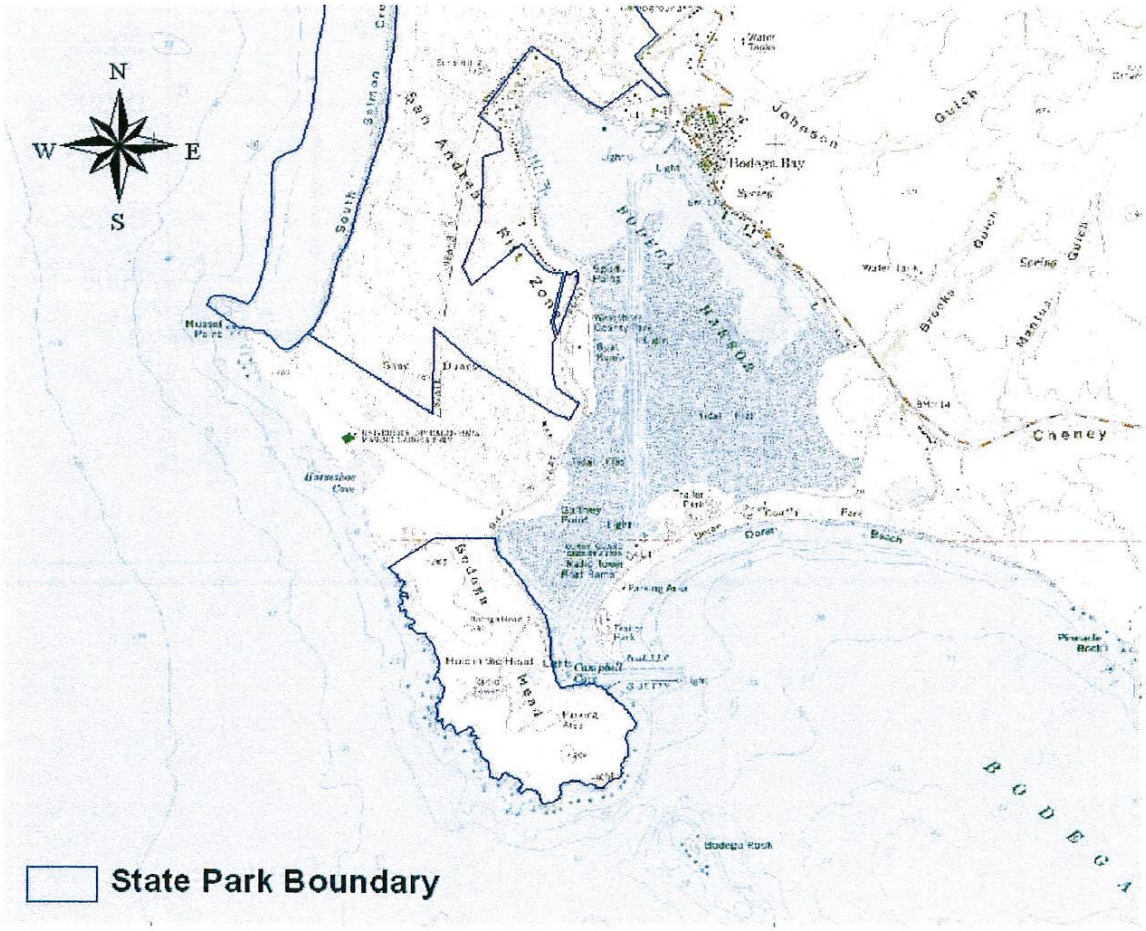
Assessment Report of Animal Species Known to Occur at Campbell Cove State Beach

Submitted to the Sonoma County Department of Health Services, Environmental Health Division, by the State of California Department of Parks and Recreation, Dec. 2003.

