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A Reptile and Amphibian Survey of Pine Mountain Wildlife Management Area

Introduction

A herpetological survey of Pine Mountain Wildlife Management Area (PMWMA) was conducted during the 1997 field season. In this report is information regarding the significance of the species located and conservation suggestions for those species. It is planned that this information will be incorporated into a management plan for PMWMA that will serve as an example of informed ecosystem management, a plan that is designed to meet the needs of nongame species as well as game and timber species.

PMWMA straddles the borders of four towns (Groton, Newbury, Ryegate, and Topsham) and two counties (Caledonia and Orange) in east central Vermont. It ranges in elevation from 740 feet in the Wells River Flood plain to 1,620 feet on the top of Burnham Mountain. It is rolling land composed of four small mountains (Burnham, Pine, Melvin, and Whitcher) and drained primarily by five small brooks; Dawes, East, Keenan, and two without names. All eventually drain into the Wells River. The region is primarily second growth mixed hardwoods with small areas of red oak, white pine, white cedar, and a fairly large valley of spruce-fir. Some open fields and an open power line right-of-way are found around the margins with a few logging headers and logging roads bisecting it. Two large, permanent, still-water bodies are found within its borders: an unnamed pond along the old railroad tracks on the northern boundary on the margin of the Wells River flood plain and a beaver enhanced pond system sitting in a saddle between Whitcher Mountain and Melvin Hill.

Methods

The primary method used was active searching, which consists of turning all types of potential cover (logs, boards, rocks, bark, debris) searching for reptiles and amphibians in their daytime hideouts, while at the same time listening for calling amphibians and watching for the movement of foraging, basking, migrating, or breeding organisms. Egg-mass searches for frogs and salamanders took place during their brief spring mating period and day- and night-time road searches were used to locate living and road-killed specimens. Night-time visits were made to select sites to look and listen for amphibians. Turtle traps were used to sample the Wells River Valley Pond. I also engaged talkative residents and hunters in what I call herp interviews to see what species they had seen. In addition, the data existing in the Vermont Herpetological Database (~15,000 records) added to my information of the area and my knowledge of its

significance relative to the rest of the state. In the results and discussion section, I am drawing extensively on my field experience (13 years of professional herpetology in Vermont), as well as my knowledge of the literature.

Overall, twelve visits of varying duration were made to the site throughout the field season. Visits were timed to take advantage of specific windows of opportunity based on a knowledge of the natural history of species potentially found in the area. The site was visited on April 29-30, May 2, 27-28, June 11-12, 24-25 and September 17-19. I was accompanied on most occasions by either my intern Jose Zevallos or personnel from the Department of Fish and Wildlife and Department of Environmental Conservation: Jim Kellogg, Scott Darling, Tom Decker, Jessica Rykken. My intern visited the site by himself on June 24 and 25.

Results & Discussion

Species

A total of eleven amphibian and five reptile species were located in the area (Table 1). Most of the species located were S5 species that are found widely throughout the state. The Pickerel frog (*Rana palustris*) and the Dusky salamander (*Desmognathus fuscus*) are less widespread but still found at many other sites in Vermont so their ranking is S4. The Smooth green snake (*Opheodrys vernalis*) is listed as S4 but in my opinion would be more appropriately considered an S3 species. I personally have only found four sites where this snake occurs over the last ten years. However, there are recent (less than 10 years old) records of this species from 22 towns in our state-wide database.

Although not found during this survey, reports of other species from the area are in the database and these species may use this site. The Wood turtle (*Clemmys insculpta*) has been found twice in the area. One was reported in 1980 near Keenan Brook just west of PMWMA by Vermont Institute of Natural Science staff and another one was found in 1994 along the Wells River near the Rte. 232 intersection by a state park naturalist. The Wood turtle is an S3 species that we consider an SC, or species of concern. If a small population of these turtles remains along Keenan Brook or along the Wells River they could wander into the WMA while foraging, egg laying, or aestivating. Part of Keenan Brook is found within the borders of the WMA.

