

Riparian Herptofauna of F. E. Warren Air Force Base, Cheyenne, Wyoming

Prepared by:

Douglas A. Keinath, Zoology Program Manager
Wyoming Natural Diversity Database
University of Wyoming
P.O. Box 3381
Laramie, Wyoming 8207-13381
(307) 766-3013
dkeinath@uwyo.edu

Prepared for:

Kathy Pesenti
Environmental Management Flight
Francis E. Warren Airforce Base
90 CES / CEVN
300 Vesle Drive
F. E. Warren AFB, Wyoming 82005

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RIPARIAN HERPTOFAUNA OF F. E. WARREN AIR FORCE BASE, CHEYENNE, WYOMING

Executive Summary

The purpose of this study was to create a list of amphibian and reptile species likely occurring on F.E. Warren Air Force Base and then survey the base to determine which of those species do in fact occur there. The survey took place over the summers of 2000 and 2001 using standardized methodologies from published sources. Seven species of herptiles were documented including two amphibians, the bullfrog (*Rana catesbeiana*) and the northern leopard frog (*Rana pipiens*), and five reptiles, western painted turtles (*Chrysemys picta belli*), common snapping turtles (*Chelydra serpentina*), a western spiny softshell turtle (*Trionyx spiniferus hartwegi*), wandering garter snakes (*Thamnophis elegans vargrans*), and a red-sided garter snake (*Thamnophis sirtalis parietalis*). Of these, the bullfrog and the western spiny softshell were unexpected. Bullfrogs are not native to Wyoming and have the potential to drive native amphibians out of those wetlands in which they occur. The softshell turtle, on the other hand, is native, although the Base is just beyond the southwestern edge of its range. Further studies could be done to document continued presence of softshelled turtles and to more extensively survey upland areas of the Base for non-aquatic lizards and snakes.

Introduction

F. E. Warren Air Force Base represents a fragment of short or mixed-grass prairie with small segments of riparian corridors and several small wetlands. It has been highly impacted by landscape-altering human development, which began in the 1800's. Land alteration on the Base has stabilized in the past few decades, and the Base has begun to pay more attention to its biological resources. Some highly sensitive animals and plants (such as the Preble's meadow jumping mouse and the Colorado butterfly plant) are known to occur on the Base. Some sensitive herptiles could also occur on the base, but no systematic herptile inventories have been recently conducted there. The purpose of this study was to create a list of amphibian and reptile species likely occurring on F.E. Warren Air Force Base and then survey the base to determine which of those species do in fact occur there.

Methods

Study Area

F.E. Warren Air Force Base is a military facility located on the western edge of Cheyenne, Wyoming, which has been active as a military installation since the mid 1800's. The northern half of the base consists of relatively

undeveloped rolling hills of mixed-grass prairie with limited, grass-dominated riparian corridors. The southern half of the base is far more developed, containing numerous facilities to house the 20th Air Force and 90th Space Command of the United States Air Force and associated support staff and equipment. The main riparian corridor through the southern half of the base is Crow Creek (Figure 3a), a perennial second order stream running roughly northwest to southeast through the base. There are two seasonal tributaries that historically joined Crow Creek within the Base: Diamond Creek (Figure 3b) joins Crow Creek from the south, but a small, unnamed tributary (Figure 3c) no longer reaches Crow Creek, since it has been largely drained and diverted due to building and landfill operations on the base. There are also several ponds that are not directly associated with the riparian areas of the base (Figure 3d).

The vegetative composition of the Base has been documented in previous studies (Young et al, 2000; CEMML, 1995; Marriott and Jones, 1988). In summary, there are extensive willow-dominated areas, scattered cottonwood stands, marshes, and several herbaceous communities. Woody overstory species are generally dominated by coyote willow (*Salix exigua*) and cottonwoods (*Populus deltoides*). Marshes are dominated by broad-leaved cattails (*Typha latifolia*) and soft-stem bulrushes (*Scirpus validus*). Herbaceous communities include sedge (*Carex spp.*) communities along stream channels, Bent-grass / Baltic rush (*Agrostis stolonifera* / *Juncus balticus*) and Kentucky bluegrass / Baltic rush (*Poa pratensis* / *J. balticus*) communities in drier, channel-side areas, and Kentucky bluegrass / western wheat grass (*P. pratensis* / *Agropyron smithii*) and needle and thread grass (*Stipa comata*) communities in upland areas. Most areas have been extensively impacted by invasive weeds, including Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia*), houndstongue (*Cynoglossum officinale*), dalmatian toadflax (*Linaria dalmatica*), and purposefully planted crested wheatgrass (*Agropyron cristatum*).

