

***White-Nose Syndrome Surveillance Across Northern Great Plains National
Park Units
2018 Interim Report***

CESU Cooperative Agreement P17AC01135

Prepared by:

Ian Abernethy, Lead Vertebrate Zoologist

Wyoming Natural Diversity Database
University of Wyoming
1000 E. University Ave, Department 3381
Laramie, Wyoming 82071



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Introduction

The predominant threat to bats in North America is White-Nose Syndrome (WNS). The disease is caused by the fungal pathogen *Pseudogymnoascus destructans* (Pd; formerly *Geomyces destructans*) and affects hibernating bats (Lorch et al. 2011). Since its discovery in New York in 2006, WNS has killed at least 5.7–6.7 million bats in North America (Froschauer and Coleman 2012). In affected areas, mortality rates of up to 100% have been documented (Frick et al. 2010). The disease continues to spread west from the eastern and southeastern US and recently made a large geographical advancement to Washington (whitenosesyndrome.org 2017). In the winter of 2016/2017 WNS was documented in bats in three counties in eastern Nebraska, marking its first occurrence within the Northern Great Plains. Prior to this surveillance effort, WNS had yet to affect the majority of the region.

It is critical to track the distribution and effects to local bat populations as the range of the disease continues to expand across the country. As such, surveillance for Pd and WNS is a central component of the National WNS Plan (United States Fish and Wildlife Service 2011). Early detection is critical to resource managers tasked with managing wildlife, landscapes, and people in the face of this novel disease. This is particularly true throughout the Great Plains region which supports bat species assemblages and habitat features that are currently not affected by WNS. It is likely that these species and habitats are susceptible to the disease but it is unknown if the disease will impact bats in the region in the same manner it has in eastern North America. We undertook a cooperative WNS surveillance effort in 2018 with the primary objective of implementing surveillance for Pd and WNS across a large region of the north central United States with the ultimate goal of helping land managers and disease ecologists better understand the distribution of Pd and how it may affect bat species not currently impacted by the disease.

Secondary objectives of this project were to fill basic information gaps for National Park Service (NPS) units in the Northern Great Plains Network (NGPN). Bat surveys have been conducted at some NPS Units within the proposed study area but most have been limited in scope or have only included passive acoustic recording of bats. As a result, basic information including species composition and demographic parameters of local populations are uncertain.

This report summarizes WNS surveillance activities conducted in 2018. Ultimately, enhanced understanding of distribution Pd and WNS and the bat species affected will help the NPS in planning current management and mitigation actions leading to preservation of bat communities that occupy NPS units in the region.

Methods

Study Area

The study area included all NPS units in the NGPN (Figure 1). These units included Agate Fossil Beds National Monument, Badlands National Park, Devils Tower National Monument, Fort Laramie National Historic Site, Fort Union Trading Post National Historic Site, Jewel Cave National Monument, Knife River Indian Villages National Historic Site, Missouri National Recreational River, Mount Rushmore National Memorial, Niobrara National Scenic River, Scotts Bluff National Monument, Theodore Roosevelt National Park, and Wind Cave National Park (Figures 2 – 11). No surveillance activities were conducted at Fort Union Trading Post National Historic Site, Knife

River Indian Villages National Historic Site, or Theodore Roosevelt National Park in 2018 due to logistical constraints.

Capture, Handling, and Sampling

Following guidelines developed by the United States Geological Survey's (USGS) National Wildlife Health Center (United States Geological Survey National Wildlife Health Center 2017) and protocols presented in the National WNS Surveillance Plan, we carried out this surveillance in April and May of 2018 (Disease Surveillance Working Group 2017). Bats were captured in 38 mm bat-specific mist nets in lengths of 6, 9, 12, and 18 m arranged in single or double-high (2.6 or 5.2 m high, respectively) sets. Mist nets were opened at civil sunset, unless non-target taxa (e.g. birds) are active at the site. Nets were closed approximately five hours after sunset unless weather conditions or low bat activity were encountered. Mist nets were checked for captures continuously and captures were removed immediately. Bats were removed by gloved hand and placed in an unused paper holding bag and processed immediately. At NPS units in South Dakota, permit stipulations required female bats be released immediately and therefore the methods described below did not apply to female bats in South Dakota. We obtained standard morphometric measurements including forearm length and ear length, mass, and evaluation of other morphological and physical characteristics required to identify the bat to species such as the presence or absence of keeled calcar, pelage color, and patagia color. We also determined the sex of each capture and evaluated the reproductive status of each individual by looking for descended testis, swollen abdomen, or signs of current or recent lactation. Time from capture to release was less than 30 minutes.

We collected non-lethal skin swabs to test for the presence of Pd on captured bats following NWHC protocols (United States Geological Survey National Wildlife Health Center 2017). Sterile, individually wrapped polyester-tipped swabs were dipped in a microcentrifuge tube containing nuclease free water and rolled across each forearm and the muzzle three times. Swabs were then placed back into the microcentrifuge tube containing nuclease free water and stored on ice until they could be shipped overnight for lab analyses. Initially, one swab was collected per bat. Following the detection of Pd at Badlands National Park, we collected two swab samples, one from the left forearm and left side of the muzzle and one from the right forearm and right side of the muzzle. This allowed independent verification of lab results. Samples were submitted to and analyzed by the Colorado State Veterinary Diagnostic Laboratory (VDL) and the NWHC.

In addition, we used two methods to evaluate the wings of all captured bats for signs of Pd infection or WNS damage. First, using an LED headlamp to backlight the flight membranes, we looked for tissue damage characteristic of bats with WNS (Reichard and Kunz 2009, Reichard 2010). We assigned each captured bat a wing damage index score following Reichard (2010). Second, we scanned the wing membranes of each capture with a UV light which causes portions of the wings infected with Pd to fluoresce a subtle pumpkin-orange color (Turner et al. 2014). If fluorescence was observed, a wing biopsy was collected from a portion of the wing where fluorescence was noted using an individually wrapped 3mm sterile single use tissue biopsy punch. Biopsy samples were placed into a microcentrifuge tube and stored on ice. Biopsy samples were submitted to either the VDL or NWHC for histological analysis.

As specified by the terms of our state and federal permits, all capture and handling protocols followed the "2018 Range-wide Indiana Bat Survey Guidelines" (United States Fish and Wildlife Service 2018) where applicable and we strictly adhered to all aspects of the "National White-Nose Syndrome Decontamination Protocol Version

04.12.2016” (United States Fish and Wildlife Service 2016). Survey methods also conformed to other recommended guidelines (e.g., Kunz and Parsons 2009, Sikes et al. 2011). All survey protocols were reviewed and approved by both the University of Wyoming and National Park Service Institutional Animal Care and Use Committees.

Results

In 2018, we captured a total of 419 bats representing 8 species over 39 nights of mist-netting (Tables 1 and 2). From these captures, we collected wing swabs from a total of 122 individual bats and wing biopsies from 9 bats (Table 2). These 122 wing swabs resulted in Pd detections in 10 individual bats (Figures 2-11; Table 2). These detections came from four NPS units: Badlands National Park, Fort Laramie National Historic Site, Jewel Cave National Monument, and the Missouri National Recreational River. Histological evaluation of one wing biopsy collected near Jewel Cave National Monument revealed evidence WNS. Results for each NPS unit are summarized below. No bats were incidentally or intentionally killed in 2018 and all bats were released at the site of capture in good condition.

Agate Fossil Beds National Monument

We captured five individual bats representing three species over five nights of mist-netting at Agate Fossil Beds National Monument in 2018 (Figure 2; Table 2). Wing swabs were collected from each bat and Pd was not detected via PCR analysis at either lab. Evaluation of the wing membranes did not reveal any evidence of Pd infection or WNS.

Badlands National Park

At Badlands National Park we captured 17 bats representing four species (Figure 3; Table 2). We collected 12 skin swabs. Pd was detected on five individual bats, four big brown bats and one western small-footed myotis. These detections represented the first case of Pd in the state of South Dakota and the first case of Pd on a western small-footed myotis. Samples collected at Badlands National Park were first submitted to the VDL for disease testing. Upon receiving positive results, extracted DNA was sent to the NWHC for confirmation. Similar results were reported by both laboratories. However, because analyses conducted by both labs used DNA extracted from the same swabs, confirmation could not be considered independent, reducing the weight of evidence. The wing membranes of the western small-footed myotis fluoresced orange under UV light (Figure 12), providing additional evidence of Pd infection on this individual. The wing membranes of the four big brown bats in which Pd was detected did not fluoresce or show any other outward signs of Pd or WNS infection. Considering both the PCR results and fluorescence of the wings under UV, we determined there was sufficient evidence to confirm the presence of Pd at Badlands National Park.

Devils Tower National Monument

We captured seven bats representing three species over four nights of mist netting at Devils Tower National Monument in 2018 (Figure 4; Tables 1 and 2). Seven skin swabs were taken but Pd was not detected. Visual evaluation of the flight membranes did not reveal any evidence of Pd or WNS infection.

Fort Laramie National Historic Site

We captured a total of 283 bats at Fort Laramie National Historic Site over three nights of mistnetting in 2018 (Figure 5; Tables 1 and 2). The high rate of captures at the park can be attributed to a large self-standing bat house which is used by at least 7,000 bats, most of which are probably little brown bats (Licht pers. comm.). We collected wing swabs from 45 individual bats and wing biopsies from six individual bats. Pd was detected on one little brown bat (Table 2). The test result for this individual was confirmed by both the VDL and NWHC. A second little brown bat was termed equivocal by the NWHC meaning that the test result was positive but test values were above the threshold used to define a “positive”. This marked the first case of Pd in the state of Wyoming. Evaluation of the flight membranes revealed a large number of bats with considerable wing scarring and white-green fluorescence under UV which is not typical of Pd / WNS. Similar observations have been made in other locations, but no cause has been determined (Verant pers comm). Histopathology of wing biopsies taken from scarred or fluorescing portions of the wings of six individual little brown bats did not reveal any evidence of WNS but did find mites and mite eggs which may have caused tissue damage observed.

Fort Union Trading Post National Historic Site

No WNS surveillance activities were conducted at Fort Union Trading Post National Historic Site in 2018 due to time and logistical constraints.

