

2003 Annual Habitat Monitoring Report Carnegie State Vehicle Recreation Area

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Amphibian survey 2003- Corral Hollow



Southern Alligator Lizard- Waterfall Canyon

Summary Report

Site Description

Carnegie State Vehicle Recreation Area (CSVRA) encompasses 1,500 acres in the coastal hills of western San Joaquin and eastern Alameda counties, used for off-highway vehicle (OHV) recreation (see map in Appendix). Recently nearly 3,000 additional acres was acquired adjacent to the unit, not currently used for OHV recreation. The topography is steep, with several habitats represented: blue oak woodland, annual grassland, coastal scrub, and riparian. The climate is Mediterranean, with cool, wet winters and hot dry summers. The unit is open to motorcycle, ATV, and 4 X 4 recreational use in all areas, except for the newly acquired properties. A network of established vehicle trails create a web over the hills and through the ravines of CSVRA.

Wildlife typically seen on or near the unit includes black-tailed deer, tule elk, coyote, red-tailed hawk, and California ground squirrel. In addition, eight special status animal species are known to inhabit CSVRA. These include foothill yellow-legged frog, California red-legged frog, Western pond turtle, Western spadefoot toad, California tiger salamander, golden eagle, prairie falcon, and Townsend's big-eared bat. Also, potential habitat exists for Alameda whipsnake and San Joaquin kit fox. Part of the purpose for monitoring wildlife in the unit is to maintain a vigil for threatened or endangered species, and to detect any changes in species abundance or composition of species in general.

Surveys

In 2003 surveys were conducted at CSVRA to gather species richness and abundance data for amphibians, reptiles, birds, and nocturnal species. An additional survey for birds was conducted in January 2004. A team consisting of 2-3 ecologists from the Inventory, Monitoring, and Assessment Program (IMAP), and 1-2 ecologists from Twin Cities District conducted all surveys. For each taxon, methodologies conducted in past surveys were reviewed. In some cases, those protocols were retained and used in the field; in other cases, different protocols were implemented in order to better satisfy the objectives of the survey. A summary of the protocols used is presented here:

<u>Survey</u>	<u>Protocol</u>
Amphibians	Daylight & nocturnal visual searches, dipnet searches, audile searches (to detect presence/ absence of species only).
Reptiles	Permanent line transect, area constrained visual search
Birds	Area search using transects, visual & audile identification
Nocturnal	Driving transect, using high-intensity spot lights
Small Mammals	To be done spring 2004, using trapping grids

In all cases, survey staff spent time prior to entering the field reviewing the results of past surveys to gain some general knowledge of known species present at the unit. Field guides and keys were also reviewed to assure optimal identification skills while in the field. In some cases, experts in identifying or surveying certain taxa were consulted.

In the past, some monitoring had been contracted out to various consultants and universities, resulting in five years of data for vegetation, amphibians, birds, and mammals. Part of the design of these monitoring studies included plots in non-riding areas, to be used as control plots. Monitoring in 2003 included use of these control plots in PCSVRA for herpetofauna and birds.

Time Expenditure

The following table presents time expenditure data for each of the surveys conducted:

Survey	# Staff	Total Person-Hours (approx.)
Amphibian	2 to 4	48
Bird (Spring)	2 to 4	76
Bird (winter)	2 to 3	30
Reptile	2 to 4	66
Nocturnal	2 to 4	9

Total person-hours of all surveys:

Survey schedule:

1. Amphibian surveys- March 6 – 7, 2003.

2. Bird surveys- May 6, 7, 14, 2003 and January 22 - 23, 2004.
3. Reptile surveys- September 16 – 18, 2003.
4. Nocturnal surveys- September 9 – 12, 2003

