

Figure 2: Mature Baker's cypress



Mention “cypress”, and I envision tall columnar trees lining the crystal-clear spring-fed pools of a Roman villa in ancient Italia. You can imagine the rest. But *Cupressus sempervirens* and its cultivars are by no means the only cypresses.

ENCOUNTERS WITH THE BAKER'S CYPRESS

BY DAVID PILZ

Indeed, North America hosts more cypress species than anywhere else. Keep in mind, however, that “cypresses”, as I use the term, no longer refers solely to members of the genus *Cupressus*. Recent phylogenetic analyses provide strong evidence for proposed changes to the generic name of Western Hemisphere “cypresses”. Adams, et al. (April 2009) proposed *Hesperocyparis*¹, and Laubenfels (September 2009) proposed *Neocupressus*². I will use *Hesperocyparis** in this article because Adams published first. The distribution of these New World species range from Central America northward through Mexico, Arizona, and California, and into southern Oregon. California has its share of such species,

*The RHS and our ConiferBase use *Cupressus*.

for instance the iconic wind-swept coastal Monterey cypress (*Hesperocyparis macrocarpa*).

As readers of my previous **ConiferQuarterly** articles know, my enthusiasm for conifers focuses on cultivating trees from personal seed collections of rare, unusual, or important conifers such as *Metasequoia glyptostroboides*, *Picea breweriana*, *Taxus brevifolia*, and now, *Hesperocyparis bakeri*. These species have merely been the highlights of my hobby of growing any tree of interest when I have the opportunity to collect ripe seed. I find it fascinating to watch trees germinate, and a fair number of these seedlings have gone on to live in suitable locations.

My first real encounter with cypresses occurred when a good friend hosted me on a March 1987 field trip to la Reserva de la Biósfera “El Triunfo”, which straddles the crest of the Sierra Madre de Chiapas in the state of Chiapas, Mexico. After I suffered a bout of Montezuma’s revenge while camping overnight in a rainstorm and an earthquake; the next day we hiked to a lush forest on the western slope of the mountains where we found old *Hesperocyparis lusitanica* specimens. They were stunning trees, some protruding from the upper forest canopy (Figure 1). I collected cones and sowed the seed in Oregon upon my return. The saplings grew three to four feet tall the first summer and then croaked with the first mild frost that autumn. Alas.

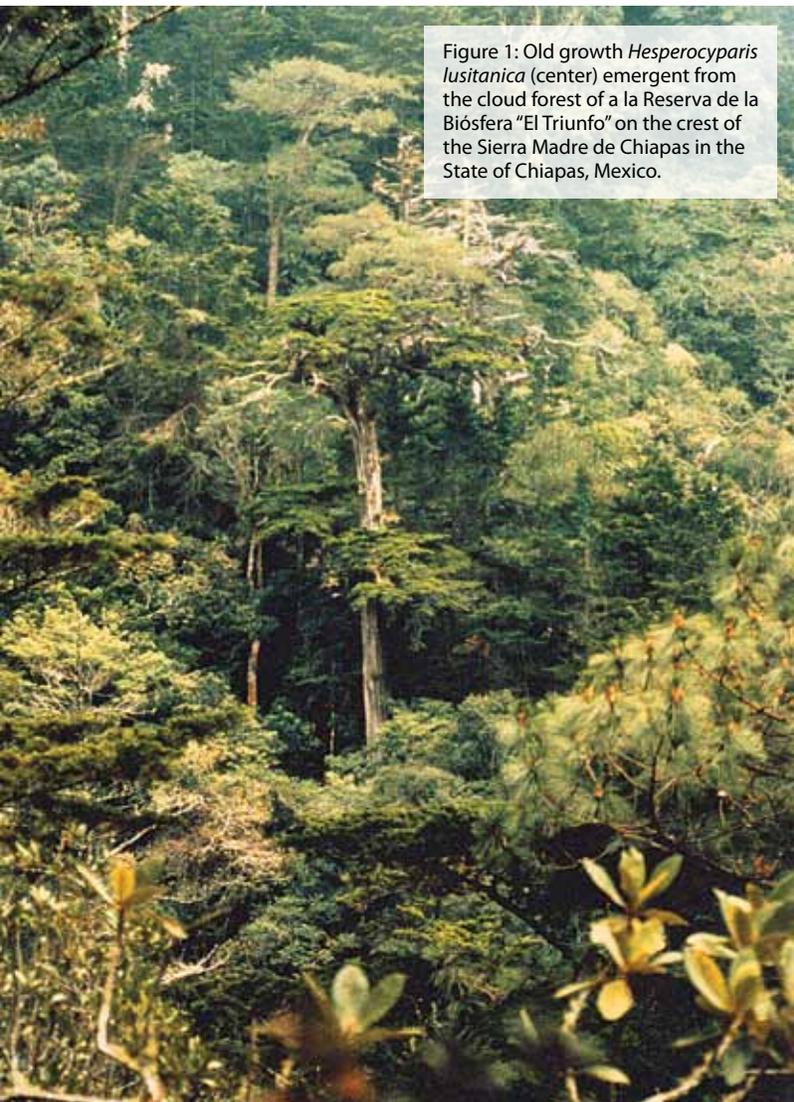


Figure 1: Old growth *Hesperocyparis lusitanica* (center) emergent from the cloud forest of a la Reserva de la Biósfera “El Triunfo” on the crest of the Sierra Madre de Chiapas in the State of Chiapas, Mexico.