Jewel Cave National Monument

We captured a total of 32 bats representing seven species over three nights of mist netting at Jewel Cave National Monument and on adjacent public lands within the Black Hills National Forest in 2018 (Figure 6; Tables 1 and 2). We collected wing swabs from 23 individuals and one wing biopsy (Table 2). Pd was detected on one male long-legged myotis and PCR results from both the VDL and the NWHC confirmed this result. A wing biopsy was collected from this bat and histopathology revealed lesions characteristic of WNS. This bat also displayed orange fluorescence on the wings under UV and had some white residue around the muzzle (Figure 13). This case represented the first confirmed case of WNS in South Dakota (the prior positive results from Badlands National Park only confirmed the presence of Pd) and the first case of WNS in a long-legged myotis. Additionally, the NWHC reported an equivocal result for Pd on one male western small-footed myotis. This result was obtained in one of three PCR replicates at NWHC but this result was not confirmed by the VDL. This suggests that this individual may have had Pd but there was not sufficient evidence to confirm that this individual carried Pd.

Knife River Indian Villages National Historic Site

No WNS surveillance activities were conducted at Knife River Indian Villages National Historic Site in 2018 due to time and logistical constraints.

Missouri National Recreational River

We captured three individual bats representing two species over seven nights of mist netting at the Missouri National Recreational River in 2018 (Figure 7; Tables 1 and 2). An additional big brown bat was removed from a home near Ponca State Park and tested. We collected wing swabs from all four individuals and three of these tested positive for Pd. These included two northern long-eared bats and one silver-haired bat. Swabs were only submitted to the VDL for disease testing.

Mount Rushmore National Memorial

At Mount Rushmore National Memorial and on adjacent public lands within the Black Hills National Forest we conducted three nights of mist netting and captured 14 bats representing three species (Figure 8; Tables 1 and 2). We collected nine wing swabs (Table 2). No Pd detections were made here in 2018 and evaluation of the flight membranes did not reveal any damage or signs of Pd or WNS.

Niobrara National Scenic River

We captured eight northern long-eared bats in five nights of mist netting across the Niobrara National Scenic River in 2018 (Figure 9; Tables 1 and 2). We collected eight wing swabs and disease testing did not detect Pd. No evidence of Pd or WNS was noted during evaluation of the flight membranes.

Scotts Bluff National Monument

We captured one big brown bat at Scotts Bluff National Monument over three mist netting occasions in 2018 (Figure 10; Tables 1 and 2). No Pd was detected from wing swabs taken from this bat and evaluation of the wing membranes did not reveal and evidence of Pd or WNS.

Theodore Roosevelt National Park

No WNS surveillance activities occurred at Theodore Roosevelt National Park in 2018 due to time and logistical constraints.

Wind Cave National Park

We captured 48 bats representing five species during three nights of mist netting at Wind Cave National Park in 2018 (Figure 11; Tables 1 and 2). We were only able to collect seven wing swabs for disease testing because the majority of bats captured at Wind Cave were females and had to be released immediately following our SDGFP permit. No Pd was detected in these samples and evaluation of the wing membranes did not reveal any evidence of Pd or WNS.

Discussion

We were able to conduct WNS surveillance at 10 of 13 NPS units across the NGPN in 2018. Parks across the NGPN occupy a large geographic area, adding to the logistical complexities of this surveillance project. However, significant findings resulted from surveillance activities in 2018. Specifically, the first detection of Pd in South Dakota and Wyoming and the first documented case of WNS in South Dakota stemmed from this project. Also, the first detection of Pd on western small-footed myotis and first documented case of WNS in a long-legged myotis were reported in 2018. These findings are critical to resource managers in this region as the disease continues to spread geographically and affect bat species not previously exposed to Pd. These findings also meet the two primary goals of surveillance presented in the “Draft WNS Surveillance Implementation Plan” (Disease Surveillance Working Group 2017).

This document also provides hierarchical rankings of the effectiveness of Pd/WNS surveillance modalities. The most effective methods of surveillance include hibernacula surveys where samples are collected from hibernating bats and capture events at hibernacula openings in spring. These types of surveillance maximize the likelihood of detection of Pd / WNS. However, disturbance of hibernating bats is known to reduce overwinter

survival and may represent an additional stressor even in disease free populations (Thomas 1995, Boyles and Brack 2009). Furthermore, permit stipulations put in place by state and federal agencies may preclude trapping of bats at known hibernacula. Additionally, relatively few hibernation sites are known or surface ownership may limit access to these sites for surveillance. Capturing bats on the landscape following emergence from hibernation is also listed an acceptable Pd / WNS surveillance method. Evidence suggests that bats exposed to Pd or suffering from WNS may retain fungal growth or display wing damage for approximately four weeks following emergence from hibernation (Langwig et al. 2015, Disease Surveillance Working Group 2017). In addition to concerns regarding disturbance of hibernating bats and regulatory limitations, few NPS units support known hibernacula. Because of these factors we were limited to landscape surveillance for Pd / WNS.

Because bats carry Pd or outward signs of WNS for only about four weeks following emergence, spring landscape surveillance activities must be carried out during April and May (Disease Surveillance Working Group 2017). Few bat survey activities have been conducted across the NGPN during this time of year. Acoustic monitoring at a number of NPS units in the region indicate that bat activity slowly increases in April and May, with higher levels of bat activity observed by mid-to-late-April (Hammesfahr unpublished data; Licht unpublished data). We observed similar patterns with very low bat activity and capture rates in early April followed by steadily increasing activity and capture rates through late April into May.

These relatively low capture rates made it difficult to obtain sufficient sample sizes at most NPS units. A power analysis conducted by the NWHC indicates that at least 25 bats need to be sampled at a site to have a 95% chance of detecting Pd in a population of bats in which Pd occurs.(United States Geological Survey National Wildlife Health Center 2017). We were only able collect 25 or more samples from two NPS units in 2018: Fort Laramie National Historic Site and Jewel Cave National Monument. Because we were unable to obtain sufficient sample sizes in other park units, it is possible that Pd or WNS could have been present at additional units but positive bats were simply not captured. At sites where Pd or WNS was documented in 2018, with Pd detected on only one bat at Fort Laramie National Historic Site and WNS detected in one bat at Jewel Cave National Monument. This further highlights the need for large sample sizes at each park. At all NPS units in South Dakota we were required by the State of South Dakota to release female bats immediately following extraction from mist nets. This further reduced our sample size at all park units in the state.

We primarily focused on collecting wing swabs from bats in 2018. This procedure is relatively non-invasive and efficient, and is well suited for sampling bats with no outward signs of Pd or WNS. In all states besides South Dakota (see below for further explanation), we also collected wing punch biopsies in certain circumstances because they provide a higher diagnostic value than swabs alone. Specifically, biopsy samples allow for genetic testing for Pd, fungal culture, and histological evaluation for WNS. It is important to note that biopsies were only collected from bats that displayed potential lesions from WNS and fluorescence on or around lesions. Because our South Dakota Game, Fish & Parks Scientific Collectors Permit precluded us from collecting biopsies during the period of time we were in Badlands National Park, WNS could not be confirmed, only that Pd was present. Following this detection, we sought an amendment to our permit to allow biopsy collection under the circumstances presented above. However, this situation highlights the importance of providing appropriate samples for disease testing and should be seen as a critical component of this type of monitoring project.

In addition to collecting appropriate sample types for disease testing, we also determined that collecting two swabs per bat was beneficial as it provided stronger evidence in the case of Pd detections. As outlined above, only one swab per bat was initially collected. Following the Pd detections at Badlands National Park we began collecting two swabs from each bat so that VDL and NWHC could independently test skin swabs. Independent confirmation from these two labs was useful in providing additional evidence of Pd presence. Lab results in all cases were generally in agreement with the exception of the equivocal results presented above. However, this may be cost prohibitive in many circumstances and results from a single lab are still critical in tracking the distribution of Pd. We recommend working with the NWHC and their individual state points of contact to facilitate disease testing where it aligns with their priorities to provide as much evidence as possible. Alternatively, two swabs could be collected from each bat with one swab being submitted for disease testing and the other stored in a freezer. If Pd were detected, the second swab could then be provided for independent confirmation.

Results from these surveillance activities indicate that the distribution of Pd and WNS continues to increase across the NGPN and into the western United States. In addition, at least two western bat species are susceptible to this fungus and disease. However, it is still unknown if the disease will impact bats in the NGPN in the same manner it has in eastern North America. There are a large number of hibernating bat species in this region in which Pd or WNS has not been confirmed. Also, there are a number of behavioral differences in bat species in the region. Many aspects of winter ecology of bats are poorly understood, especially in the western United States (Johnson et al. 2017, Klug-Baerwald et al. 2017). In eastern North America, bats typically hibernate in large numbers within caves and abandoned mines (Perry 2013, Klug-Baerwald et al. 2017). As a result, researchers have traditionally assumed that bats across the continent use similar features for hibernacula. However, these features are not ubiquitous on the landscape, yet bat populations persist. In much of the NGPN and Intermountain west, where caves and abandoned mines exist in areas with suitable geology and topography, surveys for hibernating bats rarely find congregations of bats larger than 50 individuals (Beard 2016). This suggests that bats are likely using some other landscape features for hibernacula. Indeed, recent studies have provided clear evidence that some bat species that occur in western North America hibernate in a number of different landscape features including rock crevices, talus fields, root wads of large trees, and within karst formations (Neubaum et al. 2006, Klug-Baerwald et al. 2017). This suggests that these features likely play an important role in population persistence for bat species that occur across the region. These differences in hibernation ecology may lead to different outcomes in terms of population level effects of WNS.

The information presented above highlights activities and results from WNS surveillance activities carried out in 2018. These surveys will take place again in 2019. As previously noted, no surveillance activities were conducted on NPS units in North Dakota. These parks will be prioritized in 2019. Surveys in 2019 may also yield important information regarding changes in distribution of Pd and WNS and if other bat species in the region are susceptible to Pd. In most cases, Pd or WNS was detected in only a very small proportion of bats sampled. Surveillance in 2019 will provide valuable information on how prevalence of Pd and WNS changes through time.

Acknowledgements

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Badlands National Park: Eddie Childers

Black Hills National Forest: Brad Phillips

Devils Tower National Monument: Rene Ohms and Amy Hammesfahr

Fort Laramie National Historic Site: Tom Baker and Maryann Neubert

Fort Niobrara / Valentine National Wildlife Refuge Complex: Steve Hicks and Kathy McPeak

Jewel Cave National Monument: Mike Wiles

Missouri National Recreation River: Milt Haar

Mount Rushmore National Memorial: Bruce Weisman

Niobrara National Scenic River – Gorden Warrick, Carma James.