Field Surveys

Field surveys were conducted on the riparian corridors of F. E. Warren Air Force Base in the summers of 2000 and 2001. We applied a standardized protocol for surveying the margins of aquatic habitat similar to those presented by Fellers and Freel (1995) and Sutherland (1996). Visual and auditory searches along wetland margins and nearby suitable habitat were conducted with the aid of binoculars and a dip nets (to capture animals for identification). Captured animals were identified to species and released at the capture site. Surveys were conducted periodically during daylight hours between May and September, when herptile activity is generally greatest. During each survey bout, technicians waded upstream through the near-shore aquatic vegetation and/or walked along the bank, stopping periodically to scan upstream microhabitats (e.g., shoreline, water, vegetation, etc.) with binoculars, probe dense vegetation with the dip net, and closely

investigate places of potential concealment (e.g., logs, boulders, and mats of vegetation). Upland areas and other wetlands proximate to water bodies, such as meadows, cattail marshes, willow stands, and culverts, were similarly surveyed, but walking rates were reduced and dip nets were more extensively used to probe vegetation, to compensate for the lower probability of encountering animals in these habitats. Surveys were not conducted during severely inclement weather, since animals tend to be less visible at those times. In a few areas with suspected turtle activity a modified Tamahawk live trap was used to capture turtles.

Results and Discussion

Seven herptile species were seen or captured in this study, including bullfrogs (*Rana catesbeiana*), northern leopard frogs (*Rana pipiens*), western painted turtles (*Chrysemys picta belli*), common snapping turtles (*Chelydra serpentina*), a western spiny softshell turtle (*Trionyx spiniferus hartwegi*), wandering garter snakes (*Thamnophis elegans vargrans*), and a red-sided garter snake (*Thamnophis sirtalis parietalis*) (Table 1). The most abundant amphibian on the Base seems to be the bullfrog. At this time, bullfrog observations are limited to the ponds in the north central portion of the Base (Figure 2) and since many juveniles were seen, breeding is certainly occurring. No other amphibians were documented in these ponds. This is a matter of potential concern, because bullfrogs are invasive in Wyoming and have been shown to predate and competitively exclude native frogs, such as the northern leopard frog. In contrast, northern leopard frogs seem to occur at very low abundances over most riparian areas of the Base, but we never observed more than one leopard frog at a time and no eggs, tadpoles, or juveniles were observed, so it is unclear if they are successfully breeding.

Concerning reptiles, both species of garter snake found on the Base were expected in the area, but the presence of an adult western spiny softshell turtle was somewhat unexpected, since Wyoming is on the edge of their range and they have never been found in the drainages that encompass the Base. If softshells continue to be found on or near the Base, it would represent a small range expansion for this species. With “collectable” species such as turtles, however, one cannot rule out the possibility that someone might have had a pet softshell turtle and decided to release it in Crow Creek near the Base. In such a case, the softshell turtle we found could be an anomaly. To confirm continued presence, the stretch of Crow Creek on the northern end of the base should be surveyed in future years in an attempt to observe more softshells or gain evidence of breeding. Being one of the largest turtle species in the state, the softshell turtle was too large to fit in our turtle trap. A future survey might include the use of large turtle traps to investigate presence of other softshells and to get

a better idea of the abundance of other turtle species on the base (i.e., common snapping turtles and western painted turtles).

This study was designed mainly to identify those species tied with wetland areas, which includes all the amphibians, turtles, and some snakes, but had a low probability of finding strictly upland species, such as lizards and dry-land snakes. There are several species of reptiles, most notably the northern earless lizard and the many-lined skink, that are likely to be found on the Base. To the extent that the Base wishes a complete inventory of herptiles species, a separate survey strategy should be employed to determine presence or absence of those lizards, skinks, and dry-land snakes listed in Table 1. Also, the absence of tiger salamanders in our survey was somewhat unexpected, since they are fairly widely distributed and their range encompasses southeastern Wyoming. Future surveys might also employ traps designed to capture salamanders, or at the least make an additional effort to sight salamanders during their migratory period, when they are most visible (see Table 1).