Doubly alas, I donated the *H. lusitanica* seed to the 1990–1991 ACS Seed Exchange, but I doubt, in retrospect, that anyone had luck growing them in any climate other than Hardiness Zone 10. However, the experience did lead me to become interested in the most cold-hardy of cypresses in North America; namely, the Baker’s Cypress (*Hesperocyparis bakeri* (Jeps.) (Bartel)³.

Following some research, I discovered that the northernmost population of Baker’s cypress trees in North America consisted of a stand of this species growing on Bureau of Land Management Land in southern Oregon (Neville-Nye Memorial Cypress Grove, Flounce Rock, Upper Rouge River, 10 miles southwest of Prospect, OR). Seedlots I collected from this site also were included in my submission to the 1990–1991 contribution to the ACS Seed Exchange, and I hope that some of you have them in your conifer gardens!

I also grew some seedlings from this Flounce Rock collection and planted a few in my hometown of Corvallis, Oregon, around that time. They are now 15 feet tall and very healthy. I consider the lack of pests or disease to be significant because the climate of the Willamette Valley of Oregon is milder and wetter during the winter than the sites at higher elevations where they grow in the wild. The soils also differ; in Corvallis, I planted the trees in a clayey loam, whereas natural stands occur on metamorphic, granitic or volcanic soils.

The “Baker’s” cypress is also called the “Modoc” or “Siskiyou” cypress to reflect areas where it is found. It was named after Milo Samuel Baker (1868–1961), a renowned California botanist. He discovered and collected herbarium specimens of the cypress on basaltic lava flows in the Timbered Crater Grove in 1898. Willis Linn Jepson (1867–1946), California’s preeminent botanist, named the cypress after his colleague. The collection information for the type specimen reads: California, Siskiyou Co., Near Dana, between Hills Farm and Little Hot Springs Valley, Aug 1898, Baker s.n. (JEPS)⁴.

But I digress. So why am I writing this article now? A couple of weeks ago I was cleaning out my refrigerator and decided to consolidate my seed collection too. In doing so, I found my second collection of *H. bakeri*. I contacted our coordinator of the ACS Seed Exchange, Jim Brackman, and donated the seed for the 2016 Exchange. Thus, I thought an article about the seed might be appropriate to provide readers and cultivators with background information. But there was another reason. This new collection also entails issues regarding the management of wild populations of rare conifers and how to insure their persistence.

Let me elaborate. The International Union for Conservation of Nature and Natural Resources (IUCN) has given *Hesperocyparis bakeri* “Vulnerable” status due to the few sites where it is known to occur (nine in California and two in Oregon), the small size of each area, and declines in the number of mature trees⁵. Although some of the data on this website needs updating, their conclusion puts conservation of wild *Hesperocyparis bakeri* populations into global context. Appropriate management of these stands and their regeneration are important to the conservation of the species.



Figure 3: Variations in the bark of Baker's cypress



Figure 4: Large dead cypress in the Thousand Lakes Wilderness, Lassen National Forest

From 2009 to 2013, I worked for the Lassen National Forest in Susanville, California. The Lassen NF has two of the nine areas in California with Baker's cypress populations. One is Timbered Crater where M. S. Baker first collected the species. Unfortunately, I never managed to visit that location. The other consists of scattered stands near and in the northwestern side of the Thousand Lakes Wilderness (TLW), which is located in the northwestern corner of the Lassen NF.

I had a desk job at the Lassen NF. During a summer vacation in August 2010, I decided to visit the TLW stands. I found large numbers of young, mature (Figure 2) and old Baker's cypress trees. I was struck by their attractive bark, which can range from gray and scaly to a smooth reddish-orange skin like *Arbutus* (Figure 3). I also encountered immense, well-weathered dead cypress trees scattered throughout the fir and pine stands. Presumably, these had been killed during the last fire in 1936 (Figure 4).

Throughout parts of this area, taller firs and pines had overtopped the cypresses of all ages. Shade and moisture competition from these overstory trees, as well as from numerous other small trees and large shrubs, were stressing the cypresses, causing slow growth in the younger specimens and infections and mortality in the older ones. Mistletoe was common on both the overstory and cypress trees.

