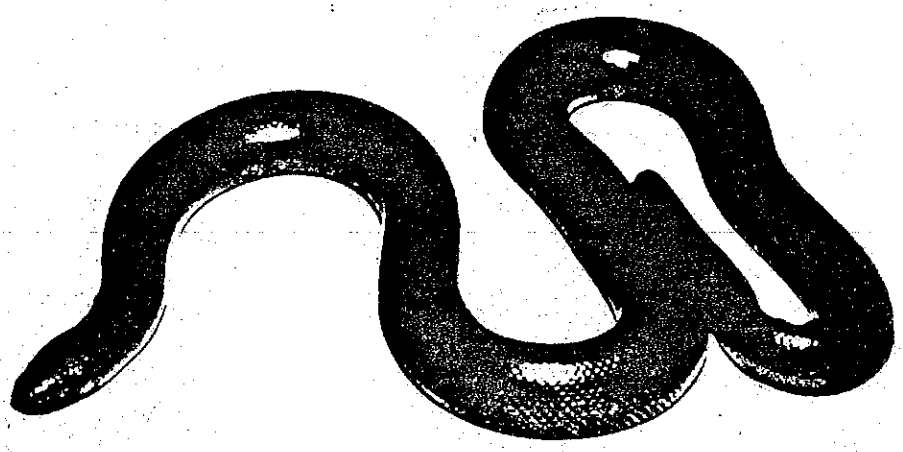

HABITAT MANAGEMENT GUIDE FOR SOUTHERN RUBBER BOA (Charina bottae umbratica) ON THE SAN BERNARDINO NATIONAL FOREST

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U.S. Department of Agriculture

San Bernardino National Forest

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INTRODUCTION

The southern rubber boa (Charina bottae umbratica) is a small secretive snake, of very restricted distribution, which was listed as rare on the first list of rare California reptiles over ten years ago, and is now listed as threatened on the State of California list of threatened and endangered species. Since the southern rubber boa was listed, habitat loss has continued at a very rapid pace, especially in the San Bernardino Mountains. With the passage of the California Wilderness Bill, the boa population on Forest Service lands in the San Jacinto Mountains is entirely within the San Jacinto Wilderness boundary, and its habitat is fairly secure from human-induced factors. The southern rubber boa is listed as a Category 2 candidate for federal listing by the US Fish and Wildlife Service, and San Bernardino National Forest habitat is considered by most experts to be critical to the continued survival of this subspecies.

The Forest Service conducts a variety of management activities that need to be carefully integrated with the biological needs of the southern rubber boa to insure its continued existence. This habitat management guide will serve to document the current knowledge of the southern rubber boa and its habitat requirements and outline the steps necessary for conservation and enhancement of its habitat on National Forest lands. The biological information presented in this plan is applicable to the southern rubber boa throughout its range, but the discussion of threats and habitat management will focus on the San Bernardino Mountains since the bulk of the known San Jacinto population is in designated wilderness. The San Bernardino Mountains are the area of greatest management concern and have the greatest opportunity for the Forest Service to influence the long term survival of the subspecies.

TAXONOMY AND DISTRIBUTION

The rubber boa (Charina bottae) is one of two members of the boa family present in the United States. It is smaller and more secretive in habits than the familiar rosy boa (Lichanura trivirgata). The rubber boa ranges from southern British Columbia to southern California and east to Montana , Wyoming and Utah. It is primarily an inhabitant of moist woodlands and coniferous forests. In the southern and interior parts of its range, its occurrence is spotty and confined to mountainous regions. Over much of its geographic range, populations of the rubber boa occur in isolated pockets. Populations occurring in southern California are found in this situation. This isolation is probably due to the warming and drying trend which has taken place since the last ice age and the resulting decline and isolation of cool moist habitats suitable for rubber boas. With the uplift of the Transverse Ranges (Santa Monica, San Gabriel, and San Bernardino Mountains) during the Pliocene and Pleistocene epochs, the rubber boa probably dispersed into southern California from the Sierra Nevada Range. The San Gabriels probably served as a corridor for this dispersal. Today however, there is considerable doubt among experts as to whether the rubber boa still exists in the San Gabriel Mountains. A probable explanation for the apparent absence of this snake in the San Gabriels is the small size and extreme isolation of pockets of suitable habitat. The

distributional hiatus represented by this mountain range may help explain the differentiation of the southern subspecies from its more widely distributed counterpart, the Pacific rubber boa (Charina bottae bottae).

