



**Amphibian and Reptile Distribution
and Habitat Relationships in the
Lost River Mountains and
Challis-Lemhi Resource Areas**

by
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**Challenge Cos-Share Agreement with Salmon-Challis National Forest, Lost River and Challis Ranger Districts,
and Bureau of Land Management, Salmon Office**

Summary

Prior to 1996, information on amphibian and reptile populations inhabiting the Salmon-Challis National Forest (USFS) lands of the Lost River Mountains and the Bureau of Land Management (BLM) lands of the Challis and Lemhi Resource Areas consisted of a few museum records and poorly documented incidental observations. Through a challenge cost-share agreement with the USFS Salmon-Challis National Forest and the BLM Salmon Office, we compiled historic records, interviewed local residents, and systematically surveyed wetland habitats within this rugged 9,000 km² area for amphibians and reptiles. Field surveys began in May, 1996, and continued through September, 1997. We compiled physical, chemical, and habitat data at 70 wetland sites, and revisited some sites, such as portions of Chilly Slough, up to a half dozen times within the same year, and in both years. Additionally, more than 50 areas were searched opportunistically both for amphibians and reptiles.

Four amphibian species and 9 reptile species were encountered during the study. Columbia Spotted Frogs (*Rana luteiventris*) and Western Terrestrial Garter Snakes (*Thamnophis elegans*) were the most common species encountered. Other amphibians detected within the study area were: Long-toed salamanders (*Ambystoma macrodactylum*), Western Toads (*Bufo boreas*), and Pacific Treefrogs (*Pseudacris* (= *Hyla*) *regilla*). Tailed Frogs (*Ascaphus truei*), although known to occur in mountain streams near the study area, were not detected. Besides Western Terrestrial Garter Snakes, we encountered the following reptiles: Painted Turtles (*Chrysemys picta*), Short-horned Lizards (*Phrynosoma douglassi*), Sagebrush Lizards (*Sceloporus graciosus*), Rubber Boas (*Charina bottae*), Racers (*Coluber constrictor*), Gopher Snakes (*Pituophis catenifer*), Common Garter Snakes (*T. sirtalis*), and Western Rattlesnakes (*Crotalus viridis*). We didn't detect any amphibians and only Western Terrestrial Garter Snakes in the Lost River Mountains. Painted Turtles, which we didn't expect to encounter, were found in a pond north of Carmen and were reported by local residents to have occurred in ponds and sloughs along the Salmon River north of Salmon for at least the last 40 years.

We taught a short course for teachers covering amphibian and reptile identification, field survey techniques, and data recording in Challis during summer 1997. We will be offering a similar course for teachers in Salmon during summer 1998.

Copies of the Geographic Information System (GIS) database of our findings, including digital topographic maps (1:100,000) of survey site and observation locations, digital photographs of survey sites, and data spreadsheets, will be provided to the USFS Salmon-Challis National Forest and the BLM Salmon Office.

Introduction

During the past decade, herpetologists and others have become concerned about perceived declines of amphibian populations worldwide. In western North America, reported species declines largely concern pond-breeding frogs and toads, particularly of the genera *Rana* and *Bufo*. Assessment of these apparent declines has been hampered by lack of baseline data and lack of long-term monitoring of amphibian distributions and population dynamics.

Until recently, east central Idaho was, herpetologically, one of the least known areas in the northern Intermountain West. C. Hart Merriam, Vernon Bailey and others of the U.S. Biological Survey collected amphibians and reptiles in Butte and Custer counties in 1890 and 1895; and a party led by C. H. Gilbert in 1894 collected reptiles in Butte county around Arco. Since then, information on amphibians and reptiles in the area has been collected sporadically and opportunistically by interested individuals and natural resource agency personnel. Recently, the scarcity of information about amphibians and reptiles of the area, and increased awareness of regional amphibian population declines by natural resource agencies, prompted herpetological surveys in east central Idaho by the USFS on the Salmon National Forest (O'Siggins 1995) and Yankee Fork Ranger District (Churchwell 1996). Two research projects concerning amphibians in high mountain lakes, in the Sawtooth Mountains (Munger et al. 1997) and in the Bighorn Crags (Pilliod et al. 1997, Pilliod and Peterson 1997), were recently initiated. However, the extensive landscape of BLM lands of the Challis and Lemhi Resource Areas, and the isolated Lost River Range, managed by USFS Challis and Lost River Ranger Districts, had not been surveyed for amphibians and reptiles prior to 1996. This area is of interest in part because several sensitive species of amphibians are known to occupy or potentially occupy the area, and range limits of several amphibian and reptile species occur here.

