Harry McAdams State Park

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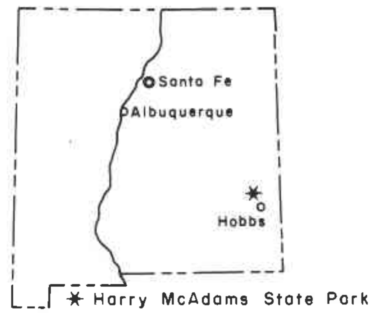

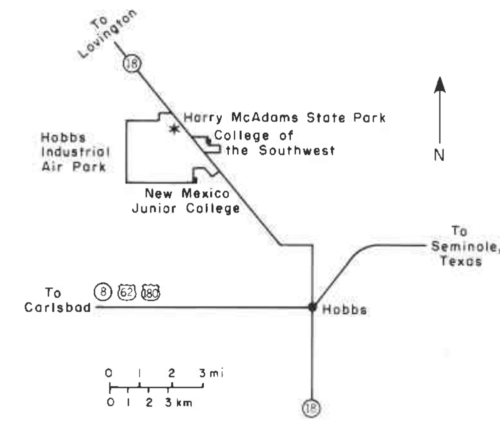

The High Plains are typically characterized by images of dry, flat, treeless, and desolate country. However, this is just the opposite of what Harry McAdams (formerly Lea County) State Park offers. Located on NM–18 about 5 miles northwest of Hobbs, New Mexico, Harry McAdams is a modern oasis of lawn, young trees, and two small ponds (Fig. 1). The ponds attract ducks, geese, and other water fowl throughout the year (Fig. 2). Water is pumped from wells to fill the manmade ponds and then circulated into the sprinkling system and sprayed onto the beautiful landscaping. Facilities include day-use picnic and sports areas as well as camping sites, restrooms with showers, utility hookups, and a playground. Extensive exhibits in the visitor's center describe the history of this region of New Mexico.

Archaeological studies reveal that Native Americans walked this area as early as 3000 B.C. Comanches and Apaches roamed these plains during the Spanish, Mexican, and American occupation of central New Mexico. Some of the famous cattle drives may have passed through the region during the mid-1800's. By the late 1800's and early 1900's, cattlemen and farmers began settling the region. In 1907, James Isaac Hobbs and his family were enroute to Alpine, Texas, when he heard that hard times had come to Alpine and that he probably could not make a living there. So he and his family headed for southeastern New Mexico and settled on a homestead. Others followed and in late 1909, his son, James Berry Hobbs, established a store and post office. The town of Hobbs grew slowly around him (Hinshaw, 1976).

These first settlers did not realize the tremendous wealth lying beneath them. Oil, "black gold," was discovered in the Midwest Refining Company's State No. 1 well on June 13, 1928, at a depth of 4,065 ft (DeFord and Wahlstrom, 1932). The well yielded 700 barrels per day. Additional wells were drilled in the Hobbs area with great success. Since the first well began production until the end of 1985, more than 560 million barrels of oil and more than 636 million cubic feet of gas have been produced from nine reservoirs or pools of the Hobbs oil and gas field, and oil and gas are still being produced. Additional oil and gas fields were discovered throughout the area that geologists call the Permian Basin in southeastern New Mexico and western Texas (Fig. 3). The city of Hobbs grew rapidly and became one of the major communities providing service for the oil fields.

Not only were petroleum resources found during drilling, but drillers also encountered several zones of polyhalite and sylvite, the major potash ores. The first potash mine, located between Carlsbad and Hobbs, went into production in 1931. Total potash production since 1950 has amounted to 63 million tons and is valued at nearly $3 billion (Austin et al., 1982). Some salt is recovered as a byproduct for animal feed. New Mexico is the largest producer of potash in the United States. Potash is an important component in fertilizers, and about 5% of the total production is used by the chemical industry.

During World War II, the Hobbs Army Airfield served as a training center for combat fliers. Harry McAdams, a decorated combat pilot, was assigned to the airfield as an instructor in 1944. After the war the airfield was closed, but the area was designated as an industrial air park. Harry McAdams retired from the army and remained in Hobbs, first as general manager and president of a local radio station, then as a state senator in 1970. While serving as a senator, McAdams supported legislation to create the state park. In 1982, Lea County State Park became the 39th state park. The name was soon changed to honor its local celebrity.

The state park occupies 35 acres in the Hobbs Industrial Air Park. Foundations and a few buildings from the old airfield can still

FIGURE 1—Looking northeast at the visitor's center with the park in the background.

FIGURE 2—Feeding the ducks and geese at Harry McAdams State Park is a favorite pastime. Picnic shelters are in the foreground.

be seen from the park. Rebuilt vintage airplanes of the Confederate Air Force can be seen at the park periodically, especially during airshows. The industrial air park includes a glider facility and is recognized as the Soaring Society Capital of the World. Many of the visiting soarers stay at the park. The industrial air park also includes a public golf course, the campuses of the New Mexico Junior College and the College of the Southwest, a rifle and archery range, and a drag strip with additional acreage set aside for future development.

