Roaring Run “Up and Over”

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The “Up and Over” Trail:

Roaring Run Trail is a wide, crushed limestone, heavily used path that is part of the ‘rails to trails’ program in Pennsylvania. There is, however a side trail which branches off just outside the parking lot in Apollo and travels up into the dense woods of the surrounding ridge. We call this trail the “Up and Over” and use it regularly for a conditioning hike. Some members of a local mountain biking group have adopted parts of this trail and have greatly improved its marking and maintenance.

The first part of this hike is all uphill. After a brief start in the woods, you turn and follow a narrow, dirt truck trail that runs straight up the ridge. The trail passes several gas wells and pipeline access points, and, depending on the time of year and the number of maintenance visits to the wells, the trail may be choked with encroaching knotweed.

Knotweed (right) is one of the more spectacular "exotic and invasive" plants not only affecting Western Pennsylvania but also much of the United States and also Europe. Originally from Northeast Asia (Korea and northern China), knotweed is a plant that is a primary colonizer of volcanic lava fields. Its tenacity and ability to grow under the extremely stressful conditions of these barren lava fields is impressive. Its establishment is a first step in the development of a vital, natural ecosystem on these lava sites. In these ecosystems, knotweed has a number of natural controls which regulate its growth. These controls will lead to the inevitable replacement of the plant via the steady, ongoing, integrated process of succession.

In ecosystems outside of its native range, though, knotweed grows out of control and persists long past the useful time intervals for pioneering colonization. In these non-native environments, knotweed forms dense, single species thickets which are unusable by most native animal species for either food or habitat. These thickets are also intensely inhospitable and destructive to native plant species.

The tiniest fragment of a knotweed plant has the ability to root and form a new plant. Water transport of fragments of the weed is very common, which explains why knotweed is so abundant along rivers. Railroad right-of-ways are also frequently clogged with knotweed possibly because the train cars and engines transport cut fragments of the weed all along the tracks. When knotweed is cut, fragments fly about and have the potential to establish new plants and colonies. Thickets also form from shoots that rise from spreading rhizomes from a single established plant. Knotweed is almost impossible to eradicate once it gets established in a site.

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Watching the knotweed two months ago when it started to grow up over the spring wildflowers along this trail, I sensed a process of great energy and destructiveness. The only good thing I have ever heard about the knotweed growing in our area was from a friend who keeps bees. The late summer, early fall flowers of knotweed are a valuable source of nectar and pollen for the bees and makes a delicious, dark honey. I like the honey, but would settle for a goldenrod variety instead if it meant being rid of this noxious plant.

Last year, this part of the trail was almost completely closed over with encroaching knotweed. The long, arching knotweed stalks knitted together to make a low-headroom tunnel through the mass of interconnecting stalks and leaves. Today, though, the knotweed has been extensively cut back by the passing gas line trucks and crews. The trail feels more like a boulevard than a path through the woods. The sides of the trail, though, and the surrounding hillsides are thick with the weed and many of the plants tower over the surface of the trail. It’s been a very wet summer, and these weeds have responded with robust growth.

We stride up the hill. It is a warm, humid July day and perspiration quickly soaks through my t-shirt and the rim of my ball cap. Mosquitoes and deer flies buzz around our faces and necks. We stop to re-apply insect repellant.

Multiflora rose is the main shrub along the path. This plant is another exotic, Asian, invasive species that has “escaped” from local gardens and hedges to which it was introduced back in the 19th century. It has become a very serious pest of our woodland and rangeland ecosystems. In the early spring, I remember looking out across this long ridge system that borders the Kiskiminetas River and seeing the scattered and, in places, almost continuous masses of the early emerging, light green leaves of the multiflora rose. If left undisturbed (which is a very good idea when you consider the number and sharpness of its thorns!) multiflora rose forms great, dome-like masses (right) of intertwined stems. Old, brown and dry, thorn-filled stems fill the inner volume of the dome, and green, flowering, but still thorn-covered stems cover its outer surfaces. Other plants are shaded out under and within the growing mass of the rose. This plant represents a very serious threat to the less aggressive, more slowly growing, native plants of our forest and grassland ecosystems.

