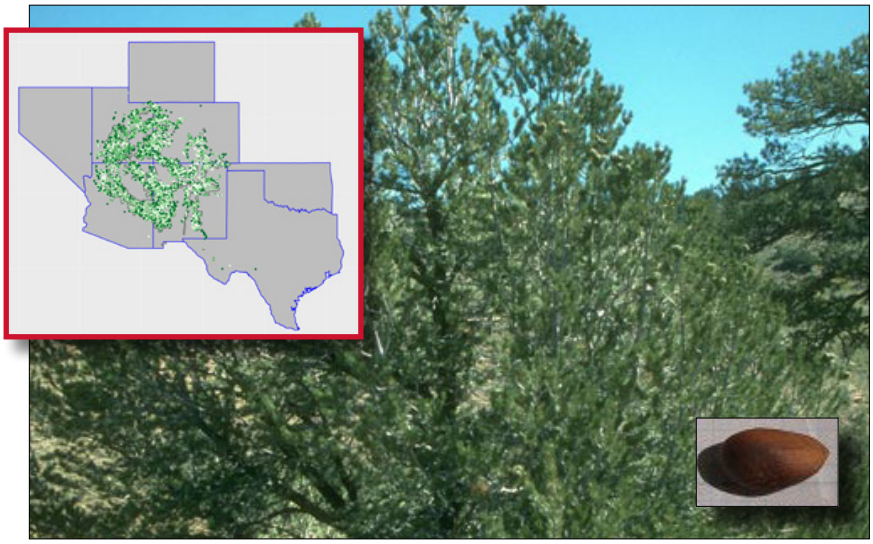
NTFPs from Trees: Nontimber Forest Products that Support our Society and Economy

PINYON PINE

Product: Pine nuts
Plant parts used: Seeds

Pinyon pine (*Pinus edulis* Engelm.) is a long-lived, drought-tolerant tree common throughout the Southwestern United States. The pinyon-juniper forest type is generally located on rocky plateaus and lower mountain slopes. It is typically found at elevations 4,500–6,000 feet above sea level. Forests in which pinyon pine is the major pine species cover close to 40 million acres primarily in Arizona, Colorado, New Mexico, and Utah (shown in green on the map below).



Key Points

- The principal contemporary use of pinyon pine is for food. Pine "nuts" are the seeds from trees, which can produce for hundreds of years.
- There is a multi-million-dollar global market for pine nuts; the United States is a net importer.
- In recent years, there has been a negative trend in overall change in cubic feet per acre of pinyon pine.
- Management of pinyon-juniper woodlands entails wildfire management, grazing, and control of invasive species and grassland invasion.
- Large-scale mortality of pinyon pine is expected as climate change impacts increase.

Nontimber Uses

- Native Americans depended on pinyon pine nuts for survival, especially during the winter when food was scarce. Pinyon pine is a cultural keystone species for Tribes of the Southwestern United States.
- In the mid-1800s, charcoal made from pinyon wood fueled smelters to process silver mined in the Southwest.
- Pinyon pine has been a staple Christmas tree in States with large pinyon-juniper forests.
- Pinyon pine nuts are delicacies. They contain about 20 amino acids, high levels of iron and vitamin A, and >2,800 calories per pound. Consumption can contribute to livelihood and food security.

Markets

- In the late 1980s, >1 million pounds of seed were harvested each year by commercial operators. There is little current information about annual harvest amounts.
- In 2004, the U.S. market for pine nuts was reportedly valued at about $100 million.
- Commercial importance of pine nuts is underestimated, so pinyon woodlands are not managed for pine nuts. 80 percent of pine nuts consumed in the United States are imported.
- The average annual value of imported pine nuts for the years 2009–2013 was approximately $25 million. Over the same period, the United States exported an estimated $922,000 annually.
- Pine nuts are one of the most expensive nuts on the market, with prices in 2004 ranging from $10–16 per pound.

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Next page TOP TO BOTTOM: USDOI National Park Service; USDA Forest Service.

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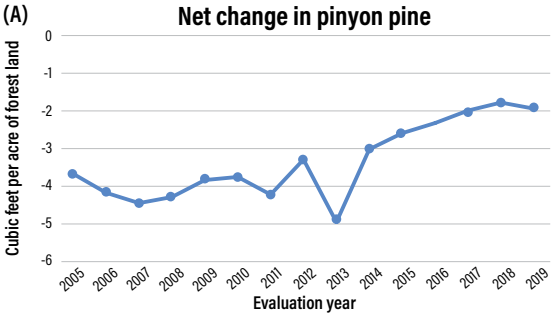
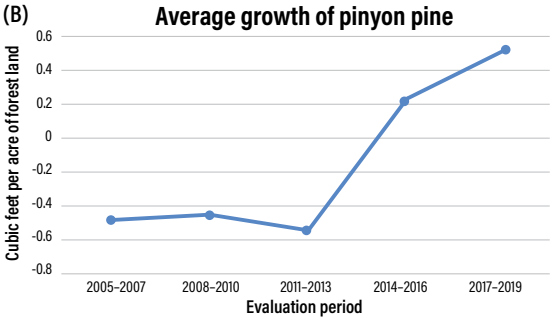
(A)



(B)



Status[a]

- According to Forest Inventory and Analysis (FIA) data, the estimated number of pinyon pine trees per acre ranged from approximately 6[b] (Nevada) to 130[c] (Colorado) in the 2019 evaluation year.
- Estimated net change (i.e., difference between growth and sum of mortality and removals) was negative across all States in their latest evaluation year. Arizona had the greatest negative net change (-3.33 cubic feet per acre), while Utah had the lowest negative net change (-0.83 cubic feet per acre).
- In general, the negative net change has been decreasing and trending toward zero over the years (see chart [A]).
- There has been a positive trend in estimated growth over the years examined (2005–2019). Although negative during the first three periods, estimated growth was positive in the latter periods (see chart [B]).

[a] Estimates are based on observations of at least one specimen of the species in an inventory plot (representing about 6,000 acres of forest land). They are not based on all forest land for the State.

[b] At 68-percent confidence level, standard error is ± 0.0 percent of estimate, indicating that there is only one data point.

[c] At 68-percent confidence level, standard error is ± 3.73 percent of estimate.

Management and Implications

- Pinyon pine trees reach cone-bearing age at around 25 years when the trees are 4–9 m tall. Seed cone production is highly correlated with late summer temperatures at the time of initial cone formation.
- A good stand of pinyon pines can produce about 400 pounds of seed per acre, but seeds are not produced in large quantities until the tree is 75–100 years old.
- Pinyon pine is shade intolerant and does not compete well with grasses. Disturbance, especially fire, is needed for the forest type to flourish.
- Higher temperatures and lower precipitation associated with climate change could cause shifts in species composition, structure, and distribution of pinyon-juniper woodlands; greater infestations from the pinyon Ips beetle (*Ips confuses* LeConte); and large-scale mortality.
- Long-lived mast species like pinyon pine have shown decline in cone production from 1970s to the 2000s in New Mexico and northwest Oklahoma.
- Additional analytical methods may be needed to capture regional ecological variations in discrete populations.

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