

Bear-Human Interaction Monitoring Plan

Sacramento Municipal Utility District

Hydro License Implementation • May 2015

Upper American River Project

FERC Project No. 2101



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1.0 Background and Introduction

This bear management monitoring plan was prepared according to the terms and conditions found in the Order Issuing New License for SMUD's Upper American River Project (UARP) issued by the Federal Energy Regulatory Commission (FERC) (FERC 2014). The FERC License-related conditions which are applicable to this monitoring plan are included at the end of this plan.

The UARP lies within El Dorado and Sacramento counties, primarily within lands of the Eldorado National Forest (USFS). The UARP consists of three major storage reservoirs—Loon Lake, Union Valley, and Ice House (with a combined capacity of 379,622 acre-feet), eight smaller regulating or diversion reservoirs, and eight powerhouses. The UARP began operations in 1961 and has a generating capacity of approximately 688 megawatts. The UARP also includes recreation facilities containing over 700 campsites, five boat ramps, and hiking and bicycling trails at the reservoirs.

California's black bear (*Ursus americanus*) population has increased over the past 25 years. In 1982, the statewide bear population was estimated to be between 10,000 and 15,000. Presently, the statewide black bear population is conservatively estimated to be between 25,000 and 30,000. Biologists recognize three regional "subpopulations" of black bears in California: California-North Coast/Cascade, Sierra Nevada, and Central Western/Southwestern (CDFW 2015). The Project Area lies within the range of the Sierra Nevada subpopulation. Forty percent of the statewide black bear population resides in the Sierra Nevada Mountains (CDFW 2015). Black bears are widespread and found throughout the Sierra Nevada region, from foothill habitats to alpine zones. They generally occur in fairly dense, mature stands of many forest types, valley foothill riparian, and wet meadow. Black bears are omnivorous, feeding largely on grasses and forbs, fruits, nuts, insects, and carrion. They require large trees and suitable den sites in tree and snag hollows, stumps, logs, caves, or holes in the ground. These habitat elements must be in mature, dense vegetation, and on sheltered slopes for suitable denning. Most young are born in winter dens from late January to early February.

Conflicts between humans and black bears in high-density recreation areas are a source of concern for recreation and natural resource managers (Claar et al. 1999). Black bears are attracted to and consume human food waste and hazardous human/bear encounters are increasing in many campgrounds and mountain residential areas, including within the UARP area. Measures to reduce such encounters implemented in high-use areas like Yosemite National Park include installation of larger, bear-proof food storage boxes, increased USFS enforcement of food storage rules, increased frequency of garbage pick-up, and better environmental education for the

public (Thompson and McCurdy 1995). The USFS uses similar measures at recreation sites they manage within the UARP area.

Several recreational studies conducted during the UARP relicensing process suggested a recent increase in bear encounters at UARP-related recreation facilities in the Project Recreation Area (DTA-LBG 2004c, DTA-LBG 2005f). Further, visitors expressed concern over the number of encounters and property damage associated with bears in the vicinity of the campgrounds. Following these episodes, several management measures were enacted by the USFS, including:

- installation of bear-proof food lockers and trash containers at problem campgrounds,
- educational postings at facilities and information stations.

The monitoring described by this plan will be used to determine if the measures above have been successful in decreasing the number of bear incidents in the UARP. Additionally, the monitoring will help inform resource managers where there are still problems that may need to be addressed with additional bear management measures.

SMUD has an additional requirement under the new FERC license to prepare a plan to install bear-proof food storage and trash receptacles at all facilities described in Condition 45 - Specific Recreation Measures (Attachment 2), of the USFS's Section 4(e) conditions, found in Appendix B of the UARP FERC License. The condition provides SMUD with 2 years to prepare the plan to install bear lockers and requires SMUD to prepare a schedule for installing the bear-proof food lockers and trash containers within 5 years of approval of that plan. Information from the monitoring effort described in the Bear-Human Interaction Monitoring Plan may provide SMUD with data to schedule and prioritize installation of bear-proof food lockers and trash containers. Table 1 lists the Project-related recreation facilities that will require this equipment and an inventory of equipment at those facilities from 2012. SMUD will work with the USFS to complete the information gaps in Table 1, including surveying these sites in the first year of monitoring to collect the necessary information.

