

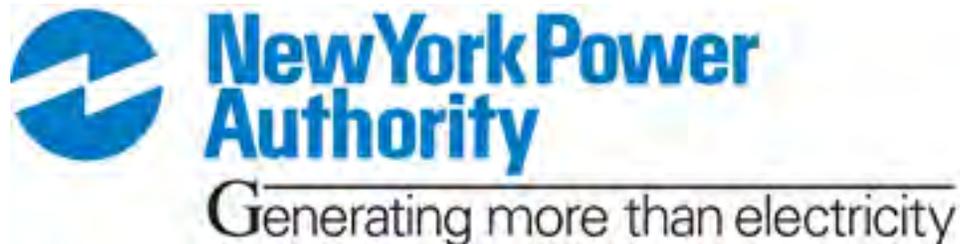


**BLenheim-GILBOA PUMPED STORAGE FERC No. 2685  
POWER PROJECT RELICENSING**

# **2013 TIMBER RATTLESNAKE (CROTALUS HORRIDUS) EMERGENCE SURVEY**

**JANUARY 2014**

**Public Version**



*Provided by:*

Kathy Michell and Tom Michell

KT Wildlife, LLC



***Kleinschmidt***

©Copyright 2014. New York Power Authority. All Rights Reserved

## TABLE OF CONTENTS

<b>1 INTRODUCTION AND PROJECT NEED.....</b>	<b>1</b>
<b>2 SITE HISTORY .....</b>	<b>1</b>
<b>3 TIMBER RATTLESNAKE BACKGROUND .....</b>	<b>2</b>
<b>4 MATERIALS AND METHODS.....</b>	<b>3</b>
<b>5 SURVEY RESULTS .....</b>	<b>4</b>
<b>6 DISCUSSION.....</b>	<b>5</b>
<b>7 SUMMARY.....</b>	<b>6</b>
<b>8 LITERATURE CITED .....</b>	<b>6</b>

## LIST OF FIGURES

Figure 1. Blenheim-Gilboa Pump Storage Project Boundary Map.....	7
Figure 2. Map of most recent (1979-1991) timber rattlesnake sightings in the vicinity of the New York Power Authority facilities. Map courtesy of New York State Department of Environmental Conservation .....	8
Figure 3. Timber rattlesnake location from 1981 in relation to NYPA facilities. Map courtesy of the New York Power Authority.....	9

## LIST OF PHOTOS

Photo 1. Open rock lookout areas at the top of the west facing alleged den hill. ....	10
Photo 2. Shelf below main ridge with no basking rock. ....	10
Photo 3. Hemlock forest at the top of ledge.....	11
Photo 4. Hemlock forest on top of mountain. ....	11
Photo 5. First small ledge at the south end of the polygon. ....	12
Photo 6. Second small ledge at the south end of polygon.....	12
Photo 7. Part of rock foundation. ....	13
Photo 8. Powerline ROW looking west. ....	13
Photo 9. Logs from maintenance lined the edges of the ROW.....	14
Photo 10. Top of mountain on ROW near the fork in the line.....	14

## 1 INTRODUCTION AND PROJECT NEED

The New York Power Authority's (NYPA) Blenheim-Gilboa Pumped Storage Power Project (B-G or Project) is located on the Schoharie Creek in the Towns of Blenheim and Gilboa, about 40 miles southwest of Albany in Schoharie County, NY. The 1,160 megawatt (MW) Project consists of an Upper Reservoir and Dike, a Lower Reservoir and Dam, conduits connecting the reservoirs and an underground powerhouse, a spillway and related facilities.

The Project helps meet the State's peak power needs by cycling water between two reservoirs – one atop Brown Mountain and the other at its base. Four pump-turbines use energy from other sources to pump water about 1,100 feet to the Upper Reservoir during periods of lower electrical demand, typically at night and on weekends. During periods of higher electricity demand, typically during the day, the motorized pumps are reversed to become turbine-generators. Water released from the Upper Reservoir spins the turbine-generators to produce up to 1,160 MW of electricity before entering the Lower Reservoir.

