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HERPETOLOGICAL SURVEY OF SOUTHCENTRAL IDAHO

by

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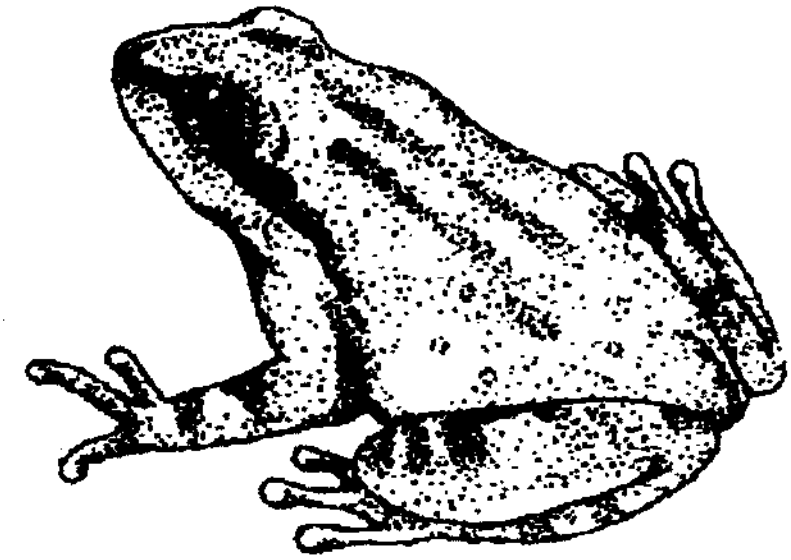

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Herpetological Survey of Southcentral Idaho

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Final Report for a FY 2000 Challenge Cost-Share Agreement between the U.S. Bureau of Land Management, Burley Field Office; Idaho Department of Fish and Game, Magic Valley Region; Idaho State University; and U.S. Fish and Wildlife Service Minidoka Wildlife Refuge

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Table of Contents

Executive Summary

The primary objective of this study was to provide information concerning current amphibian and reptile occurrence throughout southcentral Idaho where few historical data are available. This information will be incorporated into the Northern Intermountain Herpetological Database, shared with Idaho Conservation Data Center, and will provide a more thorough understanding of current species distributions in southcentral Idaho. These results provide baseline data for future comparisons and management decisions in this region.

Based on current range maps, 27 species of amphibians and reptiles were identified as potentially occurring within the study area. Three potentially occurring amphibian species, the Western Toad (*Bufo boreas*), Northern Leopard Frog (*Rana pipiens*), and Columbia Spotted Frog (*Rana luteiventris*) are considered to be Sensitive Species (BLM) and State Species of Special Concern (IDFG) for the state of Idaho. The Columbia Spotted Frog is also currently a candidate for Threatened and Endangered status by the U.S. Fish and Wildlife Service. There are also three potentially occurring reptile species, the Longnose Snake (*Rhinocheilus lecontei*), Ringneck Snake (*Diadophis punctatus*), and Ground Snake (*Sonora semiannulata*) which are considered to be Sensitive Species and State Species of Special Concern.

We employed multiple sampling techniques such as visual encounter surveys, aquatic funnel trapping, and road driving surveys to increase the chances of detecting species that occur within the study area. Site surveys were conducted over 33 total days that began on 8 June 2000 and ended on 4 August 2000. We detected the presence of 16 species within the study area including the Northern Leopard Frog, which was locally abundant at the Minidoka National Wildlife Refuge. An unconfirmed incidental observation of a Western Toad on the Big Cottonwood Wildlife Management Area (BCWMA) was contributed by an Idaho Fish and Game employee, and further observations in this area are required to establish species presence. Three other amphibian species were detected including the Tiger Salamander (*Ambystoma tigrinum*), Pacific Treefrog (*Pseudacris regilla*), and Boreal Chorus Frog (*Pseudacris maculata*). The occurrence of Tiger Salamanders in this part of the state suggests a westward expansion of the currently known distribution. Five lizard species were detected including the Longnose Leopard Lizard (*Gambelia wislizenii*), Side-Blotched Lizard (*Uta stansburiana*), Sagebrush Lizard (*Sceloporus graciosus*), Western Fence Lizard (*Sceloporus occidentalis*), and Western Whiptail (*Cnemidophorus tigris*). An additional incidental observation of a Western Skink (*Eumeces skiltonianus*) was contributed by BLM employees from the Chokecherry Canyon area. Five species of snakes were detected within the study area including the Racer (*Coluber constrictor*), Striped Whipsnake (*Masticophis taeniatus*), Gopher Snake (*Pituophis catenifer*), Western Terrestrial Garter Snake (*Thamnophis elegans*), and Western Rattlesnake (*Crotalus viridis*).

