Natural Heritage Hikes

White Mountain National Forest

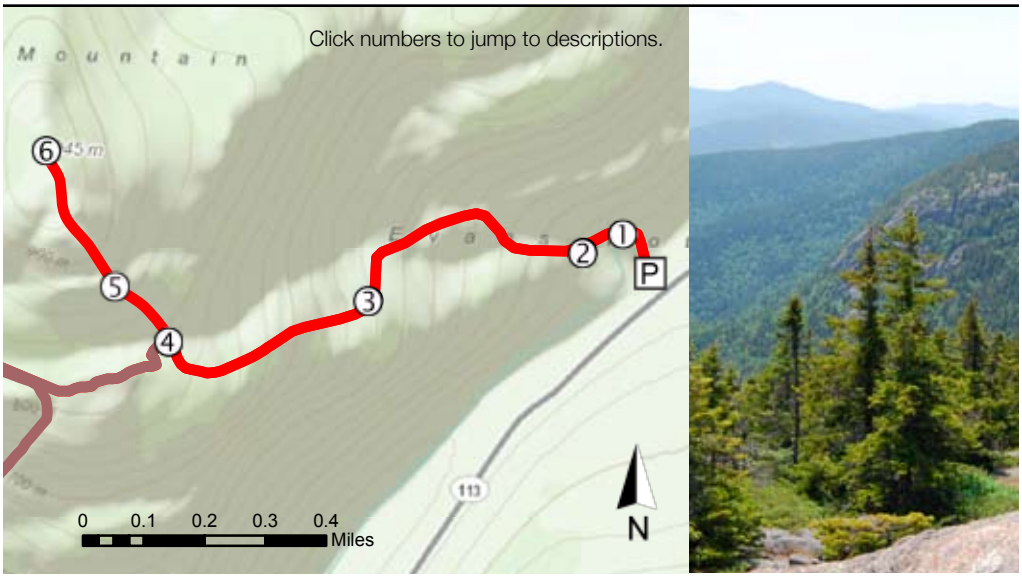
East Royce Trail - 1.5 miles each way, moderate

Want to learn the basic ecology of Maine's mountains? You're on the right trail. The East Royce Trail provides excellent examples of Maine's most abundant natural communities, organized in a vertical gradient typical of many mountains in the state. At the summit, you'll be greeted by East Royce's taller brother, a neighbor that lives a state away.

Getting There

From US Route 2 in Gilead, travel south on Maine State Route 113 (closed winters) for 7.7 miles to the parking area on the west side of the road.

From US Route 302 in Fryeburg, travel north on Maine State Route 113 for 21.9 miles to the parking area.



Blue-bead lily

① An Ancient Plant that Looks Young - *70.990625, 44.305942*

to map

The trail enters a typical Northern Hardwoods Forest.

People began classifying plants and animals centuries ago, organizing them into groups based on how closely related they are to each other. Only recently have we started applying this science of classification to habitats – or what we call natural communities. Natural communities are assemblages of organisms that share a common environment, and that recur across the landscape. Some natural communities, like this Northern Hardwoods Forest, are common and widespread in Maine, while other natural communities like Pitch Pine - Heath Barrens or Subalpine Meadows are rare.

In the Northern Hardwoods Forest community, sugar maple, American beech, paper birch, and yellow birch grow together above hobblebush, red trillium, and blue-bead lily. These species, which are well-adapted to live on the well-drained soil of relatively low hill slopes, are some of the more obvious plants in this community . Mammals, birds, reptiles, insects, and fungus are more elusive members of the same community.

Cross Evans Brook and look for an ancient plant that's trying to look young … from an evolutionary standpoint. The Canada yew is a short-needled evergreen shrub that resembles a hemlock tree creeping along the ground, hence its other common name, ground hemlock.

Naturalist's Notes

This site shows signs of nutrient-rich soils, likely because nutrients have traveled down the slope and gathered here. Look for white ash, Christmas fern, and jack-in-the-pulpit, all species indicative of slightly enriched sites.

