

U.S. Fish and Wildlife Service

Draft

Habitat Assessment Guidelines & Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat

“The purposes of the Endangered Species Act of 1973, as amended, are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved . . . and to provide a program for the conservation of such endangered and threatened species.” (The Endangered Species Act of 1973, as amended)

The language contained in the Endangered Species Act of 1973, as amended (Act), requires the U.S. Fish and Wildlife Service (Service) to not only protect individual animals, but has the further obligation of providing listed species with functioning ecosystems so protections provided by the Act are no longer necessary. For the Service to achieve this goal, the following guidelines and survey protocol have been developed to facilitate accurate assessments of the presence/absence of the federally endangered riparian brush rabbit (*Sylvilagus bachmani riparius*) and riparian woodrat (*Neotoma fuscipes* ssp. *riparia*). The information obtained will help the U.S. Fish and Wildlife Service respond to requests for applicable Federal permits and licenses in a timely manner, and to fulfill our mandate to conserve and recover the species.

Riparian Brush Rabbit Background

The riparian brush rabbit is California- and federally-listed as an endangered species (U.S. Fish and Wildlife Service 2000). It was also identified as a *Critical Needs Species* under terms and conditions of the *Friant Biological Opinion* (U.S. Fish and Wildlife Service 1991). It occupies riparian communities dominated by thickets of willows, wild roses, blackberries, and other successional trees and shrubs, and on a seasonal basis, dense, tall stands of herbaceous plants adjacent to patches of riparian shrubs in the northern San Joaquin Valley. All known populations of these species are under significant, proximate threats of extinction.

Riparian Woodrat Background

The riparian woodrat federally-listed as an endangered species (U.S. Fish and Wildlife Service 2000)

They are generally found in riparian areas where shrub cover is dense. The highest densities of houses and woodrats are often encountered in willow thickets with an oak overstory. All known populations of riparian woodrats are under significant, proximate threats of extinction.

Riparian woodrats build and live in houses of sticks and other litter, the same as other populations of dusky-footed woodrats. These conical structures are commonly leaned up against the base of an oak or willow. They can also be found high up in trees. Houses typically are placed on the ground against or straddling a log or exposed roots of a standing tree. They also are placed in the crotches of trees and hollow logs, and nests also are placed in cavities in trees. Arboreal nests are hardest to locate, but often a pole of droppings at the base of a tree signals their presence (unpubl. Observ.). The best time to survey for arboreal nests is just after trees

loose their leaves in autumn or early winter.

Woodrat houses can persist for many years (20-30) so accurate mapping is helpful in determining relative density and distribution. Houses should be examined for activity and the proportion of occupied houses noted. This will provide a measure of relative population size and density. Occupied houses generally are well-maintained, conical (as opposed to rounded), and have two to three well-used entrances. Many occupied houses have a small clear “patio” outside a main entrance. Extensive deposits of feces often are found around entrances and the patio are possible a result of house cleaning. Fresh cuttings of green plant materials often are placed on the exterior and interstices between sticks and other building material. In autumn, acorn shells should be evident around entrances.

One useful adjunct to surveying is to listen for “tail rattling,” the rapid staccato tapping of the woodrat’s tail on wooden substrates. Bursts of tail-rattling can last 5-15 seconds or longer, and usually are repeated. They can be quite loud, with volume dependent on substrate and muffling by the surrounding environment. This behavior is associated with territoriality and is more pronounced in spring and summer. Adults sometimes tail-rattle in response to simulated tail-rattling, predators, and distress calls of young. This is usually done arboreally, but also occurs inside houses in response to intruding woodrats and outside noises.

Fecal pellets can be found in distinct deposits around nests and on favorite logs or limbs where rats rest during nightly activities. Most feces are deposited at particular sites-sandy areas seem to be favored for their main latrines. These latrines probably have a territorial function. Pellets are cylindrical with rounded ends, but may vary from this pattern, with squared or (truncate) to bluntly-pointed ends. Dried pellets are slightly curved. Length ranges from 8 to about 13 mm, averaging 10.7 mm. Width averages 4.6 mm with a range from 3.9 to 5.3 mm (Linsdale and Tevis 1951).

