

**NEVADA DEPARTMENT OF WILDLIFE
NATIVE FISH AND AMPHIBIANS
FIELD TRIP REPORT**

DATE(S): 13-14 & 19 October 2005

LOCATION(S): Ash Meadows National Wildlife Refuge

PURPOSE(S): To estimate the population sizes of Ash Meadows Amargosa pupfish and Ash Meadows speckled dace and also to monitor exotic removal efforts.

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INTRODUCTION

Fish population monitoring has been ongoing since the 1980s at Ash Meadows National Wildlife Refuge. This year we conducted surveys on the Ash Meadows Amargosa pupfish, *Cyprinodon nevadensis mionectes*, and the Ash Meadows speckled dace, *Rhinichthys osculus nevadensis*, both of which are federally listed as endangered. King's Pool, Point of Rocks, Jackrabbit spring, Bradford springs 1 & 2, and Crystal Spring were the systems that were surveyed this year.

METHODS

On 13 & 14 October, standard 0.64 cm mesh Gee-type minnow traps [2.54 centimeter (cm) opening], standard 0.64 cm mesh Gee-type crayfish traps [5.72 cm opening] and Gee-type "exotic fish" minnow traps with 0.32 cm mesh [2.54 cm opening], were baited with 10-15 pieces of Chef's Blend dry cat food and set. They were allowed to fish for 3-6 hours. Fifty or more native fish were measured from one or more larval traps at each spring. All native fish greater than or equal to 30 millimeters were marked with an oblique clip on the caudal fin and released. Exotic fishes were rehabilitated on shore.

On 19 October, Bradford Springs, Point of Rocks, Kings Pool, Jackrabbit Spring, and Crystal Spring were trapped using standard 0.64 cm mesh Gee-type minnow traps [2.54 centimeter (cm) opening]. The traps were pulled 3-6 hours later. Native fish were examined for marks, tallied, and released. Exotic fish were tallied and rehabilitated on shore.

Estimates were calculated using the simple Petersen equation, $M \cdot C / R$ (where M =number of fish marked, C =number inspected for marks, and R =number of recaptured fish). Approximate 95% confidence intervals were obtained by the method recommended in Ricker (1975), using a table based upon the Poisson distribution.

RESULTS

King's Pool

On 13 October, 6 standard traps and 1 larval trap were set in the pool. Seven standard traps were set in the outflows. All traps were allowed to fish for 3.5-4 hours for a total trapping time of 59.61 hours. Four hundred seventy-nine pupfish were captured, of

which, 304 were marked. One crayfish, 1 mollie, and 3 tadpoles were caught also. The catch per unit effort (CPUE) is displayed in Table 1.

On 19 October, 7 traps were set in the pool and 7 traps were set in the outflow. They fished for 3-5 hours for a total trapping time of 62.28 hours. Four crayfish, 1 bullfrog tadpole, and 2 mollies were caught. Five hundred seventy-two pupfish were censused of which 144 were recaptures. The population estimate for *C.n.mionectes* at King's Pool was 1208 (1026-1422, $p=0.95$).

