

Please note that all location information has been removed from this document to protect Minnesota's Timber Rattlesnake populations

State Wildlife Grants Program Final Report February 2008

Project Title: Habitat Management and Protection of State Threatened Timber Rattlesnake (*Crotalus horridus*) Populations in Minnesota's Blufflands State Parks and Scientific and Natural Areas

Project Period: 1 March 2006 to 31 December 2007



Timber rattlesnakes basking in the sun on an old foundation at XXXXX2 in late- August, 2007.

The following is a summary of habitat management actions, timber rattlesnake protection efforts, and survey results related to the objectives of this project.

Timber Rattlesnake Habitat Management:

Habitat quality assessments and management priorities were determined through previous projects. Therefore, the habitat management objectives of this project were largely fieldwork oriented. Our habitat management strategies are roughly categorized into either maintenance activities or restoration activities. Habitat maintenance involved the use of prescribed fire or selective cutting of woody vegetation on sites that we considered

to be in moderate to high quality. These sites are or have the potential to be important timber rattlesnake habitat components, such as hibernacula, basking areas, or gestation/birthing areas. All management actions on these sites were completed prior to rattlesnake emergence in the spring or after ingress in the fall. Habitat restoration projects involved woody vegetation control on sites that were overgrown or invaded with invasive species to the point where they likely no longer served as important timber rattlesnake habitat. Often these sites were in such poor condition that prescribed fire would not carry successfully and could not be used as a management tool.

Over the course of this project approximately 81 acres on 24 sites were managed for important timber rattlesnake habitat through a combination of selective cutting and girdling. This is significant because all these areas are on south and west-facing slopes with rock outcrops in bluff prairie or savanna plant communities. These areas are probably most important for timber rattlesnake conservation because they serve the critical functions of thermoregulation, gestation, birthing, and as winter hibernacula. An additional 917 acres on 36 sites were managed with prescribed fire. Periodic fire maintains open rock outcrops and prairie/savanna communities on south and west-facing slopes.



Photograph of prescribed fire on a steep bluff prairie community typical of rattlesnake habitat.

We feel many sites have increased in quality and provide improved habitat conditions for timber rattlesnakes. We are encouraged by the observation of timber rattlesnakes on several of the sites where we have completed habitat improvements. We understand that it will be a long process to change the structural and compositional components of the bluff prairie and savanna communities. It will likely be longer before we see any changes in timber rattlesnake populations related to improved habitat due to the slow reproductive capabilities of rattlesnakes. However, we feel changes are in progress and we are

committed to the long-term maintenance of habitats and conservation of timber rattlesnakes.

Summary of timber rattlesnake habitat management accomplishments for the 2006 field season (1 March 2006 to 31 December 2006).

Park/SNA	# of sites managed or restored	Acres managed or restored	# of Rx Burns	Acres of Rx burns
XXXXXX1	3	8	3	28
XXXXXX2	2	5	3	18
XXXXXX3	6	13	7	203
XXXXXX4	0	0	1	12
XXXXXX5	0	0	1	8
XXXXXX6	2	5	0	0
XXXXXX7	1	6	0	0
TOTALS	14	37	15	269



Photograph showing an example of results of habitat management on a small bluff prairie at XXXXX2. Woody vegetation was cut or thinned in previous years and then burned in the spring of 2007 to release prairie vegetation. This area was almost completely shaded over prior to management actions.

Summary of timber rattlesnake habitat management accomplishments for the 2007 field season (1 January 2007 to 31 December 2007) .

Park/SNA	# of sites managed or restored	Acres managed or restored	# of Rx Burns	Acres of Rx burns
XXXXX1	6	24	7	63
XXXXX2	1	6	3	23
XXXXX3	1	7	8	525
XXXXX4	0	0	1	15
XXXXX5	1	1	1	3
XXXXX6	1	6	0	0
XXXXX7	0	0	1	19
TOTALS	10	44	21	648



Photograph of habitat work being completed at XXXXX6. This type of work was primarily done in late fall after rattlesnake egress. At this site, the crew is thinning red cedar and restoring openings near rock outcrops.