Many small animals (birds, rodents, rabbits, etc) use these rose thickets for shelter and for their nesting and denning sites. This beneficial symbiosis, though, does not balance out the potentially calamitous impact that this species is having on our native flora. In some states, it is actually illegal to have a multiflora rose plant growing on your property! All across these ridges are incredibly large numbers of these plants. Their abundance and distribution will undoubtedly increase over the coming years.
Another exotic invasive plant also present in great abundance along this ridge-top trail section is garlic mustard (right). Garlic mustard is a plant native to Europe. Via vigorous seed production and some serendipitous seed dispersal mechanisms, it has spread to almost every temperate zone ecosystem around the world. A single garlic mustard plant in its second (and final) year of life is capable of producing up to eight thousand tiny seeds that are then dispersed though the soil of their ecosystems. These seeds can cling to the feet of passing animals and can be spread everywhere that animal walks. These seeds also gather on the boots and clothing or equipment of any human moving though the system, and wherever that person goes, so go the seeds! The rate of these dispersions and the distances that are covered are incredible. On our campus nature trail, for example, we had no detectable garlic mustard back in 1985 when we did our first flora survey. In 2007, though, the understory flora, especially in the upper part of the trail, was absolutely dominated by it.

Garlic mustard (whose leaves smell fresh and garlicky when crushed) is thick and flourishing all along this ridge trail. It makes a rich green understory layer around the patches of the multiflora rose that are, in turn, bordered by knotweed: a European herb under a spreading Asian shrub surrounded by a tall Asian weed filling up the trailside here in Western Pennsylvania.

Wild grape is also growing very abundantly on the trees along this part of the trail. The grape vines provide a rich, fall food supply for birds and mammals, but also can do a great deal of damage to the trees on which they grow. The image to the left shows trees covered with grape vine. Not only do the vines shade out significant portions of the tree canopy but they also make the entire canopy denser and more resistant to wind. On our Nature Trail, for example, we have documented that white ash and yellow poplar trees are more likely to be subject to wind throw if they support significant densities of wild grape in their upper canopies.

Some good news on this “Up and Over” hike: there are large numbers of oak seedlings (right) under the taller stands of red maple and black cherry. This past fall, in fact, the trail was actually littered with acorns (which are now all gone! Only the caps remain). In the fall the abundance of acorns actually made walking on the trail difficult. The large northern red oaks and white oaks growing up on the hillside drop their acorns in the early fall which, with some help from gravity and maybe even some assistance by foraging squirrels, tumble down the slope to this flat space on the ridge. Seedlings of some appreciable size are developing under the cover of the shading,
overstory trees. Along this trail, anyway, the possibility of an eventual oak forest looks quite promising.

In the early spring it was possible to assess just how many red maples are growing on these ridges. The red maples are among the earliest trees to bud leaf out in the spring. Their swelling red leaf buds and tiny, reddish and pale green leaves make the surrounding slopes and hillsides shimmer with color. The red maples are everywhere! Red maples have become one of the most widespread and abundant trees in the forest ecosystems of the eastern United States. How and why this tree species which, according to early survey and logging records initially made up only a very small percentage of our original, uncut forest, has become so abundant is a complex question. Many forces and many characteristics have combined to favor this species over its competitors. The fact that red maples can begin to make seed as very young trees (as young as four years of age, in fact) and that a single tree a foot in diameter can make a million seeds in a single year is a significant starting point. That these seeds (the very familiar, winged “samaras”) can then fly and float in the air great distances from the parental tree and can then germinate almost anywhere over a very broad range of site conditions paints a vivid picture of red maples as ecological “generalists” filling up any open “spaces” in the eastern forests. Deer browsing of seedlings is a major force affecting the persistence and survival of many tree species. Red maples and most other tree seedlings are extensively browsed by deer especially in the winter, but the fact that there are so many red maples especially in comparison with the smaller numbers of individuals of the other tree species has allowed a substantial number of the maples to escape deer predation and become established as the incredibly abundant tree of our forests. So, the red maple’s high rate of reproduction, rapid dispersion over an area, broad tolerance of site conditions, and sheer numbers have all combined to favor its existence in our human (and deer) impacted ecosystems.

