

Basin 10: Ottauquechee and Black Rivers

Including the following sites:

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|-----------------------|-------------------------------|
| Cavendish Gorge | Black River, Cavendish |
| Buttermilk Falls | Branch Brook, Ludlow |
| Quechee Gorge | Ottawaquechee River, Hartford |
| North Hartland Falls | Ottawaquechee River, Hartland |
| Quechee Village Falls | Ottawaquechee River, Hartford |
| Crystal Cascade | Ascutney Brook, Weathersfield |
| Thundering Falls | Thundering Brook, Sherburne |

This is a small basin in central eastern Vermont, and includes the eastern slopes of the central Green Mountains (Pico, Killington, Shrewsbury Peak, etc.) and the usual rolling highlands found all along the western edge of the Connecticut River Valley. As was the case for Basin 9, we only have records for the largest and most well-known sites, and there are certainly many mountain sites that have not been listed or surveyed.

Despite the small size of the basin it contains four important sites: Quechee Gorge, the largest gorge in the state; Cavendish Gorge, a beautiful sculptured gorge with fine mosses; Crystal Cascade, one of the highest falls in the state and along a popular hiking trail, and Thundering Falls, a high woodland cascade and popular recreation area.

Report 60, Cavendish Gorge, Black River, Cavendish, Windsor County, Vermont.

Site 7, surveyed on 26 July 1983 by J.C. Jenkins.

A large, beautifully sculptured gorge with pools and cascades; a dam at the upper end and a powerplant at the lower end.

Atlas map 12, USGS Ludlow 15' quadrangle. Approach is somewhat difficult; sheer walls in a lot of places, hard to get into the head of the gorge because of the dam, hard to follow the stream down without climbing or swimming. Best to follow a footpath above the gorge on the south side and climb down here and there.

Crossing from one side of the gorge to the other is difficult. There is a catwalk over the dam but it has a locked gate which is difficult to surmount. At low water, you can cross the stream by swimming, or by walking across the footings of the dam, or in a few places by jumping from rock to rock. At high water, the only possible crossing is a high cable bridge (with very rotten planking) that crosses the lower end of the gorge by the powerhouse.

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The gorge is on a back road about three-quarters of a mile from the center of town. The nearest houses are about one-quarter mile away. The entrance road is not marked, and is comparatively rough; hence, the area is accessible but not obvious.

Both sides of the gorge are wooded with second-growth pine and hemlock stands. To the east is Hawks Mountain and to the west a small cobble which isolates it from Route 131 and the Town of Cavendish. At the head of the gorge is a concrete dam about 30 feet high and 75 feet long, with a steel catwalk to service the flashboards and two small buildings. The water is diverted into a buried penstock north of the gorge. At the bottom of the gorge is a medium-sized powerhouse probably built in the 1920's.

The gorge turns a corner about 50 yards below the dam, and has high steep walls; hence the dam, powerhouse, and the penstock are not visible from the main part of the gorge and much of the gorge is undisturbed and private.

The Black River is a medium-sized river averaging 20-40 feet wide above the gorge. It receives treated waste in Ludlow and Proctorsville, and is classified as C water for two miles below Cavendish. Despite this the water in the gorge actually appears to be quite good, with no taste or odor and very little turbidity. There are good mayfly and stonefly populations within the gorge and we may assume that the water is well oxygenated. There are no macroscopic algae.

The gorge averages 50-100 feet wide at the base, with slanting or sheer rock walls from 50-80 feet high. The rock is a hard quartzite schist with garnets and quartz veins, described by the geological map as the Cambrian Hoosic Schist. It is not at all limy. There are boulders ten to 20 feet high in the stream channel, and in the lower part of the gorge many of these have had potholes cut into them. Some are almost cut entirely away.

There are no major falls; rather, the channel consists of a series of small falls or chutes linking pools of various sizes. The largest and finest of these is about 70 feet by 40 feet with a depth of nine feet at low water. It is almost completely circled by high, moss-covered rock walls, and is the sort of private swimming and sunning place that everyone dreams about (although swimming is discouraged in Class C water due to the health threat).

The stream probably fills the gorge from wall to wall in the spring; there are no sand or gravel deposits at the base of the walls, and no areas that support woody plants.

Because of the lack of soil, all the vascular plants in the gorge are confined to ledge tops and cracks in the walls. The flora is simple, consisting only of a few common species, mostly ferns, grasses and tree seedlings. No rarities occur. No list of vascular plants was made. As a whole, they play a very casual part in the botany of the gorge.