Process

Surveying for these two species shall take a two-tiered approach. The first level is a habitat assessment to quantify and qualify habitat in the restoration or project area. If it is determined that suitable habitat exists, the next step will be live-trapping. Due to their extreme low numbers, the U.S. Fish and Wildlife Service requires that biologists who intend to use traps to survey for the riparian brush rabbit and the riparian woodrat obtain a Section 10(a)(1)(A) Recovery Permit. However, the habitat assessment portion of the survey may be conducted by a qualified biologist familiar with San Joaquin Valley riparian ecosystems who has experience working with and identifying mammals. These skills are essential to maximize the probability of detecting signs and to avoid potentially harassing the species in occupied habitats. Throughout the habitat assessment and surveying process, we encourage the applicant to maintain close coordination with a representative from the U.S. Fish and Wildlife Service.

The habitat assessment and survey protocol should be used within riparian habitats (only riparian habitats?) From....

The Service can provide a list of quads where the riparian brush rabbit and riparian woodrat may

be found. The quad list is not necessarily inclusive and the Service should be contacted for guidance concerning other land use types that may be inhabited by these species.

Habitat Assessment

A habitat assessment for the riparian brush rabbit and riparian woodrat shall complement and inform a comprehensive biological assessment. To enable the Service to evaluate the project's impacts, the following information is required:

Project Description and Map

A description of the proposed project and a map showing the precise location of the project site. The project description needs to include the project name, county where the project is located, the acreage of the project site, and the distance of the project to the closest known occurrence of the riparian brush rabbit and riparian woodrat.

Hydrology

Among the threats to riparian brush rabbit is flooding and the complete inundation of habitat.

1. Name and describe the river, stream, creek, water diversion, flood basin, irrigation canals, water pumping system or systems etc. associated with the proposed project site in both the upstream and downstream directions. If riparian brush rabbits were displaced downstream during a flood, where might they go? What habitat, if any, is available downstream? Approximately how wide is the river in the project area.
2. Discuss the manner in which federal and state water flood control, storage, delivery, and export programs, may affect habitat. Discuss the manner in which existing regulatory measures to protect listed as threatened or endangered fish may conflict with efforts to protect riparian brush rabbit habitat from flood or desiccation. Are there any flood and restoration easements in the project area?
3. Provide maps showing the 100, 500, and 1,000 year floodplain of the reach that may be affected by the action, including the areas that will be indirectly affected. Map the changes in flood flows that would result from the action, including: the volume of buildings that would be placed in the floodplain (with any ring levees), increases in the rate of runoff due to the buildings and paving that will be done, and any flood management levees, levee setbacks, detention basins, bank armoring, reservoir and canal management, and bypass channel construction that would be needed to provide adequate protection from expected levels of flow events. Account for the volumes and low rates expected in the system before and after the action, including any increases due directly, or indirectly, to the action.

Soils and geomorphology

Frequently flood-scoured and silt deposit areas may have been preferred browsing sites historically, due to the colonization of grasses and forbs to these areas. Quantify and describe by

mapping and/or aerial photography the following:

1. presence and extent of flood-scoured and silt deposit areas
2. active channel, active flood plain, lower and upper flood plain terraces at the 100 year flood level.
3. area of high ground refugia contiguous with habitat that would remain above water in the event of a flood.

Maintenance Activities

Private, local municipality, state, and federal water projects include activities such as the regular maintenance of levees and other flood control structures. These activities have the potential to impact riparian habitat. Channel maintenance including dredging may result in take of the riparian brush rabbit. The clearing of vegetation by burning, manual removal, and/or herbicide application has the potential to result in take of the riparian brush rabbit. Prescribed reduction in the fuels that occur in riparian habitat may benefit the riparian brush rabbit by reducing the risk of wild fire. Intensive ground squirrel poisoning may have affected populations

1. Discuss maintenance activities within the habitat assessment area.
2. Describe types of maintenance activities including those which are standard, routine, as-needed, emergency, under a management plan, seasonal, etc.

Description of adjacent land use

The assessment shall describe, using maps and/or aerial photographs, the use of the land adjacent to the riparian zone and within two kilometers minimum in each direction. The habitat assessment should report any current or reasonably foreseeable plans for residential commercial agricultural or other development that would prohibit future habitat restoration efforts on adjacent lands. Among the threats that development projects pose to riparian brush rabbit are river channelization, habitat loss and fragmentation, increased human accessibility, increased use of pesticides, increased risk for catastrophic fire, vandalism, legal or illegal hunting, competition with non-native species, and the introduction of domestic cats or other predators.

