Grinnell Resurvey Project 2005 - Reptile and Amphibian Surveys

Overview — During the 2005 field season we collected 422 reptiles and amphibians from 140 distinct localities (Fig. 1; Appendix 1). We recorded 27 species, including 5 salamanders, 4 frogs, 6 lizards, and 12 snakes (Table 1). We conducted fieldwork from early April until the beginning of September. A total of 34 days were spent in the field with team sizes ranging from 2 – 12 individuals. During April and May we focused on finding salamanders and secretive snakes at lower elevations (< 5,500 ft.), and after the snowmelt we headed to elevations over 6,000 feet. The majority of our effort during summer was spent at non-Grinnell sites located to the north of the Tuolumne River. Our surveys of Kerrick Meadow and Dorothy Lake utilized pack support, whereas we backpacked to Vernon and Laurel Lakes.

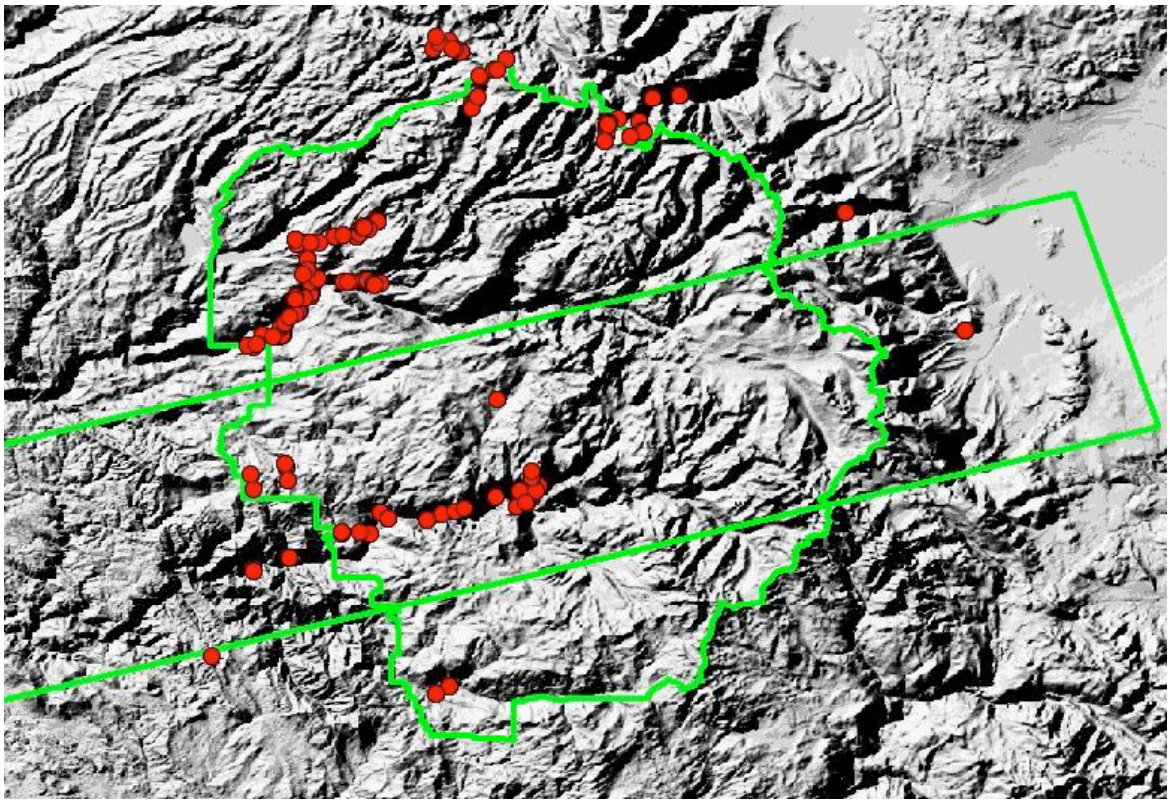

Figure 1. Map of the Yosemite transect (green outline) and localities (red circles) of reptiles and amphibians collected during the 2005 field season.

Table 1. Species recorded during the 2005 field season including the number of specimens collected per species. Specific locality data are provided in Appendix I.