Results

1. Amphibians: Three species of amphibians were detected by surveys in the unit, five species including incidental observations. The only special concern species found in surveys was the California red-legged frog (*Rana aurora*).
2. Reptiles: Two species of reptiles were detected using line transects: Western fence lizard (*Sceloporus occidentalis*) and Western rattlesnake (*Crotalus viridis*). Included was an incidental sighting of a California whiptail lizard (*Cnemidophorus tigris mundus*).
3. Birds: A total of 52 bird species were detected during spring surveys, 55 counting incidental observations. A breeding pair of greater roadrunners (*Geococcyx californianus*) was one of the highlights. Species richness was highest during the spring, and in coastal scrub habitat.
4. Nocturnal: A total of 6 mammal species, 8 birds species, and 1 arachnid species were detected in two night surveys. Species of note included Heermann's kangaroo rat (*Dipodomys heermanni*), feral pig (*Sus scrofa*), and common poorwill (*Phalaenoptilus nuttallii*).

Protocol Changes

Methodology for amphibian surveys, based on work of Davidson and Trenham (1998) was not changed, and was found to be sufficient for monitoring objectives. For reptile surveys, methods were based on a monitoring protocol used by the National Park Service for Organ Pipes National Monument (Rosen and Lowe 1995). The setting up of permanent "lizard line" transects was consistent with this method, with some alterations made for the sake of simplicity. For bird surveys, an area search method suggested by Andy Engilis, University of California Davis ornithologist, was used rather than the previously used point count method. It was thought that a line transect was favorable in gathering species richness and relative abundance data.

Habitat Monitoring

Amphibians

Methods: Before entering the field, staff involved in the surveys spent time in the office reviewing the species list for Carnegie SVRA, and used both field guides and dichotomous keys to renew identification skills of all life stages of amphibians known to exist in the unit. A CD-ROM featuring the recorded calls of adult frogs (Davidson 2000) was listened to repeatedly to gain audile identification skills. Literature searches were conducted to review the variety of monitoring methods used by herpetologists for various study objectives.

The methodology described by Davidson & Trenham in their 1998 study of amphibians in Carnegie SVRA was used to conduct surveys for presence/ absence data of amphibian species. This included a combination of daylight and nocturnal visual searches, sampling ponds with dipnets for eggs or tadpoles, and audile searches. A transect was established along Corral Hollow Creek, between the property line on the west side of the unit and the office at the entrance of the park. This was walked by a team consisting of four ecologists, and all probable habitats for amphibians were searched visually. Since the creek is intermittent, long pools of water were all that was left when the survey was conducted in early March. These pools were searched for eggs, tadpoles, or adult amphibians. A series of ponds found in the unit were also searched by quietly approaching the shore of the pond and visually scanning the shoreline with binoculars for any sign of amphibians. Dipnets were then used in a systematic search along the shore to collect any eggs or tadpoles present. At night, flashlights were used during visual searches to locate frogs in ponds by eyeshine. For comparison purposes, a transect along Corral Hollow Creek was searched outside of the riding area, as well as a pond.

Results: Tadpole larvae of Western toad (*Bufo boreas*) and Pacific chorus frog (*Pseudacris regilla*) were found in Corral Hollow Creek, as were some adult red-legged frogs (*Rana aurora*). Several of the ponds surveyed also contained tadpoles of Western toad and Pacific chorus frog. Western spadefoot toads (*Scaphiopus hammondi*) were not found during surveys, nor were California tiger salamanders (*Ambystoma tigrinum*). Results are shown in table 1, in the appendix. However, later in the season, dead larvae of California tiger salamander were found incidentally in one of the ponds that had dried. Also found incidentally were bullfrog (*Rana catesbeiana*) adults, heard in a few of the ponds.

Reptiles:

Methods: Before entering the field, staff involved in the surveys spent time in the office reviewing the species list for Carnegie SVRA, and used field guides to renew identification skills of all reptiles known to exist in the unit. Using former plot locations from previous surveys (set up by Kutilek in 1998), four line transects were established for each of four plots in Carnegie SVRA. See maps of transects in appendix. Each plot is located in a different habitat, so that grassland, blue oak woodland, coastal scrub, and riparian habitats are all represented. These four plots also represent habitats used by off-highway vehicles. As a control, four additional plots were established in non-riding areas within the unit, each representing the same four habitats. In each of these four plots, four permanent line transects were also established. The total number of line transects established is thirty-two in eight plots, sixteen in four riding area plots and sixteen in four non-riding area plots.

