

Field Trip Report Nevada Division of Wildlife

Date: 30 June, 1 July 2003

Purpose: Determine populations of Pahrump poolfish and Relict Dace

Location: Shoshone Ponds

Personnel: Mark Beckstrand, Chris Crookshanks, and Brian Hobbs

METHODS

The four ponds which contain native fish were trapped with standard, unbaited minnow traps on 30 June 2003, to estimate the population sizes of fish species present. Pahrump poolfish, *Empetrichthys latos latos*, are found in the North, Middle, and Stock ponds. Relict dace, *Relictus solitarus*, occupy the south pond. When the traps were pulled, the fish were tallied, marked, and then released back into the pond. Fish were marked with an oblique clip of the caudal fin using surgical scissors. Population estimates were made using Chapman's modification of the Peterson estimator $[(M+1)(C+1)/(R+1)]$. Approximate 95% confidence intervals were calculated using a table appropriate to the Poisson distribution, after the method described in Ricker (1975). Before marking, 78 fish were measured. Tables 1 and 2 list the number of traps used and set time at each location.

TABLE 1. Trapping effort for the mark portion of the population estimator at each of the Shoshone Ponds.

Location	Species	Traps	Set Time	Pull Time	Hours : Minutes
North Shoshone	<i>Empetrichthys l. latos</i>	5	12:45 (6-30-03)	14:45 (6-30-03)	2:00 ($\Sigma=10:00$)
Middle Shoshone	<i>Empetrichthys l. latos</i>	5	12:45 (6-30-03)	15:00 (6-30-03)	2:15 ($\Sigma=11:25$)
South Shoshone	<i>Relictus solitarus</i>	5	12:45 (6-30-03)	15:30 (6-30-03)	2:45 ($\Sigma=13:75$)
Stock Pond	<i>Empetrichthys l. latos</i>	23	12:30 (6-30-03)	15:45 (6-30-03)	3:15 ($\Sigma=74:75$)

TABLE 2. Trapping effort for the recapture portion of the population estimator at each of the Shoshone Ponds.

Location	Species	Traps	Set Time	Pull Time	Hours : Minutes
North Pond	<i>Empetrichthys l. latos</i>	5	9:45 (7-01-03)	13:30 (7-01-03)	3:45 ($\Sigma=18:75$)
Middle Pond	<i>Empetrichthys l. latos</i>	5	9:45 (7-01-03)	13:15 (7-01-03)	3:30 ($\Sigma=17:50$)
South Pond	<i>Relictus solitarus</i>	5	9:45 (7-01-03)	13:15 (7-01-03)	3:30($\Sigma=17:50$)
Stock Pond	<i>Empetrichthys l. latos</i>	23	9:30 (7-01-03)	13:30 (7-01-03)	4:00 ($\Sigma=92:00$)

RESULTS

The capture data and population estimates for each pond are shown in Table 3. Pahrump poolfish are found in the stock, north, and middle ponds. Relict Dace are the only fish found in the south pond. Figure 1 contains population estimates from 1989 and 1997 to 2003. Table 4 contains length data for the survey. Fish measured were captured in traps lined with 1/8" mesh. Water temperature (°C) and dissolved oxygen (mg/l) in each pond was measured using a YSI 55 Dissolved Oxygen probe. These physical parameters were recorded at each sampling location (Table 5).

TABLE 3. Mark-recapture data for the sampling period.

Location	Species	M	C	R	CPUE M	CPUE C	Estimate
North Shoshone	<i>Empetrichthys l. latos</i>	72	88	71	7.2	4.7	71<89<113
Middle Shoshone	<i>Empetrichthys l. latos</i>	78	87	59	6.9	5.0	89<115<148
South Shoshone	<i>Relictus solitarus</i>	59	27	1	12.1	1.5	255<840<1527
Stock Pond	<i>Empetrichthys l. latos</i>	320	249	111	4.0	2.7	596<718<864

M = number of fish initially marked, C = Number of fish examined for marks, R = Number of fish bearing marks. CPUE = Catch Per Unit Effort (fish per trap hour)

TABLE 4. Population density and length data for fish populations found at Shoshone Ponds.