Ponca State Park: Maria Korver and Scott Oligmueller

Scotts Bluff National Monument: Bob Mansek and Justin Cawiezel

Wind Cave National Park: Greg Schroeder and Marc Ohms

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Figures

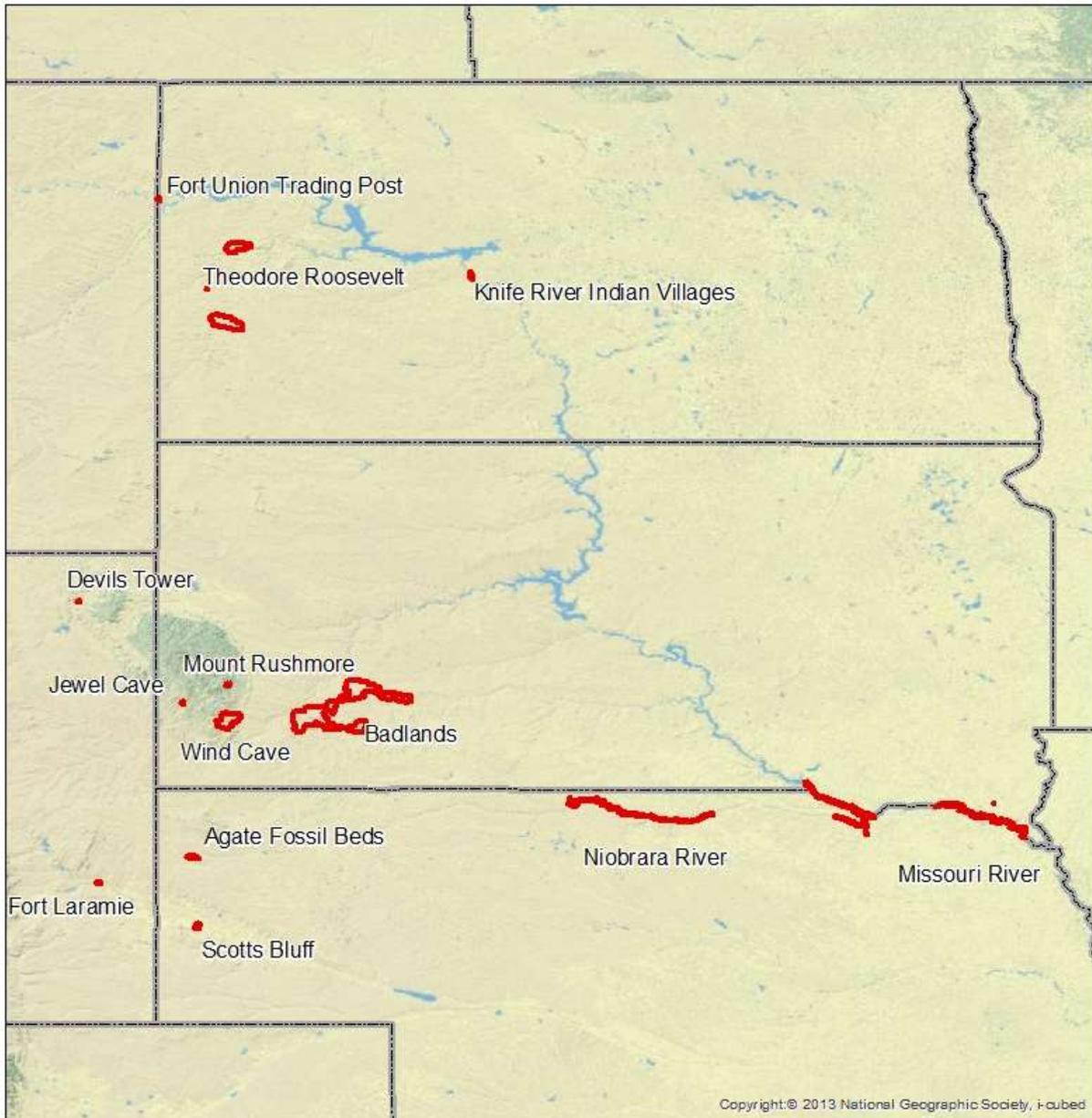
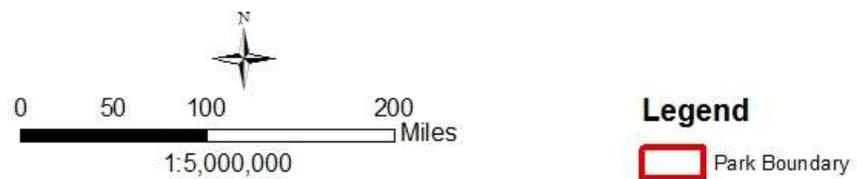


Figure 1. National Park Service units targeted for WNS surveillance in 2018. Note that surveillance did not occur at Fort Union Trading Post National Historic Site, Knife River Indian Villages National Historic Site, or Theodore Roosevelt National Park in 2018.



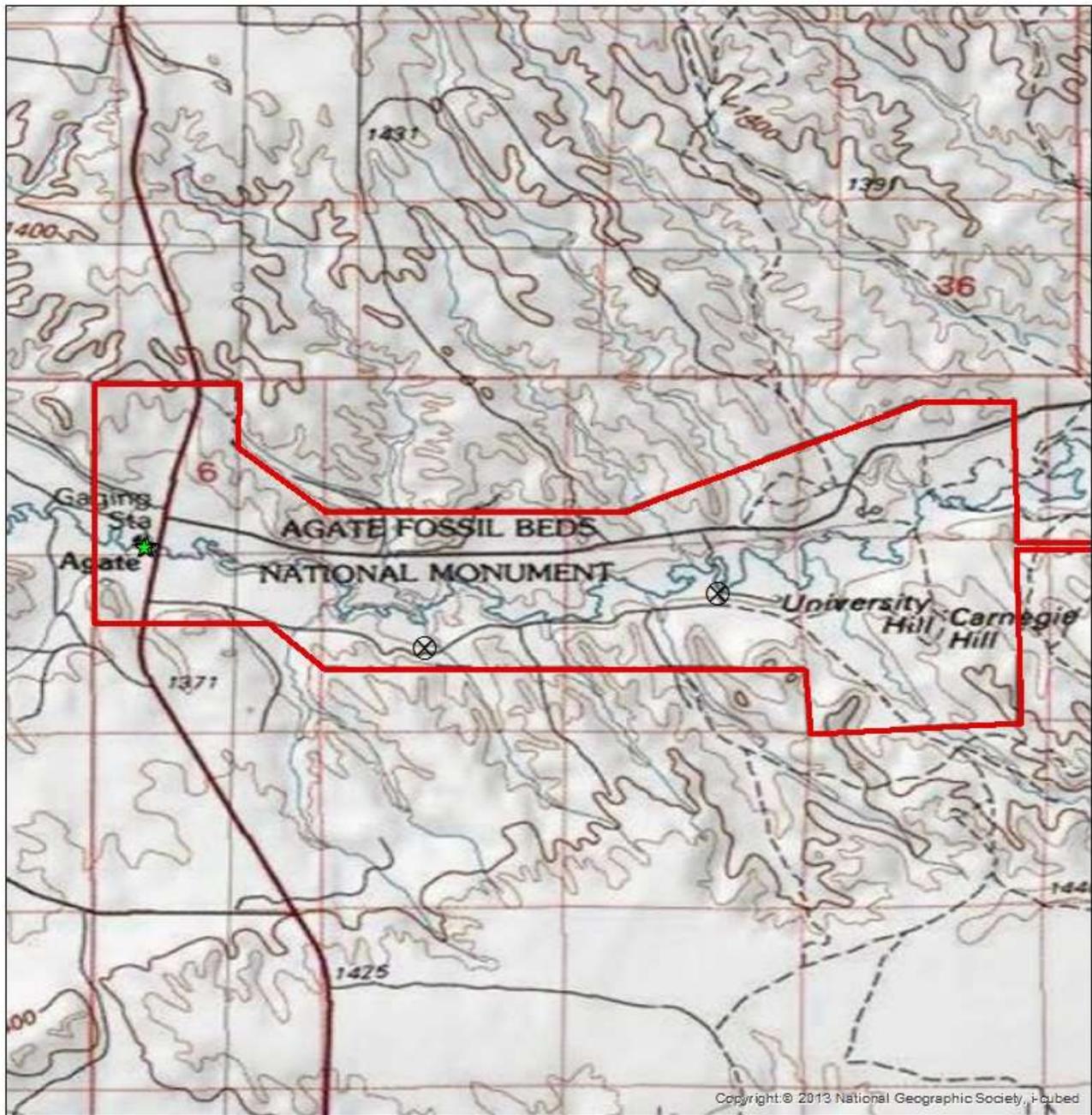
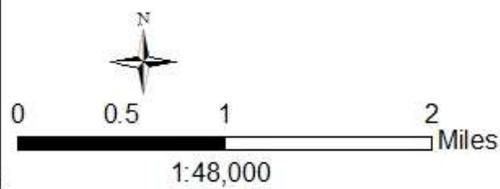


Figure 2. Mist net survey locations and Pd or WNS status of bats at Agate Fossil Beds National Monument surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- ▭ Park Boundary

