



WESTERN INSTITUTE FOR STUDY OF THE ENVIRONMENT

W.I.S.E

33862 Totem Pole Road
Lebanon, OR 97355
<http://westinstenv.org>
541-259-3787

Mike Dubrasich, Executive Director
admin@westinstenv.org

February 5, 2010

W.I.S.E. White Paper No. 2010-2

The Benefits of Forest Restoration

By Mike Dubrasich

Restoration forestry aims to recover our nation's forest heritage while also restoring the productive and harmonious relationship between people and forests that existed in historic forests. Restoration forestry is a vision for the future rooted in respect for the past. -- Dr. Thomas M. Bonnicksen, Protecting Communities and Saving Forests--Solving the Wildfire Crisis Through Restoration Forestry.

FOREST restoration means active management to bring back historical cultural landscapes, historical forest development pathways, and traditional ecological stewardship to achieve historical resiliency to fire and insects and to preclude and prevent a-historical catastrophic fires that decimate and destroy myriad resource values.

Forest restoration is beneficial to man and nature in numerous ways. The following describes these benefits in general.

1. Heritage and history

To restore means to return to a former or original state. In the case of forests, restoration requires knowledge of and respect for forest history as a starting point. Forest restoration looks to pre-Contact forest conditions as a guideline.

Many (if not most) North American forests were at one time (prior to ~120 years ago) open and park-like, with widely spaced, large, old trees. Forests were conditioned to be that way by frequent, non-stand-replacing, anthropogenic fires. Historical human features included village sites; sacred and ceremonial sites; hunting, gathering, agricultural and proto-agricultural fields; extensive trail networks; prairies and savannas; and other features induced and maintained by ancient human tending through the use of traditional ecological knowledge.

Forest restoration, properly researched, designed, and implemented, restores, protects, and perpetuates many of the heritage features of forested landscapes.

2. Ecological functions including old-growth development

Our old-growth trees arose under much different conditions than today. The forest development pathways of pre-Contact eras were not punctuated by catastrophic stand-replacing fires but instead were the outcomes of frequent, seasonal, light-burning fires in open, park-like forests. Those fires were largely anthropogenic (human-set by the indigenous residents). Because the fires of historic eras were frequent and seasonal, they gently removed fuels without killing all the trees. The widely-spaced trees thus survived repeated burning and grew to very old ages.

As more and more forests have been investigated for actual age distribution, it has been discovered that “old-growth” forests, are not even-aged. Instead, many (if not most) older forests are distinctly multi-cohort. That is, forests often have two or more widely divergent age classes of trees. This fact tends to disprove the “stand replacement fire” theory, at least in regards to older forests. Their development pathways must have been different than that. It is now widely concluded that many (if not most) North American forests were at one time (120 to 500 years ago) open and park-like with widely spaced, large, old trees, and that forests were conditioned to be that way by frequent, anthropogenic fires. That is, the actual historical forest development pathways for many (if not most) of our forests involved frequent, light-burning fires, not stand-replacing fire.

Restoration forestry seeks to restore, maintain, and perpetuate historical forest development pathways that engender old-growth trees.

3. Fire resiliency and the reduction of catastrophic fires

Modern fires, especially those in dense thickets that are no longer managed by frequent, seasonal, anthropogenic fires, cause total tree mortality. No trees survive the infrequent holocausts, and so no trees attain old-growth status. In fact, modern fires routinely kill old-growth trees that withstood multiple fires in bygone eras. Modern fires, burning in dense, build-up fuel conditions, are severe and often convert heritage forests to more or less permanent brush fields.

By restoring thicket forests to their historical norm of open, park-like conditions, and in addition by restoring historical anthropogenic fire regimes, forests can be saved from catastrophic incineration and conversion to brush.

Forest restoration also seeks to restore, maintain, and perpetuate the historical patterns of prairies (meadows), and savannas (woodlands) that existed prior to Euro-American occupation. Those landscape features aid in control of wildfires and thus reduce the potential for catastrophic megafires.

4. Watershed functions

In the West, water is the most valuable and important commodity produced by our forests. Catastrophic fires can severely impact water production through direct pollution of waterways, soil degradation, and post-fire erosion and sedimentation.

Through the maintenance of continual vegetative cover, and at the same time the near elimination of catastrophic fire, forest restoration protects, maintains, and perpetuates beneficial hydrologic functions including safeguarding soils and providing water of quality and quantity (by reducing flash flooding and extreme winter runoff and increasing minimum flows in late summer).

5. Wildlife habitat

The dense forest thickets that have arisen following the elimination of traditional anthropogenic fire have minimal wildlife diversity. Further, the fuel-laden conditions invite severe fires that eliminate old-growth and impact populations of old-growth associated wildlife species, such as Northern Spotted Owls.

It is now recognized by a wide spectrum of forest scientists and wildlife ecologists that uncharacteristic fuel loadings lead to catastrophic disturbance events and those severe disturbances are detrimental to the protection of listed threatened and endangered species.

Restoration forestry is an active management program that is sensitive to and protective of a diversity of wildlife, including listed species and their preferred habitats.

6. Public health and safety

Severe fires produce unhealthy amounts of smoke with particulates and gases that cause respiratory distress in communities far from the actual fires. Severe fires also are difficult to contain and control. They often escape from public forests and burn ranches, farms, homes, and commercial properties, sometimes invading cities dozens of miles away from ignition points.

Forest restoration removes uncharacteristic and a-historical fuel build-up and promotes light-burning ground fires instead of severe canopy fires. Fires in restored forests produce less smoke over shorter durations and are easier to contain and control. Thus forest restoration mitigates public health and safety hazards.

7. Biomass energy

Fuels removed through restoration forestry treatments may be transported to biomass energy facilities. There they can produce clean and renewable energy rather than going to waste (and devastation) in catastrophic wildfires.

8. Carbon sequestration

Carbon dioxide emissions from forest fires amount to more than half of all human-caused emissions in most Western states in most years. Forest restoration reduces catastrophic fire and thereby reduces CO₂ emissions, potential and actual. To the extent that biomass removed from forests is converted to wood products, that carbon is sequestered long-term (for the life of the product).

9. Jobs and the economy

Forest restoration is active management that produces jobs in the woods and in various mills and facilities. Forest-dependent and compatible industries such as recreation also benefit. The reduction in cost-plus-loss from catastrophic forest fires also indemnifies local and regional economies. Economic multiplier effects expand the plethora of beneficial economic impacts, including tax revenues. Forest restoration pays for itself many times over.

There are more specific benefits from restoration forestry that are not mentioned above but are covered by the general categories listed. Scenery and aesthetic beauty, for instance, are also protected and enhanced by forest restoration.

We have attempted to list the main benefits of forest restoration in a short and concise manner. Longer explications are available, either online at W.I.S.E. or in our extensive forest restoration database. Requests for that information are appreciated.

References

Bonnicksen, Thomas M. 2000. America's Ancient Forests-From the Ice Age to the Age of Discovery. John Wiley and Sons.

Bonnicksen, Thomas M. 2007. Protecting Communities And Saving Forests-Solving the Wildfire Crisis Through Restoration Forestry. Published by the Forest Foundation.