Protection of Timber Rattlesnake Populations:

Protection efforts focused on minimizing disturbance to timber rattlesnakes by humans. Park staff regularly patrolled the restricted areas at XXXXX1. No direct contacts were made with individuals trespassing in the restricted areas. Remote cameras were placed along known entrance routes to the restricted areas. Three events of trespass in the restricted areas at XXXXX1 were documented with the cameras in 2006 and 2 in 2007. The intent of the individuals seemed not to be suspicious or malicious (they looked like hikers or college students out enjoying the day).

A remote camera was also placed at a den site at XXXXX6 to monitor human disturbance. This site has a history of past human disturbance. Fortunately, the camera documented no trespass events in 2006 and only 1 in 2007. However, the site was visited by at least 2 individuals (that we learned about by chance) when the camera was malfunctioning (no images captured from mid-July to October in 2006). The hikers reported to park staff the observation of 2 rattlesnakes at the rock outcrop where the den is located.

Timber Rattlesnake Surveys:

Surveys for timber rattlesnakes involved checking selected sites under optimal weather conditions. Several types of sites were surveyed including: 1) known den sites, 2) areas where habitat management work has been completed, 3) basking areas, and 4) sites that have suitable habitat but we have no record of rattlesnake use of the site. Fortunately, of the 5 known dens sites that we surveyed, we documented the presence of at least one rattlesnake sometime during the egress or ingress periods during 2006 or 2007 (3 at XXXXX1; 1 at XXXXX2; 1 at XXXXX6). The presence of 2 rattlesnakes near the XXXXX1 park office during the emergence period leads us to believe there is another den site which we currently do not know the location of. No rattlesnakes were observed at XXXXX4, XXXXX5, or XXXXX3. The occasional report of a rattlesnake observation from visitors at XXXXX3 suggests there is an active den in or adjacent to the park. We have not been successful in locating this den site. No reproduction was confirmed at any of the parks. Although one adult rattlesnake observed at XXXXX1 was almost certainly gravid and juvenile (or at least sub-adult) rattlesnakes were observed at XXXXX6 and XXXXX1. A total of 19 rattlesnakes were observed as part of the survey efforts.



Photograph of active den site at XXXXX1. Three rattlesnakes were observed at this rock crevice in early May of 2007.

A “Deer Cam” camera was placed at one basking rock area at XXXXX1 in 2006 to determine if the cameras could be used as a tool to monitor den use. We collected 2 photos of a timber rattlesnake using the rock for thermoregulation leading us to believe the cameras could be used to monitor den sites for use and help determine egress and ingress dates. In 2007 we placed 3 Deer Cams in various locations to monitor rattlesnake activity. We captured photos of rattlesnakes at 2 known den locations at XXXXX1. We also placed the camera at a suspected den location but failed to capture any photos of snakes. We learned valuable lessons about set-up and maintenance of the cameras and feel there is potential for the use of this minimally intrusive technique for monitoring den sites. An unusual storm event with 5-15 inch rainfall totals also caused some camera malfunctioning during the fall ingress period of 2007.



Deer Cam image of a timber rattlesnake near a den site at XXXXX1 in early May of 2006.

Summary of timber rattlesnake surveys for 2006 and 2007.			
Park/SNA	# of rattlesnake observations in 2006	# of rattlesnake observations in 2007	# of known active dens
XXXXX1	4	7	3 (likely 4)
XXXXX2	1	2	1
XXXXX3			
XXXXX4			
XXXXX5			
XXXXX6	2	3	1
XXXXX7			
TOTALS	7	12	5



Deer Cam image located at the entrance of a den in the spring of 2007. The golden arrow-shaped head of a timber rattlesnake is visible in the lower left corner of the image.

Summary and Acknowledgements:

This project has allowed the Minnesota Department of Natural Resources to significantly improve timber rattlesnake habitat and conservation on State Park and selected Scientific and Natural Area lands. Thanks to the State Wildlife Grants program for funding this important work. Thanks also to State Parks staff and SNA staff for supporting and contributing to the habitat restoration, rattlesnake protection, and survey activities.