2.0 Monitoring Plan Objectives

The primary objectives and rationale for the bear management monitoring program, as described in Condition No. 31 – Monitoring Program of the USFS' 4(e) conditions, are:

Monitor effectiveness of measures related to bear management using a method acceptable to FS, FWS, and CDFG.

This monitoring will help determine if bear management measures used to keep bear populations away from recreation sites within the UARP are effective. As described in Settlement Agreement Article 1-6.10;

If, over a 5-year period, monitoring indicates that the number of bear/human interaction incidents does not decline or decrease in severity, the licensee shall work with FS, FWS, and CDFG to identify and implement additional measures necessary to reduce such problems.

3.0 Study Area and Sampling Locations

Monitoring will take place at the developed, UARP-related recreation facilities within the Project area (Figure 1 and Table 1). This includes both day-use and overnight facilities.

*Table 1. USFS Recreation Facilities Requiring Bear Proof Trash and Food Storage					
Facility	Existing Lockers	Existing Signage	Existing Bear-proof Trash	Lockers Required by SA	Comment
Campgrounds					
Northshore RV CG	N	?	?	Y	No lockers existing, 15 units
Loon Lake (New Campground)	NA	?	?	?	
Loon Lake Family CG	Y	?	?	SA requires reset lockers if needed	62 lockers, 53 units including 1 double unit.
Loon Lake Boat Launch RV Camping	N	?	?	Y	No lockers, 12 overnight units
Loon Equestrian CG	Y	?	?		8 lockers, 9 units
Loon Group CG	Y	?	?		6 lockers, 6 units
Loon Equestrian Group CG	Y	?	?		4 lockers, 5 units
Red Fir CG	N	?	?	Y	No lockers existing, 6 car maximum 25 people.
Pleasant Boat In CG	N	?	?	Y	No lockers existing, 10 units
Airport Flat CG	Y	?	?		14 lockers, 16 units
Gerle Creek CG	Y	?	?		52 lockers, 50 units including 2 double
Sunset Family CG	N	?	?	Y	36 lockers, 131 units, including 8 doubles
Sunset Group, new campground	NA	?	?	Y	
Fashoda CG	Y	?	?	Y	30 lockers, 30 units
West Point CG	N	?	?	Y	
West Point Group, new CG	NA	?	?	Y	
Yellowjacket CG	N	?	?	Y	No lockers, 40 units



Wench Family CG	N	?	?	Y	No lockers, 100 units
Wench Group CG	N	?	?	Y	No lockers, 100 PAOT, about 6 people per locker.
Wolf Creek Family CG	Y	?	?	Y	46 lockers, 42 units including 4 double units
Wolf Creek Group CG	Y	?	?	Y	6 lockers, 100 PAOT.
Azalea Cove CG	N	?	?	No lockers Required.	No lockers,
Big Silver Group CG	N	?	?	Y	No lockers, 100 PAOT with 10 units
Camino Cove CG	N	?	?	Y	No lockers,
Jones Fork CG	Y	?	?	?	10 lockers, 10 units
Lone Rock CG	Y	?	?	?	5 lockers,
Ice House Family CG	N	?	?	Y	No lockers, 83 units including 6 doubles
Northwind CG	N	?	?	Y	No lockers, 9 units including 1 double
Strawberry Point CG	N	?	?	Y	No lockers, 10 units
Day-Use Areas					
Angel Creek	N	?	?	Y	
Gerle Creek	N	?	?	Y	
Ice House	N	?	?	Y	
Fashoda	N	?	?	Y	
Upper Silver Creek	N	?	?	Y	
Highland Point	N	?	?	Y	
Trailheads					
Jones Fork	N/A	?	?	?	
Big Silver	N/A	?	?	?	
Wench Creek	N/A	?	?	?	
Loon Lake	N/A	?	?	?	

*As new facilities are developed, SMUD will incorporate them into the monitoring plan.