In spring 1996, the Salmon-Challis National Forest (Challis and Lost River Ranger Districts), the BLM (Salmon Office), and the Herpetology Laboratory at Idaho State University (ISU) combined resources and initiated a two-year survey of these lands for amphibians and reptiles. Specifically, survey objectives were:

- Summarize known information on amphibian and reptile distributions for the study area. Sources of information include: the Idaho Museum of Natural History Northern Intermountain Herpetological Database (NIHD), BLM and USFS observation records, and study area residents.
- Conduct field surveys during 1996 and 1997 using standard protocols (e.g., timed searches, dip nets, automated recordings, road driving, trapping).
- Develop a GIS database and maps of amphibian and reptile distributions, and associated habitat data.

- Provide recommendations for monitoring amphibians and reptiles.

Study Area

Our survey area encompassed the BLM Salmon District Office's Challis and Lemhi Resource Areas (RA), and the Salmon-Challis National Forest's lands in the Lost River Mountains (Challis and Lost River Ranger Districts [RD]) (Fig. 1). The area is approximately 9,000 km², almost double the size of Delaware. Although we surveyed only public lands, we also obtained some locations of amphibians and reptiles on private lands from local residents.

The Lost River Mountains are an isolated, narrow range, running northwest to southeast, surrounded by broad valleys of Great Basin sagebrush steppe. The range contains the highest peaks in Idaho (Mt. Borah at 3,859 m [12,662 ft]), rugged topography, both forested and rangeland vegetation, and many lakes and streams. The surrounding BLM lands of the Challis RA, as well as the Lemhi RA to the east, are comprised principally of Great Basin rangeland vegetation (e.g., bunchgrasses, sagebrush, greasewood, mountain mahogany) at lower elevations with gentler topography, although steep canyons and rocky cliffs are common. Two large marsh complexes on BLM lands (Chilly Slough on the Challis RA and Birch Creek on the Lemhi RA) are managed as conservation areas.

Methods

We searched museum and observation records contained in the NIHD for amphibian and reptile species collected or reported from Butte, Custer, and Lemhi counties within and adjacent to the study area. Records for the area spanned a century. We also referred to Nussbaum et al. (1983) for county records of species occurrence. From this search, we compiled a list of amphibian and reptile species either known to occupy the study area or that potentially could occupy the area based on species geographic ranges.

We contacted local residents and natural resource agency personnel (BLM, USFS, Idaho Department of Fish and Game [IDFG]) to obtain additional species occurrence and distributions. We taught a 4-day short course for public school teachers emphasizing amphibian and reptile identification, data recording protocols, and field survey techniques. These efforts added significantly to the number of documented species locations.

We focused our survey efforts on amphibians for several reasons: (1) aquatic habitats upon which amphibians depend are threatened throughout the dry Intermountain West by development, pollution, and irrigation diversions, (2) amphibians, because of their life history characteristics spanning both aquatic and terrestrial habitats, and as both herbivores and predators, can serve as important bioindicators of habitat degradation, and (3) amphibians are more easily and predictably detected than reptiles. Potential amphibian sites for the study area were identified by agency biologists either from records of reported amphibians or based on habitat. Because the study area was so large, we did not attempt to survey all possible sites, rather we selected a variety of wetland habitats (e.g., lakes, ponds, streams, springs, bogs) over a broad geographic and elevational range within the study area. Specific site selection resulted from agency management priorities (e.g., Chilly Slough and Birch Creek Conservation Areas [CA], Spring Hill, Trail Creek Area of Critical Environmental Concern [ACEC]) and ease of access. Reptiles observed incidental to amphibian survey efforts were recorded. We began the study in mid-May, 1996, and continued through September, 1997.

At each amphibian survey site, we used a standardized protocol based on a U.S. Fish and Wildlife Service "Amphibian Survey Data Sheet" developed by Paul Stephen Corn (Fig. 2). Data were recorded on locality (e.g., county, site location, Universal Transverse Mercator [UTM] coordinates, elevation), species detected (e.g., identification, abundance, life stage), physical and chemical attributes of the site (e.g., weather, pH, conductivity, water temperature), and habitat characteristics (e.g., vegetation, pond size, water depth, distance to forest) (see Table 1 for detailed methods). We used a temperature-compensated Oakton pHTestr 2 pH meter, a temperature-compensated Oakton TDSTestr3 conductivity meter ($\mu\text{S}/\text{cm}$), and a Miller & Weber cloacal thermometer to measure air and water temperature (C). We surveyed using timed visual searches in combination with dip netting. At a few sites we used an automated call recording system where we anticipated that Pacific Treefrogs or Boreal Chorus Frogs (*Pseudacris triseriata*) might be present.

During April and May of 1997, we established a grid of funnel traps in the vicinity of a reported snake den along Birch Creek in the Challis RA, a few miles southwest of Challis. The trapping grid consisted of 15 funnel traps, some with 1 m long drift fences on either side of the entrance to the trap. Traps were made of hardware cloth similar in design to a minnow trap. We monitored traps every day for 6 weeks.

Results and Discussion

Occurrence

Prior to our survey, museum records and recorded observations confirmed 5 of 9 potential species of amphibians inhabiting the study area or areas immediately adjacent (Table 2). Eight of 12 potential reptile species also were reported for the area. Local

residents reported Painted Turtles, for which there were no records of occurrence in central Idaho, in areas along the Salmon River north of Salmon. A complete summary of museum records, historic and current observations, and survey records of species occurrence for the study area are presented in Appendix I.