Area of Study

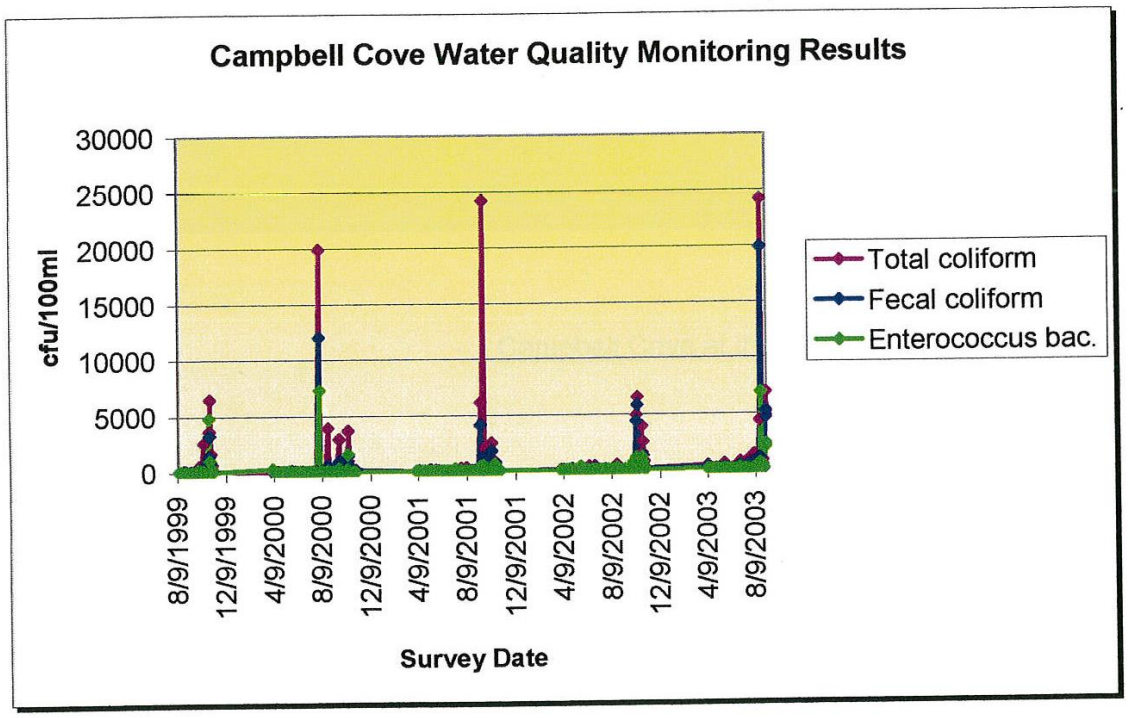
Campbell Cove State Beach is a .2 mile-long beach area within the Sonoma Coast State Beach at the opening of Bodega Harbor. The cove area is habitat for diverse populations of animal species. Campbell Cove is situated halfway between Seal Rock (also known as Bodega Rock) and the tidal flats at Gaffney Point (.7 miles northeast and southeast of Campbell Cove, respectively.) Though neither Seal Rock nor Gaffney Point are within State Beach boundaries, animal species occurring at all three locations were assessed for this report because their close proximity makes exchange and influence between populations at each location extremely likely.



Critical Season

Campbell Cove State Beach water quality data maintained by the Sonoma County Department of Health Services dating back to August 1999 show levels of coliform bacteria exceeding standard risk thresholds during regular monitoring beginning in the month of August and continuing through the end of October. Data is gathered at the minimum of a weekly basis from April 1 to October 31 each year. Data is not available for the months of November through March.

Monitoring data shows regular seasonal fluctuation, with levels of coliform bacteria growing to a peak at the end of the monitoring period each year for the last five consecutive years.

