

## **Terrestrial Reptile Survey Protocol**

### What is a survey location and what is a survey?

Each rock outcrop or coulee rim is a survey location and each person surveying each survey location is considered an independent survey. If a rock outcrop or coulee rim is extremely large then it can be broken into multiple survey locations smaller than 400 x 100 meters based on natural breaks such as a drainage or area with reduced amounts of cover objects. If rock outcrops or coulee rims are not present within a Quarter Quadrangle grid cell then transects through a dominant cover type may be substituted as survey locations.

### Selection of Survey Locations

Potential rock outcrops within each Quarter Quadrangle grid cell should be identified on 1:24,000 scale topographic maps by locating areas with greater amounts of topographic relief such as cliff faces. These areas often constitute boundaries between substrate types that differ in their erodibility. Rock strata in these areas may allow access to underground chambers that serve as hibernacula or may have collapsed to provide cover objects. These areas should be targeted for survey based on: (1) their accessibility on public land or are on private lands where you have received permission from the land owners to survey sites; (2) size of the likely rock outcrop (the larger the size, the better); and (3) the aspect of the survey location (south facing sites should be a higher priority for survey than north facing sites). Field crews should attempt to survey 4 or more rock outcrops per Quarter Quadrangle grid cell if time allows.

### Survey Methodology

Occupancy analysis assumes that surveys are independent and do not influence one another with regard to the detection of species, so be sure to take steps to ensure that surveyors do not influence one another. Begin by coordinating with other surveyors on which portion of each rock outcrop you intend to survey in order to minimize overlap in area surveyed. Use timed visual encounter surveys in all portions of the rock outcrop by slowly moving through the area. Visually examine rocks at distances of up to 15 meters as well as near your feet. Lift cover-objects taking care to keep the cover object between you and species potentially sheltering under the cover object. Use potato rakes to probe rock crevices while listening and watching for animal movements. Use write-in-rain notebooks to note times at first detection and incidental observations of other animals.

### Data and Photographs

Data sheets should be filled out thoroughly and care should be taken to ensure that data recorded is consistent with the site drawing and all related data fields (see description sheet for all datasheet fields). Record all detections by individual surveyors on the lower back of the datasheet. However, the front of the datasheet should only include a summary of the total numbers of animals observed for each species detected; if the same area is surveyed by multiple individuals then the greatest number of animals observed for each species detected should be recorded. Digital photographs of each site should be taken from a vantage point that allows the entire site to be seen in the context of surrounding habitats. Ideally only a single photograph will be needed. However, if multiple photographs are necessary, they should be labeled a, b, c, etc. as viewed from left to right. Finally, the outer boundary of the area surveyed should be drawn on the QQuad topographic maps in order to facilitate digitizing the site boundary in the GIS; each site should be labeled as R-01, R-02, ... etc..

### Preventing the Spread of Weeds

In order to prevent the spread of weeds, care should be taken to remove weed seeds from boots, socks, packs, and other field gear between sites. Weed seeds should also be removed from grills, radiators, and under carriages of vehicles whenever possible.

# Data Form for Reptile Site Surveys

## Locality Information

DM Region SE MONTANA	QQUAD	Site No:	Locality:			
State:	County:	Map Name:	T	R	S	Section Description:
Owner:	Map Elevation:	FT	Datum:	UTM Zone:	UTM East:	UTM North:

## Habitat Information

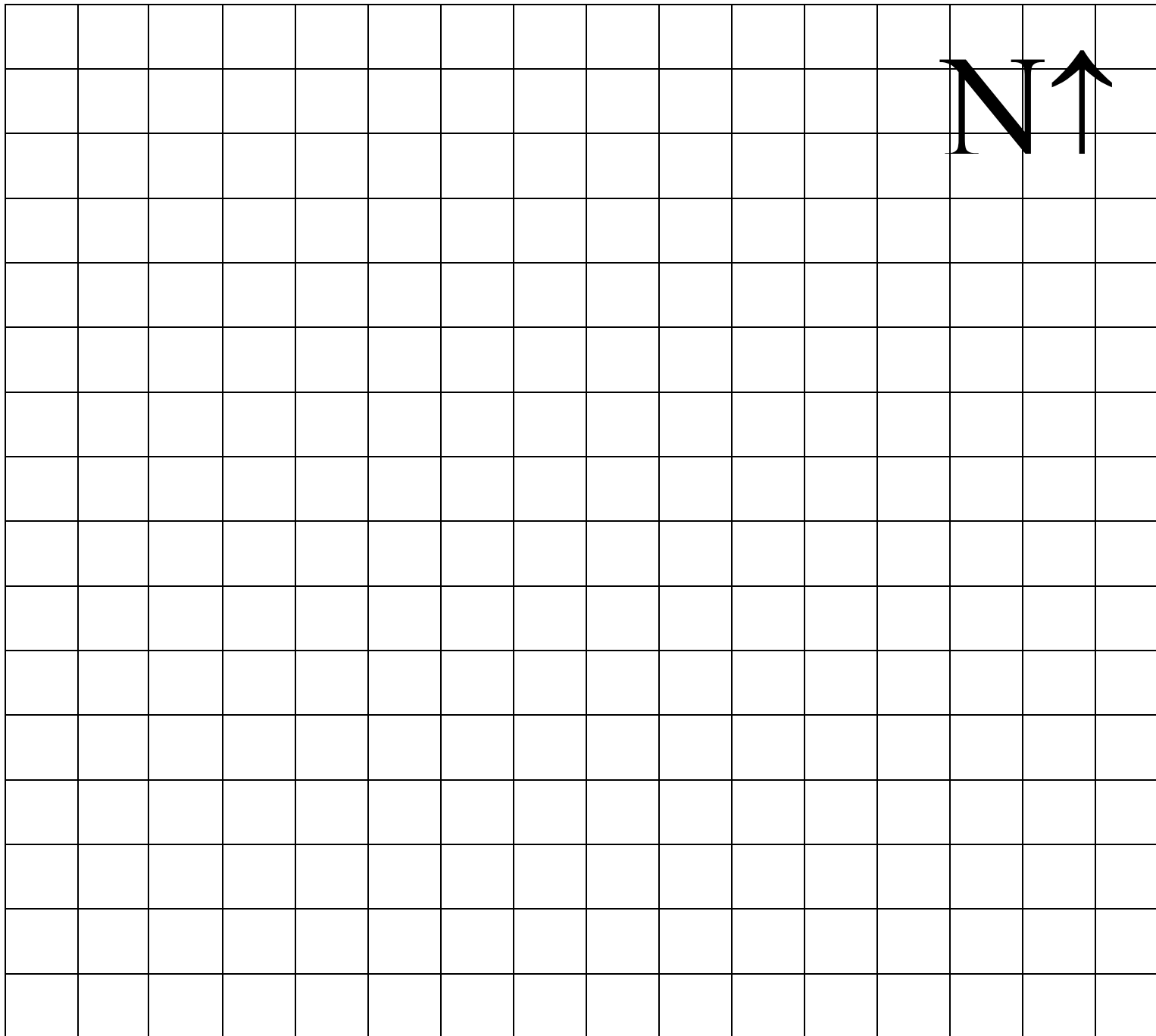
Date:	Observer(s):	Begin Time:	End Time:	Total Person Minutes of Search:	Area (M <sup>2</sup> ) Searched:		
Percentage of Site Searched: 1-25 26-50 51-75 76-100	Percent Slope:	Aspect: N NE NW S SE SW E W Flat					
Habitat Cover Type As Percent of Site Surveyed:							
Cliff/Outcrop	Bluff/Coulee Rim	Talus	Open Conifer Forest	Open Mixed Forest	Shrub/Steppe	Grassland	Other _____
%	%	%	%	%	%	%	%
Site Overview Photo Taken <input type="checkbox"/>				Air Temp: °C	Soil Temp: °C		
Photo Description(s)				Weather: Clear Partly Cloudy Overcast Rain Snow	Wind: Calm Light Strong	Potential Hibernaculum Y N	
Soil Moisture: Dry Damp Wet Standing Water Snow			Dominant Substrate Type: Bedrock Compressed Soil Sand Detritus Gravel (<4 cm diameter) Cobble (4-30cm diameter) Boulder (>30 cm diameter)				
Habitat Description/Threats:							

## Reptile Species Information

Species:	Number and Time at First Detection (e.g., 2 x juveniles, 25 cm TL @ 10 minutes)	Cover Type at Animal's Location:
Tissue Number (e.g., MTHP5533)	Substrate Association of Animal (Circle):	
Voucher Number & Description:	under wood in vegetation	on/under 4-20cm rock fragments on leaf litter in rock fracture
		on/under >20cm rock fragments Other _____
Species:	Number and Time at First Detection (e.g., 2 x juveniles, 25 cm TL @ 10 minutes)	Cover Type at Animal's Location:
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		on/under >20cm rock fragments Other _____

# Site Map for Reptile Site Surveys

**Grid Scale:**



\* Draw a rough sketch of the site labeling major features such as cliffs, talus slopes, and all habitat cover types. Be sure to indicate where animals were detected and label the following locations on the map: **G** = GPS reading, - - - - - = area surveyed, and **P→** = photo locations and directions of photos.