I found a road-killed Milk snake (*Lampropeltis triangulum*) on Rte. 302 in Ryegate. This species may also be found in small numbers near the farms and homes around the border of the WMA. It is an S5 species. The Ringneck snake (*Diadophis punctatus*), an S4 species, was reported from Newbury in 1934 and from Groton State Park in 1996. If it is presently within the WMA it would probably be found in small openings within the woods or on the edge of the woods with a southern or western exposure. It is a secretive snake and small numbers could be missed.

Although Mink frogs (*Rana septentrionalis*) have been seen in Groton State Park, I did not find them, nor do I believe that there are any to be found in PMWMA. Bullfrogs (*Rana catesbeiana*) have been reported from Groton, Ryegate, and Newbury but they were not found in the WMA. The pond along the railroad tracks in the Wells River Valley is appropriate habitat for them. If colonizers arrive, a population could develop at this site.

None of the amphibians located during this survey showed any obvious external deformities.

Smooth Green snakes

The most unusual species to be found was the Smooth green snake. I was excited by the find. Although not a listed species, I very rarely see them. This species has shown declines in New England over the last 50 years (Klemens 1993). They are a grassland species that feeds almost entirely on insects and spiders. Most theories about the cause of their decline focus on changes in land use and pesticide use. Upland meadows and pastures (not croplands) seem to be their ideal habitat. In Vermont and other New England states most of the upland pastures have been deserted and have returned to woodlands. DDT is suspected to have caused direct mortality of the snakes and removal of their food supply. A third theory, which makes a great deal of sense to me, is that the change of haying technology to power mowers and bailers has reduced populations to below sustainable levels. I have heard many stories from farmers about dead snakes in hay bales. Fast and low cutting lawn mowers that are used in and around residences also case a lot of direct mortality. Most reptiles, unlike some amphibians, produce relatively few young to begin with, and most of these do not reach sexual maturity. The steady removal of a few breeding adults from a population will gradually eliminate a population. The Smooth green snake lays eggs. Most of the more successful snake species in Vermont (e.g., Garter snake) give live birth. Giving live birth is an advantage in the north. It allows gravid snakes to move with the sun throughout the day as the need arises to keep the temperature of the young at an optimum. Eggs must be laid in a sunny and/or warm location.

I found a small population of Green snakes in only one location (Figure 1). Three snakes were found in the logging header at the end of the old access road traveling south west out of the opening with the hunting camp. Other logging headers are found in the PMWMA and all were searched, but only the this one had a population of these snakes. I also searched the meadows and the power line right of way but did not find any more of this species. Why they are here and no where else is not clear to me. A few possibilities exist: that this opening has unique habitat characteristics (e.g., anthills or mammal burrows for over wintering sites), that this site has been managed differently than the headers and meadows (the others are being cut, this one has partially returned to shrubbery), or perhaps that this header just happened to be found by a gravid female (the top of Galusha Hill to the southwest is a large open horse pasture that might contain a source population).

If this site is to continue to serve as Smooth green snake habitat it will need to be kept open. It is largely grown in now and will gradually lose its basking, egg laying and foraging sites. This WMA contains a number of small openings that are potential snake habitat (also Redbelly and Ringneck snake). I would recommend that they be kept open. Woodland openings do not have to be large to provide good habitat for snakes but there must be areas that receive a lot of direct sunlight in the spring and the fall. In a system unaltered by humans, these openings are provided by beaver, fire, storms, ledge and talus areas, pond and lake edges, and in openings created where mature trees have fallen. Any site that is kept open for snakes should be mechanically cut or burnt when direct mortality to the snakes can be minimized. This is possible in the late winter or early spring (through April), or in the fall after the first heavy frosts (late October on) when these snakes are underground. Late fall is preferable near water, since spring breeding amphibians may be active in April. If sites need to be cut during the summer, sunny hot afternoons during late July or early August would find most snakes under cover. They would be active in the morning until their body temperature gets too warm, at which point they would need to seek shade. Whenever a site is cut, if the mower is set high, and the ground is not raked or baled, it would help minimize mortality. It might also be beneficial to keep part of the habitat in berries and other low dense shrubbery.