Scientific Name	**Common Name**	*Specimens Collected*
Salamanders (5 species)		
Aneides lugubris	Arboreal Salamander	3
Batrachoseps diabolicus	Hell Hollow Slender Salamander	1
Ensatina eschscholtzii platensis	Sierra Nevada Salamander	21
Hydromantes platycephalus	Mount Lyell Salamander	3
Taricha torosa	California Newt	47
Frogs (4 species)		
Bufo boreas	Western Toad	2
Bufo canorus	Yosemite Toad	25
Pseudacris regilla	Pacific Treefrog	97
Rana muscosa	Mountain Yellow-legged Frog	6
Lizards (6 species)		
Aspidoscelis tigris	Western Whiptail Lizard	1
Elgaria coerulea	Northern Alligator Lizard	13
Elgaria multicarinata	Southern Alligator Lizard	5
Eumeces gilberti	Gilbert Skink	25
Sceloporus graciosus	Sagebrush Lizard	32
Sceloporus occidentalis	Western Fence Lizard	81
Snakes (12 species)		
Charina bottae	Rubber Boa	4
Coluber constrictor	Racer	2
Contia tenuis	Sharp-tailed Snake	1
Crotalus viridis	Western Rattlesnake	3
Diadophis punctatus	Ringneck Snake	1
Hypsiglena torquata	Night Snake	3
Lampropeltis zonata	California Mountain Kingsnake	1
Masticophis lateralis	California Whipsnake	3
Pituophis catenifer	Gopher Snake	6
Thamnophis couchii	Western Aquatic Garter Snake	9
Thamnophis elegans	Western Terrestrial Garter Snake	25
Thamnophis sirtalis	Common Garter Snake	2
	Total number of specimens collected:	*422*

Western Edge of Yosemite National Park (8-11 April, 2005)

Salamanders have a limited distribution in the Yosemite National Park region of the Sierra Nevadas. Certain species are of interest because their distributions in the park, if they occur there at all, are uncertain. For instance, *Batrachoseps diabolicus* approaches within several miles of Yosemite Valley along the Merced River, but no populations are known from within the park. Another species, *Aneides lugubris*, is known from just one specimen collected in 1973 from "Water Tank, Cascade falls ca. 5200-5800 ft.", which is a dubious locality since *Aneides* do not occur above ~4000 ft. in the surrounding area. *Ensatina eschscholtzii platensis* is distributed more broadly through the lower area of the park, but apparent gaps in their distribution raise the possibility that additional populations await to be found.

We predicted the distributions of *Batrachoseps diabolicus, Aneides lugubris,* and *Ensatina eschscholtzii platensis* in the Yosemite N.P. region of the Sierra Nevada with ecological niche modeling, and used the results to guide our subsequent survey efforts. We downloaded distribution records of these species from the MVZ website and used ecological niche modeling with climate (e.g., monthly rainfall, mean temperature, etc.) and terrain variables (e.g., elevation, aspect, slope, etc.) We used two methods of analysis, BIOCLIM and Domain. On April 8-11, a team of 12 biologists (mostly herpetologists) searched for these species in Yosemite using the modeling results as a guide.

Batrachoseps diabolicus - The eastern-most limit of this species is predicted to extend just barely into Yosemite along the Merced River (Fig. 2). We searched for this species along Hwy 140 over the past three years and could find it on occasion at the South Fork of the Merced, but no populations were discovered east of Sweetwater Creek (~5 mi. west of the Yosemite N.P. border). Within Yosemite, we searched for this species along the narrow strip of habitat bounded by the Merced River and Hwy 140 from the Arch Rock entrance station to Cascade Creek. It is possible that populations reside on the southern side of the Merced River, but we were not able to access this area.