Large areas of the walls are covered by mosses and liverworts. The species identified are listed on the next page. No rare species were found, but it should be stressed that this was a general survey and not a complete inventory. The main pool mentioned above is a particularly fine place for bryophytes, and the walls are covered by the liverworts Marsupelia emarginata and Scapania nemorosa to heights of 40-60 feet above the stream. In general, mosses are abundant throughout the gorge and the variety of species is good, considering that there is no lime. We saw few gorges in which the bryophytes were as lush or extended higher up the walls, hence, we regard this as an important bryophyte site.

The gorge currently is a popular local swimming area; it does not receive much tourist use and is probably not too popular for partying, perhaps because climbing into it at night would be risky. It is currently quite clean, with definite signs of use but almost no trash or junk.

Visually it is a striking place; the rocks and the mosses are beautiful, the water is clean, and there are high walls and handsome pools. You cannot hear cars from the gorge, and because it is narrow and winding you have a strong sense of privacy and isolation. A lovely and satisfying place in good condition.



CAVENDISH GORGE



CAVENDISH DAM

Future power development is unlikely since the power station must already use most of the available flow and since there is neither any way nor any reason to get more head. The current level of recreational use is not damaging the gorge. Were the use to increase the gorge would get dirtier and more trampled, and this would be a loss.

Current summer flow from leaks around the dam appears adequate for swimming and to preserve the plant communities and keep the pools cool enough for fish*. Lower flows would dry the gorge out, raise the water temperature, and possibly damage the plants, which require considerable humidity. This would cost the state one of its best lowland sites for mosses and liverworts.

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Summary: Woodland setting, impacted by a hydroelectric project, spectacular rocks, exemplary botany, moderately wild and secluded, no trash, light or perhaps moderate use, good swimming (although discouraged), clean water.

HIGH IMPORTANCE SITE: Great beauty, important site for bryophytes.

WE RECOMMEND: That arrangements be made to guarantee flows, and that no further development occurs.

* Editor's Note: Leakage through the dam is negligible based on a Department of Water Resources site visit in 1986. It is doubtful that this leakage flow would be adequate to maintain the gorge pools for fish and swimming. It is possible Jenkins saw the gorge with flows higher than normal leakage flow.

Bryophytes From Cavendish Gorge

Fissadens bryoides
? Barbula sp.
Myurella sibirica
Hygrohypnum ochraceum
Racomitrium aciculare
Plagiothecium laetum
Amblystegium varium
Marsupellia emarginata

Ceratodon purpureus
? Gymnostomum aeruginosum
Philonotis marchica
Isoptyrigium sp.
Hypnum curvifolium
Hygrohypnum eugyrium
Scapania nemorosa
Calypogeias trichomanes

Report 61, Buttermilk Falls, Branch Brook, Ludlow, Windsor County, Vermont.

Site 610, surveyed on 26 July 1983 by J.C. Jenkins.

A small gorge and below that three falls with pools and cascades, open and broad and sunny, popular for swimming.

Atlas map 15, USGS Ludlow 15' quadrangle. The falls parallel the old Route 103 for about one-quarter mile east of the abandoned bridge.

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The falls are in a wooded section of the Black River Valley, about a one-half mile from a settled area on the outskirts of Ludlow. There are a few houses within one-quarter mile but no dwellings or structures visible from the falls. An abandoned bridge (former right of way for Route 103) crosses the gorge above the falls, but the falls themselves are separated from the road by a narrow band of woods.

Branch Brook is a medium-sized upland stream. It runs in a shallow wooded gorge and is 20-40 feet wide in the vicinity of the falls. The valley above the falls is sparsely settled and there are no major pollution sources. The Crowley Cheese Factory is about four miles upstream but according to the water quality maps they do not discharge anything into the stream. The water appears quite clean, without odor or turbidity, and the rocks in the stream have only small amounts of algae.

The site is about 300 yards long and consists of several separated falls. At the old Route 103 bridge, there is a small gorge about 100 feet long with vertical rock walls 30 feet high. This has been somewhat altered by the bridge abutments. Below this, there are two falls 50 and 100 feet wide and about 15-20 feet high. Below each falls, there is a large shallow pool enclosed by a gravel bar at its base. Just above the second falls, there is a very pretty rock pothole about 25 feet across and six feet deep. Below the second falls, there is a stretch of ordinary channel, then rocks with another pothole pool, then a steep cascade about 20 feet high down a series of rock steps, then another large shallow pool with a gravel beach.

The rock is a massive pink Precambrian quartzite with some schist. It is extremely hard and resistant. The bedding is at right angles to the river, and so the rock extends across the river in continuous square-edged dikes, and the river pours off the top of the dikes in broad, wide walls, as if it was running off a table. Most of the rock surfaces are flat planes meeting at square corners and except for the potholes - which I find anomalous in quartzite and can not explain - it looks like the falls were built yesterday and the water had not rounded them at all.