The Federal Energy Regulatory Commission (FERC) issued an initial 50-year operating license to NYPA for the Project, effective May 1, 1969 and the Project entered commercial operation in 1973. The current license expires on April 30, 2019; therefore, an application for a FERC license for a new term must be filed before April 30, 2017. NYPA must file with FERC its Notice of Intent (NOI) to relicense the Project and a Pre-Application Document (PAD) by April 30, 2014. The Federal Energy Regulatory Commission (FERC) license for the Project expires in April 2019 and NYPA is currently working to obtain a new license for the facility. The relicensing process typically takes seven to nine years and involves environmental studies as well as agency consultation. Identification of rare, State or Federal listed species included reviews of the New York State Department of Environmental Conservation Natural Heritage Program (NYSDEC NHP) database, which revealed two State-threatened species as potentially occurring in the Project vicinity: the bald eagle (*Haliaeetus leucocephalus*) and timber rattlesnake (*Crotalus horridus*). To address the potential occurrence of timber rattlesnake, NYPA conducted studies in 2012 and 2013 in preparation of the PAD.

The area within the Project boundary and the surrounding vicinity contains large amounts of mature or mixed age conifer, deciduous and mixed forest. Other habitats include wetlands, some rocky ridges, successional habitats and riparian areas. The Project lands and facilities within the Project boundary are owned and operated by the New York Power Authority (NYPA) and the New York State Office of Parks, Recreation and Historic Preservation ([Figure 1](#)).

This report addresses emergence/post-emergence surveys completed for the timber rattlesnake within the vicinity of the Project, and specifically the study area. The area directly east of the Project has been identified as a potential denning site by the NYSDEC NHP (see [Figures 2](#) and [3](#)). This potential denning area (blue polygon on [Figures 2](#) and [3](#)) was the primary study area and the focus for three of the four survey days. In addition, a Right-of-Way (ROW) north of the primary study area was also evaluated for rattlesnake basking individuals/habitat on the fourth day of surveys ([Figure 1](#)).

## 2 SITE HISTORY

In past decades, apparent isolated populations of timber rattlesnakes occurred in Schoharie County in the vicinity of the Project. According to the Natural Heritage Program record between 1979 and 1983, there was one confirmed sighting, two confirmed mortality reports and one probable mortality report of timber rattlesnakes. In addition, there have been a number of unconfirmed sightings within and adjacent to the Project boundary. The NYSDEC reported that surveys were conducted in 1979, 1981 (last known confirmed sighting in the area), 1983 and 1991. No rattlesnakes were located during the 1979, 1983 and

1991 surveys. On 17 and 22 September 2001, NYSDEC Senior Biologist Nancy Heaslip and Kathy Michell, as part of general DEC rattlesnake population surveys, surveyed the mountain slope east of Valenti Road with no snakes of any species being located.

Wildlife habitat surveys were conducted in 2012 within the Project boundary. A habitat investigation initially conducted on May 21, 2012 by Kathy Michell of K. T. Wildlife, and Jeff Geller and Jeff Gerlach of NYPA, evaluated the possibility of rattlesnakes denning within or around an onsite structure on the south end of the lower reservoir (referred to as Coyne Cottage). There had been some historic unconfirmed reports of rattlesnakes denning at this location. K. Michell concluded, based on the characteristics of the structure and its location that rattlesnakes were not denning in or within the vicinity of this building.

In addition, a wildlife, vegetation, and rattlesnake habitat reconnaissance survey was conducted on July 11 and 12, 2012 by a team of scientists from Kleinschmidt Associates, KT Wildlife, L.L.C., Amy S. Greene Environmental Consultants, Inc., (ASGECI), and NYPA ([Kleinschmidt et al., 2013](#)) within the Project boundary. The survey evaluated deciduous and conifer forested habitats, riparian corridors, successional and open areas, and wetlands surrounding the reservoirs on the NYPA property. The studies did not reveal the presence of rattlesnakes or any rattlesnake habitat within the Project boundary. However, locations outside, but nearby the Project boundary (including the primary study area identified by NYSDEC), were observed at distance and given consideration as potential habitat. These offsite areas were not surveyed on foot at the time of the 2012 reconnaissance.

In an effort to determine if there is an extant population of timber rattlesnakes in the vicinity of the Project, KT Wildlife, LLC was contracted by ASGECI to conduct emergence/post-emergence rattlesnake surveys of the habitat historically identified in the NYSDEC Natural Heritage database as being the probable denning site of these rattlesnakes.