Pesticides or herbicides should not be used. Rarely, have even the more benign biocides been tested to see what the long-term or sub-lethal effects are on native reptiles or amphibians.

Snake habitat could be enhanced with the addition of course woody debris for cover. Scattered logs, or bark within the open areas would serve this purpose. A pile of hay or sawdust might also create an egg laying or over wintering site that generates or maintains some warmth. Exposing a piece of a stone wall, old foundation or natural talus or ledge provides good basking sites and cover. Some rare snakes, such as Ribbon snakes (which I did not find) and common snakes such as Garters would benefit from having these sites contiguous with water. A natural source of such sites is beaver ponds and the eventual beaver meadows.

Pickerel frog

Pickerel frogs (S4) are much more widespread in the state than Smooth green snakes but are missing from many developed and agricultural areas. They are unusual for frogs in that for part of their lives they will use the same sort of openings mentioned above for snakes (most frogs are woodland species as adults). Adults seem to thrive in dense annual vegetation (grasses, sedges, rushes, etc.) near (within approximately two hundred meters) of a breeding site (beaver pond or other semipermanent or permanent pond). Other adults seem to survive well in moist wooded river valleys.

At this site I found Pickerel frogs using some of the river valleys, the grassed over logging roads, beaver meadows, and an old piece of pasture next to a beaver pond.

Management for this species would be the same as for Smooth green snakes but the openings would need to be near water. Digging small fishless permanent ponds in naturally wet areas near openings would create habitat for this species and many others. Beaver provide this habitat naturally.

Dusky salamanders

Dusky salamanders (S4) can be fairly common in wet, closed-canopy, woods with lots of coarse woody debris. They can be hard to find or missing in smaller and drier watersheds, highly disturbed areas, open areas, and agricultural areas. They require saturated soils in well-shaded areas. They usually lay their eggs under moss growing along the tops of logs over or very near small streams, springs, and seepage areas with pools of water. The adults can be found on saturated soil in the spaces underneath logs, and rocks, in or near these streams, springs, and seepage areas. I found them in PMWMA using both stream edges and seepage areas. These areas need to remain wet, dark, and full of organic debris. These areas should not be cut (exposed or thinned). I would expect that sedimentation of small brooks would fill the interstitial spaces needed by the adults and their prey. Consequently, siltation from any cuts should be kept well away from small streams and brooks. Maintaining 100 foot buffers along small streams, seepage areas, and springs will help to maintain these species. Making sure sediment from nearby disturbances does not enter the brooks may require additional measures. The more common Two-lined salamander (*Eurycea bislineata*) would also be protected by the same measures. A third salamander that uses similar habitat but was not found during the survey is the Spring salamander (*Gyrinophilus porphyriticus*). If it is in or near the area they would also be served by protection of the same habitat type. These habitats provide foraging areas for Pickerel frogs, young Green frogs, Wood frogs, and Red efts (adolescent eastern newts). All of these in turn provide food for Garter snakes.

Wood turtle (*Clemmys insculpta*)

Although I did not find this species in the area, the two previous records suggest that small numbers of Wood turtles (S3, SC) may still use the area. If it is found nearby, the purchase of additional lands should be considered. It takes fourteen years for this species to reach sexual maturity. It can not tolerate the regular removal of adults from a population. This largely terrestrial species needs to be able to travel from over wintering sites in the streams to feeding, egg-laying, and aestivating sites that may be hundreds of meters away from the streams. Mortality on roads, mortality by haying or logging equipment, or kidnapping and transporting by humans are threats to Wood turtles. There is great demand for this species in the pet trade both legal and black market. Although a permit from the commissioner is required to take this turtle, the profit that can be made has in many cases motivated illegal collectors to wipe out populations in other states and collection may be occurring here. If this turtle is located in PMWMA in the future, trails and roads should be kept outside their primary range and the presence of this species should not be published in any public documents.

