Fish Slough

Area of Critical Environmental Concern

BUREAU OF LAND MANAGEMENT

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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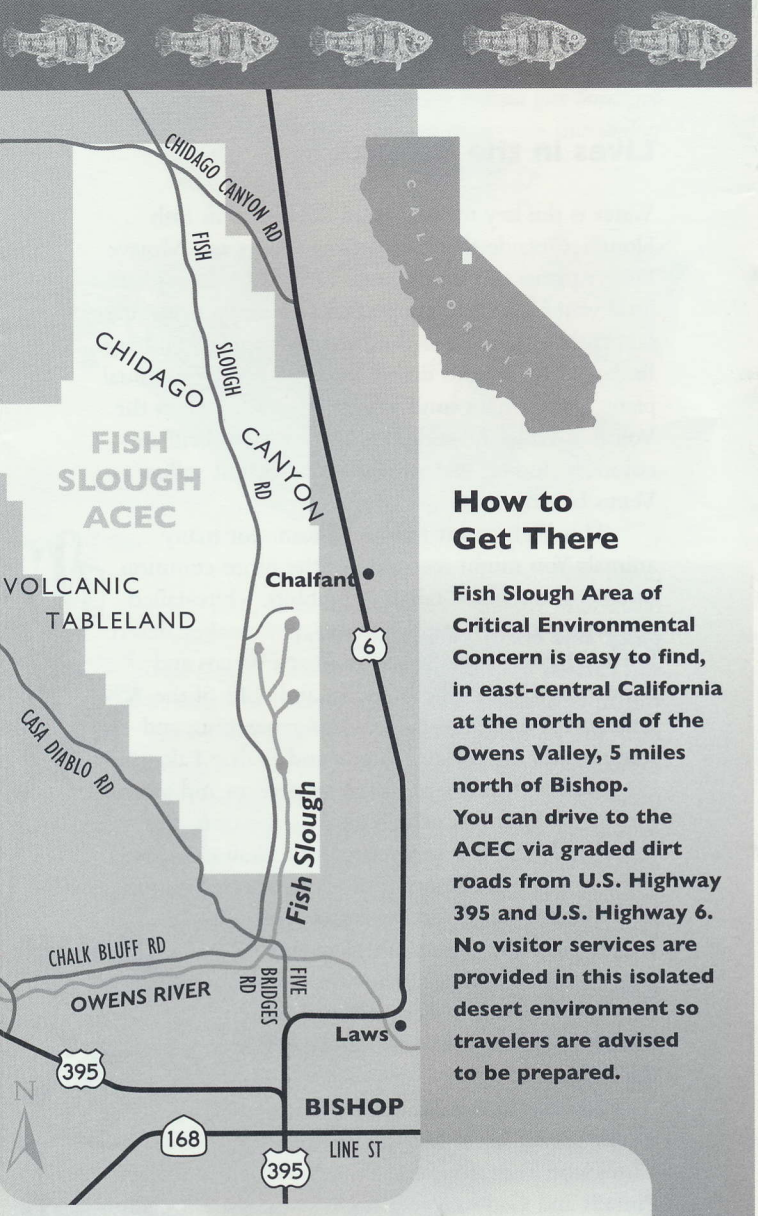
Fish Slough is a lush oasis in an arid landscape known as the Volcanic Tableland. The wetland and part of the Volcanic Tableland totaling 36,000 acres is designated as an Area of Critical Environmental Concern (ACEC) to recognize, maintain, and enhance its unique resource values.

You will discover the ACEC is a special place. The marsh creates a rich environment supporting diverse plant and animal life, including several unique and sensitive species. Nestled between the towering White Mountains to the east and Sierra Nevada to the west, the unusual geological features that give rise to the springs make a colorful landscape of cliffs and terraces with warm pastel hues that are especially striking in the early morning and evening hours. Prehistoric and historic peoples were also drawn to this habitat for the special resource values we recognize today. Several agencies manage the ACEC under a Cooperative Management Plan, with the help of volunteers from the Eastern Sierra Audubon Society.



How to Get There

Fish Slough Area of Critical Environmental Concern is easy to find, in east-central California at the north end of the Owens Valley, 5 miles north of Bishop. You can drive to the ACEC via graded dirt roads from U.S. Highway 395 and U.S. Highway 6. No visitor services are provided in this isolated desert environment so travelers are advised to be prepared.