Acknowledgements

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Literature Cited

- Baxter, G. T. and M. D. Stone. 1985. Amphibians and Reptiles of Wyoming, 2nd Edition. Wyoming Game and Fish Department, Cheyenne, Wyoming.
- Center for Ecological Management of Military Lands (CEMML). 1995. Vascular plant list of F. W. Warren Air Force Base, Laramie County, Wyoming. Department of Forest Sciences, Colorado State University, Fort Collins, Colorado. February 16, 1995.
- Fellers, G. M. and K. L. Freel. 1995. A standardized protocol for Surveying Aquatic Amphibians, Technical Report NPS/WRUC/NRTR-95-01. United States Department of Interior, Cooperative National Park Resources Unit, University of California, Davis, California.
- Marriott, Hollis; Jones, George. 1988. Preserve Design Package for a Proposed Colorado Butterfly Plant Research Natural Area. Report prepared for the U.S. Air Force, F.E. Warren Air Force Base.
- Sutherland, W. J. 1996. Ecological Census Techniques: A Handbook. Cambridge University Press, Cambridge, United Kingdom.
- Young, David P., Jr.; Erickson, Wallace P.; Gruver, Jeffery C. Investigation of Management and Effects of Structure, Composition and Distribution of Riparian Vegetation on Preble's Meadow Jumping Mouse: 1999. 2000. Report prepared for U.S. Air Force, F. W. Warren Air Force Base, March 31, 2000.

Tables and Figures

Table 1: Herptiles actually and potentially occurring on F. E. Warren Air Force Base. Those in bold type were documented during this study. *

Species	Presence	Source	Breeding Period	Habitat Notes
Tiger Salamander (<i>Ambystoma tigrinum</i> Green)	Known nearby from previous studies.	University of Kansas Museum	March – June	Tiger salamanders can be found in a variety of wetland habitats from low-elevations plains to forested foothills. They are most visible during migration from winter hibernacula to breeding areas in April and May and vice versa in September.
Plains spadefoot toad (<i>Scaphopus intermontanus</i>)	FEWAFB is within Range.	Baxter and Stone, 1985	Several days in May-June	The plains spadefoot toad uses temporary ponds in grasslands and sagebrush shrublands for breeding.
Woodhouse's Toad (<i>Bufo woodhousei woodhousei</i>)	FEWAFB is within Range.	Baxter and Stone, 1985	Sporadically throughout spring and summer (Uncertain)	Woodhouse's toad can be found near permanent or irrigation water in plains foothills.
Northern Leopard Frog (<i>Rana pipiens</i>)	Known nearby. Confirmed on FEWAFB in this survey.	University of Wyoming Museum. WYNDD, 2001.	Mid-April - May	The northern-leopard frog can be found near permanent water in areas up to about 9,000 feet. Lower elevation sites are usually swampy cattail marshes and higher ones tend to be beaver ponds.
Bullfrog (<i>Rana catesbeiana</i>)	Not native to Wyoming. Discovered on FEWAFB in this survey.	WYNDD, 2001	Mid summer	In Wyoming, the bullfrog is found in a variety of warm habitats, especially large ponds and lakes.
Western spiny softshell (<i>Trionyx spiniferus hartwegi</i>)	Discovered in this survey	WYNDD, 2001	Time of egg laying is unclear for Wyoming.	Western spiny softshell turtles can be found in permanent lakes and large streams below 6000 feet. They are highly aquatic, but often seen basking near water.
Western Painted Turtle (<i>Chrysemys picta belli</i>)	FEWAFB is within Range. Confirmed on FEWAFB in this survey.	Baxter and Stone, 1985. WYNDD, 2001	Time of egg laying is unclear for Wyoming.	Painted turtles can be found in and near ponds, marshes and muddy streams at low elevations. Often seen basking on exposed logs or on shore.
Common snapping turtle (<i>Chelydra serpentina</i>)	FEWAFB is within Range. Confirmed on FEWAFB in this survey.	Baxter and Stone, 1985. WYNDD, 2001	Eggs laid in May – June.	The common snapping turtle can be found in permanent ponds, lakes and deep pools of streams where it often buries itself in the mud.
Many-lined Skink (<i>Eumeces multivirgatus</i>)	FEWAFB is within Range.	Baxter and Stone, 1985.	Eggs may be laid in May, but precise timing in Wyoming is unclear.	The many-lined skink occurs in grassland communities or open scarp woodlands. It lives on the ground and often hides under loose objects (e.g., boards, logs, rocks, etc.).
Northern sagebrush lizard (<i>Sceloporus graciosus graciosus</i>)	FEWAFB is within Range.	Baxter and Stone, 1985.	Becomes active in May and eggs laid about June.	The northern sagebrush lizard occurs in rocky outcrops in sagebrush communities, usually below 6000 feet.
Red-lipped prairie lizard (<i>Sceloporus undulatus erythrocheilus</i>)	FEWAFB is within Range.	Baxter and Stone, 1985.	Becomes active in May and eggs laid about June.	Red-lipped prairie lizards are restricted to boulders and rock cliffs near the hogback along the Front Range, but may occasionally be found around abandoned buildings in the same areas.