This species demonstrates the effect of fragmentation and the need for travel corridors. If a family of otters was to locate a wintering pool, or some natural catastrophe took place, a local population such as might be found along Keenan Brook could be wiped out. At that point, despite the existence of appropriate habitat, the site would be in need of a colonizing movement from a nearby successful population. In this case, it would seem that the West River is the logical corridor for recolonization. Unfortunately, Rte. 302 follows the river valley. The traffic along that road is a significant barrier to recolonization. Vermont's human population continues to grow, more land is consumed, more roads are built or enlarged and those that already exist become more frequently traveled. As a result, populations of surface-traveling, slow-breeding species will become isolated to the point where, if they die out, they will not be recolonized. The maintenance of corridors, underpasses, and other forms of active human management will be needed until we address human population growth and the resulting consumption and fragmentation of land.

Other Species

All the other species located at this site are S5 species. I will not go over management suggestions for each of these species individually. However, I will discuss habitat requirements, the need to allow natural movement patterns, and I will summarize general management guidelines for them as a group. Some species that we in Vermont now consider very abundant (e.g., Eastern newt) are reported to be declining in Rhode Island where development has fragmented landscapes more severely (Raithel pers. comm.). This should warn us of the need to actively conserve habitat for even S5 species.

Habitats and microhabitats

The importance of protecting streams, springs, and seepage areas at the site has already been mentioned. The most significant pieces of breeding habitat for amphibians other than these are vernal, semipermanent, and permanent ponds. Only one small vernal pond of significance was located within the site (Figure 1). It is man-made or at least enhanced by an old log road that partially dammed its drainage. Within the PMWMA, the species that often use vernal ponds, e.g., Spotted salamander (*Ambystoma maculatum*) and Wood frogs (*Rana sylvatica*), appear to be more dependent on the beaver dams, and the margins of permanent ponds (both natural and anthropogenic) for breeding sites. Egg masses of these species were found in depressions left by uprooted

trees, and in the depressions created by some of the old log roads. It is unlikely however that these small pools hold water long enough for successful metamorphosis and growth of populations over the long term. An additional vernal pool near the top of Melvin Hill was reported to me by Bob Popp of the Nongame Program. It appears to be outside the management area. However, this survey was not intended to locate all vernal pools within the PMWMA and other significant breeding pools may well exist.

Beaver ponds were found along many of the small brooks in the WMA. Some of the most productive were the new ponds at the headwaters of Keenan Brook near the southern boundary of the WMA. These ponds had woods on the east, old pasture on the west, a margin of emergent vegetation, and loose soil in an old gravel pit which would be ideal for turtle egg laying (no turtles seen).

Some species require permanent water. At this site it is provided in the form of beaver dams and in the two large permanent ponds previously mentioned (Figure 1). Green frog (*Rana clamitans*) tadpoles and adults over winter in the water. Eastern newt (*Notophthalmus viridescens*) adults and larvae use them. The flood plain pond has a large population of fish. Permanent water species seem to be able to coexist with fish. Emergent vegetation and organic debris around the margins of ponds provide refuge from fish and should be encouraged and maintained. Flooded areas along the margins of these large permanent ponds serve as breeding sites for Spotted salamanders, Wood frogs, Spring peepers (*Pseudacris crucifer*), and Gray treefrogs (*Hyla versicolor*). All of these species also require the surrounding woods at other times during their life cycles. The Green frogs leave the water to forage in the surrounding woods on rainy nights. The Spotted salamanders, Wood frogs, and Spring peepers, forage and over winter in the surrounding woods up to 500 meters from their breeding ponds. The Gray tree frog uses nearby standing trees with dead branches, hollow trunks, and knotholes in which to forage throughout the summer. The young Newts (red efts) wander overland for miles and years before settling into a beaver pond somewhere as adults. Garter snakes that often feed along the margins of these ponds must find a suitable place to keep from freezing over the winter. Nearby burrows or hollow trees often meet these needs.