Pacific Treefrogs exhibited the greatest relative abundance throughout the study area contributing 42% (56% of amphibians) to the total observations. Surprisingly, the Northern Leopard Frog had the second highest observed abundance representing 24% (33% of amphibians) of the total. Western Fence Lizards had the highest observed lizard abundance contributing 55% (8% of the total observed) to all lizard observations. Gopher Snakes were the most abundant snake species observed representing 38% (4% of total observed) of the snake observations.

Introduction

The primary objective of this study was to document reptile and amphibian species occurrence in south central Idaho, which encompasses Cassia county and also includes Minidoka, Power, and Twin Falls counties, a region of the state where historical observational data and formal surveys are few (McDonald 1996, Makela 1998). The collected information will provide updated records of current distributions of amphibian and reptile species in this part of the state, especially for those species considered to be Sensitive by the Bureau of Land Management (BLM) or considered State Species of Special Concern by the Idaho Department of Fish and Game (IDFG). The data will be shared with the Idaho Conservation Data Center and have also been incorporated into the Northern Intermountain Herpetological Database (NIHD) of the Idaho Museum of Natural History (IMNH), where it will be used to establish a more comprehensive understanding of current statewide species distributions and to provide baseline data for future comparisons and management decisions.

Methods

Study Area

The survey area extends throughout four counties in south central Idaho (Figure 1). The majority of survey sites are primarily located within Cassia County with only a few isolated survey sites located throughout the surrounding counties of Minidoka, Power, and Twin Falls. The majority of survey sites were located on the Sawtooth National Forest (55%) with shorter excursions onto BLM land (12%), U.S. Fish and Wildlife (USFWS) Minidoka Wildlife Refuge land (12%), State land (6%), and private -land (14%). With a study area this large, there is a considerable amount of variation in

habitat composition and characteristics. Elevations in the study area ranged from 1250m at Minidoka National Wildlife Refuge to 2806m at Independence Lake 4 on the Sawtooth National Forest. The lowlands are generally dominated by xeric sage-steppe habitat with an overstory of native species such as Wyoming Big Sagebrush (*Artemisia tridentata wyomingensis*) and Utah Juniper (*Juniperus osteosperma*), but also an understory of non-native species such as Crested Wheatgrass (*Agropyron cristatum*) and Downy Brome (*Bromus tectorum*). The higher elevation forested uplands were generally dominated by species such as Quaking Aspen (*Populus tremuloides*), Douglas-Fir *(Pseudotsuga menziesii*), and Lodgepole Pine (*Pinus contorta*).

Sampling Site Selection

We determined the location of survey areas based on historical observations of Sensitive Species in south central Idaho and from numerous other suggested areas of interest to local BLM and IDFG biologists. Within an identified survey area (i.e., Big Cottonwood Canyon), we chose specific sites based on background knowledge of potentially suitable habitat (i.e., wetlands or south-facing talus slopes) for the species in these areas. We took photographs of most of the sites we surveyed throughout the study for identification and to provide visual examples of the various habitats we encountered (Appendix A). Our goal was to determine which species were present in the study area, not to obtain unbiased data for modeling habitat relationships.

Determination of Site Coordinates

We collected Universal TransMercator (UTM) coordinates at each survey site and for any amphibian or reptile species observation. We used a Trimble GeoExplorer GPS

(Trimble Navigation Limited, Sunnydale, CA) receiver on 8 June 2000 through 12 June 2000, and 19 June 2000 through 23 June 2000. Due to difficulties in detecting satellites with the Trimble unit in many of the deep canyons located throughout the study area, we began using a Garmin GPS II Plus receiver following the surveys on 23 June 2000 which provided a faster and more reliable contact with satellites. We continued using this unit for the duration of the study.