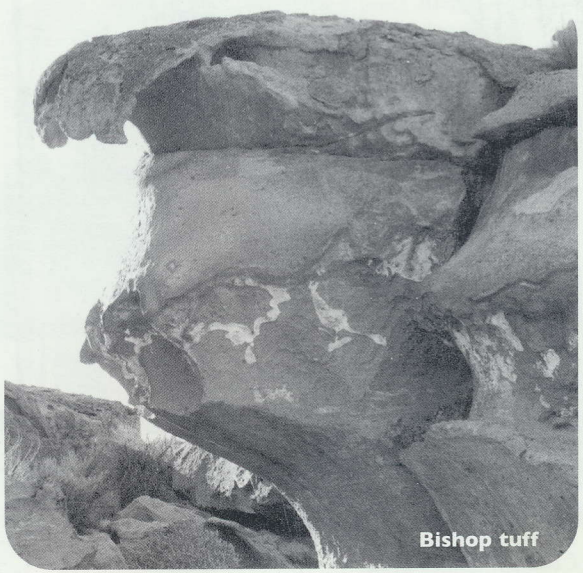
Fish Slough

A Land Formed by Cataclysm

Violent geologic events are the natural forces underlying Fish Slough's subtle beauty. Glowing hot rhyolite ash flowed like a scorching avalanche out of the Long Valley Caldera 760,000 years ago, destroying every living thing in its path and blanketing the landscape several hundred feet deep for miles around. This pyroclastic flow then fused to create the porous white, pink and tan rock called Bishop tuff that makes up the Volcanic Tableland.

Later, faulting action warped and cracked the gentle slope of the Tableland, lifting some parts and dropping others. The smooth surface broke into blocks that that eroded into jagged or oddly curving forms. The small round bumps that dot some parts of the Tableland are the result of fumaroles of hot water and steam that vented from the cooling ash flow and hardened the tuff so that it resisted erosion.

Pick up a piece of Bishop tuff and notice how light it is. Air pockets in the hot ash flow became small holes that allow water to pass through quickly. Water, wind and earthquakes continue to change the landscape you see today. One of the most active fault scarps runs along the east side of Fish Slough. Rising abruptly from the edge of the Tableland, the East Side Bluff is more than 5 miles long and 300 feet high!



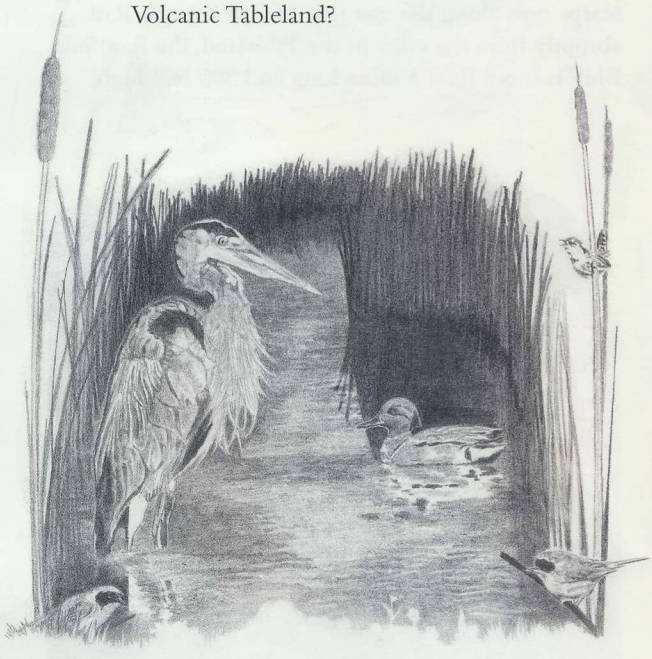
Bishop tuff

Water in the Desert

The Volcanic Tableland lies at the meeting place of the Great Basin Desert to the north and the Mojave Desert to the south. The geologic forces that created the Tableland also created an oasis in these arid lands. The faulting action that lifted the East Side Bluff threw a huge block of land at its base down to the level of the water table, so that a rich wetland was formed.