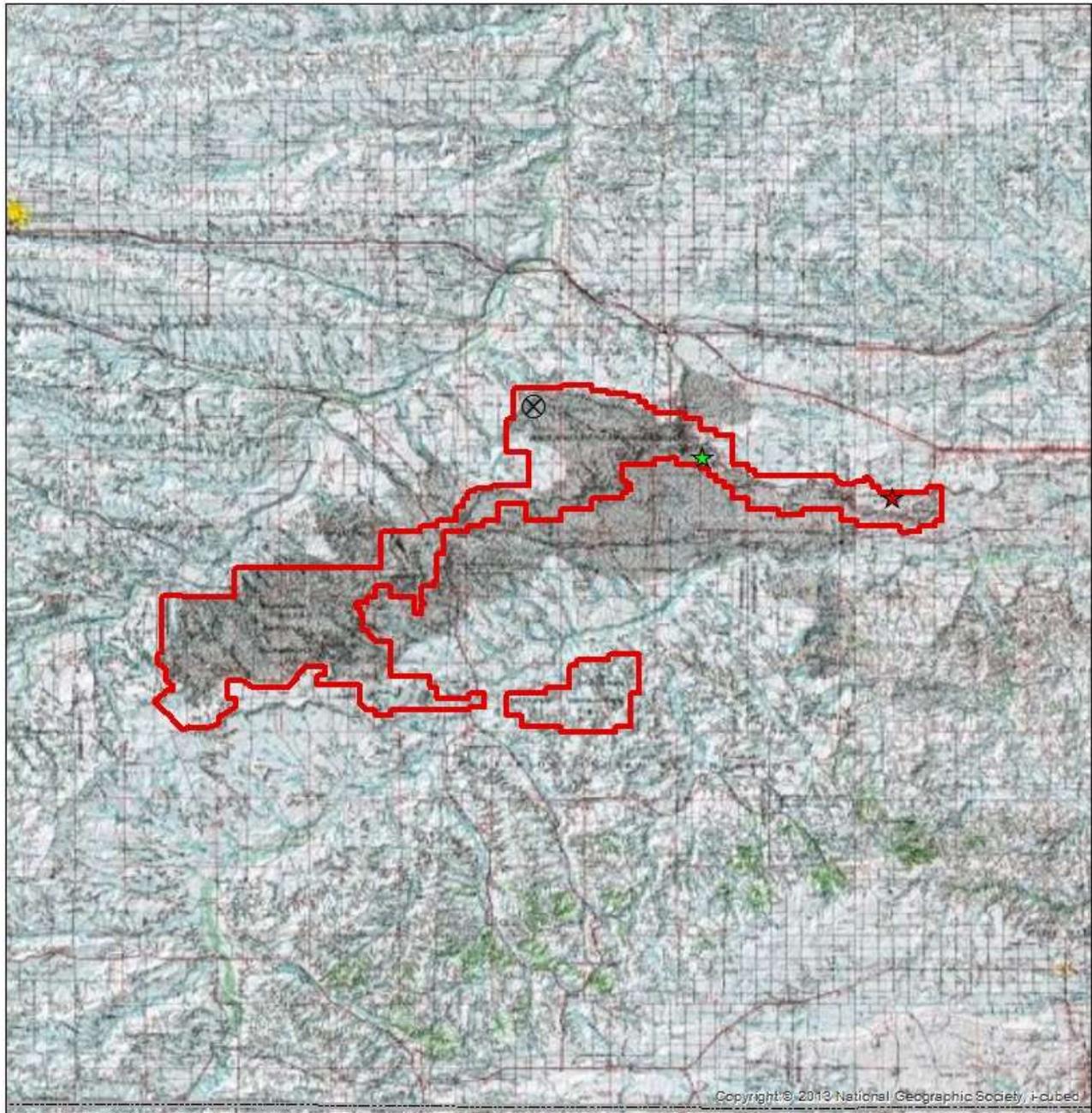
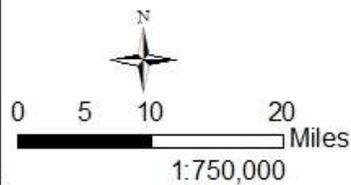


Figure 3. Mist net survey locations and Pd or WNS status of bats at Badlands National Park surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- ▭ Park Boundary

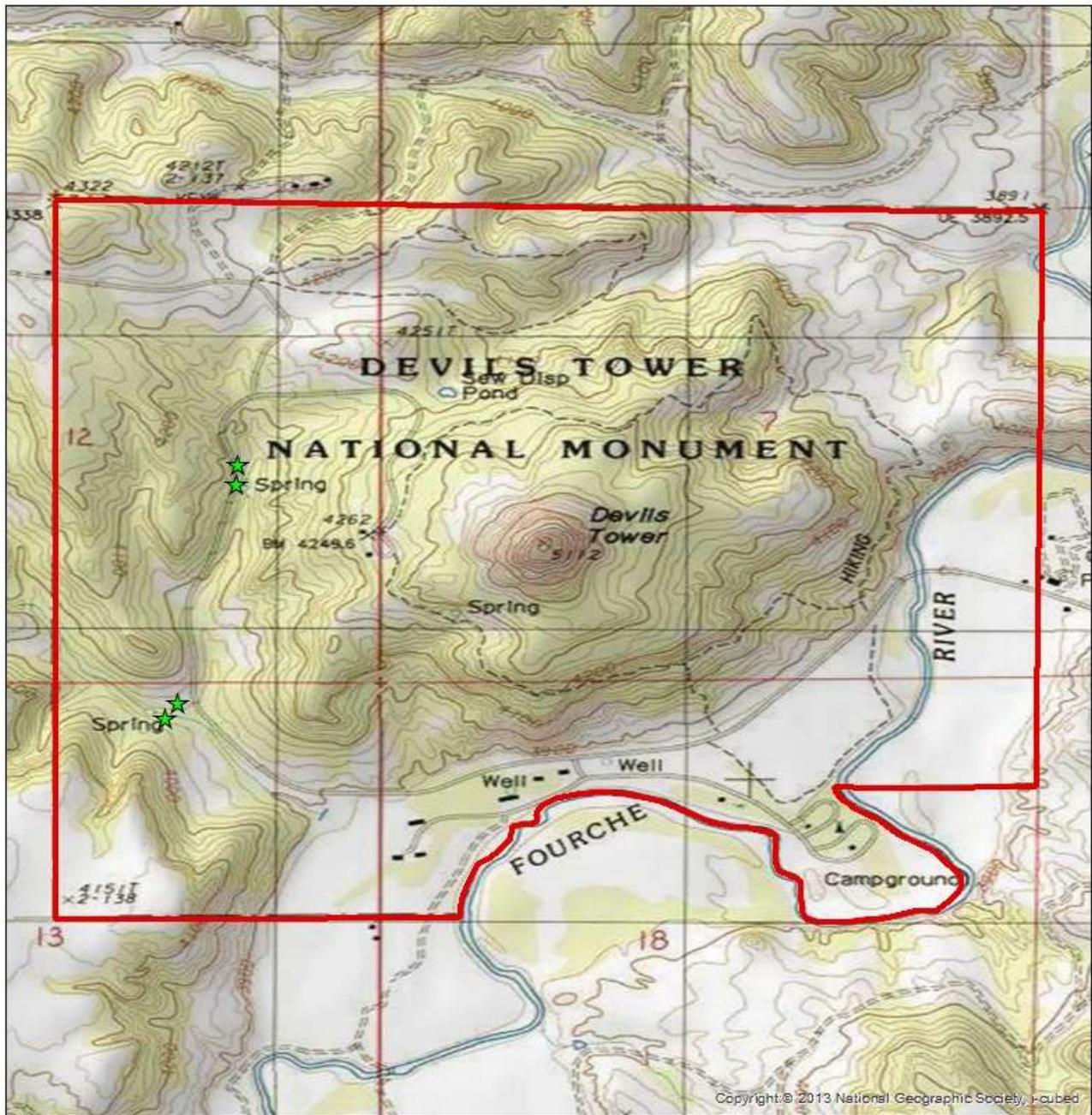
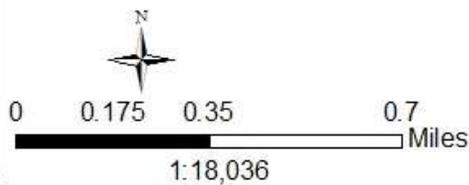


Figure 4. Mist net survey locations and Pd or WNS status of bats at Devils Tower National Monument surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- Park Boundary

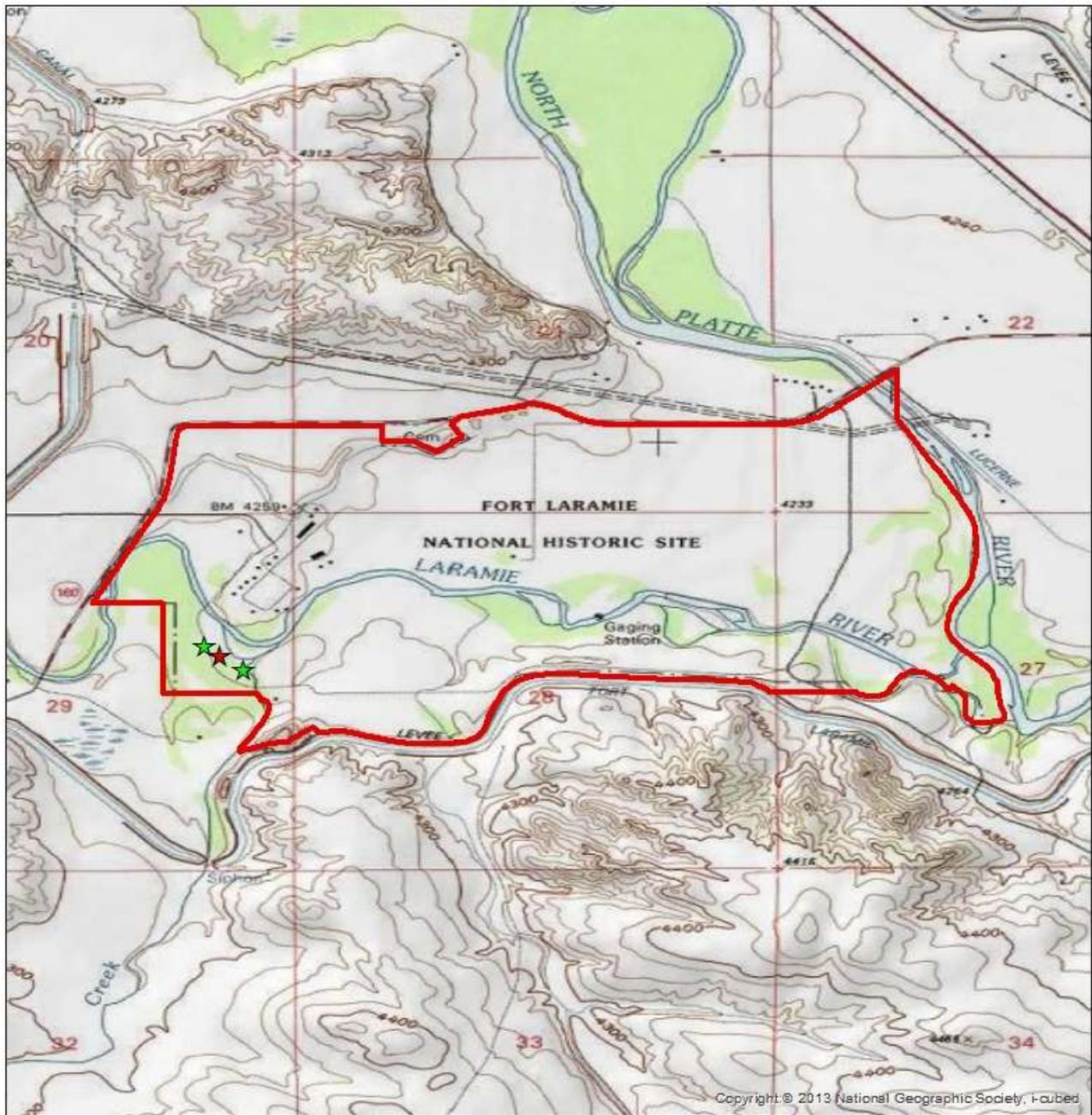
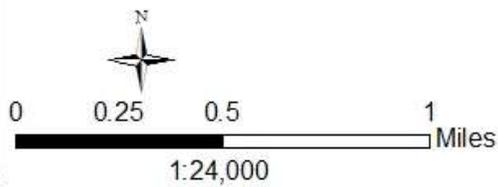