We only recorded location coordinates when the displayed position dilution of precision (PDOP) was at least 7.0 or lower when using the Trimble unit, or when the estimated potential error (EPE) was 10 meters or lower when using the Garmin unit. The Department of Defense turned off Selective Availability (SA) this year which formerly was responsible for the intentional scrambling of satellite signals that created position coordinate errors of l00m or more. Currently GPS receivers are capable of determining locations with position estimate errors of only about 10m without differential correction to account for SA. Consequently, we did not differentially correct any of the recorded GPS points collected in the study.

Site Characteristics and Environmental Measurements

We collected habitat and environmental measurements at all surveyed sites and locations where species observations were made using a standard form for amphibian and reptile surveys (Appendix B, Peterson 1997). Various environmental conditions such as radiation, cloud cover, precipitation, and air temperature were recorded at each survey site. Radiation and cloud cover were visually estimated, while shaded 1m height air temperature measurements were made using a Taylor (Model 9841) digital thermometer.

We also collected data on wetland characteristics when surveying aquatic sites such as length, width, depth, water temperature, water chemistry (pH and conductivity), and National Wetlands Inventory (NWI) classification (Cowardin et al. 1979). Site length and width were visually estimated, while wetland depth was classified as either <1 meter, 1-2 meter, or >2 meter. All water temperature measurements were taken at roughly 1 cm depth and approximately 1 m from the shoreline using the same thermometer used for the air temperatures measurements. We used a TDSTester 3 ATC for all conductivity measurements, and an Oaktown pHTester 2 ATC pocket meter (Forestry Supply, Jackson, MS) for all pH measurements. Various other data were collected at each wetland site surveyed, such as primary substrate, dominant vegetation, and relative percent of shoreline with emergent vegetation. We visually estimated each of these parameters following visual encounter surveys to ensure the entire site is represented in the reported data. A comprehensive listing of all environmental conditions and habitat characteristics that were recorded are reported in Appendix C.

We also estimated a habitat classification for each survey site based on the land cover classification system developed for the Idaho Gap Analysis. Land cover classification is divided into nine major categories: Urban or Developed Land (1000), Agricultural (2000), Non-Forested Lands (3000), Forest Uplands (4000), Water (5000), Riparian and Wetland Areas (6000), Barren Land (7000), Alpine Meadow (8000), and Snow, Ice, Cloud or Cloud Shadows (9000). Within each of these major categories are sub-categories which further specify distinct habitat types, and these codes are explained when reported (Tables 1 and 2).

We calibrated the pH and conductivity meters prior to the beginning of the survey and about every two weeks until the completion of the study. Waders, dipnets, and

aquatic funnel traps were rinsed and sterilized using a diluted bleach solution (roughly 10%) in conjunction with equipment calibration to decrease the chance of transmitting disease or pollutants among wetland survey sites.

Amphibian and Reptile Sampling

Based on range maps in Nussbaum et al. (1983), Stebbins (1985), Baxter and Stone (1985), and records from the Northern Intermountain Herpetological Database, 27 species (7 amphibians and 20 reptiles) were identified as potentially occurring in the study area (Tables 3-5).

We conducted sampling at numerous times throughout the late spring and summer of 2000. Site surveys were conducted on 8 June 2000 through 12 June 2000, 19 June 2000 through 23 June 2000, 28 June 2000 through 2 July 2000, 5 July 2000 through 8 July 2000, 18 July 2000 through 22 July 2000, 25 July 2000 through 28 July 2000, and 1 August 2000 through 4 August 2000. A summary of the days we surveyed and the corresponding sampling techniques that were used on those days can be found in Figure 2.

We did not perform Calling Surveys during the study because the study began too late in the spring and breeding amphibians had already undergone mating.

Voucher photographs were taken of all sensitive species we found within the study area. The photographs can be found in Appendix D.

