scavenge large mammal carcasses. The bald eagle population declined dramatically in the 1960s due to the effects of pesticides causing egg shell thinning and reproductive failure. This species is federally-listed as Threatened and state-listed as Endangered.

The bald eagle rarely nests in southern California. However, small wintering populations are found scattered throughout the region. Big Bear Lake supports the largest of these wintering populations and may include as many as 30 individuals in peak years. This species is typically observed at Big Bear Lake between November and March.

Survey Methodology

The project site and the surrounding area was observed on four separate occasions in February 2002 for approximately four hours on each occasion. Trees on the property were visually scanned using binoculars and a spotting scope. Observations were conducted from various vantage points on the property, as well as from Windy Point, approximately 1/2 mile west of the property across Grout Bay. All trees utilized by eagles for perching and/or roosting during these surveys were marked with numbered, circular tree tags. Additionally, the San Bernardino National Forest Service was contacted and a review of their historic records of bald eagle use on the north shore of Big Bear Lake was completed.

Survey Results

Bald eagle observations were performed on February 7, 12, 14, and 21, 2002. Bald eagles were observed on the project site on all four occasions. A minimum of nine, seven, three, and four individual bald eagles were seen on the four observation dates, respectively. Bald eagles were observed perching in three, eight, two, and two separate trees on the project site on the respective observation dates. Nine individual trees were used on the project site by bald eagles during surveys. The sizes and descriptions of the trees used for perching are provided in Table 1. Tree locations on the project site are presented in Exhibit 3.

The best and most reliable data for reviewing historical use of the project site by bald eagles was an unpublished report by Devaud and Devaud in 1990 which presented the findings of surveys conducted during the winter of 1989-1990. The Devauds observed, mapped, and photographed bald eagle perch trees along the north shoreline of Big Bear Lake between December 10 and April 6 of that winter. Eighty of the 176 mapped eagle sightings (45 percent) were located on the project site. The most commonly recorded use of a single perch tree was also on the project site with 51 sightings (i.e., tree number 886). This is clearly the most important eagle perch tree on the project site and potentially the most important on the north shore of Big Bear Lake. The next most commonly recorded use of a single perch tree was off the project site near the east end of the lake with 32 sightings.

Recommendations

The project site contains several trees used extensively by this wintering population of bald eagles. Removal of these trees could restrict access to and/or affect the ability of individual eagles to forage in the vicinity of Big Bear Lake. Removal of important perch trees could be considered a significant impact under the federal and state Endangered Species Acts (ESA). It is recommended that the numbered trees presented in Table 1 are avoided during project construction and preserved in place upon project completion. Additionally, all large trees (i.e., greater than 20-inches diameter at four feet from ground) within approximately 200 yards of the

high water line should be considered potential perch trees, avoided during construction, and preserved in place upon project completion, if possible.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager

R:\Projects\RBF\J008 Eagle Survey-041602.wpd

Enclosures: Table 1 and Exhibits 1-3

References

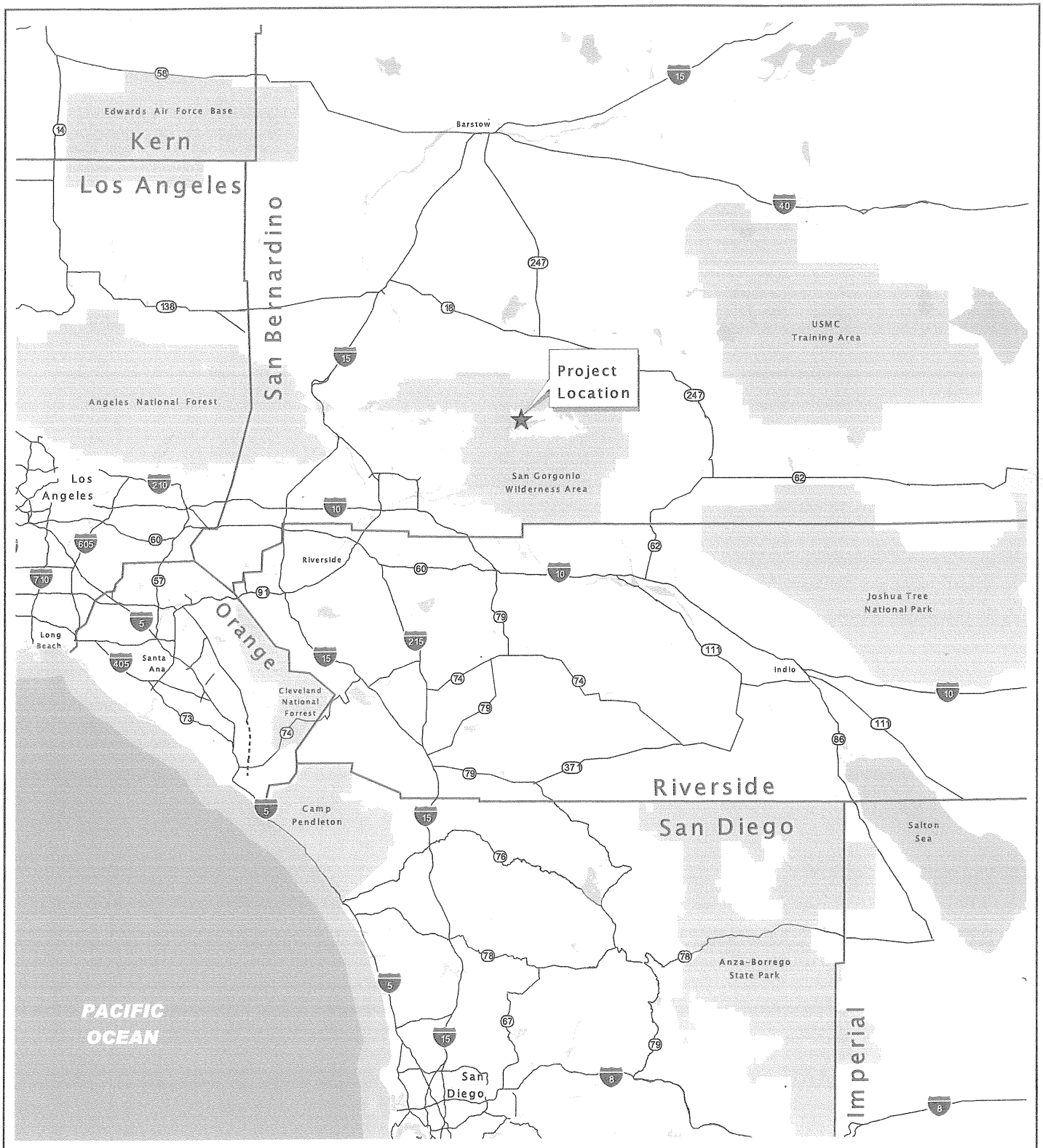
Devaud J. & Devaud S. 1990. *Bald Eagle Habitat Use of the North Shore of Big Bear Lake, San Bernardino County, California.* Unpublished Document in San Bernardino National Forest Service Files.

Environmental Planning Consultants. 1988. *Big Bear Lake Bald Eagle Cumulative Impact Study.* Unpublished Document in San Bernardino National Forest Service Files.