There are a lot of sunny cobble and gravel shores and so there are many wetland plants. Two species were of special interest. Stellaria alsine is a northern species of chickweed, known historically from less than five localities in Vermont. A few plants were found by the edge of the stream in between the second and third falls, and this is our only recent record in Vermont. Panicum boreale is a panic grass that is supposed to be widespread in Vermont but in our experience is at most infrequent. It occurred several times along the edge of the stream. Neither of these plants were on rocks or specifically associated with the falls as such.

The main falls had only a few mosses, but the rocks and banks along the edge of the stream had small areas of good moss habitat, and a number of species occurred. The collections have not been identified yet, but my impression is that the diversity was good but not exceptional.

The falls are a very popular swimming area, with room for lots of people and lots of places to sit and sun. There was a little garbage in the woods, but the falls themselves were largely clean.

A nice place: good swimming, a lot of sun and water, not wild but no houses in sight either, and you can see the quartz shining and looking like the backbone of the whole mountain range. Not a spectacle like Huntington Gorge, but a very satisfying place, enjoyed, used, and despite the road and the use, largely undamaged. I would travel some distance to visit it, and do not know that many sites of equal size: hence, we consider it of state importance.

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Summary: Woodland setting, fine rocks, two rare species present, not secluded, a little trash, clean water, good for scenery, swimming, fairly large and fairly natural site, handsome rocks, popular recreational site.

Plants From Buttermilk Falls

Mosses not identified yet.

Vascular plants

Hemlock-hardwoods forest, some willow thickets by stream, dogbane community on bars.

| | |
|-------------------------------|-----------------------------------|
| <i>Solidago rugosa</i> | <i>Solidago gigantea</i> |
| <i>Aster divaricatus</i> | <i>Chrysanthemum leucanthemum</i> |
| <i>Athyrium felix-femina</i> | <i>Thalictrum polygamum</i> |
| <i>Ranunculus acris</i> | <i>Eupatoreum maculatum</i> |
| <i>Osmunda claytoniana</i> | <i>Agrostis perrenans</i> |
| <i>Anthoxanthum odoratum</i> | <i>Phalaris arundinacea</i> |
| <i>Prunella vulgaris</i> | <i>Carex prasina</i> |
| <i>Carex torta</i> | <i>Glyceria striata</i> |
| <i>Glyceria melicaria</i> | <i>Lysimachia ciliata</i> |
| <i>Juncus articulatus</i> | <i>Juncus nodosus</i> |
| <i>Leersia oryzoides</i> | <i>Scirpus atrovirens</i> |
| <i>Trifolium pratense</i> | <i>Trifolium repens</i> |
| <i>Plantago major</i> | <i>Viola sp.</i> |
| <i>Tussilago farfara</i> | <i>Spiraea alba</i> |
| <i>Hypericum ellipticum</i> | <i>Salix discolor</i> |
| <i>Hieracium pratense</i> | <i>Poa compressa</i> |
| <i>Rosa virginiana</i> | <i>Mentha piperita</i> |
| <i>Aster puniceus</i> | <i>Dryopteris intermedia</i> |
| <i>Mentha arvensis</i> | <i>Stellaria alsine</i> |
| <i>Agrimonia sp.</i> | <i>Mimulus ringens</i> |
| <i>Eupatorium perfoliatum</i> | <i>Galium palustre</i> |
| <i>Woodsia ilvensis</i> | <i>Aster lateriflorus</i> |
| <i>Oxalis europa</i> | <i>Oenothera biennis</i> |
| <i>Danthonia spicata</i> | <i>Salix bebbiana</i> |
| <i>Panicum lanuginosum</i> | <i>Panicum boreale</i> |
| <i>Lactuca sp.</i> | <i>Erigeron strigosus</i> |
| <i>Rubus occidentalis</i> | <i>Vaccinium myrtilloides</i> |
| <i>Phleum pratense</i> | <i>Hypericum punctatum</i> |
| <i>Taraxacum officinale</i> | <i>Cerastium vulgatum</i> |
| <i>Fragaria</i> | <i>Bromus ciliatus</i> |
| <i>Galium asprellum</i> | <i>Anaphalis margaritacea</i> |
| <i>Ranunculus repens</i> | <i>Aster macrophyllus</i> |

(The length of this list reflects the large amount of sunny, more or less wet stream bank habitat and not some particular favorableness or other peculiarity of the soil and rock.)

Report 62, Quechee Gorge, Ottauquechee River, Hartford, Windsor County, Vermont.

Site 392, surveyed on 5 June 1983 by P.F. Zika and J.C. Jenkins.