Location	Length Data(mm)			
	Av	SD	Range	N
North Shoshone	34	5.2	25-44	45
Middle Shoshone	37	7.5	26-51	23
South Shoshone	41	3.2	37-43	3
Stock Pond	45	7.4	30-61	33

TABLE 5. Selected physical parameters at sampling locations on 30 June 2003.

Parameter	North	Middle	South	Stock (inflow)	Stock (n. shore)	Stock (s. shore)
Temperature	24.3°C	20.7°C	24.3°C	17.9°C	18.1°C	18.2°C
Dissolved oxygen	5.18 mg/L	5.85 mg/L	2.65 mg/L	6.55 mg/L	6.60 mg/L	6.40 mg/L

A population of *E. l. latos* was first found in the outflow of the artesian well approximately 75 meters north of the north pond during the September and October surveys of 1999. The water from the well maintains stream-like qualities for approximately 50 meters before turning into a marsh. Fish were observed in the flowing water, but not in the marsh. It is not known how these fish arrived at this location. The pond immediately north of the artesian well did not contain fish.

During the 1997 surveys an unidentified fish type was found in the middle pond. The survey crew thought that it most closely resembled a speckled dace, *Rhinichthys osculus ssp.* This species of fish has not been observed since. Northern leopard frogs, *Rana pipiens*, were observed and common at all four sampling locations in 2000. However, only three were observed at the stock pond in 2001. In 2002 leopard frogs were only observed at the smaller ponds. This year only one leopard frog tadpole was observed in the stock pond. Table 6 summarizes the sampling effort for 1989 and 1997 through 2003.

TABLE 6. Summary of population estimates (Peterson) for Shoshone Ponds fishes (1989,1997-2003).

Year	North Shoshone Pond	Middle Shoshone Pond	South Shoshone Pond	Shoshone Stock Pond
1989	381<450<531	1 captured	264<502<1129	2146<2451<2798
1997	197<303<496	1294<1714<2330	195<400<1000	1373<1600<1866
1998	173<266<435	1170<1538<2021	313<482<790	959<1203<1506
1999	225<269<321	1132<1382<1687	288<568<1137	2710<3989<6155
2000	245<310<391	333<467<679	276<435<731	3194<3511<3860
2001	200<235<277	512<743<1127	214<407<915	2608<3028<3516
2002	210<283<388	1,005<1,294<1,662	178<307<576	5,786<6,572<14,444
2003	71<89<113	89<115<148	255<840<1527	596<718<864

