

Life zones and plant communities of the Santa Rita Mountains & Madera Canyon



A view of Madera Canyon from the desert grassland bajada below Proctor

From the nearby community of Green Valley to the west up to the 9453ft. summit of Mount Wrightson, the Santa Rita mountains rise nearly 7000 feet. Temperatures in Madera Canyon can range from over 100° F at the canyon mouth in “dry summer” to well below 32° F on the high peaks in winter. As described in “Sky Island Mountain Ranges”, temperature measurably decreases while moisture increases with every 1000 feet of elevation gain. This change in conditions creates a succession of **four** elevation-dependent **life zones** in Madera Canyon. (And, there is actually a **fifth life zone** not dependent upon elevation!)

Each of the four Madera Canyon life zones supports communities of plants and animals adapted to the environmental conditions found in that zone. Life zones extend into lower elevations on a cool north-facing slope than on a warm south-facing one. The edges of life zones also overlap, creating a transition or **ecotone**. Ecotones contain a blend of the plants and animals from each life zone above and below (see diagram below).

Madera Canyon life zones and associated plant communities:

Lower Sonoran Zone (0' to 4500') - This life zone extends from the Santa Cruz Valley up to just above Proctor Parking Area at the mouth of Madera Canyon and has two associated plant communities. **Sonoran Desertscrub** with desert trees, shrubs and cactus grows in hot, dry lower elevations. A transition to **Desert Grassland** with grasses, shrubs and scattered Velvet Mesquite occurs as temperature and moisture moderate higher up on the bajada.

Upper Sonoran Zone (4500' to 6500') - Arising just above the canyon mouth, around the elevation of Proctor Road, this zone is slightly cooler and more moist than the Lower Sonoran below. This zone has three plant community components. **Oak/Juniper Woodland** (or **Encinal**) grows at lower altitude, represented by plants such as Mexican Blue and Arizona White oaks, Alligator Juniper, shrubs and bunchgrasses. This woodland

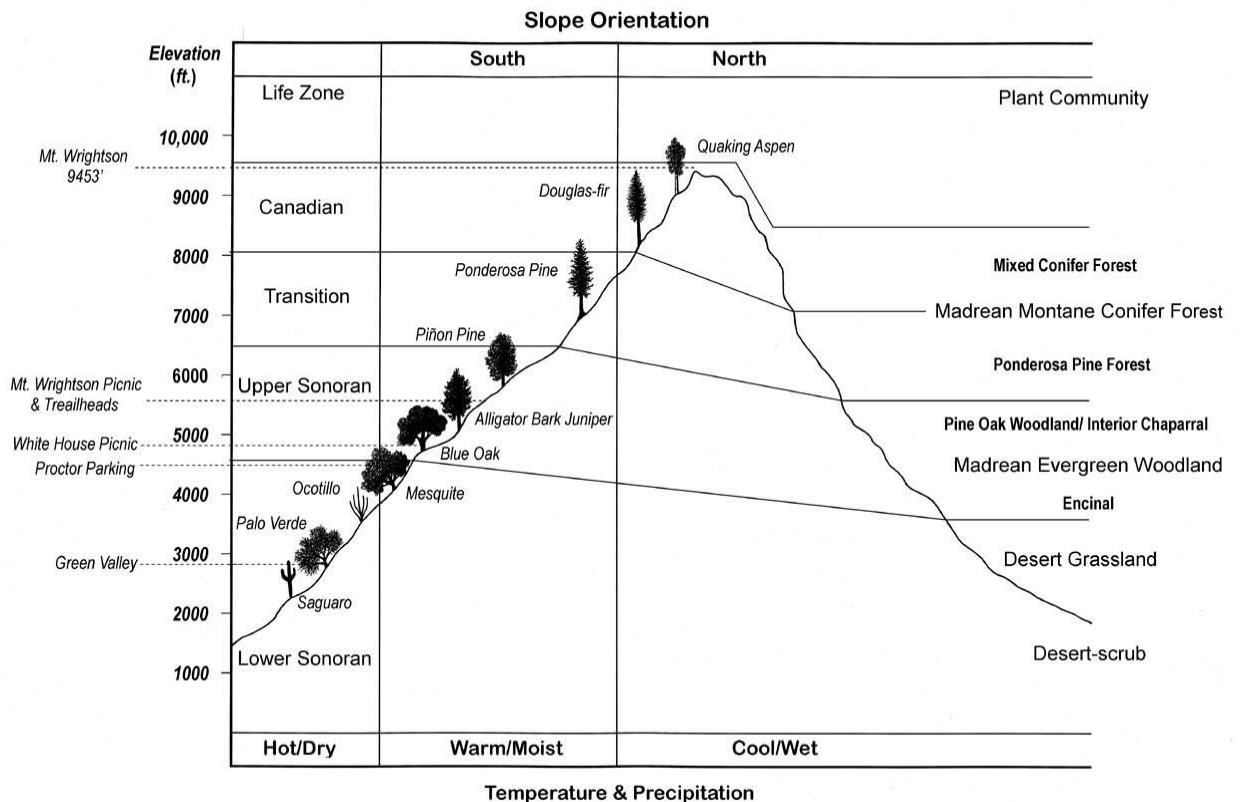
transitions to **Pine/Oak Woodland** higher up, with different evergreen oak species, Chiricahua, Apache, and Mexican Pinyon pines, and other plants. Collectively, these two communities form the **Madrean Evergreen Woodland**, with the plant species showing affinity with the Sierra Madre to the south (see diagram below).