Following the basic protocol used by the National Park Service (NPS) in Organ Pipes National Monument (Rosen & Lowe 1995), the dimensions of the line transects were 100 meters long, by 15 meters wide. The beginning and end of each transect was flagged, to be replaced by permanent carsonite markers. A Trimble GPS unit was used to digitize each transect, for placement in a geographic information system. Digital photos were taken from each end of each transect, to assist in locating them in the future.

As a modification of the NPS protocol, two people search for reptiles on either side of the midline, rather than one person along the midline. Weather data, including air and ground temperatures were recorded, along with start and end times of the surveys. All reptile species were recorded as individuals, along with age-class and sex type, as was possible.

Results: For all plots, a total of two species were detected: the Western fence lizard (*Sceloporus occidentalis*) and Western rattlesnake (*Crotalus viridus*). A total of 4.36 hours of effort was put into the surveys, with 2.09 hours in riding areas, and 2.27 hours in the non-riding areas. Survey results are found in table 2 in the appendix. Fifteen individuals representing two species were observed in the non-riding areas, while ten individuals of one species were observed in riding areas. Across habitats, more lizards were seen in riparian than any other in riding plots, while in non-riding plots both riparian and oak woodland yielded more individuals

than other non-riding habitats. In coastal scrub no species were detected in either riding or non-riding plots, however a few individuals were seen incidentally in both plots. A likely cause of this was the poor detectability due to high brush density. Raw and standardized data are reported in table 2 in the appendix. Incidental species observed at the unit include Western whiptail (*Cnemidophorus tigris*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Coast horned lizards (*Phrynosoma coronatum*) have been reported incidentally by park employees in the past.

Birds

Methods: Before surveying the unit for birds, the species list that had been compiled in the past for CSVRA was reviewed, along with field guides and audio CDs of birdcalls, to refresh identifications skills. Avian biologist Andrew Engilis, curator of U. C. Davis Vertebrate Museum, was consulted for a survey method that would maximize probability of collecting data for monitoring purposes. He suggested a simple area search, consisting of walking along a 1-mile permanent transect and recording all bird species seen or heard at an unlimited distance. Start and end times are recorded to determine amount of time spent on each transect. The transect surveys are to be done in spring and winter, twice in each season. The results would yield both species richness data and relative abundance data, which could be compared across years. It was decided to adopt this method, rather than the variable circular plot method, since the purpose will be monitoring species richness and abundance instead of species population change. Also attractive is the fact that more area is covered by one transect than one point count station.

For CSVRA, four transects were chosen at different parts of the unit to reflect the variation in habitat and topography. See maps in appendix for locations and GPS coordinates. Transect A is a loop transect beginning at a point in the grassland area of the Potter Loop, and passes through blue oak woodland and coastal scrub along the Upper Franciscan Loop, ending back at Clear Pond. Transect B loops around the Los Osos and Ridge trails, including grassland, blue oak woodland, and coastal scrub. A third transect follows the bottom of Kiln Canyon through a combination of riparian, grassland, and coastal scrub habitats. The fourth transect is placed along Corral Hollow Creek and is by and large disturbed riparian habitat. During the winter survey, three non-riding survey routes were considered for controls. One of them, passing into Mitchell

ravine, was surveyed once. The others will be scouted in early 2004 before a decision is made on which to include permanently.

Results: For the spring surveys, a total of 44 bird species were detected. In winter, a total of 34 species were recorded. Pooling both seasons resulted in a total species count of 61, and counting incidentals 63. Shannon-Wiener diversity index was rated fairly high for bird species: 2.78 ($H'_{\max} = 4.11$ and $J' = 0.676$). A list of species is found in table 5 in the appendix.

