

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PGPIN04020

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Pinus aristata*

COMMON NAME: Rocky Mountain bristlecone pine, bristlecone pine, hickory pine, Colorado bristlecone pine; foxtail pine

SYNONYMS: *Pinus balfouriana* var. *aristata*

FAMILY: Pinaceae

AUTHOR, PLACE OF PUBLICATION: Engelm, American Journal of Science, ser. 2, 34: 331. 1862.

TYPE LOCALITY: LT: Rocky Mountains, Colorado, USA, July 1962.

TYPE SPECIMEN: LT: MO, C.C. Parry s.n., July 1962.

TAXONOMIC UNIQUENESS: The species *aristata* is 1 of 55 in the genus *Pinus*. *Pinus longaeva* formerly included by NatureServe, is now considered by Kartez (1994 checklist) to be a separate species, and is found in Utah, Nevada and eastern California. Some botanists treat these two species as populations of a single species, *Pinus aristata*. According to Ahlenslager (1986), "Bailey designated the western populations of bristlecone pine as *Pinus longaeva* D.K. Bailey (Great Basin bristlecone pine = Intermountain bristlecone pine) and reserved the older name of *P. aristata* Engelm. (Rocky Mountain bristlecone pine) for the eastern populations. *Pinus balfouriana* var. *aristata* (Engelm.) Engelm. is included in *P. longaeva*. Greta Basin and Rocky Mountain bristlecone pines differ in several important characteristics: chemistry, needle structure, and cone morphology. The Colorado-Green River drainage has separated them for millions of years, and crosses between the two species are relatively unsuccessful. Today they are separated by 160 miles (260 km)."

DESCRIPTION: A small monoecious tree of high elevations, reaching a height of 15 m (49 ft) or less and up to 0.76 m (2.5 ft) in trunk diameter under favorable conditions but remaining shrub like on exposed windy ridges. The branches of younger trees are horizontal to ascending, forming a dense, spreading crown, branching of older trees tending to form a more irregular crown with upper limbs ascending and lower limbs usually deflexed. The twigs are orange-brown to dark gray, glabrous to puberulent. Bark of younger trees grayish-white and smooth, the older bark shallowly and irregularly fissured, scaly and reddish-brown. The wood is soft, moderately heavy and brownish red. The needles are numerous and densely crowded in fascicles of 5, stout, mostly 2.5-5 cm (1-2 in) long, somewhat appressed, tending to be crowded towards the younger end of

branches, narrowly linear, stiff, curved, dark green, shiny, 3-angled, and pressed against the twig not spreading out, remaining attached 10-15 years and forming brush like or "foxtail" masses along the ends of the branches. The adaxial faces glaucous-whitened, the abaxial surface frequently marked by conspicuous, often whitish, granules of resinous material; sheaths persistent. The seeds are ovoid, flattened, light brown with darker mottling, 5-8 mm long with a, light brown terminal wing about 3 times longer than the body of the seed. The male cones are short, 1-1.2 cm (0.4-0.5 in) long, oval, dark orangish-red, often clustered near the tips of the branchlets; female cones, occurring singly or in pairs, near the ends of the branchlets. Ovulate cones are a dark purplish-brown, 6 to 9 cm (2.3-3.5 in) long, ovoid, short-stalked, the scales thick with long, bristle like, incurved prickles nearly ¼ inch long.

AIDS TO IDENTIFICATION: Resembles *Pinus balfouriana* but its needles remain on the branches even longer. On trees of the central Rockies, tiny droplets of gray resin mark needles and cones. Another species *P. longaeva* lacks these resin droplets. The long, hooked spines on the cone scales are distinctive for this species and the Intermountain Bristlecone Pine. However, the ranges of the two species do not overlap, and are separated by 160 miles (260 km).

ILLUSTRATIONS: Color drawing (Brockman, 1986)
Brown and White Drawing (Elias, 1980)
Color photos (Missouri Botanical Garden in http://mobot.mobot.org/cgi-bin/search_vast)
Color photo (Colorado Springs Utilities in <http://www.scu.org/cgi-bin/xeri/Xeriinclude?Xeridetail?PIS-pat>)
Color photo (W.K. Wagner, in PLANTS Database <http://plants.usda.gov>)

TOTAL RANGE: Colorado, New Mexico and Arizona, in high mountains near timberline.

RANGE WITHIN ARIZONA: San Francisco Peaks, Coconino County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Evergreen tree.

PHENOLOGY: Initiate flower and vegetative buds during late July and early August. The buds continue to develop through mid-September. Hardening off begins in late September and is completed by about mid-October. These buds remain dormant from October until the end of May. The time span from flower bud initiation to mature seed covers about 26 months. Another nine months are required before the seed develops into a young plant. The seed has to wait until both temperature and moisture are adequate for germination, usually about one week after the first good rain in July.

BIOLOGY: Short, 90-day growing seasons and low temperatures contribute to the slow growing nature of these trees. According to Elias (1980), these pines are of limited value to wildlife, and White-crowned sparrows, solitaires, and Clark's crows feed on the seeds and occasionally used the trees for cover. This tree is intolerant of dense shade and is replaced by competition with more tolerant spruces and firs. According to Schubert (1971), in its natural habitat, bristlecone pine helps build soil, ameliorates inhospitable environments and has ecological significance to both plant and animal associates.

HABITAT: High mountains near timberline in open grassy stands or in Douglas- and spruce-fir forests. In New Mexico it is dry and rocky. According to Ahlenslager (1986), "The Rocky Mountain bristlecone pine series occurs on cold, dry sites at high elevation in pure stands or with limber pine. It grades into Engelmann spruce and subalpine fir at lower elevations."

ELEVATION: 8,900-11,500 ft (2712-3505 m), according to AGFD HDMS unpublished records (accessed 2002).

EXPOSURE: In Colorado and New Mexico, usually on rocky outcrops of southern and southwestern slopes with limited soil, intense sunlight, and rapid runoff. In Arizona, it is found on south-facing ridges and talus slopes. (Ahlenslager 1986).

SUBSTRATE: Occurs most often on igneous and volcanic substrates.

PLANT COMMUNITY:

POPULATION HISTORY AND TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:

STATE STATUS:

Salvage Restricted (ARS, ANPL 1999)

OTHER STATUS:

MANAGEMENT FACTORS:

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: USFS - Coconino National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION:

The Ancient Bristlecone Pine Forest Botanical Area within the Inyo National Forest, California, contains trees as old as 4,600 years, the oldest known dated trees, as well as logs more than 2,000 years older.

Bristlecone pine, named for the prickles on the cones, has an unusual, scattered distribution on widely separated high peaks in six states. As the trees are small, uncommon, and not accessible the wood is seldom used.

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