

CONIFERS OF THE SAN FRANCISCO MOUNTAINS, SAN RAFAEL SWELL, AND ROAN PLATEAU¹

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This is the second in a series of notes on conifer distribution in The Great Basin and adjacent mountain areas. An earlier paper (Lanner, 1971) presented results of field surveys in selected parts of northern Utah. This article will cover three Utah areas further to the south, which represent diverse geological and environmental conditions. The occurrence of previously unrecorded species localities is supported by specimens deposited in the Intermountain Herbarium at Utah State University, Logan, Utah (UTC).

SAN FRANCISCO MOUNTAINS

The San Francisco Mountains, a typical Great Basin fault-block range, are located in Beaver and Millard counties. The range is oriented roughly on a north-south axis and is about 18 miles in length. To the west across the Wah Wah Valley lie the massive Wah Wah Mountains. On the east is the Escalante Desert and the town of Milford. Elevations in the valleys approximate 5000 ft, and the San Francisco Mountains rise to a maximum of 9660 ft at Frisco Peak. The lower east slopes are comparatively gentle, and the west slopes are very steep.

Erdman (1970) reported Utah juniper (*Juniperus osteosperma* [Torr.] Little) and singleleaf pinyon (*Pinus monophylla* Torr. and Frem.) from this range. An early report by Butler (1913) mentioned supposed pinyon pines "two feet or more in diameter," from upper slopes used as timbers in the Horn silver mine. This suspicious report and the high elevation of Frisco Peak prompted a field trip in the summer of 1968. Access was facilitated by a newly completed road to electronic equipment at the summit.

In the rolling hills to about 7500 ft are thick stands of Utah juniper and singleleaf pinyon associated with sagebrush and rabbitbrush, as well as alder-leaf mountain mahogany (*Cercocarpus montanus* Raf.), as reported by Erdman (1970).

From about 7500 ft to the summit the slope steepens perceptibly, and a richer tree flora is found in sheltered places. White fir (*Abies concolor* [Gord. and Glend.] Lindl.) was found from 7500 ft nearly to the summit of Frisco Peak, scattered or in dense stands on east-facing slopes.

Ponderosa pine (*P. ponderosa* Laws.) was fairly abundant from 8500 ft almost to the summit. Some of these trees have diameters approaching 36 inches at breast height.

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Other species found in the same elevational zone with ponderosa pine were Utah juniper, Rocky Mountain juniper (*Juniperus scopulorum* Sarg.), singleleaf pinyon, and Douglas-fir (*Pseudotsuga menziesii* [Mirb.] Franco). The latter species was restricted mainly to north aspects.

A dense stand of quaking aspen (*Populus tremuloides* Michx.) was encountered in a sheltered ravine facing the north at about 9000 ft.

From about 9300 ft to the summit, scattered specimens of bristlecone pine (*Pinus longaeva* D. K. Bailey) were found on southwestern exposures. These trees show fairly vigorous growth. Near the top of Frisco Peak they are associated with singleleaf pinyons, an unexpected species at so high an elevation.

SAN RAFAEL SWELL

The San Rafael Swell is a rugged area of sandstone lying in Emery County, east of the Wasatch Plateau and west of the Green River Desert. It is about 60 miles in length on the north-south axis, and up to 40 miles from east to west. Much of the area consists of flat-topped mesas of sagebrush and grass deeply dissected by the San Rafael River and its tributaries. Floristically and topographically this area has much in common with the Canyonlands area. The southern part of the swell, including much of the "Sinbad Country" drains southward into Muddy Creek, a tributary of the Dirty Devil River, thence into the Colorado. Interstate Highway 70 now bisects the swell area. The highest point in the swell is San Rafael Knob, 7921 ft.