- 1) Describe the levee or slope of the land
- 2) Flow regimes in the area
- 3) Vegetation management
 - * exotic control
 - * fuel management
 - * planting
 - * cutting and thinning

A brief description on the type and quality of habitat, and its use, on the opposite side of the watercourse should also be provided.

Vegetation: diversity, distribution, structure

Riparian forests are structurally and floristically complex vegetation communities. These forests occur in many different forms throughout the Central Valley. The following list includes many of the plants which characterize riparian habitat.

Plant list

- Overstory

Platanus racemosa (California sycamore)

Populus fremontii (Fremont cottonwood)

Quercus lobata (valley oak)

Salix spp. (willow spp.)

- Intermediate layer

Acer negundo subsp. californicum (box elder)

Fraxinus latifolia (Oregon ash)

Salix spp. (willow spp.)

Sambucus spp. (elderberry)

- Vines (lianas) growing through various layers

Aristolochia californica (Dutchman's pipe vine)

Clematis spp. (Wild clematis)

Vitis californica (wild grape)

- Undergrowth

Artemisia douglasiana (Douglas' sagewort))

Baccharis pilularis (coyote brush)

Rhus diversiloba (poison oak)

Rosa californica (California wild rose)

Rubus spp. (blackberry)

Urtica dioica (stinging nettle)

native and non-native grasses and sedges

native and non-native forbs

Describe any areas in the vicinity of habitat to be affected, directly or indirectly, by the action (plus areas within about 1/4 mile downstream of the affected area) that remain above water, including the presence of any vegetation or rocky cover that could protect rabbits and other wildlife during flood events. These areas can be either islands during floods or connected to adjacent uplands.

Describe the continuity of the vegetative communities between the project site and five miles upstream and downstream.

Distribution

A habitat assessment shall describe (taxa keyed to species) and quantify with mapping and/or aerial photography, the location and number of clumps of dense continuous vegetation that are 460 square meters (4,951.398 square feet) or greater. Dense continuous clumps tend to be dominated by *Rubus spp.* (blackberry) and *Rosa californica* (California wild rose). They are characterized as allowing little light to penetrate to the substrate due to prolific stem growth and foliage orientation.

Structure

•Succession

A habitat assessment shall describe and quantify with mapping and/or aerial photography, the presence or absence of old growth overstory. Vegetation should be keyed to species and categorized into recent, intermediate, or old growth successional stages. The distribution of overstory trees in relation to understory shrubs should be included.

The level and type of disturbance present at the project site should also be discussed.

Things to Look for and Record

The assessment should report evidence of areas in use by riparian brush rabbit and/or riparian woodrat, specifically the following:

1. travel paths or runways
2. areas with fecal pellets/droppings
3. areas with clipped sedges/grasses
4. “resting” logs proximal to dense vegetation
5. tufts of fur on vegetation
6. skulls or bones
7. typical and atypical woodrat houses
8. footprints

It is essential to search thoroughly in thickets of willows, blackberries, poison oak, wild roses, and other shrubs for the above listed indicators of presence. Signs of woodrat use may be found in the canopy of trees or at the base of trees.

Photos

A series of photos should be taken of the vegetation in the area, showing diversity, height structure, and density. Any woodrat houses encountered should be photographed and GPS coordinates should be taken for them.

Refugia

The habitat assessment shall characterize the distribution and structure of vegetative cover occurring on refugia if refugia are present. The report should also note if the vegetative cover is continuous from low elevations to the high ground refugia.

Other species

Look for and list signs, knowledge, and sightings of other species known to occur in the survey area.

All riparian brush rabbit and riparian woodrat detections should be recorded and subsequently plotted to estimate the location and extent of habitats utilized. This will help researchers

determine where traps should be set if it is decided to survey for the animals.

Confirmation trapping for the RWR may be required if signs are present and habitat appears suitable. If woodrat houses are located, trapping is not necessary to verify presence.

Note: The Service must document effects of an action, as well as possible, even if the action agency does not provide the information necessary to be sure that an effect will not occur. If you do not adequately demonstrate that an effect will be minimal, we must, by law, make a reasonable estimate of the expected level of the effect and prescribe measures to minimize the impacts on the species.