TABLE 1
BALD EAGLE PERCH TREES

Tree Number	DBH* (inches)	Tree Height (feet)	Condition	Eagle Observations
880	26	68	Dead top	2
881	29	77	Top 20% dead	1
882	21	44	Young tree, live top	1
883	42	98	Dead top, lower branches dying	3
884	40	112	Needles thinning on upper 25%	1
885	31	91	Snag	1
886	46	109	Top 15% of tree dead	2
887	32	88	Top 25% of tree dead	2
888	48	105	Healthy, flattened growth	1

* Diameter at Breast Height (four feet from base) in inches



Regional Location

Exhibit 1

Tentative Tract 16136

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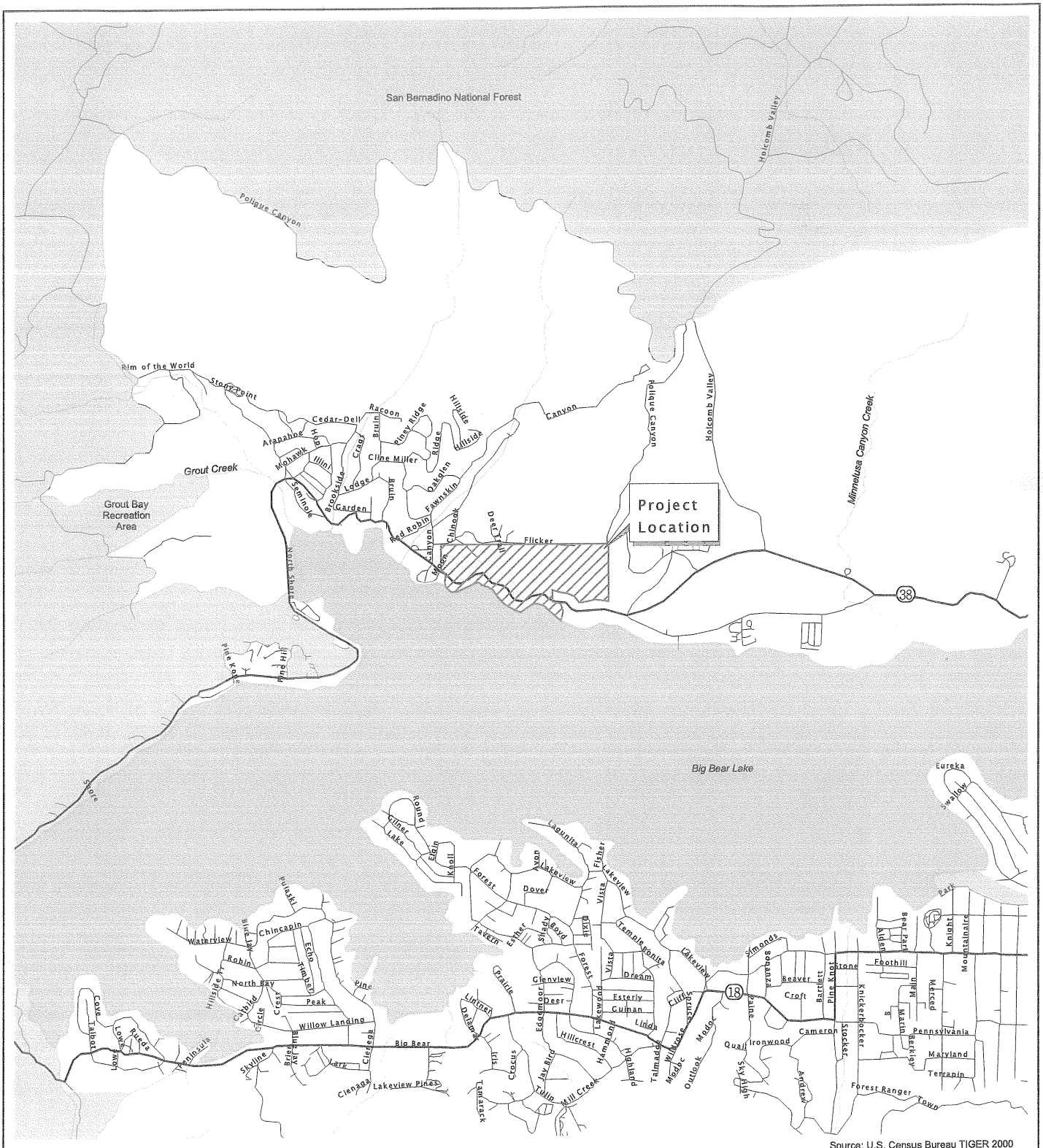

Source: U.S. Census Bureau TIGER 2000

Local Vicinity

Exhibit 2

Tentative Tract 16136

N
W E
S

0.25 0 0.25 0.5 Miles

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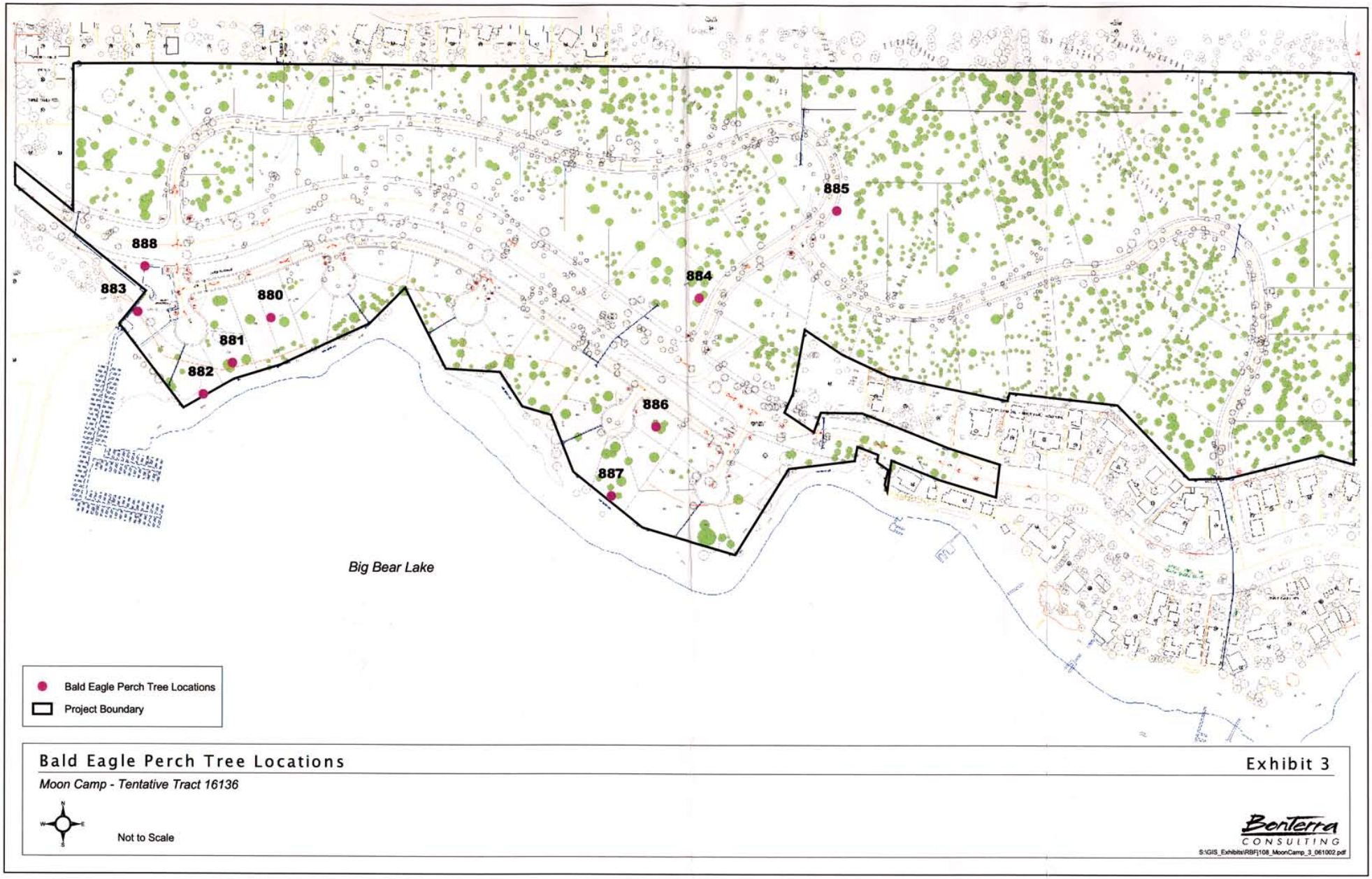

Bald Eagle Perch Tree Locations

Exhibit 3

Moon Camp - Tentative Tract 16136

Not to Scale

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Bald Eagle Perch Tree Locations

Moon Camp - Tentative Tract 16136

Not to Scale
Source: Lilburn Corporation

Exhibit 3

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An Environmental Planning/Resource Management Corporation

August 23, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92718

Subject: Results of Southwestern Willow Flycatcher Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of focused surveys to evaluate the presence or absence of the southwestern willow flycatcher (Empidonax traillii extimus) performed on Moon Camp – Tentative Tract 16136 (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by the U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E, and includes portions of Sections 7 and 12. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The proposed project involves the subdivision of the project site into developable parcels. The purpose of the survey was to determine presence or absence of the southwestern willow flycatcher on the project site in order to assess impacts associated with its development. Surveys were conducted according to guidelines established by the U.S. Fish and Wildlife Service (USFWS) and by biologists with the necessary federal Endangered Species Act (ESA) survey permits.