The southern rubber boa (Charina bottae umbratica) is one of two recognized subspecies of the rubber boa. The other is the Pacific rubber boa (Charina bottae bottae). The southern rubber boa is known only from the San Bernardino and San Jacinto Mountains of southern California. What appear to be intergrade populations are found on Mt. Pinos and in the Tehachapi Mountains. The southern rubber boa is smaller in average size and averages fewer ventral, mid-body dorsal and subcaudal scales. It is usually a camel tan in color, compared to the dark brown or olive green color of the Pacific rubber boa. The frontal plate of the southern rubber boa usually has a nearly horizontal posterior margin in contrast to the distinctly convex or angular posterior margin of the northern subspecies.

The relationships amoung the various populations of the rubber boa are still poorly understood. Maps with southern rubber boa locality records and potential habitat in the San Bernardino Mountains and locality records for the San Jacinto Mountains are included as a part of this document. These maps were developed by Keasler, under Forest Service contract in 1982.

STATUS

The southern rubber boa is listed as Threatened by the State of California and as a Category 2 proposed species being considered for federal listing by the U.S. Fish and Wildlife Service. Threatened species are defined by the State as species that are not presently threatened with extinction, but are in such small numbers throughout their range that they may become endangered if their environment worsens. Threatened species are protected by State law and may be taken only for research purposes under a memorandum of understanding issued by the Department of Fish and Game, as authorized by the Fish and Game Commission. Category 2 taxa being considered for listing by the Fish and Wildlife Service are taxa for which information now in possession of the Service indicates that proposing to list the taxa as endangered or threatened is possibly appropriate, but for which substantial data are not currently available to biologically support a proposed rule. Further biological research and field study will normally be necessary to ascertain the status of the taxa in this category. Since its State listing as rare, habitat losses in the San Bernardino Mountains have continued despite efforts by the Forest Service and San Bernardino County to consider the well-being of the snake in areas of occupied habitat.

HABITAT AND HABITAT USE

Several studies have been conducted by the Forest Service to identify habitat components and determine distribution of the southern rubber boa on National Forest lands. These studies have provided some specific information regarding the habitat requirements of the boa and greatly improved distributional knowledge. Several studies failed to locate any boas using conventional collection methods. Although recent improvements in collection techniques have greatly improved the ability to locate boas, they are difficult to find. In a

six week period in 1981, a team of field workers were able to find only twelve boa locations searching in "ideal" potential habitat during an optimal time of year. A two month survey in 1982 in similar habitat found seven additional locations. The rarity and scattered occurrence of the southern rubber boa was validated in these surveys.

Like its northern relative, the southern rubber boa usually occurs in moist woodlands and coniferous forests. It is highly secretive, primarily a burrower, and crepuscular or nocturnal in its activity. Specimens are usually found under logs and other surface objects or in piles of leaf litter. Recent surveys have demonstrated the ability to find the snakes under rocks in the spring, both where they emerge from their winter hibernacula in rock outcrops and in areas of scattered surface rock exposed to the sun. These snakes are active during evening hours or heavily overcast days with high humidity and air temperatures in the 60-70 degree Fahrenheit range. Seasonal activity varies with the climate, but in southern California rubber boas probably hibernate from November through March, depending on weather conditions.

While the habitat requirements of the southern rubber boa have yet to be completely defined, the evidence suggests that it prefers mixed conifer-oak forests and woodlands at elevations of 5,000 to 8,000 feet. Old logs, surface rocks and rock outcrops provide daily shelters. Rock outcrops, and perhaps extremely large down logs, provide winter hibernacula. Adequate soil moisture seems to be essential to this fossorial snake which is most frequently observed in damp draws near springs, seeps, and streams during the summer months. This association with surface moisture, during the summer, is probably a seasonal phenomenon, however, as the southern rubber boa is most frequently found under rocks on ridges in the spring. 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 over a period of one season.

Overstory plant species most frequently associated with known rubber boa habitat include Jeffrey pine, sugar pine, ponderosa pine, white fir, black oak, and incense ceder. Small openings in the forest within occupied boa habitats usually have a dense cover of bracken fern and other herbaceous plants, or shrub cover of Ceanothus, manzanita or other species. These openings appear to be preferred as winter and spring habitat provided that adequate hibernacula such as rock outcrops are present. In general, southern rubber boa habitat appears to consist of some of the most vegetatively productive sites within the San Bernardino National Forest in this elevation range. Soils appear to be generally deep and well-developed, especially in summer habitat.

Surface objects such as rocks, and logs as well as a well-developed litter/duff layer are considered to be very important habitat components for rubber boas. They are needed in order to create and maintain areas of high soil moisture and to provide cover. These elements of the rubber boa's habitat also provide habitat for prey species, which most likely consist primarily of lizards, young rodents, and insect larvae.

