



As the snow melts and green starts to return to our forests, we are reminded of the cycles of the seasons. Near Wolf Creek Pass, the status of beetle kill forests also remind us of a deeper cycle that the forest knows intimately.

Seasons of Change

How spring represents a new time in our high elevation forests

WORDS AND PHOTOS BY MIKE REMKE

REBIRTH

As the days begin to lengthen, spring is a time where the mountains shed their snow covers and life is reborn. We recognize spring with the arrival of the first flowers of the season and the swelling of rivers. Spring is a symbol of birth as buds burst into leaves and flowers begin to decorate the landscape. Simultaneously, the songs of birds fill the forest as temperatures warm. Naturally, each season fits into a recognizable phase of annual cycles. These seasons are deeply familiar to all of us, their reliability so celebrated, often with some sort of ritual. The reality is: forests also experience and celebrate their own cycles.

CYCLES

Just as we recognize and celebrate the annual cycles of seasons, the plants of the forests are also deeply in tune with the dynamic realities of seasons and time their life cycles around them. And this is just one of many cycles that brings life to the forest. The trees of the forests are much older than humans, thus forests operate on cycles grander than most Western cultures can fully comprehend. At its core, the grandest cycle that humans can understand is that of life and death. Seasons are a microcosm of the cycle of life and death — where autumn brings senescence with fungi decaying what is left behind, and spring is the rebirth. For humans, a life cycle operates on a time scale of less than a

century — for forests, especially high elevation forests, the cycle of life and death is often three centuries or more.

Trees have a tendency to grow indefinitely until some external factor stresses them to death. It seems a tree could live for some infinite amount of time, though their life is still attached to some sort of cycle. For a high elevation forest in Southwest Colorado, deep snowpack carries a tree's life onward for some unforeseeable amount of time. We tend to marvel at the deep snowpack year after year, even in bad years, and continually admire the growth of the forest. Though, a hidden cycle of drought and other climate factors grip the fate of forests to a greater extent than our own awareness, one that oscillates at scales of centuries or longer.

CHANGE

Since the early 2000s, the greater San Juan Mountain region has spiraled into a prolonged series of droughts, partly associated with a climate phenomenon known as a Warm Pacific Decadal Oscillation, which often corresponds to warmer and drier conditions. For the forest, this often means higher stress, as well as increased mortality and change.

For those who have rambled around the San Juan Mountains for a while, change seems memorable — a once green forest on Wolf Creek Pass transitioned to brown and grey ghostly skeletons of trees. Bark beetles took advantage of warm winters and drought-stressed trees to grow their populations and advance on instigating dramatic alterations to the forest. These native beetles have always been part of our forested ecosystems, and while the scale of change witnessed today is entirely novel to our Anglo perspective, stories of tribes and ecology reveal a deeper understorey.

UNDERSTORIES

We often speak of seeing the forest for the trees, though, it's imperative that we also see the forest for the community. While these major changes occur and our eyes catch the dramatic change in the overstory, it's easy to forget to look down. As the sun penetrates through the openings of the forested areas altered by these deep cycles of time, the world comes to life in scenic and dramatic blooms. Wildflower, shrub and tree regeneration thrive in the forest understorey where light now arrives in greater quantities than before. In some ways, it seems obvious that the forest mortality does not instantly bring back a new forest, yet it's exciting to imagine that observing the transformation is like watching the birth of a forest.

Further, it is likely that observed forest mortality like what we are seeing is not fully unprecedented. There is mounting scientific evidence to share the deeper perspective that periodic drought facilitates wide scale forest disturbances and alterations, and that the ecology self stabilizes. Three-toed woodpeckers, as an example, thrive in beetle killed forests with their primary diet consisting of bark beetles. As their populations expand, they migrate to intact forests where bark beetles exist in smaller numbers. Perhaps the increased pressure of three-toed woodpeckers helps regulate beetle populations and preserve the forest. In so many ways, the ecology takes care of itself.

FUTURE GROWTH

While it seems easy to assume we know what we need to know, there is great uncertainty carrying forward. The extensive green of the forest's past serves as a memory. The vibrant understorey blooms and a rich bird habitat of the present tells us some of the future, but not all. Global change compounded by human activity brings with it a strong deal of uncertainty to keep the curious mind fed and the knowledgeable humble. At the end of the day, are you paying attention to the world and noticing changes in the cycles? 🌲

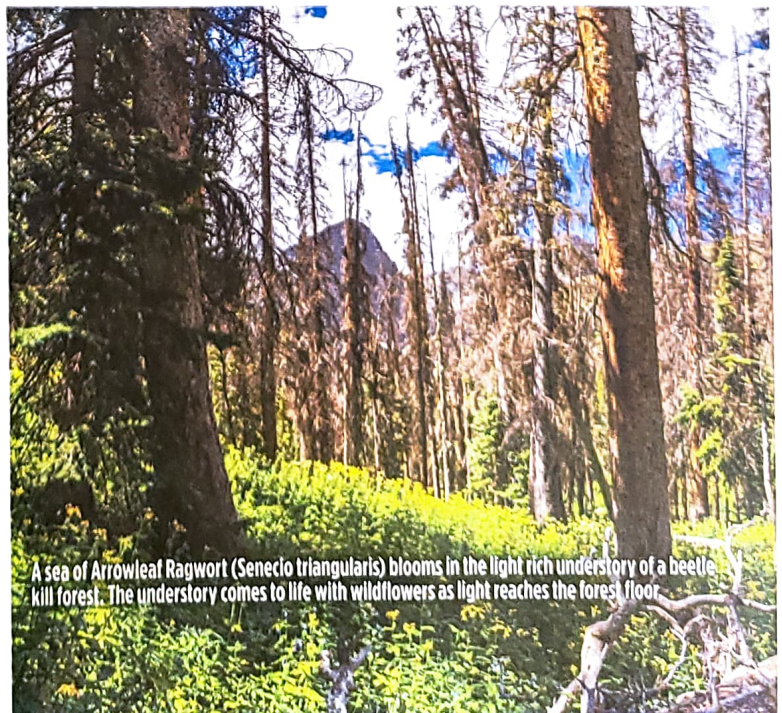
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A three-toed woodpecker feeds on bark beetles in a single downed, beetle kill tree. These native birds thrive in areas with beetle-based mortality and help set the stage to regulate populations.



An iconic Douglas-fir towers above spruce killed forests, a stark reminder that forests are dynamic and complex. This stately Douglas-fir is better adapted to drought than the surrounding spruce that are spiraling into mortality from drought and beetle attacks.



A sea of Arrowleaf Ragwort (*Senecio triangularis*) blooms in the light rich understorey of a beetle kill forest. The understorey comes to life with wildflowers as light reaches the forest floor.