

OBSERVATIONAL NOTE

WESTERN GRAY SQUIRRELS FORAGING CONES OF MCNAB CYPRESS

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ABSTRACT

This is the first known field report of the behavior of western gray squirrels cutting, transporting and consuming only the outer soft tissue of McNab cypress cones. Squirrels abandoned the partially eaten cones, which later desiccated and released the seeds for germination and potential tree establishment. Hopefully, this report will encourage additional field observations and reports on western gray squirrels and other cypress cone foragers. *Phytologia* 94(3): 413-416 (December 1, 2012).

KEY WORDS: *Hesperocyparis (Cupressus) macnabiana*, McNab cypress, western gray squirrel, seed dispersal.

McNab cypress (*Hesperocyparis macnabiana*) grows in northern California in the foothills bordering the Sacramento Valley. A disjunct population is also found on the south-facing slopes of Sprignett Butte in Jackson County, Oregon. The latter representing the northern limit of its distribution. This cypress is often found on nutrient imbalanced soils derived from ultramafic or basaltic parent materials derived from lava flows and not enriched by ash layers. Regarding dispersal mechanisms of seeds or cones of this species, my search of the literature has revealed no specific information.

I first noticed Western gray squirrels (*Sciurus griseus*) in northern California harvesting McNab cypress cones. After cutting cones from the trees, I also observed the gray squirrels carrying the cones to stumps or rocks before starting to feed. Gray squirrels (a prey

species) commonly transport cones to higher outposts where they can watch for potential predators.

Using field glasses, I spent the next hour watching their activity. During this time I observed squirrels take a cache of cones to a high rock and subsequently chew off the fleshy outside portion of each cone. Finally, they left the remains in the hot sun where they had been feeding.

Intrigued by the squirrels' behavior, I decided to investigate the effects on the cones. I discovered that many of the discarded cones opened as they dried out and were releasing many seeds. Initially, I was puzzled that the squirrels were not consuming the seeds. However, upon closer examination I discovered the seeds had sharp-bladed edges (Fig. 1). Once the squirrel chews off some of the waxy protective coating, the cone desiccates very rapidly - within hours as ground or rock temperatures can easily reach or surpass 140° F (60° C). I also noticed piles of loose seeds and rejected desiccated cones at many of the stations and young seedlings downhill from most of the sites. It appears the squirrels may not eat the seeds (either not in this instance or incompletely); this mirrors the activities of the Douglas squirrels use of *Sequoiadendron giganteum* cones as they also only eat the fleshy outer part of the cones and reject the fibrous inner cone elements (scales) that contain the seeds (Harvey et al 1980).

This leads me to hypothesize that the seeds might cut or irritate the squirrel's gums and are mostly avoided. If this hypothesis is correct, gray squirrel feeding behavior might provide an aid in cypress seed dispersal. My personal observations of McNab cypress recruitment, as evidenced by younger age classes, have been in the vicinity of gray squirrel feeding stations. Many of the young trees I have observed were located upslope from the main cypress stands; some as far as 60 m. Therefore, as a vector for dispersal, gray squirrels have likely moved seeds in the opposite direction of gravitational dispersal. To date, I have observed this behavior at two sites in Shasta County in northern California: Lack Creek and Round Mountain. At both sites, cypress trees ranged in age from seedlings and saplings to mature trees.



Figure 1. Composite of closed and opened cones and seeds of McNab Cypress. Note the sharp edges on the seeds.

Given that Arizona cypress (*H. arizonica*) cones (whose seeds also have sharp edges) make up more of the diet of Chiricahua fox squirrels (*Sciurus nayaritensis chiricahuae*) in southeastern Arizona than any other species (Koprowski and Corse 2001), the seeming avoidance of McNab seeds by Gray squirrels may be due to factors besides cutting their gums. Further study of gray squirrel feeding behavior, and its potential relationship to McNab cypress seed dispersal seems warranted.

As a side note, the largest known McNab cypress is located in the Lack Creek area. It is currently 21 m tall with a 21 m crown spread and an over 1.2 m basal diameter.

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