Vermont's deepest and longest gorge, formerly an important site for rare plants, now with hydro projects above it and regulated summer flows.

Atlas map 16, USGS Quechee 7.5' quadrangle. Vermont Route 4 crosses the gorge. The safest access to the gorge is to walk along the rim of the gorge and enter from either end. If you descend directly from the bridge you must be roped.

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The site is a rural area east of Woodstock with some developed land and some second-growth woods. There are a few trails, several tourist shops, the Route 4 bridge and a dam about 40 feet high at the head of the gorge. According to maps, the gorge belongs to the state.

The Ottauquechee is a lowland river, mostly 25 feet wide in the gorge and quite fast and wild. The gorge is considered too dangerous to be a recreational whitewater site. The water is mildly polluted but well aerated by the rapids.

The gorge is about one-half mile long and at the deepest somewhat over 150 feet deep. It is 50-100 feet wide at the bottom and perhaps 200 feet wide at the top. The walls are partly dirt and partly rock and probably have an average angle of 45-60 degrees. In places there are vertical or nearly vertical cliffs 30-75 feet high.

The bedrock is the lower Devonian Gile Mountain formation schist; it is uniformly limy. Some of the rock is sculptured and there are a few potholes but the gorge is more memorable for its size than for the rocks themselves.

Quechee Gorge was formerly the most important low elevation site for northern plants in Vermont, and from the 1890's on, it was much visited and written about. Six rare species were found here: the ferns Woodsia glabella and Woodsia alpina, the gentian Halenia deflexa, the anemone Anemone multifida, the lily Tofieldia glutinosa, and the fleabane Erigeron hyssopifolius. So far as we know, only one of these - the fleabane - is currently found in the gorge.

The five species that seem to have disappeared from the gorge are all very rare in New England as a whole; Halenia is currently missing from the Vermont flora, Anemone and Woodsia alpina are currently represented in Vermont by a single colony of each, and the other two are known from fewer than ten Vermont sites.



QUECHEE GORGE

We have made perhaps eight searches of Quechee Gorge in the last nine years, and also know of other botanists who have made trips to the gorge. Parts of the gorge are hard to explore, but the botanists who found the plants in the first place were not technical climbers, and we know from their accounts that they just walked in, mostly entering by the south end and following the eastern shore. None of the searches have yielded any information about the missing species, and in fact none of the searches has added appreciably to the list of species that JJ and Peter White found when they explored the gorge in the early 1970's.

Hence, we conclude, reluctantly, that as far as we can tell the five most interesting plants in the gorge have disappeared sometime between 1930 and 1970 and that the gorge currently contains only three noteworthy species: Erigeron hyssopifolius (currently rare in Vermont), Selaginella apoda and Cryptogramma stelleri (both currently scarce in Vermont).

Why have five species seemingly gone extinct in an area that has not had any major alterations? Possible reasons are climatic change in the state as a whole, change in the microclimate because of the dams, reduced summer flows, destruction of plants by landslides, and destruction of plants by botanists. We are inclined against the last two reasons on general grounds (gorge plants like landslides and the old botanists did not climb much and so could not have reached all the plants), but we have no evidence that points at one cause rather than another.

So far the mosses and liverworts seem to be all common limestone species.

The bridge and trails receive heavy use from tourists, but very few people get into the gorge itself except at the bottom end. There is fair swimming, compromised by the pollution and fast water. There is some litter around the parking areas; the trails and gorge are clean.

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Summary: Rural setting, impacted by hydroelectric project, woods and roads and stores; nice rocks, spectacular gorge, average botany, currently one rare species, formerly six, wild but not secluded, some trash, mildly polluted water, a little swimming, very popular tourist stop, much use of trails and lower end of gorge, none of the middle of the gorge.

HIGH IMPORTANCE: Largest gorge in the state, very popular tourist site. On the Vermont Fragile Areas Registry.

Report 63, North Hartland Falls, Ottauquechee River, Hartland, Windsor County, Vermont.

Site 957, surveyed on 3 October 1983 by P.F. Zika.

Two large cascades on either side of a rocky island, below a covered bridge and a dam.

Atlas map 22, North Hartland 7.5' quadrangle. The best view of the falls is from the railroad bridge over the Ottauquechee, just east of the covered bridge. Take U.S. Route 5 south from the Village of North Hartland, cross under the interstate, take the next left, and follow that road straight for about half a mile to the river and bridge.

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The site is near the Village of North Hartland, about one-quarter mile from the Connecticut River. It is open and rural; besides the covered bridge and railway bridge there is a quarry upstream and hayfields and a few houses downstream.

