sampling Sites

The study areas for each objective are as follows:

- Objective No. 1: Areas within 0.5-mile of all Project features and facilities
- Objective No. 2: Gerle Creek Canal and the ditch below the outlet of the Rubicon-Rockbound Tunnel
- Objective No. 3: Project penstocks - Robbs Peak, Jones For, Union Valley, Jaybird, Camino, White Rock
- Objective No. 4: Ice House Road from the intersection with Peavine Ridge Road to Loon Lake Reservoir; Wentworth Springs Road from Ice House Road to Gerle Creek Reservoir; Access road to Ice House Reservoir from Ice House Road to Strawberry Point Campground.

Field studies will be restricted to those lands where the Licensee has legal access (e.g., ownership/easement rights, public lands) and will not occur on private lands without prior permission from the landowner.

It is understood that additional study areas (e.g. the developed and dispersed recreation areas being identified by the Recreation TWG and the Project roads being identified through the Project Sources of Sediment Study in coordination with the Recreation and Aquatic TWGs) will be added to this study area where appropriate.

6.8.5 Information Needed From Other Studies

Information on the distribution of mule deer habitat will be derived in-part from the Vegetation Mapping Study. Important information on deer movement patterns and the location of critical habitat use areas will also be obtained from existing ENF and CDFG data. Information on deer drowning mortality in open water conveyances will be obtained from the Licensee's records. Information on deer road kills will be derived in-part from SMUD and ENF personnel who drive these roads on a regular basis.

6.8.6 Study Methods and Schedule

This study consists of four separate methodologies:

Habitat Mapping: A map will be prepared at a scale of 1:24000 (or at a scale determined by the Terrestrial Resources Technical Working Group (TWG) following initial data analysis) that shows the location of designated critical fawning habitat, holding areas, critical summer range, critical winter range, and primary migration corridors within 0.5-mile of Project features and facilities. The location of critical deer habitats and migration corridors will be obtained from existing CDFG and ENF records, and consultation with biologists with knowledge of the Pacific Deer Herd. This information will be plotted and overlaid with available recreation use information to determine if certain activity is affecting deer populations.

Canal Drowning: The extent of deer fatalities due to drowning in the Gerle Creek Canal and the ditch below the outlet of the Rubicon-Rockbound Tunnel will be determined from the Licensee's records of carcass removal from these features. In addition, a survey will be made of the length of these facilities to record: 1) existing crossing locations suitable for deer; 2) intersection of major deer trails with the canal; 3) location of escape points along the canal; and 4) topographic features that may contribute to deer entrapment. Operation patterns (e.g., flow) that may influence deer drowning potential will be determined from the Licensee's records. Crossing and potential escape points will be recorded using Global Positioning System (GPS) instrumentation and/or mapped on aerial photos or Project base maps.

Penstock Crossing: The availability of suitable crossing points for deer along Project penstocks will be determine from visual inspection of the selected penstocks along their entire length. Deer are reported to crawl under fences with as little as 16 inches of clearance (Yoakum et al. 1980). This study assumes that penstocks with 24 inches of clearance are adequate to allow crossing by mule deer and not impede migration or daily movements. Therefore, penstock locations with less than 24 inch clearance will be recorded using GPS and/or mapped on aerial photos or base maps.

Road Kills: Wildlife road kills are influenced by vehicle traffic volume, vehicle speed, weather, season, location of feeding areas, roadside habitat, road design, topography, and other factors (Downing 1980). Traffic associated with the Project and related recreation may contribute to road kill levels, and such traffic is assumed to be greatest on the roads described under Study Area (survey roads). The extent and timing of these kills will be determined using two methods: 1) SMUD workers, ENF staff, and road maintenance crews who regularly drive the survey roads will be interviewed to obtain qualitative, anecdotal information on the prevalence of road kills. A survey card will be prepared and distributed to USFS, CDFG and SMUD staff who may access the Project roads on a frequent basis. This card will be used by the staff who will record field mortality and provide the information to USFS. Information will be solicited on species, sex, age, and location of road kills. These individuals will be requested to submit all road kill observations over a 12-month study period. 2) Biologist(s) will conduct a focused survey of road kills once per week (usually on a Monday) from September to mid-November or until two weeks following the first major storm system. In general, these surveys would occur on Saturday and Monday mornings (or Tuesday following a Monday Holiday) based on the assumption that traffic is heaviest on weekends. In addition to deer, all other road-killed species will be recorded along with location, sex, and age where identifiable. Biologists will also record incidental observations of deer along these roads .

As information is gathered from this effort, a determination may be made by the Terrestrial Technical Working Group that additional study may be needed, which will be completed in the following year.

6.8.7 Analysis

Analysis will be conducted for each of the study components as follows:

Habitat Mapping: Maps of Project features relative to deer habitat will be reviewed to determine if substantial impacts to deer and sensitive habitats may be occurring as a result of ongoing Project operation and maintenance, proposed Project Improvements, or recreational developments associated with the Project. If substantial impacts are discovered, these maps will help in developing strategies for minimizing these impacts.

Canal Drowning: The extent of deer fatalities due to drowning in the Gerle Creek Canal and the ditch below the outlet of the Rubicon-Rockbound Tunnel will be analyzed to determine the significance of this loss relative to deer population estimates for the area as derived from CDFG. In addition, survey results will be reviewed to determine the need and potential for installing additional crossings and/or escape facilities along the length of the conveyance.

Penstock Crossing: The extent and distribution of penstock locations with adequate clearance to allow passage by deer will be evaluated to determine the need and potential for increasing the amount of crossings available for deer.

Road Kills: The extent, timing, and location of road kills will be evaluated with respect to deer population estimates for the area to determine the significance of this mortality. In addition, survey results will be reviewed to determine the need and potential for modifications (e.g., traffic pattern changes, habitat modification, etc.) that could reduce the risk to deer and other wildlife.

6.8.8 Study Output

Study results will be presented to the Terrestrial Resources TWG and Plenary Group toward the end of 2002. However, the ultimate study output will be a written report that includes the issues addressed, objectives, study area, methods, analysis, results, discussion, and conclusions. The reports will be prepared in a format that allows the information to be inserted directly into the Licensee-prepared Draft Environmental Assessment that will be submitted to FERC with the Licensee's application for a new license.

6.8.9 Preliminary Estimated Study Cost

SMUD's consultant estimates that this study will cost $34,000 ± 20 percent.

6.8.10 TWG and Plenary Group Endorsement

Terrestrial TWG representatives from the following agencies/organizations approved this study plan on December 21, 2001: California Department of Fish and Game, Eldorado National Forest, California Sport Fishing Alliance, and SMUD. The Plenary Group approved this study plan on February 6, 2002. The participants at the meeting who said they could "live with" the study plan were California Department of Fish and Game, California Native Plant Society, California Outdoors, California Sportsfishing Protection Alliance, El Dorado County, El Dorado County Citizens for Water, Friends of El Dorado County, National Parks Service, Placer County Water Agency, Sacramento Municipal Utility District, State Water Resources Control Board, Taxpayers or El Dorado County, U.S Bureau of Land Management and Eldorado National Forest. None of the participants at the meeting said they could not "live with" the study plan though PG&E abstained since this study plan does not apply to the Chili Bar Project.

6.8.11 Literature Cited

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