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A Visionary Concept for a Carbon Conservation Corps (CCC)

A Win-Win Solution to Benefit Forest Restoration, Climate, and Youth Employment

The Problem:

- Forest ecosystems in the Western United States are in trouble. Western forests have become degraded as a result of suppression of natural fire regimes and a lack of forest management. An unnatural build-up of small diameter trees and brush has created a tinderbox in many forested areas that threatens even the large, mature trees, like redwoods, that have survived many wildfires.
- The acreage of forest that needs to be treated is vast, and disposal of the waste wood is expensive and has negative impacts on forest soil. When slash is burned in piles, it destroys the organic soil underneath, increasing the potential for soil erosion. Chipping and mastication create thick piles of material that can smother forest soils when left in place. Each of these methods produces additional greenhouse gas emissions.
- Every year, out-of-control wildfires are getting worse, requiring an ever-increasing workforce of trained firefighters, yet there are not enough young people being trained in firefighting and ecological restoration work. Meanwhile, many youth lack employment as they face a warming world. Some are experiencing a loss of hope.

The Solution:

- Biochar is defined as charcoal made from biomass. Including biochar in the solution set for managing forest biomass has benefits for forest soils, drought resistance, air quality, and avoided greenhouse gas emissions. Biochar also provides a mechanism for sequestering carbon in soils, removing it from the atmosphere for centuries to millennia.
- Biochar can be made in the woods as an alternative to destructive, smoky burn piles. Making biochar requires a simple steel container called a biochar kiln. The kiln burns cleanly with very little smoke and produces biochar rather than ash (Fig. 1). A source of water is required to extinguish the biochar. The resulting biochar can be easily used on-site for forest soil benefits, tree planting, and to achieve restoration objectives such as erosion control (Fig. 2).
- A nationwide Carbon Conservation Corps program would recruit youth to do this necessary restoration work in our forests, while also training them for essential firefighting jobs, and providing a sense of pride and satisfaction that they are helping to sequester carbon and fight climate change (Fig. 3).

Benefits of Biochar to Forest Health:

- Due to historic, natural wildfires, from 10-50% of the carbon found in forest soils is charcoal (Pingree 2012). Because of aggressive fire suppression in the last century, this charcoal component is often missing in the top layer of soil.
- Biochar increases soil carbon content and can improve soil health by binding toxic elements, and by improving and enhancing nutrient retention, nutrient cycling, and water retention. (Page-Dumroese, 2016). Biochar improves soil aggregate formation and water infiltration, and can be used to help revegetate and control erosion on vulnerable sites such as fire recovery areas on steep slopes (Petulo 2018). Biochar also sequesters carbon and has value for climate mitigation.
- Biochar promotes strong root growth in nursery propagation and helps with planting and establishing young trees.

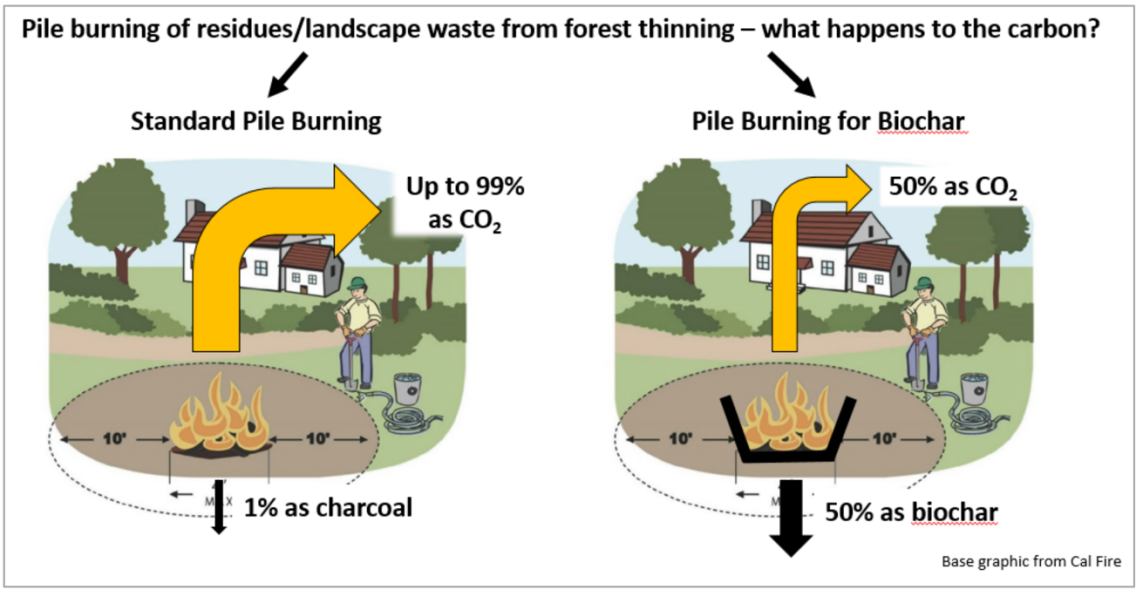

Figure 1. Burning in a biochar kiln instead of a standard burn pile converts half of the carbon in wood waste into biochar. Biochar lasts for thousands of years in soil, benefiting forest health and sequestering carbon.

Figure 2. Tree seedlings and many different forest plants benefit from biochar.

Figure 3. Above: On December 3, 2020, the California Conservation Corps made enough biochar in three hours of work time to sequester one ton of CO_2. The biochar will be used to help young redwoods grow in the Usal Redwood Forest. Below: the work continues in January, 2021.

References

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