

Southern Rubber Boa

Southern Rubber Boa (*Charina umbratica*)

Management Status

Heritage Status Rank: G5T2T3S2S3

Federal: USDA Forest Service Region 5 Regional Forester's Sensitive Species

State: Threatened

Other: None

General Distribution

Four populations of rubber boa are known to occur south of the Sierra Nevada. These populations are in the Tehachapi Mountains, Kern County; the Mt. Pinos area (including Mt. Abel and Alamo Mountain), straddling the Kern/Ventura County line; the San Bernardino Mountains in San Bernardino County; and the San Jacinto Mountains in Riverside County (Hoyer and Stewart 2000).

Distribution in the Planning Area

The southern rubber boa is found in the San Bernardino and San Jacinto Mountains at elevations of 5,050–8,070 feet (1,540–2,460 meters) (Stewart 1988). Approximately eight localities are known in the San Jacinto Mountains (including Fern Valley, Dark Canyon, Devil's Slide trail, and the North Fork San Jacinto River near the Highway 243 crossing); and over 40 locations are known in the San Bernardino Mountains (Loe 1985, Stewart 1990). Twenty-six of the localities in the San Bernardino Mountains are in a 10-mile (16-kilometer) strip between Twin Peaks on the west and Green Valley on the east (Stewart 1988). Other locations include Barton Flats, north-facing slopes immediately south of Big Bear Lake (Stephenson and Calcarone 1999), and the vicinity of Oak Glen Conservation Camp at the southern end of the San Bernardino Mountains (Loe pers. comm.).

Systematics

Three subspecies of rubber boa were recognized (Stebbins 1985), although elevation of the southern rubber boa to the specific level has been proposed (Hoyer 2001). Morphological and electrophoretic

analysis of specimens from isolated populations found in the southern Los Padres area show them to be intergrades between southern rubber boa and northern rubber boa (*C. b. bottae*), which occurs in the Sierra Nevada range (Stephenson and Calcarone 1999).

A recent publication (Stebbins 2003) did not include subspecific epithets for this species due to uncertainties about the circumscription of subspecies. Stebbins (2003) did note, however, that there is considerable evidence to support the contention that rubber boas found in the San Bernardino and San Jacinto Mountains are sufficiently distinctive to possibly warrant status as a distinct subspecies. Rubber boas found in the western Transverse Range may also prove to be part of this clade but more data from a large sample size is needed to help elucidate the exact taxonomic status of these snakes and those found in the Tehachapi Mountains. Meanwhile, the State of California continues to recognize the southern rubber boa as a valid taxon.

Natural History

Habitat Requirements

Southern rubber boa is associated with moist woodlands and coniferous forests, which include Jeffrey pine, yellow pine, sugar pine, white fir, and black oak. It tends to be associated with vegetatively productive sites, usually with deep, well-developed soils. It is a burrower and commonly makes use of rock outcrops as hibernacula. Large downed logs and a well-developed litter/duff layer are considered important for cover and for maintaining high soil moisture. Soil moisture may be a limiting factor for rubber boas, as they are usually found during summer months in damp draws near springs, seeps, and streams (Loe 1985).

Reproduction

Females in reproductive condition usually emerge from hibernation in April. Courtship begins immediately and lasts into mid-May. Young are born alive, generally from late August through the first 3 weeks of September. Young are born in loose, well-aerated soil, under surface objects, or within rotting logs. Each female bears two to eight young (Hoyer and Stewart 2000, Stewart 1988, Zeiner and others 1988).

Survival

A female southern rubber boa, originally captured and released in 1971, was recaptured several times until taken into captivity in 1989 due to poor health. This snake is still alive today and is estimated to be 50–70 years old (Hoyer pers. comm.).

Dispersal

Very little information exists on dispersal in southern rubber boas; however, Hoyer and Stewart (2000)

reported that a 5-year study produced evidence of site fidelity. Eighteen of 21 recaptures were within 26 feet (8 meters) of the original capture sites. The two exceptions were adult males found during the breeding season at a rock outcrop approximately 230 feet (70 meters) from the original capture sites.