THREATS TO THE BOA IN THE SAN BERNARDINO MOUNTAINS

Southern rubber boa habitat in the San Bernardino Mountains has been severely altered over the last 100 years. Much of the optimal habitat for this subspecies has been developed and is now a part of the various mountain communities. This type of high-density human development is not compatible with maintenance of rubber boas. Rubber boas have been able to survive only on the fringes of these communities.

Most of the optimal boa habitat was logged in the early part of the century. Large, high-intensity wildfires have modified some areas of prime habitat. The southern rubber boa has demonstrated an ability to survive these types of temporary habitat alterations. Boas are present (at least seasonally) in second growth timber and shrub and herbaceous openings.

Fuelwood gathering in areas adjacent to mountain communities has been taking place for many years and may have significantly reduced habitat quality within easily accessible areas. The Forest Service has attempted to rectify the shortage of down logs on a few areas where timber harvest and stand treatment is taking place by felling some trees and letting them lie.

Campgrounds, summer home tracts, and various organization camps have been located in what was once prime rubber boa habitat. Whether rubber boas still exist in these areas depends on the density of development, the severity of habitat alteration on-site, and the proximity of unaltered habitat nearby.

San Bernardino County has required developers to build rubber boa protection measures into some developments in occupied habitats. Measures have included reduced residence densities and areas left as open space.

There has been a significant increase in the use of off-highway-vehicles (OHVs) in the San Bernardino Mountains over the past 5 years. Damage is most pronounced in riparian areas, relatively gentle areas, and areas adjacent to mountain communities. Since mountain communities are located in and adjacent to the best rubber boa habitat, considerable damage to boa habitat has occurred where OHV use is the heaviest. The Forest Service has attempted to control OHV use, but up until this time has not been very effective in eliminating resource damage. One road and trail system has been closed to reduce damage to rubber boa habitat, but with reduced recreation budgets, the ability to enforce OHV regulations is decreasing. New loop trails are being constructed in the hope of shifting illegal use to well-designed trails.

Continuing land developments in the San Bernardino Mountains are fragmenting formerly contiguous large tracts of rubber boa habitat. Whether this habitat fragmentation will result in the loss of boa populations is not known, but previous studies indicate that the likelihood of extirpation from environmental disturbances or genetic problems increases with decreases in population size and isolation and fragmentation of habitats. The apparent lack of rubber boas in the San Gabriel mountains could be an indication of the vulnerability of rubber boa populations that are isolated.

The southern rubber boa's habitat preference for productive mixed conifer-oak vegetation on relatively gentle slopes with adjacent riparian habitat puts it in direct conflict with the high public demand for housing in these same areas. Preferred rubber boa habitat is some of the most valuable mountain real estate in southern California. Property near riparian areas is all the more valuable. Communities in the San Bernardino Mountains have been located, almost without exception, in what was historically prime rubber boa habitat. These communities are expanding at a very rapid rate, and it appears that all of the remaining private land capable of being developed in these areas will eventually be developed. Areas not developed will be primarily floodplains and steep slopes, which at this time do not appear, by themselves, to be able to support rubber boas. Much of the remaining undeveloped private land in rubber boa habitat will eventually consist of small isolated areas that may not be capable of supporting viable populations of the snake.

Roads and pets (dogs and cats) associated with urban development create additional significant threats to the southern rubber boa. Pets catching and bringing rubber boas to their homes is a fairly common occurrence, especially where areas of natural habitat exist adjacent to human development. Predation by dogs and cats in these areas is probably a significant mortality factor based on the large numbers of snakes reportedly taken. Paved roads are an attractant to rubber boas for thermoregulation during certain weather conditions and seasons of year, resulting in road kills. These two human-induced mortality factors associated with mountain communities raise grave doubts as to the value of small isolated habitats surrounded by urban development in perpetuating the southern rubber boa.

Heavy dispersed recreation use and developed recreation have been implicated as significant threats to the well being of the southern rubber boa. The most serious of these is believed to be off-highway vehicle use. Impacts include direct mortality from crushing of individuals and indirect impacts associated with habitat degradation such as soil compaction and drying of habitats resulting from accelerated runoff. Disturbance of small rock outcrops by OHV use is another potential problem. Some concern has been expressed over soil compaction and erosion resulting from foot and horse traffic. Additional developed recreation sites are being planned and constructed in potential rubber boa habitat. The ability of these sites to support rubber boas after construction and use is doubtful in light of existing examples.