SPECIES BACKGROUND

The southwestern willow flycatcher (SWF) was formerly a more common and widespread summer resident of southern California's lowland riparian woodlands (Grinnell and Miller 1944, Garrett and Dunn 1981). The substantial population decline of this avian species over the latter half of the 20th century is attributable to the loss and degradation of riparian habitats and, perhaps more importantly, brood parasitism by the brown-headed cowbird (*Molothrus ater*). As a result, all willow flycatchers breeding in California, which includes the subspecies *E. t. brewsteri* and *E. t. adastus*, in addition to SWF, were listed by the California Department of Fish and Game (CDFG) as Endangered on January 3, 1991. The USFWS listed the SWF as Endangered on February 27, 1995 (USFWS 1995).

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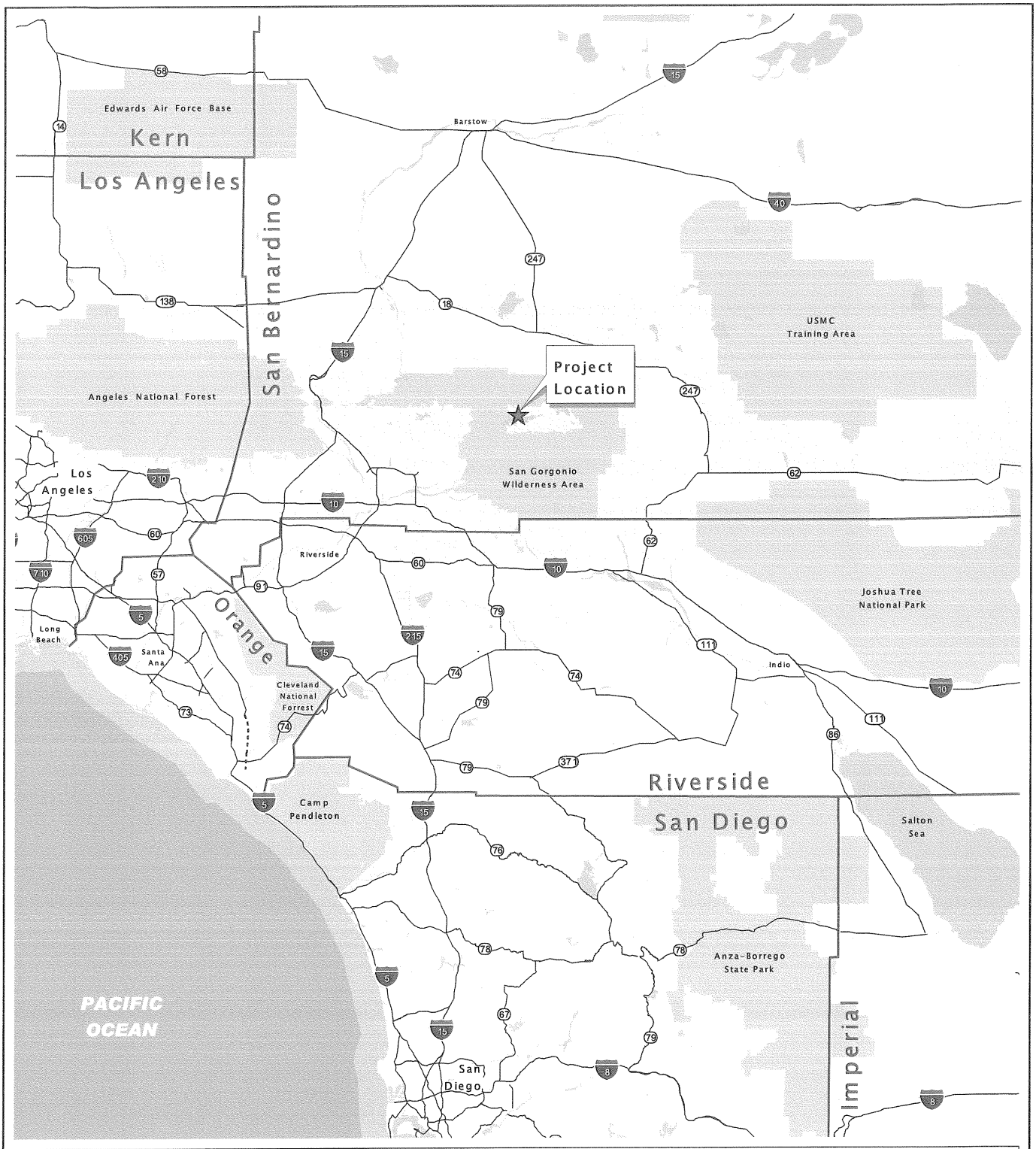

Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

N W E S

10 0 10 20 Miles

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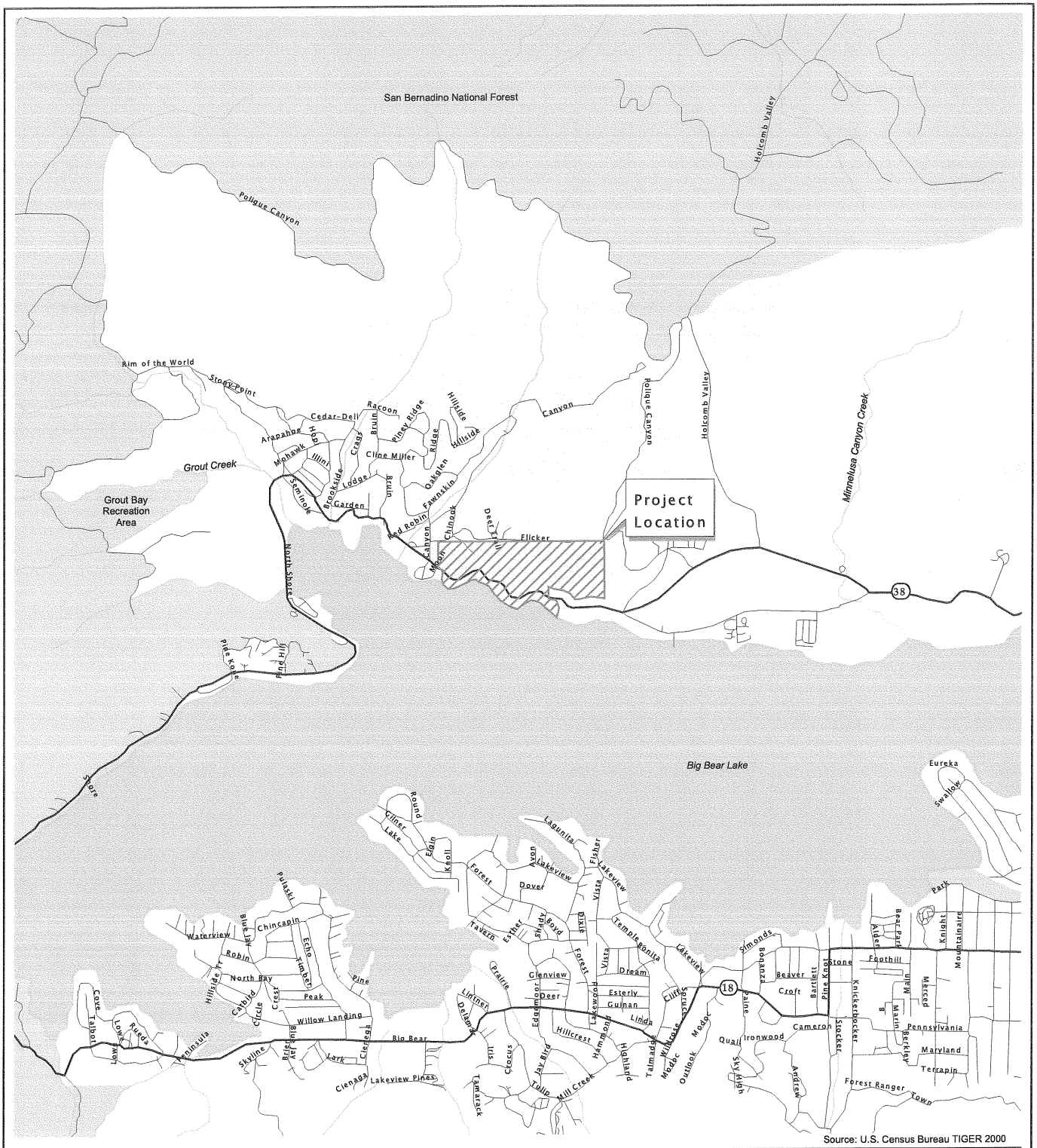