The Ottauquechee is a medium-sized alluvial river, over 20 feet wide near the site. It is mildly polluted and murky.

There are two large cascades, both about 25 feet high. The south cascade is the more interesting of the two. It is split into two channels, and has nice carved and rippled rocks. The north cascade splits into about five channels but does not have any carved rocks and is less pretty overall.

The rocks are green to light brown. They are mapped as the Post Pond volcanic series, a part of the Orfordville formation, of Ordovician age.

The vascular plants are ordinary except for Aster tradescanti, a scarce (almost rare) species that is locally frequent on river ledges in Vermont and New Hampshire. This is a technical species and a bit of a nuisance taxonomically: it has all the look of a distinct species but lacks decisive technical characters to separate it from commoner species.

Bryophytes were uncommon at the site.

From the railroad you can not see the dam, and the two cascades look very nice. The site is used for swimming and fishing and parties, and is a popular tourist attraction, much viewed and photographed. The dam has been in place for a long time. A hydroelectric project has recently been redeveloped at this site.

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NORTH HARTLAND FALLS

Summary: Industrial and rural setting, impacted by a hydroelectric project, nice rocks, average botany, not secluded or wild, some trash, mild water pollution, fair swimming, popular for tourists and parties. Two fairly large cascades, unspoiled site if you face the right direction, popular tourist attraction.

Vascular Plants of North Hartland Falls

| | |
|------------------------|----------------------|
| Quercus alba | Daucus carota |
| Quercus rubra | Mentha arvensis |
| Andropogon scoparius | Solidago juncea |
| Andropogon gerardii | Panicum lanuginosum |
| Erigeron sp. | Verbena hastata |
| Medicago sp. | Salix rigida |
| Verbascum thapsus | Poa compressa |
| Campanula rotundifolia | Amelanchier sp. |
| Solidago puberula | Bromus latiglumis |
| Aster tradescanti | Hypericum perforatum |
| Bidens frondosa | Fragaria virginiana |
| Rosa blanda | Juniperus virginiana |
| Ulmus americana | Lonicera morrowi |

Report 64, Quechee Village Falls, Ottauquechee River, Hartford, Windsor County, Vermont.

Site C, surveyed on 5 October 1983 by P.F. Zika.

A small gorge and a dam, formerly a waterfall.

Atlas map 21, Quechee 7.5' quadrangle. The site is under the covered bridge in the center of the Village of Quechee.

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The site is urban with buildings and roads all around. There is a concrete dam where the waterfall was. Below the gorge, the surroundings are more natural and the banks of the river have young hardwood forests and open ledge.

The Ottauquechee is a medium-sized alluvial river, 50-75 feet wide below the dam. There is trash in the channel. Summer flows can be quite small partly due to regulation by the hydroelectric plant in Taftsville.

The dam is at the head of the site. It is about 15 feet wide by six feet high and is probably on top of the old falls. The gorge begins below this and extends about 100 yards down river with walls from five to 25 feet high. The walls on the north shore slope are at about 30-40 degrees while those on the south shore are steeper and are occasionally vertical.

The rock is schist from the lower Devonian Gile Mountain formation. It has many garnets and seems limy. There are some carved and rippled rocks, and a number of small potholes under two feet in diameter.

The vascular plants were ordinary with with the exception of the grass Cinna arundinaecea, an uncommon but widely distributed floodplain species. It was uncommon at the site and only a few small plants were seen.

Bryophytes were not diverse or common except near the waterline on the ledges. A Climaceum species was seen, as well as Polytrichum juniperinum, Polytrichum ohioense, and a moss in the Pottiaceae.

The site is fairly pretty but you do not want to get close to the water. From the trash it appears to be a party spot.

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Summary: Industrial and urban setting, impacted by a hydroelectric project, nice rocks, average botany with one rare plant, no seclusion, some trash, mildly polluted water, no swimming, locally popular for scenery and parties.