Removal of excessive amounts of down wood and snags for firewood is a major concern to southern rubber boa experts. This activity is limited to areas where there is vehicle access. On areas of flat ground, vehicle access is increasing due to illegal OHV use, wood gathering and dispersed recreation that creates new roads and trails. Once a road or trail is started by illegal vehicle use, it will generally continue to be used. Over time, these become well-defined routes which encourage additional vehicle use and conflicts for the boa.

Commercial timber sales, which are designed to improve the health and vigor of the timber stands, do not have a significant impact on boas because snags and down material can be retained. After timber sales improve vehicular access, however, OHV use can cause substantial habitat quality losses as previously described. Improved vehicular access resulting from timber sales also opens areas up to increased legal and illegal fuelwood removal, which can degrade boa

habitat if sufficient amounts of dead wood are not retained. Indications are that public demand for fuelwood will continue to increase, especially in light of projected increases in natural gas prices. Many mountain community home owners have invested in wood burning stoves, assuming an unlimited supply of fuelwood in the mountains.

Land exchanges from public to private ownership and special use permits can result in the permanent loss of boa habitat, and further fragment existing populations unless carefully planned and implemented.

Site preparation associated with forest regeneration efforts and fuelbreak construction can have significant effects if not properly planned and executed. Barriers to boa movement between hibernacula and seasonal use areas can be created if large areas are denuded of ground cover with inadequate corridors retained.

The trend toward converting large blocks of habitat owned by organizations to urban development is a severe threat to the continued existence of the boa.

PROPOSED HABITAT MANAGEMENT

Southern rubber boa habitat will be managed to maintain viable populations as well-distributed as is possible considering Forest Service land ownership patterns. To accomplish this, the following standards and guidelines for habitat maintenance and enhancement will be applied to all designated habitats within the range of the species, excluding parcels shown in red on the attached map. This includes all known currently occupied prime habitats of the species as well as those suspected habitats that should be managed to maintain habitat suitability.

Parcels shown in red are known or suspected rubber boa habitat that are not considered critical to the survival of the rubber boa if this plan is implemented. They are isolated parcels of National Forest land that are difficult to manage for any resource activity. They are being increasingly impacted by the development of adjacent private lands and associated activities. In general, they are marginal habitat, are now or will eventually be somewhat isolated from other boa habitat, or are on the extreme edges of areas of suitable habitat. They are not considered as significant for the perpetuation of the southern rubber boa and are identified as available for disposal through the Forest land adjustment program. There are some private lands within the San Bernardino National Forest which are known or suspected habitat, and it is the intention of the Forest Service to acquire these, if feasible, to help insure the continued existence of the southern rubber boa on the Forest.

<u>All Occupied and Suspected Habitat (Letters and Roman Numerals on Map)</u>

1. Avoid creating isolated populations or habitat for rubber boas in management activities and uses.

2. Reforest areas where wildfire has converted forested areas to brush.

A. Retain corridors of vegetation in site preparation projects to provide for movement of boas between rock outcrops and drainages.

B. Retain vegetative cover along drainages and around rock outcrops.

C. Plant native species while striving for mixed species composition including hardwoods and conifers.

D. Conduct ground-disturbing activities when boas are safe in hibernacula if possible.

3. Restrict OHV use to designated and designed roads or trails.

A. Locate routes outside of riparian areas and away from hibernacula and movement corridors whenever possible.

B. Increase enforcement and public education efforts to gain compliance with OHV regulations.

C. Monitor OHV damage to rubber boa habitat to determine whether existing controls are adequate. Institute more stringent controls, including designated route closures, construction of vehicle barriers, and increased enforcement where monitoring indicates downward trends in boa habitat conditions.

4. Limit vehicular access to the minimum number of designated roads and trails needed to provide for compatible dispersed recreational use and needed management activities.

5. Close roads not needed for management or desired levels of public use.

6. Strictly enforce fuelwood cutting regulations.

7. Manage timber stands to perpetuate mixed species composition and maintain health and vigor.

A. Improve habitat conditions for rubber boas and associated wildlife species with K.V. funding in conjunction with timber sales by creating snags, down logs, and rock outcrops where lacking.

B. Retain 2-3 down logs per acre and sufficient snags as future replacements in forested areas. Down logs should be a minimum of 20 feet long and at least 12 inches in diameter to meet this requirement. Strive for a mixture of logs in various stages of decomposition. (Note: data are not available at this time to make firmer requirements. This requirement will be reevaluated as work being conducted by Chris Maser in the Pacific Northwest progresses.)