Figure 5. Mist net survey locations and Pd or WNS status of bats at Fort Laramie National Historic Site surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- ▭ Park Boundary

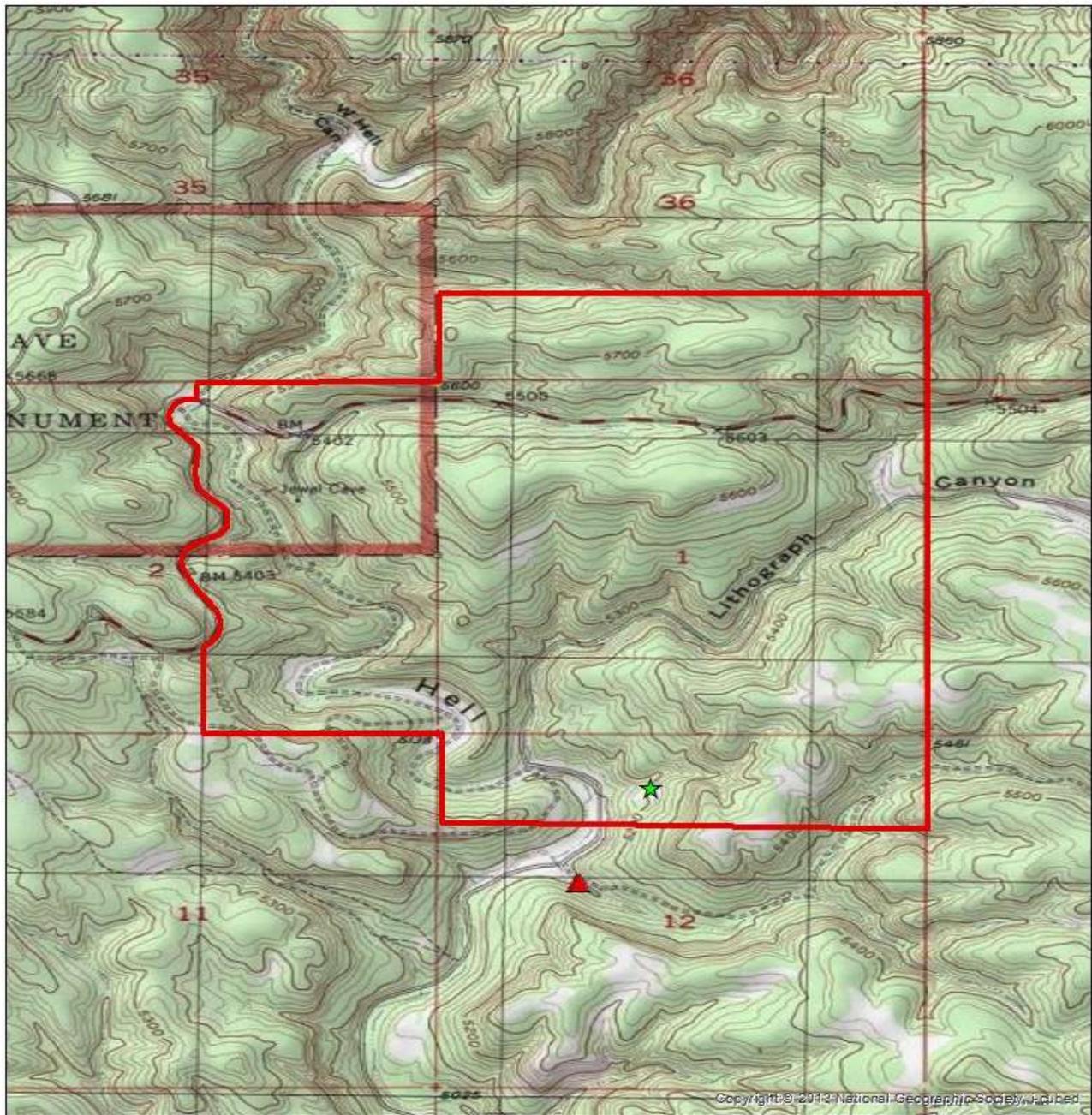
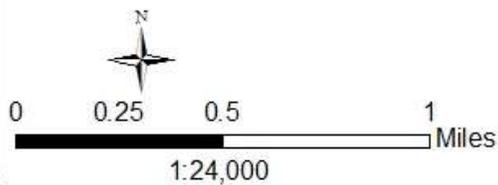


Figure 6. Mist net survey locations and Pd or WNS status of bats at Jewel Cave National Monument surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- Park Boundary

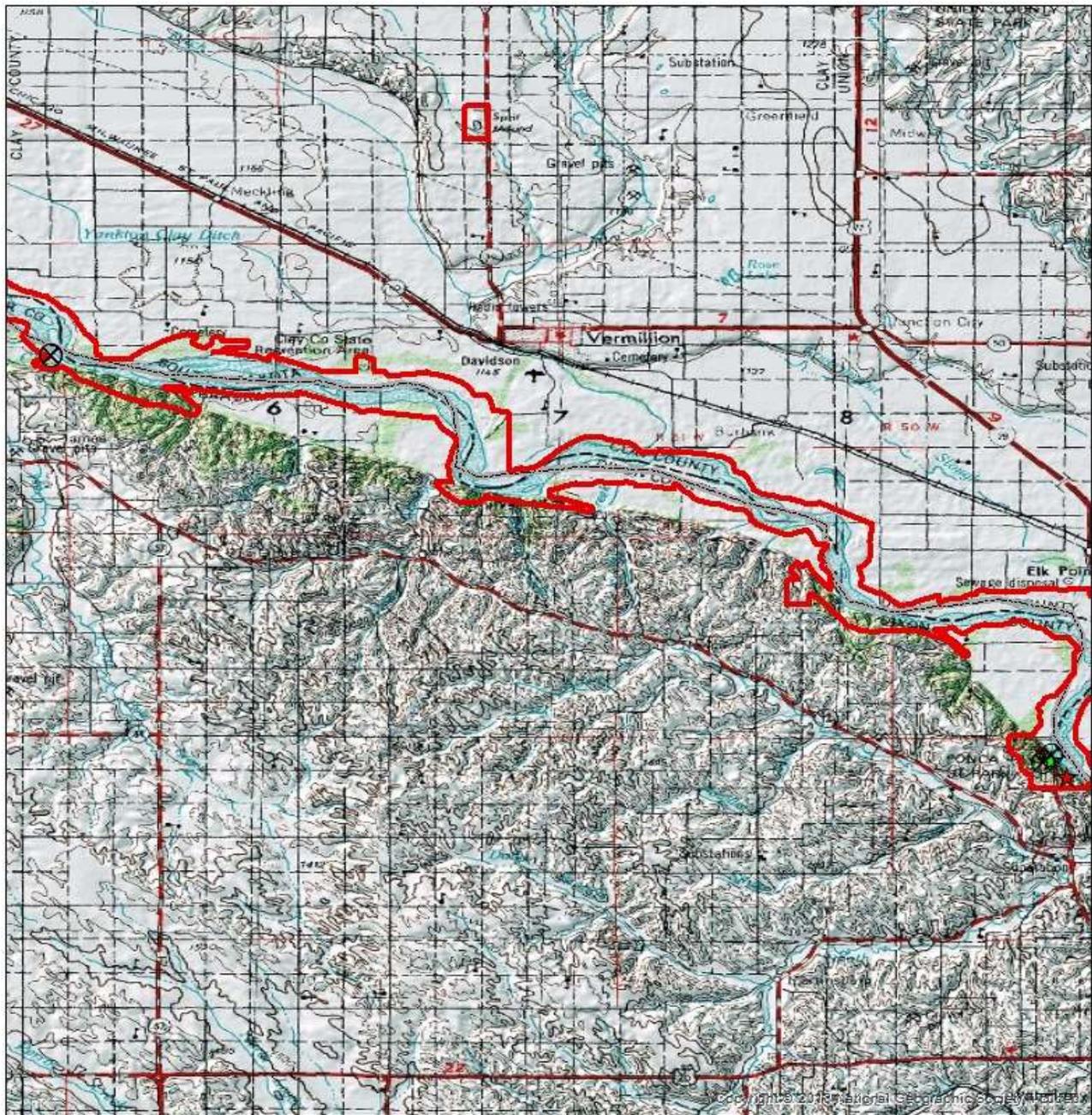
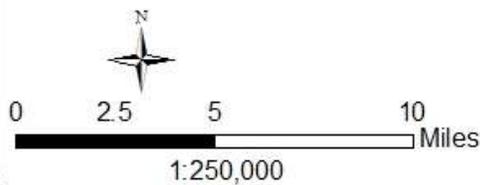
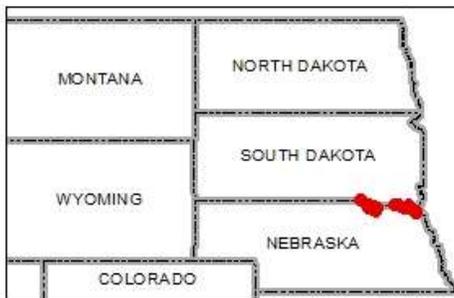


Figure 7. Mist net survey locations and Pd or WNS status of bats at the Missouri National Recreational River surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- ▭ Park Boundary