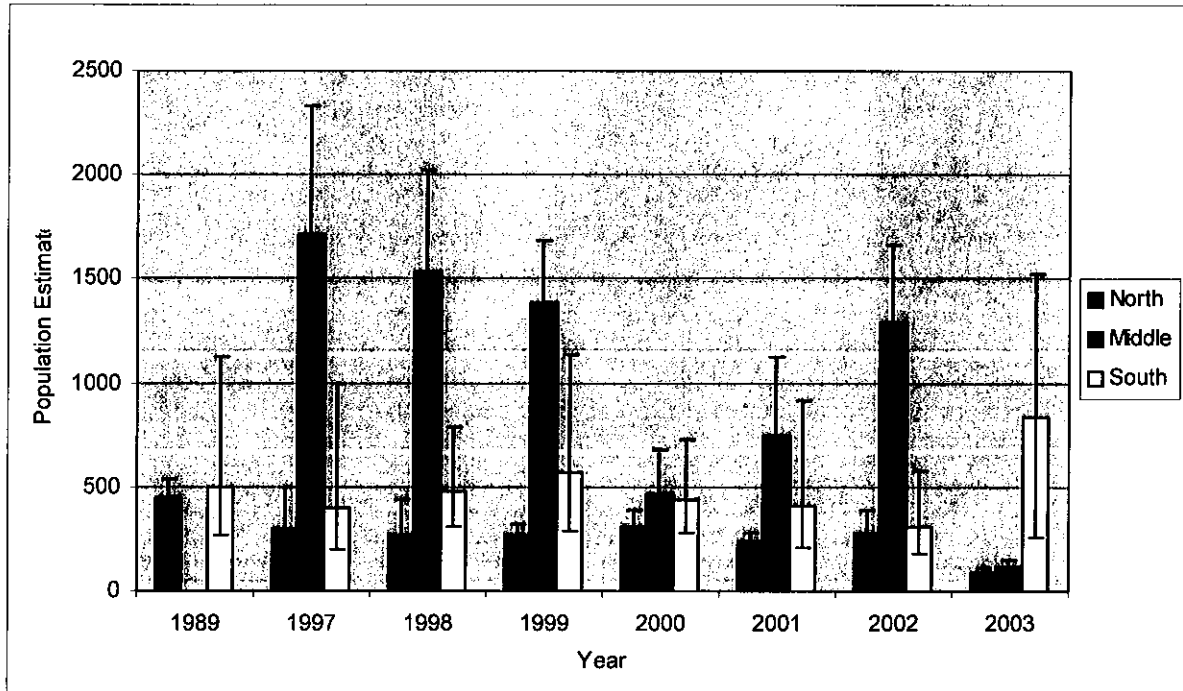


FIGURE 1. North, Middle, and South Shoshone Ponds Native Fish Populations

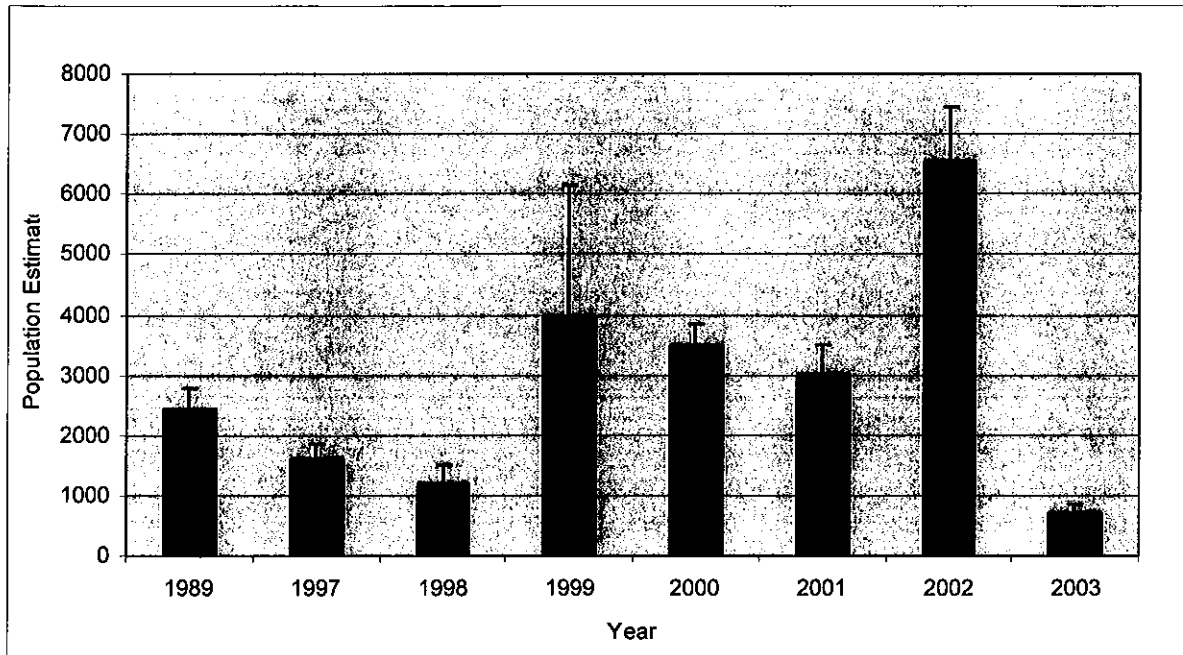


FIGURE 2. Stock Pond at Shoshone Ponds Native Fish Populations

DISCUSSION

This year, estimates for poolfish populations were as much as 90% lower than in 2002. The reason for this drastic reduction are unknown. Habitat conditions looked similar to conditions in previous years. One possibility, is that there is water flowing over the banks at the South, Middle, and North ponds. In the past, there has always been a marshy area between the ponds but it may be possible that increasing vegetation in the ponds or a slightly malfunctioning valve may be the culprit. It may also have been an unusually cold winter in the area and poolfish simply died off due to colder than normal temperatures. A letter has been sent to the Bureau of Land Management in Ely regarding this situation and the BLM and NDOW will investigate the possible causes of this decline.

LITERATURE CITED

Ricker WE. 1975. Computation and interpretation of biological statistics of fish populations. Bull Fish Res Board Can. 191: 382 p.