Source: U.S. Census Bureau TIGER 2000

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N
W E
S

0.25 0 0.25 0.5 Miles

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The willow flycatcher is a neotropical migrant that breeds in the west from northern Baja California to central British Colombia and generally east through the northern half of the United States to the Atlantic coast (A.O.U. 1998). The willow flycatcher winters in Central America from Nayarit, Mexico (Pacific coast) and Honduras (Gulf of Mexico coast) to Panama and also to northern Colombia and northwest Venezuela (Sedgwick 2000). Depending on the authority, there are four or five recognized subspecies of willow flycatcher (Sedgwick 2000). The breeding range of the SWF includes southern California, Arizona, New Mexico, western Texas, and extreme southern parts of Nevada and Utah (USFWS 1993). The California range of the SWF is north along the coast to the Santa Ynez River, Santa Barbara County, and north in the interior to the Owens River, Inyo County (Unitt 1987, USFWS unpubl.). The largest breeding populations of SWF in California are located at the South Fork of the Kern River, Kern County; the Santa Ynez River, Santa Barbara County; and the Upper San Luis Rey River and Santa Margarita River, San Diego County. The range-wide population of SWF is estimated at between 300 and 500 pairs (USFWS 1997a). The population of SWF in California is estimated to be about 70 pairs (USFWS 1993). Recent estimates, such as a total of 117 pairs in 1999 (USFWS unpubl.), indicate that the southern California SWF population may slowly be recovering.

The SWF breeds in willow dominated riparian habitats, with a strong dependence on willow thickets, for all its requirements (Grinnell and Miller 1944). In addition, the SWF appears to have a preference for sites with surface water in the vicinity, such as along streams, the margins of a pond or lake, and at wet mountain meadows (Grinnell and Miller 1944, Flett and Sanders 1987, Harris et al. 1987), and in Arizona the SWF invariably nests near surface water (Phillips et al. 1964). Recently, the SWF has adapted to introduced vegetation present in riparian communities, such as tamarisk (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*) (USFWS 1993).

The willow flycatcher is a common migrant in the interior of California and a rare to uncommon migrant along the coastal slope, with most birds during the spring season moving through southern California between May 15 and June 20 (Garrett and Dunn 1981, Unitt 1987). The spring migration of SWF is earlier than that of the northern subspecies (Unitt 1984, USFWS 1993). As a result, surveys for nesting SWF are complicated by the presence of more abundant subspecies migrating through the range of SWF during its breeding season.

On July 22, 1997, USFWS published a final critical habitat for this species (USFWS 1997a). A total of 99.8 river miles in Kern, Riverside, San Bernardino, and San Diego counties were designated for the SWF. The project site is not located within the designated critical habitat area for this species.

EXISTING HABITAT

The majority of the project site consists of dry chaparral and open Jeffrey pine (*Pinus jeffreyi*) forest to the north of Highway 18. With the exception of a few small red willows (*Salix laevigata*), the majority of onsite willows consist of shrubby Scouler willows (*Salix scoulerana*) with a maximum height of 20 feet, occurring in small patches near the shoreline of Big Bear Lake on the south side of Highway 18. Other plant species observed along the lake shoreline include willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), black cottonwood seedlings (*Populus balsamifera* spp. *trichocarpa*), and arroyo willow (*Salix lasiolepis*).

METHODS

Surveys for the SWF were conducted on May 25, June 16, 23, and 30, and July 13, 2002. These surveys followed the recommended USFWS guidelines. The survey protocol for SWF (USFWS 1997b) was revised on July 11, 2000. Instead of the previous minimum of three surveys, a total of five surveys must now be performed for all project-related SWF surveys. The surveys should be conducted in three specified time periods, at least five days apart. The first survey must be conducted between May 15 and May 31; the second survey must be conducted between June 1 and

June 21; and three surveys must be conducted between June 22 and July 17, with the first of the three final surveys conducted between June 22 and June 30. The surveys were conducted by Senior Biologist Jim Pike (Permit # PRT382946).

The willow habitat on the project site was systematically surveyed by walking slowly and methodically along its margin. Taped vocalizations of SWF were used to elicit a response from any potentially territorial SWF. If no SWFs were detected after the initial tape playing, the recording was usually replayed at least once. All, if any, observations of willow flycatcher (all subspecies), including pertinent behavior, were recorded and their locations mapped in the field onto topographic based maps.

The surveys were conducted under optimal weather conditions, and during the early morning hours when bird activity is at its peak. Numbers were recorded for all bird species detected during the surveys including notable observations of any special status species or other birds such as the brown-headed cowbird.

SURVEY RESULTS

No breeding SWF or individual willow flycatchers were detected during these surveys. Additionally, no federally- and/or state-listed Threatened or Endangered bird species, federal Species of Concern, or state Species of Special Concern were detected during surveys. One to two brown-headed cowbirds were detected on every survey.

CONCLUSION

Vegetation on the project site does not appear to provide suitable territorial or breeding habitat for the SWF. Although willow species are present adjacent to open water (i.e., Big Bear Lake), these willows are patchy and lack the dense growth or willow thicket required by the SWF. Therefore, this species is not expected to territorialize or breed on the project site.

Please call Ann Johnston or Sam Stewart at (714) 444-9199 with any questions.

Respectfully submitted,

BONTERRA CONSULTING

Ann M. Johnston

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager/Ecologist

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cc: Jim Pike

REFERENCES

American Ornithologists' Union. 1998. *Check-list of North American Birds*, 7th ed. American Ornithologists' Union, Washington, D.C.

Flett, M.A., and S.D. Sanders. 1987. Ecology of a Sierra Nevada population of Willow Flycatchers. Western Birds 18:37-42.

Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Audubon Press, Los Angeles.

Grinnell, J., and A.H. Miller. 1944. *The Distribution of the Birds of California*. Cooper Ornithological Club, Pacific Coast Avifauna No. 27.

Harris, J.H., Sanders, S.D., and Flett, M.A. 1987. Willow Flycatcher surveys in the Sierra Nevada. Western Birds 18:27-36.

Phillips, A.R., J. Marshall and G. Monson. 1964. *The Birds of Arizona*. University of Arizona Press, Tuscon.

Sedgwick, J.A. 2000. Willow Flycatcher (*Empidonax traillii*). *In* The Birds of North America, No. 533 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Unitt, P. 1984. *The Birds of San Diego County*. San Diego Society of Natural History, Memoir 13.

Unitt, P. 1987. *Empidonax traillii extimus*: An endangered subspecies. Western Birds. 18:137-162.

U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and Threatened Wildlife and Plants; Proposed Rule to List the Southwestern Willow Flycatcher as Endangered With Critical Habitat. Federal Register Vol. 58: 39495-39522 (July 23, 1993).

USFWS. 1995. Endangered and Threatened Wildlife and Plants; Final Rule Determining Endangered Status for the Southwestern Willow Flycatcher. Federal Register Vol. 60: 10694-10715 (February 27, 1995).

USFWS. 1997a. Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Southwestern Willow Flycatcher. Federal Register Vol. 62: 39129-39147 (July 22, 1997).

USFWS. 1997b. A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol. Technical Report NPS/NAUCPRS/NRTR-97/12. Colorado Plateau Research Station at Northern Arizona University. Prepared for National Park Service and Department of the Interior.

