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The Burn Objective

The crackling flames create a warm glow. Tongues of fire lick the logs, engulfing them in heat and color. With a long, sharpened stick, I poke the coals at the bottom of this fire, causing sparks to shoot up to the birch bark that balances between two larger pieces of wood. The bark ignites quickly, temporarily brightening the fire as it burns rapidly. Safe and contained, this bonfire demands all of my attention. A beautiful, mysterious, potentially dangerous thing. Each shade of red, orange, and yellow catching my eye in turn. The embers glowing through the increasing amount of ash at the base of the fire. I try guessing which part of a particular log will be the next to be ignited, avoiding the smoke as it comes swirling up in great clouds. I stretch out my hands, keeping myself warm despite the chilly night.

Despite being captivated by campfires, I have grown up with an extremely negative view of natural fires. Among the general population of rural northern Michigan—my home—fire is seen solely as a danger. A threat to our collective well-being and lifestyle. Every few years, a large wildfire sweeps through the area, which really upsets the people who see only the negative in fire. I admit that until this summer, I myself was one of these people.

In 2007, a large wildfire went through Grayling, Michigan. At that point in my life, I was becoming more interested in environmental issues, but I was totally ignorant on the subject of fire ecology. Therefore, I was less aware of the impact of that fire ecologically speaking, but I remember driving south on I-75 a few months after the fire

had roared through. I was appalled by the devastation. There had been enough wind behind the fire that it had jumped the freeway, leaving nothing but dead, blackened trees on either side of the road. I was with my high school track team when I drove through for the first time, and we spoke in hushed tones as we passed through the area, mainly exclaiming things like “oh my God” and “oh, that’s so awful,” along with “that poor forest, destroyed” and “I can’t believe this happened.” In my mind, it looked like something from a movie about the apocalypse.

Since this occurrence three or four years ago, I’ve become slightly less ignorant on the subject of fire ecology. As I entered college, I took introductory level biology and ecology classes and spent time discussing ecological issues with people far better informed than myself. I realized that fire is not necessarily bad for the environment. In fact, I learned a secret—occasional fire is even healthy for some ecosystems. I would walk past prescribed burn areas in the Arboretum in Ann Arbor and smile, glad the Arb’s employees were also in on this secret. However, I still didn’t understand specifically *why* fire was good for some areas. I just knew that existing environments burned, and then somehow that helped new plants to grow back afterword. End of story, right? No. This lack of true understanding prevented me from completely accepting the idea that fire might be good for my home forests of northern Michigan.

So this past May, when fire again came roaring through my beloved home region, I was not happy. As I was already at home in Charlevoix for the summer, I learned about this event from the local news station. The reporters did not make me feel better about the situation. There was no talk of fire as a natural disturbance, no mention of its benefits to the ecosystem. This fire, now dubbed the Meridian Fire, had burned near Gaylord,

Michigan. A few homes and a portion of the downtown Gaylord area were destroyed. I watched with my family in horror as the events unfolded on television. The news anchor interviewed individual home and business owners who had been directly affected by the fire's destruction. As they told their stories—of losing everything, of barely making it out with their lives, of trying to rebuild their lives from scratch, all my knowledge of ecology was forgotten. I felt their anguish, their despair. *How is this good for the environment?* I found myself thinking. *And even if it does help the ecosystem, what does that matter if people are in danger? How do destructive things like this happen?* All I knew was that apparently, some idiot had let his brushfire get out of hand, and now all these people (and Gaylord's economy) were paying the price.

A month after I watched this event on TV, I started classes here at the University of Michigan Biological Station. In my forest ecosystems class, I soon learned about the natural history of the development of the ecosystems here in northern Michigan – which involved fire. Ryan, my forests professor, taught our class that due to the landform and climate, the Grayling area is the perfect habitat for fires. I learned that the area is a high-elevation outwash plain, which means that 4,500 years ago the receding glacier left a flat, sandy area where water quickly drains through the soil, making the area fairly dry most of the time. The temperature is harsh: extreme cold in winter and extreme heat in summer. For the ecosystems developing here, fire became a natural disturbance in the environment. Often sparked by something as simple as a lightning bolt from a spring or summer storm, a stray spark could ignite the forests on these lands.