Look closely into the bottoms of the pools at the north end of Fish Slough. The upwelling bubbles you may see are springs that feed the pools and replenish the marsh. Three perennial, free-flowing freshwater spring systems merge their waters to flow south toward the Owens River. The springs and their outflow are surrounded by wet marshlands. These, in turn, are bordered by seasonally wet alkali meadows, frosted with a white crust of minerals left by evaporating water.

Because of the water in Fish Slough, there is a greater abundance of life here than in the surrounding desert. What differences in life can you see between Fish Slough and the Volcanic Tableland?



Great Blue Heron, Green-winged Teal, Marsh Wren, Common Yellowthroats

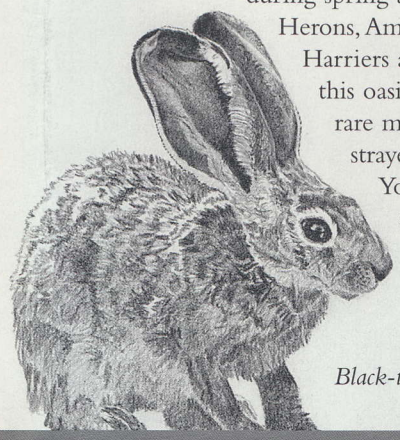
Lives in the Balance

Water is the key to the varied life found in Fish Slough. Outside the marsh, Great Basin and Mojave Desert plants survive extreme heat and cold with very little water. These hardy plants include shadscale, Parry saltbrush, four-wing saltbush, spiny hopsage, bud sage, Indian ricegrass, and desert trumpet. Seeds of annual plants lie dormant until a wet springtime when the Volcanic Tableland suddenly blooms with brilliant colors, including vast sweeps of the bright yellow Venus blazing-star.

This high desert habitat is home for many animals. You might see some of the more common ones: coyotes, black-tailed jackrabbits, white-tailed antelope squirrels, gopher snakes, rattlesnakes, desert horned lizards, Sage Sparrows, Rock Wrens and Mourning Doves. The boulders and cliffs of the fault scarps offer excellent hunting, perching and nesting sites for Golden Eagles and Prairie Falcons.

Notice the change in the vegetation and animal life as you look from the high desert over to the marshland. The seasonally saturated alkali meadows support a rare community of plants adapted to the high alkalinity and varying water levels. At water's edge the vegetation changes to a type that is even more water-dependent. Bulrushes, cattails, sedges, willows and cottonwoods are a few of the plants that thrive here.

You can find wildlife here that depend on the marsh for at least part of their life cycle. Cinnamon Teals, Mallards, Ruddy Ducks, Northern Pintails and Gadwalls frequent the marsh, especially during spring and fall migration. Great Blue Herons, American Bitterns and Northern Harriers also use the wetlands, and this oasis in the desert attracts rare migrating birds that have strayed far from their usual home. You may also see raccoons or striped skunks wading in the shallows, or deer coming to drink.