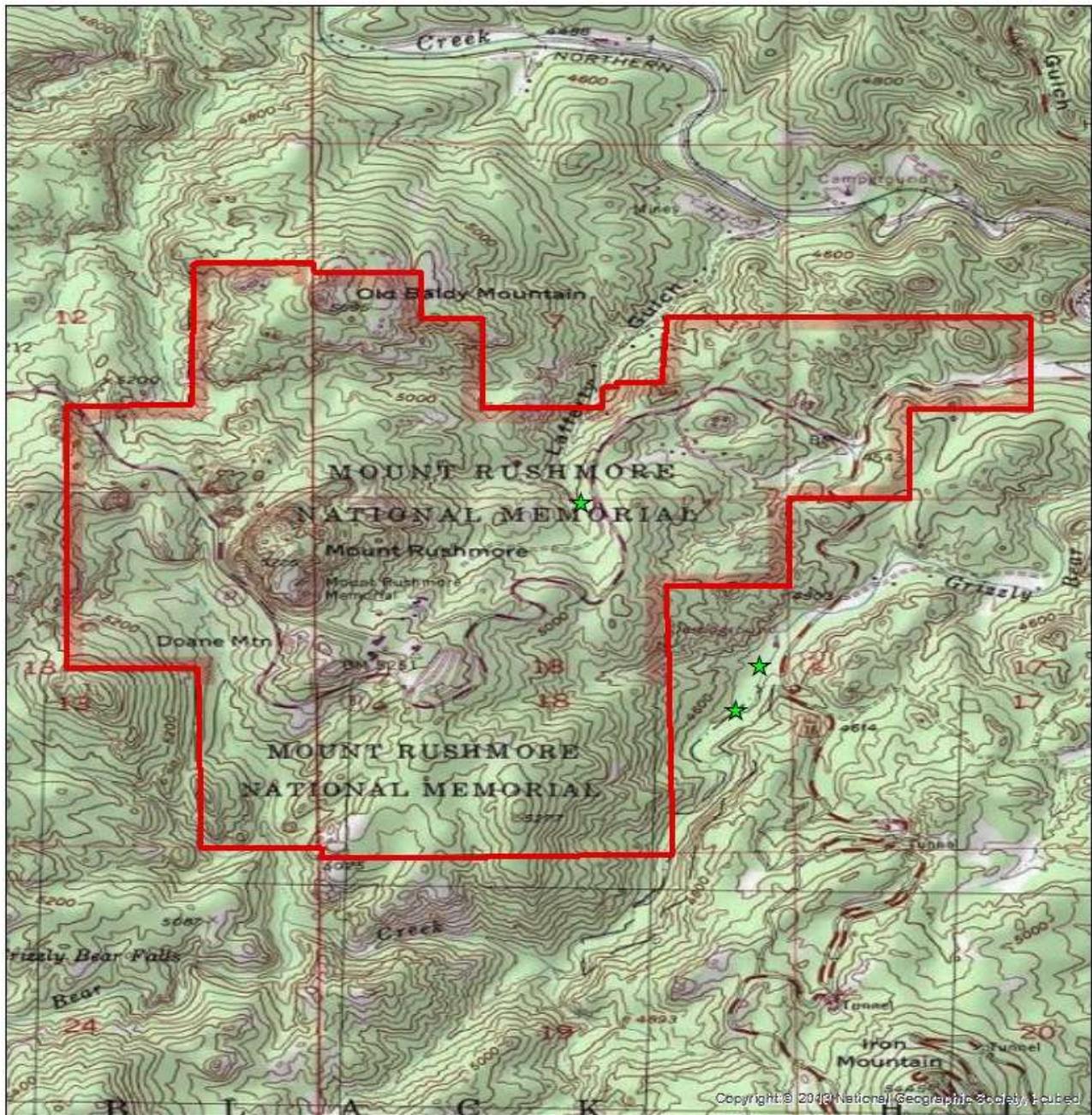
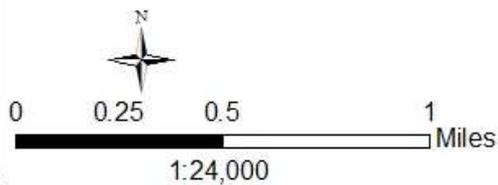
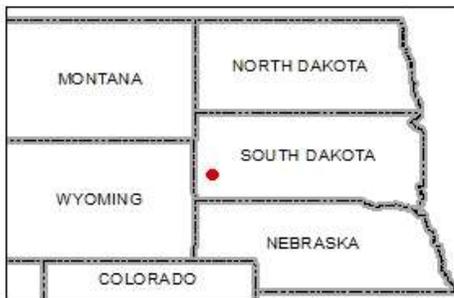


Figure 8. Mist net survey locations and Pd or WNS status of bats at the Mount Rushmore National Memorial surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- ▭ Park Boundary

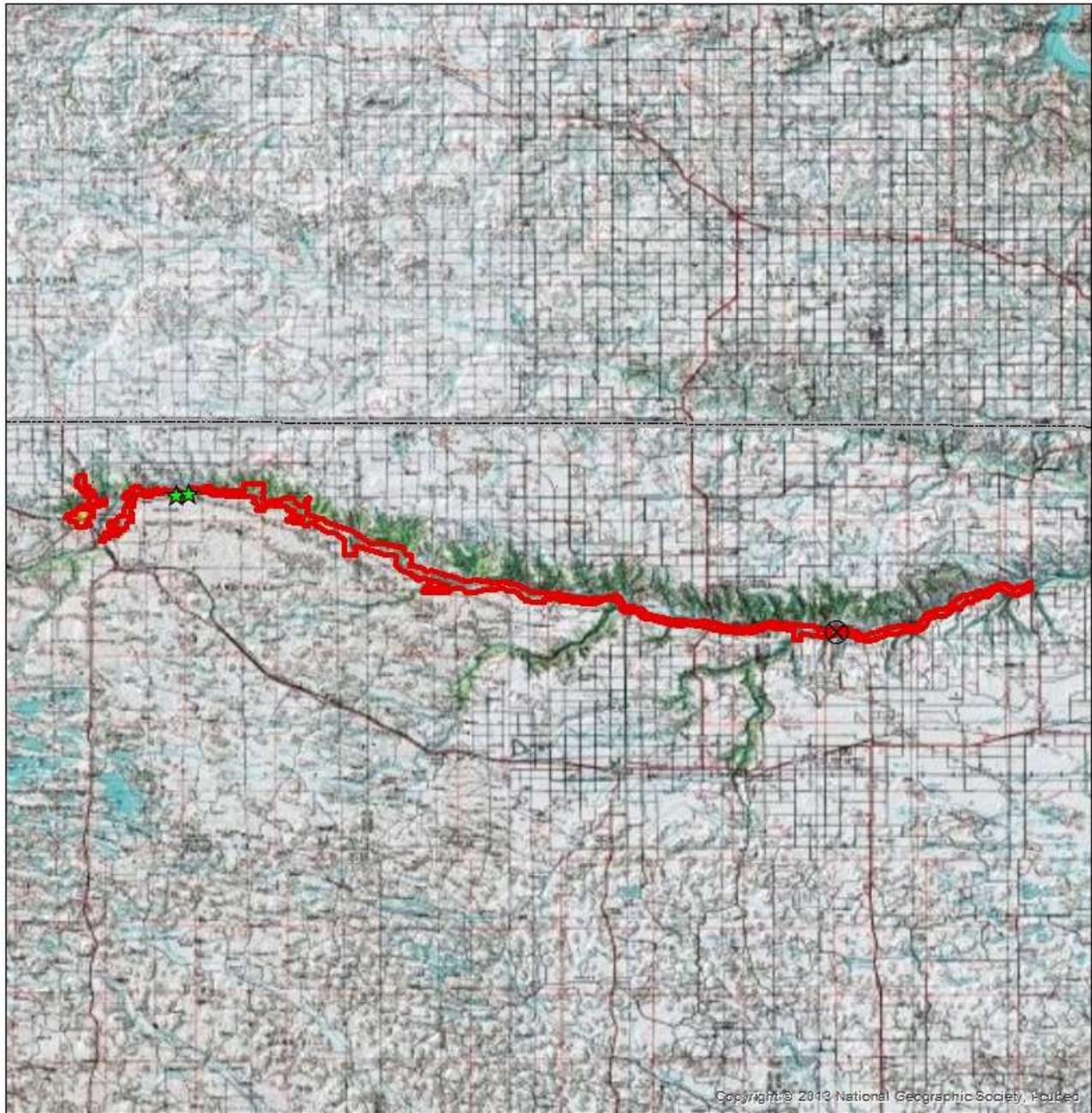
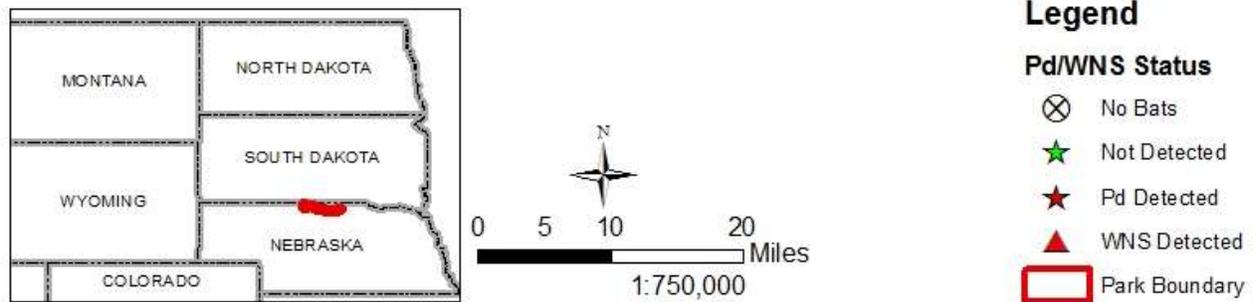


Figure 9. Mist net survey locations and Pd or WNS status of bats at the Niobrara National Scenic River surveyed in 2018.



