Managing Pinyon Ecosystems As Nut Groves

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Pinyon trees, foundation species

Pinyon trees are the dominant overstory species on 36 million acres in the southwestern United States.

Colorado pinyon (*Pinus edulis)* and singleleaf pinyon (*Pinus monophylla*) are the most abundant species.

Once considered weeds by range ecologists, millions of pinyon trees were removed from the best growing sites between 1950 and 1980.

Ecologists now recognize pinyons as foundation species in pinyon-juniper ecosystems. Foundation species stabilize local environmental conditions, and their removal has serious negative impacts on biodiversity and ecosystem health.

An ecosystem at risk

During the 20th century, fire suppression and intense grazing created dense thickets of pinyon trees in landscapes that were once much more open wooded savannahs.

In the 1990s and early 2000s, drought and insects killed millions of pinyon trees across the Southwest, leaving the remaining trees vulnerable to wildfires.

By managing pinyon ecosystems as nut groves, land managers can restore these degraded landscapes to healthy conditions, reducing fire risk and contributing to local rural economies.

Pine nuts, the forest's pulse

"With the pinyon crop you can see the pulse of the forest. The year after the pinyon, you should see the mice. Then the coyotes. Then the raptors. It comes in a huge pulse, and it all goes back to the pinyon." (Pine nut gatherer)

Pine nuts, which are botanically seeds, are the means by which pinyon trees reproduce. Their seeds are too heavy for the wind to carry, so pinyons depend on birds, rodents, and humans for seed dispersal.

The seed production cycle varies from 3 to 10 years, depending on the species, growing site, and climatic conditions. Large seed crops occur about every 4 years for singleleaf pinyon and every 7 years for Colorado pinyon.

People and pine nuts

In the American Southwest, pinyon trees and people have co-evolved for 10,000 years. Pine nuts are sacred to indigenous societies of the southwestern United States and are an integral part of Hispano culture.

Indigenous peoples managed the Southwest's pinyon forests as nut groves, selectively removing trees with poor nut crops and clearing vegetation to reduce fire risks.

Restoring pinyon ecosystems

Steps that land managers can take toward restoring pinyon ecosystems include:

1) Developing management approaches that build on indigenous management traditions

2) Creating two-way information sharing networks with pine nut harvesters and buyers

Step 1 - Best management practices

Selective thinning - Pinyon trees in mixed aged stands will produce more nuts if they are spaced far enough apart for their crowns to develop fully.

Pruning — Pruning the pinyon tree's lower branches reduces the likelihood of fire damage.

Weeding — Removing shrubs from around pinyon trees reduces ladder fuels, reducing the risk of fire damage.

Fertilization – Adding fertilizer, especially nitrate nitrogen, enhances nut production.

Irrigation – Shallow contour ditches are a low-cost, low-impact way to channel additional water to individual trees, thereby enhancing nut production.

References

Aldron, E. F. and D.W.Shaw, editors. 1993. *Managing pinyon-juniper ecosystems for sustainability and social needs: Proceedings of the symposium, Santa Fe, NM, April 26-30*. General Technical Report RM-236. USDA Forest Service, Fort Collins, Colorado.

Anderson, M.D. 2002. Pinus edulis. In: *Fire effects information system* [Online database]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/

Floyd, M.L. (editor) and D.D. Hanna, W.H. Romme, and M. Colyer (technical editors). 2003. *Ancient pinon-juniper woodlands: A natural history of Mesa Verde country*. University Press of Colorado: Boulder, Colorado.

Lanner, R.M. 1981. *The Pinon pine: A natural and cultural history*. University of Nevada Press: Reno, Nevada.

McAvoy, D. 2006. Pine nuts: A Utah forest product. *Utah Forest News* 10(4):1-3. http://extension.usu.edu/forestry/Reading/Assets/PDFDocs/UFN/UFN1004.pdf

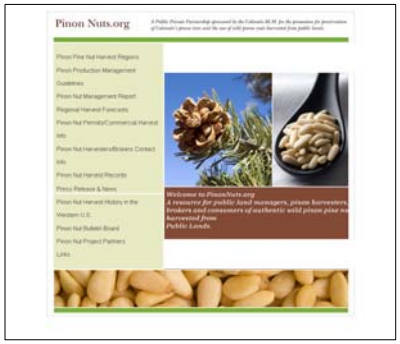
Nabhan, G.P., M. Coder, and S.J. Smith. 2004. *Woodlands in crisis: A legacy of lost biodiversity on the Colorado Plateau*. Bilby Research Center Occasional Papers Number 2. Northern Arizona University: Flagstaff, Arizona.

Pilz, D., H. Ballard, and E.T. Jones. 2006. *Broadening Participation in biological monitoring: Handbook for scientists and managers*. General Technical Report PNW-680. USDA Forest Service, Portland, OR.

Step 2 – Integrating local knowledge

Many harvesters and buyers have extensive knowledge of pinyon-juniper ecosystems, but their knowledge rarely makes its way into public land management decisions.

In 2007 the Colorado Wood Utilization and Marketing Program sponsored an experimental interactive website, www.pinonnuts.org, to encourage information sharing between pine nut buyers, harvesters, and land managers.



Pinonnuts.org provides information about harvesting sites, decreasing the time and money harvesters spend on scouting out gathering areas. Additonally, it is a virtual marketplace, connecting buyers and harvesters with each other.

The website also connects harvesters and buyers to public land managers, fostering relationships based on mutual trust. A long term goal of the project is to encourage the development of participatory inventory and monitoring programs.

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Photos by Steven Baskauf located at Bioimages. www.cas.vanderbilt.edu/bioimages/frame.htm Accessed September 21, 2007.