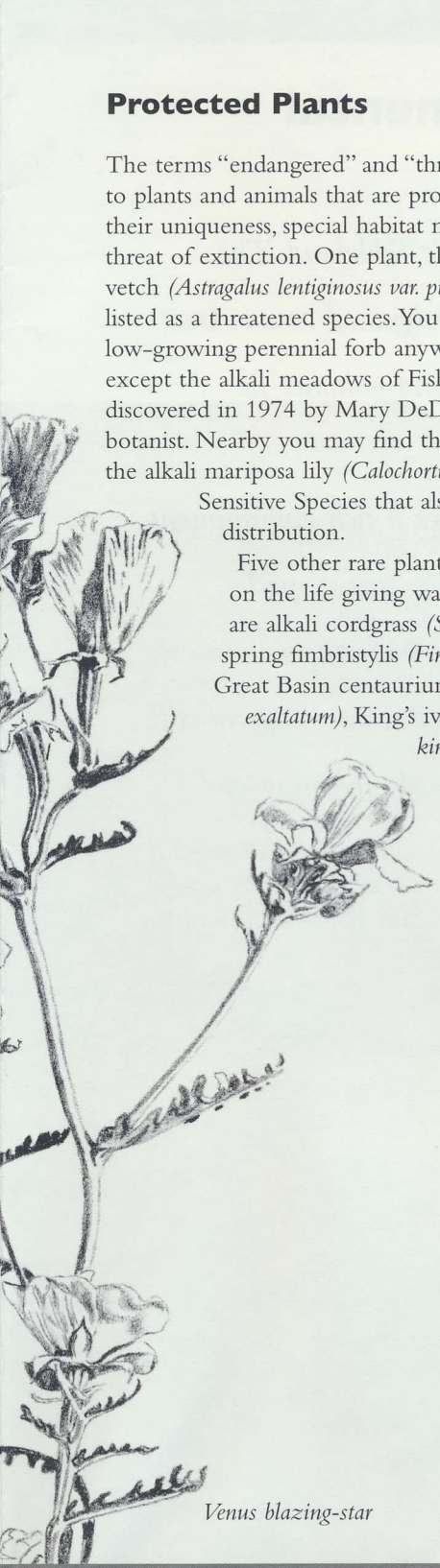


Black-tailed jackrabbit

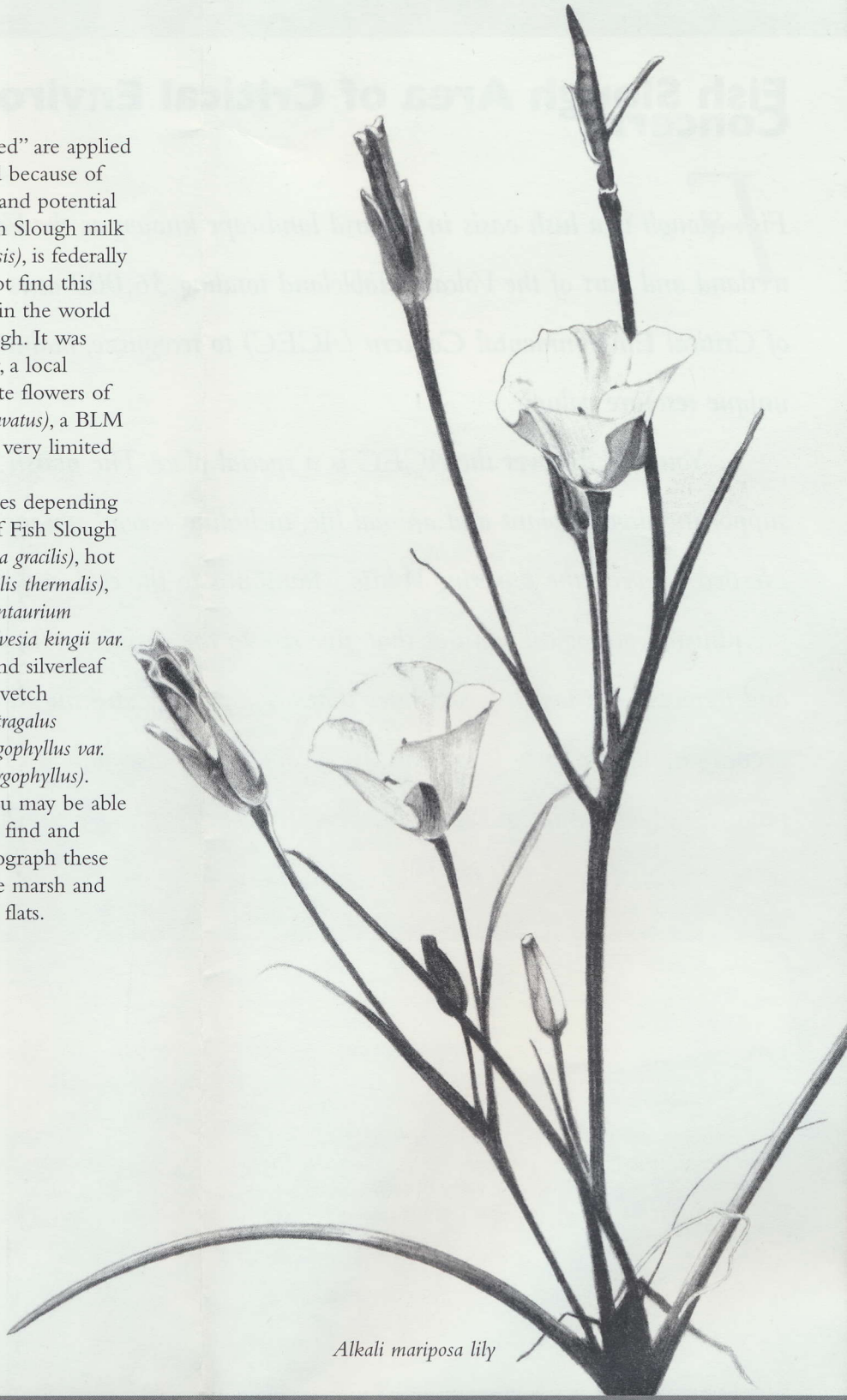
Protected Plants

The terms "endangered" and "threatened" are applied to plants and animals that are protected because of their uniqueness, special habitat needs, and potential threat of extinction. One plant, the Fish Slough milk vetch *(Astragalus lentiginosus var. piscinensis)*, is federally listed as a threatened species. You cannot find this low-growing perennial forb anywhere in the world except the alkali meadows of Fish Slough. It was discovered in 1974 by Mary DeDecker, a local botanist. Nearby you may find the white flowers of the alkali mariposa lily *(Calochortus excavatus)*, a BLM Sensitive Species that also has very limited distribution.

Five other rare plant species depending on the life giving waters of Fish Slough are alkali cordgrass *(Spartina gracilis)*, hot spring fimbristylis *(Fimbristylis thermalis)*, Great Basin centaurium *(Centaurium exaltatum)*, King's ivesia *(Ivesia kingii var. kingii)*, and silverleaf milk vetch *(Astragalus argophyllus var. argophyllus)*. You may be able to find and photograph these in the marsh and alkali flats.



