LEATHERMAN BIOCONSULTING, INC.
*Biological Surveys, Management & Monitoring*

July 12, 2018

Mr. David DuFour
**PINE ROSE CABINS**
25994 Highway 189
Twin Peaks, California 92391

Subject: Addendum Habitat Assessment for Southern Rubber Boa and San Bernardino Flying Squirrel or a Lot Line Adjustment to the Arrowhead Pine Rose Cabins Property, Twin Peaks, San Bernardino County

Dear Mr. DuFour:

This letter represents an addendum report with the results of a habitat assessment for the southern rubber boa (*Charina bottae umbratica*) and San Bernardino flying squirrel (*Glaucomys sabrinus californicus*) at the Arrowhead Pine Rose Cabins property in Twin Peaks, San Bernardino County, California. The southern rubber boa is a state-listed Threatened species, and the San Bernardino flying squirrel is a state species of special concern, and is on the U.S. Forest Service watch list. Both of these species occur on the County's Biotic Resources Overlay Map, and a habitat assessment to assess issues associated with a lot line adjustment annexing a portion of the parcel to the north was required by the County.

A habitat assessment was conducted by Leatherman BioConsulting, Inc. on the property in 2013. This addendum updates the original assessment and addresses the additional habitat added to the property for a lot line adjustment currently being considered. Specifically, the lot line adjustment annexes property in the parcel north of the existing Pine Rose Cabins property extending 275 ft. west of Grandview Road.

SPECIES' BIOLOGY

The sections below were updated to incorporate recent information and findings regarding the status and distribution of the southern rubber boa and San Bernardino flying squirrel.

Southern Rubber Boa

The southern rubber boa is state-listed as a Threatened species under the California Endangered Species Act (CDFW 2018a). It is also considered a sensitive species by the U.S. Forest Service in the San Bernardino National Forest (Stephenson and Calcarone 1999), but currently has no status under the federal Endangered Species Act (USFWS 2015a). In 2015, the U.S. Fish and

Wildlife (USFWS 2015b) published a 90-day finding on a petition to list the southern rubber boa as an Endangered or Threatened species and found that the petition presented substantial information indicating that the action may be warranted, thus initiating a 12-month review period. No final rule has been published as of the date of this report. Potential threats to the species that have been identified include development (the majority of known locations are on private lands) (Stewart 1988, 1991), off-road activity, commercial timber sales, personal fuelwood harvesting (Stewart et al. 2005), and habitat destruction by collectors (Steinhart 1990), although there is no empirical evidence to support them.

The southern rubber boa is semi-fossorial (living underground most of the time), nocturnal (active at night) or crepuscular (active early morning or late evening), and highly secretive, so individuals are rarely encountered and their seasonal activity and habitat use are difficult to determine. Rubber boas begin to emerge from hibernation in early April but most emerge in late April depending on climatic conditions (Hoyer and Stewart 2000a). Boas generally disappear during the summer months though may emerge after rains or periods of high humidity (Stewart et. al 2005). It is likely that some individuals remain in rock outcrops during the summer and retreat deeper into crevices (Stewart et al. 2005), but others may move into cooler, moister forest and riparian habitats (Loe 1985, Stewart 1988). Boas have been observed on the surface as late as October (Hoyer and Stewart 2000a).

Habitat for the rubber boa includes mixed conifer-oak forest and woodland habitats at higher elevations in the San Bernardino and San Jacinto Mountains, at elevations between approximately 5,000 to 8,000 feet (Stewart 1988, 1991). In the San Bernardino Mountains, most of the records occur in a roughly 10-mile stretch of habitat between Twin Peaks on the west and Green Valley on the east, including the Running Springs and Lake Arrowhead areas (Stewart 1988, 2005). More recently, they have been found as west as Cedarpines Park (west of Crestline) and as far east as Oak Glenn Camp (southwest of Little San Gorgonio Peak). Dominant trees in occupied areas include Jeffrey pine (*Pinus jeffreyi*), ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), and black oak (*Quercus kelloggii*)(Stewart 1988). However, snakes are regularly encountered in open areas that contain few conifers and areas with the least amount of shading (Hoyer 2015a). In a multi-year study of the southern rubber boa in the San Bernardino Mountains, Hoyer and Stewart (2000a) found southern rubber boas in a variety of vegetation types and slope aspects, but all collection sites were on or around small to large rock outcrops, which are apparently important as hibernacula (Keasler 1982, Stewart 1988).