Two turtle species were found using the Wells River Valley Pond and its margins: Snapping turtle (*Chelydra serpentina*), and Painted turtle (*Chrysemys picta*). The female turtles of these two species leave the pond to lay their eggs in early summer, otherwise they will spend almost all of their lives within the pond. I recommend that the road bordering the pond not be improved or used any more heavily. In addition the natural shoreline bordering the remainder of the pond should be maintained.

Permanent ponds without fish act as breeding sites for both permanent water and vernal pool amphibians. Two small man-made ponds were found along the southern border of the cut fields in the west central portion of the management area (Figure 1). Both provide breeding sites for amphibians. Two permanent springs, where ground water could be seen boiling up from the bottom, were found. One was just south of and adjacent to the upper permanent pond and the second was 100 meters west of the vernal pool. I was surprised to see that these sites were not used as breeding sites. Perhaps the water is too cold to allow normal development or for the development of a food supply. One of the springs did serve as an over wintering site for a pickerel frog.

Although I am not able to point at particular forest sites that are the most significant for foraging or over wintering of herp species, all the hardwood, mixed hardwood, and hemlock woods in the study area provide important foraging, and over wintering sites. The importance of forested land to amphibians is usually underestimated. Most amphibians spend the majority of their lives in wooded areas. A few spend only a small

portion of their lives in the woods. Very few species can survive without forest cover. Pine and spruce-fir are the least productive of the forest types in this area. Older moist hardwoods located near breeding sites are the most productive, particularly if they have a deep litter layer.

Coarse woody debris on the forest floor of the hemlock and mixed hardwood areas provide egg laying sites for the Redback salamander and foraging sites for the Redback salamander, Spotted salamander, Red eft, Wood frog, and almost all other reptile and amphibian species at some point in their lives. Dead and down trees, piles of bark, and large downed branches should be maintained. Sterile park-like woods provide no cover, feeding, or egg-laying areas.

Movement Needs

Foraging, Breeding, and Over wintering

I have tried to illustrate that most amphibians require a mosaic of habitats to meet the needs of their entire life cycle. Consequently they must be able to move freely from breeding water, to foraging sites, to over wintering sites, and back to breeding sites the following spring. In addition to natural barriers, we humans have created many artificial barriers to this movement. Roads can be deadly barriers to movement. The wider and more traveled they are, the greater the mortality on them. Agricultural fields can be a barrier to the smaller amphibians such as Redback salamanders. Some of these barriers are not complete, but instead cause varying degrees of mortality as reptiles and amphibians cross them. Parking lots, residential areas, and mown lawns, all create barriers to certain species.

Reptiles do not tolerate as much of the additional mortality brought on by such barriers as roads and mown areas (lawn mowers, bailing equipment) as a result of their much lower reproductive output. Species such as the Wood turtle take 14 years to reach sexual maturity. Most young die before becoming sexually mature. Once maturity is reached, natural mortality is very low. The additional mortality of one or two road-killed adults a year can eventually eliminate a population. Snakes need to move from foraging areas to over wintering sites. Mortality of adults in roads can eventually eliminate local populations.

Amphibians can tolerate more mortality than reptiles but there are still limits. Massive kills of breeding adults crossing roads during their spring movements to ponds will eventually eliminate populations. An option for known crossing areas of heavily traveled roads is to install a tunnel or underpass. These are used extensively in Europe for amphibians. On infrequently traveled roads, user awareness and sensitivity to small wildlife can make a difference. I did not locate any heavily used crossing areas during my visits to this site. If roads are proposed that separate any of the breeding ponds from surrounding foraging habitat, some thought should be put into their relocation or design to minimize mortality.

