THE MARINE MOLLUSKS OF BALLONA

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INTRODUCTION

The marine mollusks of Ballona were surveyed during 1980-81 in order to compare the mollusks with those of similar, but undisturbed salt marsh faunas in southern California.

METHODS

During July, 1980, I made a preliminary survey of the molluscan fauna, making random collections of dead shells along the tidal channels. This enabled a general assessment of the mollusks present. For the quantitative sampling, seven stations (Figure 1) were established. All stations were fully exposed at low tide. Monthly samples were taken from each of these stations over a ten month period from August, 1980, through May, 1981. Samples were taken from the center of the channel at each station using a core tube 33 cm in circumference x 18 cm in height, volume 1,559 cc.

Core samples were wet-seived in the field with a 1.0 cm sieve box and transported in plastic bags to the laboratory for further seiving of the mud. The mollusks recovered were transferred to shallow pans for examination and identification. Living mollusks and dead mollusk shells were recovered in this way. The epifaunal species that live abundantly on the mud surfaces at or slightly below the high water line (Melampus olivaceus, Assiminea californica, and Cerithidea californica) were recovered as dead shells. Other species, all of which live epifaunally on the mud surfaces exposed at low tide, or burrow infaunally in the mud, were recovered primarily as dead shells, although living examples of all species were verified. A voucher collection representing each species has been deposited in the LACMNH permanent collection.

RESULTS

Scientific and common names of the marine species found in this study are listed in Table 1, which also gives the stations from which each species was collected. Additional references to the species at the Ballona from other survey reports are also given in Table 1. All species are characteristic salt marsh forms, as described and illustrated in McLean (1978) and Abbott (1974). Thirteen bivalve species were collected in the present study, three of which (Chione californiensis, Laevicardium substriatum, and Tresus nuttalli) were found only as dead valves during the preliminary survey. Two additional bivalves, Ostrea lurida Carpenter, 1864, and Spisula sp., were reported from Ballona by Reish (1980). Of the 13 species collected in this study, seven were not found by Reish (1980). Six gastropod species were found in the present study, only one of which was reported by Reish (1980).

Table 2 shows the total number of specimens of each species collected from each station over the ten month period from August, 1980, to May, 1981, and also the total number of specimens of each species from all stations combined over the ten month period. Of the 16 species appearing in the quantitative samples, station 4 was the most diverse, having 14 species. Differences in diversity between the stations are not significant; all the abundant and relatively common species (Macoma nasuta, Protothaca staminea, Tagelus californianus, Acteocina inculta, Assiminea californica, Cerithidea californica, and Melampus olivaceus) were present at each station. The higher count of species at some stations is a result of the occurrence of species that are sporadic and represented by very few numbers. These sporadic species are Cryptomya californica, Leptopecten latiauratus, Mytilus edulis, Saxidomus nuttalli, Tellina carpenteri, Zirfaea pilsbryi, Bulla gouldiana, and Haminoea virescens.

Table 3 shows the sampling results of each species by month, also giving the total number collected, which matches the same tally in Table 2. Although

the monthly results show some fluctuation, with a trend toward greater abundance of most species during the fall months, these results, which are based primarily upon dead shells, are not significant.

In addition, dead shell of three fresh water species /Gyraulus parvus (Say, 1816); Helisoma sp.; and Physa virgata Gould, 1855/ were collected along the Centinela Creek drainage ditch. Such species occur away from salt marshes in fresh water, though their shells commonly wash into the marshes (McLean, personal communication).

CONCLUSIONS

Despite its relatively small area, the Ballona salt marsh supports a varied aggregation of invertebrate animals, of which the mollusks are an important component. The Ballona salt marsh is comparable in the diversity and abundance of its molluscan fauna to the two salt marsh localities in southern California--Mugu Lagoon, Ventura County, and Mission Bay, San Diego County (MacDonald 1969a, 1969b). Essentially the same species are present in all three salt marshes.

