BRISTLECONE PINE NATURE NOTES

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The Bristlecone Pine is widely distributed here at Bryce Canyon National Park. Recent newspaper and magazine articles have made the general public aware of this unique and scientifically valuable tree. Therefore, in attempt to answer some of the questions that the park visitor might ask you, I have herein attempted to provide the ranger staff with an interpretive guide to the Bristlecone Pine.

Since there is presently a lack of solid scientific information concerning the Bristlecone Pine in the Bryce Canyon library most of the information that I am presenting you is from memory. No doubt, the information contains many inaccuracies and ommissions. I take full responsibility for any errors or misleading statements herein included. If any misleading information is discovered please bring it to my attention so that the proper corrections can be made. Hopefully, when additional information is obtained, a more comprehensive and accurate information sheet will be produced.

Norman B. Smyers

The Bristlecone Pine is recognized as the oldest living tree species, and the oldest living form of life. Claims have been made to the contrary, words to the effect that there is a bush in Mexico, China, or whereever that is older. None of the claims have been, to my knowledge, scientifically substantiated.

The formal name for the Bristlecone Pine is Pinus aristata Engelmann. There has been a recent attempt to create two Bristlecone species, the California-Great Basin variety called Pinus aristata, and the Colorado form being known as Pinus longavea. However, as far as I know, this taxonomic distinction is not formally recognized, and therefore, the tree should be referred to as Pinus aristata.

The ancestors to the modern Bristlecone can be traced back 27 million years to Pinus aristata cressi. This fossil representative first noted from Colorado. It does appear that the Bristlecone were more widespread in the past. But due to drying conditions across the west they became more restricted in their occurance. This later situation also effected the other major species of pine as well. Also, there is good evidence that the pinyon pine evolved from the Bristlecone family about 20-25 million years ago.

The Bristlecone Pine is today found from extreme eastern California, across the Great Basin of Nevada, through Utah, and to the crest of the Colorado Rockies. Groves of Bristlecone are also found in northern Arizona and New Mexico. The oldest trees are those found in the Great Basin of Nevada and in the White Mountains of California. The trees in Utah, Arizona, New Mexico and Colorado are considerably younger. Many of the White Mountain and Great Basin trees are in excess of 4,000 years of age, the oldest; the "Methuselah" tree in the White Mountains is 4,900 years old and still alive.

The trees of the other states range between 1000 - 3000 years of age however, most do not exceed 2,000 years of age.

The Bristlecone Pine throughout its distribution is generally found at high elevation, above 8,000 feet (usually above 10,000 feet); growing on limestone or dolomite (alkaline soils); on dry and exposed sites. Within Bryce Canyon National Park these patterns of preterrential growth can be seen. The Bristlecone in the park are most common in the limestone layers or along the exposed rim areas and ridges. The trees within the park are much different from those found elsewhere, tall and slender, not squat and many branched as found at Cedar Breaks, across Nevada, and in the White Mountains.

According to rumor, it seems the oldest Bristlecone in the park are 1,200 - 1,600 years of age. These trees are at Bryce and Rainbow Points. It is near impossible to give the age of a Bristlecone without either coring it, or cutting and sectioning it. Most trees begin to produce cones after twenty to twenty-five years of age, but then again, a tree might not bear cones every year, particularly if environmental conditions were unfavorable.

Perhaps the most asked question about the Bristlecone Pine is: "Why do they live so long?" Although the entire truth of the matter is not yet know, several ideas with substance have been put forth, and they are as follows:

(1) The trees growing at high elevations, and on dry, poor growth sites face little competition from other trees and plants. Additionally, the sparse ground cover in these places preclude damage from unchecked fires.

(2) The wood and bark of the tree is possessed with a tremendous amount of pitch and resin. Thus the tree has a built in preservation system. The pitch and resin repells bark boring beetles, inhibits fungal growth, and retards natural decay and decomposition. In the White Mountains some Bristlecone wood has been lying on the ground for as long as 1,500 to 2,000 years.

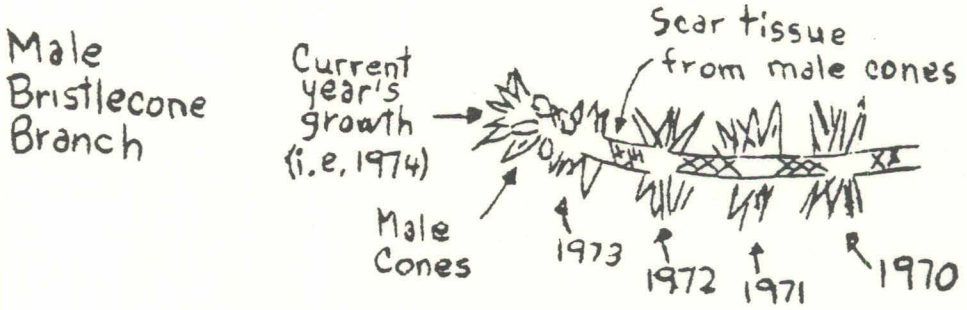
(3) The species has a trememdous ability to adjust to environmental stress. In bad growth years it will not add new wood, and the needles produced during poor growth periods will be shorter than normal (look for short bunches of needles among longer ones).

(4) As a tree grows older and becomes unable to substain its entire needs it will die back. Many times ninety percent of a tree may be dead, only a few live branches may be found supported by narrow strips of bark running to the remaining live roots.

(5) The roots form a shallow but broad system that gather water from a large area.

Branches are of separate sexes. Female branches have the seed cones - purple when one or less years old; dark green second season; brown and open cones appear the third and fourth seasons.

The male cones appear toward the end of the branch. The male cones are small and red, often dispensing yellow pollen when tapped. Since each year's branch growth occurs at the branch end, the new needles must be added beyond the male cones. Scar tissue may then be found between the needle growth sites of each successive year. Therefore, one can count the age of the needles by counting back from the end of the branch, each group of needles representing a different year.



This is sometimes difficult and impossible to do. And as a result, don't be discouraged if you fail to the first several times.

The record needle retention for Bristlecone Pine is 41 years. The average for other pines are four to seven years. This is an advantage because much energy is expended in needle production. So the longer the needles remain on the tree, the more efficient the food production system becomes.