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**1997 AMPHIBIAN AND REPTILE SURVEYS IN THE TAHOE NATIONAL FOREST:
THE RESULT OF CCSA-05-97-17-024**

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INTRODUCTION

Current knowledge of the distribution of amphibian and reptile populations in California, particularly in the northern Sierra Nevada, is patchy and inconclusive. This is true of what is known of the herpetofauna of the National Forests as well. Although museum holdings from the Sierra Nevada date from the late 19th century, collection records are spotty and surprisingly few given the active history and land management interests of the region. Surveys that rely on visual observations or photographic documentation can be inconclusive. Such methods simply do not provide sufficient information for researchers and may be unreliable due to the varying experience and expertise of surveyors and observers. For example, photographs offer little assistance in identifying cryptic species. Data from visual or photographic studies are often difficult to access as opposed to specimens housed in museum collections. Specimens collected following standard museum practices provide a permanent record that can be referenced for species confirmation.

Not only are museum specimens verifiable, but they provide a wealth of scientific information such as age, reproductive stage, stomach contents, parasite load. Liver or blood samples can be used for molecular studies in evolution or population dynamics. Retrospectively, museum specimens provide for future research which has yet to be determined. Originally, specimens valued for their external characteristics are now the focus of research on their "internal" attributes that are revealed by light microscopy, x-ray, scanning electron microscopy, and molecular techniques. None of the current technologies and resulting discoveries could have been predicted at the time of the specimens' collection. Museum specimens are also the only means for validating the presence of a species in a given area.

The field surveys conducted for this study contribute to the current body of knowledge and provide valuable voucher specimens (preserved specimens which serve to document the occurrence of that species at a site) from the Tahoe National Forest (TNF). As a result of this study, we supply here a checklist of confirmed species for the TNF (Table 1); a summary of thirteen museum holdings (museums listed in Appendix 1) differentiated by county and whether the specimens were found within the boundaries of the TNF (Table 2); a complete list of museum holdings from TNF (Appendix 2); and distribution maps for each species occurring in TNF, distinguishing between recent and previous museum records (Appendix 3).

METHODS AND MATERIALS

Prior to the surveys, museum records were requested from all major US museums for their holdings from the four counties (Nevada, Placer, Sierra, and Yuba Counties) which comprise the TNF. Of eighteen museums which were contacted (Appendix 1), thirteen collections had relevant holdings and serve as a baseline for validated species. Latitude and longitude, either supplied by the collector or determined from the original written locality, were associated with all specimens from the TNF.

Surveys

Surveys consisted of three field trips: 14-21 May, 21-25 July, and 20-29 August. Due to the time limitations, systematic surveys of large areas were not possible. We did investigate targeted localities during a given field trip. Surveys were mainly conducted in Nevada and Sierra Counties. Specific localities can be found in Appendix 2. Surveys occurred during daylight hours.

Personnel conducting the surveys varied according to availability; CAS staff were present on all field trips. CAS staff included Collections Manager Jens V. Vindum and Curatorial Assistant Carol L. Spencer (two trips). USFS staff included Marilyn M. Tierney (Downieville Ranger District, TNF).

Specimens

Specimens were collected and humanely euthanized under the protocol approved by the Animal Welfare Committee of the three herpetological societies in North America (American Society of Ichthyologists and Herpetologists 1987). They were fixed in 10% neutral-buffered formalin and later stored in 70% ethanol. In addition, tissue (usually liver) was removed and frozen in liquid nitrogen. Locality and other associated data were recorded for all collected specimens. All specimens are deposited in the California Academy of Sciences' herpetology collection.

RESULTS

From the compilation of thirteen museum collections, we composed a baseline dataset of 1,117 specimens for the Tahoe National Forest region (Nevada, Placer, Sierra and Yuba counties). The 1997 fieldwork resulted in an additional collection of 273 specimens (82 specimens from Nevada County and 183 from Sierra County). Appendix 2 lists the collection records for all 837 specimen records by genus and species, which is the entire dataset for the Tahoe National Forest based on the museums queried and our collections. From these data, distribution maps were created (Appendix 3) using basemaps from Digital Chart of the World and the Sierra Nevada Ecosystem Project.

Based on museum records, 34 amphibian and reptile species are known to occur in the four counties which surround the TNF (Table 3). Of these, 20 were from within the National Forest boundaries. As a result of our 1997 field work, 20 species were collected, two of which (*Ambystoma macrodactylum* and *Diadophis punctatus*) were new records for the TNF. Thus, there are currently 24 species of amphibians and reptiles known to occur within the TNF boundaries. An additional 17 species of amphibians and reptiles are expected to occur according to range maps in Stebbins (1985) and Zeiner et al. (1988) but are not validated by museum specimens (Table 1).