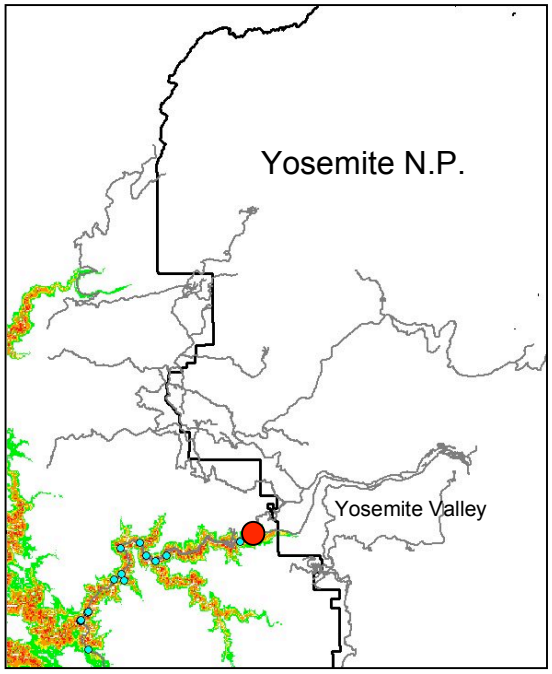

Figure 2. Predicted distribution of *Batrachoseps diabolicus* in Yosemite N.P. This species is predicted to only occur at the western edge of Yosemite Valley along the Merced River. One specimen was collected at the South Fork of the Merced along Hwy 140 (indicated by the red circle). Blue circles indicate previous collecting records. The probability of occurrence at a site is shown in color: high=red, medium-high=orange, medium-low=yellow, low=green.

Aneides lugubris – As stated previously, this species is only known from one dubious locality within Yosemite N.P. The predicted distribution of this species suggests an extensive range throughout the Yosemite and Tuolumne River valleys (Fig. 3). We searched for this species in both areas, and discovered two specimens at a site ~2 mi. east of the Arch Rock entrance station along the narrow strip of habitat between the Merced River and Hwy 140. This is an exciting rediscovery that verifies the occurrence of this species in Yosemite. Our specimens were found several miles west of Cascade Falls, which is the previous collecting locality. However, we believe it is more likely the original specimen was found at the base of the falls at ~4,000 ft. as opposed to the reported elevation of 5200-5800 ft., which places the salamander at the top of the falls. Although we did not detect *A. lugubris* along the Tuolumne River, we anticipate that suitable habitats in Poopenaut Valley contain undocumented populations.

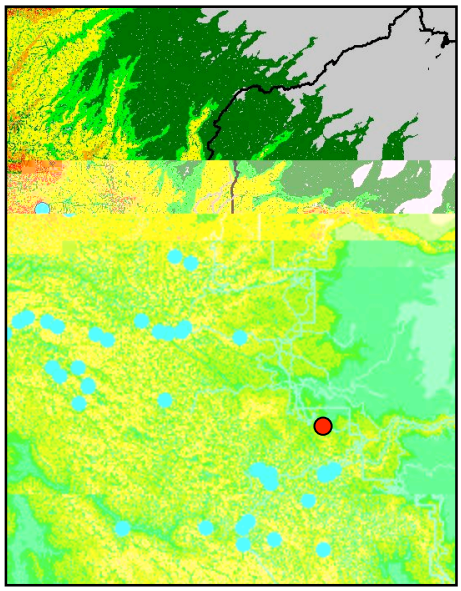

Figure 3. Predicted distribution of *Aneides lugubris* in Yosemite N.P. This species is predicted to occur throughout the western edge of Yosemite and to extend up the Merced and Tuolumne Rivers. Blue circles indicate previous collecting records (the original record from Yosemite is omitted). We discovered two specimens at a site near Cascade falls in Yosemite Valley (indicted by the red circle). These specimens verify the historic record of this species in the park (see text). The probability of occurrence at a site is shown in color: high=red, medium-high=orange, medium-low=yellow, low=green, lowest=dark green.

Below: Photographs of the collecting site and one of the specimens discovered. The salamanders were found under the rocks shown in the foreground of the photo.

Ensatina eschscholtzii platensis – This species is predicted to occur throughout the western edge of Yosemite with populations extending east up the Merced and Tuolumne rivers (Fig. 4). It is fairly common in Yosemite Valley, as indicated by prior collecting records. We also found this species to be quite abundant at sites below 5000 ft. in the south and southwestern regions of Yosemite during prior surveys in 2003 and 2004. Therefore, we concentrated our efforts on detecting new populations of this species along the Tuolumne River. We found two new populations of *Ensatina e. platensis* in this area. One population is located just east of the Hetch Hetchy Ranger Station (fig. 4), and the other is located on the south side of the Hetch Hetchy Reservoir. Additional populations are predicted to occur further up the Tuolumne, but we were not able to access these areas. Subsequent surveys for *Ensatina e. platensis* on 20 May at Tuolumne Grove of Giant Sequoias and Merced Grove of Giant Sequoias resulted in additional records of this species in Yosemite at areas predicted by the ecological niche models.