Table 1 Continued

Species	Presence	Source	Breeding Period	Habitat Notes
Northern prairie lizard (<i>Sceloporus undulatus garmani</i>)	FEWAFB is on the edge of its Range.	Baxter and Stone, 1985.	Becomes active in May and eggs laid about June.	The northern prairie lizard is mostly found in grasslands, but also in low shrublands and in woodlands along rock escarpments (not among large rocks and cliffs, as the red-lipped prairie lizard).
Eastern short-horned lizard (<i>Phrynosoma douglassi brevirostre</i>)	FEWAFB is within Range.	Baxter and Stone, 1985.	Becomes active in May and gives live birth in late June or July.	The short-horned lizard is found in both grasslands and shrublands, typically in flat, arid areas.
Northern earless lizard (<i>Holbrookia maculata maculata</i>)	FEWAFB is on the edge of its Range. Known nearby from previous studies.	Baxter and Stone, 1985. University of Wyoming museum.	Breeding penology unclear for Wyoming.	The northern earless lizard is usually found in grassland communities, preferring exposed, sandy areas with yucca. Suitable habitat exists on FEWAFB.
Hognose Snake (<i>Heterodon nasicus nasicus</i>)	FEWAFB is on the edge of its Range.	Baxter and Stone, 1985.	Eggs are usually laid in late June or early July.	The hognose snake is found in grassland communities in the plains zone, especially near areas with sandy or tilled soil, where it burrows.
Bullsnake (<i>Pituophis melanoleucus sayi</i>)	FEWAFB is within Range. Known nearby from previous studies.	Baxter and Stone, 1985. University of Wyoming museum.	Eggs are usually laid in July.	Bullsnakes are found in grasslands, sagebrush, and scarp woodlands east of the Rocky Mountains.
Wandering garter snake (<i>Thamnophis elegans vargrans</i>)	FEWAFB is within Range. Confirmed on FEWAFB in this survey.	Baxter and Stone, 1985. WYNDD, 2001	Young snakes are born alive, in late summer (August – September).	Wandering garter snakes are found in a wide variety of habitat types up to high elevations. They are often found near water, particularly along rubble-covered banks of large streams.
Red-sided garter snake (<i>Thamnophis sitalis parietalis</i>)	FEWAFB is at the edge of its Range. Confirmed on FEWAFB in this survey.	Baxter and Stone, 1985. WYNDD, 2001	Young snakes are born alive, in late summer (August – September).	Red-sided garter snakes are usually found near permanent water in a variety of habitats at lower elevations.
Western plains garter snake (<i>Thamnophis radix haydeni</i>)	FEWAFB is at the edge of its Range.	Baxter and Stone, 1985.	Young snakes are born alive, in late summer (August – September).	Plains garter snakes are found near small streams, marshes and ponds in grasslands and in brushy urban areas.
Prairie rattlesnake (<i>Crotalus viridis viridis</i>)	FEWAFB is within Range. Known nearby from previous studies.	Baxter and Stone, 1985. University of Wyoming museum.	Young snakes are born alive, in late summer (August – September).	Prairie rattle snakes are found throughout the plains communities, but are most prevalent in scarp and foothills woodlands.

* Data in this table were compiled from records at WYNDD including literature reports, museum specimens and established range maps from Baxter and Stone (1985). Based on habitat requirements and known distributions, all of these animals could occur on the air force base, although not all of them have been documented there.