Even with the addition of our survey data, increasing the known records by 33 percent, the distribution records for many species is still spotty. Of the 24 confirmed species, 14 species are known from ten or fewer localities; nine of these species are known from five or fewer localities (see distribution maps in Appendix 3).

The lack of thorough documentation for the region is also apparent given the new county records obtained this year for relatively common species. Six county records for Sierra and Nevada Counties were discovered, all within the National Forest (Spencer et al., In Prep). The six species are *Ambystoma macrodactylum*, *Coluber constrictor*, *Crotalus viridis*, *Diadophis punctatus*, *Elgaria coerulea*, and *Lampropeltis zonata*. Interestingly, these six species and seven others (*Elgaria multicarinata*, *Eumeces skiltonianus*, *Pituophis melanoleucus*, *Rana boylei*, *Rana muscosa*, *Taricha torosa*, *Thamnophis sirtalis*) have not been recorded in TNF for at least the last 20 years until our surveys in 1997. And three species have not been documented in TNF for at least 50 years: *Contia tenuis* was last collected in 1936; *Eumeces gilberti* in 1947; and *Rana aurora* in 1939. *Rana aurora*, in particular, has no record of occurring on TNF property but only on private land within the general boundaries of the NF.

There are still large gaps in our knowledge of the amphibian and reptile distributions within the TNF as indicated by Appendix 3. Areas lacking museum records stand out as priority sites for future survey work. Specifically these areas include: north-central Sierra Co., specifically the Lavezzola and Downie River drainages; most of the Foresthill Ranger District, Placer Co. including the Sailor Meadows area; the area between Highway 89 and County Road 860, north of Stampede Reservoir (Sardine Peak area), Sierra Co.; and Mt. Ina Coolbrith region, Plumas and Sierra counties.

While this study has expanded our understanding of the distribution of the herpetofauna for the Tahoe National Forest, it identifies species and areas where our knowledge is deficient. Perhaps the best use of the current information is to encourage further collecting efforts towards a more comprehensive dataset.

LITERATURE CITED

- American Society of Ichthyologists and Herpetologists (ASIH), The Herpetologists' League (HL), and the Society for the Study of Amphibians and Reptiles (SSAR). 1987. Guidelines for the use of live amphibians and reptiles in field research. 14 p.
- Spencer, C. L., M.M. Tierney, J.V. Vindum, and M.S. Koo. In Prep. New records from Tahoe National Forest demonstrating unvalidated species distributions in the Sierra Nevada.
- Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston, Massachusetts. 336 pp.
- Zeiner, D.C., W.F. Laudenslayer, Jr., and K.E. Mayer, eds. 1988. California's Wildlife. Vol. 1. Amphibians and reptiles. California Statewide Habitat Relationships System, California Department of Fish and Game, Sacramento, California. 272 pp.

Table 1. Checklist for Confirmed and Expected Species in Tahoe National Forest.

<u>Confirmed Species for Tahoe NF*</u>	<u>Additional Species Expected to Occur in Tahoe NF**</u>
Amphibians:	Amphibians:
<i>Ambystoma macrodactylum</i> †	<i>Batrachoseps attenuatus</i>
<i>Bufo boreas</i>	<i>Rana aurora</i>
<i>Ensatina eschscholtzii</i>	<i>Rana catesbeiana</i>
<i>Hydromantes platycephalus</i>	<i>Rana pipiens</i>
<i>Hyla regilla</i>	<i>Scaphiopus intermontanus</i>
<i>Rana boylei</i>	
<i>Rana muscosa</i>	
<i>Taricha torosa</i>	
Reptiles:	Reptiles:
<i>Charina bottae</i>	<i>Clemmys marmorata</i>
<i>Coluber constrictor</i>	<i>Cnemidophorus tigris</i>
<i>Contia tenuis</i>	<i>Gambelia wislizenii</i>
<i>Crotalus viridis</i>	<i>Hypsiglena torquata</i>
<i>Diadophis punctatus</i> †	<i>Lampropeltis getulus</i>
<i>Elgaria coerulea</i>	<i>Masticophis flagellum</i>
<i>Elgaria multicarinata</i>	<i>Masticophis lateralis</i>
<i>Eumeces gilberti</i>	<i>Masticophis taeniatus</i>
<i>Eumeces skiltonianus</i>	<i>Phrynosoma coronatum</i>
<i>Lampropeltis zonata</i>	<i>Phrynosoma platyrhinos</i>
<i>Pituophis melanoleucus</i>	<i>Rhinocheilus lecontei</i>
<i>Sceloporus graciosus</i>	<i>Uta stansburiana</i>
<i>Sceloporus occidentalis</i>	
<i>Thamnophis couchii</i>	
<i>Thamnophis elegans</i>	
<i>Thamnophis sirtalis</i>	

* Within Tahoe National Forest's overall boundary.

