



# United States Department of the Interior



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Witness Report: Relict Dace and Shoshone Ponds

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## Background

The relict dace, Family Cyprinidae, *Relictus solitarius* described by Hubbs and Miller (1972), is an endemic fish at sites associated with the pluvial Lakes Franklin, Gale, Waring, and Steptoe. Situated to the south of pluvial Lakes Lahontan and Bonneville, this contiguous, closed basin system desiccated in the Pleistocene epoch approximately 10,000 years ago. Recent range of the relict dace is limited to the intermountain valleys of Ruby, Butte, Steptoe, and Goshute in contemporary Elko and White Pine Counties. This fish was once the most abundant species in the North-Central Great Basin; however it was extirpated in many areas due to habitat alteration (spring and outflow modifications) and introduction of predatory non-native species, such as largemouth bass (*Micropterus salmoides*). Two groups (consisting of several populations in separate waters within the valley) of relict dace are known to exist in White Pine County: One on the Cordano Ranch in Steptoe Valley and another at the Keegan Ranch in Spring Valley (Haskins, 1995). Hubbs et al (1974) suggest that the population(s) within the Spring Valley, as well as the Utah chub (*Gila atraria*) and mountain sucker (*Catostomus platyrhynchus*), are not native to the valley, but were planted by Mormon settlers during the 1800's. Heinrich, et al (1999) state that several introduced populations still occur in Spring Valley. The distribution of the relict dace is currently being updated by the Nevada Department of Wildlife (NDOW) (NDOW, 2005).

The relict dace occurs in three general habitat types: Springs (thermal and non-thermal), their outflows, and lakes and ponds. These habitats affect life history and probably morphology. One factor that varies is reproduction. Reproduction varies seasonally in non-thermal habitats and is protracted in thermal environments, where it is likely dependant upon other factors such as

photoperiod. Oxygen content probably affects activities more than temperature, and diel variations in oxygen probably influence distributions. Morphology may also be affected, such as the dace in moving water of the spring outflows being more fusiform than dace in the springs.

These dace are opportunistic omnivores. The primary component of their diet is a wide range of invertebrates. Studies in aquaria by Vigg (1982) has shown that they easily adapt to manufactured food, which suggests that they consume plant material in the wild, or whatever else is suspended in the water column. Debris containing periphyton may make up a portion of their diet.

Due to their widespread distribution, only one refuge, a small pond at Shoshone ponds, has been established for this species. Hubbs and Miller (1972) recommended management of several locations for maintenance of this species; however most of those populations were extirpated during the 1970's. Vigg (1982) recommended sanctuaries in Ruby Valley, Phalan Spring, and in the Spring Valley. Likely due to the decline of the populations described by Hubbs and Miller (1972), this dace from the Steptoe Valley were stocked within Shoshone ponds during 1977 (Barber in Litt, 1989). Shoshone Ponds have produced low numbers of dace, and the population currently stands at 832 (95% confidence interval of 149-8,320 individuals), which was a marked increase from 132 (95% confidence interval of 40-240 individuals) in 2004 (NDOW, 2004; NDOW, 2005). It is unclear to what has driven this apparent decline. It must be noted that low numbers of captures created a large confidence interval, therefore there is a large uncertainty towards the actual population numbers in both 2004 and 2005 preventing meaningful analysis. The Service has no current data regarding population numbers within the other locations within Spring and Steptoe Valleys.

Recommendations by Hubbs and Miller (1972) and Vigg (1982) regarding the sanctuaries for this species suggest a genotypic or phenotypic distinctiveness of the relict dace within the Steptoe Valley. Fish sharing an ancestral pluvial watershed typically diverge once that watershed is separated by drying or geologic processes. If the pattern is consistent with the much-studied speckled dace (*Rhynchichthys osculus*), it is likely that each general location, consisting of one or more sites, contains genetically distinct populations. If genetically distinct, loss of one of these populations will result in the loss of unique forms and genotypes of the fish.

## Literature Cited

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