Migration

Individuals may migrate annually between the ridges and canyon bottoms as they move from winter hibernacula to summer habitat. A southern rubber boa has been recorded moving up to 300 yards (274 meters) over a period of one season (Loe 1985).

Daily/Seasonal Activity

The southern rubber boa is highly secretive, primarily a burrower, and crepuscular or nocturnal in its activity. Southern rubber boas are active during evening hours or heavily overcast days with high humidity and air temperatures in the 60–70 F (15–21 C) range. Seasonal activity varies with the climate, but southern rubber boas probably hibernate from November through February or March (Loe 1985). In the spring when they emerge from their winter hibernacula in rock outcrops, specimens are usually found under rocks, logs and other surface objects. Adult males appear to outnumber females during the spring emergence period (Hoyer and Stewart 2000).

Diet and Foraging

Food consists primarily of small mammals, especially nestlings, and lizards and occasionally small snakes and salamanders (Stebbins 1954, 1985). Hoyer and Stewart (2000) conducted feeding trials with southern rubber boas and found that nestling *Peromyscus* ssp., nestling insectivores (*Sorex* ssp.), and lizard eggs were taken with the greatest frequencies. When nestling rodents are encountered, the snake will eat the entire litter if possible, deflecting any attacks from the mother mouse with its blunt tail.

Territoriality/Home Range

Rubber boas have not been observed to aggressively defend resources in the wild (Zeiner and others 1988).

Predator-Prey Relations

Because of its secretive behavior this snake is probably not subject to heavy predation. Adults and young may occasionally be taken by hawks and owls or by predatory mammals such as skunks and raccoons (Hoyer 2001, Zeiner and others 1988). However, there have been numerous reports of domestic cats bringing southern rubber boas home by residents in the Lake Arrowhead area (Loe pers. comm.).

Inter- and Intraspecific Interactions

Southern rubber boas potentially compete for food resources with California mountain kingsnake (*Lampropeltis zonata*) where their ranges overlap, and they may prey on mountain kingsnake eggs (Hoyer and Stewart 2000, Zeiner and others 1988).

Population and/or Habitat Status and Trends

The southern rubber boa is state-listed as threatened. According to the California Department of Fish and Game (2000), the status of southern rubber boa was unknown in 1999. Stewart (1991) notes that an assessment of the status of the southern rubber boa is complicated by a number of factors. The snake is secretive and difficult to observe, even where it might be considered common. Secondly, the snake truly does seem to be rare. During Keasler's 1981 and 1982 springtime searches, he found mountain kingsnakes (a Forest Service Sensitive Species) at a frequency about 10 times that of rubber boas.

On National Forest System Lands

Habitat trends on the national forest are changing rapidly due to the recent drought and tree mortality. Because of the potential for catastrophic fire resulting from the huge amount of dead fuel loading, a significant amount of fuels work is being done around the mountain communities and other developments in the San Bernardino and San Jacinto mountains. This is resulting in unprecedented ground disturbance. The effects on rubber boas is not known, but it has long been assumed that ground disturbance with heavy equipment was detrimental to the species. Unauthorized fuelwood gathering and off-highway vehicle (OHV) use on the Forest has been more effectively controlled in recent years. Mountain bike impacts in and around the communities are increasing greatly.

Beyond National Forest System Lands

Private land capable of supporting rubber boas continues to develop at a rapid pace. Large amounts of fuels work are also taking place on private land.

Threats and Conservation Considerations

Rubber boas are vulnerable to habitat loss from development on private land, water diversion or extraction, and land use activities that destroy soil or surface cover. The majority of known rubber boa locations are on private lands. The lush, mesic forests that are prime habitat for this species tend to be highly interspersed with private lands (e.g., around Lake Arrowhead and Idyllwild). Where such forest conditions occur on public land, care should be taken to maintain mesic conditions, downed logs, and leaf cover (Stephenson and Calcarone 1999).

Crestline to the Snow Valley Ski Area has long been considered the best southern rubber boa habitat in the San Bernardino Mountains. Currently, 44 percent of this area is private land subject to development (Stewart 1991). Twenty-seven of the forty recorded rubber boa localities are in this area and sixteen of

the twenty-seven are on private property.