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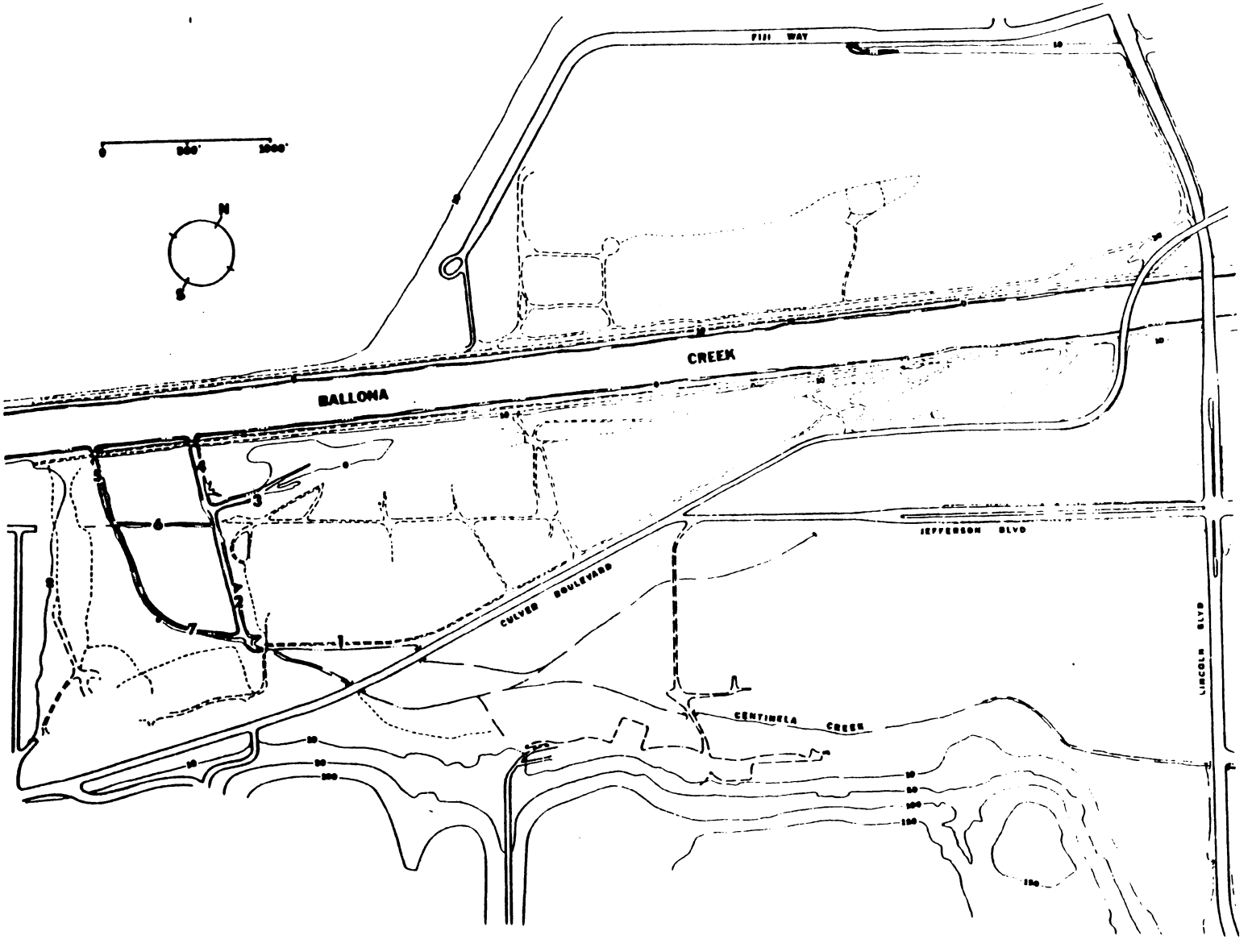

Figure 1. Marine mollusk collecting stations, 1980-1981.