Visual Encounter Surveys (VES)

This method of survey was the most frequently used technique throughout the study. Using this method, we walked within an identified survey site visually searching

for amphibian and reptile species. Visual encounter surveys were employed in all terrestrial sites with the effort focused on sampling particular areas which appeared to provide suitable habitat for potentially present species. Visual encounter surveys were also made around the perimeter of wetland sites prior to entering the water, and again throughout the main portions of the site itself. Shed snake skins were collected whenever encountered and were later used to identify the species through scalation patterns.

Dipnetting and cover turning are complementary techniques to visual encounter surveys, and were subsequently used throughout the study as well. These additional sampling components were employed to maximize the possibility of detecting species that generally remain hidden within vegetation or underneath cover.

1. Dipnetting -Historically, this method has been proven effective at locating amphibian species hidden in submerged vegetation (Crisafulli 1997). We used a fine-mesh dipnet, and dipped approximately every 5 steps around wetland perimeters. In shallow ponds, we also waded portions of the interior wetlands to access potentially good habitat.

2. Cover turning -This method incorporates the lifting and turning of cover objects, such as rocks and logs, to locate animals hidden beneath them. All cover objects were returned to the original placement after turning. This method was primarily used in terrestrial sites, especially where rocks and downed logs were abundant throughout the landscape.

Road Driving

We drove roads in the mornings and early evenings and identified any reptiles or amphibians that were observed (Shaffer and Juterbock 1994). Roads were also continually surveyed while driving to and from survey sites throughout the study

period. Any species observations made while road driving were recorded using a standard form for amphibian and reptile multiple observations (Appendix E) and the results are reported in Appendix F. The dates that roads were driven and the corresponding results are listed in Appendix G .

Aquatic Funnel Trapping

We used standard minnow traps to perform aquatic funnel trapping. These traps incorporate a central holding chamber with two tapered openings that direct organisms towards the traps interior. This method has proven effective for capturing amphibian larvae, but also for some adults of smaller species (Adams et al. 1997). The number of traps placed in a wetland was determined based on the general size of the wetland, and the relative area of shallow shorelines. We placed traps in a generally even distribution around a site whenever possible, and specifically in locations that contained emergent vegetation or submerged aquatic vegetation with depths deep enough to cover the openings of the traps. We also placed a few traps in open water areas so that these locations were not excluded from sampling. The number of traps placed in a wetland site ranged from four to ten possible based upon the number of traps available and wetland characteristics mentioned above. Traps were placed and left out for two nights to collect animals. Traps were placed in shallow water so that they were not completely submerged. This helped ensure that non-target species would not drown if caught accidentally. The data collected from the Aquatic Funnel Trapping are summarized in Appendix H.

Incidental Observations

We made incidental observations any time a species was located in an area that was not actively being sampled. GPS points were collected at the location of the observation, and some general descriptions of the species and location were made as well. Any observations that were contributed from an outside source (e.g., BLM or IDFG employees) were considered incidental observations.

Data Management

We entered the data into a Microsoft Excel spreadsheet for management and analysis. The data were also incorporated into the NIHD of the IMNH. Maps of species distributions were developed using ArcView 3.2 (ESRI Redlands, California) Geographic Information Systems (GIS). The topographic maps used in the creation of the species distribution maps were acquired from the Idaho All Topo Maps: Idaho software (iGage, Salt Lake City, UT).

Results and Discussion

Site Characteristics and Environmental Measurements

Throughout the study, shaded air temperatures ranged from 17.2°C to 34.9°C with an average temperature of 26.2°C. Wetland water temperatures taken at 1cm depth ranged from 14.1°C to 28.1°C with an average of 23.2°C. Water chemistry exhibited considerable variation over the course of the study with pH values ranging from 5.3 to 10.8, and conductivity values ranging from 10 mg/L to 660 mg/L.

Occurrence

We encountered 16 (5 snake species, 6 1izard species, and 5 amphibian species) of the 27 potentially occurring species within our study area (Tables 3-5). We detected one Sensitive Species (BLM) within the study area. Northern Leopard Frogs (*Rana pipiens*) were found at three separate locations on the Minidoka National Wildlife Refuge, and an additional observation was contributed from Murtaugh Lake. One additional incidental observation of a Western Toad (*Bufo boreas*) was reported along Big Cottonwood Creek by an IDFG employee stationed at the Big Cottonwood Wildlife Management Area (BCWMA), but this observation has not been confirmed through specimen or photograph voucher. For most cases we only sampled survey sites once throughout the study, and it is important to realize the failure to detect a particular species does not indicate that species is absent from a site.

