Picacho State Recreation Area

Sonoran Wetlands

Several designated wilderness areas and wildlife refuges surround Picacho State Recreation Area. The wildlife refuges lie along the Colorado River, an important oasis for birds migrating along the intercontinental Pacific Flyway. The river delta lies approximately 12 river miles downstream in Mexico and provides the most significant desert estuary and wetlands in the American Southwest.

Features:

Structural geology and tectonics of highly extended terrane, and ore deposits

The geologic history of the Sonoran desert defines a sub-province of the much larger Basin and Range geomorphic province which extends from Oregon and Idaho to Mexico. The most conspicuous aspects of this scenic geologic sub-province resulted from the Basin and Range extension. Scattered yet nationally important deposits of metallic ore that once fueled the desert economy occur near the State Recreation Area.

Why it's important: Picacho SRA lies on the State border along the Colorado River which crosses the thirsty Sonoran Desert. The SRA characterizes the topography and geology of eastern California's Mojave Desert Geomorphic Province which overlaps with the Sonoran Desert. This geologic landscape is continuous throughout southern Arizona—home of the northern Sonoran Desert.

Mining

The Picacho District is distinguished as the home of the earliest recorded gold mining in California starting sporadically in 1779. Gold was mined from Bear Canyon and along Picacho Road as well as other areas surrounding the SRA. Other metals (silver, lead, and copper) were mined but were less economically important. Within Copper Basin, just south of the SRA, low grade copper deposits can be recognized by a greenish-blue coloration. Ore was likely hauled through the SRA to the mill. The mill site along the river is preserved within the SRA. Paddlewheel boats were used to navigate the shallow waters of the river and to deliver supplies prior to the establishment of the railroad.

Geologic Setting

Picacho State Recreation Area lies at the eastern end of the Chocolate Mountains of California that extend 100 miles toward the northwest—nearly to Joshua Tree National Monument. South and west of the Chocolate Mountains, lies the San Andreas Fault and the Salton Trough—an active rift zone within the adjacent Colorado Desert Geomorphic Province named for the lower Colorado River. The Chocolate Mountains consist of a 100-mile long fold or bulge (called an anticlinorium). The core of the anticlinorium consists of metamorphic rocks. Layers of pre-Tertiary sedimentary rocks and Tertiary (2 to 65 million years old) volcanic rocks overlay the core. The core is exposed where the volcanic and sedimentary layers have been eroded away. Faults divide the core and the cover. Due to the folding, the sedimentary and volcanic strata on the northeastern flanks of the anticlinorium generally tilt to the northeast (as in the SRA) while strata on the southwestern flanks tilt to the southwest. One of the tilted volcanic deposits occurs just south of the Picacho Mill site along Ferguson Wash and has been determined to be 26 million years old. Folding—commonly related to compression—at this time represents a paradox because the entire Basin and Range province was undergoing major extension during the mid-Tertiary.

The exposed metamorphic rocks that comprise the core of the anticlinorium range in age from millions to billions of years old. An important metamorphic rock within the SRA is the schist which is generally thought to correlate with other schists in the region that formed in the Late Cretaceous (65-100 million years ago). These regionally extensive schists are collectively referred to as the Pelona-Orocopia-Rand schists (POR schists). The POR schists are isolated bodies of pervasively metamorphosed and deformed sandstone, stretching across southern California and into southwestern Arizona. They probably formed 20 miles deep above a subduction zone. Some geologists suggest these deposits correlate to the Franciscan Formation (in northern California's Coast Ranges).

Mid-Tertiary

The mid-Tertiary (37 to 15 million years ago) marks an important change in the way the North American and Pacific tectonic plates converged. As a result, the rate of subduction slowed and magma began to rise in the crust feeding a series of magma chambers and volcanoes that erupted across the region. At the same time, changes in the stress pattern stretched the crust (as much as 100%) westward. This stretching, or extension, broke the crust into a series of tilted fault blocks and basins giving the Basin and Range Province its name. In areas, the extension exposed the basement metamorphic rocks along a meshwork of faults.

Colorado River

Prior to the mid-Tertiary, much of this region was topographically higher than the Colorado Plateau and drainage was to the north. But between 8 and 14 million years ago, this situation reversed, as the Colorado Plateau uplifted and the Basin and Range stretched. Drainage eventually re-organized to flow southward. The river that begins in Colorado established itself through the Grand Canyon and in the local area within the past five million years. Prior to construction of several dams, the natural flow of the Colorado River was highly erratic. Draining a large area of the erodible continental interior, it carried a very heavy load of sediment, which was ultimately flushed out into the delta at the head of the Sea of Cortez. Now, the dams trap much of the sediment and water. The riparian zone and estuary near and downstream of Picacho once supported vast wetlands, much of which have since been converted to agriculture. Within the State Recreation Area, abandoned channels (Taylor Lake and Stewart's Lake) and nearby wildlife refuges preserve some of the natural values of the river.

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Final Thoughts

Gold prospecting has been a catalyst for geologic study since before California's statehood.

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