During spring, a higher total number of species were seen in transect A, but if compared to other transects on a per mile basis, Kiln Canyon might prove to be more species rich if the transect was longer. In comparing spring species richness for habitats across all transects, it appears that coastal scrub is the most species rich (25 species), with blue oak woodland (19 species), riparian (15 species), and grassland (6 species) following. One factor worth mentioning is that most of the species detected in coastal scrub and blue oak woodlands were near the bottom of ravines, close to water, though riparian plant species weren't necessarily plentiful in these narrow strips. Data is reported in tables 3 and 4 in the appendix.

A large number of hummingbirds were seen in the coastal scrub during migration, including Anna's hummingbird (*Calypte anna*), Costa's hummingbird (*Calypte costae*), and rufous hummingbird (*Selasphorus rufus*). In the past, Audubon society birders have also reported other species (Holt personal communication), and Kiln Canyon is known to birders as one of the prime spots in California for hummingbird viewing. The abundance of black sage (*Salvia mellifera*) offers a food source in its nectar. In winter, only Anna's hummingbird was recorded, yet in various habitats.

Other notable species seen in the unit include greater roadrunner (*Geococcyx californianus*), loggerhead shrike (*Lanius ludovicianus*), common poorwill (*Phalaenoptilus nuttallii*), Northern harrier (*Circus cyaneus*), sage sparrow (*Amphispiza belli*), lark sparrow (*Chondestes grammacus*), California thrasher (*Toxostoma redivivum*), olive-sided flycatcher (*Contopus cooperi*), and canyon wren (*Catherpes mexicanus*).

Nocturnal

Methods: The route decided upon was the same one set up by Kutilek in the 1990s. It runs from the ranger office, along Corral Hollow, past the maintenance yard, up Juniper trail and winds up

through the hills, looping back via Franciscan Loop and Pottery Loop trails to Corral Hollow and the starting point. A map of the transect is located in the appendix. The surveys began at dusk, and the transect driven twice, in opposite directions. This way any crepuscular animals could be detected as well as nocturnal animals. The surveys were done on two separate nights. Four participants were involved in the surveys: one driver, one recorder, and an observer on each side of the vehicle. The observers used high-powered spotlights to search either side of the vehicle, as it passed along the transect, creating a strip transect with an approximate width of 400 yards. All fauna observed were recorded.

Results:

A total of 15 animal species, representing mammals, birds, and arachnids, were observed. The most commonly seen were common poorwill and black tailed deer. Unusual sightings included Heermann's kangaroo rat and tarantula. A family of feral pigs was observed foraging at dusk. See tables 6 and 7 in the appendix for results.

Data Management

Copies of raw data are on file at the Natural Heritage office of Natural Resources Division, downtown Sacramento. Excel data files of survey data are stored as well, on the shared H drive at the Natural Heritage office, along with all GPS data. A copy of this report, Excel files, digital photos, and GPS data have been copied onto a CD, which accompanies this report.

References

Davidson, C. and P. Trenham. 1998. Final report: amphibian surveys, spring 1998. Carnegie State Vehicle Recreation Area. Twin Cities District. Unpublished report to OHMVRD of the California Department of Parks and Recreation, Sacramento, CA.

Jameson, E. W., and H. J. Peeters. 1988. California mammals. University of California Press, Berkeley, CA.

Kutilek, M., H. Shellhammer, and W. Bros. 1991. Inventory, wildlife habitat protection program, and monitoring program of Carnegie State Vehicular Recreation Area, California. Unpublished contract report to OHMVRD of the California Department of Parks and Recreation, Sacramento, CA.

National Geographic. 2002. Field guide to the birds of North America, 4th edition. National Geographic, Washington D.C.

Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of field methods for monitoring landbirds. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U. S. Department of Agriculture.

Rosen, P. C., and C. H. Lowe. 1995. Lizard monitoring protocol for the ecological monitoring program in Organ Pipe Cactus National Monument, Arizona. Spec. Rept. No. 11, Coop. Parks Studies Unit, Univ. Arizona, Tucson, AZ.

Stebbins, R. C. 1985. A field guide to western reptiles and amphibians. 2nd edition. Houghton Mifflin Company, New York.

Appendix