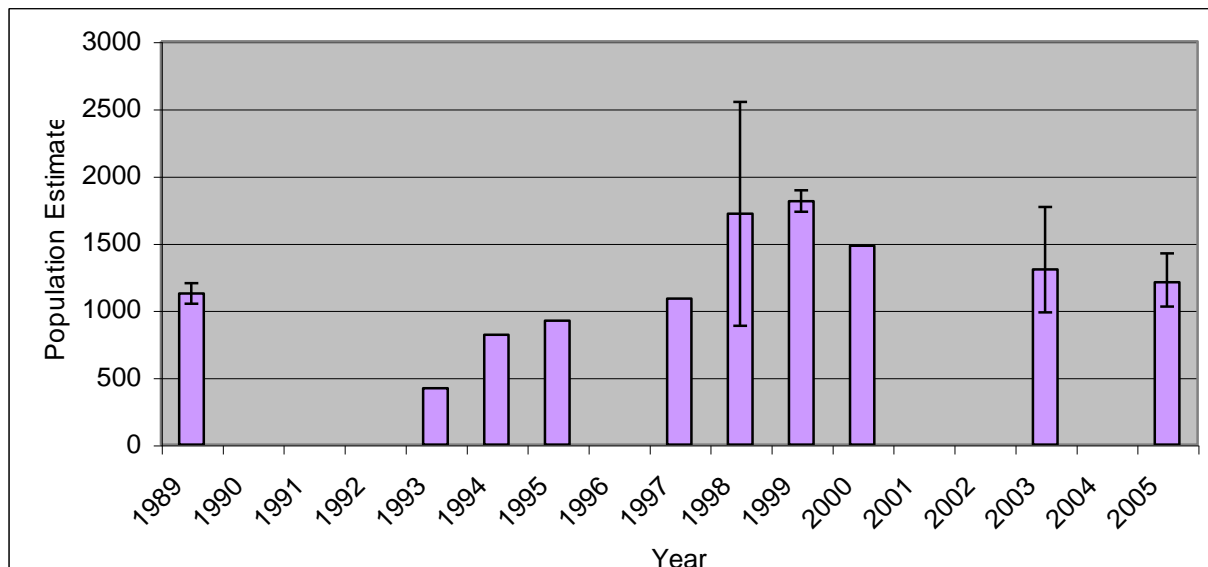


Figure 1. Population Estimates of *C. n. mionectes* at King's Pool, 1989-Present

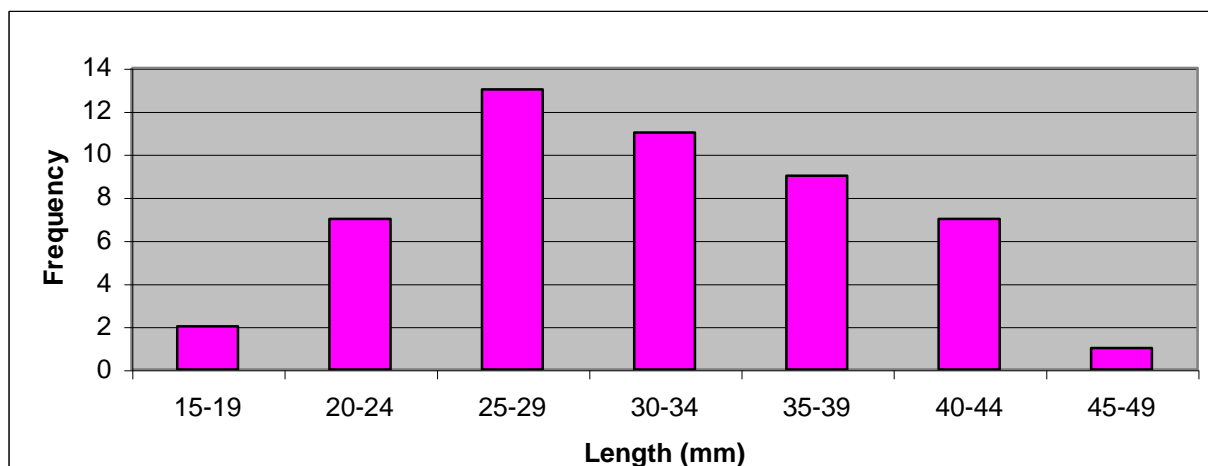


Figure 2. Total length of 50 *C.n.mionectes* at King's Pool-2005

Point of Rocks

On 13 October, 3 larval traps were placed in the pool and 8 standard traps were placed in the outflows. They were allowed to fish for 3.5-4 hours for a total trapping time of 55.42 hours. One hundred seventy-four pupfish were captured of which 154 were marked. Seven speckled dace were also captured but not marked. Ten crayfish, 24 mollies, 1 *Gambusia* and 5 tadpoles were also caught.