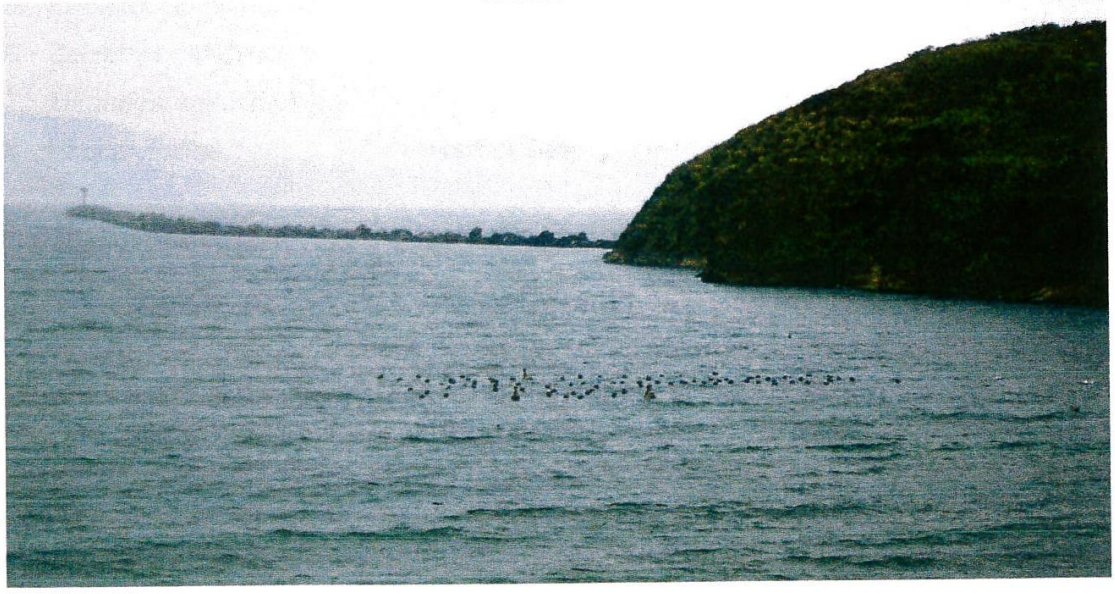


Survey Habitat

Surveys have shown high levels of total coliform, fecal coliform, and/or enterococcus bacteria in shallow waters on the harbor shore. The deep waters of the channel and mid-bay areas have shown clean or low contamination values.

Bodega Harbor and Gaffney Point

Campbell Cove at the entrance to Bodega Harbor



Survey Species

For the purposes of this report, animal species are listed below which occur in significant numbers within the survey area during the critical season of elevated coliform bacteria levels.

Mammals

1. *Didelphis virginiana*	Opossum	Common
2. *Sorex vagrans*	Vagrant shrew	Common
3. *Procyon lotor*	Raccoon	Common
4. *Memphitis memphitis*	Striped skunk	Common in uplands
5. *Eumetopias jubatus*	Steller's sea lion	Uncommon
6. *Zalophus californianus*	California sea lion	Common
7. *Mirounga angustirostris*	Northern elephant seal	Uncommon
8. *Phoca vitulina*	Harbor seal	Common
9. *Odocoileus hemionus columbianus*	Black-tailed deer	Common in uplands
10. *Microtus californicus*	California vole	Common
11. *Rattus norvegicus*	Norway rat	Uncommon, disturbed areas

Birds

The results of field surveys of bird populations present in the survey area conducted by State Parks personnel correspond with Bodega Marine Laboratory list *Birds of Bodega Harbor, Bodega Head, and Bodega Dunes* (2003). The list is derived in part from the data in *Birds of Sonoma County* by G.L. Bolander and B.D. Parmeter as revised by BD Parmeter (Redwood Region Ornithological Society, 2000) and *The Sonoma County Breeding Bird Atlas*, B. Burridge, editor (Madrone Audobon Society, 1995). Except as noted, the following are known to be common migratory or winter resident shorebirds within the area:

1. *Gavia pacifica*	Pacific loon	Migratory, Winter Resident
2. *Gavia adamsii*	Common loon	Winter Resident
3. *Podiceps auritus*	Horned grebe	Winter Resident
4. *Podiceps nigricollis*	Eared grebe	Winter Resident
5. *Aechmophorus occidentalis*	Western grebe	Winter Resident
6. *Puffinus griseus*	Sooty shearwater	Migratory
7. *Pelecanus erythrorhynchos*	American white pelican	Summer Resident
8. *Pelecanus occidentalis*	Brown pelican	Summer Resident
9. *Branta bernicla*	Brant	Winter Resident
10. *Anas americana*	American wigeon	Winter Resident
11. *Anas platyrhynchos*	Mallard	Winter Resident
12. *Anas clypeata*	Northern shoveler	Winter Resident
13. *Anas acuta*	Northern pintail	Winter Resident
14. *Aythya marila*	Greater scaup	Winter Resident

15. *Mealnitta perspicillata*	Surf scoter	Migratory, Winter Resident
16. *Bucephala albeola*	Bufflehead	Winter Resident
17. *Bucephala clangula*	Common goldeneye	Winter Resident
18. *Mergus serrator*	Red-breasted merganser	Winter Resident
19. *Oxyura jamaicensis*	Ruddy duck	Winter Resident
20. *Fulica americana*	American coot	Winter Resident
21. *Pluvialis squatarola*	Black-bellied plover	Winter Resident
22. *Charadrius semipalmatus*	Semipalmated plover	Migratory, Winter Resident
23. *Haematopus bachmani*	Black Oystercatcher	Permanent Resident
24. *Recurvirostra americana*	American avocet	Winter Resident
25. *Catoptrophorus semipalm.*	Willet	Winter Resident
26. *Limosa fedoa*	Marbled godwit	Winter Resident
27. *Arenaria melanocephala*	Black turnstone	Winter Resident
28. *Aphriza virgata*	Surfbird	Migratory, Winter Resident
29. *Calidris alba*	Sanderling	Winter Resident
30. *Calidris mauri*	Western sandpiper	Winter Resident
31. *Calidris minutilla*	Least sandpiper	Winter Resident
32. *Calidris alpina*	Dunlin	Winter Resident
33. *Limnodromus scolopaceus*	Long-billed dowitcher	Migratory, Winter Resident

34. *Larus heermanni*	Heermann's Gull	Summer Resident
35. *Larus canus*	Mew Gull	Winter Resident
36. *Larus delawarensis*	Ring-billed Gull	Winter Resident
37. *Larus californicus*	California Gull	Winter Resident
38. *Larus occidentalis*	Western Gull	Permanent Resident
39. *Larus glaucescens*	Glaucous-winged Gull	Winter Resident
40. *Sterna forsteri*	Forster's Tern	Winter Resident

Discussion

State Park survey information results in a list of 11 species of mammals and 40 species of birds that are common residents within the survey area during the critical season of coliform bacteria levels.

The regular seasonal fluctuation of coliform bacteria levels supports the hypothesis that the elevated levels may be due to the increased presence of migratory and winter resident bird populations in the fall and winter.

Thousands of migrant shorebirds winter at Bodega Bay each year, attracted by the wide range of benthic invertebrates living in the soft sediments of intertidal mudflats and sandflats. The affected area of elevated coliform bacteria levels measured at Campbell Cove State Beach would be consistent with potential sources from wintering and migrant shorebirds which feed along the bay shore, particularly congregating on Gaffney Point.

Seal Rock (Bodega Rock) and the southern coves of Bodega Head support substantial populations of marine mammals, among them California sea lions and harbor seals. The moderate levels of indicator bacteria reported at Seal Rock in the *Aug.-Oct. 2003 Quarterly Progress Report for the County of Sonoma Campbell Cove/Bodega Bay Tidal Circulation and Fecal Bacteria Study* would be consistent with mammal or avian influence from these outer areas on contamination levels within the Bodega Harbor.