QUECHEE VILLAGE FALLS

Vascular Plants of Quechee Village Falls

| | |
|-------------------------|---------------------------|
| Solidago juncea | Aster umbellatus |
| Solidago bicolor | Aster simplex |
| Solidago graminifolia | Dryopteris marginalis |
| Panicum lanuginosum | Apocynum androsaemifolium |
| Panicum capillare | Fragaria virginiana |
| Taraxacum officinale | Calamagrostis canadensis |
| Rhus vernix | Agrostis perenans ? |
| Rubus occidentalis | Athyrium filix-femina |
| Rubus odoratus | Elymus riparia |
| Rubus idaeus | Antennaria sp. |
| Tussilago farfara | Desmodium canadense |
| Sagina procumbens | Eragrostis pectinacea |
| Spiraea alba | Eragrostis sp. |
| Salix discolor | Eragrostis pilosa ? |
| Salix bebbiana | Alnus serrulata |
| Vaccinium myrtilloides | Acer rubrum |
| Populus tremuloides | Diervilla lonicera |
| Onoclea sensibilis | Campanula rotundifolia |
| Thalictrum polygamum | Bidens frondosa |
| Thelypteris phegopteris | Juncus dudleyi |
| Solanum dulcamara | Cinna arundinacea |
| Osmunda claytoniana | Andropogon gerardi |
| Poa compressa | Equisetum arvense |
| Vicia cracca | Danthonia spicata |
| Phalaris arundinacea | Anaphalis margaritacea |
| Lythrum salicaria | Achillea millefolium |
| Aster cordifolius | Aquilegia canadensis |
| Aster novae-angliae | Lemna minor |
| Elodea canadensis | |

Report 65, Crystal Cascade, Ascutney Brook or Mill Brook, Weathersfield, Windsor County, Vermont.

Site not numbered by the state, surveyed on 2 August 1984 by P.F. Zika.

Atlas map 16, USGS Claremont 15-minute quadrangle. See also pp. 180-181 of the Green Mountain Club's Day Hiker's Guide to Vermont. Access is from the end of Crystal Falls Road off Route 131. The Weathersfield Trail (currently closed and posted) starts behind a blue trailer and has white blazes. The site is a 25 minute walk. The stream is crossed several times and at a junction, fork to the right, following signs to the falls.

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Crystal Cascade is set in deciduous mountain woods, remote from development but on a well-used hiking path maintained by the Ascutney Trails Association (ATA). The only signs of disturbance are natural rockfall from the cliff, stumps in the forest, and occasional motor vehicle sounds that carry over from I-91, about three miles distant.

Ascutney Brook (also called Mill Brook in the Vermont Atlas) is a tiny mountain stream, clear, clean and low in the summer. The water tastes good. A small amount of algae was observed on the wet cliff surface and on some of the rocks in the stream. Aquatic insect larvae were limited; only beetles were seen, no mayfly, caddisfly, or stonefly larvae.

The site begins where the brook descends 30 feet of low angle ledge and then drops over an impressive cliff face about 70 feet high and 50 feet wide. There is a six by four foot wide pool at the base of the long and steep cascade, but it is only about six inches deep, which gives an accurate impression of how low Ascutney Brook is in the summer. The trail ascends to the west of the cascade and comes out at the top of the cliff, where there is a fine view south over the Windsor County countryside.

The geology of Crystal Cascade appears to be unique in Vermont. It is a rare example of a ring dike, formed in the Permian or Triassic by the upward flow of magma in a somewhat circular fissure. The molten rock ate and shoved its way through overlying sedimentary rocks layed down in the Devonian. The fledgling volcano lacked the thrust necessary to reach the surface however, and all the magma cooled off underground. Subsequent erosion and glaciation have worn away much of the overlying bedrock, exposing the igneous edge of the ring dike at the present-day brownish cliff and upper cascades. The dike is mapped as the White Mountain plutonic-volcanic series. The rocks at the border of the newly formed pluton were metamorphosed by the extreme heat of the magma, and this contact zone is clearly visible at the base of Crystal Cascade, where a second bedrock

type shows as a gray mass. It appears to be part of the Waits River formation on the geologic map. Further evidence of the ring dike formation can be found at the top of Crystal Cascade. Chunks of the surrounding bedrock were constantly consumed by the magma as it moved upwards, but pieces that were only partially absorbed when the magma had cooled are reported to be visible in the flat outcrops above the cliff. The ATA's Guide to the Trails of Mt. Ascutney states that the only other large example of a ring dike is in Norway, where it is called a nordmarkite.

The vascular plants and bryophytes at Crystal Cascade are ordinary. A species list is given at the end of this report. The forest in the ravine at the base of the cascades is a maple, ash, and birch association. Most of the herbs recorded were in the open and damp areas along the base of the large cliff, or on the talus slopes where the woods were more open.

Crystal Cascade is a popular site with a distant view, and is surely one of the reasons the Weathersfield Trail receives so much use. It is unfortunate that the landowner at the trailhead recently decided to deny that access. The vista, the remoteness, and especially the geological uniqueness of the cliff makes this an important natural area. If it is considered a cascade in the sense of this study, it is the second tallest unaltered one we have seen in the state. Although the height of the main cascade is impressive, an estimated 70 feet, it is barely more than an ephemeral falls. In the spring and after storms it probably is a grand sight, but at the time of the visit it was not much more exciting than a garden hose spraying out a seventh story window.