On 19 October, 3 traps were set in the pool and 7 traps were set in the outflow. They fished for 3-4 hours for a total trapping time of 36.69 hours. Eight crayfish, 6 *Gambusia*, and 1 mollie were captured. One hundred twenty-two pupfish were censused of which 43 were marked. The population estimate for *C.n.mionectes* at Point of Rocks was 437 (324-589, $p=0.95$). Four speckled dace were captured too. The population estimate for *R.o.nevadensis* at Point of Rocks was undetermined.

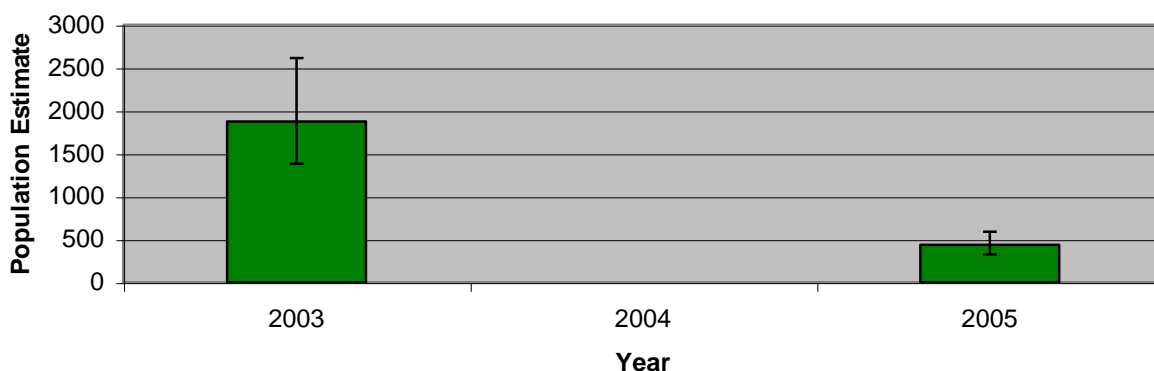


Figure 3. Population Estimates for *C. n. mionectes* at Point of Rocks, 2003-Present

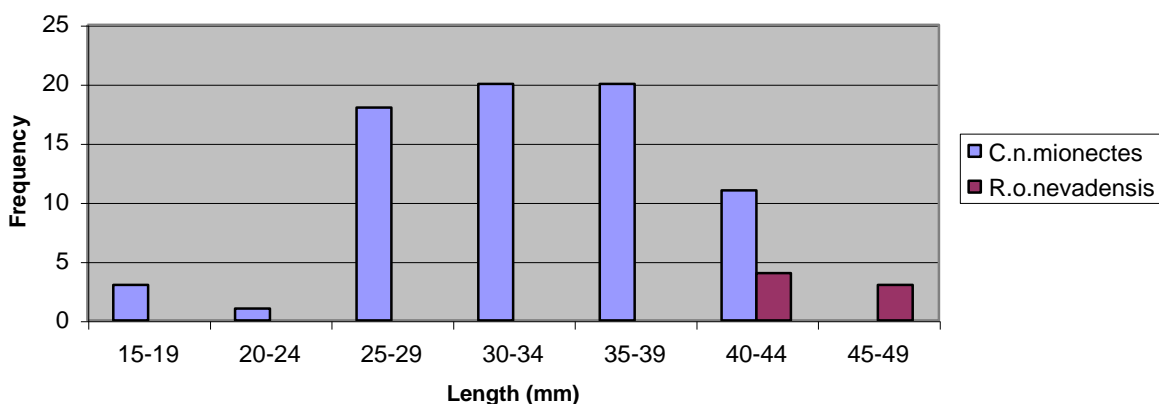


Figure 4. Body lengths of 80 native fishes at Point of Rocks-2005

Bradford 1 & 2

On 13 October, 1 larval trap, 6 crayfish traps, and 3 standard traps were placed into Bradford spring 1. One larval trap, 3 crayfish traps and 3 standard traps were placed in the spring pool at Bradford 2. Two crayfish traps were placed in the outflows of Bradford 2. They were allowed to fish for 4-5 hours for a total trapping time of 84.76 hours (39.93 hours in 1, 44.84 hours in 2) In the 1st pool, 123 speckled dace were captured of which 78 were marked. One hundred crayfish and 11 *Gambusia* were also caught. In the 2nd pool and outflow, 148 speckled dace were caught of which 142 were marked. Eighty-three crayfish, 47 *Gambusia*, 5 tadpoles, and 2 pupfish were captured too.

