

Spatial and Temporal Variation in Ephemeral Pool Crustacean Communities¹

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Extended Abstract

Vernal pool habitat losses in San Diego County, California, are estimated at 95 percent and will increase as development continues. The majority of San Diego's remaining pools are located at the Marine Corps Air Station, Miramar. Crustacean communities in eight vernal pools in San Diego County were sampled over 3 years that differed in rainfall amount and pattern. In 1994, rains occurred late but were moderate in quantity, and species richness ranged from 1 to 22 species; 1998 was a high rainfall El Niño year, and pools varied from 0 to 15 species; 1999 was a low rainfall La Niña year, and pools contained 4 to 7 species. No spatial pattern was seen among neighboring pools. Longer-lived pools had more species, including the more rare species; smaller pools included the more common taxa (*table 1*). Diversity within pools varied between years, although the highest rainfall year did not result in the highest diversity (*fig. 1*). These data indicate the necessity of surveying multiple pools over a period of several years to establish baseline data for these complex communities. Therefore, adequate monitoring of restored or created pools must extend over several pools and several years. Certain species present within a cyst bank may not hatch every year due to weather conditions or other factors. Some species hatch repeatedly after a filling but may not breed and replenish the bank.

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Table 1—Number of species of vernal pool crustaceans in 4 different pools sampled in 3 different years (A = 1994, B = 1998, and C = 1999). Pools 1 and 2 persisted much longer than pools 6 and 7. Pool 7 was not sampled in 1999.

Pool number: Year	<u>Long-lived Pools</u>						<u>Short-lived Pools</u>					
	1			2			6			7		
	A	B	C	A	B	C	A	B	C	A	B	C
Anostraca												
<i>Branchinecta sandiegoensis</i>	x	x		x	x		x	x		x	x	
<i>Branchinecta</i> juveniles	x	x	x	x	x	x	x	x	x	x	x	
Total # of species	1	1	(1)	1	1	(1)	1	1	(1)	1	1	-
Cladocera												
<i>Macrothrix hirsuticornis</i>	x	x	x	x	x	x	x	x	x			
<i>Ceriodaphnia dubia</i>	x	x		x	x	x	x				x	
<i>Moina micrura</i>	x			x			x					
<i>Alona cf diaphana</i>	x	x		x	x			x				
<i>Simocephalus</i> sp.	x	x		x								
Total # of species	5	4	1	5	3	2	3	2	1	0	1	-
Ostracoda												
<i>Cypris pubera</i>	x	x	x	x	x	x	x	x		x	x	
<i>Cypris</i> sp. 1	x	x	x	x	x	x	x	x				
<i>Cypris</i> sp. 2	x	x		x	x		x					
<i>Cypris pustulosa</i>	x	x	x		x	x						
<i>Limnocythere glypta</i>	x	x		x	x						x	
<i>Potamocypris</i> sp.	x	x		x	x							
<i>Prionocypris</i> sp.	x											
<i>Cypris virens</i>		x		x	x							
<i>Cypridopsis vidua</i>				x								
<i>Herpetocypris</i> sp.												
Ostracod N												
Unknown				x								
Total # of species	7	7	3	7	8	3	3	2	0	1	2	-
Copepoda												
<i>Acanthocyclops vernalis</i>	x	x	x	x	x	x	x	x	x	x	x	
<i>Acanthocyclops robustus</i>	x	x	x		x		x	x	x	x	x	
<i>Hesperodiaptomus franciscanus</i>	x	x		x	x		x					
Total # of species	3	3	2	2	3	1	3	2	2	2	2	-
TOTAL # OF SPECIES	16	15	7	15	15	7	10	7	4	4	6	-

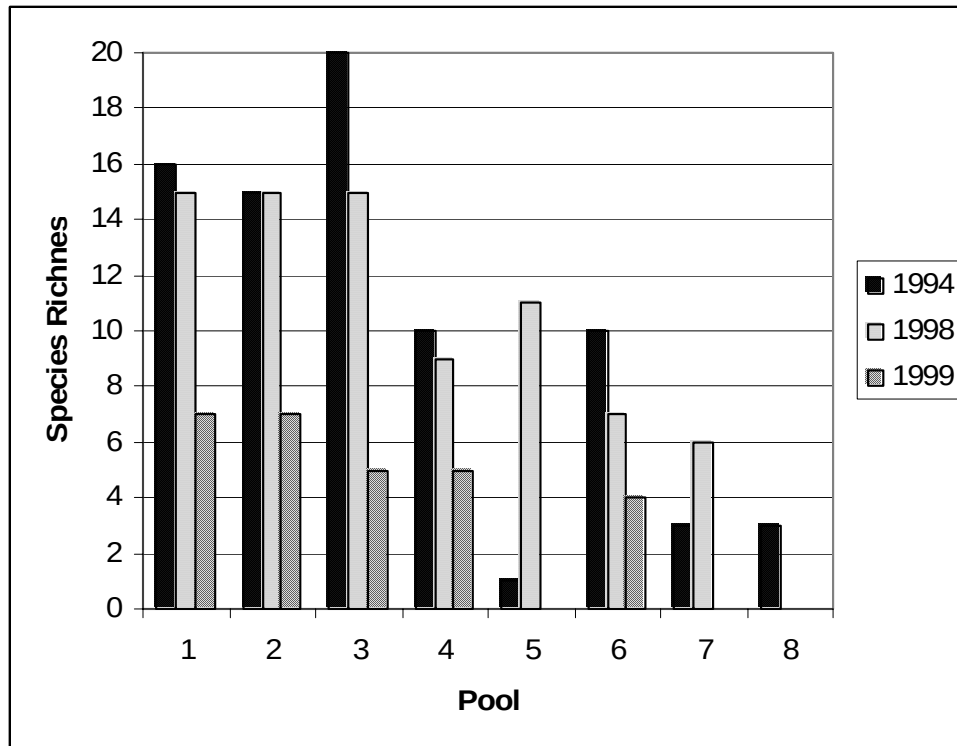


Figure 1—Comparison of species richness in 1994, 1998, and 1999 in eight vernal pools in San Diego County.