

Snake Hibernacula Monitoring Report for Calendar Year 2012



Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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1.0 Introduction

For the general public, snakes are one of the least understood and most feared groups of animals, often resulting in the intentional killing of individuals and destruction of habitat. However, snakes fill an important role in the ecosystems they occupy, eating a variety of prey, and providing a source of food for many other predators.

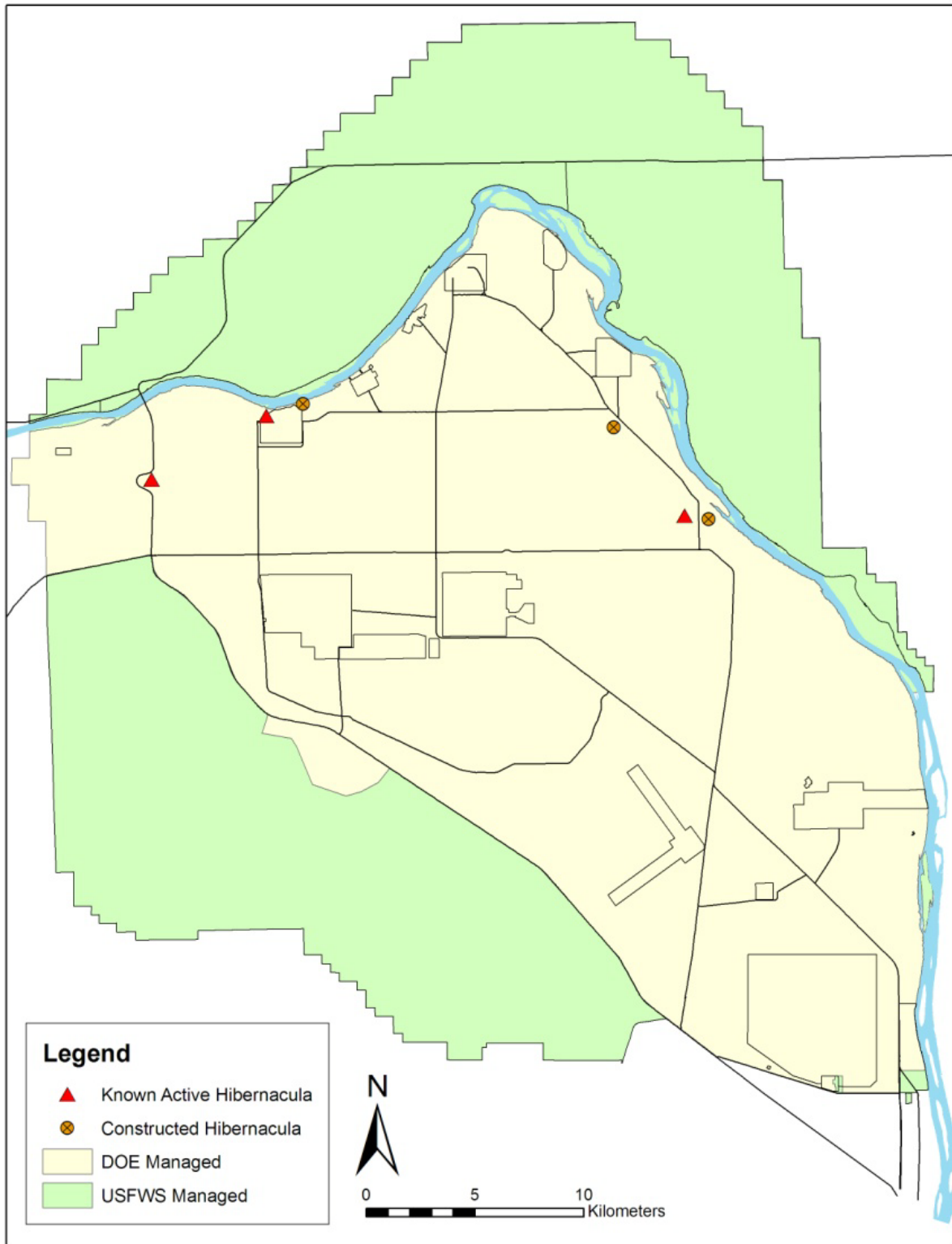
Snakes in temperate climates must seek shelter from freezing temperatures to survive the winter, and will congregate at specific sites known as hibernacula. A single hibernaculum may contain hundreds of snakes, often of several different species. Snakes show strong site fidelity to these specific locations year after year. Finding and protecting snake hibernacula is critical to maintaining Hanford Site populations of both common and sensitive species. The striped Whipsnake (*Masticophis taeniatus*), the night snake (*Hypsiglena torquata*), and racers (*Coluber constrictor*) are three sensitive species of snakes documented on the Hanford Site. The Washington Department of Fish and Wildlife (WDFW) consider the striped Whipsnake a Candidate for listing as Threatened or Endangered. The striped Whipsnake is known to den with other species including western rattlesnakes (*Crotalus viridis*), racers, and gopher snakes (*Pituophis melanoleucus*) (Larsen 1997). The Department of Natural Resources considers hibernacula destruction a key threat to this species (Hallock 2005). The night snake and racer are on the WDFW State Monitor list. These three sensitive species could be sharing hibernacula with other snakes that are known to be present on the Hanford Site, including gopher snakes, common garter snakes (*Thamnophis sirtalis*), western terrestrial garter snakes (*Thamnophis elegans*), and western rattlesnakes. Although not documented, rubber boas (*Charina bottae*) also potentially occur on the Hanford Site.