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Summary: Mountain setting, unique rocks - a geological landmark, average biology, secluded and private since the trailhead was closed to the public, almost no trash, clean water, no swimming, formerly a popular hiker's destination en route to the summit of Mt. Ascutney, fine view.

HIGH IMPORTANCE



CRYSTAL CASCADE

Vascular Plants at Crystal Cascade

| | |
|---------------------------|----------------------------|
| Betula alleghaniensis | Danthonia compressa |
| B. papyrifera | D. spicata |
| Acer saccharum | Muhlenbergia mexicana |
| A. pensylvanicum | Panicum lanuginosum |
| A. spicatum | Poa compressa |
| A. rubrum | Agrostis scabra |
| Fraxinus americana | Brachyletrum erectum |
| Ostrya virginiana | Aster divaricatus |
| Quercus rubra | A. schreberi |
| Pinus strobus | A. acuminatus |
| Fagus grandifolia | Solidago arguta |
| Prunus pensylvanica | S. juncea |
| Cornus rugosa | S. canadensis |
| Rubus idaeus | S. rugosa |
| R. allegheniensis | S. sp. (? bicolor) |
| R. odoratus | Smilacina racemosa |
| R. pubescens | Aquilegia canadensis |
| Diervilla lonicera | Viola canadensis |
| Spiraea tomentosa | V. sp. |
| Amelanchier sp. | Arisaema triphyllum |
| Salix humilis | Actaea pachypoda |
| Vaccinium myrtilloides | Polygonatum pubescens |
| Dryopteris marginalis | Chelone glabra |
| D. intermedia | Circaea quadrisulcata |
| Cystopteris bulbifera | Drosera rotundifolia |
| Athyrium filix-femina | Antennaria plantaginifolia |
| Thelypteris phegopteris | Eupatorium rugosum |
| Onoclea sensibilis | E. perfoliatum |
| Dennstaedtia punctilobula | E. maculatum |
| Carex platyphylla | Hydrocotyle americana |
| C. debilis | Achillea millefolium |
| Cinna latifolia | Prenanthes sp. |
| Oryzopsis racemosa | |

Report 66, Thundering Falls, Thundering Brook, Sherburne, Rutland County, Vermont.

Site B, visited on 17 May 1984 by P.F. Zika.

A series of small cascades and two large cascades, with two small dams above the large cascades.

Atlas map 20, USGS Pico Peak 7.5-minute quadrangle (probably). To reach the site from Rutland take Route 4 east past the intersection with Route 100 north. The next left is Thundering Brook Road. Follow this over the dike along Kent Pond, descend to a brook crossing, and park. The cascades are a short distance downstream and are easily viewed from either bank. They can also be reached by River Road off Route 4 in Sherburne, one mile south of the Sherburne Town Hall.

* * *

The site has a dense stand of hemlocks on the north bank and mixed hardwoods and conifers on the south bank. The surrounding forest is quite rocky and steep. A red millhouse and footbridge are visible at the foot of the long cascade, but otherwise no buildings or structures are visible from the site. The surrounding forests are for the most part natural and undisturbed except for occasional logging. The Appalachian Trail passes nearby. There is a six foot high concrete dam at the top of the cascades and an abandoned penstock running along the south bank. The site is close to the Killington Ski Area, and it is likely that there will be some development in the vicinity in the next few years.

Thundering Brook is a small mountain stream emptying out of nearby Kent Pond. It varies from six to 12 feet wide, and has a moderate flow. The water is clear and cold, and at the base of the long cascade several mayfly and caddisfly larvae were seen. Streambed rocks near the mill are slippery with algae.

At the top of the cascades there is a shallow pool about 20 feet across, formed by a low (one-foot high) concrete dam. Below this, the brook splits and forms two five-foot high cascades at the base of a small island, goes over small cascades, and pools behind a six foot concrete dam. There is a diversion well that fed the now-broken penstock on the left (south) side. Below the dam, there is a 25 foot steep cascade some 12-15 feet wide over an unbroken rock face. Below this, the stream turns south along a rock wall, and the dam is no longer visible. There are then some small cascades and pools, then a pair of parallel cascades 25 feet high, then a single cascade about 50 feet high, which, at one point, funnels into a six foot channel that is cutting under a cliff. Below this cascade, there is an old mill building and some concrete retaining walls and open land.



THUNDERING FALLS

The last two cascades, taken together, have a combined drop of about 75 feet, making the site one of the tallest cascades in Vermont.

The bedrock is part of the Precambrian Mt. Holly complex. There appear to be gneiss boulders in the nearby woods, and massive sheets of a brownish quartzite at the upper cascade. The main cascade cuts through a dark schist. There is a nice contact between the schists and quartzites on the bluffs south of the cascade. There is very little sculpturing of the rock faces and only a few potholes under three feet in diameter. The ledges do not appear to be limy.