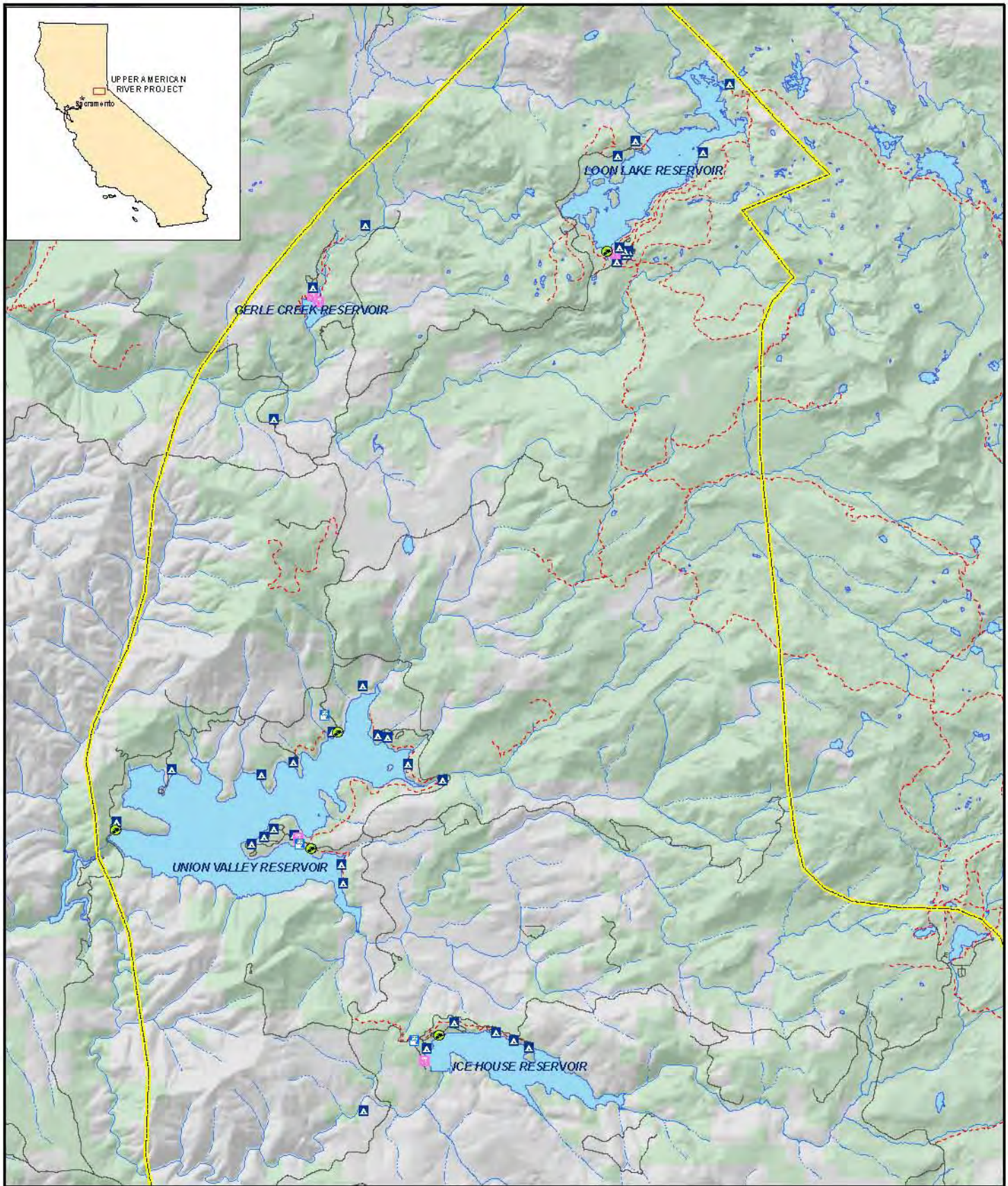


Figure 1. Bear-Human Interaction
Crystal Basin Study Area
Upper American River Project



Map Features

- Primary Roads
- - - USFS ENF Trails
- National Forest
- Other
- ▲ Developed Campground
- Day Use Area
- ⊙ Boat Ramp
- Sanitation Station



4.0 Methods

Given that the objective of this study is to monitor the effectiveness of measures implemented subsequent to the relicensing studies and any forthcoming measures, data will be collected using a post-incident methodology. Recreationists and others will be encouraged to report all bear/human interactions. To standardize the data, a Bear Encounter Form (Form) and data collection process has been prepared using an approach similar to one developed for Denali National Park and Preserve. Much of the following methodology was adapted from their Bear-Human Conflict Management Plan (NPS 2003). Attachment 1 contains the Form to be used for the CBRA monitoring.