Baker's cypress does not like shade, and its seedlings germinate best in bare soil. Indeed, on some sites, it grows on metamorphic or lava substrates which preclude significant competition from dense stands of other conifers. The southern Oregon stand at Flounce Rock grows on metamorphic soils, where the cypresses compete only with a meager grass and shrub understory. On more fertile volcanic soils, such as the TLW site, larger conifers thrive and soon overtop them. In these situations, the cypress is considered a "fire-dependent" species, in part, because repetitive fires keep the canopy open and give the cypress a competitive advantage.

The Lassen National Forest was, at the time of my visit, preparing to reintroduce prescribed fire to re-invigorate cypress populations at this location. The effects of fire vary with burn intensity, return intervals, and the autecology of the affected species. Therefore, carefully tailored, prescribed fire treatments are needed to achieve conservation goals.

It is commonly assumed that, because *Hesperocyparis* is a species with serotinous cones, fire is required to open the cones for adequate seed dispersal. Although the term "serotinous" is often misused in forestry literature to describe tree species which require the heat of fire for their cones to open, serotiny simply means "...pertaining to cones [which] remain closed on a tree for several months or years after maturity and are therefore late in dispersion". The heat of fires will cause cypress cones to open and release seeds in a flush (pyriscence), but warming by the sun (soliscent) and low humidity (xeriscent) will also do so, just more slowly and over longer periods of time. Both times that I collected Baker's cypress cones, I merely laid them on an aluminum cookie tray for several weeks and, as they dried and opened, they readily dropped all their seed without any physical manipulation. Baker's cypress has multiple years' worth of cones on each tree (Figure 5), and, every year, some of the seed is released during periods of summer heat and low humidity.

A Joint Fire Science Project (JFSP) had recently studied seedling establishment at numerous Baker's cypress sites, including the TLW location⁷. Regeneration rates (seedlings per unit area) at several sites were sampled in areas with bare soil, resulting from manual disturbance and bare soil, resulting from a recent burn and concomitant pyriscent. The non-burned plots had 5 seedlings per square meter (about 20,000 seedlings per acre). The burned plots had 85 seedlings per square meter (about 340,000 seedlings per acre). Indeed, I personally observed small saplings established at a rate of about 1 per square meter (about 4,000 saplings per acre), even in the dense shade and thick litter layer of a mature pine and fir forest at the TLW site. Along the cut-bank of one

roadside, a line of six-foot tall cypresses had seeded in at such high density that they formed an impenetrable thicket. Because mature stands of cypresses would likely not support more than a couple of hundred trees per acre, all these rates of regeneration were more than adequate for new tree recruitment. How to thin this copious reproduction seems to be a more salient issue.

Here are my management recommendations for insuring the persistence of the cypress stands near the Thousand Lakes Wilderness and elsewhere with similar ecological conditions.

Fell and remove the larger and more common conifers which shade the cypresses and compete for moisture. Also, thin other small trees and dense shrubs. Conduct this operation carefully to avoid damage to mature and old cypress trees.

Reintroduce periodic, low intensity, prescribed fire to preclude regrowth of competing vegetation. Low heat ground fires might also thin the areas of high cypress seedling densities while being less likely to cause huge seed releases.

Ideal fire intensity and intervals between fires will vary by stand conditions, and much remains to be learned. Prescribed fires should only be applied incrementally to portions of stands to learn how better to design appropriate treatments from the trial results.

And, then there is one last final twist on the topic of managing these rare cypresses within the Thousand Lakes Wilderness itself. Management activities are greatly restricted in Federal Wilderness Areas; chainsaws and logging are not allowed. Even prescribed fire can be a controversial issue in such areas. Normally, I would vote for just letting natural fires burn in wilderness areas, not intentionally setting them. But what should managers do when the goal of conserving rare species bumps up against the goal of preserving the wilderness value of natural ecosystem processes? The Baker cypresses within the Thousand Lakes Wilderness are being shaded out by dense stands of competing pines and firs. Maybe prescribed fire could be reintroduced into this portion of the wilderness after competing trees are girdled with handsaws. What do you think?



Figure 5: Cones mature and persist for many years on Baker's cypress trees

In any case, please avail yourselves of the ACS Seed Exchange and grow a few Baker's cypress from the boundary of the Thousand Lakes Wilderness. Conifer conservation takes place in the private gardens of ACS members too! 🌲

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Because most cypress stands cover small areas, it should be feasible to protect well-spaced cypress saplings from fire mortality by raking duff and debris away from around their bases before igniting prescribed burns. This would be useful in areas where no mature or old cypress trees currently grow.

Clear duff and debris from around the base of old cypresses so that they survive the prescribed fires. This would also constrain excessive heat-induced releases of seed. Even if old cypresses are senescent and prone to disease and decay, they still have ecological and aesthetic values.

If sapling densities become too high, manual thinning remains an option.