



Colorado pinyon seeds
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Partners:

Bureau of Land Management (Colorado State Office) - Colorado Wood Utilization and Marketing Program - Institute for Culture and Ecology - Goods from the Woods

The Pine Nut Management Project is part of a larger endeavor called *Beyond Firewood and Fence Posts: Exploring and Expanding the Commercial Potential of Colorado's Pinyon-Juniper Woodlands*.

Beyond Firewood and Fence Posts is a partnership between the Bureau of Land Management (BLM) and the Colorado Wood Utilization and Marketing Program (CO Wood) to search for enhanced and increased commercial opportunities for woodland products. Learn more about the efforts and outcomes of this partnership at www.colostate.edu/program/cowood.

Photos in this report by Penny Frazier unless otherwise noted.

Pinyon Trees — Foundation Species for Pinyon-Juniper Ecosystems

Pinyon trees are the dominant overstory species on more than 36 million acres of land in the southwestern United States. These short, twisted trees with large branching crowns live in association with more than 1000 species of microbes, plants, insects, birds, and mammals.

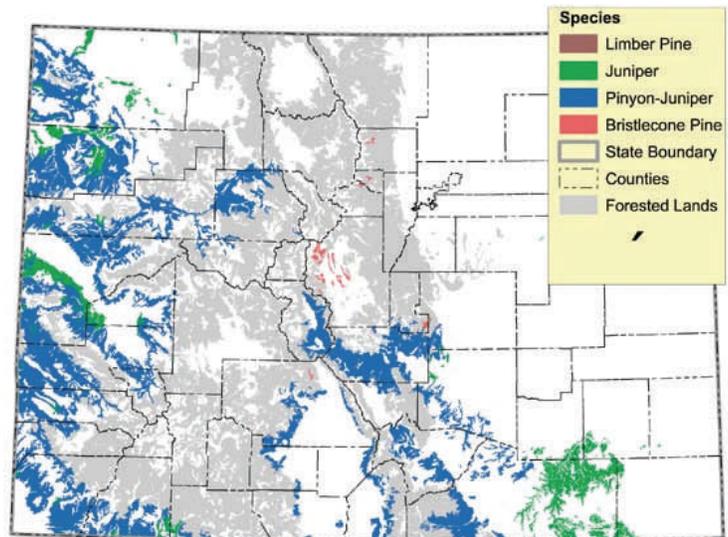
The two most abundant species of pinyon are the Colorado pinyon (*Pinus edulis*), found in New Mexico, Arizona, Colorado, and eastern Utah, and the singleleaf pinyon (*Pinus monophylla*) which grows primarily in Nevada and western Utah. Colorado pinyon trees are widely distributed throughout Colorado, where pinyon-juniper woodlands cover more than 4.8 million acres.

Once considered weeds by rangeland ecologists and removed by the millions from the best growing sites in the Southwest between 1950 and 1980, pinyons are now recognized as foundation species in pinyon-juniper ecosystems.

Foundation species stabilize local environmental conditions in ways that permit numerous other species to thrive. The removal or death of a large percentage of a foundation species population leads to rapid loss of biodiversity and serious negative impacts on the ecosystem's overall health.

A century of fire suppression and overgrazing created abnormally dense thickets of pinyon trees on sites that were unaffected by mid-20th century pinyon clearing programs. A prolonged drought during the 1990s increased the vulnerability of these trees to insect attacks, leading to the death of large numbers of pinyon trees in Colorado, New Mexico, and Arizona during the early 2000s. These dead trees, as well as the remaining live pinyon trees, are now at extreme risk from wildfires.

Management approaches that facilitate the restoration of healthy pinyon stands in the face of global warming are badly needed. One approach is to manage pinyon-juniper ecosystems as nut groves rather than as grazing lands. This report briefly lays out what a pinyon nut-focused management system might look like.



Source: Colorado State Forest Service. 2002.

Pine Nuts — The Forest's Pulse



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Female pinyon cones

“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.” (Pinyon nut gatherer)

Pine nuts, which botanically are seeds rather than nuts, are the means by which pinyon trees reproduce themselves. Because their seeds are too heavy for the wind to carry, pinyon trees depend on vertebrates, such as jays, rodents, and humans, for seed dispersal. Seed predators avidly seek out pinyon nuts, which are extremely rich in proteins, carbohydrates, and fats.

Birds such as the pinyon jay and Clark’s nutcracker disperse the vast majority of each year’s seed crop, caching the seeds in numerous surface sites over a large area. Packrats, squirrels, and other rodents, which cache pinyon seeds deeper underground, play a lesser, but still important, role in pinyon reproduction. The seed production cycle for Colorado pinyon varies from 4 to 10 years, depending on climatic conditions. In practice, this means that very large seed crops occur about every 7 years.

People and Pinyon — A Longstanding Positive Relationship

Pinyon seeds, which are also known as pinyon or pine nuts, have a complete complement of amino acids, and will store for years in the Southwest’s dry climate. For millennia, sedentary agriculturalists of the Colorado Plateau and hunters and gatherers in the Great Basin depended upon pine nuts for survival.

