WILDLIFE NOTES

White Sands pupfish

Found nowhere else in the world, the White Sands pupfish *(Cyprinodon tularosa)* lives in only two springs and a small stream on White Sands Missile Range and another smaller stream on Holloman Air Force Base in southern New Mexico. It was listed as a threatened species by the New Mexico State Game Commission in 1975.

DESCRIPTION

White Sands pupfish look a bit like small, dark-eyed, silver-scaled goldfish without a forked tail fin. Light brownish-gray above and silvery-white below, the pupfish has a short, chunky body (1-3/4 to 2-1/2 inches long). They have filmy translucent fins and a slightly jutting lower jaw. Adult males have very distinct, iridescent blue coloration and a dusky band along the outer edge of the caudal (tail) fin. Adult females are distinguished by a dark spot (ocellus) at the base of the dorsal fin and a distinct vertical barring pattern on their sides.

HABITAT

The White Sands pupfish is the only fish native to New Mexico's Tularosa Basin. Although relatively plentiful where they occur, the pupfish are considered at risk because of their extremely limited distribution. The White Sands pupfish lives in three small desert oases on the White Sands Missile Range. Salt grass and salt cedar border these habitats, and pondweed, bullrush, cattail, and sedges are common aquatic plants. On the Missile Range, White Sands pupfish are found in Malpais Spring (Otero County), Salt Creek (Sierra County), and Mound Spring (Lincoln County). A fourth population persists in Lost River (Otero County) on Holloman Air Force Base.

BREEDING

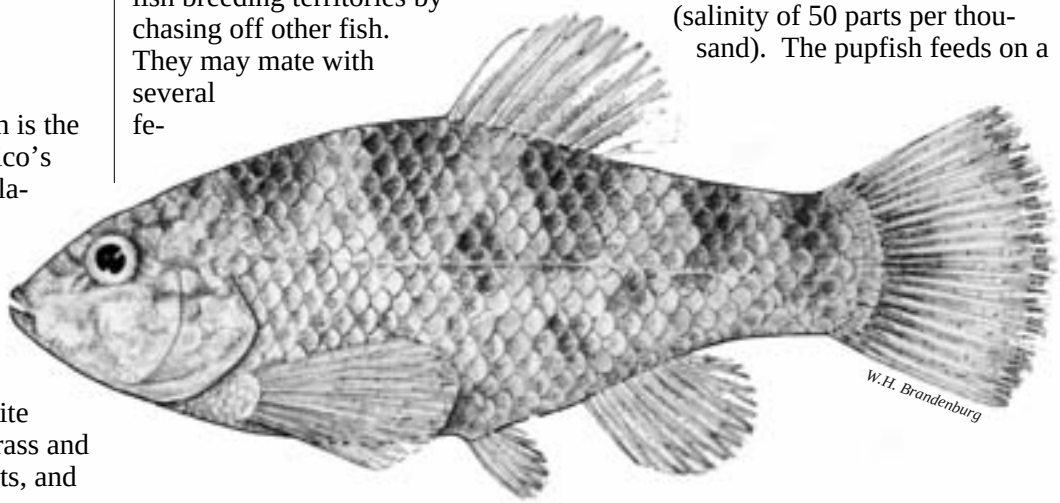
During the mating season from early April through October, male White Sands pupfish are transformed from their usual pale coloration into brilliant courtship displays. Their fins assume a yellowish-orange hue, their tail becomes yellow, their belly pale orange, and the rest of the body reflects a metallic blue. Female coloration also takes on an alluring hue: bright greenish-yellow, with fins the color of butter.