Canada yew

The Canada yew is a type of non-flowering, seed-producing plant in the group of plants known as the gymnosperms. In evolutionary history, gymnosperms, which include the conifers (pines, spruces, and hemlocks), developed before flowering plants (angiosperms). Instead of flowers, common gymnosperms typically have cones, and instead of fruits, they produce naked seeds.

We would therefore expect the yew to also reproduce with a cone, but instead we find fleshy red berries. The berries on the yew are not true berries or even fruits, they are cones that have evolved to be more berry-like than cone-like. This gymnosperm can almost trick you into thinking it is an angiosperm – part of a much "younger" (or more recently evolved) group of plants.

Paper birch with frost crack

The berry-like cones help attract birds like thrushes and waxwings, which eat the seeds and disperse them undamaged in their droppings. Left long enough on the plant, yew "berries" can ferment and have the potential to get birds drunk. But don't eat them; they are poisonous to humans.

② A Tree that Wears White All Year *-70.99162, 44.305718*

to map

Around the first bend, one of many large paper birches grows beside the stream.

Thanks to its white, peeling bark, the paper birch can grow farther north and at higher elevations than almost any other deciduous (leafy) Maine tree.

One danger to trees growing in cold temperatures is frost cracking. When wood cools, it shrinks, and when it warms, it expands. When the sun dips below the horizon, the quickly cooling and shrinking outer wood squeezes the slowly cooling inner wood. As a result, the outer wood can split, creating long, vertical cracks in trees. Trees with thin bark are particularly vulnerable to frost cracking.

The paper birch wears reflective white to help it stay cool during the day. In the next half-mile, keep an eye out for paper birches with frost cracks. This south-facing slope is warm enough during the day to thwart the birch's protection against cracking.

Large yellow birch beside trail

③ A Trail of Two Birches *-70.997897, 44.305221*

to map

At the end of the first mile, the forest is filled with yellow birches.
A particularly large one grows right beside the trail.

Birches have tiny, light seeds that can travel long distances in the wind. But small seeds come with a price; they don't contain much stored food for a young plant. To be successful, birch seeds must land on bare soil where the new plant's root doesn't need to poke through layers of leaf litter to find the nutrients in the soil.

Where do birch seeds find bare soil? Under natural conditions, at sites that have recently burned or been eroded, and in human influenced conditions, on sites that have been logged and or machine-scraped to bare soil. Yellow birches are more tolerant of shade than paper birches, so they are more likely to colonize a forest where the leaf litter burned but the canopy survived. Ironically, yellow birch bark is extremely combustible and makes for excellent kindling.

Yellow birch (middle) flanked by two paper birches

If you have trouble telling the difference between yellow birch and paper birch, which is especially difficult when they are saplings, scratch a thin twig with your fingernail and smell it. If you smell wintergreen, you've got a yellow birch. The chemical that gives off the wintergreen fragrance is methyl salicylate, the same compound found in naturally-flavored root beer. Medium-sized yellow birches also have glossy silvery-yellow bark that peels off in thin strips, unlike the duller white bark of paper birch, which comes off in larger sheets.

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④ **Maine's Mountainside Community** *-71.002328, 44.303901* to map

At the trail junction, keep right on the East Royce Trail.

Did you notice a change in the forest as you climbed? As the elevation increased, the forest shifted from mostly leafy northern hardwood trees to mostly evergreens. The forest on the cooler upper slopes here is a Montane Spruce - Fir Forest.

Bunchberry (L) Canada mayflower (R)

Montane Spruce - Fir Forests are a common natural community of Maine's colder climate zones, which include moderate (600 – 3000') elevations in the central and northern parts of the state. Because higher elevations are generally colder than lower elevations, Montane Spruce-Fir Forests are found on the upper slopes and ridge tops of most mountains in these regions, except for the highest peaks, which support subalpine and alpine (above treeline) communities on their summits. Look for red spruce, balsam fir , bunchberry, Canada mayflower, and common broom-moss in this community.

Between the trail junction and the summit, look for signs of Maine's largest animal. In the winter, moose dwell in evergreen forests like this one, where they use their lower teeth to scrape bark off the trees for food. Moose droppings (scat) are gumball-sized pellets found in large piles, often near trails.