C. Monitor amounts of dead and down material in occupied rubber boa habitat to determine whether objectives are being met.

D. Lop and scatter or leave slash piles for cover and as prey substrate where possible, rather than burning slash.

E. Close timber sale roads and skid trails to public vehicular use unless needed to meet desired management and public access objectives.

8. Give consideration to keeping treated areas small and retaining down logs and unburned corridors for cover when planning for prescribed burns.

A. Seeps, springs and riparian areas will be excluded where possible from prescribed burns.

9. Protect rock outcrops, springs, seeps and riparian areas from mechanical disturbance where possible.

10. Acquire private land which will consolidate National Forest land for protection of rubber boa habitat and to facilitate Forest Service management activities.

11. Coordinate with the Southern Rubber Boa Advisory Committee, as needed, to assure optimum habitat management.

12. Adjust habitat management prescriptions, as necessary, to assure continued perpetuation of this species and its habitats.

OCCUPIED HABITAT (Letters on Map)

1. Compensate for any losses of high quality boa habitat by securing conservation easements on or acquiring private lands of equal or higher value through direct fee acquisition or land exchange.

2. Mitigate for habitat quality reductions resulting from planned management activities and land uses. Specific mitigation measures will be applied on an action-specific basis and should include recommendations set forth by discussions of these activities with the Southern Rubber Boa Advisory Committee.

3. Work actively with county and city governments in planning actions to ensure coordinated habitat management to the greatest extent possible.

PLANNING, RESEARCH AND INVENTORY

This plan is based on the assumption that the continued existence of the southern rubber boa is currently being jeopardized by a variety of land use activities, and that unless specific measures for protecting populations and habitats are followed, the boa will need to be listed by the federal government as threatened or endangered. This assumption could be wrong, but in the opinion of experts, the concern is real. It is the intent of the Forest Service to manage the habitat for the southern rubber boa so that listing will not be necessary.Additional information on the life history and the habitat requirements of the southern rubber boa is needed. Additional inventory work would also more accurately determine boa distribution. Extent of threat to the boa can then be determined by determining the degree and severity of habitat modification from a variety of activities.

This plan presents habitat management guidelines for the southern rubber boa on Forest Service lands based on current information. Recent advances in inventory techniques plus a considerable amount of interest in the snake should provide additional information which can be applied toward effective species and habitat management. The formation of the Southern Rubber Boa Advisory Committee has helped agencies concerned with the boa coordinate their management activities. In order for this plan to best provide for the needs of the southern rubber boa and interface with the multiple use demands within the San Bernardino National Forest, it needs to be a dynamic document. The Forest will meet at least annually on a formal basis with the Southern Rubber Boa Advisory Committee to evaluate any new information and update management actions within the plan.

REFERENCES

Alten, Gary R. and G. Keasler. 1978. Southern rubber boa study, Mt. Pinos Ranger District, Los Padres National Forest. Unpublished report to the U.S. Forest Service, 38p.

Banta, Benjamin H. 1979. An analysis of the status of the extant populations of (Charina bottae umbratica). Unpublished report to the U.S. Forest Service, 20p.

Cereceres, Celia 1977. Habitats of the southern rubber boa (Charina bottae umbratica) in the San Bernardino Mountains. Unpublished report to the U.S. Forest Service, 13p. and 2 maps.

Keasler, Gary L. 1981. Rubber boa survey for the San Bernardino National Forest. Unpublished report to the U.S. Forest Service, 26p. and 2 maps.

_____ 1982. Eastern San Bernardino Mountain southern rubber boa survey. Unpublished report to the U.S. Forest Service, 22p. and 2 maps.

Stewart, Glenn R. 1977. Charina, C. Bottae. Pages 205.1-205.2 In: L.D. Wilson, ed. Catalogue of American Amphibians and Reptiles. Society for the Study of Amphibians and Reptiles.

_____ 1976. Final report on southern rubber boa, survey in the Angeles National Forest. Unpublished report to the U.S. Forest Service, 6p. and 2 maps.

* In addition to the above references, letters to the Forest Service from the Southern Rubber Boa Advisory Committee and Glenn R. Stewart, recognized southern rubber boa expert, making recommendations on specific projects were used.

** The draft of this plan was reviewed by the Deputy Forest Supervisor, Forest Supervisor's Staff, involved District Rangers, the Department of Fish and Game, Long Beach and Sacramento, the U.S. Fish and Wildlife Service, Sacramento and Laguna Niguel, San Bernardino County Planning Department, and all members of the Southern Rubber Boa Advisory Committee. All comments were incorporated where possible.