Of all the known and potential habitat in the San Bernardino Mountains, roughly 81 percent is on public lands managed by the Forest Service. Stewart considered the most pervasive habitat impacts on National Forest System lands to be personal use fuelwood harvesting and off-highway vehicle use. He estimated that 46 percent of the known and potential southern rubber boa habitat received high to moderate impacts from fuelwood harvesting and approximately 35 percent received high to moderate impacts from OHV use. Other habitat impacts cited were fern picking, commercial timber harvesting, fire management, skiing, and land exchanges.

Stewart estimated that most of the suitable southern rubber boa habitat on private lands would be lost in the next 20-40 years, and in a worse case scenario, most of the habitat that is heavily impacted by OHVs and fuelwood harvest could also be lost. In his opinion, if this happened, the resulting loss of 50-60 percent of the suitable habitat would endanger the San Bernardino Mountains southern rubber boa population. To minimize potential losses of suitable habitat he recommended the following: 1) strict enforcement of fuelwood harvesting, 2) OHV regulations with monitoring, 3) additional Forest Service land acquisition of the best remaining habitat on private land.

Since Stewart's 1991 assessment, the San Bernardino National Forest has made some progress in controlling unauthorized OHV use and impacts from fuelwood harvest (Loe pers. comm.). A system of authorized OHV trails have been built and designated and enforcement using State OHV funds has been increased. Fuelwood gathering has been more strictly controlled and is now restricted to roads.

Mountain biking has greatly increased in recent years and this trend is expected to continue. To minimize the impacts of mountain bike use to the natural hydrology, there is a need to keep them on designated trails and avoid off trail use that would result in new trails being created.

There is limited information regarding the Idyllwild population. There has not been a significant effort to survey and document boa occurrence or habitat use. Assuming that the habitat and the elevations are similar to the San Bernardino Mountains, the threats from management activities are not as great. When compared to the San Bernardino Mountains, there are fewer people and less road access in the Idyllwild area. This corresponds with fewer impacts associated with OHV use and fuelwood gathering (Loe pers. comm.). However, the smaller amount of habitat in the San Jacinto Mountains results in greater natural risk.

The recent 2000-2002 severe drought in the San Bernardino and San Jacinto Mountains may have had a significant impact on the southern rubber boa. This 500-year drought event (by some estimates) has resulted in tremendous mortality of forest and shrub species. Extreme fears of major wildland fire have prompted the Forest Service, California Department of Forestry, and local agencies to launch into a massive fuels reduction program around the communities and organizational camps in the two mountain ranges. This will result in considerable ground disturbance on thousands of acres and a substantial increase over normal ground disturbance.

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The following is a list of conservation practices that should be considered for the southern rubber boa:

- Continue to implement the Habitat Management Guide for Southern Rubber Boa on the San Bernardino National Forest.
- Retain down logs and snags at or above the standard set in the 1988 San Bernardino National Forest Plan.
- Work cooperatively with other agencies (California Department of Fish and Game, U.S. Geological Survey, U.S. Fish and Wildlife Service, etc.) to conduct species and habitat surveys.
- Strictly control off-road vehicle travel in southern rubber boa habitat, including dispersed camping and fuelwood cutting.
- Require mountain bikes in boa habitat to stay on designated trails.
- Protect rock outcrops and riparian areas from ground disturbance.
- Apply the interagency fuels treatment guidelines developed with Fish and Game and California Department of Forestry.
- Prioritize acquisition of high quality boa habitat in parcels large enough to manage for boas and other threatened, endangered, and sensitive species.

Evaluation of Current Situation and Threats on National Forest System Lands

Factors that put the southern rubber boa at risk include the following: 1) it is on the extreme edge of its range and is isolated from other populations, 2) it seems to prefer flat productive areas that are prime for development and recreation, 3) it is sensitive to ground disturbance.

Most of the suitable southern rubber boa habitat on private land will be developed in the next 20-30 years. The effects of private land development also affect national forest. In the San Bernardino Mountains, there is a large amount of suitable habitat on the national forest. While this is expected to provide for viability, the population is expected to decline over time.

