

Exhibit 5



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http://www.dfg.ca.gov/hcpb/cgi-bin/read_one.asp?specy=fish&idNum=28

Santa Ana Speckled Dace
Rhinichthys osculus ssp.

State Status: Species of Special Concern
Federal Status: None

Fish Species of Special Concern in California, Santa Ana Speckled Dace. California Department of Fish and Game, 1995.

Nonindigenous Fish Distribution Information, Species List, *Rhinichthys osculus*. U.S. Geological Survey, Nonindigenous Aquatic Species, 1999.

http://nas.er.usgs.gov/fishes/accounts/cyprinid/rh_oscul.html

SANTA ANA SPECKLED DACE

Description: This is a small (<80 mm SL) cyprinid, with basic characteristics similar to those of Amargosa Canyon speckled dace. Cornelius (1969) presented evidence that the Santa Ana dace differs from other speckled dace in some of its meristic and morphometric characteristics. Santa Ana speckled dace have finer scales (69-82 scales in lateral line), a better developed frenum on the upper lip, a longer head, and smaller eggs than other California dace.

Taxonomic Relationships: The Santa Ana speckled dace has not been formally described as a subspecies, but the data of Cornelius (1969) suggest that it warrants this status. Hubbs et al. (1979) listed it as an undescribed subspecies. Preliminary electrophoretic data seem to confirm that Santa Ana speckled dace are distinctive and deserve taxonomic recognition (T. R. Haglund, pers. comm.). The data also support the contention of Cornelius (1969) that this dace appears to be more closely related to dace of the Colorado River drainage than to populations to the north.

Life History: No specific information is available on the life history of this subspecies, although length data in Deinstadt et al. (1990) indicate that it probably lives for three years. Other aspects

of its life history are presumably similar to those described for other stream dwelling speckled dace, summarized by Minckley (1973) and Moyle (1976).

Habitat Requirements: The Santa Ana speckled dace requires permanent flowing streams with summer water temperatures of 17-20 C. Typically, these streams are maintained by outflows of cool springs. The dace inhabits shallow cobble and gravel riffles (Wells and Diana 1975). The best description of its habitat is provided by Deinstadt et al. (1990) for the West Fork of the San Gabriel River. The West Fork is a small (typical summer flow of 4 cfs, 5-8 m wide, depths mostly 15-30 cm), permanent stream that flows through a steep, rocky canyon with chaparral-covered walls. Overhanging riparian plants, mainly alders and sedges, provide cover for fish. Even though Deinstadt et al. (1990) found dace throughout the 14 km of stream they sampled, the dace were common only in the lower reaches of the stream where the dominant habitat types were runs and riffles with gravel and cobble substrates. In the West Fork, Santa Ana speckled dace are most common where other native fishes (rainbow trout and Santa Ana sucker) are common as well. Introduced species (largemouth bass, green sunfish) may be present, but only in low numbers so far. Brown trout are more piscivorous and are believed to prey on native cyprinids such as the dace. Brown trout are very rare or absent from the San Gabriel system, but flourish in the Santa Ana River and its major tributary, Bear Creek, where speckled dace have been absent for a long time.

Distribution: The Santa Ana speckled dace was once distributed throughout the upland portions of the Santa Ana, San Gabriel, and Los Angeles river systems of southern California (Los Angeles and Orange counties), but was rare in the lowlands. In all three drainages, the species occurred in the mountains and was scattered in the foothills. It was not noted among other freshwater fishes that occurred farther down on the Los Angeles Plain (Culver and Hubbs 1917). Later, a few widely scattered local populations were documented, but they all disappeared by about 1950 (Swift et al. 1993). Today the dace has a very limited distribution in the headwaters of only the Santa Ana and San Gabriel rivers. It seems to have been recently extirpated from the Los Angeles River drainage (T. R. Haglund, pers. comm.).

Santa Ana speckled dace also have been reported from the South Fork of the San Jacinto River, Riverside County, and they were introduced into the Santa Clara and Cuyama rivers and River Springs on the east side of Adobe Valley, Mono County (Miller 1968, Swift et al. 1993). The status of the introduced populations is not known, although the Santa Clara introduction apparently failed. This subspecies has been reported from Pismo and Arroyo Grande creeks south of San Luis Obispo Creek. Populations in San Luis Obispo Creek probably are more closely related to those farther north rather than to the southern California form (Cornelius 1969; Swift et al. 1993), based on electrophoretic data (T. R. Haglund, pers. comm.).

Abundance: Numbers of dace have been reduced in all cases because of reductions in range. It is now so diminished in numbers that it is in danger of extinction. The Lytle Creek situation is documented in the section that follows. The situation is repeated for Big Tujunga Canyon and the San Gabriel River as shown by comparing collections from the 1960s at California State University, Fullerton (now in the Natural History Museum of Los Angeles County [LACM]), from the 1970s (at LACM), and the 1980s (at LACM, University of California, Los Angeles, and the U.S. Forest Service).

Nature and Degree of Threat: The Santa Ana speckled dace occupies only remnants of its native range because of water diversions, urbanization of watersheds, introduction of nonnative species, and a myriad other factors associated with expanding human populations in the Los Angeles region. It is considered to be one of the rarest native fishes in coastal southern California. Its possible remaining populations, and the threats to them, are (from Swift et al. 1993):

- Big Tujunga Creek. Fish inhabited the stream for 10-20 km below Big Tujunga Dam. Stream flows and temperatures vary so much that a trout population cannot maintain itself. During drought years, these unstable conditions, in combination with the establishment of red shiners (*Cyprinella lutrensis*), apparently led to the extinction of the dace. The shiners became established around 1985 and may have competed with dace for food and space and preyed on dace eggs. In any case, surveys of the creek in 1991-92 failed to find any dace (T. R. Haglund, pers. comm.)