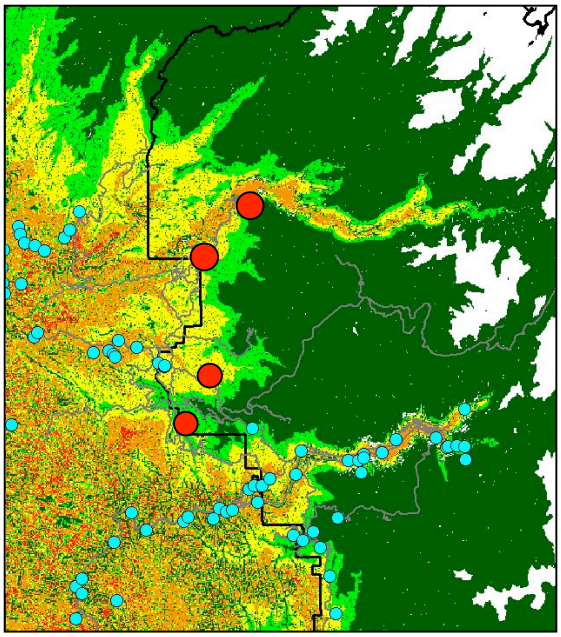

Figure 4. Predicted distribution of *Ensatina eschscholtzii platensis* in Yosemite N.P. This species is predicted to occur throughout the western edge of Yosemite and to extend up the Merced and Tuolumne River Valleys. We detected new populations of this species at multiple sites predicted by the ecological niche model (red circles). Blue circles represent prior collecting records. The probability of occurrence at a site is shown in color: high=red, medium-high=orange, medium-low=yellow, low=green, lowest=dark green.

Below: Photographs of the collecting site adjacent to the Hetch Hetchy Ranger Station and one of the specimens discovered. During the day, salamanders were found under the fallen logs shown in the foreground of the photo. At night, we found specimens walking on the snow-covered ground.

Poopenaut Valley, Wapama Falls, Rancheria Falls, Hetch Hetchy Road, Mariposa Grove of Giant Sequoias, Tuolumne Grove of Giant Sequoias, Yosemite Valley (19-29 May, 2005)

A team ranging from two to four people including Matt Fujita, Adam Leaché, Anne Leaché, Charles Linkem, Sean Rovito, and Carol Spencer collected 119 specimens from 50 distinct localities across lower elevations in Yosemite. We directed our efforts towards detecting rare species of snakes and increasing our geographic sampling of the Western Fence Lizard (*Sceloporus occidentalis*) from throughout Yosemite. Our sampling efforts included focused searching during the day by turning rocks and logs, and driving at night to detect snakes on the road. Notable records are listed below:

We searched for the Western Toad (*Bufo boreas*) in Yosemite Valley and found three specimens. Two were killed on the road by passing vehicles (both collected), and the third was found in the stomach of a Bullfrog (*Rana catesbeiana*) along with several Pacific Treefrogs *(Pseudacris regilla*).

We found one Sharp-tailed Snake (*Contia tenuis*) at the Tuolumne Grove of Giant Sequoias under a pile of rocks located on the side of the road. The same rock pile contained Northern Alligator Lizards (*Elgaria coerulea*) and Sierra Nevada Salamander (*Ensatina e. platensis*). The only other individual of *C. tenuis* that we have recorded was found in Hetch Hetchy during the 2003 survey. One of the few historic specimens of *C. tenuis* collected in 1955 was also found in Tuolumne Grove.

We found one specimen of the Ringneck Snake (*Diadophis punctatus*) at the trailhead to Poopenaut Valley under a rock. The only other individual of this species that we have recorded during our survey work was a road-kill specimen we found on Hetch Hetchy Road in 2003. We have not detected this species at historic (1930s and 1940s) collecting sites in Yosemite Valley, although we have found specimens just outside of the park along the Merced River.

Vernon Lake, Laurel Lake (4-10 August, 2005)

Adam Leaché, Der-shing Helmer, and Guin Wogan backpacked to Vernon Lake and Laurel Lake and collected 122 specimens from 27 distinct localities. We began at Hetch Hetchy and proceeded to Vernon Lake, where we spent three nights camped at the western end of the lake. From Vernon Lake we hiked to Laurel Lake and spent two days and one night surveying that area.