In the San Jacinto Mountains, there is a real threat to viability. These threats include the following: 1) little is known about their distribution and habitat, 2) the population appears to be much smaller than in the San Bernardino Mountains, 3) in areas of quality habitat, widespread ground disturbance is anticipated as plans are implemented to deal with the historically unprecedented drought and dead trees.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, and disjunct in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability outcome for National Forest System lands

1	2	3	4	4a	5	6
B, C in SJ	B, C in SJ	B	B, C in SJ	B, C in SJ	C, D in SJ	B

Viability outcomes in SJ are for the San Jacinto Mountains

The southern rubber boa is associated with moist woodlands and coniferous forests. The primary threats to this species are private land development, water diversion and extraction which disrupts the mesic conditions required, drought, ground disturbing activities, personal fuelwood harvesting and off-highway vehicle use. The majority of known rubber boa locations are on private land. The lush, mesic forests that are prime habitat for this species tend to be highly interspersed with private lands (e.g., around Lake Arrowhead and Idyllwild). These areas will likely continue in their recreational and resource use. These areas are developing at a rapid pace and this is expected to continue with its direct and indirect adverse effects on the boa. There is a huge amount of ground disturbance taking place in prime rubber boa habitat around the mountain communities as part of the fuel reduction program and implementation of the National Fire Plan. This work does not vary by alternative.

Under Alternative 1, there is a high level of investment in intensive control of human use at a few locations to protect sensitive resources, and actions needed to avoid and minimize effects on species-at-risk. There will be a low level of increase in OHV opportunities. Unauthorized OHV use is a substantial threat to boas. Alternative 1 has a large acreage in motorized use land use zones. There will continue to be slow and steady progress towards protecting and conserving this species.

The theme of Alternative 2 is to maintain biological diversity and ecological integrity while accommodating a gradual increase in recreation opportunities. Under Alternative 2, land use zoning is similar to Alternatives 1 and 4 with a large amount of land in motorized use zoning which is potentially detrimental to the boa. Increased vehicle access exposes more habitat to removal of dead and down wood and unauthorized vehicle use. There will be a low level of increase in OHV opportunities, which could potentially be a problem because of unauthorized use in boa habitat. Acquisition focuses on consolidation, species, and linkages. There will also be steady progress towards protecting and conserving this species, at a little faster pace than in Alternative 1, through the implementation of adaptive management.

Alternative 3 focuses on natural resource protection through a high level of special area designations while maintaining public access to existing roads and trails. It is similar to Alternatives 1 and 2, but there is much more area managed as wilderness and Back Country Non-Motorized zoning. There is a high level of investment to modify facilities to protect species (including road decommissioning). Conservation education and partnerships, and proactive habitat improvement and surveys are a part of

this alternative. There will be no net gain in OHV opportunities. Acquisition focuses on consolidation and species and linkages. Land use zoning emphasizes non-motorized public access, which should benefit southern rubber boa.

Although Alternative 4 is similar to Alternative 2 in the use of an adaptive management approach for species habitat protection, there is a greater emphasis on accommodating recreation demand and maintaining sustainable recreation opportunities while mitigating effects on biological diversity and ecological integrity. Alternative 4 is similar to 1 and 2 in that there is a lot of land in motorized land use zoning. There will be a low level of increase in motorized trails. New recreation opportunities may be developed where they are determined to be sustainable and compatible with other resources. Acquisition focuses on species and consolidation. This alternative will assist in the protection, conservation and recovery of this species while attempting to accommodate recreation demand. Mitigation of recreation impacts will be more reactive than in Alternative 2, 3, 4a, and 6 and occur after problems are identified. For Alternatives 2, 3, 4, and 4a, adverse effects from on-going activities in established sites will be equally mitigated.