On 19 October, 10 traps were placed into Bradford spring 1. Seven traps were placed in the spring pool at Bradford 2. Two traps were placed in the outflows of Bradford 2. They were allowed to fish for 3-4 hours for a total trapping time of 65.87 hours (33.05 hours in 1, 32.82 hours in 2) In the first pool, 119 speckled dace were captured of which 50 were recaptures. The population estimate for *R.o.nevadensis* at the first Bradford pool was 186 (142-241, $p=0.95$). Seventy-two crayfish and 6 *Gambusia* were also caught. In the second pool and outflow, 86 speckled dace were caught of which 29 were recaptured. The population estimate for speckled dace at the second Bradford pool was 421 (293-605, $p=0.95$) Forty-three crayfish, 29 *Gambusia*, 9 tadpoles, and 1 pupfish were captured too.

The total population estimate of *R. o. nevadensis* at Bradford Springs was 493(396-620, $p=0.95$)

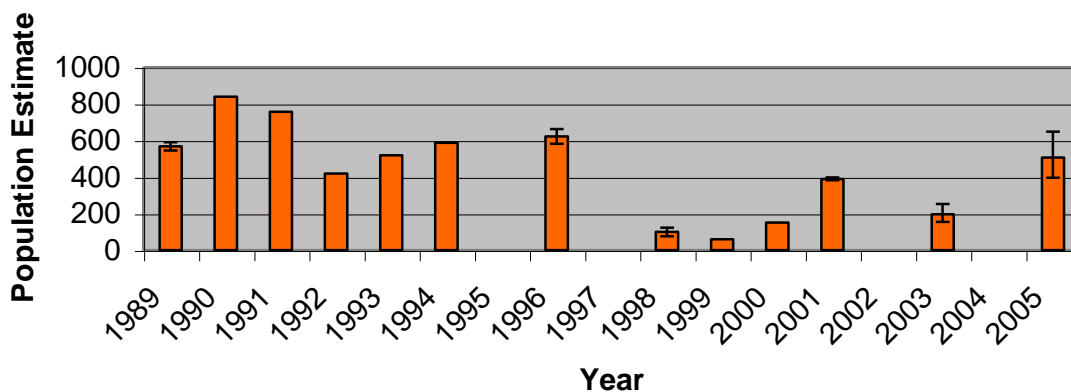
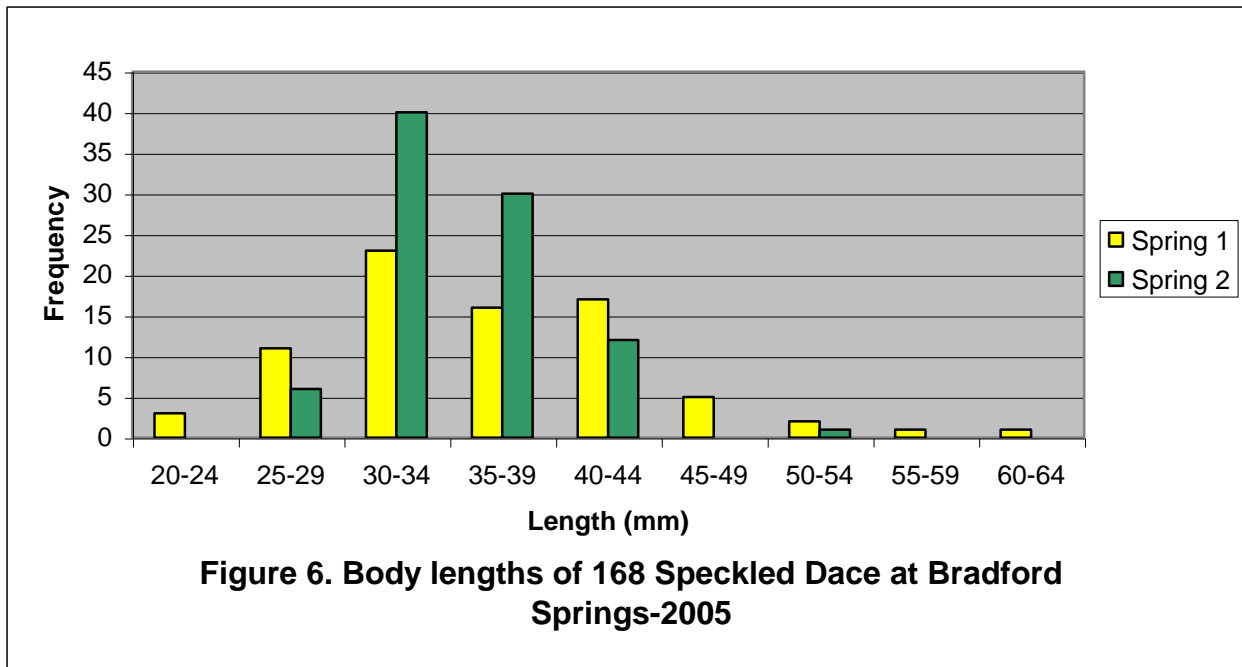