Figure 1: Map of the F. W. Warren Air Force Base, Cheyenne, Wyoming showing major wetland areas and riparian corridors (— = base boundary).

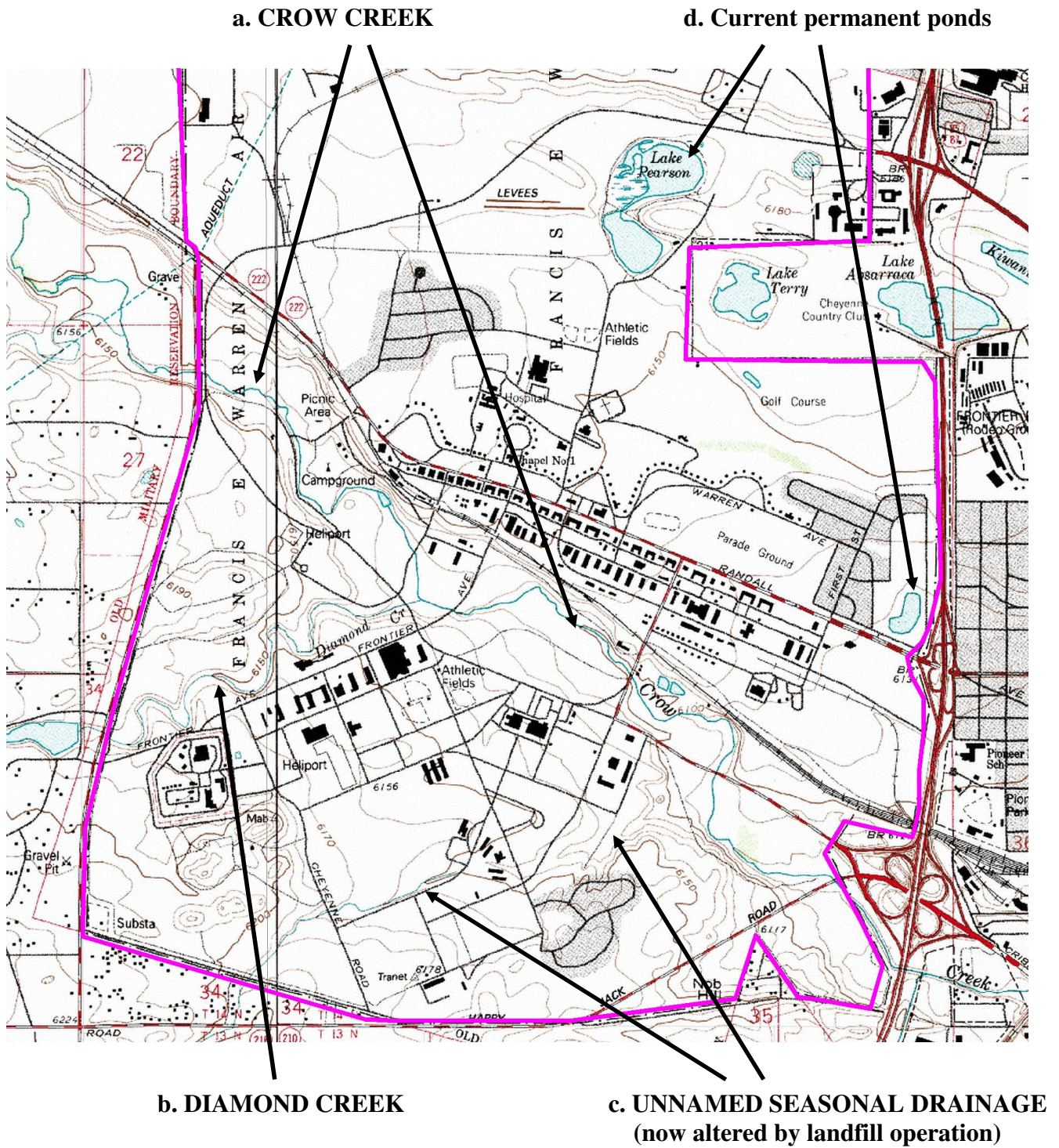


Figure 2: Locations of survey areas and herptile observations along riparian corridors and ponds of F. E. Warren Air Force Base.