Based on available data at the time, Stuart (1988) suggested that southern rubber boa populations appear to be isolated, with tracts of apparently suitable habitat unoccupied; however, with the exception two extended surveys, large areas of potential boa habitat have never been surveyed due to a lack of road access and seasonal constraints (Hoyer 2015a). In addition, based on the concept of habitat association, when two known localities are connected with suitable habitat, it is not unreasonable to assume that the species occurs between them. As such, the southern rubber boa may not be as rare as it is widely accepted to be. In fact, Hoyer (2015b) cites several studies with data supporting that the boa is likely the one of the most abundant snakes above 5,500 feet in the San Bernardino Mountains.

(Stewart 1988) suggests that rock outcrops on southern exposures tend to be favored in the spring and that as the weather becomes warmer and dryer the snakes may move into cooler and moister habitats such as riparian areas and forest, but acknowledges that there is practically no data on their seasonal movements. Hoyer and Stewart's (2000a) 5-year study produced evidence of high site fidelity by boas, with 19 of 21 recaptures being within 26 feet of their original capture location, and the two farthest recaptures being approximately 231-247 feet from their original capture location. One southern rubber boa is reported as moving up to 300 yards in a single season (Loe 1985).

San Bernardino Flying Squirrel

The San Bernardino flying squirrel, a subspecies of the Northern flying squirrel, is a state species of special concern (CDFW 2018a), a U.S. Forest Service sensitive species (Davidson and Calcarone 1998), and on the County's Biotic Resources Overlay Map. The U.S. Fish and Wildlife (2012) published a 90-day finding on a petition to list the San Bernardino Flying Squirrel as an Endangered or Threatened species and found that the petition presented substantial information indicating that the action may be warranted, thus initiating a 12-month review period. However, in 2016 the USFWS published its 12-month review and determined that listing was not warranted (USFWS 2016).

The Northern flying squirrel is often associated with fairly dense coniferous forest, but also lives in mixed conifer-deciduous forest, and occasionally in pure stands of deciduous hardwoods (Heaney 1999). The San Bernardino flying squirrel prefers habitats that consist of mature older forests with large diameter trees and open understories between 5,200 and 8,500 feet elevation (Williams 1986). Zeiner et al. (1990) suggest that mature, dense conifer forest, particularly those with white fir in proximity to riparian habitats, may be preferred, and Williams et al. (1992) state that it generally occurs in mixed conifer forests where white fir and black oak are the "principal trees associated with these squirrels."

The San Bernardino flying squirrel primarily occurs in mature old growth forests where it uses old woodpecker holes or other cavities in large dead trees and snags for nesting and cover (Ingles 1965). The subspecies also tends to choose trees for dens or nests that are over 100 ft. tall with diameters (at breast height) greater than 30 in. (Butler *et al.* 1991). It does not hibernate (Heaney 1999), although snow persists for most of the year in some parts of its range. It is strictly nocturnal, activity peaking after dark and ending before dawn.

The main food preference for San Bernardino flying squirrels is truffles, a type of underground fungus that occurs below the surface of the forest floor (Butler *et al.* 1991). It does not collect and store food for winter: when snow covers food resources in the winter, the squirrels eat arboreal lichens and hair moss (Ingles 1965, Smith 2007). Flying squirrels will also eat a variety of other foods including seeds, nuts, fruit, meat bait, oatmeal, raisins, insects, eggs and the flesh of small mammals and birds (Ingles 1965, Heaney 1999). San Bernardino flying squirrels have also been reported using backyard bird feeders in low density developments adjacent to heavily forested areas (Stephenson and Calcarone 1999).

Owls are one of the primary predators of the Northern flying squirrel (Ingles 1965, Heaney 1999). Smith et al. (1997) found the squirrel to be an uncommon prey of the California spotted owl (*Strix occidentalis*), but well distributed throughout forested vegetation in the San Bernardino Mountains. Other known predators include hawks, weasels, bobcats, foxes, and coyotes. Threats associated with increasing developments and habitat modifications, including the impacts on their ability to disperse among increasingly fragmented suitable habitats, are unknown.

EXISTING CONDITIONS

The Arrowhead Pine Rose Cabins property is located in an area with low density mountain cabins and community centers. It is located on the northwest corner of Highway 189 and Grandview Road, and is bisected by North Road, and Sunset Loop, two public roads. A district fire station and San Bernardino County government offices are across Grandview Road to the east. Open space occurs to the north-northwest beyond the property and surrounding residential areas.