Although Alternative 4a is similar to Alternative 4 in the use of an adaptive management approach for species habitat protection, there is a greater emphasis on only providing recreational uses that are compatible with the sustainability of the natural resources. There is a low level of growth of recreation use and facilities. Alternative 4a has a substantial amount of land in public non-motorized land use zones. There is a low level of increase in motorized trails. This alternative will have more dispersed recreation area management. This is beneficial to the boa because it reduces the amount of unauthorized vehicle use and removal of dead and down material. Habitat and imperiled population restoration activity efforts will be made in Alternative 4a by using a variety of strategies. There will be an emphasis on land acquisition for biodiversity. Forest visitors will have an increased understanding and appreciation of the local environment and an increased willingness to help maintain it. New recreation opportunities may be developed where they are determined to be sustainable and compatible with other resources. This alternative will assist in the protection, conservation and recovery of this species at a faster rate than Alternatives 1, 2, 4, and 5. The greatest difference between the Alternative 4a and Alternative 4 is the designation of a greater acreage of land use zones that are managed for non-motorized uses. This should benefit the southern rubber boa.

Alternative 5 has an emphasis of increased motor vehicle-based recreation activities, commodity development, and accommodating community infrastructure. This results in a more reactive approach to protecting species-at-risk, and the possibility of higher risks to the species and habitat because of the effects of more overall development, motorized uses and extraction activities occurring concurrently. The theme of this alternative is to emphasize land use zones compatible with development. There is a high level of investment in retaining and improving access for all uses and to allow recreation to continue as fully as possible with few restrictions. There would be a low level of public conservation education. Conservation objectives would be met at a much slower rate in Alternative 5 compared to any other alternative. This alternative poses serious problems for the southern rubber boa because high quality habitat occurs next to the communities where a lot of special uses would be located. Unauthorized vehicle use and fuelwood gathering are also big concerns for the boa. These activities are

predicted to increase substantially as a result of increased motorized access in this alternative.

Biodiversity is the primary emphasis of Alternative 6. Alternative 6 is generally similar to Alternative 3, although moving towards the desired conditions and achieving protection and recovery of at-risk species would occur at a faster rate than under any other alternative because of the primary emphasis. The transportation system is reduced to a core for public and administrative use. Existing facilities would be managed to protect resources or would be decommissioned. There is a high level of public conservation education program. There will be priority on surveys and studies which will lead to habitat restoration. As described in Alternative 3, Alternative 6 would also relocate conflicting uses, prioritize land acquisition for biodiversity benefits, and put more of an emphasis on enhancement of habitat for species-at-risk. The majority of the Forest is managed in non-motorized land use zones which is beneficial for this species

Alternatives 2, 3, and 6 have more land use special designations (recommended wilderness, Research Natural Areas, Special Interest Areas) that would inherently protect a portion of the land base and species from increased human use, disturbance and extractive demands due to less accessibility and higher biodiversity management emphasis.

The difference in the viability statements for National Forest System lands reflects the substantial differences in the condition of populations of this species in the San Bernardino and San Jacinto Mountains. The viability call for the southern rubber boa is better for the San Bernardino Mountains due to higher population numbers, better distribution and habitat information, plus better habitat conditions. The viability call for the southern rubber boa in the San Jacinto mountains were given a lower rating in San Jacinto because of, smaller population numbers, restricted distribution and lack of habitat and population information.

The Southern rubber boa is classified as a sensitive species under the Forest Service Region 5 Regional Forester's Sensitive Species list, and is listed as threatened under the California Endangered Species Act; which assures that any new project proposed in or near its habitat will undergo considerable analysis at the site-specific level. Forest Plan Standards were written to provide protection for the southern rubber boa.

Viability outcome for all lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C, D in SJ	C, D in SJ	C	C, D in SJ	C, D in SJ	D	C

The primary threats are from land disturbing activities including fuels treatments, fuelwood gathering and off-highway vehicle uses, as well as urban development on private lands adjacent to or within forest boundaries. Most private land within the boas range will be developed in the next 50 years. The sum total of effects from on and off National Forest System lands is likely to result in a dramatic reduction in the distribution and persistence of southern rubber boa. This will lead to an increased importance of the habitat found on National Forest System lands.

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Personal Communications

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**South Coast Red-Sided Garter
Snake**

Southern Sagebrush Lizard