Notable records from Vernon Lake include the California Newt (*Taricha torosa*), which we found in the western end of Vernon Lake and Falls Creek. This population at Vernon Lake pushes the elevation limit of the species in the Sierra Nevada from 6,500 ft. to ~6,700 ft. We also found two specimens of the MountainYellow-legged Frog (*Rana muscosa*), which is surprising given the abundance of fish in the lake. One frog was found at the edge of the lake and tried to escape by jumping into the water. A second frog was found at ~7,000 ft along a creek at the southeastern end of Vernon lake. Other species recorded from the area include the Pacific Treefrog (*Pseudacris regilla*), Western Fence Lizard (*Sceloporus occidentalis*), Sagebrush lizard (*S. graciosus*), Northern Alligator Lizard (*Elgaria coerulea*), Western Terrestrial Garter Snake (*Thamnophis elegans*), and Western Rattlesnake *(Crotalus viridis*).

We found California Newts (*Taricha torosa*) at high abundance along the southern edge of Laurel Lake. Other species recorded from this area include the Western Fence Lizard (*Sceloporus occidentalis*), Sagebrush Lizard (*S. graciosus*), Pacific Treefrog (*Pseudacris regilla*), Western Terrestrial Garter Snake (*Thamnophis elegans*), and Common Garter Snake (*T. sirtalis*).

Kerrick Meadow (15-22 August, 2005)

Adam Leaché and Der-shing Helmer hiked to Kerrick Meadow with pack support and collected 79 specimens from 38 distinct localities, including Kerrick Meadow and the major lakes and ponds located around Crown Point, including Peeler Lake, Crown Lake, and Snow Lake e

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addition to our distributional knowledge for the species. We collected 2 salamanders and took nondestructive buccal swab samples from 13 others for future genetic analysis. We searched areas of suitable habitat near Dorothy Lake, Grace Meadow and Bond Pass for salamanders during the day without success, but future surveys would be necessary to determine if any of these other locations have salamander populations since *H. platycephalus* is difficult to find during the day.

Locality	**Latitude**	**Longitude**	**Species**
On trail south of Leavitt Meadows, north of Roosevelt Lake	38.29783	119.54221	*Thamnophis elegans*
On trail south of Leavitt Meadows, south of Lane Lake	38.28542	119.53897	*Elgaria coerulea*
In small lake ~100m S of Dorothy Lake, Yosemite NP, Tuolumne Co., CA	38.17303	119.59591	*Thamnophis elegans, Pseudacris regilla*
On east side of ridge ~750m south of Bond Pass	38.16594	119.61033	*Pseudacris regilla*
On top of ridge, about 0.5km south of Bond Pass in pond	38.16776	119.61063	*Pseudacris regilla*
Grizzly Meadow, about 0.5km southeast of Emigrant Pass	38.19185	119.62918	*Pseudacris regilla, Bufo canorus, Thamnophis elegans*
About 500m NW of Middle Emigrant Lake	38.19456	119.65882	*Hydromantes platycephalus*
On ridge above Grace Meadow to the west	38.14054	119.61824	*Thamnophis elegans*
Grace Meadow, SE of Bigelow Peak	38.14326	119.61478	*Pseudacris regilla*
0.5km Northwest of Dorothy Lake Pass	38.18458	119.58434	*Pseudacris regilla*
Pond at NW end of Grace Meadow	38.1416	119.61604	*Pseudacris regilla*
About 0.5km south of Emigrant Pass	38.19545	119.63547	*Bufo canorus*
About 100m east of Emigrant Meadow Lake on trail from Grizzly Meadow	38.20243	119.64116	*Bufo canorus*
Outflow dam on west side of Emigrant Meadow Lake	38.20068	119.65139	*Bufo canorus*
About 0.75km NW of outflow dam on west side of Emigrant Meadow Lake	38.20648	119.6553	*Bufo canorus*
About 0.75km SW of Emigrant Pass	38.19543	119.63842	*Bufo canorus*
South end of Grace Meadow, Yosemite National Park	38.13468	119.61919	*Thamnophis elegans*
About 400m north of Grace Meadow along PCT	38.14632	119.61263	*Elgaria coerulea*
Southeast side of Dorothy Lake	38.17303	119.59293	*Rana muscosa*

Family	Species	Commonness	Number of localities	Numbers captured
Bufonidae	*Bufo canorus*	Uncommon	6	8
Hylidae	*Pseudacris regilla*	Common	7	10
Ranidae	*Rana muscosa*	Rare	1	0
Plethodontidae	*Hydromantes platycephalus*	Rare	1	2
Colubridae	*Thamnophis elegans*	Common	4	8
Anguidae	*Elgaria coerulea*	Uncommon	2	2

Notable observations:

- Discovery of a new population of *Hydromantes platycephalus* from Middle Emigrant Lake
- Healthy adult *Rana muscosa* found at Dorothy Lake