Physiography and geology

Harry McAdams State Park lies on the Llano Estacado or "staked plains." The origin and meaning of this term is controversial. Some claim that the name refers to natural stockades created along the rough rim of this plateau, which rises 150 ft above the adjacent plains and river valleys. Estacada is Spanish for palisade or fence, and canyons along the rim became famous as pasture for cattle and horses. Other explanations for the term range from the tall native yuccas resembling stakes at a distance to tales of Indians and later wagon trains from the east marking their routes with stakes across this vast, featureless plateau (Pearce, 1965).

The Llano Estacado is part of the High Plains section of the Great Plains physiographic province (Hawley, 1986). It extends from the Pecos River on the west to Palo Duro Canyon in Texas on the east and northward to the Canadian River in northeastern New Mexico and Oklahoma, covering an area of about 32,000 mi^2 (Reeves, 1972). The plateau slopes to the southeast at an average grade of only 8–10 ft/mi. The western rim of the plateau near the state park is the Mescalero Ridge. Small closed depressions with ephemeral (playa) lakes, locally called buffalo wallows, are frequent and form local water holes. Sand dunes locally cover parts of the Llano Estacado, but in much of Lea County the plateau is capped with a thick caliche caprock overlain by thin, silty to clayey soils of the Pleistocene Blackwater Draw Formation (Table 1).

This land feature is formed by an extensive alluvial and eolian deposit, known as the Ogallala Formation, which consists of eolian sand and silt and fluvial sand, silt, clay, and gravel derived from the Rocky Mountains between mid-Miocene to early Pliocene time, about 4–12 m.y. ago (Reeves, 1972; Texas Bureau of Economic Geology, 1976; Hawley, 1984). A caprock of hard, impermeable caliche formed near the surface in many places under arid conditions during the early Pliocene. This caliche caprock forms the rim of the Llano Estacado (including the Mescalero Ridge) and is about 10–20 ft thick. It is used locally for crushed and decorative stone. The caliche caprock is primarily formed by the soil-forming process of downward percolation of surface waters depositing calcium carbonate in the Blackwater Draw Formation and in the upper beds of the Ogallala Formation and overlying eolian deposits (Bachman, 1976; McGrath and Hawley, 1985). Important aquifers (reservoirs of ground water) occur in the Ogallala Formation, and they supply much of the water used for livestock, irrigated farms, and recreation areas such as the state park.

The Ogallala Formation was deposited on top of Precambrian (0.8–1.2 b.y.) through Mesozoic (about 60–70 m.y.) rocks (Table 1). Precambrian granite and metamorphic rocks lie at a depth of about 11,200 ft and are overlain by about 2,700 ft of mostly limestone and dolomite of Cambrian to Lower Permian age (about 550–250 m.y.). Most of the Cambrian–Lower Permian rocks were deposited on widespread, shallow-marine shelves (Adams, 1965). In Pennsylvanian–Permian time, deep marine basins were formed south and west of Hobbs and encroached upon shallow-marine shelves represented by the Abo, Hueco, and Yeso Formations. As the shoreline of the seas moved north, limestone and dolomite were deposited (San Andres Limestone). Many of the region's important oil and gas fields, including some at Hobbs, occur in these rocks.

Seas continued to cover much of southeastern New Mexico and west Texas depositing more limestone, dolomite, and gypsum-anhydrite (the Artesia Group). A limestone reef, the Capitan Limestone, formed in the warm tropical seas south of the Hobbs area at the margin between the shelves and basins. Limestone reefs are built by various organisms, such as corals and algae, that secrete a limy skeleton which is anchored to the sea bottom. As older organisms die, others build their skeletons on top, eventually forming the reef that acts as a barrier to the sea. Fossil remains of such organisms are on display at the state park visitor's center. The Capitan Limestone reef is one of the most famous fossil reefs in the world and is exposed at the surface along the escarpment between Carlsbad Caverns National Park and Guadalupe Peak, 100 mi southwest of Hobbs. The reef trend continues in the subsurface. South of the Capitan reef lies the deep marine Delaware Basin (Fig. 3).

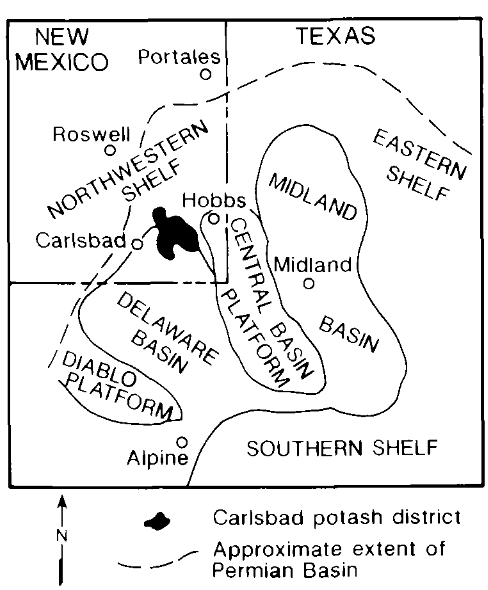

FIGURE 3—Sketch of the Permian Basin of New Mexico and west Texas showing subdivisions and the potash district (modified from Adams, 1965; Hills, 1984 and Ward et al., 1986).