Figure 5. Population Estimates of *R. o. nevadensis* at Bradford Springs, 1989-Present



Jackrabbit Spring

On 13 October, 3 larval traps and 3 standard traps were placed in the pool and ten standard traps were placed in the outflows 10-20 meters apart. The traps were allowed to fish 4-5 hours for a total trapping time of 81.08 hours. Eight hundred twenty-one pupfish were caught of which 469 were marked. The majority of the fish were at the springhead and only the larger pupfish were found in the outflows. Thirteen speckled dace were caught of which all but one were marked. Two hundred thirty-eight crayfish, 10 mollies, and 44 *Gambusia* were also captured.

On 19 October, 6 traps were set in the pool and 5 traps were set in the outflow before the burn. They fished for 4-5 hours for a total trapping time of 58.97 hours. One hundred and two crayfish, 5 mollies, and 3 *Gambusia* were captured. Three hundred seventy-six pupfish were caught of which 178 were recaptures. Seventeen speckled dace were captured of which only 4 were recaptures. The population estimates for all of Jackrabbit Spring sampled (including the burn areas) are reported. The population estimate for *C.n.mionectes* was 1027 (887-1188). The population estimate for *R.o.nevadensis* was 117 (53-318).

Jackrabbit-Burn Area

On 13 October, 5 standard traps were placed in the Jackrabbit outflows near the still intact quarters building. Two standard traps were placed just above the culvert (on the way to Big Spring) and 3 standard traps were placed below the culvert. The traps were allowed to fish 4-5 hours for a total trapping time of 54.94 hours. Twenty speckled dace were caught of which 13 were marked. Seven speckled dace were caught below the culvert, the rest were caught by the quarters building. Thirteen crayfish, and 14 mollies were also captured.

On 19 October, 4 traps were placed where the burn meets the outflows of Jackrabbit just below the springhead. Five traps were placed in the Jackrabbit outflows near the still intact quarters. Three traps were placed just above the culvert (on the way to Big spring) and 2 traps were placed below the culvert. The traps were allowed to fish 4-5 hours for a total trapping time of 65.57 hours. Eleven speckled dace were caught of which 3 were recaptured. One dace was recaptured below the culvert. One dace without a mark was caught by the quarters, and nine dace were caught just below the springhead in the burn area. Thirty-three crayfish, 5 *Gambusia* and 26 mollies were also captured.