On the Hanford Site, snakes typically seek out hibernacula in mid-October, and remain there until April. Sometime during early to mid-April, depending on temperature, western rattlesnakes will typically spend 2-3 weeks moving into and out of the hibernacula locations prior to dispersing to feeding ranges. Some species may remain nearby the hibernaculum longer for breeding and egg laying (Larsen 1997). Hibernacula locations used by western rattlesnakes are readily identifiable during the emergence period, due to the presence of snakes at the openings. A thorough investigation into the locations of snake hibernacula across the Hanford Site has never been performed to-date, and no repository of snake data exists for the Site. Project staff knew of three snake hibernacula and three constructed hibernacula locations prior to the start of this project (Table 1, Figure 1).

Table 1. Known Active and Constructed Hibernacula on the Hanford Site Prior to the 2012 Survey

Type	Name	General Location
Known Active	North of Asphalt Tanks	West of Hanford Townsite
Known Active	Rolling Rock	100-B/C
Known Active	Utility Pole Base	Vernita Cliffs
Constructed	Former Waste Site 128-B-2	100-B/C
Constructed	Former Waste Site 600-109	Hanford Townsite
Constructed	Former Waste Site 600-3	South of 100-F

Figure 1. Hanford Site Known Active Hibernacula and Constructed Hibernacula



2.0 Methods

Potential hibernacula can be located at any time of year. The major characteristic of a potentially suitable hibernaculum include available void spaces that are of sufficient depth underground to avoid freezing. Other conditions within the void spaces such as humidity and airflow may also play a role. Hibernacula can include burrows, rock piles, rock crevices, or manmade structures. Personnel can identify areas as “potential hibernacula” at any time of year, and then return to the location during snake emergence to determine if the site is functioning as a hibernacula.

Project staff determined the initiation of emergence by regularly visiting the known snake hibernacula on the Site. Once snakes were visible at the entrances to these locations, it was determined that conditions were suitable to locate snakes in other areas. Personnel walked through areas previously identified as “potential hibernacula” and listened for the rattle of a western rattlesnake. Once located, photographs and GPS positions were taken to document each location (Figure 2). Personnel continued to monitor the known hibernacula to determine the timing of snake dispersal.