Naturalist's Notes

The secret to an evergreen's success in cold climates is its needles. Every time a tree loses a needle, it forfeits the nutrients stored in that needle. On a balsam fir, each needle remains on the tree for about four years before it is replaced, limiting the nutrient loss. In colder climates, where growing seasons are shorter and soils are often damp, dead plant material decays relatively slowly and nutrients can take a long time to reach the roots of the trees. To survive in these climates, trees must cling to every nutrient and every needle they have.

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⑤ **A Balding Summit** *-71.003766, 44.304911* to map

The forest opens into a Rocky Summit Heath.

Notice that the forest opens as you approach the summit. Groups of trees are interrupted by patches of barren bedrock. The towering red spruces present lower on the mountain have been replaced by smaller, stunted examples of the same species.

Sheep laurel

The thin soils and harsh weather found atop mountains can limit plant growth, so the trees in this Rocky Summit Heath natural community do not grow very large. As you approach the summit, look for sheep laurel and lowbush blueberry. Both of these plants are in the blueberry family (Ericaceae), which is particularly adept at surviving in harsh environments.

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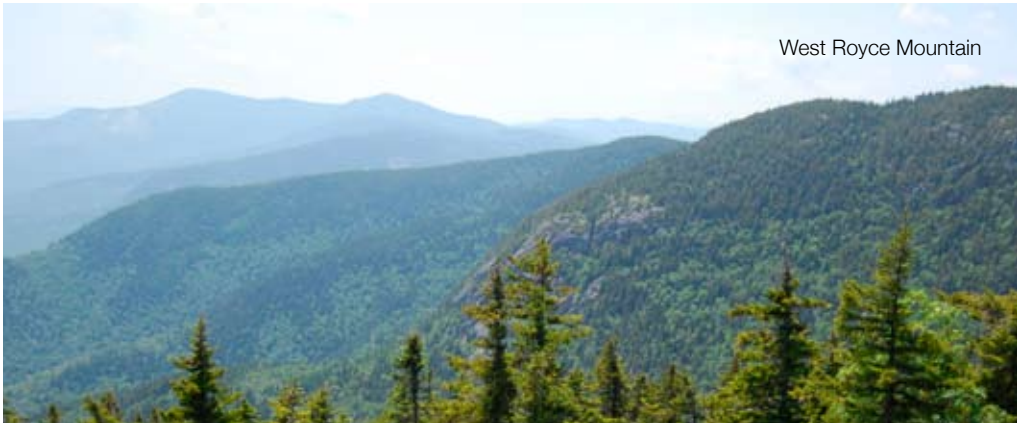
⑥ **Baked Rock** *-70.389288, 43.47850* to map

The summit offers a view of West Royce Mountain.

West Royce Mountain, only two feet taller, is the closest peak to the southwest. Though its summit is only 0.7 miles away, it's located in New Hampshire. Due west, the dramatic peaks and ridges of the famed Presidentials are about 15 miles away. Surprisingly, this well-known mountain range in "the Granite State" (New Hamp-

shire) isn't composed of granite, but a type of metamorphic rock called schist.

East Royce Mountain is composed of metamorphic rock, too. When rock is exposed to high heat and pressure, as during mountain building, it is deformed and often chemically altered. Depending on the composition of the original rock and the intensity of the "metamorphosis," sparkling flakes of a soft mineral called mica may appear. These flakes are visible in newly broken rock faces on this summit. On your way down the mountain, keep an eye out for "glitter" in the soil – this is mica that has eroded out of the bedrock.



West Royce Mountain

Naturalist's Glossary

Canopy: The highest layer of branches in the forest.
Climate: Long-term temperature and moisture patterns.
Erosion: The process by which soil and rock are transported and deposited in other locations.

Natural Heritage Hikes is a project of the Maine Natural Areas Program in partnership with the Maine Trail Finder website. For more Natural Heritage Hikes, please visit www.mainetrailfinder.com.

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Map sources: Maine Office of GIS, Esri