**Other Notes:**

**Detection Summary** (list surveyors in left column and species detections in others (e.g., 1 @ 5 min))

Surveyor						

## Definitions of Variables on Reptile Site Survey Form

### Site Information

**Strata Number:** The sample strata in which the 6<sup>th</sup> level HUC watershed lies.

**HUC Number:** The sample number of the 6<sup>th</sup> level HUC.

**Site No:** Identify three digit number of the site being surveyed within each sampling block (range 001-999).

**Locality:** Describe the specific geographic location of the site so that the type of site is described and the straight-line air distance from one or more permanent features on a 7.5-minute (1:24,000 scale) topographic map records the position of the site (e.g., Large talus slope 1.5 miles north of Engle Peak, N side of FS Road 225).

**State:** Use the two-letter abbreviation.

**County:** Use the full county name.

**Map Name:** List the name of the USGS 7.5-minute (1:24,000 scale) topographic quadrangle map.

**T:** Record the Township number and whether it is north or south.

**R:** Record the Range number and whether it is east or west.

**S:** Record the Section number

**Section Description:** Describe location of the site at the ¼ of ¼ section level (e.g., SENE indicates SE corner of NE corner).

**Owner:** Use abbreviation of the government agency responsible for managing the land you surveyed. (e.g. USFS, BLM). If private land was surveyed list the owner's full name to indicate that you did not trespass.

**Map Elevation:** The elevation of the site as indicated by the topographic map in feet (avoid using elevations from a GPS)

**Datum:** The map datum used (typically NAD 27 if off topographic map or WGS84 if off GPS unit on standard setting).

**UTM Zone:** Universal Transverse Mercator zone recorded on the topographic map.

**UTM East:** Universal Transverse Mercator easting coordinate in meters as recorded on the topographic map or GPS receiver. Be sure to note any major differences between UTM coordinates on the map and those on the GPS receiver.

**UTM North:** Universal Transverse Mercator northing coordinate in meters as recorded on the topographic map or GPS receiver. Be sure to note any major differences between UTM coordinates on the map and those on the GPS receiver.

### Survey Information

**Date:** Use MM-DD-YY format (e.g. 05/12/00 for May 12 of 2000).

**Observers:** List names or initials of individuals involved with survey of this site and circle the name of the recorder.

**Begin Time:** List the time the survey began in 24-hour format.

**End Time:** List the time the survey ended in 24-hour format.

**Total Person Minutes of Search:** Record the total person minutes the site was searched (e.g. if one person surveys for 15 minutes and another surveys for 30 minutes, but takes 5 minutes to measure a specimen the total person minutes is 40 minutes).

**Area (M<sup>2</sup>) Searched:** Area in square meters that was surveyed.

**Percent of Site Searched:** Circle the appropriate category.

**Percent Slope:** Percent slope of site. Enter range if variable.

**Aspect:** Circle primary aspect of the site.

**Habitat Cover Type as Percent of Site Surveyed:** Identify percent composition of each habitat type within site surveyed.

**Photo Frame Number(s) / Descriptions:** The number of the photo as viewed on the camera's view screen and a description of the contents of the photograph (e.g., #13 = 1 x Milksnake and #14-18 = 5 x habitat). Take photos of all portions of the site and anything else that may be of interest (e.g., reptile species, potential site threats).

**Air Temp:** Record air temperature in °C at chest height in the shade. °C = (°F - 32)/1.8

**Soil Temp:** Record soil temperature in °C at 10 cm depth. °C = (°F - 32)/1.8

**Weather:** Circle weather condition during survey.

**Wind:** Circle wind condition during survey (> 20 mph winds should be classified as strong).

**Potential Hibernacula:** Does the site contain suitable underground refugia (e.g., talus, caves) to support overwintering.

**Soil Moisture:** Circle the appropriate category.

**Dominant Substrate Type:** Circle the appropriate category.

**Habitat Description/Threats:** Note the most prominent characteristics of the site with relation to reptiles (e.g., could the site support overwintering). Also note habitat threats from grazing, logging, mining, flooding, road building, weeds, fire, etc.

### Species Information

For each species record the first two letters of the scientific genus and species names for all amphibian and reptile species found at the site (e.g., COCO for *Coluber constrictor*). Record the total number of person minutes of survey required before each life history stage of each species was encountered and the size or size range of the animals encountered. Record the tissue number or range of tissue numbers for tissue samples collected (see tissue collection protocols). Record the preliminary museum voucher specimen number for voucher specimens collected (see voucher specimen collection protocols). Circle the substrate the animal was associated with at time of detection. Record the presence of other species detected at the site (e.g., millipedes), the time at first detection, and the voucher number and description of animals collected (see voucher and tissue collection protocols).