Colonization and Recolonization

In addition to regular annual movements, there is a need to maintain colonization and recolonization corridors. Amphibian populations can be volatile as a result of factors such as disease, winter kill, and droughts. Metapopulation dynamics describe the local range of a species as a constantly shifting range of populations. As some local populations blink out others blink on. If the system is not too highly fragmented, roughly the same number of populations will remain in existence over the long term but

individual populations will come and go. Consequently amphibians from ideal core habitats need to be able to recolonize sites from which they have been extirpated. In addition, as new habitats become available they must be able to travel to them. This requires movements through corridors free of natural or anthropocentric barriers.

Connected Riparian Corridors

If connections can be maintained between PMWMA and other watersheds, or at least other portions of the Wells River Watershed, long-term viability of populations will be enhanced. Often the logical locations for these travel corridors are along river valleys, with connectors of protected lands between them. Not only do many species travel along drainages naturally, but locating these protected corridors in river valleys meets practical and water quality goals as well. These areas are often too wet to have been developed for structures or agriculture. A partial list of the mechanisms by which water quality is protected incudes; minimizing siltation, absorbing nutrients before they reach the water body, lowering the temperature of the water, and increasing the dissolved oxygen content of the water. When seeking to protect all components of working ecosystems however, it should be kept in mind that many organisms, including reptiles and amphibians, need to move laterally from these corridors, move up and down very small scale drainages (ditches, tiny rivulets), and require other sorts of habitats for breeding, foraging, and over wintering. Protected upland areas adjacent to protected corridors can both serve to connect the corridors and protect other types of habitat necessary for the survival of upland organisms. These upland areas need to be large enough to protect a system of interconnected upland microhabitats.

General Management Guidelines

I have attached a document (Appendix A) on forest management practices that outlines my recommendations for maintaining populations of the species not specifically addressed. I list some important points here.

- Maintain intact habitat complexes with unobstructed movement between them and to other drainages.

- If the site is managed for timber; maintain long rotations, maintain forest cover with only small openings, and maximize both standing dead and dead and down woody debris.

- When maintaining openings, late fall cutting is best. If that is not possible, set the mower high and do not rake or bail the cut material.

- Minimize or eliminate the addition of anthropogenic chemicals to the air, soil, and water of the area.

- Do not introduce fish to sites where they are not already native.

- When possible, allow beavers to alter habitat naturally.

- Do not drain, fill, pollute, or remove cover from wetlands, seeps, springs, or water bodies.

- Minimize additional consumption of land (structures, roads, intensive strip cropping, mown lawns).

Summary

The most unique species found during this survey was the Smooth green snake. Habitat should be maintained and enhanced for this species, particularly at the logging header where they were found. Doing so will also provide habitat for other secretive snake species. No other sites were critical to an unusual species. All the wetlands should be protected and movement in and out left unrestricted. Those mentioned and mapped support healthy populations but of relatively common species. The beaver dams in the area are tremendously important as breeding sites and should be allowed to shift naturally. The two permanent water sites in combination with their surrounding floodwaters, beaver dams, and woodlands, support the widest variety of species. The upper site has the benefit of being remote and relatively pristine. The lower site has the benefit of being near the floodplain thus supporting turtles and being more easily recolonized. Ideally it would be nice to see travel restricted near the lower pond and the surrounding land (to the edge of river) purchased and managed.

Since reptiles and amphibians are widely distributed in the area and most move between habitats, protection of breeding sites is meaningless without protection of the surrounding woodlands and openings. Many recommendations for the management of the woodlands and openings have been included.

If the Wood turtle is found at this site at a later date, it too should be actively protected and the purchase of land or conservation agreements with surrounding landowners should be considered.

