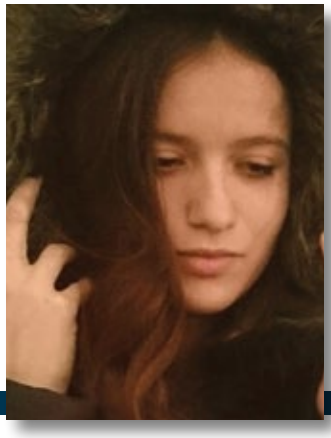
Wildfire Damage:

Towards a Broader Definition



By Esther Bogorov, *AWA Conservation Specialist*

Our wilderness is where we play, heal, and thrive. Over the last few centuries, our urban spaces have been coming closer and closer to the wild spaces, increasing the wildland-urban interface. We have seen how this development can come with tremendous danger and significant cost. We have policies and procedures that try to keep us safe, including active fire suppression, in hopes of decreasing damage and reducing the total cost. There is ample evidence that countless lives and property have been saved through the hard work of firefighters and the forestry services in this way.

In 2006, Mariam Lankoande and Jonathan Yoder released a paper at Washington State University titled "An Econometric Model of Wildfire Suppression Productivity." For nearly a century, wildfire studies have looked at the total cost of wildfire as being the sum of cost and damage. If we minimize the cost of fire suppression and minimize the cost of damage, the total amount we spend financing wildfire suppression should, in this outdated theory, decrease.

The report came to more nuanced conclusions by looking at data around the return on investment (ROI) for different stages of fire suppression. The researchers concluded that the government was focusing too heavily on suppression activities compared with pre-suppression initiatives. The ROI in preparedness created a more substantial dent in the overall cost of wildfire management. Hypothetically, the cost of preparedness can eventually approach zero, with the aid of effective fireproofing education and bylaws, knowledge of fire-watch tools that are publically available, and quick and efficient distribution of event-specific information.

The other factor of total wildfire cost is damage, which the authors of this study identified as a vague variable without a clear definition. "Damage" typically includes, but is not limited to, perceived negative effects on timber, recreation, and improvements (e.g. irrigation and roads). For the total cost of wildfires to decrease, the cost of this direct damage must decrease as well. But a broader definition of damage would also include the damage caused by suppression, starting with the increased intensity of wildfire in forests that amassed excess fuel after years of fighting. From the perspective of direct damage, the potential for the destruction of property in our communities is only increasing.

Fire as an Ecological Process

Fires can destroy livelihoods, property, and at worst, lives, which is all very real, tangible damage. Damage also includes the psychological toll of fire, taking forms of apprehension and fear— natural reactions to the potential uncontrollable nature of wildfire. Together, these issues have led us to avoid fire, seemingly at all costs. But some of the perceived damage is simply based on the historic misunderstanding of the land we live on. Green forests and mature grasslands are beautiful, but burned forests and charred grasslands offend our some of our aesthetic sensibilities. We may even conclude that such lands are *dead*.

We increasingly appreciate this isn't the case. Soon after fire the land begins to revive, part of the cycle of rejuvenation. This is true both in grassland and forest. In the latter, when conifers are hit by fire, their needles and cones burn, the bark tears up, but the roots stay. As a carbon sink, these trees are still functional, locking whatever didn't escape into the atmosphere in place. Fungus and insects, important biodiversity representatives, eat up the carbon stores, from the inside out and outside in. Meanwhile, the grass grows, deciduous plants shoot up, and conifer seedlings slowly and confidently start building their forest story.

Grassland fires burn along the ground at low intensity, lower than most fires in forests. They prevent tree encroachment and maintain the characteristic openness of the land. Grasslands also burn more readily, where a single spark can spread from blade to blade in an instance.

With this quick-to-burn tendency comes a quick natural recovery strategy. A study published in the *Rangeland Ecology & Management* journal in 2011 concluded that the effect of fire on total biomass of grasses on site was minimal in the growing season following a burn. The authors explained that resources are taken up by surviving plants, many of which have specific resilience traits, such as the production of a below-ground store of buds and roots. Grasslands, after fire, are ready to grow back.

The "what" and "where" of forest and

What really meets the eye is life in the understory: the plants on the ground are finally getting a taste of the sun. PHOTO: © C. WEARMOUTH

grassland plants post-fire is dependent on highly variable pre-fire conditions and unpredictable subsequent events. If it rains, different plants will emerge and dominate than if it stays dry. If the fire was severe, much more of the carbon stored in the plant matter will have escaped into the atmosphere, and nutrient availability for plant recovery will decrease. If the slope is steep, the fire might lead to more runoff immediately and over a longer period of time than if the fire passes through a flat valley. This complexity of causes and effects has resulted in variable study approaches and results. But in general, when we zoom out to study a fire event from the habitat and landscape scale, we see that the systems are not fighting off change, as suppression forces them to, but are instead highly resilient.

Last Word: The Need for Resilience

Policies and practices in Alberta do not yet reflect an intuitive understanding that works as well as it could with the complexity of the land. Historically, we have favoured a "one size fits all" approach to dealing with wildfire, one we increasingly recognize as not fitting a highly variable and inevitably uncertain ecosystem well. Gradually, we are compiling our knowledge by piecing together information across the region and starting to understand what the ecological cycle looks like on the ground.

Based on our studies and observations, we have learned what ecological succession means in the forests and across the prairies. By shifting our own perspectives as recreationists, homeowners, and decision-makers, we can encourage resilience in our communities, our forests, and our grasslands. By working with the natural processes that surround us, we can redesign, retrofit, and rebuild the environment we inhabit to react appropriately.

So, let's pick our battles, knowing we can't win the war on fire. The land we live on is dynamic — it grows, "dies," and grows again. Understanding the system and preparing for change might end up being the best and cheapest solution to the challenge of wildfire.