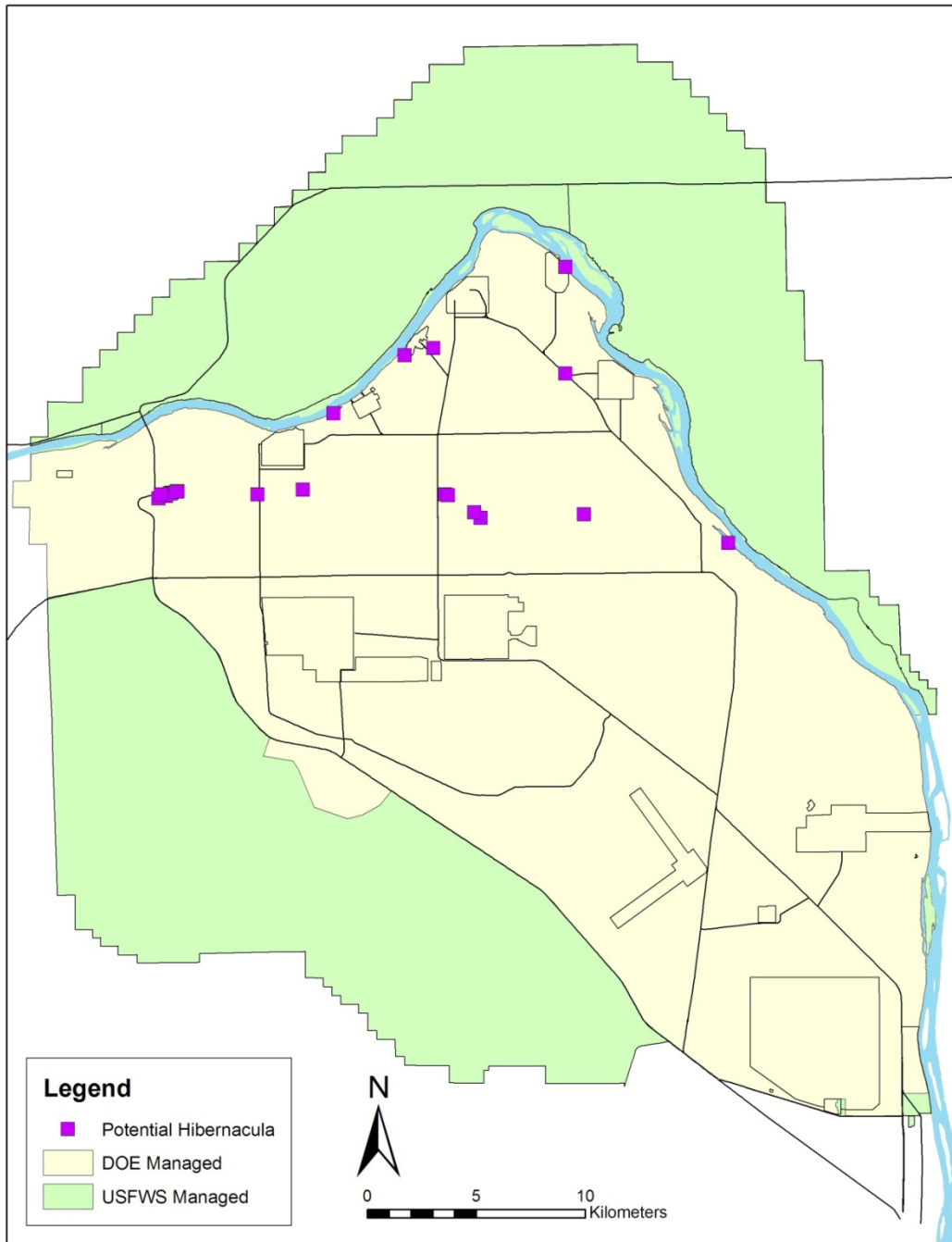
Figure 2. Field team members document the newly discovered “Den 2” on Gable Butte



3.0 Results

Personnel conducted two surveys to identify potential hibernacula areas based on the presence of the characteristics described above. Photos and GPS positions were taken at the locations, and plans were made to re-visit these locations once snake emergence was documented. Project staff identified many locations as *potential hibernacula*, including some large expanses of talus slopes, as well as man-made features such as piles of rip-rap basalt (Figure 3).

Figure 3. Potential Hibernacula Locations Identified During Initial 2012 Field Walk Downs



Due to the limited timeframe when snakes are present at hibernacula openings, only one day of surveying for new hibernacula was completed prior to snakes dispersing. Surveyors documented initiation of emergence at the North of Asphalt Tanks, hibernaculum on April 3, and conducted a survey of 'potential hibernacula' on April 10. During the survey day, six new snake dens were documented on the Hanford Site (Figure 5), including Den 1 shown in Figure 4. The details of each new den are shown in Table 2.