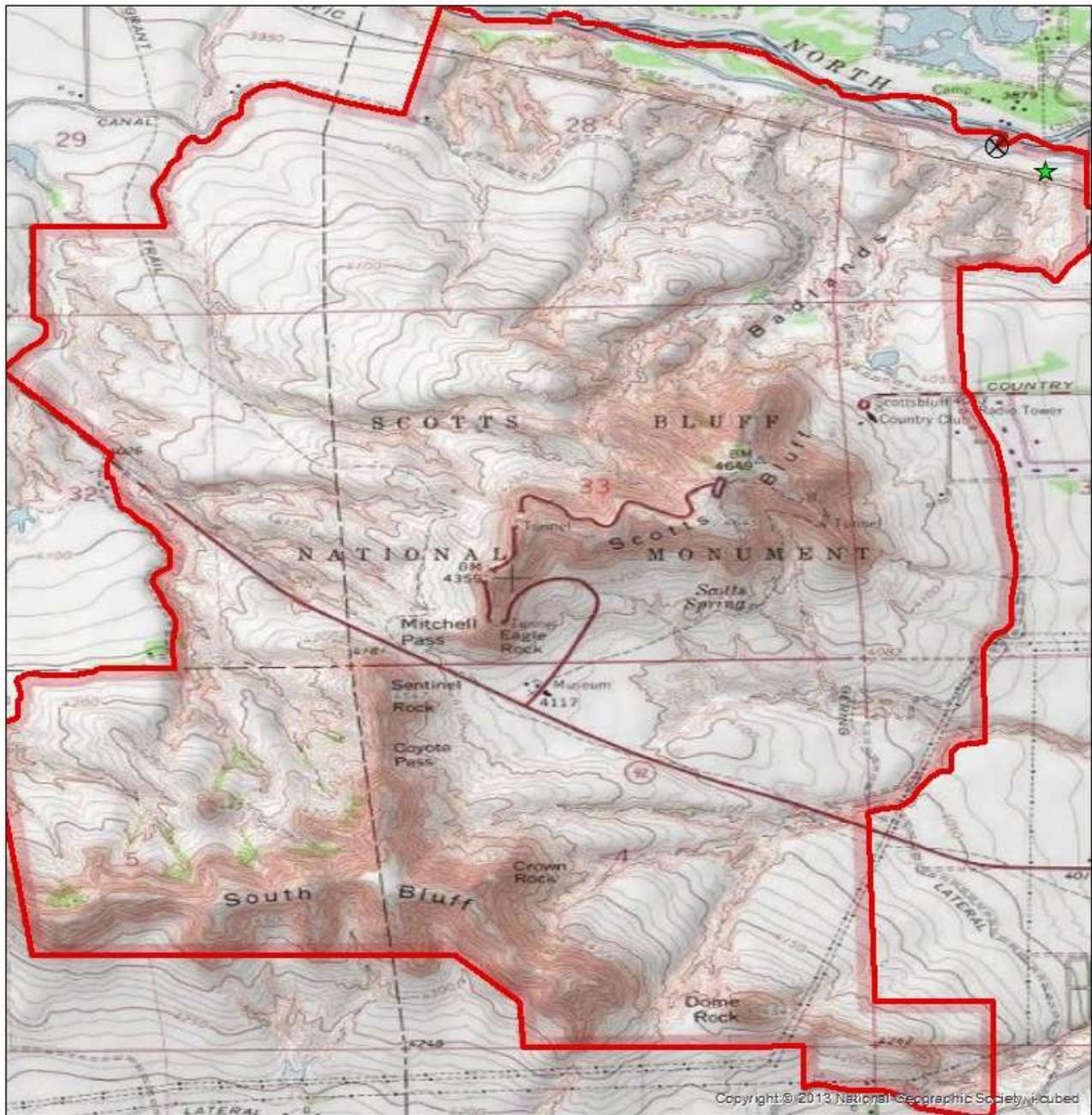
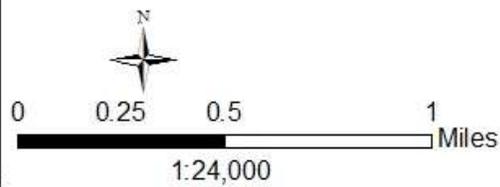


Figure 10. Mist net survey locations and Pd or WNS status of bats at Scotts Bluff National Monument surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- ▭ Park Boundary

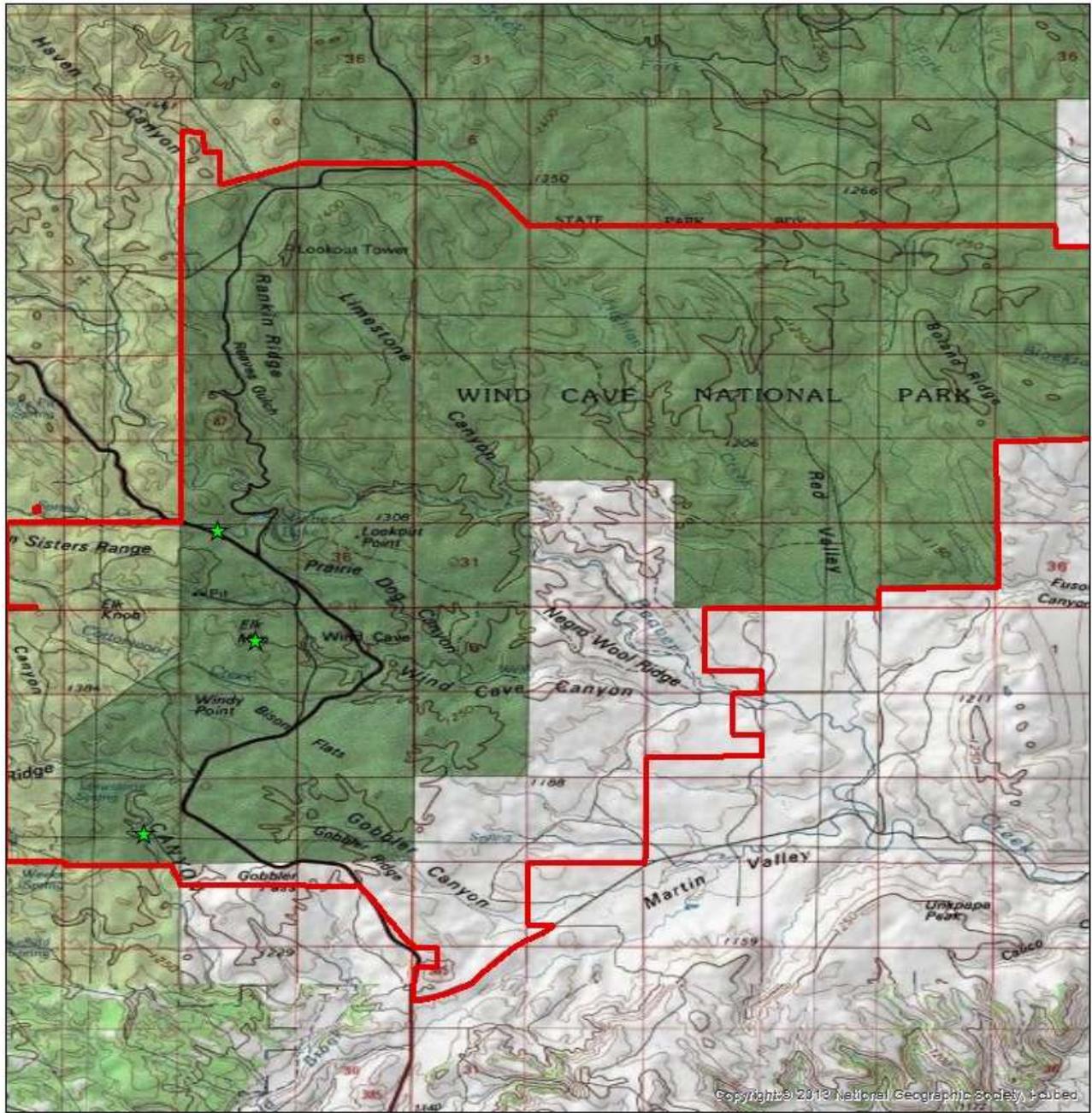
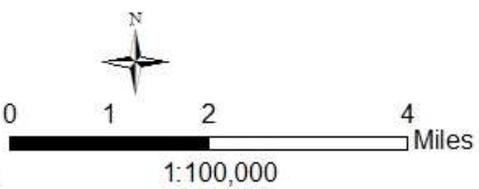


Figure 11. Mist net survey locations and Pd or WNS status of bats at Wind Cave National Park surveyed in 2018.



Legend

Pd/WNS Status

- ⊗ No Bats
- ★ Not Detected
- ★ Pd Detected
- ▲ WNS Detected
- Park Boundary



Figure 12. Wing membrane under UV light showing orange florescence in a western small-footed myotis captured at Badlands National Park in 2018.



Figure 13. Wing membrane under UV light showing orange florescence in a long-legged myotis captured at Jewel Cave National Monument in 2018.

Tables

Table 1. Mistnet surveys carried out at NPS units across the NGMN in 2018 including topographic locality, survey date, Pd or WNS status, and geographic coordinates.

Park Unit	Locality	Date	Pd/WNS Status	x	y
AGFO	Niobrara River	4/17/2018	Not Detected	-103.746	42.419
AGFO	Historic Cook Ranch	4/19/2018	Not Detected	-103.792	42.423
AGFO	Derelict Cottonwood Stand	4/20/2018	Not Detected	-103.769	42.415
AGFO	Historic Cook Ranch	5/30/2018	Not Detected	-103.792	42.423
AGFO	Historic Cook Ranch	5/31/2018	Not Detected	-103.792	42.423
BADL	South Fork Sage Creek	5/2/2018	No Bats	-102.411	43.896
BADL	Conata Road	5/3/2018	Not Detected	-102.195	43.828
BADL	Cedar Pass	5/5/2018	Pd Detected	-101.952	43.778
DETO	Tarpot Spring	5/2/2018	Not Detected	-104.727	44.585
DETO	Graham Spring	5/3/2018	Not Detected	-104.725	44.592
DETO	Tarpot Spring	5/4/2018	Not Detected	-104.726	44.586
DETO	Graham Spring	5/5/2018	Not Detected	-104.725	44.593
FOLA	Oxbow pond	5/15/2018	Not Detected	-104.559	42.199
FOLA	Bat House	5/16/2018	Pd Detected	-104.561	42.120
FOLA	Bat House	5/17/2018	Pd Detected	-104.56	42.199
JECA	Lower Bat Pond	5/22/2018	WNS Detected	-103.831	43.718
JECA	Chokecherry Spring	5/24/2018	Not Detected	-103.828	43.722
JECA	Lower Bat Pond	5/25/2018	WNS Detected	-103.831	43.718
MNRR	Bow Creek Preserve	4/24/2018	No Bats	-97.1401	42.774
MNRR	Bow Creek Preserve	4/25/2018	No Bats	-97.1401	42.774
MNRR	Bow Creek Preserve	4/26/2018	No Bats	-96.9669	42.784
MNRR	Ponca West Shelter	4/27/2018	Not Detected	-96.7138	42.601
MNRR	Ponca West Shelter	4/30/2018	No Bats	-96.7176	42.601
MNRR	Ponca Boat Launch	5/2/2018	No Bats	-96.7139	42.604
MNRR	Ponca Beaver Pond	5/3/2018	Pd Detected	-96.7073	42.594
MORU	Lafferty Gulch	5/8/2018	No Bats	-103.448	43.882
MORU	Grizzly Creek	5/9/2018	No Bats	-103.441	43.876
MORU	Grizzly Creek	5/10/2018	Not Detected	-103.441	43.874
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/11/2018	Not Detected	-100.427	42.900
NIOB	James Ranch	4/12/2018	No Bats	-99.582	42.726
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/24/2018	Not Detected	-100.427	42.900
NIOB	Fort Niobrara Wildlife Refuge Y Creek	4/26/2018	No Bats	-100.411	42.903
NIOB	Fort Niobrara Wildlife Refuge Y Creek	4/27/2018	No Bats	-100.411	42.903
SCBL	North Platte River	5/22/2018	Not Detected	-103.687	41.850
SCBL	North Platte River	5/23/2018	No Bats	-103.707	41.855
SCBL	North Platte River	5/24/2018	No Bats	-103.689	41.851

Park Unit	Locality	Date	Pd/WNS Status	x	y
WICA	Cold Spring Creek	5/8/2018	Not Detected	-103.494	43.578
WICA	Elk Mountain Spring	5/9/2018	Not Detected	-103.488	43.559
WICA	Herp Hole Pond	5/10/2018	Not Detected	-103.507	43.526

Table 2. Bats captured during WNS surveillance at NPS units across the NGPN in 2018.