Non-herp species notes

Many other species were seen during the course of the survey. A couple notes on interesting sightings:

Black ducks appeared to be exhibiting territorial behavior at the upper permanent pond in late April. Purple finches were singing and turkeys were gobbling in the area at the same time. Belted kingfisher were also using the pond.

Along the powerline cut just below (northeast of) the west gate (the one to the deer dumping site) was some cottongrass. On investigation a small wetland area with a very small 2m x 2m open spring was found.

Attachments

Attached to this report are a variety of short documents with related information that may prove useful: A printout of all the species found on our visits to the site, Forest Management Practices to Minimize Negative Impacts on Vermont Reptiles and Amphibians, The Frogs of Vermont, The Salamanders of Vermont, Amphibians and Reptiles of Vermont: Legal Status and Informational Ranks as of October 1997, and a draft of Reptile and Amphibian Aquatic Habitats.

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Useful Sources of Information on Reptiles and Amphibians

Identification. A few good field guides to reptiles and amphibians exist. One that is easy to find, and up to date is:

Conant, R., and J.T. Collins. 1991. A field guide to reptiles and amphibians of Eastern and Central North America. Third Edition, Houghton Mifflin Company, Boston Massachusetts 450 pp.

Natural History. Other excellent sources of local natural history information about New England's reptiles and amphibians are:

DeGraaf, R.M., and D.D. Rudis. 1983. Amphibians and reptiles of New England. The University of Massachusetts Press, Amherst, Massachusetts 85 pp.

Hunter, M.L., J. Albright, and J. Arbuckle (eds.). 1992. The amphibians and reptiles of Maine. Bulletin 838, The Maine Agricultural Experiment Station, University of Maine, Orono, Maine 188 pp.

Klemens, M.K. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut, Bulletin No. 112 318 pp.

Tyning, T.F. 1990. A guide to amphibians and reptiles. Little, Brown and Company. Boston Massachusetts 400 pp.

Calls. A very useful tape to help learn the calls of frogs and toads is:

Eliot, L. 1992. The calls of frogs and toads; Eastern and Central North America. Nature Sound Studio. Ithaca New York.

Management. A useful review article on forest management practices is:

deMaynadier, P. and M. Hunter. 1995. The relationship between forest management and amphibian ecology: a review of the North American literature. Environmental Reviews 3: 230-261.

Table 1. Reptile and amphibian species located in the Pine Mountain Wildlife Management Area during the 1997 inventory. Data were gathered using seven methods over twelve days in the field.

Species	Common Name	State Status
Amphibians		
Ambystoma maculatum	Spotted salamander	S5
Bufo americanus	American toad	S5
Desmognathus fuscus	Dusky salamander	S4
Eurycea bislineata	Northern two-lined salamander	S5
Hyla versicolor	Gray tree frog	S5
Notophthalmus viridescens	Eastern newt	S5
Plethodon cinereus	Redback salamander	S5
Pseudacris crucifer	Spring peeper	S5
Rana clamitans	Green frog	S5
Rana palustris	Pickerel frog	S4
Rana sylvatica	Wood frog	S5
Reptiles		
Chelydra serpentina	Snapping turtle	S5
Chrysemys picta	Painted turtle	S5
Opheodrys vernalis	Smooth green snake	S4
Storeria occipitomaculata	Redbelly snake	S5
Thamnophis sirtalis	Garter snake	S5