Distribution

Throughout the study area we surveyed 49 sites; 29 terrestrial and 20 aquatic/wetlands. We detected amphibian or reptile species in 10 of the wetland sites (50%) and in 19 of the terrestrial sites (66%). The Minidoka National Wildlife Refuge proved to be a "hotspot" for amphibian observations, while the South Hills area (i.e. Big Cottonwood Canyon, Big Cedar Canyon, Little Cedar Canyon, Robber Gulch, Buckhorn Canyon, and Mountain Road) near the BCWMA represented the area with the most common and diverse reptile observations.

Relative Abundance

Of the 543 amphibian and reptile observations made throughout the study area, Pacific Treefrogs (*Pseudacris regilla*) exhibited the highest relative abundance representing 42% of the total number of observations (56% of all amphibian observations) (Figure 3). Many of these observations were of tadpoles and it is important to realize that not all of these individuals may metamorphose, mature, and subsequently contribute to the population. Interestingly, Northern Leopard Frogs, which are considered a Sensitive Species (BLM) and Species of Special Concern (IDFG), exhibited the second highest relative abundance in the study area representing 24% of the total number of observations (33% of all amphibian observations). Contrary to the Pacific Treefrog, the majority of Northern Leopard Frog observations were metamorphs that have already overcome the initial hardships of metamorphosing from tadpoles. Western Fence Lizards (*Sceloporus occidentalis*) had the highest relative abundance of any lizard species representing 55% of all lizard observations, but only contributed 8% to the total number of observations made throughout the study area (Figure 4). Gopher Snakes (*Pituophis catenifer*) had the highest relative abundance of any snake species detected throughout the study area representing 38% of all snake observations, but only contributed 4% to the total number of observations made throughout the study area (Figure 5).

Habitat Relationships

Of the nine major Idaho Gap Analysis categories for vegetation and cover classification, we identified six (Agricultural, Non-Forested Lands, Forest Uplands, Water, Riparian and Wetland Areas, and Barren Land) of these categories within the sites

we surveyed in our study (Table 4). Species occurrence throughout these recognized vegetation and cover classifications was fairly limited to one or two different habitat types, with the Non-forested Lands (specifically the Xeric Shrubland sub-category) providing the most utilized habitat (Table 5). The majority of species we identified in this study are habitat generalists (Stebbins 1985) and are not expected to be associated specifically with certain habitat types. Western Terrestrial Garter Snakes *(Thamnophis elegans*) and Racers (*Coluber constrictor*) were both considerably widespread with respect to habitat preference. We observed both species in three different vegetation and cover categories.

Species Accounts

Tiger Salamander (*Ambystoma tigrinum*)

The observed distribution of Tiger Salamanders was very limited and centered primarily at Sagehen Spring pond. We found 12 larvae at Sagehen Spring pond. There were contributed observations from this site of 34 larvae, two metamorphs, and a single adult. There was an additional contributed observation of a single adult found at gravel pits near Rock Creek, south of Hansen, ID. This species is not considered Sensitive or of Special Concern, however these observations do suggest a westward extension of this species currently understood state distribution.

Pacific Treefrog *(Pseudacris regilla)*

This species was the most abundant and widespread species detected in the study area. This species was locally very abundant in some sites such as

Independence Lake 3 where 200+ larvae were observed, while in other sites such as the spring below Curtis Reservoir, only a single individual was detected. We observed 219 larvae, four metamorphs, and seven adults. Three additional observations were contributed by BLM and IDFG employees.

Boreal Chorus Frog (*Pseudacris maculata*)

This species' distribution was limited throughout the study area, and was detected in only one site near the Minidoka Wildlife Refuge Headquarters. A single metamorph was observed at this site. One additional observation of this species at Murtaugh Lake was contributed by a BLM employee.