A detailed description of the property was provided in the original habitat assessment (Leatherman BioConsulting, Inc. 2013). Generally speaking, Arrowhead Pine Rose Cabins is a developed property with scattered cabins and activity centers, two independent artificial streams that meander through the cabins, a maintenance area for the grounds including various equipment and landscape materials, and roads and walking paths that provide access throughout the property.

The dominant trees in the developed Pine Rose Cabin area include several mature incense cedars and black oak trees. A few white firs and yellow pines also occur on the property. Several young incense cedars and other trees occur scattered throughout the property in landscaped areas. Understory vegetation was obviously cleared and removed when the property was developed. The trails, driveways and activity centers are maintained free of vegetation, although a few native shrubs were observed in some of the landscaped areas. Logs are used as borders of the trails and parking areas, but naturally occurring downed logs and forest leaf litter are largely absent from the property. Large rocks were used to line the artificial streams and coi ponds, but no naturally occurring rock outcrops were observed.

The habitat in the area to be annexed is undeveloped but has sustained various levels of disturbance due to its proximity to the resort and adjacent highway. Several dirt roads and trails pass through the area. The dominant trees include several mature incense cedars, Jeffrey pines, sugar pines, and black oak trees. Several white firs and canyon live oak trees (*Quercus chrysolepis*) also occur in the area. Native shrubs are sparse in the annex area and few herbaceous species were observed. Several tree stumps were observed throughout but no downed trees or rotten logs were observed indicating that they had been removed from property, likely during management activities associated with the bark beetle (*Dendroctonus* spp.) infestation that occurred in the mid-2000's. Naturally occurring rock outcrops suitable for use as hibernacula by the southern rubber boa do not occur the annex area, but there are boulders adjacent to Grandview Road at the north end of the cabins, presumably placed for erosion control

at roadside drains. Leaf litter in the form of pine needles covers most of the forest floor throughout the area.

Off the property and annex area, the drainage that slopes away to the north-northwest consists of forested habitat dominated by incense cedars and black oaks with scattered yellow pines and white firs. No rock outcrops were observed, but scattered native shrubs occur in the understory, and leaf litter and woody debris with occasional downed logs were observed.

## METHODS

Prior to conducting the habitat assessment, Leatherman BioConsulting, Inc. conducted a search of the California Natural Diversity Data Base (CDFG 2018b, San Bernardino North, Harrison Mtn., Silverwood Lake, and Lake Arrowhead 7.5 minute series USGS quadrangles) and reviewed other relevant available documents to determine if or to what extent the rubber boa and flying squirrel may occur on the property or in the vicinity. Numerous additional references and resources, cited throughout this report, were used to compile information on the current agency status, distribution, habitat requirements, and life histories for each species.

The site was visited by Mr. Brian Leatherman July 3, 2018 to conduct a general biological survey and to evaluate the suitability of the habitat for supporting the rubber boa and flying squirrel. The survey consisted of visiting the Pine Rose Cabins resort area and walking slowly and methodically over the entire annex area to allow close inspection of all habitat features and an evaluation of the suitability of those features for the species of interest. Weather conditions during the survey were excellent, consisting of clear skies, mild temperatures (74 °F), and a light breeze (2-4 mph).

## RESULTS

### Southern Rubber Boa

Seventeen records for the rubber boa were found in the CNDDB (CDFG 2018b) for the four quadrangles searched, however, all records were on the Harrison Mtn. quadrangle. Because location information in the CNDDB is suppressed for this species (to deter illegal collecting), the proximity of these observations relative to the project site is unknown. The most recent record is from 2002: all other records are from 1982 or before. The distribution of the southern rubber boa includes the Twin Peaks area where there are known records (Stewart 1988). Based on information in our project files, the nearest reliable record is from approximately 0.6 mile southwest of the property.

The primary habitat features, natural rock outcrops and rotten logs, were not observed in the annex area. Fallen trees and downed logs were likely removed in the mid 2000's during bark beetle management activities. Although rock outcrops with fissures, cracks or other features that provide access to underground refugia were not observed, surface rocks were observed, but most were exposed boulders placed below storm drains along Grandview Road. These placed rocks represent low quality habitat that could provide limited refugia for the boa.