### **3 TIMBER RATTLESNAKE BACKGROUND**

Timber rattlesnakes are heavy bodied snakes which require very specific conditions in which to hibernate. Some of the factors include the type of rock, structure of the formation, moisture and groundwater content, aspect and availability of an adjacent basking area. Rattlesnakes return to these ancestral dens each year between early September and the end of October depending on the latitude of the location ([Brown 1993](#)). During the spring emergence period, the rattlesnakes often bask for several days as they warm their bodies before leaving the vicinity of the den to begin their seasonal activities, traveling up to 2.5 miles from their dens ([Brown 1993](#)). During this post-emergence basking period, usually mid to late April or early May, timber rattlesnakes are very easy to find in natural open areas close to their dens. Before European settlement, hundreds could be found basking in these areas, hence the widespread accounts of killings of hundreds throughout their range.

The timber rattlesnake is a member of the venomous pit-viper family and measures 3 to 4.5 feet in length. The two color phases that are commonly found include a yellow phase, which has dark bands on a lighter base color, and a black phase, which has dark bands on a dark base color. The color patterns make the species highly cryptic. Timber rattlesnakes are active from early April until mid-October, although in northern New York, they may not emerge until mid-May ([Brown, 1993](#)).

Timber rattlesnakes in New York are typically found in deciduous forests in rocky terrain. Gravid females often gestate on open, rocky ledges in close proximity to their dens where temperatures are higher. Males and non-gravid females use a more varied habitat mosaic including deciduous forests. During the active season, male rattlesnakes typically travel an average of 2.5 miles from their den, and non-gravid females typically travel 1.3 miles from their den ([Brown 1993](#)) (see Section 3.0 below).

The range of the timber rattlesnake extends from areas in New Hampshire, south along the Appalachian Mountains to northern Georgia, and west to southwestern Wisconsin and northeastern Texas ([Brown](#)

1993). There are also populations in some Coastal Plain areas in the Mid-Atlantic. Timber rattlesnakes historically occupied a significant portion of New York State.

Some experts estimate that the timber rattlesnake has been extirpated from about half of its historic range. Presently, timber rattlesnakes occur in New York in the Hudson Highlands, Shawangunks, southern Catskills and peripheral eastern Adirondacks with scattered populations in the western and central parts of the state (Gibbs et al., 2007). Historically, there were scattered populations throughout the interior of New York, including Schoharie County. Jephtha Sims (1845) described locations where “hundreds could be killed in a single day” near Middleburgh and Schoharie. Efforts of the early settlers to exterminate the rattlesnakes by slaughtering them at the dens in late April or early May were quite effective because Sims wrote in 1845 that the venomous snakes were nearly exterminated by then.

The remaining remnant populations became vulnerable to extirpation by natural causes, including lack of genetic diversity, extremes in weather conditions, hydrologic changes, reproductive failures, changes in the forest composition and continued losses resulting from incidental killings and other human interactions. As many of the populations became completely extirpated, the remaining rattlesnake populations became isolated and inbred. This isolation and resulting loss of genetic diversity can impose additional stress to those populations further reducing their long term viability.

## 4 MATERIALS AND METHODS

The widely accepted protocol of surveying an area four times in the spring to determine presence or absence of timber rattlesnakes is used in many states including New York. To determine if timber rattlesnakes are denning in the study area (blue polygon shown on Figure 2 - map provided by NYSDEC), three emergence surveys were conducted during favorable conditions for rattlesnake basking (May 10, May 16, and May 28, 2013) and one survey was conducted on June 24, 2013, when rattlesnakes are often at basking areas with shelter rocks to undergo their shed cycle (ecdysis). Figure 2 also shows the locations of timber rattlesnake sightings since 1979, the last being in 1983. Figure 3 is a map provided by NYPA with the same polygon from the NYSDEC database and showing the location of the NYPA facility and property ownership. Since the study area is privately owned, the NYSDEC contacted the owners for permission to survey the properties. The surveys were conducted by walking through the area of the polygon to visualize as much as possible and search for any open rock areas where a snake could potentially bask. All rocky areas were searched for the presence of snakes. The search was expanded to the east and southeast in the vicinity of the primary study area in an effort to locate more open areas where rattlesnakes could potentially bask. If any timber rattlesnakes were located, they would be implanted with a Holohil® SI-2 transmitter to find the exact location of their den in the fall.