In addition to the red maple, black cherry, and red oak, yellow birch, yellow poplar, and bitternut hickory are also growing abundantly along this ridge trail. In the spring, I had to use my binoculars to see their flowers high up in the canopy. Redbud trees also are growing densely along the trail. On spring hikes their neon-bright, red-purple flowers really light up the path. Down along the main trail near the parking area Korean dogwoods have been planted. They flower gloriously in the spring with white, red, and pink varieties planted side by side. There are very few native dogwood trees up along the upper trail, though, and their large, showy, white flowers are sorely missed. The native dogwoods have probably succumbed to the destructive ravages of the introduced fungus Discota destructiva that causes the disease dogwood anthracnose. It is possible that native dogwoods as a species will not survive this disease onslaught although pockets of intact native trees are still present on other trails in the area.

Red bellied woodpeckers call all around us on our upward climb. Titmice and chickadees are also in great voice as the males assert their territorial ambitions and try to attract mates. Bumblebees and honey bees fly in significant numbers around the tree flowers, along with tiger swallowtail, comma, question mark, and red spotted purple butterflies. In the moister woods, mayapple is abundant. The white mayapple flowers (left) that were so abundant two months ago have made the green fruit (right) that gives the plant its name. Many

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other common flowering plants can be spotted on this hike, and, depending on the month, you may see the flowers of spring beauty, pepperroot, wild geranium, bloodroot, Dutchman’s breeches, squirrel corn, trillium, fire pink, bluets, rue anemone, wood anemone, foamflower, trout lilies, jack-in-the-pulpit, violets, wild blue phlox, Solomon’s seal, Indian cucumber, and Canada mayflower.

Near the top of the ridge our hiking path diverges off of the truck road onto an unmarked, seldom walked trail. This trail curls around a deep pool and dives into a dense forest of knotweed. The abundant June rains have nourished the knotweed into heights and densities that we have not previously experienced. The “trail” is almost invisible under the cover of the knotweed (left). We push our way through the intertwined stems, bent low, using our arms to bend and break the weeds in front of us. It is like hiking through a rainforest. We need machetes to carve our pathway. We climb up over the pool and pause in an isolated break in the knotweed. An old concrete foundation now filled with water and partially covered with broad concrete slabs stands just to the left of the trail. Is this a relic of some old mine that was dug into the ridge? It is strange and quiet now and echoes with frequent drips of water.

The next half mile of the trail takes us through a nearly continuous tunnel of knotweed. We are incredibly relieved to re-enter the shadier woods along the ridge top and leave the knotweed behind.

About an hour and a half into the hike there is a good sitting log that overlooks the upper valley of the Kiskiminetas. We almost always stop here and take a water break and enjoy the view. On one May hike while we sat on our resting log, we were serenaded by the piercing whistles of a red tailed hawk. We got out the binoculars and waited for the hawk to soar past. But he/she never did! The whistle kept sounding, but no hawk showed up. Walking a short distance away, we saw a set of poplar trees and noted that the hawk call was coming from them. I scanned the trees, but could not find the large, familiar silhouette of a perching hawk. As we got closer, a blue jay now calling in his harsh “jay-jaay” flew away. The jay had been sitting in the tree mimicking the call of a red tail. This is a frequently described behavior for blue jays, but I had no idea how good they were at it! Hawk calls may be used by the jays as warnings to their fellow jays that hawks are near, to draw the nestling-eating red tails away from blue jay nests, or to scare away competing birds from food sources. The hawk calls were, as far as we could determine, almost perfect imitations. In July, we also took a break on our log and once again heard the call of a red tail hawk. We walked over to the poplar trees thinking to catch the jay at his mimicry again but were instead surprised by a beautiful red tailed hawk soaring past us at eye level out over the steep drop off into the valley below. This is a great lesson in the dangers of presumption and anticipation!

As we continue, we see a black cherry tree with two large, freshly chipped out, vertically arranged, rectangular holes (right). Looking into the literature, I found an almost identical set of holes in a U.S.Forest Service publication. These holes were identified as piledated woodpecker feeding holes (the bird was after ants that were living in the tree). Looking more closely at the
picture, I realized that this forest service picture, too, was of a black cherry tree.