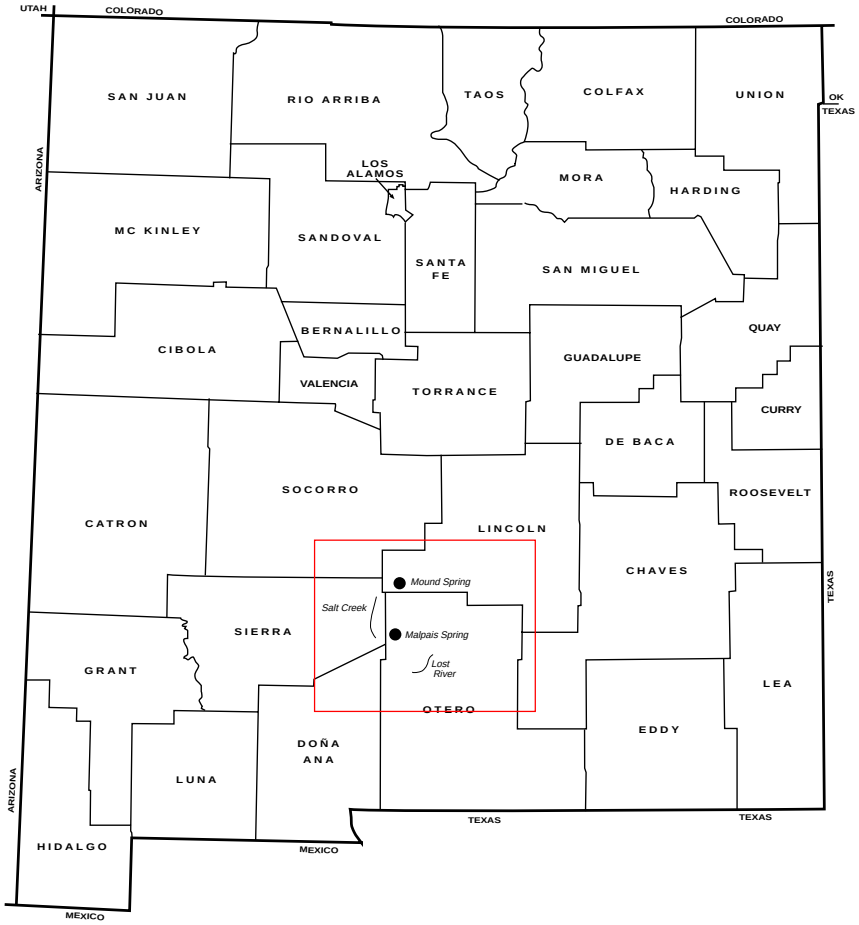
Most spawning occurs in shallow habitats when the water temperature reaches at least 65 degrees F. (18 C.) Males establish breeding territories by chasing off other fish. They may mate with several females during the breeding season. Females spawn several times in each season, releasing 12-15 eggs at a time. The number of mature eggs per female in her ovaries is about 6,000 at any time during the breeding season.

White Sands pupfish grow rapidly after hatching, reaching about 1-3/4 inches in the first year of life. The growth rate diminishes as the fish become adults. White Sands pupfish live about two years.

FEEDING and BEHAVIOR

White Sands pupfish occupy a variety of micro-habitats, ranging from deep spring ponds to shallow pools and calm spring runs. Daily water temperatures can vary dramatically, often by more than 70 degrees F. (Winter air temperature lows are around 30 degrees F. while summer air temperature highs often exceed 100 degrees F.) Similarly, the salt content of the water ranges from fresh water (salinity of three parts per thousand) to saltier than seawater (salinity of 50 parts per thousand). The pupfish feeds on a





variety of plants, detritus, and small organisms, including mosquito larvae — a definite benefit for humans living in the area.

THREATS and CONCERNS

Maintaining White Sands pupfish habitat, primarily the water sources that sustain them, is essential for its continued survival. Non-native fishes (introduced years ago into a few nearby ponds) pose a threat to pupfish, because they would actively prey upon pupfish or compete with them for food if introduced into pupfish habitat.

In addition to non-native fish, other threats include groundwater pumping, pollution, habitat alteration through construction, and missile debris impacts. A natural threat is the continued expansion of saltcedar, an exotic tree that began appearing in the Southwest during the 1950s. Although green and pleasing to the eye, saltcedar is highly detrimental to localized water supplies, choking ponds with vegetation and draining water levels.

PROTECTION and CONSERVATION

A Cooperative Agreement and Conservation Plan, signed in 1994 and updated in 2006, by the New Mexico Department of Game and Fish, U. S. Fish and Wildlife Service, White Sands Missile Range, White Sands National Monument, and Holloman Air Force Base, helps protect and monitor the White Sands pupfish. The plan includes the following general measures to help maintain viable populations of the White Sands pupfish: (1) eradicate non-native fishes from nearby ponds, (2) monitor the populations, (3) educate humans about the White Sands pupfish, (4) establish replicate populations at other suitable sites, (5) control saltcedar, (6) characterize hydrology of the habitats, (7) monitor changes in habitats, (8) reduce likelihood of toxic substance spills in the area, and (9) identify the presence of groundwater contaminants. The most significant action was to reduce the number of feral (wild) horses at the White Sands Missile Range. The feral horses on the Missile Range were largely the offspring of horses released by ranchers after they vacated the premises in the 1940s. In past years, feral horses made hard use of pupfish ponds, severely altering the habitat with their hooves and heavy grazing. Horse reduction has resulted in greatly improved water quality, volume, and physical habitat characteristics.

Through implementation of the Conservation Plan and continued cooperation among the five agencies, it is hoped that the White Sands pupfish will continue, unimpeded by humans, on its unique evolutionary journey.

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