Utah juniper and pinyon (*P. edulis* Engelm.) are widely distributed throughout the area. Ponderosa pine is fairly common above 6700 ft on Cedar Mountain, where it is associated with aspen and Rocky Mountain juniper. A single ponderosa pine was spotted on Bottleneck Peak at about 6000 ft. Another ponderosa pine location was a ledge of a north-facing cliff about 2 miles southwest of the Blocks. Associated species were pinyon, Utah juniper, Douglas-fir and river birch (*Betula occidentalis* Hook.). Douglas-fir, which has not previously been reported from this area, was also found on north-facing slopes in Eagle Canyon, Devil's Canyon, and at the head of the south fork of Coal Wash (7200 ft).

Fremont poplar (*Populus fremontii* S. Wats.) is common along the San Rafael River and in washes and seeps throughout the swell. Singleleaf ash (*Fraxinus anomala* Torr.) was found in Buckhorn Wash.

ROAN PLATEAU

The Roan Plateau is a major topographic feature in Carbon, Uintah, Duchesne, and Grand counties, Utah; and Garfield and Rio Blanco counties, Colorado. It rises gradually southward from the Uintah Basin to elevations often exceeding 9000 ft. The south edge of the plateau is an S-shaped row of multilayered cliffs—the Book

Cliffs below and the Roan Cliffs above—winding from Helper, Utah, to Grand Junction, Colorado. This area of well over 10,000 square miles is unevenly bisected by the Green River as it transits Desolation Canyon. The smaller area west of the Green is commonly known as the West Tavaputs Plateau, and the larger eastern area as the East Tavaputs Plateau. Coverage of so extensive an area of land, where access is hindered by roads that are few and far between, is bound to be cursory. We summarize below observations of three field trips (totaling 18 man-days in the field) made in the summer of 1969.

Pinyon and Utah juniper are abundant between 6000 and 8000 ft throughout the area. Occasionally pinyon is found to 9000 ft. Some common associates of these species are Gambel oak (*Quercus gambelii* Nutt.), Douglas-fir, ponderosa pine, and Rocky Mountain juniper.

Douglas-fir is most common between 6500 and 9000 ft. It is more abundant on the East Tavaputs Plateau than on the West, and more common on slopes and in canyon bottoms than on the plateau tops.

Ponderosa pine is typically found in small scattered stands on rocky outcroppings, in steep canyons, or near seeps. The only stands found on the West Tavaputs Plateau were in the Coal Creek drainage north of Wellington at 6600 ft. Some locations on the East Tavaputs Plateau are near the heads of West Fork of Hill Creek and Florence Creek, and on Wagon Road Ridge. According to Ralph Miles, state forester at Heber, Utah, ponderosa pine is also found on the west-facing slope of Main Canyon, a tributary of Willow Creek (Sec. 16, T14S R22E). Some other ponderosa pine locations are Little Horse Canyon and East Canyon, which drain to the south. In a side canyon of the West Fork of Hill Creek, ponderosa pine was associated with Douglas-fir, aspen, subalpine fir (*Abies lasiocarpa* [Hook.] Nutt.), limber pine (*Pinus flexilis* James), and blue spruce (*Picea pungens* Engelm.).

Limber pine occurs in isolated groups between 8000 and 9500 ft. On the West Tavaputs Plateau it was found above Sheep Canyon. Typical locations on the East Tavaputs Plateau were on the plateau tops or on steep slopes above Horse Canyon, West Willow Creek, and West Fork of Hill Creek.

Subalpine fir is common on both sides of the Green River on steep slopes above 9000 ft. On the West Tavaputs Plateau it is abundant in canyons draining into Range Creek and the Green River. Typical locations on the East Tavaputs Plateau are around the heads of Florence Creek, West Willow Creek, and West Fork of Hill Creek. Subalpine fir is usually associated with Douglas-fir and aspen.

Blue spruce was found only along West Fork of Hill Creek, on the East Tavaputs Plateau, between 8000 and 8500 ft.

DISCUSSION

Most of the observations recorded above augment the scanty knowledge of some rugged and inaccessible areas. Thus, six species



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