There are several isolated pools of water along this hike. The depressions that form these pools were generated by mining and quarrying activities. One long, productive pool is at the base of a tall rock highwall (right) from which limestone and hematite were quarried back during the charcoal iron furnace period of site use (over 150 years ago). An important part of this hike for us is checking in on the amphibian populations that both inhabit and visit these pools. In the early spring great floating masses of amphibian eggs cover the edges of these ponds, and through the summer there is a gloriously chaotic frenzy of frogs leaping and splashing into the covering water as we walk past.

These “vernal” pools (left) exist on the razor’s edge between success (persistence) and failure (drying up). Last spring I was concerned that the lower than average spring rain totals would cause an increased failure rate in the pools and would, therefore, lead to a high reproductive failure rate in our local amphibians. Fortunately, last year’s May and June rains kept the pools full and the salamanders, frogs, and toads did quite well up on these ridges. This year, the abundant rain and snow have resulted in very full pools but cool temperatures through the spring delayed reproduction and slowed down the rate of egg and tadpole maturation. There were huge numbers this year of egg masses but a very late hatching of tadpoles. These small, dark tadpoles were concentrated down in the sunnier (i.e. warmer) end of the pool. The larger eggs looked healthy (and like last year, many were bright green with symbiotic algae which have been shown to be of benefit to the developing embryos) but they were developmentally at least two weeks behind last year. Passing the long pool in July, though, we see good water levels and a riot of jumping, calling frogs.

Around the long pool, a pair of veeries (a small thrush) is flitting in and out of the surrounding shrub and thicket cover. Their movements appear to be centered around a space in some low tree branches in which, we speculate, they are building a nest. We watch them closely but do not go too close for fear of frightening them away from a very ideal nesting site.

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After we pass through the area of the pool, we drop down to one of the most beautiful sections of the trail (left). An even aged forest of 40 year old Norway spruce and big toothed aspen trees (representing a re-planting of a strip-mined area perhaps?) generates an extremely quiet, shady, and picturesque trail environment. We almost always see deer in this section of the trail and, so, keep our dog close or even put him on his leash when we enter these trees. The spruces are extensively planted throughout this area. As we hike down into the upper ravine of Rattling Run (one of Roaring Run’s tributaries) there are an increasing number of white pines inter-planted with the spruces. Yellow birch, probably natural “volunteers,” are also inter-mixed with the conifers. After we cross over the top of Jackson Falls (below - where rattling Run cascades over layers of shale and sandstone) we see relatively young eastern hemlocks (80 to 100 years old?) growing in what are apparently naturally occurring re-growth stands.

The hemlocks are a historically significant tree species in this area. They are also the state tree of Pennsylvania! Hemlocks grew in isolated clusters in the cool, moist, sheltered ravines throughout the Kiskiminetas River valley. Their historical uses for bark tannins and lumber are discussed in the “Forests of Pennsylvania” essay. They were, undoubtedly, extensively logged as European settlers took control of this valley in the early nineteenth century. The persistence and slow re-growth of this species in these cool, wet valleys is a wonderful sign of the vigor of the ecological healing processes going on around us.

Much of this area around Roaring Run was, back in the 1830’s and 1840’s, part of a large multi-thousand acre forest site that was repeatedly logged to make charcoal that was then used to fuel crude, iron furnaces. During the era of these furnaces, forest ecosystems were cut and charcoaled and then left to re-grow only to be re-cut and re-charcoaled years later. Crews of wood cutters circled through the thousands of acres around each furnace to generate sufficient fuel for the iron generating process. I talk more about these furnaces in the “Forests of Pennsylvania” essay and the Rock Furnace Trail Narrative.

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We circle back on a section of the Rock Furnace trail, cross over the new bridge over Roaring Run and return to the main Roaring Run hiking and biking trail. After the long walk through the woods up on the ridge this broad, crushed limestone trail feels like an interstate highway. It is two miles to the main parking area. We’ve covered a good six miles with sufficient “up and down” to stretch our leg muscles. Great trees, wildflowers, amphibian eggs, and birds highlighted the hike and made the hours pass so quickly.