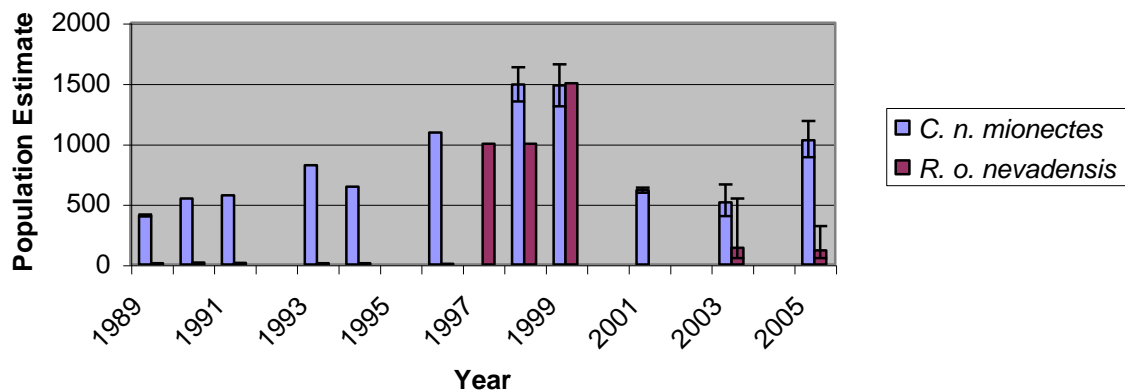


Figure 7. Population Estimates of *C. n. mionectes* and *R. o. nevadensis* at Jackrabbit Springs, 1989-Present