Venus blazing-star

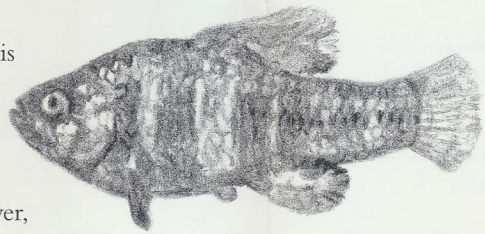


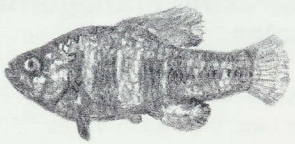
Alkali mariposa lily

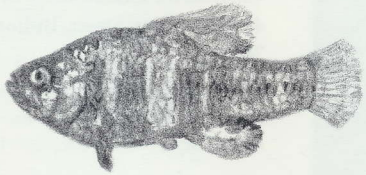
Desert Fishes

Move closer to the water's edge. Spend a few moments sitting quietly and gazing into a clear pool. What kinds of life forms can evolve and thrive in an isolated desert wetland?

The endangered Owens pupfish is a small fish observed in vast numbers throughout the Owens Valley in 1859 by U.S. Army Captain J. W. Davidson, and still abundant in 1916 in the north end of the valley. However, Owens pupfish numbers and habitat were dwindling. Water diversions and wetland drainage were responsible, along with the introduction of predatory fish. By 1948 the species was believed extinct—but in 1964 a small population was rediscovered in Fish Slough.





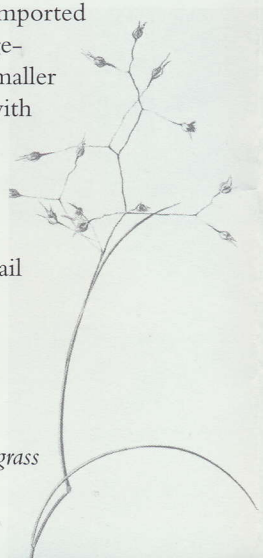


Owens pupfish

Owens pupfish feed on insect larvae and other small aquatic creatures and can survive in warm, salty water with low oxygen levels. The males will fight aggressively to defend the small territories where they display their blue and silver breeding colors to attract a mate.