Furthermore, Ryan continued to explain that where these regular fires occurred, the communities of organisms adapted to the disturbance. For example, Jack pines, *Pinus*

banksiana, have serotinous cones. Serotinous means these cones are sealed with wax. It is only upon being heated from a blazing fire that the scales of the cone open, releasing the seeds into the soil under a newly opened forest canopy. Because Jack pine relies on fire for seed dispersal, it actually promotes fire with its flammable needles and the retention of its lower branches, allowing fire to climb up to the canopy. Paper birch is another fire-loving tree. The bark of *Betula papyrifera* does not decompose very fast, and so upon falling or dying in some way, the inner part of the tree will break down, but the white, curling strips of bark remain for a long time, inviting a fire to come along and burn it so new birches can take its place in the forest. Other species, such as red maple, have evolved into prolific sprouters. After a disturbance such as fire has eliminated the main trunk of *Acer rubrum*, many more stems will sprout up from the base, determined to continue the species' livelihood. Red oak, *Quercus rubra*, has learned to cope with fire by evolving root-collar sprouts after the original trunk has been destroyed.

On a forest ecosystems field trip with Burt Barnes, the former Forest Ecosystems professor and author of *Michigan Trees*, we stopped to see a specific area on UMBS property with extensive red oak root-collar sprouting. Burt called this area a "moonscape," and it was clear why. Without "normal" forest vegetation, this area appeared alien and strange. It was obvious the area had previously burned, as we counted approximately 15 red oak sprouts from what had originally been one oak tree. Apart from the recovering red oaks, this area was quite barren. Only reindeer lichen, which is itself an indicator of past fire, managed to grow in large quantities. As I learned about these adaptations and saw post-fire regeneration firsthand, I finally began to understand exactly how fire could be good for an environment, or at least good for these specific tree species

and landforms. And more importantly, I started realizing that these trees are only small parts of whole ecosystems that have adapted to the presence of regular fire in the environment.

As I began to better understand fire as a part of the natural history of northern Michigan, the forests class began to learn about the Native Americans' use of fire. The Native Americans, who have been a part of northern Michigan's landscape since soon after the retreat of the last glacier, were using fire as a management practice long before European settlers came to this area. In their lifestyle, low-intensity fires were used for a myriad of purposes, including travel ease, increased berry production, and especially for their agricultural practices. They would burn small plots for planting crops, and after farming those plots for eight to ten years, they moved on to new areas so as to not completely deplete the land of its nutrients. The Native Americans also recognized that light fires were an excellent way to return nutrients to the soil and promote the growth of new plants, a process we now call succession.

However, not every fire in northern Michigan's history has been beneficial. Natural fires and low-intensity fires controlled by Native Americans helped the environment, but fires caused by carelessness have not had positive consequences. In the late nineteenth and early twentieth centuries, logging decimated the former forests of Michigan. After the "worthy" trees such as Eastern white pine were cut and taken away, all of the slash (branches and leaves) was left. Between the natural occurrence of fires and human-induced burning, the groundcover plants, leaf debris, and twigs left on the forest floor all burned. The slash left from the logging of the area promoted more fires because there was so much of it everywhere in the forests and the dry slash was so

flammable. These burns were so extensive that white pine stumps still bear scorch marks. The natural layer of detritus and organic matter along the forest floor was eliminated, leaving behind bare mineral soil. The A horizon, the top layer of mineral soil, became nonexistent, instead replaced by a layer of charcoal. Bare mineral soil aides the growth of some plants, but not when literally all of the nutrients are gone. The nutrients are gone in these areas that were slashed-and-burned. There are still areas in Michigan's Upper Peninsula where the burning was so extensive that to this day nothing can grow there. Towns were abandoned. Wildlife fled or was killed. Devastation. With this history, it only makes sense that the people who later lived in this area came to see only the destructiveness of fire. With thoughts of helping the land, fire prevention became a common term.

As permanent, non-logging settlements became more prevalent in Northern Michigan, there was even more danger in these fires. They became a threat not only to human lives, but also to the increasing infrastructure and overall stability the settlers here were trying desperately to build. This area became more and more built up, with houses and towns replacing what had been for years the site of regular burns. As this happened, fire became the enemy. A destructive, dangerous beast to be controlled and refused. Whether or not anyone realized fire was a necessary part of the natural world here did not matter. What mattered was protecting themselves and their development from this natural monster. Somewhere along the way, the people living here managed to convince themselves that this protection applied to the land too. They applauded themselves on maintaining a fire-free environment and even encouraged this pride in a lack of fires in the general population. With Smokey the Bear as the mascot, this sense that all fires were

bad and dangerous infiltrated their consciousness, influencing the opinion of the general public.

Today, fire continues to have a bad reputation among the general public. This typically negative reaction to fire makes sense when one considers this history of devastation in regard to the aftermath of logging in Michigan. The heavy burning had such a harsh, lasting impact on the environment here that a negative attitude toward fire is understandable, reasonable even. For years, we have protected the forest from what we have seen as a destructive enemy. In doing this, though, we have in fact prevented natural succession from taking place. While we may still delude ourselves into thinking fire suppression is helping the environment, it doesn't take much searching to realize the main reasons for fire prevention are, as they have been for a century, self-preservation and the protection of our infrastructure.