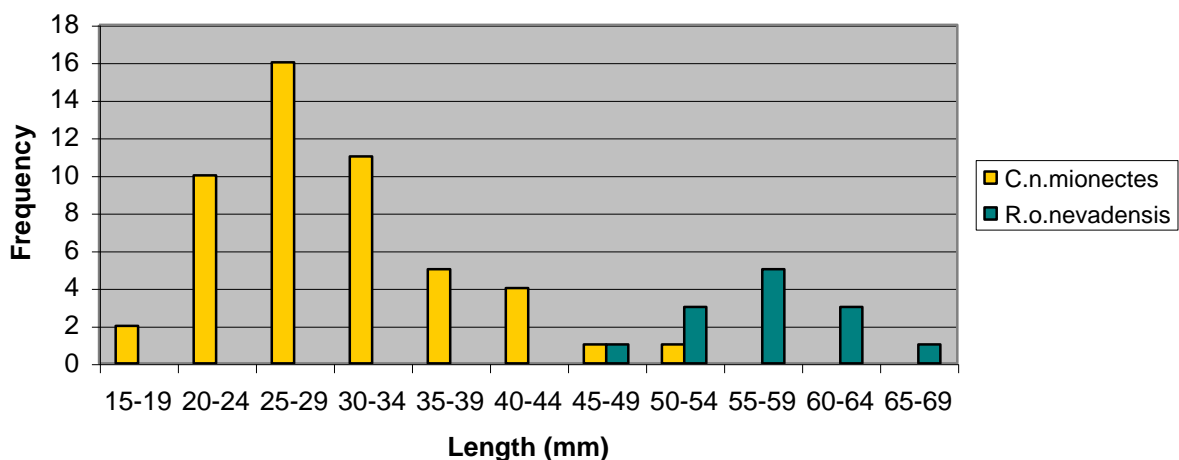


Figure 8. Body lengths of 63 native fishes at Jackrabbit Spring-2005

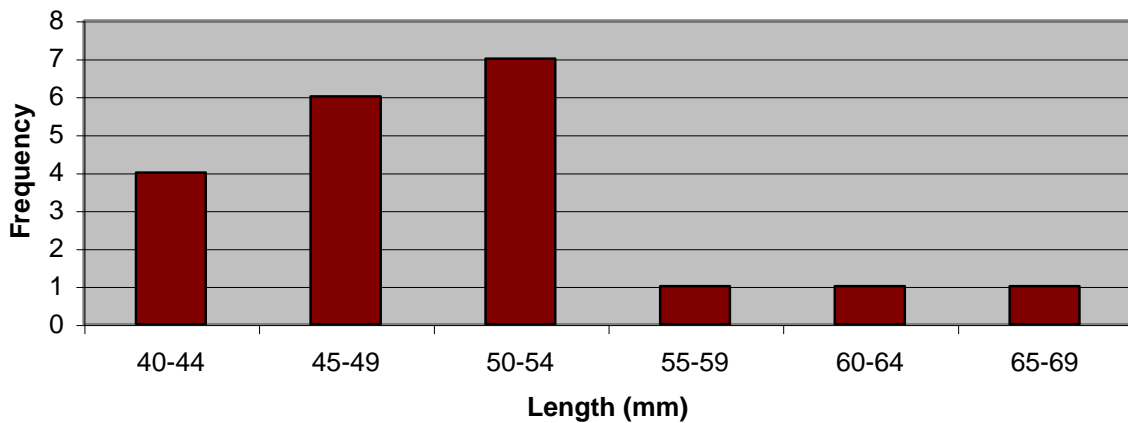


Figure 9. Body lengths of 20 speckled dace found in the burn area at Jackrabbit Spring-2005

Crystal Spring

On 14 October, 2 larval traps and 8 standard traps were set at the pool. Fourteen standard traps and 1 larval trap were set at 20-25 m intervals in the outflow. Traps were allowed to fish for 3-6 hours for a total trapping time of 131.97 hours. One thousand two hundred eighty-two pupfish were captured of which 925 were marked. Sixty-nine crayfish, 42 *Gambusia* and 5 mollies were also caught.

On 19 October, 10 traps were set in the pool and 10 traps were set at 20-25 m intervals in the outflow. They fished for 5-6 hours for a total trapping time of 113.92 hours. Eight crayfish, 5 *Gambusia*, and 2 mollies were caught. Nine hundred and four pupfish were censused of which 195 were recaptured. The population estimate for *C.n.mionectes* at Crystal Spring was 4288 (3727-4934, $p=0.95$).

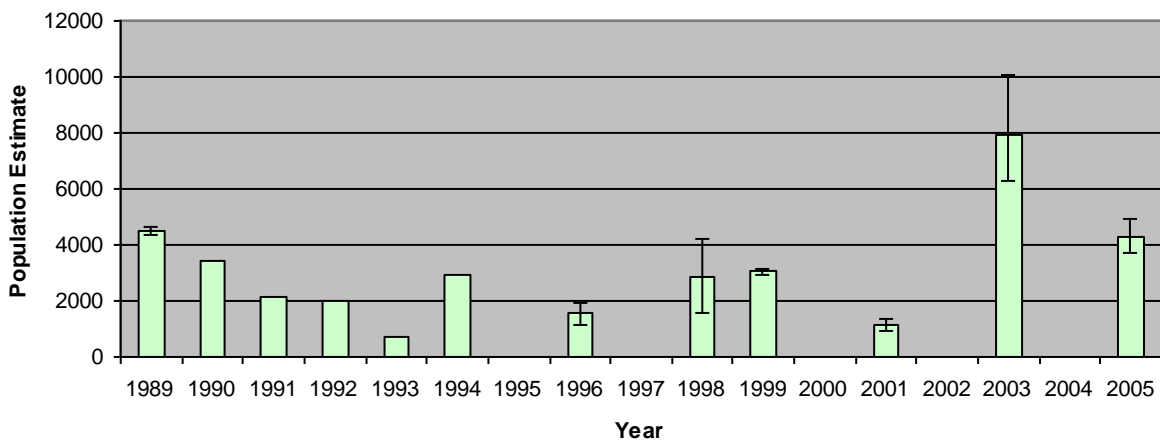


Figure 10. Population Estimates of *C. n. mionectes* at Crystal Spring, 1989-Present