The third plant community, **Interior Chaparral**, is found on the hotter and drier exposed slopes of the Transition Zone. Adapted to poor rocky soil and drier conditions, Interior Chaparral predominates on these harsher slopes with widely scattered small oak and juniper trees, hardy shrubs, yucca, sotol, beargrass, and grasses.

Transition Zone (6500' to 8000') - With mild summers and cold winters, the temperate Transition Zone is characterized by **Ponderosa Pine Forest** with many plants common to the Rocky Mountains. Ponderosa Pine, deciduous Gambel's Oak, Smooth Sumac, maples, and other mountain species grow in the upper canyon.

Canadian Zone (8000' to 9500') - The highest and coolest life zone in the Santa Rita Mountains occurs on the lofty peaks above the canyon. The plant community is called Mixed Conifer Forest with northern plants such as Douglas-fir, Southwestern White Pine, Quaking Aspen, Bracken Fern, and Kinnikinnick grow in this high altitude zone.

The Ponderosa Pine Forest and Mixed Conifer is collectively termed the **Madrean Montane Conifer Forest** (see diagram below).



Madera Canyon & Santa Rita Mountains Life Zones & Plant Communities:

Note: The tallest of the Sky Island ranges, the Pinaleno Mountains with Mt. Graham, rises above 10,000 feet, creating climatic conditions that form an additional life zone- the **Hudsonian Zone** (9,500 to 11,500 ft.). This life zone, the highest and wettest vegetation belt in which full-size trees can grow, is characterized by spruce, subalpine fir, and other higher elevation/northern North American plants not found in lower Sky Island ranges.

Riparian Life Zone:

Madera Canyon is a bowl-shaped watershed. Side-canyons funnel water from springs and runoff in seasonal streams that feed Madera Creek. This stream system and the abundant plants along its banks form a **riparian corridor**. This riparian corridor descends through all other canyon life zones creating excellent plant and wildlife habitat, forming an additional 5th life zone called the **Riparian Life Zone**. This zone has two primary plant communities separated primarily by elevation (thus, also temperature and moisture) and a third “companion” community.

At lower elevations along the creek from below Proctor to above Amphitheater, the riparian zone is dominated by large deciduous trees- Arizona Sycamore, Fremont Cottonwood, Velvet Ash, Net-leaf hackberry, and two willow species. This water dependent woodland is called **Interior Riparian Deciduous Forest**. A diverse flora of shrubs, vines, grasses, perennials, and seasonal annuals grows in the abundant shade under the tree canopy. Characteristic of seasonal streams and washes in the region, a thick band of Velvet Mesquite trees flanks both sides the riparian corridor from well down the bajada below Proctor to just below Madera Picnic Ground. This “companion” woodland community, with its own characteristic shrubs and understory plants, is called a **Mesquite Bosque**.

As the elevation increases in Madera Canyon, the Interior Riparian Deciduous Forest gradually transitions to a higher elevation riparian community along the creek and tributaries called the **Montane Riparian Forest**. The Montane Riparian Forest is composed of trees like Arizona Walnut, Velvet Ash, Box Elder, and Bigtooth Maple, with other plants like New Mexico Locust, New Mexico Raspberry, and Canyon Grape. There is also a diverse flora of perennial and annual wildflowers, sedge s, grasses and other plants that grow in this riparian plant community.