We surveyed 70 sites with many sites revisited during the same year and over both years during the two years of surveys (Fig. 3, Appendix II-V). We also opportunistically searched > 50 aquatic and terrestrial habitats in addition to the surveyed sites. We encountered 4 of the 5 confirmed amphibian species during surveys and opportunistic searches. Nine reptile species were encountered during surveys and searches.

We found no record of amphibians in the Lost River Mountains. Bart Gamett, Lost River RD, who conducted surveys of lakes as well as water sources for bighorn sheep throughout the Lost River Range didn't report encountering any amphibians (Gamett 1990). Likewise, we didn't find any amphibians in the Lost River Range although we searched numerous streams and lakes throughout the range. Most accessible lakes and major creeks have fish, many stocked by IDFG over the past 30-50 years (IDFG records, Salmon). However, we surveyed a number of suitable looking ponds and small lakes without fish but didn't detect amphibians. For example, Spring Hill on the east side of the Lost River Range contains more than a half dozen ponds, many supporting lush emergent vegetation, and none with fish detected. We surveyed these ponds in June 1996 and July 1997, encountering a few Western Terrestrial Garter Snakes but no amphibians. There were cattle grazing around these ponds but only a few ponds evidenced excessive trampling, and removal of riparian and emergent vegetation. There are observations of Columbia Spotted Frogs on both sides of the Lost River Range on private and public lands (Fig. 9). Tailed Frogs may inhabit the range but searches in several drainages failed to detect them.

We can only speculate about the apparent absence of amphibians in the Lost River Mountains. Many of the lakes and streams in the range have been stocked with fish for sport fishing by IDFG. Many of the creeks originating in the range are diverted for irrigation at the base of the mountain range. And the range is surrounded mostly by dry sagebrush desert. We don't know whether amphibian populations ever inhabited the Lost River Range or became extinct with many obstacles to recolonization.

Distribution

Columbia Spotted Frogs and Western Terrestrial Garter Snakes were the most widespread amphibian and reptile species, respectively, in the study area (Table 2). Both species distributions encompassed the geographic extent of the study area with the exception that spotted frogs were not detected in the Lost River Range. Western rattlesnakes also were widespread although not commonly seen.

Amphibian populations, generally, are sparsely dispersed and uncommon throughout the study area, particularly in the Challis RA. The Challis RA contains some of the most xeric landscapes in Idaho so wetland habitat is scarce. Therefore, amphibian populations may be isolated from each other. Extensive disturbance of a breeding site may cause the extinction of a local amphibian population with little likelihood of recolonization from other distant populations e.g., a population of spotted frogs in the Bear Creek drainage of Road Creek is unlikely to interact with a population of spotted frogs in Chilly Slough, many kilometers distant with little suitable habitat in between. The marshes and sloughs on private lands in Round Valley around Challis, and the lower reaches of the Pahsimeroi River have been drained or modified for agriculture during the past century. Still small populations of spotted frogs exist in these areas.

The Lemhi RA contains more mesic habitat with amphibian populations (apparently at least Columbia Spotted Frogs and Pacific Treefrogs) more evenly dispersed and presumably less isolated than in the Challis RA. Therefore, localized disturbance of amphibian habitat may have less severe long-term consequences to amphibian populations than in the Challis RA.

Relative Abundance

We found Long-toed Salamanders at 3 survey sites, Western Toads at 1 survey site, Pacific Treefrogs at 2 survey sites, and Columbia Spotted Frogs at 14 survey sites. Western Terrestrial Garter Snakes were the only reptile species found during surveys (7 sites).

Except for larvae of Long-toed Salamanders and tadpoles of Columbia Spotted Frogs, we encountered few individuals of any species at surveyed sites or elsewhere. Twelve adult Columbia Spotted Frogs at a pond in the Cow Creek drainage (Lemhi RA, Site No. 62) was the largest number of any species (excepting larvae and tadpoles) detected at any surveyed sites. Dozens of Western Toad metamorphs were observed near Horse Basin Spring No. 1 (Challis Ra, Site No. 49) in early June, 1996 by BLM personnel (Appendix I). Generally, museum records, observations, and surveys document only one to a few individuals of any amphibian or reptiles species in the study area.

Habitat

Surveyed sites ranged from high-elevation cirque lakes (e.g., Merriam Lake in the Lost River Mountains, Fig. 4a), to permanent ponds surrounded by willows and sedges (e.g., a Spring Hill pond on the east side of the Lost River Mountains, Fig. 4b), to seasonal ponds with emergent sedges (e.g., a pond near the abandoned South Butte Mine west of Clayton, Fig. 4c), to large marshes with dense cattails and sedges (e.g., Chilly Slough CA north of Mackay, Fig. 4d).