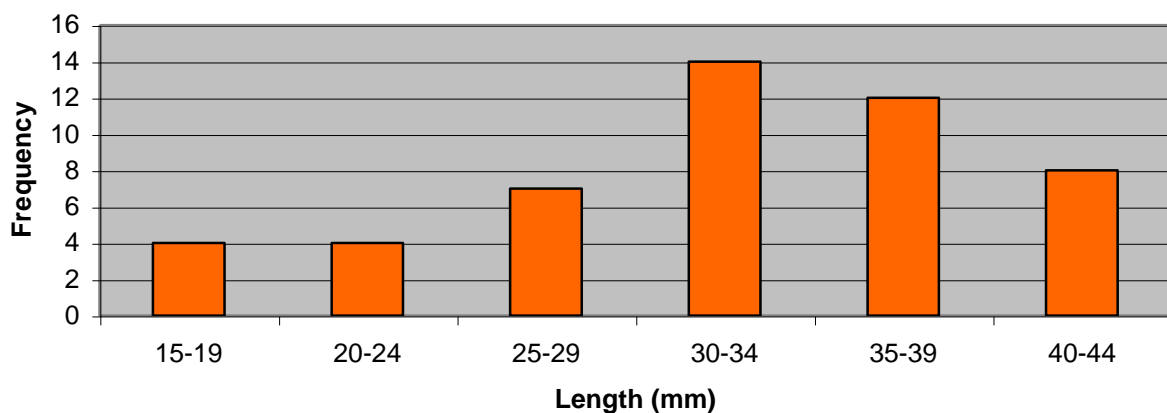


Figure 11. Body lengths for 49 *C.n.mionectes* at Crystal Spring-2005

Table 1. Catch per unit effort at Ash Meadows, Nye Co., NV, 2005.

Location	Date	Pupfish	Dace	Crayfish	Mollies	<i>Gambusia</i>	Tadpoles
King's Pool	10/13/05	8.04	0	0.02	0.02	0	0.05
	10/19/05	9.18	0	0.06	0.02	0	0.02
Point of Rocks	10/13/05	3.14	0.13	0.18	0.43	0.02	0.09
	10/19/05	3.33	0.11	0.22	0.03	0.16	0
Jackrabbit	10/13/05	10.13	0.14	2.94	0.12	0.54	0
	10/19/05	6.38	0.29	1.73	0.08	0.05	0
Jackrabbit (burn area)	10/13/05	0	0.36	0.24	0.25	0	0
	10/19/05	0.27	0.17	0.50	0.40	0.08	0
Bradford 1	10/13/05	0	3.08	2.51	0	0.28	0
	10/19/05	0	3.60	2.17	0	0.18	0
Bradford 2	10/13/05	0.04	3.30	1.85	0	1.05	0.11
	10/19/05	0.03	2.62	1.31	0	0.88	0.27
Crystal	10/14/05	9.71	0	0.52	0.04	0.32	0
	10/19/05	7.94	0	0.09	0.02	0.04	0

DISCUSSION

The pupfish population in King's Pool is stable. Habitat restoration here has really benefited the pupfish and hurt the non-natives. CPUE for exotics is much less than that at Point of Rocks, where this year's estimate was 75% less than the 2003 estimate. Looking at the habitat at the two springs, there is not much in common. The springhead at King's Pool lacks the "carpet" of green algae that covers Point of Rocks. This may be due to lower velocity or to the more southerly exposure at Point of Rocks.

The recently repatriated speckled dace at Point of Rocks have remained in detectable numbers and should continue to do well. With speckled dace populations doing well at

Bradford 1, several hundred more young-of-the-year dace should be moved to Point of Rocks in the spring and summer of 2006.

Crayfish trapping at Bradford 1& 2 should continue in order to maintain the stable population of speckled dace. Traps that allow only fish to escape could be set on a fairly frequent basis and could be set for many hours at a time. On a monthly basis, smaller crayfish can be trapped using minnow traps.

At Jackrabbit Spring, the pupfish population appears to be stable, despite the recent fire. The speckled dace, however, may not have fared as well, but it is difficult to say for sure since the population estimate this year was very close to that in 2003. Growth of emergent vegetation in the burned areas could become very thick and alter flows and should be closely monitored.

The Amargosa pupfish population at Crystal Spring also looks stable at over 4000 fish. It seems that the habitat here favors the pupfish, because very few exotics are captured compared to the number of pupfish. The ratio of pupfish to exotics should be monitored closely in the case that the current situation begins to shift in favor of the exotics.

LITERATURE CITED

Ricker WE. 1975. *Computation and Interpretation of Biological Statistics of Fish Populations*. Bulletin of the Fisheries Research Board of Canada. 191: 382 pp.