Unit	Locality	Date	Species	Sex	Wing Damage	Pd Swab Taken?	Wing Biopsy Taken?	VDL Results	NWHC Results
AGFO	Cook Ranch	5/30/2018	MYLU	M	0	Yes	No	Not Detected	Not Detected
AGFO	Cook Ranch	5/30/2018	EPFU	F	0	Yes	No	Not Detected	Not Detected
AGFO	Cook Ranch	5/31/2018	LACI	M	0	Yes	No	Not Detected	Not Detected
AGFO	Cook Ranch	5/31/2018	EPFU	F	0	Yes	No	Not Detected	Not Detected
AGFO	Cook Ranch	5/31/2018	EPFU	F	0	Yes	No	Not Detected	Not Detected
BADL	Conata Road	5/3/2018	MYCI	F	UNK	No	No	NA	NA
BADL	Conata Road	5/3/2018	MYCI	M	OP	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	MYCI	F	UNK	No	No	NA	NA
BADL	Conata Road	5/3/2018	MYSP	F	UNK	No	No	NA	NA
BADL	Conata Road	5/3/2018	EPFU	M	OP	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	EPFU	M	OP	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	EPFU	M	0	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	EPFU	M	0	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	EPFU	M	0	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	EPFU	M	0	Yes	No	Not Detected	NA
BADL	Conata Road	5/3/2018	MYCI	F	UNK	No	No	NA	NA
BADL	Cedar Pass	5/4/2018	MYCI	M	OP	Yes	No	Pd Detected	Pd Detected
BADL	Cedar Pass	5/4/2018	MYSP	UNK	UNK	No	No	NA	NA
BADL	Cedar Pass	5/4/2018	EPFU	M	0	Yes	No	Pd Detected	Pd Detected
BADL	Cedar Pass	5/4/2018	EPFU	M	0	Yes	No	Pd Detected	Pd Detected
BADL	Cedar Pass	5/4/2018	EPFU	M	OP	Yes	No	Pd Detected	Pd Detected
BADL	Cedar Pass	5/4/2018	EPFU	M	0	Yes	No	Pd Detected	Pd Detected
DETO	Graham Spring	5/3/2018	MYTH	F	OP	Yes	No	Not Detected	NA
DETO	Graham Spring	5/3/2018	MYTH	M	OP	Yes	No	Not Detected	NA
DETO	Graham Spring	5/3/2018	MYSE	M	OP	Yes	No	Not Detected	NA
DETO	Tarpot Spring	5/4/2018	MYSE	M	OP	Yes	No	Not Detected	NA
DETO	Tarpot Spring	5/4/2018	MYTH	F	OP	Yes	No	Not Detected	NA
DETO	Tarpot Spring	5/4/2018	EPFU	M	OP	Yes	No	Not Detected	NA
DETO	Graham Spring	5/5/2018	MYTH	F	OP	Yes	No	Not Detected	NA
FOLA	Oxbow Pond	5/15/2018	MYLU	M	OP	Yes	No	Not detected	Not detected
FOLA	Oxbow Pond	5/15/2018	MYLU	F	OP	Yes	No	Not detected	Not detected
FOLA	Oxbow Pond	5/15/2018	EPFU	F	0	Yes	No	Not detected	Not detected
FOLA	Oxbow Pond	5/15/2018	EPFU	F	OP	Yes	No	Not detected	Not detected
FOLA	Oxbow Pond	5/15/2018	EPFU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/16/2018	MYLU	F	1	Yes	No	Not detected	Not detected

Unit	Locality	Date	Species	Sex	Wing Damage	Pd Swab Taken?	Wing Biopsy Taken?	VDL Results	NWHC Results
FOLA	Bat House	5/17/2018	MYLU	F	1	Yes	Yes	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Equivocal
FOLA	Bat House	5/17/2018	MYLU	F	OP	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F		Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	OP	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	1	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	OP	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	OP	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F		No	No	NA	NA
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	0	Yes	No	Not detected	Not detected
FOLA	Bat House	5/17/2018	MYLU	F	OP	Yes	No	Pd Detected	Pd Detected
FOLA	Bat House	5/17/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/17/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/18/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/19/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/20/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/21/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/22/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/23/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/24/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/25/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/26/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/27/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/28/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/29/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/30/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	5/31/2018	MYLU	F	0	No	No	NA	NA

Unit	Locality	Date	Species	Sex	Wing Damage	Pd Swab Taken?	Wing Biopsy Taken?	VDL Results	NWHC Results
FOLA	Bat House	6/1/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/2/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/3/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/4/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/5/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/6/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/7/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/8/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/9/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/10/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/11/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/12/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/13/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/14/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/15/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/16/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/17/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/18/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/19/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/20/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/21/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/22/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/23/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/24/2018	MYLU	F	0	No	No	NA	NA
FOLA	Bat House	6/25/2018	MYLU	F	0	No	No	NA	NA
JECA	Lower Bat Pond	5/22/2018	MYTH	M	0	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	MYLU	M	0	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	MYTH	M	0	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	MYTH	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	EPFU	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	EPFU	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	EPFU	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/22/2018	LANO	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/22/2018	MYTH	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	MYLU	M	0	Yes	No	NA	NA
JECA	Lower Bat Pond	5/22/2018	EPFU	M	OP	Yes	Yes	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	LACI	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/22/2018	EPFU	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	LANO	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	EPFU	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/22/2018	EPFU	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/22/2018	MYTH	M	OP	Yes	No	Not Detected	Not Detected

Unit	Locality	Date	Species	Sex	Wing Damage	Pd Swab Taken?	Wing Biopsy Taken?	VDL Results	NWHC Results
JECA	Lower Bat Pond	5/22/2018	MYLU	F	UNK	No	No	NA	NA
JECA	Chokecherry Spring	5/24/2018	MYTH	M	OP	Yes	No	Not Detected	Not Detected
JECA	Chokecherry Spring	5/24/2018	MYVO	M	OP	Yes	No	Not Detected	Not Detected
JECA	Lower Bat Pond	5/25/2018	MYVO	M	1	Yes	Yes	Pd Detected	Pd Detected
JECA	Lower Bat Pond	5/25/2018	EPFU	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/25/2018	EPFU	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/25/2018	EPFU	F	UNK	No	No	NA	NA
JECA	Lower Bat Pond	5/25/2018	MYVO	M	OP	Yes	No	Not Detected	NA
JECA	Lower Bat Pond	5/25/2018	LANO	M	0	Yes	No	Not Detected	NA
JECA	Lower Bat Pond	5/25/2018	MYCI	M	0	Yes	No	Not Detected	Equivocal
JECA	Lower Bat Pond	5/25/2018	MYVO	M	OP	Yes	No	Not Detected	NA
JECA	Lower Bat Pond	5/25/2018	EPFU	M	1P	Yes	No	Not Detected	NA
JECA	Lower Bat Pond	5/25/2018	EPFU	M	OP	Yes	No	Not Detected	NA
JECA	Lower Bat Pond	5/25/2018	LANO	M	OP	Yes	No	Not Detected	NA
JECA	Lower Bat Pond	5/25/2018	MYTH	M	OP	Yes	No	Not Detected	NA
MNRR	Ponca West Shelter	4/27/2018	EPFU	F	0	Yes	No	Not Detected	NA
MNRR	Ponca Beaver Pond	5/3/2018	MYSE	F	0	Yes	No	Pd Detected	NA
MNRR	Ponca Beaver Pond	5/3/2018	MYSE	F	0	Yes	No	Pd Detected	NA
MNRR	Ponca Beaver Pond	5/3/2018	LANO	F	OP	Yes	No	Pd Detected	NA
MORU	Grizzly Creek	5/10/2018	EPFU	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	EPFU	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	EPFU	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	EPFU	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	EPFU	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	LANO	F	UNK	No	No	NA	NA
MORU	Grizzly Creek	5/10/2018	MYSE	F	UNK	No	No	NA	NA
MORU	Grizzly Creek	5/10/2018	EPFU	M	OP	Yes	Yes	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	LANO	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	LANO	M	OP	Yes	No	Not Detected	NA
MORU	Grizzly Creek	5/10/2018	LANO	F	UNK	No	No	NA	NA
MORU	Grizzly Creek	5/10/2018	LANO	F	UNK	No	No	NA	NA
MORU	Grizzly Creek	5/10/2018	LANO	F	UNK	No	No	NA	NA
MORU	Grizzly Creek	5/10/2018	LANO	M	OP	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/11/2018	MYSE	M	0	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/11/2018	MYSE	M	0	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/11/2018	MYSE	M	0	Yes	No	Not Detected	NA

Unit	Locality	Date	Species	Sex	Wing Damage	Pd Swab Taken?	Wing Biopsy Taken?	VDL Results	NWHC Results
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/24/2018	MYSE	M	0	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/24/2018	MYSE	F	0	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/24/2018	MYSE	F	0P	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/24/2018	MYSE	F	0	Yes	No	Not Detected	NA
NIOB	Fort Niobrara Wildlife Refuge Tyler Creek	4/24/2018	MYSE	F	0P	Yes	No	Not Detected	NA
SCBL	North Platte River	5/22/2018	EPFU	M	0	Yes	No	Not Detected	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYVO	M	0P	Yes	No	Not Detected	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYTH	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYTH	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYTH	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYVO	M	0P	Yes	No	Not Detected	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	M	0P	Yes	No	Not Detected	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	M	0P	Yes	No	Not Detected	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	F	UNK	No	No	NA	NA
WICA	Elk Mtn. Spring	5/9/2018	MYSE	M	0P	Yes	No	Not Detected	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	M	0	Yes	No	Not Detected	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA

Unit	Locality	Date	Species	Sex	Wing Damage	Pd Swab Taken?	Wing Biopsy Taken?	VDL Results	NWHC Results
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	M	0	Yes	No	Not Detected	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	LANO	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA
WICA	Herp Hole Pond	5/10/2018	EPFU	F	UNK	No	No	NA	NA