By using educational postings at the various facilities and through verbal information provided by camp hosts, all visitors will be encouraged to report any bear incidents. Educational postings will include the California Department of Fish and Wildlife's (CDFW) "Keep Me Wild" campaign. Brochures and posters will be provided to SMUD by CDFW. SMUD will make Forms available at sites or information will be provided to direct visitors to a location where Forms can be found. SMUD will investigate the use of an online form tied to a QR code that could be read with a smart phone.

Educational signage will be posted at each campground listed in Table 1 and other facilities approved by USFS in consultation with SMUD, United States Fish and Wildlife Service (USFWS), and CDFW (Agencies). At selected locations approved by USFS in consultation with SMUD and the Agencies, Forms may be provided in a box attached to the information sign at the site. The boxes will include a separate locked compartment for visitors to deposit completed Forms for later collection by SMUD. SMUD will collect Forms from these sites periodically. At other sites, the visitors will be directed to the location of a Form. Prior to the first year of monitoring SMUD will survey the facilities in Table 1 and determine needs for signage and boxes for Forms.

Recreationists will be encouraged to complete Forms for the following bear encounters:

- Property damage, injury, food or garbage incidents, including a bear unsuccessfully trying to get into a garbage can, vehicle, tent or other property.
- Observations of bears seen within 0.4 km (1/4 mile) of developed areas (campgrounds, day-use areas, trailheads, visitor centers, boat ramps, reservoir shorelines and building complexes).
- Other bear-human interactions (i.e. on hiking trails, angling, etc.).

The Form will specify that a separate form should be completed for each separate interaction. For example, if a bear damages tents in two campground sites in one night,

two separate Forms should be completed. Collecting complete information in conjunction with the Form should provide the critical initial information required for determining what management responses might be necessary. This information will also help prioritize facilities for the installation of bear resistant food and trash receptacles as required by Settlement Agreement Article 1-19.

SMUD staff will coordinate annually with USFS staff in implementing the monitoring program. All completed Forms shall be collected following the end of the recreation season by SMUD staff or contractors for summarization and in preparation for generating the annual report. All data will be stored in a GIS spatial database designed for this purpose. If SMUD has questions related to the information on the Forms and logs, SMUD will make an effort to contact the visitor or camp host for clarification.

5.0 Reporting

Study output will include an annual written report covering the monitoring effort. The report will include at a minimum, the frequency, timing, and general locations of bear incidents during the calendar year and the activities occurring with respect to the people involved in the incidents. Further discussion will include whether any injuries or property damage were suffered and any subsequent management actions taken by the USFS or other agencies. Since a considerable amount of time has passed since the Settlement Agreement was completed and the USFS has implemented some bear management measures, the first year's annual report will include a summary of actions taken by the USFS and whether they have observed any effect on bear-human interactions since the measures have been implemented.

SMUD will submit a draft annual monitoring report to the Agencies at the conclusion of each calendar year, covering the results of monitoring throughout that year. SMUD will submit the draft report to the Agencies on or before March 1 of the subsequent year. SMUD will then convene the Annual Review of Ecological Conditions Meeting by April 1 of each year to discuss the draft report, after which SMUD will allow the Agencies at least 30 days to review and comment on the draft report. SMUD will also invite all members of the Consultation Group to attend the annual meeting, per the Settlement Agreement (SMUD et al. 2007).

The final annual report will be filed with FERC by June 30 of the year following monitoring. SMUD will include in the final report any comments and recommendations made by the agencies on the draft report.

Following the installation of all license-required bear-proof receptacles, if monitoring of bear/human interaction incidents indicates an increase in incidents or severity, SMUD will consult with the Agencies to identify and implement additional measures to reduce interactions. Any additional measures shall be approved by USFS. Conversely, if monitoring of bear/human interaction incidents indicates a decline or decrease in severity, SMUD may request that monitoring efforts be reduced or eliminated. Any reduction in monitoring frequency shall be approved by the Agencies.