The vascular plants at Thundering Falls are ordinary. The forests are attractive, and the oldest hemlocks are probably well over 100 years old. A recently-cut three inch hemlock on the north bank was over 50 years old. The woods are dark and, except along the stream where the light levels are higher, there are few species in the understory. A list of the species identified is at the end of this report. In addition to the species in the list, there is a report of the yellow lady slipper (Cypripedium calceolus) from the site, a species that would not have appeared at the time of the survey.

Bryophytes are numerous and at least moderately diverse. No specimens have been collected. A detailed inventory might be interesting.

Because it was in the peak of the migration, a number of birds were easily seen along the cascades. Two species, Swainson's thrush and yellow-bellied flycatcher, are noteworthy. Both of these breed at higher elevations in the adjacent mountains and in the boreal forest of northern Vermont, and were probably only transients along the cascades.

Thundering Falls is a popular recreational area. There is not much fishing, but the area is suitable for picnicking, bathing, and sightseeing. There are a number of different vantage points from both banks that give good views of the twisting drops and the rocks. The Appalachian Trail is a short distance east, and the cascades are probably visited by hikers. The site is clean.

The rumble of the lower cascades is pleasing and it is easy to see how the place was named. The undercut cliffs and zig-zag drops are unusual. The site would be greatly improved if the corroded penstock was removed. Even with the penstock and the concrete at the the upper end, this site is important. It is an impressive site that gets a good deal of use, and is unusually high. Along the middle of the cascades, there is a feeling of remoteness because of the crash of the water and the surrounding dense woods. This is one of the only high waterfalls in Vermont that is still relatively unspoiled.

Thundering Falls is on private property. A hydroproject and large housing development are proposed for the area*. Surveyor's flags are already on both banks. Building and clearing would irreparably alter everything pleasant about the site except the noise it makes. We recommend the site be left in as natural a state as possible and that the old penstock be removed. We recommend against any cutting or construction.

* * *

Summary: One of the largest cascades in Vermont, impacted by hydroelectric project, mountain setting, average rocks and biology, moderately secluded but not wild, clean, clean water, bathing but no swimming or fishing, popular for picnics, sightseeing, and probably parties, well-known to Appalachian Trail hikers and locals.

HIGH IMPORTANCE

*The site was redeveloped for hydroelectric generation in 1985 and is now in operation.

Vascular Plants at Thundering Falls

| | |
|-------------------------------------|----------------------------------|
| <i>Tsuga canadensis</i> | <i>Heracleum maximum</i> |
| <i>Betula allegheniensis</i> | <i>Taraxacum officinale</i> |
| <i>Osmunda</i> sp. | <i>Carex torta</i> |
| <i>Aster macrophyllus</i> | <i>Carex pedunculata</i> |
| <i>Acer saccharum</i> | <i>Carex</i> sp. (communis ?) |
| <i>Acer pensylvanicum</i> | <i>Picea rubens</i> |
| <i>Acer rubrum</i> | <i>Fagus grandifolia</i> |
| <i>Rubus allagheniensis</i> | <i>Diervilla lonicera</i> |
| <i>Prenanthes</i> sp. (altissima ?) | <i>Viburnum alnifolium</i> |
| <i>Solidago rugosa</i> | <i>Betula papyrifera</i> |
| <i>Dryopteris marginalis</i> | <i>Veratrum viride</i> |
| <i>Dryopteris intermedia</i> | <i>Polypodium virginianum</i> |
| <i>Trillium erectum</i> | <i>Spiraea latifolia</i> |
| <i>Trillium undulatum</i> | <i>Maianthemum canadense</i> |
| <i>Thalictrum polygamum</i> | <i>Lonicera canadense</i> |
| <i>Amelanchier laevis</i> | <i>Tiarella cordifolia</i> |
| <i>Amelanchier</i> sp. (shrub) | <i>Polystichum acrosticoides</i> |
| <i>Fragaria virginiana</i> | <i>Taxus canadensis</i> |
| Poaceae spp. | <i>Oxalis montana</i> |
| Cyperaceae spp. | <i>Clintonia borealis</i> |
| <i>Alnus rugosa</i> | <i>Streptopus roseus</i> |
| <i>Athyrium filix-femina</i> | <i>Prunus pensylvanicus</i> |
| <i>Thelypteris phegopteris</i> | <i>Smilacina racemosa</i> |
| <i>Prunella vulgaris</i> | <i>Gymnocarpium dryopteris</i> |
| <i>Mitella diphylla</i> | |