With this influx of knowledge regarding fire and northern Michigan's history and the natural development of ecosystems, I thought I understood issue entirely. I was still engaged in an internal battle, though. The scientist in me, who had spent the summer becoming so much better informed, understood the ecology of it. Moderate fire is good for the environment. Period. It happened throughout history, Native Americans learned to use it to their advantage, and many common species in this area had adapted so that they actually benefited from fire. Issue solved. However, I realized that the northern Michigan resident (what I call the human side) in me, though, was still apprehensive. Even if fire was a natural occurrence, how could we just allow something to happen that not only threatened people and infrastructure, but was also historically proven (even as recently as May) to harm these things so important to the communities up here.

It was with this state of mind that I hesitantly looked forward to our Forest Ecosystems field trip to the site of the Meridian Fire, which I had learned about at home in May. Everyone else in my class seemed so excited, commenting on how "awesome" it would be to see the aftermath of this burned area.

"Fires are so cool!" one classmate raved to me, "I'm so glad we get to go there."

I tried to nod my head in agreement and appear excited. I felt conflicted. I certainly thought the idea of fire ecology was really interesting, but I also had preconceived ideas about this fire from what I heard last spring. My inner battle of scientist versus northern Michigan resident was still raging, and I was slightly annoyed with my classmates and their inability to understand the disastrous effects this fire had had in this area. Didn't anyone realize the devastation this fire had caused? It wasn't simply another cool thing to see on a field trip. It wasn't benign like exposed bedrock or finding boulders in the middle of the woods. This fire had meant a huge economic loss for the area, particularly Gaylord, where many business owners had lost their livelihood. Individuals had been negatively affected, as many homes were burned to the ground. Why did no one seem to care?

When we got to the site of the Meridian Fire, our class met up with Steve Cross, a Fire Management Specialist for the DNR. He explained some of the finer details of the fire to us. It had covered approximately 8,500 acres. *Yup, right into downtown Gaylord*, I thought. It had gotten out of control due to decreased snow last winter and a dry spring. It initially started because of an old man—with a burn permit—just trying to get rid of his brush pile. *Oh, so he's not an arsonist or an idiot—just old.* And he emphasized how the regeneration of Jack pines from the fire will create a larger habitat for the Kirtland's

warbler, the rarest songbird in North America. *Well, at least something good has come out of this,* I began to think. We questioned Steve further about the beginning of this fire—how did that old man get a burn permit that day, if it had been so dry? Apparently he had requested and been granted a permit through the DNR's website. Steve described the process for obtaining a burn permit online and admitted the process was flawed; no one should have been able to burn that day. Steve told us how locals often get upset when burn permits are unavailable, though. Especially when the DNR performs a prescribed burn on a day everyone else is denied.

"Wait, WHAT?" an incredulous classmate asked.

"You guys can burn when other people can't?" someone else chimed in.

"Yeah," admitted Steve a little reluctantly. "It's the only way to meet the burn objective."

The burn objective. A designated number of acres to be burned by the DNR each season. This interaction with Steve left me feeling a little confused, as my internal battle continued. Part of me wanted to scoff at the phrase "burn objective." It sounded so ironic, not to mention stiff and uncompassionate toward the local people of northern Michigan who were forced to deal with the aftermath of these "controlled burns." On the other hand, a growing part of me realized that the DNR knew what they were talking about. I knew these people had the natural environment's best interest at heart, and the area had developed with fire as a natural disturbance.

Though the rational, scientific side of me understands fire to be natural and even necessary, my doubts still remain because the resident side of me has seen firsthand the destructive potential of fires beyond human control. I understand both the scientists

calling for prescribed burns and the homeowners saying no, fearing for their own safety. What I call for, then, is a balance. The general public needs to be better educated about fire. Something beyond Smokey the Bear, self-righteous with his anti-fire propaganda. At the same time, the science side of this issue needs to understand human concerns. Is meeting a “burn objective” worth lighting a fire on an overly windy day, risking lives and homes? Is it worth facing the grieving families of the fire’s victims?

One thing is clear. In northern Michigan, both fire and people are here to stay. We must learn to respect and live with the power of fire. The flammable ecosystems of this area will continue to burn, and fire will continue to be suppressed in towns and neighborhoods. Stability, a coexistence of sorts, is necessary to ensure that the careful balance of life continues on, for the good of both the human population and the natural environment.