Since the precise location of a timber rattlesnake den was unknown, the survey began at the location of the last known female spotted in 1981. This location consisted of exposed bedrock outcropping outside of the NYPA Project boundary. This site and the surrounding area were identified by NYPA’s timber rattlesnake experts (KT Wildlife and A.S. Greene) and the NYSDEC as the most likely location for a spring emergence survey. The entire area of exposed bedrock was included to account for the fact that the 1981 data point might not represent the exact historic den crevice location. Spring of 2013 was colder than normal, delaying the emergence of timber rattlesnakes a week or two beyond the “normal” emergence time. Due to the size of the primary study area (approximately a half mile long), the surveys targeted the immediate post-emergence basking period where the snakes, if any were to be found, would be more visible. If a den location was known, an earlier survey could be conducted because the exact crevice or talus could be searched for the presence of snakes. Given the size of this area, and the colder than normal spring, however, NYPA needed to enlarge the search area as well as delay the survey dates. The survey targeted both the most likely time and most likely place to find timber rattlesnakes, if present.

## 5 SURVEY RESULTS

The first emergence survey was conducted by K. Michell of KT Wildlife, LLC and J. Gerlach from NYPA on 10 May 2013. The day was mostly sunny and temperatures ranged from 19°C to 24°C during the survey (0930 to 1500). This survey was conducted by approaching the polygon and approximate 1981 rattlesnake location from the west side off Valenti Road. There are several levels of ledge each of which has a very steep slope approaching it. The base of the first ledge is shaded by Eastern hemlock (*Tsuga canadensis*) with only a few rocks of marginal quality for basking. The second ledge was also steep with a few rocks below it. J. Gerlach accessed the first ledge and continued to the second ledge and found the same steep slope approaching it and same few rocks below it. Most parts of the ledges were very dry with no moisture trickling from them, which would be essential for hibernation. J. Gerlach located the approximate point of the 1981 observation and did not find timber rattlesnakes or basking habitat. This area was at the base of the third and uppermost ledge. The only snake observed was a common garter snake (*Thamnophis sirtalis*) at the base of the mountain near Valenti Road. The extensive shading by conifers and lack of basking habitat were very obvious on this survey and supported the lack of observations over the past 30 years.

The second emergence survey was conducted by K. Michell and T. Michell of KT Wildlife, LLC and J. Gerlach of the New York Power Authority on 16 May 2013. The day was mostly sunny with temperatures ranging from 21°C to 25°C during the survey from 1000 to 1600. Surveyors approached the uppermost ledge from the east side after meeting with landowner Kristin Wyckoff. The forest at the top of the mountain is currently being logged for most of the hardwoods. It is a shaded forest dominated by Eastern hemlock and some white pine (*Pinus strobus*). An earlier review of aerial and topographic maps of the southeast side of the mountain revealed a sloping deciduous forest. The top of the ledges were easily accessed and there are some small sunny locations at the rim of the ledge which are regularly used as lookout areas by the owners ([Photo 1](#) and [2](#)). [Photos 3](#) and [4](#) show the typical forest and ledges at the top of the mountain, which is known as Reed Hill on the USGS topographic maps. If there had been any loose slab rock suitable for rattlesnake basking at the top of the ledges it would have been removed long ago since there is no evidence of recent disturbance in the area. A few marginal rocks set back a short distance from the rim were searched with no snakes or basking habitat observed. Although there were a few small ledges on the southeast side of the mountain, without any adjacent open basking areas, they are not potential dens sites. The survey team was unsuccessful in finding any basking areas during the second emergence survey. The only herpetofauna observed on this date were red newt (*Notophthalmus viridescens*) efts and some dried spotted salamander (*Ambystoma maculatum*) egg masses in the logging truck tracks.