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August 23, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92718

Subject: Results of Spotted Owl Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of focused surveys for the California spotted owl (*Strix occidentalis occidentalis*) on the Moon Camp – Tentative Tract 16136 (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E, and includes portions of Sections 7 and 12. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The proposed project involves the subdivision of the project site into developable parcels. The purpose of the survey was to determine presence or absence of the California spotted owl on the project site. Surveys were conducted according to methods established by the U.S. Forest Service (Forsman 1983).

SPECIES BACKGROUND

The spotted owl is a large, dark-eyed owl that is typically found in dense forests of western North America and Mexico (Gutiérrez et al. 1995). The California subspecies range includes the Sierra Nevada, the coastal ranges of central and southern California, and the Sierra Juárez and Sierra San Pedro Mártir of Baja California.

Spotted owls are found in mature forests, typically where there is a dense, multi-layered canopy. Nest stands often have a well-developed hardwood understory (e.g., canyon live oak [*Quercus chrysolepis*]) and a conifer overstory. However, some high-elevation territories (above 6,500 feet) consist primarily or solely of conifers and some low-elevation territories (below 3,000 feet) are found in pure hardwood stands. Territory sizes vary widely depending on habitat type, with territories becoming larger in the high-elevation, conifer-dominated sites (LaHaye et al. 1997).

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This owl feeds primarily on rodents, and woodrats (*Neotoma* spp.) compose a large proportion of its prey base in southern California (Smith et al. 1999). In the southern portion of its range, the California spotted owl occurs in a series of semi-isolated populations in a small number of the largest mountain ranges in the region (LaHaye et al. 1994). Throughout its range, this species has declined due to the removal of older forests through logging. This situation prompted the U. S. Fish and Wildlife Service (USFWS) to list the Northern (*S. o. caurina*) and Mexican subspecies (*S. o. lucida*) as Threatened under the federal Endangered Species Act (USDI 1990, 1993). Currently, the USFWS is reviewing the status of the California subspecies to determine whether a similar listing is warranted.

EXISTING HABITAT

The project site occurs on a generally south facing slope that supports low density Jeffrey pine (*Pinus jeffreyi*) and mixed conifer forests with several areas that are nearly treeless. Spotted owls typically require dense, closed canopied forests for roosting and nesting (Bill LaHaye et. al. 1994). In southern California, suitable nesting and roosting habitat are usually found on north facing slopes or in steep canyons.

METHODS

The project site and the surrounding area were surveyed at night on six occasions by walking predetermined survey routes designed to provide thorough survey coverage of the area. Surveys were conducted during the breeding season (April 1 through August 31). During the field surveys, individuals and pairs of owls were located by imitating their calls with the human voice or using taped broadcasts of their calls to elicit a response from the owls, as described by Forsman (1983). This owl is very vocal and territorial and usually readily responds to a perceived intruder. Owl observations during nighttime surveys were relocated during daylight to determine exact roost locations. All roost locations were evaluated to determine whether they were on or in close proximity to the project site. Surveys were conducted by William S. LaHaye and Brian Kertson.

RESULTS

Six nighttime surveys and one roost location survey were performed on and in the vicinity of the project site. These surveys were conducted on April 25 and 30; May 6, 15, and 21; and June 10, 2002. A male spotted owl responded on April 25 approximately one mile north of the project site. This owl was later observed at its roost on May 6, 2002 at a different location that was also located approximately one mile north of the project site. This owl was observed at its roost location shortly before dusk and was followed until it left its roost to begin foraging. During the period of observation the male took several short flights but did not call to a mate, a behavior typical of paired spotted owls during the breeding season. Therefore, the observed owl was most likely a solitary male. No spotted owls were observed on, or within one mile of, the project site.

CONCLUSIONS

No spotted owls were observed on the project site. Additionally, given the south facing slope and low tree density, spotted owls are not expected to nest or roost on the project site. However, spotted owls are known to forage on forest habitats similar to those found on the project site and this owl is known to have large home ranges. Therefore, the project site could provide potential foraging habitat for the male spotted owl located approximately one mile north of the project site.

Thank you for the opportunity to assist on this project. If you have any questions or comments, please contact either Ann Johnston or Sam Stewart at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager/Ecologist

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cc: Bill LaHaye

REFERENCES

Forsman E.D. Methods and materials for locating and studying spotted owls in Oregon. 1983. Portland, OR, U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. General Technical Report PNW-GTR-162.

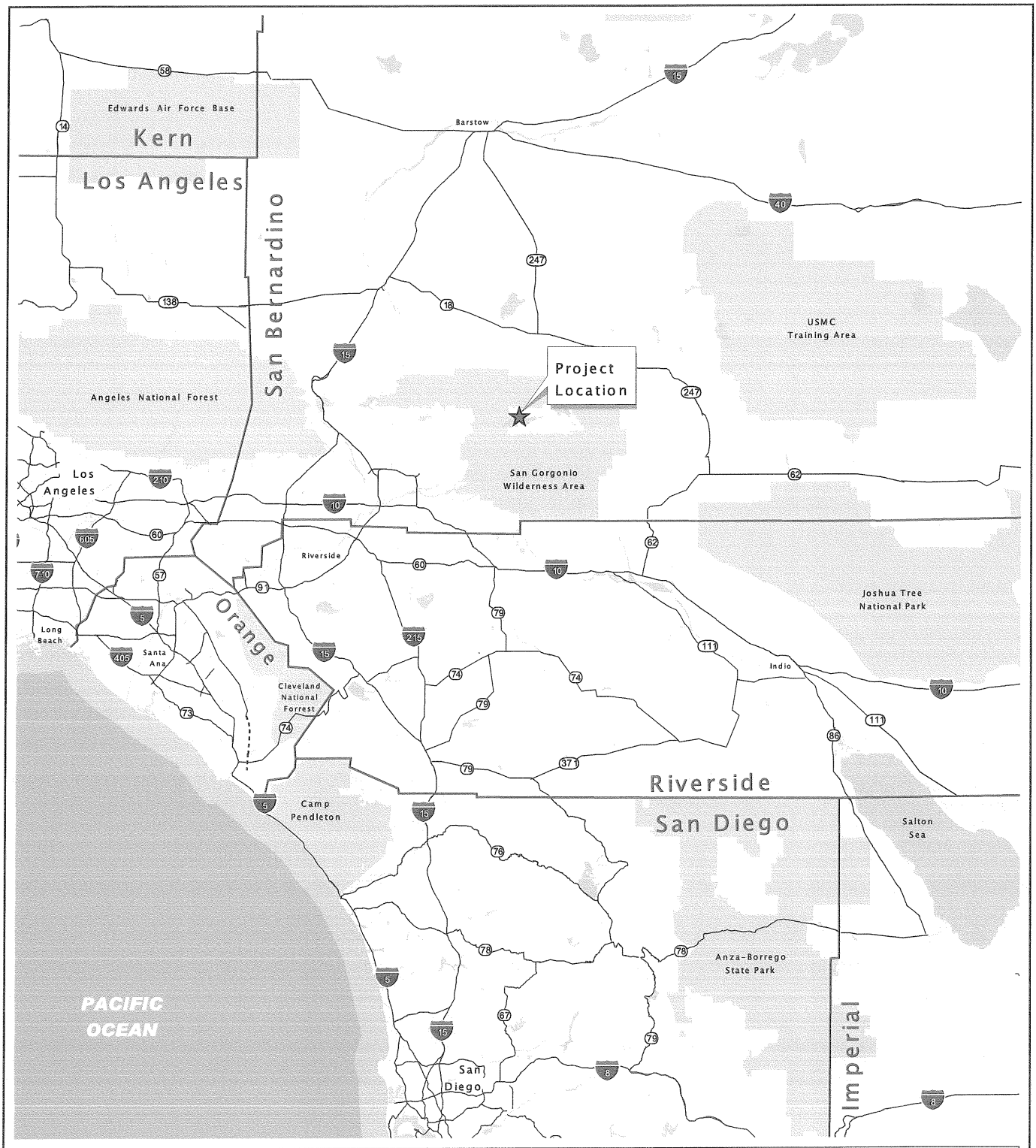
Gutiérrez R.J., Franklin, A.B. & LaHaye, W.S. Spotted Owl (*Strix occidentalis*). 1995. Philadelphia, PA.; Washington, D.C.. The Academy of Natural Sciences and The American Ornithologists' Union. The Birds of North America No. 179. Poole, A. and Gill, F. eds.