Pinyon trees and pine nuts are sacred to all of the indigenous societies of the southwestern United States and are an integral part of Hispano cultural traditions. In North America, indigenous peoples nurtured pinyon nut groves by weeding vegetation from around pinyon trees, and pruning away lower branches to reduce the risk of fire.



Colorado pinyon nuts

The Pine Nut Industry — A Thriving 21st Century Business

Humans have traded pine nuts for centuries, if not millennia, and a thriving trade in locally harvested pine nuts exists throughout the Southwest. In national and international markets, Southwestern pine nuts struggle to compete with cheaper pine nuts imported from China (*Pinus koreaiensis* and *Pinus sibirica*) and the Mediterranean (*Pinus pinea*).

Demand for imported pine nuts increased steadily from 1989 to 2006, and it is likely to continue rising. Demand for pine nuts harvested in the Southwest increased at the same time. Pine nut brokers in northern New Mexico, the heart of the U.S. pine nut harvesting grounds, note that yearly demand for locally harvested pine nuts always exceeds available supplies. Lack of labor is the key challenge to expanding the Southwestern pine nut market. Picking pine nuts is hard, sticky work, and a decade of drought and small nut crops has decreased the number of people who are willing to pick commercially.



Source: USDA-Foreign Agricultural Service imports database.
www.fas.usda.gov/ustrade

Allocating Access to Pine Nut Harvesting Sites (BLM and US Forest Service)

The BLM and the U.S. Forest Service assign pine nut harvesting activities to one of three categories according to the amounts harvested and whether and how much of the product is harvested for commercial exchange.



Pinyon cones

Incidental use: Incidental use is the harvesting of pine nuts for personal consumption that day. No permits are required for incidental use.

Personal use: Personal use is the harvesting of small amounts of pine nuts for non-commercial purposes. The BLM and the U.S. Forest Service generally do not require harvesters to obtain a permit for personal use pine nut harvesting. Personal use limits vary from 25 pounds per year on BLM and Forest Service lands in Nevada and western Utah to 75 pounds per year on most BLM and Forest Service lands in Colorado and northern New Mexico.

Commercial use: Commercial use permits are required for amounts exceeding the personal use limit (even if the picker does not intend to sell the nuts). Permit prices vary from 20 to 25 cents per pound. In Nevada and western Utah, the BLM and the U.S. Forest Service allocate access to pine nut harvesting sites through a combination of sealed bid and standard commercial permits. Auctions are used in areas where intense competition exists for commercial harvest and where a competitive bid system will result in higher revenues for the agencies. An important change since the mid-1990s is that the BLM in Nevada has closed some areas to commercial harvest at the request of Native American groups with traditional claims to those sites.

Best Management Practices for Nut Production

The simplest approach to managing pinyon-juniper ecosystems for pine nut production is to incorporate nut production enhancement activities into on-going management of wild pinyon stands. A list of recommended best management practices is provided below. All these activities are compatible with fuels reduction objectives.

1) Selective thinning—Pinyon trees growing in mixed-aged stands on flat ground with deep soils will produce more nuts if they are spaced far enough apart for their crowns to develop fully.

2) Pruning — Pruning the pinyon tree's lower branches reduces the risk of fire damage to nut-bearing trees.

3) Weeding — Removing shrubs from around the base of the pinyon tree eliminates ladder fuels and reduces the fire risk.

4) Fertilization -- Applying fertilizer, especially nitrate nitrogen, stimulates cone production.

5) Irrigation — Shallow ditches that direct small but critical amounts of water to individual trees are a low-cost, low-impact way to enhance nut production.



Candidates for more active management

Next Steps—Building Capacity for Pine Nut Management

Integrating local and traditional ecological knowledge with scientific management — A first step in understanding how to manage for healthy pinyon-juniper ecosystems is to develop partnerships with harvesters and brokers likely to have ecological knowledge useful for producing and maintaining healthy pinyon groves.

Regional pine nut crop forecasting — From 1938 to 1948, the U.S. Forest Service distributed yearly pine nut crop forecasts to buyers throughout the Southwest. Today's land managers could establish a regional web-based crop forecasting system. Eventually the website could include other landowners, such as state land offices and private landowners. This site would provide information about the location of cone-bearing pinyon trees and yield estimates for that year's pine nut harvest.

Participatory inventory and monitoring — Many pine nut pickers and buyers have difficulty obtaining information from land managers about the location of nut bearing trees and their age and yield characteristics. Land managers lack information about the extent and impacts of pine nut harvesting on the lands they administer. Participatory inventory and monitoring systems involving partnerships between land management agencies, harvesters, and other interested stakeholders could help fill these information gaps.

Gathering and disseminating this information will improve the viability of both the household consumption and commercial pine nut sectors. It will also provide land managers with a much better understanding of the overall reproductive health of pinyon populations. Putting into place such a tracking system will help all interested stakeholders better measure the pulse of pinyon-juniper forests.

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