The third and last emergence survey was conducted by K. Michell and T. Michell from KT Wildlife, LLC, H. Strano from ASGECI, and J. Gerlach from NYPA on 28 May 2013. Temperatures ranged from 18°C to 21°C during the survey conducted from 1130 to 1600. The day remained mostly overcast, and at approximately 1500, a light rain started. This survey focused on the ledge above the 1981 rattlesnake location and the southern half of the polygon. The same heavily shaded forest dominated by Eastern hemlock was encountered in this area. Secondary deciduous forest species included sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), white birch (*Betula papyrifera*), and striped maple (*Acer pensylvanicum*). At the southernmost end of the study area were two small ledges which had a few slab rocks near them ([Photos 5](#) and [6](#)). These areas contained some herbaceous plants and shrubs including small aspen (*Populus tremuloides*) and huckleberry (*Vaccinium* sp.). A more open wetland meadow running north south was located just east of these ledges. This wetland contained sedges (*Carex* spp.), sensitive fern (*Onoclea sensibilis*), spotted jewelweed (*Impatiens capensis*) and various grasses. A common garter snake was found basking by an old rotting stump. Near the log landing at the eastern top of the mountain there are old rock walls and remains of foundations ([Photo 7](#)). These were searched for snakes or shed skins because there is a scarcity of open area and these could be suitable for basking.

No other herpetofauna were found during this survey. On this date, surveyors drove to the upper reservoir on Brown Mountain to determine if there was any exposed rock on the southeast slope of the reservoir with potential for rattlesnake basking, but found none. Kristin Wyckoff (local resident) had mentioned that the last rattlesnake sighting that she heard of was on a farm in that vicinity some 30 years ago.

The fourth survey was delayed until 24 June 2013 so that the open area of the NYPA powerline ROW ([Figure 1](#)) could be surveyed for possible pre-shed basking snakes. Several of the historic locations were located along the ROW and near the campground at the fork in the power lines. On the aerial maps there appeared to be some rocky areas on the ROW at the top of the mountain. K. Michell and J. Gerlach surveyed the line from Valenti Road east approximately one mile until the ROW enters the woods to the east. The weather was overcast, warm and humid with temperatures ranging from 28°C to 30°C during the survey from 1000 to 1500. Very little rock was located on the ROW. There were some piles of old logs along the edges which could be used for basking but no good quality natural basking area was located. [Photos 8, 9](#) and [10](#) are representative of the powerline ROW habitat. When we reached the rocky area at the top of the mountain, we found the rocks to be fairly small and scattered about in a wetland. A milk snake shed was found in one of these rocky patches. There were no slab rocks or any habitat that could be used for gestation areas in the wetland. To the east of the campground, there were several fairly long, wide rock walls built with various sized stone including slab rocks. Blueberry (*Vaccinium* sp.) and briars have grown alongside the rock walls affording some cover to allow a temperature gradient for basking snakes; however no snakes or sheds of any kind were found in the rock walls. Although these rock walls could be suitable for basking activities, they would only be secondary to a primary natural basking area which was not found. On the return trip down the mountain, a common garter snake on the western slope in the woods to the north of the ROW was observed.

## 6 DISCUSSION

In 2012, a habitat survey was conducted within the Project boundary and no suitable timber rattlesnake habitat was observed ([Kleinschmidt et al., 2013](#)). Later in 2012, the team discussed with the NYSDEC (Nancy Heaslip, NYSDEC) the potential of timber rattlesnake habitat and the possibility of an extant population in the vicinity of the Project (outside the Project boundary but with a range that could potentially include some areas within the Project boundary). It was concluded that timber rattlesnake emergence surveys would be needed in order to determine if peripheral or marginal populations of this species remain in the Project vicinity. The historic location reports of varying credibility which are sparsely scattered within a mile or so of the NYPA Project raise the possibility of finding a remnant population.

After conducting these surveys in 2013, both T. and K. Michell believe there is not an extant rattlesnake population in the vicinity of the study area (polygon from NYSDEC's database). It is very possible that sporadic sightings from the 1970s and 1980s also occurred to the south and east. Since the timber rattlesnake was not a protected species in New York State until 1985, incidental killings of individuals by landowners were probably never reported.

The survey results do not support the existence of timber rattlesnakes in the vicinity of the NYPA Project or the NYSDEC polygon. It is questionable whether this area was ever utilized as a rattlesnake den. It faces nearly due west, and although there are dens facing west, they are not common particularly as far north as Gilboa.