In Late Permian time, the climate became arid and the seas began to dry up, leaving behind thick deposits of salt and anhydrite on top of older Permian sediments. If an area of seawater is evaporated, about 75% of the water will have to evaporate before anhydrite will precipitate and nearly 90% of the water must evaporate before salt precipitates. More than 4,000 ft of salt, potash, and anhydrite were deposited during this time (Salado Formation), and these rocks contain important salt and potash resources. The last records of the Permian sea are found in the Rustler and Dewey Lake Formations, which consist of marginal marine and continental deposits.

Triassic continental fluvial and lacustrine sediments were deposited on top of the Permian rocks. The seas returned during Cretaceous time, but only scattered remnants of these deposits are found in the subsurface of southeastern New Mexico. The nonmarine Ogallala Formation was then deposited on top of the older units.

Petroleum, which is generated from source rocks rich in organic material, migrates into reservoir rocks where it is trapped. In southeastern New Mexico, oil and gas are produced from many reservoirs of Cambrian through Permian age, from many rock types ranging from sandstone to limestone to dolomite (Table 1). Petroleum is less dense than the water residing in the pore spaces of the reservoir rocks and tends to migrate updip until it is trapped by an impermeable shale, sandstone, limestone, or sealing faults (Broadhead, 1987). Petroleum can also accumulate at the top of anticlines or in stratigraphic traps resulting from changes from one type of deposit to another (Broadhead, 1987). These structural and stratigraphic traps are common in the Hobbs area.

Summary

Visitors to Harry McAdams State Park have a unique opportunity to envision 1) geologic history when the ancient seas deposited layers of rock, which subsequently filled with oil and gas; 2) early history of nomadic tribes of Native Americans and later cattlemen roaming the plains; 3) the settlement of the plains by cattlemen and farmers during the late 1800's and early 1900's; 4) the discovery and production of oil, gas, and potash during the 1930's to 1950's; 5) the Hobbs Army airfield, which was active in training World War II pilots, and finally; 6) the creation of the state park during the 1980's, named in honor of a local decorated veteran, businessman, and state senator. Harry McAdams State Park is the only state park to be named for a living person and one of the ☞

TABLE 1—Stratigraphic section in the Hobbs area (modified from DeFord and Wahlstrom, 1932; Bates, 1942; Nickolson and Clebsch, 1961; Ash, 1961; Adams, 1965; Kelley, 1971; Hills, 1984; Ward et al., 1986). Several of these units thin and pinchout on the Central Basin platform and may not be present directly beneath Hobbs. *Oil and gas producing zones; +potash producing zones.

Geologic age	Geologic unit		Thickness (ft)	General lithology
Cenozoic				
Quaternary				
Holocene and Pleistocene	Blackwater Draw Formation and eolian alluvium and lake deposits		Thin veneer	Unconsolidated sands and gravels
Tertiary				
Miocene–early Pliocene	Ogallala Formation		0–170	Semiconsolidated calcareous sand and silt capped with a thick caliche layer with some clay and gravel
Mesozoic				
Cretaceous	Undifferentiated		0–200	Thin and isolated blocks and layers of limestone, siltstone, and shale
Triassic	Dockum Group			
	Chinle Formation		200–2000	Red and gray to green shales and sandstones with local conglomerates and limestones
	Santa Rosa Sandstone		100–200	Red to gray sandstone with some interbedded red shale
Paleozoic				
Permian	Tecovas Formation		100–200	Red shale
	Dewey Lake Formation		50–100	Laminated orange-brown to red sandstone and siltstone
	Rustler Formation		100–450	Dolomite, limestone, gypsum-anhydrite, and gray shale with some sandstone
	+Salado Formation		0–2500	Thick salt and potash deposits with thin gypsum-anhydrite and red shale and local dolomite
	Artesia Group	Capitan Limestone		
	Tansill Formation		100–300	Dolomite, anhydrite, and siltstone
	Yates Formation		250–350	Siltstone, sandstone, dolomite, limestone, and minor anhydrite
	*Seven Rivers Formation (including Bowers sand)		450–600	Dolomite, siltstone, and anhydrite
	*Queen Formation		200–400	Dolomite and sandstone with some shale and anhydrite
	*Grayburg Formation		200–450	Dolomite and sandstone
	*San Andres Limestone		250–1150	Dolomite and limestone with some anhydrite and sandstone
	*Yeso Formation (including the Blinebry and Drinkard zones)		0–1400	Sandstone, siltstone, dolomite, and anhydrite
	Abo and Hueco Formations		0–1250	Sandstone, limestone, dolomite, and siltstone
Cambrian through Pennsylvanian	*Undifferentiated		300–4000	Limestone, dolomite, sandstone, and shale
Precambrian			—	Granite, metamorphic rocks

few to be named after any individual. It is indeed worth a visit.

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