The canyon west of the annex area and north-northwest of the resort also provides low quality habitat (due to lack of rock outcrops) for the southern rubber boa. Boas that might occur there and move onto Pine Rose Cabin development are unlikely to stay because of the lack of suitable habitat (due to residential cabin development). Boas that might move into the annex area are likely to leave because of the lack of suitable rock outcrops, or be killed at night on road surfaces (boas and other snakes are known to sit on asphalt roads after dark to absorb warmth).

San Bernardino Flying Squirrel

Five records for the flying squirrel were found in the CNDDB (2018b) for the four quadrangles searched. The nearest record is from Lake Arrowhead: the remaining records were from Lake Gregory or west (Crestline, Cedarpines Park, Sawpit Canyon). None of the records were from the vicinity of the property. Although the number of records is sparse, the flying squirrel is known to be widely distributed in the San Bernardino Mountains, based largely on prey remains identified in spotted owl pellets (La Haye, pers. comm.).

The flying squirrel favors fairly dense coniferous forest near riparian habitats, possibly because their favorite food (underground fungi and lichens) thrives in the resulting mesic environment. White fir and black oak usually make up a portion of the tree canopy in occupied sites. Mature black oaks and white fir occur in the annex area, and it is adjacent to an undeveloped drainage that continues downslope to the northwest. Yellow pines (Jeffrey and Ponderosa) and sugar pines also occur in the annex area and provide suitable habitat. Incense cedars are also common but the density of the branching on these trees may not be conducive to the squirrel's gliding behavior. The canopy of the forest in the annex area appears healthy, and many trees appear to be mature, but many features of an old growth forest are lacking apparently due to management activities in the past. San Bernardino flying squirrels may forage through the area on occasion, but dead trees and snags that usually harbor suitable nesting cavities have been removed and few suitable cavities were observed in the trees that remain.

## CONCLUSIONS

Records for the southern rubber boa and San Bernardino flying squirrel in the vicinity of the property are very few, and no records for the property itself were found. Both of these species are very secretive and nocturnal, and formal surveys are rarely conducted, so lack of records does not necessarily indicate that they are not in the area. When focused surveys are conducted, they are rarely considered to be conclusive by the resource agencies because the squirrel might occur only sporadically and the boa is only active for a brief period of the year (and is difficult to find when it is active). However, the existing use of the Pine Rose Cabins as a mountain resort and the maintenance of the grounds are not conducive to the establishment of a population or long term use of the site by either species. Even if they did occur, the continued operation of the resort is not expected to change the pattern of use by either species.

The annex area consists of undeveloped but variably disturbed habitat and may be visited by the San Bernardino flying squirrel, and habitat suitability continues to improve off-site along the drainage to the north-northwest of the property. The highly mobile flying squirrel may therefore occasionally move through or occupy the area as it forages through the forest at night, especially

given that they are known to take advantage of food provided at bird feeders at cabins adjacent to undisturbed forest lands. However, dead trees and snags where suitable tree cavities are likely to be found (and that could provide flying squirrels with a permanent retreat) have been removed from the annex area. Therefore, although the squirrel may move through the habitat, it does not likely nest there and it is not likely to rely on resources on the property that are not available elsewhere.

The rubber boa is a fairly sedentary species and does not move widely through occupied habitat. If one were to move into to annex area from the adjacent habitat it likely would not remain because of the lack of suitable habitat (natural rock outcrops and rotten logs that provide refugia). However, rocks placed below storm drains along Grandview Road provide limited low quality habitat. Boas that might occur there are subject to road kill, which severely limits the long term potential occurrence of this species.

No impacts are expected to occur as a result of the lot line adjustment. However, if future development of the annexed property involves removal of rocks below storm drains along Grandview Road, impacts to the southern rubber boa could occur if one was present. Therefore, to avoid potential impacts to the southern rubber boa, a biological monitor should be present when habitat is removed to search for boas. If one is observed during the process, construction would be temporarily delayed and Pine Rose Cabins would be required to consult with the California Department of Fish and Wildlife to obtain a 2081 permit. The permit would allow take of the species under certain conditions and with approved mitigation measures to offset impacts.

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It has been a pleasure to provide these services to Arrowhead Pine Rose Cabins. If you have any questions regarding the contents of this report, please contact by phone at the number above or by email at bleathermanwlb@aol.com. The references cited are included at the end of this letter report.

Sincerely,

**LEATHERMAN BIOCONSULTING, INC.**

Brian Leatherman
Principal Biologist

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