- Fish Canyon (lower tributary of the San Gabriel River). The population in this tiny stream was very small on February 15, 1988; only 6-7 fish were seen, despite a thorough search, and it may now (1994) be gone. The best habitat in the lower canyon is being actively encroached upon by a rock quarry operation. The population is isolated from other San Gabriel River fish by Morris Dam.

- The contiguous West, North and East Forks San Gabriel River. These streams together are the best remaining habitat for the dace. They consist of about 40 km of stream below Cogswell Reservoir and 1-2 km each in Devil's Canyon and the West Fork, all tributaries to the reservoir. The population estimates of Deinstadt et al. (1990) indicate that probably less than 2,000 dace exist in the West Fork. The West Fork is constantly threatened by accidental high releases of water and sediment from Cogswell Reservoir that have devastated this stream section several times in the past. There were major releases of sediments from Cogswell Dam in 1981 and again in 1991, from which the stream is now recovering. These sediments smothered most of the dace's habitat and were not flushed out until 1988 through a combination of high rainfall and releases from the dam. Cogswell Dam was constructed for flood control, so the water stored in it is normally released after storms have passed. Often there is little water in the reservoir during the summer, and the stream is maintained only by seepage from below the dam and from springs. This water is reliable enough, however, for the CDFG to manage much of the stream below the dam as a wild trout fishery (Deinstadt et al. 1990). Dace were present in "fair numbers" in 1993; in a 68 m section of stream 29 dace were captured with three passes of an electrofisher (J. Deinstadt, pers. comm.). Sampling by CDFG in 1993 also indicated that the dace was abundant in the 1 km of stream immediately above the reservoir. Mining has increased on the Cattle Canyon tributary of the East Fork, and at times the population has been much smaller or nonexistent in Cattle Canyon.

- Cajon Creek has a large population, but much of the watershed has not burned in a long time; thus, a large fire (and subsequent catastrophic flood scouring) could eliminate the population (S. Loe, pers. comm.). Recently most of the fish have been within 2 km above and below the crossing of Interstate 15.

- North Fork of Lytle Creek. A CDFG survey crew noted one fish on June 30, 1977, the only recent record from the Lytle Creek drainage. This population has been very small since 1975 and may no longer exist. Fish were abundant in 1967 (Cornelius' collection, LACM), but none were found in 1992 (T. R. Haglund, pers. comm.).

- The West Fork of City Creek had dace in 1982; a small but stable population apparently still exists, but it has not been examined recently.

- Strawberry Creek (tributary of the Santa Ana River. A small population was discovered in the fall of 1992 by R. Robinson (U.S. Forest Service; C. Swift, pers. comm.). The viability of this population is undetermined.

- Silverado Canyon at Shrewsbury Springs. A small population maintained itself here through 1987. During the fall of 1990 none were found in the few areas in which they had been seen previously.

- Mill Creek (tributary to the Santa Ana River) held speckled dace into the late 1980s, but they could not be found after 1990. The dace probably no longer occur in this creek.

- The San Jacinto River has about 15-30 km of stream where fish had been recorded in the 1970s. However, Dr. Thomas Haglund had difficulties finding any native fishes in the middle 1980s. He is completing a survey of the area. This should be the second largest and best locality for the speckled dace after the San Gabriel River. In particular, the North Fork, South Fork, Herkey Creek, and Strawberry Creek are desirable *Rhinichthys* and trout habitat. Dr. Haglund and the U.S. Forest Service note that large portions of the main river and lower creeks become dry in the summer, and the minimum habitat in the fall has not been documented.

The populations of Cajon Creek, North Fork of Lytle Creek, West Fork of City Creek, Silverado Canyon, and the San Jacinto River represent isolated headwater stocks separated by vast areas of dry washes most of the year, so that repopulation among them is not possible. The Lytle Creek population already has apparently become extirpated. The localities suffer variously from (1) severe reduction in size of habitat, (2) inability of populations to intermix, even during the (wetter) winter, because of dams, (3) erratic water flows from upstream control devices, (4) introductions of nonnative species, (5) heavy human recreational use of areas that can alter stream habitats and disturb spawning and feeding behavior, (6) degradation of water quality, and (7) historically record-breaking low water levels during the 1986-1992 drought.

Overall, it appears that the remaining populations of Santa Ana speckled dace in the Los Angeles River were extirpated during the past ten years and that dace in the Santa Ana River system are in imminent danger of extinction. Populations in the San Gabriel River are less threatened, but their very limited range means that they could be eliminated from either or both forks by major floods, debris torrents, or landslides. Such events can occur if heavy rains follow a season of heavy fires that eliminate stabilizing vegetation on the slopes of the drainages. The problems with Cogswell Dam in the past indicate that its presence is no guarantee for the safety of the fish that live in the stream below it.

Management: Immediate steps should then be taken to protect the remaining habitats in all the San Gabriel and Santa Ana drainages, including measures to secure enough water for the fish to live in. Studies of their life history should be undertaken to establish the parameters needed for survival.

As an immediate conservation measure, the East and West Forks of the San Gabriel River should be given the status of Aquatic Diversity Management Areas (Moyle and Ellison 1991, Moyle and Yoshiyama 1992) or refuges to protect the dace as well as other native fishes. Jonathan Baskin and Thomas Haglund completed a thorough survey of the San Gabriel River system in the summer of 1991, so there is adequate information to establish a refuge.

For the Los Angeles River system, thorough surveys should be made of all habitats where the dace have been recorded as existing. If any populations are rediscovered then immediate conservation actions should be taken. If the dace is found to be extirpated from the drainage, rehabilitation of potential habitats should begin and dace reintroduced as soon as possible.