The Monarch Big Sagebrush of White Mountain

EDWARD R. SCHNEEGAS and EAMOR C. NORD

Wildlife Management Biologist, Inyo National Forest, Bishop, California; and Plant Ecologist, Pacific Southwest Forest and Range Experiment Station, Forest Service, USDA, Riverside, California.

Highlight

An unusually massive big sagebrush plant has been discovered growing in the White Mountains in eastern California. This plant is almost 15 ft tall, has an average crown spread of 11 ft, and its main trunk is 48 inches in circumference at ground level. The aggregate value of this monarch shrub is 65.4.

A big sagebrush *(Artemisia tridentata* Nutt.) plant—believed to be the most massive of its species—has been discovered in eastern California. It is growing in the shadow of White Mountain—one of the tallest mountain peaks in the United States. This plant is nearly 15 ft tall, its crown spread averages 11 ft, and its main trunk measures 48 inches circumference at ground level (Fig. 1 and 2).

Size of the plant was gauged by the formula developed to determine bigness in trees (Dixson, 1961), but the formula was modified to accommodate distinguished shrubs (Nord, 1962; Driscoll, 1963). The aggregate value of this plant is 65.4, based upon measurements shown in Table 1.

The plant branches appear just above the ground surface. Three main stems range from 20 to 25 inches circumference at 1 ft above the surface; the largest is 19 inches circumference at breast height.

The monarch specimen is located about 300 ft east of the road that fords Wyman Creek, in the NE ¼, Section 20, T. 6 S., R. 36 E.; it stands about 5 miles northeast of Deep Springs College, the nearest inhabited place, and 33 miles northeast of Big Pine. An unimproved road extends into the area; however, it is advisable to use either a jeep or pickup truck to drive to the site of this plant.

The sagebrush stand, where this specimen grows, is at an elevation of about 6,600 ft near the mouth of Wyman Creek. It covers several acres in a canyon bottom that is as much

FIG. 1. Monarch big sagebrush plant in White Mountains, eastern California, estimated to be about 50 to 60 years old is nearly 15 ft high, its crown spread averages 11 ft across, and it has an aggregate value of 65.4.

as 300 ft wide and about 0.5 mile long. The very deep, well drained soils are mostly loamy, coarse sand with a neutral to slightly acid reaction (pH 6.7). Composed of alluvial deposits, they are derived from quartz diorite rocks and some schistose materials, transported from higher elevations.

The stand that includes this monarch consists of a dense cover of big sagebrush with lesser amounts of rubber rabbitbrush *(Chrysothamnus nauseosus)*, fourwing saltbush *(Atriplex canescens)*, desert bitterbrush *(Purshia glandulosa)*, rose *(Rosa* spp.), and willow *(Salix* spp.). Rubber rabbitbrush, like the sagebrush, tends to be very rank and tall; some of these plants are more than 10 ft tall. Fire swept over the area 50 to 60 years ago, judging from annual growth rings counted on some of the larger sagebrush plants. Rapid growth of sagebrush was indicated by the wide spacing between the annual growth rings.

Rank and rapid growth of the plants is in large measure attributed to the deep, well-drained soils; the availability of adequate subsurface moisture supplied throughout the year by Wyman Creek, which traverses the site; additional nutrients brought in by occasional deposition of materials as a result of flooding; as well as other favorable growing conditions. This growth is not due

FIG. 2. Crown spread shown by the position of the men supporting the bar is nearly 14 ft across in one direction.

Table 1. Plant dimensions and values of monarch big sagebrush in White Mountains.

Item	Dimension	Rating weight	Value[1]
Height-maximum exclusive of current year's growth	14 ft 8 in	1 per ft	14.7
Circumference-ground level	48 in	1 per in	48.0
Crown spread (14 x 8 ft)	11 ft	0.25 per ft	2.7
Aggregate value			65.4

[1]The weighted values in this index were obtained in the same way as those used to determine bigness in trees, except that stem circumference was measured at ground level instead of 4½ feet.

to the climate, which is very arid. Average annual precipitation is estimated to be about 6 inches, but in some years it may be much less. At the Deep Springs College gauging station, rainfall was less than 3 inches in 1964 (U.S. Weather Bureau, 1964).

We have found other unusually large sagebrush plants in the immediate area, including one reported by Al Noren[1], formerly a Forest Ranger on the White Mountain District, Inyo National Forest, that was 15.5 ft tall with a stem diameter of 12 inches at breast height. None of these other plants equals the aggregate size value of the specimen we regard as the monarch.

[1] *Personal communication.*

Other large sagebrush plants have been reported in other states. Little (1953) mentions that on favorable moist sites, big sagebrush has been recorded as a small tree up to 20 ft high, with a single trunk 4 to 14 inches d.b.h. Pase (1956) found a big sagebrush plant east of Kanab, Utah, that was 15 ft 7 in high, with an unbranched stem diameter of 8.9 inches at 1 ft above the ground surface. Beetle (1962) reported a big sagebrush in Park County, Wyoming, having stem circumferences of 41 and 34 inches, respectively, at the base and at 20 inches above the ground. No attempts to equate the over-all size of the plants were made. Therefore, we cannot make comparisons with other unusually large specimen plants—as in the case of bitterbrush (Driscoll, 1963; Nord, 1962)—or big trees (Dixson, 1961).

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