TABLE 1

Marine Mollusks of Ballona Collected 1980-81

Name	Stations	Additional References
CLASS PELECYPODA (BIVALVES)		
Chione californiensis (Broderip, 1835) California Chione	P*	
Cryptomya californiaca (Conrad, 1837) California Glass Mya	4	Reish, 1980
Laevicardium substriatum (Conrad, 1837) Egg Cockle	P	
Leptopecten latiauratus (Conrad, 1837) Wide-eared Scallop	4	
Macoma nasuta (Conrad, 1837) Bent-Nose Clam	1-7	Reish, 1980
Mytilus edulis Linnaeus, 1758 Bay Mussel	1-2,4-5	Metz, 1978 Reish, 1980
Protothaca staminea (Conrad, 1837) Littleneck Clam	1-7	Metz, 1978 Reish, 1980
Saxidomus nuttallii Conrad, 1837 Washington Clam	4	
Tagelus californianus (Conrad, 1837) California Jacknife Clam	1-7	Bakus, 1975
Tagelus subteres (Conrad, 1837) Purplish Jacknife Clam	1-5	Reish, 1980
Tellina carpenteri Dall Carpenter's Tellin	4	
Tresus nuttalli (Conrad, 1837) Gaper Clam	P	
Zirfaea pilsbryi Lowe, 1931 Rough Piddock	4	Reish, 1980
CLASS GASTROPODA (MARINE SNAILS)		
Acteocina inculta (Gould, 1855) Small Acteocina	1-2,4-7	
Assiminea californica (Tryon, 1865) California Assiminea	1-7	

Name	Stations	Additional References
Bulla gouldiana Pilsbry, 1893 California Paper Bubble	1,3	Metz, 1978
Cerithidea californica (Haldeman, 1840) California Horn Snail	1-4	Bakus, 1975, Metz, 1978, Clark, 1979 Reish, 1980
Haminoea virescens (Sowerby, 1833) Green Paper Bubble	5	
Melampus olivaceus Carpenter, 1857 Salt Marsh Snail	1-7	

*Shells collected along the main channel during the preliminary survey.

TABLE 2

Total numbers of each species by station over the ten month period, August, 1980, to May, 1981. Also showing the total number of specimens of each species from all seven stations combined, and the number of species collected at each station.

Stations	1	2	3	4	5	6	7	Total
Pelecypoda								
Cryptomya californica				5				5
Leptopecten latiauratus				4				4
Macoma nasuta	12	8	27	39	28	29	13	156
Mytilus edulis	1	2		15	12			30
Protothaca staminea	2	8	20	193	50	22	3	298
Saxidomus nuttallii				1				1
Tagelus californianus	6	16	16	13	8	5	8	72
Tagelus subteres	11	29	9	11	1			61
Tellina carpenteri				1				1
Zirfaea pilsbryi				3				3
Gastropoda								
Acteocina inculta	13	3		14	1	1	1	32
Assiminea californica	324	70	1	17	71	77	14	574
Bulla gouldiana	1		2					3
Cerithidea californica	578	1109	529	1630	303	111	433	4693
Haminoea virescens					1			1
Melampus olivaceus	40	35	3	64	16	64	58	279
Species/station	10	9	8	14	10	7	7	

TABLE 3

Numbers of each species from all stations by month. Also showing the total number of specimens for the ten month period from August, 1980, to May, 1981.

	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	TOTAL
Pelecypoda											
Cryptomya californica	4	1									5
Leptopecten latiauratus	1	2	1								4
Macoma nasuta	23	15	18	22	11	12	15	15	12	13	156
Mytilus edulis	5	4	7			5	1	2	3	3	30
Protothaca staminea	39	36	46	45	21	31	30	30	8	12	298
Saxidomus nuttallii							1				1
Tagelus californianus	9	15	16	8	2	9	1	5	4	3	72
Tagelus subteres	8	5	4	5	2	14	7	6	5	5	61
Tellina carpenteri	1										1
Zirfaea pilsbryi	1	1	1								3
Gastropoda											
Acteocina incluta	2		12	6	4	6	1			1	32
Assiminea californica	75	69	85	42	112	177	23	21	24	46	574
Bulla gouldiana	2			1							3
Cerithidea californica	352	473	651	765	499	415	361	463	473	241	4693
Haminoea virescens			1								1
Melampus olivaceus	14	25	43	16	39	29	39	37	28	9	279