6.0 Plan Revisions

If SMUD, USFS, CDFW, or SWRCB collaboratively determine that revisions should be made to the plan, SMUD will make any revisions to the Plan in coordination and consultation with the listed resource agencies. Any revisions to the plan must be approved by USFS, CDFW, and SWRCB. Any revisions shall be filed with FERC for approval prior to implementing.

7.0 Literature Cited

- CDFW (California Department of Fish and Wildlife). 2015. Black Bear Population Information. <http://www.dfg.ca.gov/wildlife/hunting/bear/population.html>.
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- National Park Service (NPS). 2003. Denali National Park and Preserve, Bear-Human Conflict Management Plan. The Wildlife Team, Denali National Park and Preserve Center for Resources, Science, and Learning. June 2003.130pp.
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- Thompson, S., and K. McCurdy. 1995. Black bear management in Yosemite National Park: more a people management problem. Pages 105-115 in Proceedings of the 5th Western Black Bear Workshop. February 22-25, 1995, Provo, UT. J.Auger and H. Black, eds.

Attachments**Attachment 1. Condition 31 – Bear Management****Terrestrial Wildlife Monitoring****Bear Management**

Within 6 months of license issuance, the licensee shall develop a bear management monitoring plan in consultation with FS, *CDFG*, *FWS*. The licensee shall provide FS, *CDFG*, *FWS* a 90-day review and approval period for the monitoring plan prior to implementation. The licensee shall implement the plan upon approval.

Method: Monitor effectiveness of measures related to bear management using a method acceptable to FS, *FWS*, and *CDFG*.

Frequency: Annually.

Rationale: The alternative includes several measures related to managing bear populations to keep them away from recreation sites. This monitoring will determine whether additional or different measures need to be implemented.

Attachment 2. Condition 45 – Specific Recreation Measures (discusses the plan for bear-proof equipment)

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With regard to the bear-proof food storage and trash receptacle facilities described in this section, within 2 years of license issuance, the licensee shall develop a plan to install bear-proof food storage lockers and bear-proof trash receptacles at all recreation facilities identified as lacking such equipment. The plan shall include a schedule for installing the bear-proof equipment within 5 years of plan approval by the FS *and* CDFG. The licensee shall implement the plan according to the schedule.

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Attachment 3.

Bear Encounter Form

19. WHERE DID YOU LEARN TO BEHAVE IN BEAR HABITAT?

- A. Park interpretive program
- B. Backcountry video
- C. Park ranger
- D. Park newspaper
- E. Posted warnings
- F. Previous knowledge
- G. Books
- H. No information received

20. DESCRIPTION OF BEAR-HUMAN INTERACTION:

(Please describe what happened)

21. REPORT COLLECTED BY: _____

22. DATE: _____

Please drop off at Crystal Basin Information Station (12 miles north of Highway 50 on Ice House Road) or mail to:

SMUD License Implementation
P.O. Box 1500
Pollock Pines, CA 95726

BEAR ENCOUNTER FORM

BEAR MANAGEMENT MONITORING

1. PERSON(S) INVOLVED: Name: _____



Address: _____

City: _____ State: _____

Zip Code: _____ Phone: _____

Country: _____

2. GROUP TYPE:

- A. Visitor
- B. Concession Employee
- C. USFS Employee
- D. Contractor
- E. Other _____

3. VISITOR ACTIVITY:

- A. Camping – Developed campground
- B. Camping – Dispersed site
- C. Day Use Area
- D. Hiking on maintained trail
- E. Other _____

4. GROUP SIZE: _____

(number of people that encountered the bear)