The Owens speckled dace is a subspecies of speckled dace now found in very few sites within the Owens River drainage. It was thought to be gone from Fish Slough but was rediscovered here in 2002. Biologists hope to reintroduce the once-abundant Owens sucker and Owens tui chub to parts of the slough that are safe from non-native fish. Owens tui chub became endangered mainly because of inter-breeding with other chubs that were imported as bait. Non-native species such as large-mouth bass and crayfish prey on the smaller natives, while mosquitofish compete with them. Non-native animals can disrupt the fragile natural balance of this complex wetland environment.

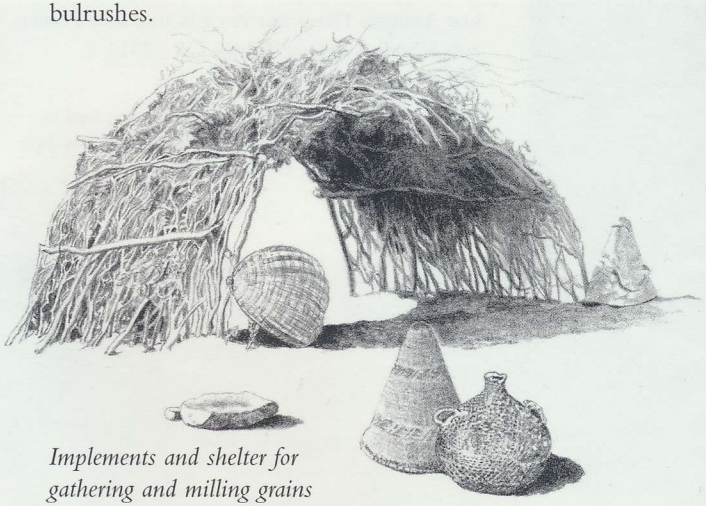
Of the many small aquatic invertebrates, the Fish Slough springsnail is unique. This diminutive snail, barely larger than the head of a pin, is found in specific freshwater locations in the Fish Slough wetland—and nowhere else in the world.



Indian ricegrass

Early Occupants

Fish Slough's abundant resources naturally attracted Native Americans to the area. Food sources included various wetland and desert scrub plant resources, waterfowl, deer, pronghorn, rabbits, freshwater mollusks, and the native desert fishes. Fish were caught by using plant derived poisons and fishing nets, and by dragging baskets through the water. Indian ricegrass, a major food source, was harvested and carried in durable baskets woven from willow. Duck eggs could be gathered and carried with temporary baskets woven on the spot from bulrushes.

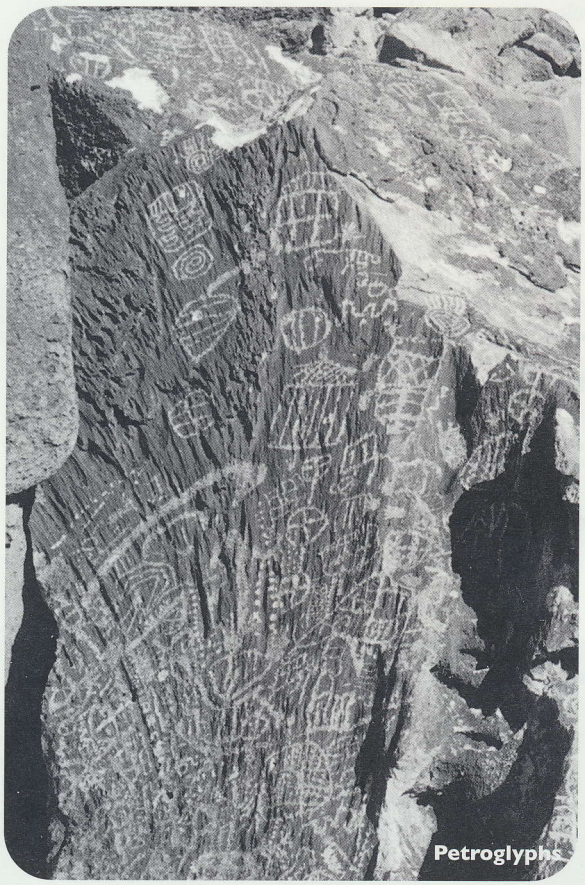


Implements and shelter for gathering and milling grains

Mysterious Rock Art

You can find many prehistoric rock art sites in the Fish Slough ACEC. These carvings, called petroglyphs, were made by Native Americans prior to white settlement. Notice the unusual geometric symbols and designs of the petroglyphs. Their meaning has many interpretations, often associated with shamanic or hunting magic. One theory speculates a relationship may exist between these carvings and hunting rituals since game trails are found near many petroglyphs sites. However, this is a mystery that may never be solved.

