



March 18, 2010

Eye on the Environment

Rocky Mountain Juniper

By Steve Lamar

While walking along the Swan River last week, I observed several Rocky Mountain juniper trees growing within a few feet of the river's edge. This particular tree species has always been a bit of a puzzle to me.

At first glance, several aspects about the Rocky Mountain juniper seemingly do not quite add up. It is generally classified as a dry site tree species, yet here in the Swan Valley it is often found in riparian areas bordering streams and ringing various types of pothole wetlands.

The other puzzling observation is that Rocky Mountain juniper seedlings and saplings are very scarce. During my many years of doing forest stand exams and stocking surveys for the USFS, I came across only a handful of Rocky Mountain juniper seedlings. I thought that was odd when other tree species at these sites regenerated, often prolifically. Intrigued, I decided to track down some answers.

Rocky Mountain juniper (*Juniperus scopulorum*) is a native evergreen tree species that generally grows to 30 feet or more. It has a thin, fibrous bark that usually shreds with age. This tree is considered a slow growing but long-lived species that can survive 300 years or more. One particular tree in Utah was estimated at 3000 years old. Mature leaves are scale-like or needle-like on newer growth.



Roger Marshall standing next to the #2 ranked Rocky Mountain juniper in Montana. 2010. Photograph by Steve Lamar.

This tree species is mostly dioecious, meaning that there are separate male and female trees. The female trees may become cone bearing as early as 10 to 20 years of age, but more optimally from 50 to 200 years. This tree can be an exceptionally prolific cone producer when stunted or growing in the open.

What many refer to as 'juniper berries' are actually the cones of the tree. These berry-like cones take two years to mature so a tree may have both green immature cones as well as mature blue-purple cones. Generally, within each fleshy cone are 1 to 3 seeds. These cones are voraciously eaten by Bohemian waxwings and other birds and wildlife. This interaction is the primary way that seeds get dispersed across the landscape.

Some researchers think that the passing of this cone through the bird's digestive system helps dissolve the fleshy outer covering and give the seeds a better chance of germination. In addition, these seeds do not germinate the first spring after maturing. They have a delayed germination process that requires an 'after-ripening' period of 14 to 16 months during which moisture and chemical change occur within the seeds.



Allen Branine standing next to the #1 ranked Rocky Mountain Juniper in Montana. 2010. Photograph by Steve Lamar.

A number of detrimental things could happen to the seeds during the lengthy three plus years from the time a seed forms to its maturation period. This process may partially explain why we see so few seedlings and saplings in our area.

An additional factor to consider is that seedlings and saplings of this species of juniper are highly shade intolerant and cannot survive dense competition from other forms of vegetation. Fire exclusion since the early 1900s has resulted in dense vegetation across the landscape.

Fire is another important factor. The Rocky Mountain juniper does not tolerate fire very well. Research has shown that avoiding fire for the first 20 years is critical if the juniper has any chance of survival from fire effects. Past forest fire events may help explain why many of

the junipers in Swan Valley are found in or adjacent to wetter riparian areas that offer some degree of protection. Seedlings and saplings in the dryer areas would have had a much less chance of surviving the periodic forest fires.

Wildlife browsing may also play an important role in further reducing the number of juniper seedlings and saplings. Whitetail deer readily browse this specie especially when it is young. Research has shown that Juniper is rated good in energy value, making it especially important as a food source in the winter time.

Another consideration offered by several foresters is that the habitat of the Rocky Mountain juniper in Swan Valley is at the edge of its ecological range, located on the fringe of the juniper's natural distribution.

Perhaps the best explanation was offered by emeritus University of Montana botany professor James Habeck. He conveyed that the Rocky Mountain juniper exhibits 'episodic' behavior, meaning that there are long intervals between successful crops of seedlings, and only when a number of critical environmental events coincide. This behavior in conjunction with low survival rates of those seedlings resulted in periods of sparse and scattered trees across the landscape. This factor, along with the other obstacles, decidedly stacks the deck against this tree species from being prolific in this area.

In spite of all the factors working against this tree species, Swan Valley currently holds the distinction of having the two top-ranked Rocky Mountain junipers in the state of Montana. Both trees are located in river bottom riparian areas.

In 1999, forester Glen Gray and several crew members found the highest ranked juniper on the Swan River State Forest. When measured, this tree was 66 feet tall, had a diameter of 31 inches, a circumference of 97 inches, a crown spread of 27 feet. This tree rated a total score of 170.

The second ranked juniper was found west of the Condon Work Center in 1996 by

USFS employees Rick Trembath and several crew members. At that time, this tree was 36 feet tall, had a diameter of 39 inches, a circumference of 123 inches, a crown spread of 18 feet, and had an overall score of 164. For perspective, the national record tree scored 331. More information can be found in the *Montana Register of Big Trees*.

Rocky Mountain juniper has had a long history of human use. Native cultures used the seeds, cones, foliage, and wood in a variety of ways, including incense, teas, tools, and medicinal purposes. Due to juniper's durable, close-grained, aromatic wood it is used for

fencing, furniture, paneling, 'cedar chests', novelties, and fuel.

Although the Rocky Mountain juniper is not as common as many other tree species found in this area, it is another interesting component that makes up the rich ecological diversity that makes Swan Valley a natural treasure.

References:

Arno, S. F., Habeck J. R., Wirt, S., Konen, K., Ensign, D., Trembath, R., Gray, G., Marshall, R., Branine, A. and Meyer, N. 2010. Email and telephone communications.

Arno, S. F. and Hammerly, R. P. 2007. *Northwest Trees*. The Mountaineers. Seattle, WA. 85-88.

Juniperus scopulorum. <http://www.fs.fed.us/database/feis/plants/tree/junsco/all.htm>.

Kershaw, MacKinnon, and Pojar. 1998. *Plants of the Rocky Mountains*. Lone Pine Publishing. Renton, WA.

Parish, Coupe, Lloyd. 1996. *Plants of Southern Interior British Columbia and the Inland Northwest*.

Pfister, R. D., Kovalchik, B. L., Bernard L., Arno, S. F., Presby, R. D. 1977. *Forest Habitat Types of Montana*. USDA.

USDA. Natural Resources Conservation Service. *Rocky Mountain Juniper*. Plant Guide.

USDA Forest Service. *Montana Register of Big Trees*. 2008. Rocky Mountain Research Station.