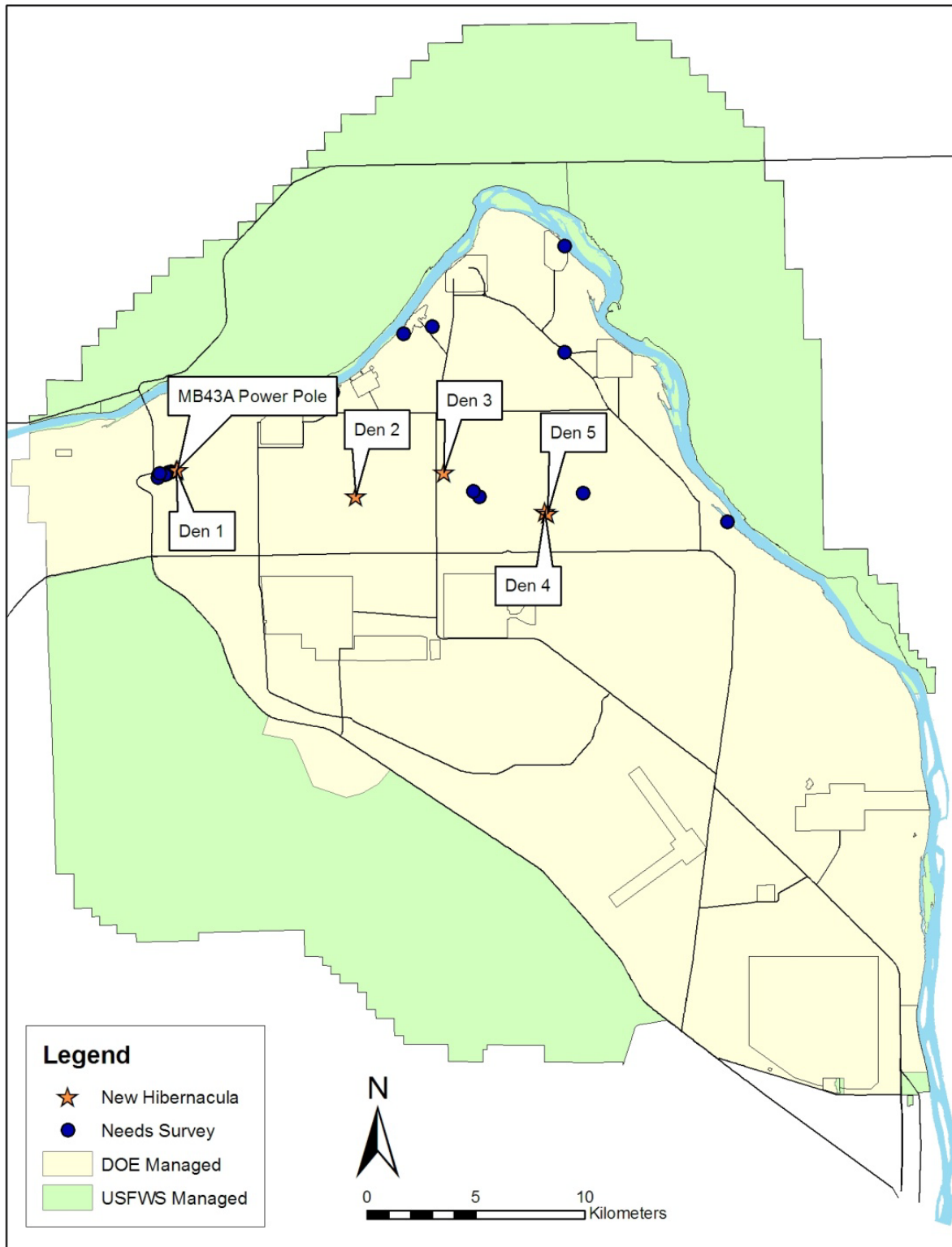
Table 2. Details of new hibernacula located during the 2012 survey

Name	General Location	Description	Snakes Observed
Den 1	Vernita Cliffs	double wooden powerpole laying down and partially covered with soil	2
Den 2	Gable Butte	at base of transmission tower: Line 2-Mile 9-Tower 3	5
Den 3	Pit 28	large man-made pile of basalt rip-rap in borrow pit	2
Den 4	Gable Mountain	natural basalt outcrop on steep slope	2
Den 5	Gable Mountain	large man-made pile of basalt in quarry	4
MB43A Power Pole	Vernita Cliffs	in rocks at base of wooden power pole	5

Figure 4. Entrance to Den 1 Located during the 2012 Survey



Figure 5. New Hibernacula Identified in 2012 and Locations Remaining to be Surveyed



On April 24, 2012, field personnel surveyed the North of Asphalt Tanks hibernaculum. No snakes were observed along the length of the hibernaculum, even though conditions were ideal for seeing snakes (sunny and temperature in the low 70s). Based on this information, it was determined that the snakes had likely dispersed from the hibernacula onsite. Thus, hibernacula surveys were ended for 2012.

4.0 Discussion

The snakes visible at the entrances to the dens may represent only a portion of the total number of western rattlesnakes using the particular den. In addition, snakes of other species, potentially including sensitive species, are likely using these locations but are unlikely to be detected using this survey method because they do not exhibit the same emergence behavior as the western rattlesnakes.

The 2012 survey increased the number of known active hibernacula on the Hanford Site from three to nine. This greatly increases our understanding of snake hibernacula use across the Hanford Site, allows these locations to be considered and protected during Ecological Compliance Reviews, and provides additional opportunities for research into suitable hibernacula characteristics. This also provides opportunities for determining the presence of sensitive species.

Future research could include trapping at known hibernacula, prior to snake dispersal, to capture dispersing snakes. This technique could be used to document species other than western rattlesnakes that are using the known hibernacula locations. In addition, fifteen locations identified as potential hibernacula remain to be evaluated during future field surveys (Figure 5), providing additional opportunity for understanding snake hibernacula use on the Hanford Site.

5.0 References

- Hallock, L.A. and McAllister, K.R. 2005. *Striped Whipsnake*. Washington Herp Atlas. Online at <http://www1.dnr.wa.gov/nhp/refdesk/herp/>
- Hallock, L.A. and McAllister, K.R. 2005. *Western Rattlesnake*. Washington Herp Atlas. Online at <http://www1.dnr.wa.gov/nhp/refdesk/herp/>
- Larsen, E. M., editor. 1997. Management recommendations for Washington's priority species, Volume III: Amphibians and Reptiles. Washington State Department of Fish and Wildlife, Olympia. 122pp.