LaHaye, W.S., R.J. Gutierrez, and H.R. Akcakaya. 1994. Spotted owl metapopulation dynamics in southern California. Journal of Animal Ecology **63**:775-785.

Smith, R.B., M.Z. Peery, R.J. Gutierrez, and W.S. La Haye. 1999. The relationship between spotted owl diet and reproductive success in the San Bernardino Mountains, California. Wilson Bulletin **111**:22-29.

U.S. Dept.of Interior (USDI). 1990. Endangered and threatened wildlife and plants; determination of threatened status for the northern spotted owl. Federal Register **55**:26114-26194.

U.S. Dept.of Interior (USDI). 1993. Endangered and threatened wildlife and plants; final rule to list the Mexican spotted owl as a threatened species. Federal Register **58**:14248-14271.



Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

N
W E
S

10 0 10 20 Miles

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Source: U.S. Census Bureau TIGER 2000

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N W E S

0.25 0 0.25 0.5 Miles

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BonTerra
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An Environmental Planning/Resource Management Corporation

December 5, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92718

Subject: Results of Rubber Boa Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of focused surveys for the southern rubber boa (*Charina bottae umbratica*) on the Moon Camp project site – Tentative Tract 16136 (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by the U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1W, and includes the northern portion of Section 13. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The proposed project involves the subdivision of the project site into ninety-two developable parcels. The purpose of the survey was to determine the presence or absence of the southern rubber boa on the project site. Surveys were conducted according to survey guidelines developed by the California Department of Fish and Game (CDFG) (CDFG undated) and operated under a Memorandum of Understanding issued by the CDFG.

SPECIES BACKGROUND

The southern rubber boa (SRB) is a state-listed Threatened species and federal Species of Concern, and is considered a sensitive species by the U.S. Forest Service in the San Bernardino National Forest (Stephenson and Calcarone 1999). Threats to the species include development (the majority of known occurrences are on private lands), off-road vehicles, and habitat destruction by collectors (Steinhart 1990).

The SRB is typically associated with moist coniferous forest and woodland habitats (Stewart 1977), although they may occur in a variety of habitats (Hoyer and Stewart 2000). They generally occur in the Tehachapi, San Bernardino and San Jacinto mountains within an elevation range of approximately 4,900 to 7,900 feet above mean sea level (msl) (Stewart 1988). The SRB spends most of its life

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underground and is only active during the early morning, late evening, or nighttime hours. Consequently, specimens are rarely encountered. It hibernates in rock outcrops, rotting logs, or other subterranean retreats until April or May (Steinhart 1990). Rock outcrops on southern exposures tend to be favored in spring as the snake emerges from hibernacula (Stewart 1988). Riparian and forested areas with more mesic conditions may be favored later in the season as the weather becomes warmer and drier (Stewart 1988), but there is no empirical data to support seasonal movements. In fact, Hoyer and Stewart (2000) found strong site fidelity in SRB recaptured during their 5-year study (19 of 21 recaptures were within 25 feet of the original capture site).

Most of the known SRB occurrences in the San Bernardino Mountains occur in a roughly 10 mile stretch between Twin Peaks on the west and Green Valley Lake on the east, including the Running Springs and Lake Arrowhead areas (Stewart 1988). Populations appear to be isolated, with tracts of apparently suitable habitat unoccupied. Dominant and representative trees in these occupied areas include Jeffrey pine (*Pinus jeffreyi*), ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), incense cedar (*Callocedrus decurrens*), and black oak (*Quercus kelloggii*). One occurrence of the SRB in the Big Bear Valley was recorded in 1989 south of Big Bear Lake and east of the Snow Summit ski area, near the San Bernardino National Forest boundary. No SRB have been observed since. Stewart (personal communication 2001) suggests that SRB are probably widespread but not common in that area.

EXISTING HABITAT

The project site is located on a south facing slope along the north shore of Big Bear Lake. Most of the project site consists of open Jeffrey pine forest with scattered western juniper (*Juniperus occidentalis*) and black oak in the overstory. The tree canopy is especially open in the western half of the site, where the habitat matches published descriptions of "pebble plains" (Derby & Wilson 1978; 1979), a unique habitat type supporting several listed Threatened or Endangered plant species. At the eastern end of the project site, especially around a mapped ephemeral stream where topographic relief is higher than elsewhere, overstory canopy is higher. Beneath the trees, there is an open shrub layer including Great Basin sagebrush (*Artemisia tridentata*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), birchleaf mountain mahogany (*C. betuloides*), and cupleaf ceanothus (*Ceanothus greggii*). The herbaceous layer includes a variety of grasses and herbs. Standing dead trees, fallen trees, and leaf litter are fairly common in this portion of the project site.

Patches of meadow and riparian habitat occur along the southern margin of the project site, between Highway 38 and the lake shore. Dominant herbaceous species include sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (genera unknown). Shrubby willow trees (*Salix* sp.) occur in scattered patches.

Potentially suitable habitat for the SRB occurs in the drainage in the eastern portion of the project site. The combination of steeper slopes and higher tree densities (of both Jeffrey pine and black oak) results in leaf litter accumulation, well developed soils, and more mesic conditions overall. Standing dead trees, fallen trees, and leaf litter characteristic of this portion of the project site is similar to descriptions of where SRB may occur during the warmer, drier summer months.

The western half of the project site does not provide suitable habitat because of the open, dry conditions. The substrate consists of cobble. Leaf litter or other cover material is lacking. Several off-road vehicle tracks traverse this portion of the project site. Additionally, the patches of meadow and riparian habitat occurring along the southern margin of the project site between Highway 38 and the lake shore do not provide suitable habitat because of the lack of leaf litter accumulation and well developed soils.

METHODS

The draft survey guidelines developed by the CDFG (CDFG undated) for the SRB includes three years of repeated intensive active searches before a determination of absence can be made. Intensive active searches of suitable habitat for SRB are similar to the visual encounter survey (VES) method described by Crump and Scott (1994) in which a subsample of sites exhibiting high value habitat within the site as a whole are surveyed intensively for presence.

The draft guidelines allow for negative findings in less than three years (in two years) if trapping is conducted. Trapping consists of the use of a system of pitfall traps connected by drift fences, known as arrays, to capture SRB. Surveys reported here included a combination of both survey techniques simultaneously to maximize probability of detecting SRB, if present. This combination of surveys is expected to provide the surveying biologist with adequate data to identify the likelihood of presence/absence with an acceptable level of confidence in one season.

Surveys for SRB are best conducted as they emerge from hibernacula through their peak activity season (March 15 to May 15). The draft guidelines state that "surveys shall be conducted every one to two weeks" during that period. Recommended survey times range from 0900 to 1200 hours and from 1600 to 1900 hours but may vary depending on cloud cover, temperature, and humidity. On overcast days, surveys may be conducted between 1000 and 1600 hours. There is no guidance from the CDFG in the draft guidelines regarding the number of trapping periods or the number of days that traps should be opened when using arrays. The only requirement is that arrays should be in place before 15 March of the survey year.

Prior to conducting the focused survey for the SRB, a literature search and a reconnaissance level biological survey was conducted on December 10, 2002 by Brian Leatherman and Scott White to assess existing habitat and its potential suitability for a variety of special status plants and wildlife. The literature search included a review of the most recent version of the California Natural Diversity Data Base (CDFG 2002, Fawnskin and Big Bear Lake USGS quadrangles) and other relevant available documents to determine if and to what extent special status species, including the SRB, are known to occur in the area.