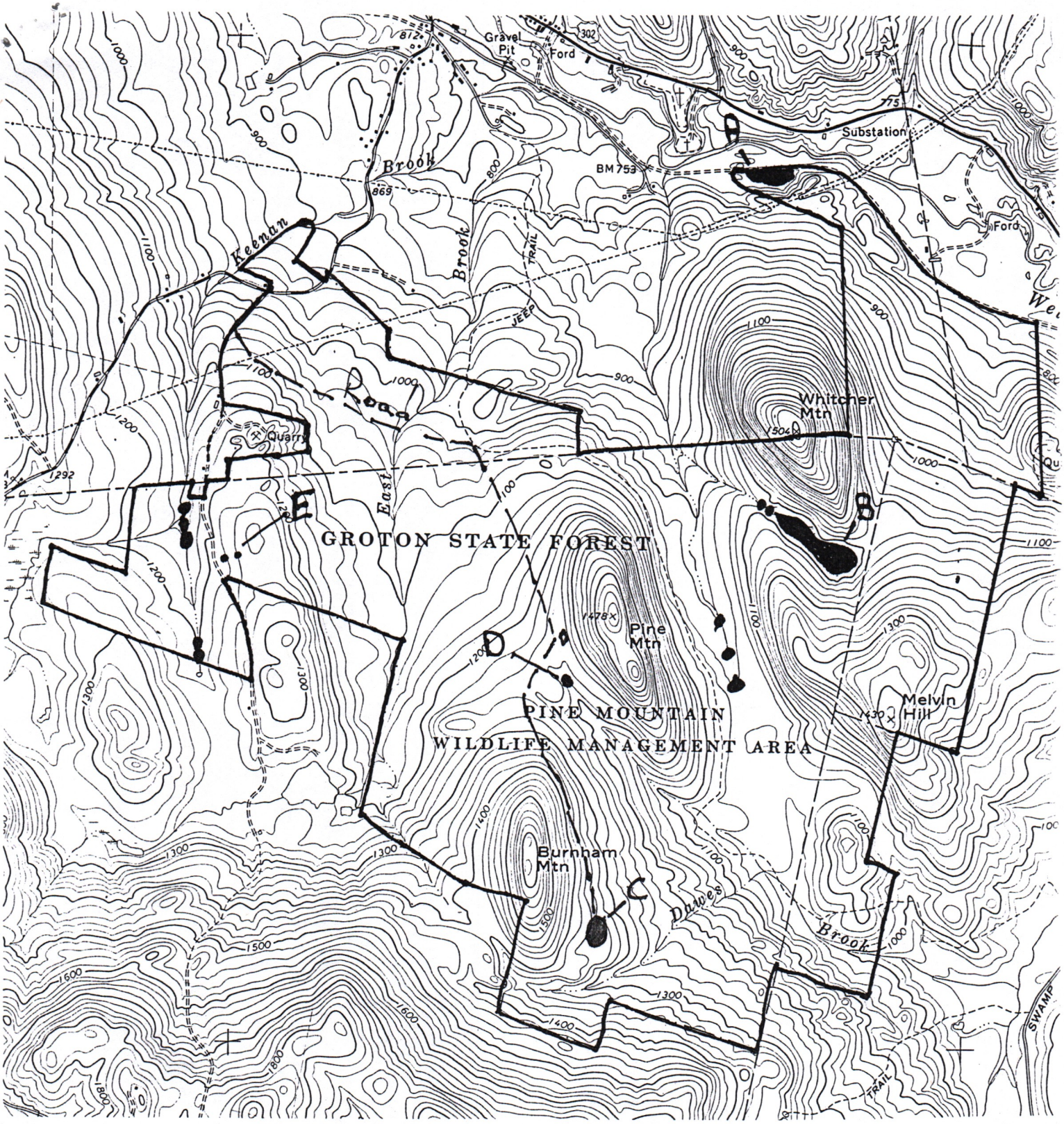

Figure 1. Shown are a few sites of herpetological significance within the Pine Mountain Wildlife Management Area in Vermont. These sites were found during a reptile and amphibian survey during the 1997 field season. Site A is the Wells River flood plain pond. Site B is the site of the upland beaver-enhanced pond system. Site C is the old logging header where the Smooth green snakes were found. Site D is a small vernal pool partially dammed by an old logging road. Site E is the location of two small man-made ponds.