Upon completion of the habitat assessment, a detailed report shall be written describing, in detail, the above requested information for the site. This report shall be sent to the Service as part of the biological assessment, or as an addition to it. The Service will then send a biologist to the site to verify the habitat assessment.

Trapping Protocol

In order to conduct trapping surveys, you must have a valid 10(a)(1)(A) Recovery Permit. These guidelines have been developed to minimize exposure to excessive or inappropriate handling, predation, temperature extremes, stress, shock, capture myopathy, and undue suffering. The following protocol contains general requirements of all surveys. Adjustments to this protocol may only be made with Service concurrence.

Field Data Form

Researchers are expected to keep detailed and precise notes throughout the length of the survey. The following information should be recorded on the top of each field data form: Date, Researchers, 10(a)(1)(A) Permit Number, Location, County, File Number(s), Weather, Moon Phase, Start/End Dates, AM/PM, Census Day, Number of Traps Set, and Comments. The following information should be recorded for each animal trapped: Species/subspecies, Trap #,

The researcher is also responsible for taking note of all other species that were trapped incidental to the target species, and their general physical appearance upon release.

Length of Survey

The optimum time of the year to survey is from May through the end of September. Surveys during this time shall be conducted for a minimum of five days. Detectability from October through April is generally lower, therefore surveys conducted during this time shall span a total of 7 days.

Lactating mothers?

Placement of Traps:

The amount of traps used shall be determined by the size and associated vegetation of the area to be surveyed. However, there should be no less than five traps per acre on a large project site. To determine where to set the traps, one must identify possible travel pathways. Traps intended to catch rabbits should be placed towards the edge of vegetative clumps, where they are more likely to feed.

Providing there are no large breaks in vegetation

Minimum of 1 kilometer in both directions from project site or until break in habitat of 500 feet or more.

If the area is particularly large or stretched for more than 2 kilometers, it may be necessary to repeat the trapping sequence more than one time.

Types of Traps:

We recommend the use of Tomahawk brand double-door, wire-mesh traps (15.2 cm wide and high by 61 cm long). Traps should have plywood strips wired to the top and sides to protect captives from predators. Between 5-15 traps per acre is generally an appropriate number. Traps should be placed as close as possible to house entrances. Arboreal trapping should be done, where appropriate, using bungi cords to secure livetraps to trunks and limbs.

Traps should mainly be placed on the edge of habitat, as rabbits and rats generally tend to feed in these areas.

Other traps may be used upon approval of the Service.

Bait:

An effective and recommended bait contains a mix of rolled oats, diced apples, molasses, and finely chopped or ground walnut meats (a few ounces of walnuts will go a long way). Some bait should be scattered near the doors of the trap and a larger amount placed on both sides of the tripping treadle.

Monitoring Traps:

Traps should never be left open all day or all night. The best time to capture rabbits and rats is during the crepuscular period in the evening and in the morning. Traps should be open. Therefore, traps should be opened approximately one hour before nightfall.

Marking Animals:

Unless given prior permission by the Service, animals shall not be permanently marked for identification purposes. To temporarily mark animals during the course of a trapping survey, it is appropriate to use a dark colored non-toxic marker on the underside of the animal. Other

marking techniques must first be approved by the Service.

Measurements:

Data to be recorded for both species:

Weight (in grams): All rabbits and rats, even the non-target species should be weighed. To obtain the weight of an animal, it should be placed in a clean, dark, cloth bag, and weighed. The weight of the bag should then be subtracted and the animal's weight recorded.

Trap Number

Identification Number Ear tag, Pit tag, or other (describe). Authorization of the type of marking to be done on the animal must first be authorized by the USFWS.

Sex

Age: Specify if each individual is a juvenile or adult

Reproduction: Specify if the individual is able to reproduce and if they are gravid or lactating.

Samples taken: Specify if hair, pellets, or other (describe) samples were taken. *Note: Unless previously authorized, it is not permissible to take blood or tissue samples.*

Notes: Record the general physical condition of the animal, and any other pertinent information

The following measurements should be taken for the riparian brush rabbit:

Ear (mm),

Hind-foot (mm)

The following measurements should be taken for the riparian woodrat:

Length of body (from nose to ?? and length of tail)

Samples:

In order not to affect the normal behavior, physiology, ecology or survival of individuals, we ask that marking techniques no long-term hindrance or irritation from the mark

No other marking techniques should be used without prior approval of the USFWS.