Northern Leopard Frog *(Rana pipiens)*

The observed distribution of this species was limited to three separate wetland sites at the Minidoka Wildlife Refuge. This species holds the status of Sensitive (BLM) and Species of Special Concern (IDFG) for the state of Idaho, however it was the second most abundant species found within the study area. We detected three larvae, 129 metamorphs, and two adults. A single additional observation from Murtaugh Lake was contributed by a BLM employee.

Longnose Leopard Lizard (*Gambelia wislizenii*)

This species' observed distribution was limited to an area of exposed rocky desert north of the Minidoka National Wildlife Refuge Headquarters. The number of individuals observed was low, with only one juvenile and three adults found at this site.

Side-blotched Lizard (*Uta stansburiana*)

The observed distribution of this species was limited with only two observations made throughout the study area. One juvenile was detected in Big Cedar Canyon and an additional juvenile was detected in sagebrush-steppe uplands near Curtis Reservoir .

Sagebrush Lizard (*Sceloporus graciosus*)

This species exhibited an intermediate distribution, which was mostly concentrated around the City of Rocks National Reserve, Emery Creek, and an access road near McClendon Springs. This species was the second most abundant lizard encountered during our surveys with six juvenile and 20 adult observations.

Western Fence Lizard *(Sceloporus occidentalis)*

The observed distribution of this species was widespread with the majority of observations made in habitat dominated by talus slopes and exposed rocks in the South Hills, particularly in Big Cottonwood Canyon, Big Cedar Canyon, and Little Cedar Canyon. This species was the most abundant lizard species encountered throughout the study area with 12 juvenile and 32 adult observations.

Western Skink (*Eumeces skiltonianus*)

This species was not detected in any of the sites that we surveyed. A single observation was contributed by BLM employees from the Chokecherry Canyon area.

Western Whiptail (*Cnemidophorus tigris*)

The observed distribution of this species was limited to one site in Little Cedar Canyon and one observation from an access road near McClendon Springs. This species' observed abundance was considerably low with only three juvenile and one adult observations made throughout the study area.

Racer *(Coluber constrictor)*

The observed distribution of this species was intermediate with the majority of sightings occurring around wetlands or riparian areas such as the pond surveyed in Big Cottonwood Canyon and near the stream in Cave Canyon. We detected four juveniles and three adults throughout the study area.

Striped Whipsnake (*Masticophis taeniatus*)

The observed distribution of this species was intermediate with no particular area of concentrated observations. We observed four juveniles and three adults throughout the study area.

Gopher Snake *(Pituophis catenifer)*

The observed distribution of this species was primarily limited to the South Hills particularly on roads near the BCWMA and surrounding canyons. This species was the most abundant snake species found throughout the study area with 12 juvenile and nine adult observations. A number of these observations were road killed individuals.

Western Terrestrial Garter Snake *(Thamnophis elegans)*

The observed distribution of this species was widespread with individuals detected in most of the regions surveyed throughout the study area. This species was the second most abundant snake species detected with nine juvenile and six adult observations.

Western Rattlesnake (*Crotalus viridis*)

The observed distribution of this species was limited primarily to the roads near BCWMA, and a single observation from Bobcat Canyon on the Minidoka National Wildlife Refuge. We detected two juveniles and three adults throughout the study area.

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We would like to thank Paul Makela (BLM Burley Field Office) and Mike McDonald (IDFG Magic Valley Region) for the opportunity to perform this study. Funding was provided via Idaho's BLM Challenge Cost Share Program and the IDFG provided a vehicle and housing for the fieldwork. Ted Scherff (Idaho State Parks and Recreation, National Park Service) provided useful information concerning historical observations and suggestions for potential survey sites at the City of Rocks National Reserve. Steve Bouffard (USFWS) provided housing and transportation while surveying the Minidoka National Wildlife Refuge, and also provided valuable information concerning historical observations and suggestions for potential survey sites. We would like to thank Rob Wilson for contributed observations and for the initial tour of the canyons near the BCWMA. Will Hayes spent a few days in the field surveying sites and his help was greatly appreciated. We want to thank Carl Austin for the opportunity to survey on his private ranch, and also for pointing out the areas on the ranch where previous casual observations have been made.

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