Visual encounter surveys were conducted on April 25 and 30, May 15 and 21, and August 29, 2002. Biologists who participated in some or all of the surveys included Mr. Leatherman, Bill La Haye, Sam Stewart, and Brian Kertson. All surface objects that potentially provided suitable refugia for the SRB (and could be moved by one or two people) were dislodged and checked under and replaced. Surface objects included small rock piles, boulders, wood debris, log piles, and natural downed logs. In addition, leaf litter was raked and sifted down to the ground surface under shrubs and forest areas where moist conditions result in suitable microhabitat sites.

Use of drift fences and pitfall traps as a survey technique is described in detail by Corn (1994) and others. The technique has been modified here to focus the effort on the capture of SRB. Four 100-foot long arrays were used to try to capture SRB. Each of the four arrays consisted of four five-gallon buckets (which act as pitfalls), one piece of carpet (which provides artificial refugia for SRB), and one snake funnel trap. The buckets were countersunk into the ground and placed more or less equidistant from each other with one bucket at each end of the drift fence. The carpet pieces, which were approximately 18 by 24 inches in size, were placed nap down and covered over with a thin layer of leaf litter. Each funnel trap was constructed of quarter inch hardware cloth (wire mesh) and were approximately 3 feet long and 6 inches in diameter with 8 inch inverted cones (funnels) inserted into each end.

The four arrays were concentrated within the SRB habitat at the eastern end of the project site and located to maximize the likelihood of capturing SRB, if present (see Exhibit 3). The arrays were operated under a Memorandum of Understanding from the CDFG because of the SRB's state listed Threatened status. Arrays were installed on March 12, 2002, and removed on the final day of trapping on August 30, 2002. Trap locations were determined by Mr. Leatherman, who installed them with assistance from Mr. LaHaye and Mr. Stewart. Mr. LaHaye monitored the traps daily when in operation per the MOU.

The arrays were operated during three separate trapping periods of ten days each. The trapping periods were from April 28 to May 5, June13-22, and August 21-30, 2002. The first trapping period was intended to coincide with the peak period of SRB emergence from hibernacula in the San Bernardino Mountains, based on a recent five-year study by Hoyer and Stewart (2000). The subsequent periods were intended to coincide with the period in which SRB may move into more mesic areas (like the area sampled).

RESULTS

No SRB were captured or observed during the 2002 focused survey efforts. A summary of the species captured in the arrays is provided in Table 1. Several species were also observed during independent visual encounter surveys, but due to the focus of this effort on the detection of snakes (not lizards or other species) and the intensive nature of the sampling effort, detailed notes on the species observed were not recorded in the field. Several lizard species were observed during the visual encounter surveys, including sagebrush lizards (*Sceloporus graciosus*), western skinks (*Eumeces skiltonianus*), and southern alligator lizards (*Elgaria multicarinatus*), but all of these were also detected in the arrays. The only species detected during visual encounter surveys but not captured in the arrays was one western rattlesnake (*Crotalus viridis*) observed on August 29, 2002.

TABLE 1
SUMMARY OF WILDLIFE CAPTURED IN ARRAYS – 2002

SPECIES	TRAPPING PERIOD			
	4/28 - 5/5	6/13 - 6/22	8/21 - 8/30	Total
Reptiles				
Sagebrush Lizard (*Sceloporus graciosus*)	9	27	29	65
Western Fence Lizard (*Sceloporus occidentalis*)	0	0	1	1
Western Skink (*Eumeces skiltonianus*)	2	36	29	67
Southern Alligator Lizard (*Elgaria multicarinatus*)	3	4	1	8
Mammals				
Ornate Shrew (*Sorex ornatus*)	0	1	4	5
Brush Mouse (*Peromyscus boylii*)	0	0	2	2
Dusky-footed Woodrat (*Neotoma fuscipes*)	0	1	0	1
California Vole (*Microtus californicus*)	0	1	0	1
Total	14	70	66	150

CONCLUSIONS

SRB have been detected in a variety of vegetation types in the San Bernardino Mountains by Hoyer and Stewart (2000). Occupied habitat at these locations ranged from grasses and ferns in relatively open areas with sparse shrubs and small deciduous trees, to coniferous or deciduous forest or a mixture of both. The one common component of all sites was the presence of small to large rock outcrops interspersed throughout the area. Rock outcrops, which are known to provide hibernacula (Stewart 1988), also appear to represent an important component of preferred habitat for the SRB. Rock outcrops do not occur on the project site.

The use of cover objects for detecting rubber boas in known occupied habitat has been shown to be highly successful. At a study site in Oregon where natural cover objects were lacking, Hoyer and Storm (1992) relied entirely on artificial cover objects to capture rubber boas. Hoyer and Stewart (2000) showed that the number of SRB detected per unit time was substantially greater for artificial cover objects compared to natural cover (1.76/hr vs. 0.40/hr respectively). No boas were found under artificial cover objects placed along the arrays or under natural cover during the proposed project surveys.

The proposed Moon Camp project site is on a south-facing slope where open dry conditions prevail. The easternmost portion of the site has higher tree density, more leaf litter, more developed soils, and downed logs that provide limited habitat for the SRB. This eastern portion was surveyed intensively using two focused survey techniques: visual encounter surveys and arrays with drift fences, pitfall traps, snake funnel traps, and artificial cover (i.e. carpet). No SRB were captured or observed during the focused survey efforts. Given the lack of historical records for the immediate project area, the lack of rock outcrops that appear to be an important component of occupied habitat, and the negative results of two independent focused survey techniques in the best SRB habitat on the project site, the SRB is not presently expected to occur on the project site.

Thank you for the opportunity to assist on this project. If you have any questions or comments, please contact either Ann Johnston or Sam Stewart at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M Johnston / jms

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Samuel C. Stewart IV
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Attachments: Exhibits 1, 2 and 3

cc: Brian Leatherman

REFERENCES

California Department of Fish and Game, Natural Diversity Data Base (CDFG). 2001. Special Animals. Unpublished report available from CDFG, Natural Heritage Division, Sacramento.

California Department of Fish and Game, Natural Diversity Data Base (CDFG). 2002. Rarefind electronic data base of special status species locations for Fawnskin and Big Bear Lake USGS 7.5 minute series quadrangles. California Department of Fish and Game, Natural Heritage Division, Sacramento.

California Department of Fish and Game (CDFG). undated. Draft survey protocol for Southern Rubber boa (*Charina bottae umbratica*). Region 6, Chino Hills. 12 pp.

Corn, P.S. 1994. Straight Line Drift Fences and Pitfall Traps. In Heyer, W.R., M.A Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Forster (eds.) Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians. Smithsonian Institution Press, Washington DC.

Crump, M.L. and N.J Scott Jr. 1994. Visual Encounter Surveys. In Heyer, W.R., M.A Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Forster (eds.) Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians. Smithsonian Institution Press, Washington DC.

Derby, J.A. and R. Wilson. 1978. Floristics of pavement plains of the San Bernardino Mountains. Aliso 9:374-378.

Derby, J.A. and R. Wilson. 1979. Phytosociology of pavement plains of the San Bernardino Mountains. Aliso 9:463-474.

Hoyer, R.F. and G.R. Stewart. 2000. Biology of the rubber boa (*Charina bottae*), with emphasis on *C.B. umbratica*. Part I: Capture, size, sexual dimorphism, and reproduction. Journal of Herpetology 34(3): 348-354.

Hoyer, R.F. and R.M. Storm. 1992. Reproductive biology of the rubber boa (*Charina bottae*). *In* M.J. Uricheck (ed.), 15th International Herpetological Symposium on Captive Propagation and Husbandry, pp. 109-118. Seattie, Washington.

Stebbins, R. 1985. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston, MA. 336 pp.