Typically dens face east to southeast to south and sometimes southwest. Some of the nearby historic locations where rattlesnakes were hunted to extinction in the 1800s included: near the Town of Schoharie, on the west side of the river, which would be an east/southeast facing slope; north of Fox Creek which is a south facing slope; and Rattlesnake Mountain in Middleburgh. Stevens Mountain, Conesville and Vroman Corners, which are closer to the NYPA Project, are also mentioned in the history books as

having rattlesnakes. Reed Hill, the mountain east of the Project with the NYSDEC polygon, was not mentioned in any of the Schoharie history books searched.

The most significant outcome of the study was the failure to find any open natural basking close to the alleged den ledge. The few small marginally adequate basking rocks seen during the surveys would not be sufficient to support a population of timber rattlesnakes. In addition, the forest composition is primarily Eastern hemlock which cannot support any sizeable rodent, including chipmunk and squirrel, population for rattlesnake foraging. The hemlock also prevents direct sunlight from reaching much of the forest floor including the rim above the ledge. The forest appears to have been logged multiple times in recent years. Depending on the logging practices, sometimes after the hardwoods are removed the new growth is totally different from what was in the area. If there had been a den on the west side of Reed Hill, the change in the forest vegetation could have shaded the area to the point where successful gestation may not have been possible. The absence of snakes in this area is significant as Eastern rat snakes (*Pantherophis alleghaniensis*) and Northern racers (*Coluber constrictor*) are commonly seen in areas inhabited by timber rattlesnakes. The surveys yielded three common garter snakes and one milk snake (*Lampropeltis triangulum*) shed. Garter snakes were also seen at Coyne cottage on the NYPA Project in 2012.

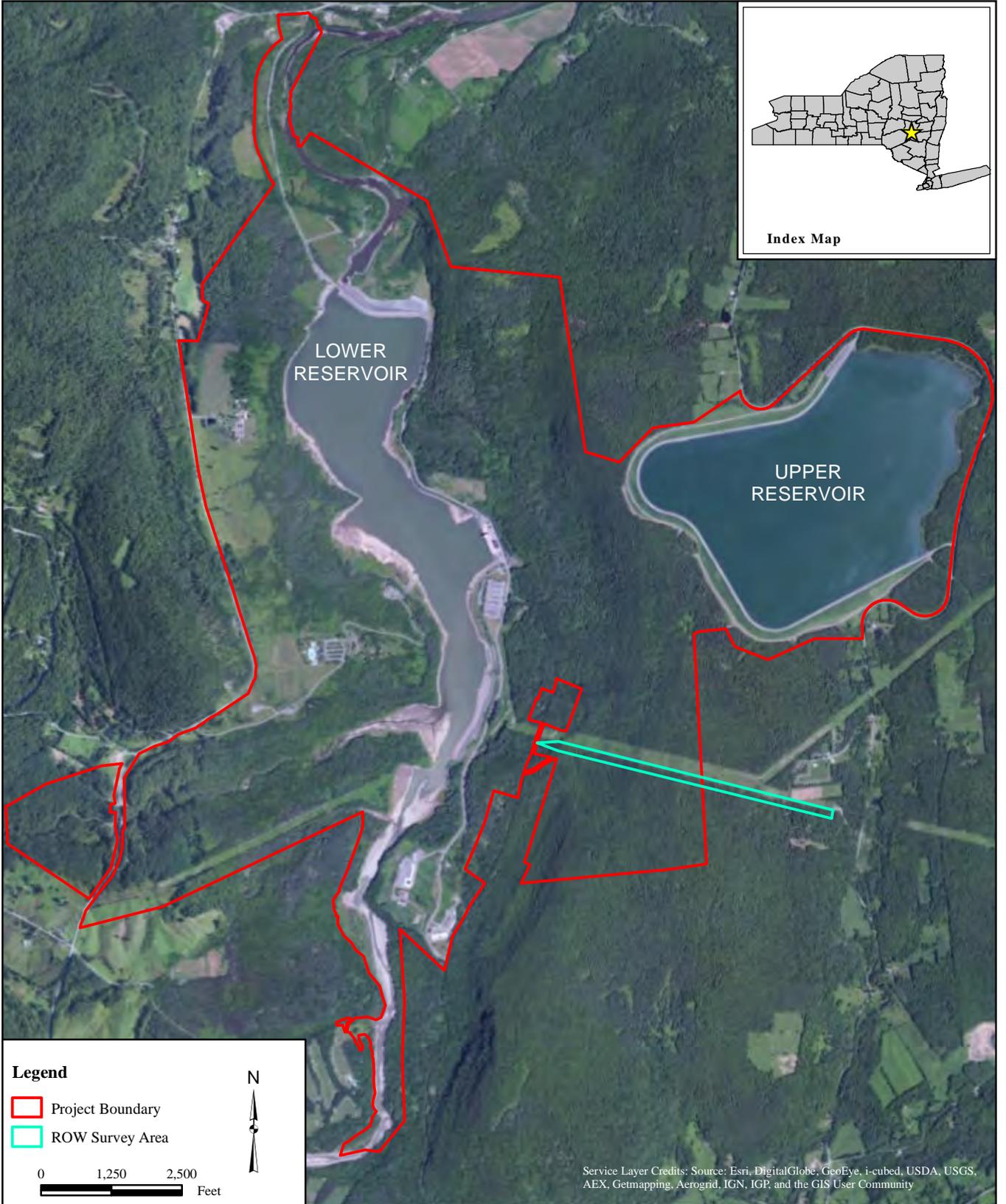
Currently, there are no known extant timber rattlesnake dens in Schoharie County. There are still remote areas where a remnant population may be surviving. Recovery of long lived animals with low reproductive rates can be very slow. During the investigation of historic areas we heard of a recent report of a logger seeing a rattlesnake at a location about ten miles away from the survey area, but the Project is not within the range of this anecdotal siting.