To minimize the risk of the riparian brush rabbit injuring itself, or the handler, Improper restraint can lead to physiological disturbances.

Fur samples should be taken from each animal captured. These samples should be taken from the back of the animal, pulled close to the roots, and then stored in paper envelopes.

Unless given prior permission, no other types of samples may be taken.

The numbers and locations of other species detected should be recorded during each survey and subsequently reported to us.

Photos

In areas from where there have been no previous recorded occurrences, it is essential to take photographs. A photo in which the entire body of the animal is visible should be taken for each species. For the riparian brush rabbit additional photos should be taken of the ears and tail. For the riparian woodrat additional photos should be taken of the back feet.

Inclement Weather Conditions:

Surveys should not be conducted during periods of excessive or abnormal cold, heat, wind, rain, or other inclement weather that individually or collectively may reduce the likelihood of detection. During rainy weather it will be essential to take extra precautions to ensure that animals are not exposed to puddled water or direct rain. Traps should be weatherproofed and situated in areas that will not be in the path of running or standing water. If these modifications result in placement of the traps in less than optimal areas, the trapping effort shall be delayed until the rain stops and the puddles dry sufficiently. In moderate to heavy rains, animal activity is likely to be minimal and surveys will have to be postponed until the rain stops or slows down. An all-weather plywood housing should be used during cold or wet weather

If trapping efforts occur at a site where riparian brush rabbits and riparian woodrats, are not known to occur, animals should be photographed.

A final report, including maps, should be prepared. The report should include survey dates and times, descriptions or accounts of the methods, locations, data and information identified in preceding sections.

This final report should be provided to us (at the address letterhead) and to the local office of the Department of Fish and Game within 45 calendar days following the completion of the survey effort. This requirement is separate from the 10(a)(1)(A) requirement to

Notes to Surveyer

Low detectability

Due to the difficulty of capturing rabbits and rats, and to their low population numbers, trapping surveys may fail to show presence, even when the site is occupied. If sufficient sign exists, but rabbits and rats are not captured in traps, the site may be considered occupied.

Researchers should avoid restraining animals that are gravid. Rabbits should be handled quickly and without sudden movements.

When handling the rabbits, excessive noise from equipment, vehicles, and talking should be minimized.

Upon receiving all of the above information, the Service will evaluate the information as to whether or not the project site represents habitat, the quality of the habitat, and the value of that habitat to the recovery of the riparian brush rabbit and riparian woodrat. The Service will set forth its reasoning for such determination in writing within 30 days. If it is determined that the project will not result in take, the project applicant may proceed with the project. If the Service determines that take will occur as the project is currently presented, the project applicant should initiate discussion with the Service to determine appropriate project modifications to protect kit fox, including avoidance, minimization, restoration, preservation, or compensation. If signs of riparian brush rabbits and riparian woodrats are not found using this survey protocol, but the project is within the known historic range of the species, the Service will interpret the results, and appropriate project modification, if necessary, will be discussed with the applicant. Factors the Service will consider in interpreting such cases include the number and dates of kit fox sightings, distance of such sightings from the project site, the continuity of habitat or vegetative types between kit fox sightings and the project site, habitat suitability within the project site, available results of surveys in the project vicinity, and the opinions of other riparian brush rabbit and riparian woodrat experts. If, based on such information, the Service determines that a project site represents habitat, it will, if requested by the applicant or the applicant's representative, set forth its reasoning for such determination in writing.

* part here about compensating for habitat.

Additional Information, limitations, and caveats

If riparian brush rabbits or riparian woodrats are identified, the Service must be notified immediately and a California Natural Diversity Data Base form must be completed and mailed to:

Results of these surveys together with other pertinent information must be compiled into a survey report or biological assessment and submitted to the Service for review and comment.

The applicant should consult the California Department of Fish and Game to determine their responsibilities under the California Endangered Species Act

If the applicant conducts the prescribed surveys without finding any riparian brush rabbits or riparian woodrats, and either of these species is later determined to occupy the project site, all project actions likely to result in incidental take of kit foxes shall cease immediately and the Service shall be contacted immediately for further guidance.