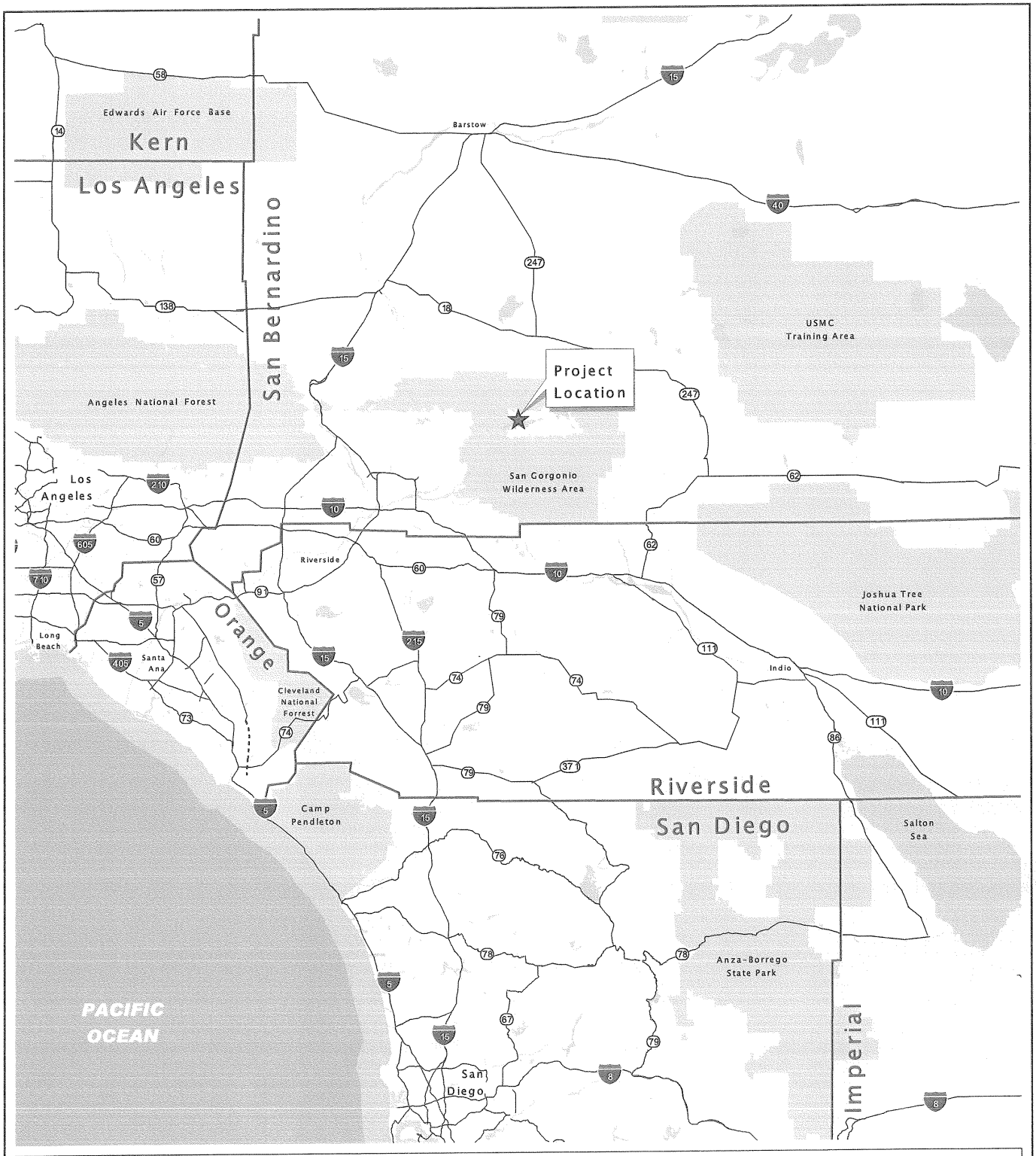
Steinhart, P. 1990. California's Wild Heritage: Threatened and Endangered Animals of the Golden State. California Department of Fish and Game.

Stephenson, J.R. and Calcarone, G.M. 1999. Southern California mountains and foothills assessment: habitat and species conservations issues. General technical Report GTR-PSW-172. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 402 pp.

Stewart, Glenn R. 1977. *Charina bottae*: Rubber Boa. Catalogue of American Amphibians and Reptiles 205.1-205.2

Stewart, Glenn R. 1988. The rubber boa (*Charina bottae*) in California, with particular reference to the southern subspecies (*C.b. umbratica*). Proceedings of the Conference on California Herpetology. Southwestern Herpetologists Society. H. DeLisle, P. Brown, B. Kaufman, and B. McGurty (eds.)

Stewart, Glenn R. 2001. Personal communication via email regarding southern rubber boa occurrence in Big Bear Valley. January 10.



Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

N W E S

10 0 10 20 Miles

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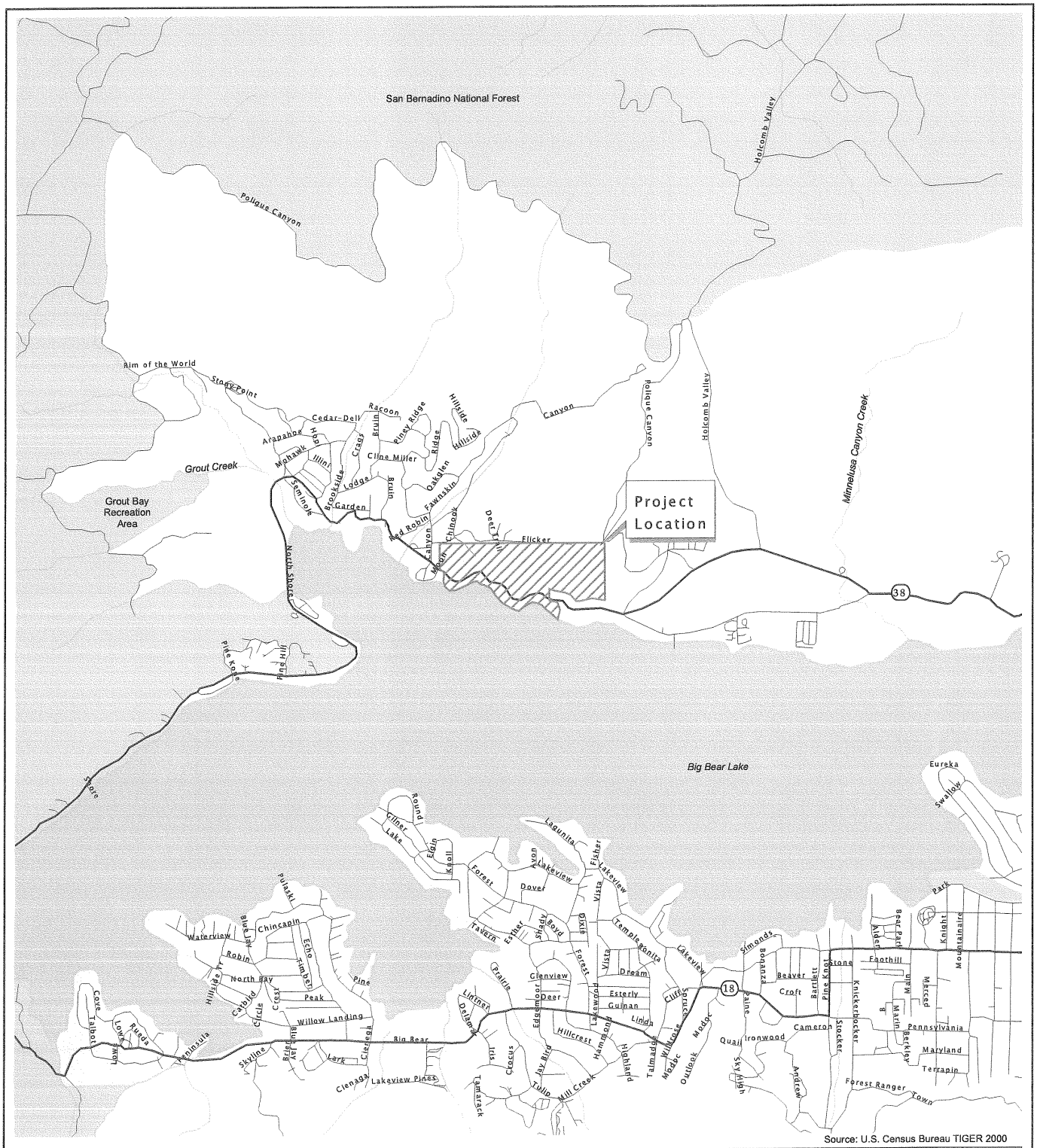

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N W E S

0.25 0 0.25 0.5 Miles

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