## **7 SUMMARY**

Surveys were conducted in the spring of 2013 during optimal weather and dates for timber rattlesnake emergence and basking on and around a west facing slope off Valenti Road near the New York Power Authority. The purpose of the survey was to determine if timber rattlesnakes are extant in or adjacent to the Blenheim-Gilboa Project. The lack of suitable basking and gestating habitat in the vicinity of the ledges, the failure to locate any timber rattlesnakes or shed skins and the lack of any reported observations in the past 30 years leads us to conclude that timber rattlesnakes are extirpated from this area.

## **8 LITERATURE CITED**

- Brown, W. S. 1993. Biology, Status, and Management of the Timber Rattlesnake (*Crotalus horridus*): A Guide for Conservation. SSAR Herp. Circular No. 22.
- Gibbs JP, Breisch AR, Ducey PK, et al. 2007. The amphibians and reptiles of New York State: identification, natural history, and conservation. New York: Oxford Univ. Press.
- Kleinschmidt, Gomez and Sullivan Engineers, P.C., Amy S. Greene Environmental Consultants, and TRC. 2013. Land cover, land use, and terrestrial habitat assessment. Blenheim-Gilboa Pumped Storage Power Project (FERC No. 2685). January 2013.
- Sims, Jephtha R. 1845. History of Schoharie County and Border Wars of New York. Munsell and Tanner. Albany.



**Blenheim-Gilboa Pumped Storage Power Project (FERC No. 2685)**

**2013 TIMBER RATTLESNAKE EMERGENCE SURVEY**

**Figure 1: Blenheim-Gilboa Pump Storage Project Boundary Map**

©Copyright 2014. New York Power Authority. All Rights Reserved

**Figure 2. Map of most recent (1979-1991) timber rattlesnake sightings in the vicinity of the New York Power Authority facilities. Map courtesy of New York State Department of Environmental Conservation**

**Figure contains Sensitive Species Location Information and has been removed from report.**

**Figure 3. Timber rattlesnake location from 1981 in relation to NYPA facilities. Map courtesy of the New York Power Authority.**

**Figure contains Sensitive Species Location Information and has been removed from report.**



Photo 1. Open rock lookout areas at the top of the west facing alleged den hill.



Photo 2. Shelf below main ridge with no basking rock.



Photo 3. Hemlock forest at the top of ledge.



Photo 4. Hemlock forest on top of mountain.



Photo 5. First small ledge at the south end of the polygon.



Photo 6. Second small ledge at the south end of polygon.



Photo 7. Part of rock foundation.



Photo 8. Powerline ROW looking west.



Photo 9. Logs from maintenance lined the edges of the ROW.



Photo 10. Top of mountain on ROW near the fork in the line.