**Based on distribution maps presented in Stebbins (1985) and Zeiner et al. (1988).

† New species for the Tahoe National Forest based on 1997 surveys.

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Table 2. Species Occurrence for the Tahoe National Forest and the Four County-Area.

	Placer Co.	Nevada Co.	Sierra Co.	Yuba Co.
<i>Ambystoma macrodactylum</i>	0	<i>NF</i>	NF	0
<i>Batrachoseps "attenuatus"</i>	X	X	0	X
<i>Bufo boreas</i>	NF	NF	NF	0
<i>Ensatina eschscholtzii</i>	NF	NF	NF	NF
<i>Hydromantes platycephalus</i>	0	0	NF	0
<i>Hyla regilla</i>	NF	NF	NF	NF
<i>Rana aurora</i>	X	0	0	0
<i>Rana boylei</i>	X	NF	NF	X
<i>Rana catesbeiana</i>	X	X	X	0
<i>Rana muscosa</i>	NF	NF	NF	0
<i>Rana pipiens</i>	X	0	0	0
<i>Taricha torosa</i>	NF	NF	0	NF
<i>Charina bottae</i>	NF	NF	NF	0
<i>Cnemidophorus tigris</i>	X	0	0	X
<i>Coluber constrictor</i>	NF	NF	<i>NF</i>	X
<i>Contia tenuis</i>	X	X	NF	0
<i>Crotalus viridis</i>	NF	X	<i>NF</i>	0
<i>Diadophis punctatus</i>	X	X	<i>NF</i>	0
<i>Elgaria coerulea</i>	NF	NF	<i>NF</i>	0
<i>Elgaria multicarinata</i>	X	NF	NF	X
<i>Eumeces gilberti</i>	X	NF	0	X
<i>Eumeces skiltonianus</i>	NF	X	NF	X
<i>Hypsiglena torquata</i>	X	0	0	0
<i>Lampropeltis getulus</i>	X	0	0	0
<i>Lampropeltis zonata</i>	0	NF	<i>NF</i>	0
<i>Masticophis lateralis</i>	X	X	0	X
<i>Phrynosoma coronatum</i>	X	0	0	0
<i>Pituophis melanoleucus</i>	X	X	NF	X
<i>Rhinocheilus lecontei</i>	X	0	0	0
<i>Sceloporus graciosus</i>	NF	NF	NF	X
<i>Sceloporus occidentalis</i>	NF	NF	NF	X
<i>Thamnophis couchii</i>	NF	NF	NF	0
<i>Thamnophis elegans</i>	NF	NF	NF	X
<i>Thamnophis sirtalis</i>	NF	NF	NF	X

Based on thirteen museum collections, including the four largest California holdings (CAS, LACM, MVZ, SDSNH).

NF = present within the overall boundary of the National Forest
 X = present in county but not in National Forest
 0 = no records from county or National Forest
bold italics = county record as of 1997.

Appendix 1. Museum Collections Checked for County Holdings and their Abbreviations.

American Museum of Natural History	AMNH
Brigham Young University	BYU
California Academy of Sciences*	CAS
California State University, Chico*	CSUC
California State University, Sacramento*	SSU
Carnegie Museum of Natural History	CM
Field Museum of Natural History*	FMNH
Kansas University*	KU
Los Angeles County Natural History Museum*	LACM
Museum of Comparative Zoology, Harvard University	MCZ
Museum of Vertebrate Zoology, University of California, Berkeley*	MVZ
Museum of Zoology, University of Michigan*	UMMZ
National Museum of Natural History*	USNM
San Diego Natural History Museum*	SDSNH
Texas Memorial Museum, University of Texas, Austin	TNHC
University of Nevada, Las Vegas*	UNLV
University of Nevada, Reno*	UNR
University of Texas, Arlington*	UTA

*collections with relevent holdings.

Appendix 2. List of Museum Records by Genus and Species for Tahoe National Forest.