Over the centuries many Native American cultures have used Fish Slough; most recently, the Owens Valley Paiute Indians. Besides petroglyphs, other prehistoric sites in the ACEC include temporary camps, semi-permanent village sites, and lithic scatters—the scraps left from stone tool making.



Petroglyphs

New Settlers in the Deepest Valley

During the 1860s ranchers and miners began to occupy the present day areas of Bishop and Laws. These and other new settlers homesteaded land in America's deepest valley along creeks, rivers and springs. Part of the Fish Slough wetland was pioneered in 1890 by Phillip Keough, who set up a stage stop near the northwest spring.

In the last quarter of the 19th century the Fish Slough Road became a main wagon route connecting Bishop and Laws to the prosperous mining camps of Benton Hot Springs, Bodie and Aurora. Freight and supplies were transported on this route, which also served as a cattle driveway. Dust-covered settlers routinely traveled this rutted and sandy road to Bishop from as far north as Reno and Carson City.

In the 1920s and 1930s the City of Los Angeles bought riparian lands in the Owens Valley, including Fish Slough, in order to acquire water rights and supply water to a growing city. As a secondary result, intensive agricultural uses and private land development were precluded here. After the remnant population of Owens pupfish was discovered in the 1960s, the City of Los Angeles Department of Water and Power and the California Department of Fish and Game established the Fish Slough Native Fish Sanctuary. Since then the wetland has become increasingly recognized for its unique qualities and ecological significance.

Looking to the Future

Since developing a Cooperative Management Plan in 1985, five agencies have taken steps to preserve the area's ecosystem by striving to study, protect and enhance the ACEC's water quality and quantity, plants, animals, and scenic values. The plan encourages public access and recreation use that is consistent with maintaining the natural integrity of the ACEC.

Public awareness and support of the ACEC's special values are essential to successfully protect them. Your knowledge and appreciation of Fish Slough's resources can contribute to the ACEC's long-term ecological health.

Your help is needed to protect the ACEC's resources!

- Animals, plants, physical features, and historic and prehistoric sites and artifacts are protected by law and may not be removed, disturbed or damaged.
- Except where posted otherwise, fish only for bass, carp and catfish according to California Department of Fish and Game regulations.
- Although it may appear harmless, introduction of non-native plants or animals is prohibited—they can seriously alter and damage this fragile environment.
- Please pack out garbage you bring into the ACEC. Packing out litter left by others also helps.
- Since physical scars from cross country vehicle use remain visible for many years, all vehicles are required to stay on designated roads.
- Signs are a tool to protect the area from unintentional visitor abuse. Please respect signs restricting swimming, fishing, and driving in certain areas at certain times.
- Help us improve this area by volunteering to assist with conservation projects. Contact any of the cooperating management agencies to learn more.

Fish Slough milk-vetch

Cooperating Management Agencies

USDI Bureau of Land Management
351 Pacu Lane, Bishop, CA 93514
760 872-5000

The Bureau of Land Management is responsible for the balanced management of public lands and resources to best serve the needs of the American people.

California Department of Fish and Game
407 West Line Street, Bishop, CA 93514
760 872-1171

The Department of Fish and Game manages California's diverse fish, wildlife and plant resources for their ecological values and for use and enjoyment by the public.

USDA Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
916 414-6600

The U.S. Fish and Wildlife Service implements the Endangered Species Act and other federal laws governing wildlife conservation.

Valentine Eastern Sierra Reserve
University of CA, Santa Barbara
HCR 79, Box 198
Mammoth Lakes, CA 93546
760 935-4334

The University of California, through its Natural Reserve System, conducts management related research and advises on natural areas management.

Los Angeles Department of Water and Power
300 Mandich Street, Bishop, CA 93514
760 872-1104

The Department of Water and Power administers land for watershed values, electric power generation, and other multiple uses for the City of Los Angeles.

Printed in cooperation with the Eastern Sierra Interpretive Association.