5. TIME OF ENCOUNTER: Month: _____ Day: _____ Year: _____ Time: _____ am/pm

6. LOCATION OF ENCOUNTER: *(Describe exact location (sec 20), map if possible.)*

- a. Pleasant Campground
- b. Loon Lake Campground/Boat Ramp
- c. Loon Lake Chalet
- d. Northshore RV Campground
- e. Red Fir Group Campground
- f. Gerle Creek Campground Complex
- g. Angel Creek Day Use Area
- h. Airport Flat Camp ground
- i. Sunset Campground/Boat Launch
- j. Fashoda Campground
- k. Jones Fork Campground
- l. Big Silver Group Campground
- m. Union Valley Bike Trail
- n. Yellowjacket Campground/Boat Launch
- o. Wolf Creek Campground
- p. Wolf Creek Group Campground
- q. West Point Campground/Boat Launch
- r. Wench Creek Campground
- s. Wench Creek Group Campground
- t. Azalea Campground
- u. Lone Rock Campground
- v. Junction Reservoir Boat Launch
- w. Ice House Campground/Boat Launch/Day Use
- x. Strawberry Point Campground
- y. Northshore Campground
- z. Other _____

7. DESCRIPTION OF BEAR(S):

- A. Color:**
1. Blond
 2. Light brown
 3. Cinnamon
 4. Dark brown
 5. Black

B. Size:

1. Small
2. Medium
3. Large
4. Unknown

C. Age:

1. Spring cub
2. Yearling
3. Sub-adult
4. Adult
5. Unknown

D. Sex:

1. Male
2. Female
3. Unknown

8. Second Bear

1. Blond
2. Light brown
3. Cinnamon
4. Dark brown
5. Black

1. Small

2. Medium
3. Large
4. Unknown

1. Spring cub

2. Yearling
3. Sub-adult
4. Adult
5. Unknown

1. Male

2. Female
3. Unknown

9. Third Bear

1. Blond
2. Light brown
3. Cinnamon
4. Dark brown
5. Black

1. Small

2. Medium
3. Large
4. Unknown

1. Spring cub

2. Yearling
3. Sub-adult
4. Adult
5. Unknown

1. Male

2. Female
3. Unknown

10. WHAT WAS THE BEAR DOING WHEN YOU FIRST SAW IT

- A. Feeding on human food
- B. Feeding on garbage
- C. Feeding on vegetation
- D. Digging
- E. Standing
- F. Resting
- G. Hunting

- H. Walking towards people
- I. Running towards people
- J. Running away from people
- K. Traveling
- L. Playing
- M. Investigating property
- N. Other _____

11. WHAT WERE YOU DOING BEFORE YOU SAW THE BEAR?

- A. Sleeping
- B. Eating/cooking
- C. Hiking
- D. Running

- E. Sitting
- F. Photographing
- G. Setting up/Breaking camp
- H. Other _____

12. HOW DID THE BEAR REACT TO YOU?

- A. Not aware of people
- B. Stood on hind legs
- C. Growled/woofed/made noise
- D. Walked away
- E. Ran away
- F. Ran towards people
- G. Remained in area ignoring people

- H. Watched people
- I. Walked towards people
- J. Circled around people
- K. Bluff charged
- L. Made contact with person
- M. Investigated equipment/property
- N. Other _____

13. WHAT DID YOU DO THEN?

- A. Walked away/ backed away
- B. Ran away
- C. Remained still/quiet
- D. Continued hiking same direction
- E. Used pepper spray

- F. Made noise (talked, yelled, banged pots)
- G. Threw something at bear
- H. Photographed bear
- I. Abandoned property (pack, tent, gear)
- K. Other _____

14. HOW DID THE BEAR REACT?

- A. Walked away
- B. Ran away
- C. Walked towards people
- D. Ran closer
- E. Remained in area ignoring people
- F. Stood on hind legs

- G. Watched people
- H. Circled around people
- I. Bluff charged
- J. Made contact with person
- K. Investigated property
- L. Other _____

15. HOW CLOSE DID YOU COME TO THE BEAR (ft)? _____

16. WAS HUMAN FOOD PRESENT?

- A. Food not in bear resistant container
- B. Food in bear resistant container
- C. Food odor only
- D. Food hung in tree
- E. No food present
- F. Unknown

17. WAS HUMAN FOOD EATEN BY THE BEAR?

- A. No
- B. Yes (what?) _____
- C. Unknown

18. WAS PROPERTY DAMAGED? A. No B. Yes (list property and estimate costs)