

Environmental Baseline of
The Aquatic Insects of
San Pedro Creek

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The middle fork of San Pedro Creek is one of the few creeks left in the Bay Area that has not been tunneled underground. San Pedro Creek flows northwest through the district of Linda Mar in the city of Pacifica, San Mateo County. The creek starts at the head waters which are located in the hills which surround the Linda Mar valley.

By the looks of the creek where it empties into the Pacific Ocean most people think that the creek is polluted and sustains no life. The creek is actually full of life, but not to many people know this, because no one ever takes the time to look. One group of animals that few people realize exists are the aquatic insects. Their existence proven many times when I was in the field. I would get questions asking what I was doing in the creek, and on giving my reply of "establishing an environmental baseline of the aquatic insects of San Pedro Creek" most people didn't know what an aquatic insect was or even that there was any life at all in the creek. The creek is not polluted beyond the point of no return. If people begin to realize that a natural creek is still flowing with life, maybe people would start to help the creek. If people don't start realizing that the creek is alive with plants and animals, and do nothing to help it, then the creek will soon die. My study of the aquatic insects will hopefully make more people aware that San Pedro Creek is still alive, even with as small of animals as aquatic insects.

The insects were collected from the mouth of the creek, one hundred yards from the high tide mark of the Pacific Ocean, and up to one hundred yards up-stream of the North Coast County Water District

pump station. The collecting covers only the middle fork of San Pedro Creek, the north and south forks and other tributaries are not covered. The sample sites were every fifty yards from the mouth to up-stream of the pump station.

Each sample site was approximately one square yard. A three foot wide net would be placed perpendicular to the current. The area above the net, about one square yard would then be disturbed. The plants would be shaken and the bottom rocks and sand would be over turned. The insects would then flow with the current into the net.

The abundance for an area was described on a scale from rare, not common, common, very common, to abundant. Quantitatively rare meaning less than five, and abundant being more than fifty of one species of aquatic insect collected in one area.

The field work started on the fifteenth of September 1974, and ended on the twenty-first of November 1974. A total of forty-three species were collected from the orders of Ephemeroptera, Cdonata, Plecoptera, Hemiptera, Trichoptera, Coleoptera, and Diptera. The aquatic insects were found through out the creek, from the farthest point down-stream to the highest point up-stream. At no area anywhere in the creek was there a complete lacking of aquatic insects.

The order Ephemeroptera includes the Mayflies. Four species of Ephemeroptera were found in San Pedro Creek coming from the families Baetidae and Heptageniidae. All species in the Baetidae family were found in the mouth area of the creek, this includes one species from each of the genera Isonychia, Paralentophlebia, and Baetis.

Isonychia was very commonly found in the slow moving waters, from

the mouth to two hundred yards up-stream. The species was found hidden among the rushes, cat-tails, and other aquatic plants that line the sides of the creek. The water was one to two feet in depth and very high in hydrocarbons. Isonychia was found in no other parts of the creek.

Paralentophebia was found commonly in the same area as Isonychia and was less common in one area twenty yards down-stream from the Sanchez School bridge. Paralentophebia was found, like Isonychia in the plants growing in the creek, in one to two feet of water. Both places that Paralentophebia was found had a high content of hydrocarbons trapped in the bottom sand.

The most abundantly found aquatic insect in the creek was Baetis. Baetis was found anywhere the water was moving fast and shallow, and commonly found in deep slow moving water. Unlike the first two Ephemeropteras, Baetis was found under rocks and other submerged debris.

The last species in the order Ephemeroptera was in the genus Heptagenia. Heptagenia was found in the higher areas of the creek, but was not common. Two places in which it was found are fifty and seventy yards up-stream from the pump station. Heptagenia lives in the bottom organic debris of small pools with moderate current flowing through the pool.

Only one species of Odonata was found in San Pedro Creek. The Damselfly, in the family Coenagrionidae, Argia sp. was not commonly found in any one area, but could be found down-stream from the Adobe drive bridge in small numbers. Argia was collected in grasses, alder roots, and other plant material that could be found in slow moving water. Argia could also be found, but rarely, under rocks

in the faster moving currents.

Plecoptera, or Stoneflies, were generally found in the cleaner parts of the creek. They were always found where the water was shallow and swiftly moving. Four species were found and three species were only located up-stream from the north fork tributary entry. Leuctra was found commonly where the water was moving swiftly over rocky bottoms. Not like the other species of Plecoptera, Leuctra was found on both sides of the north fork entry area.

Acroneuria californica and Claassenia were both found in shallow fast moving water, on the under sides of large rocks. Acroneuria californica was commonly found anywhere above the north fork entry. Claassenia although found in the same types of area as Acroneuria californica was not common.

The fourth Plecoptera found was in the genus Paraperlinae. Paraperlinae was commonly found in the leaves and other organic material on the bottom of small pools with slow currents. Like Acroneuria californica and Claassenia, Paraperlinae was only found in the clean, high airated, parts of the creek never in the creek below the entry of the north fork.

Two different families in the order Hemiptera, the true bugs, were collected in San Pedro Creek. The family Gerridae has two species which were commonly found through-out the creek. The most common of the two species was in the genus Gerris. Gerris was found anywhere the water was moving slow, never on the faster currents. The depth and purity of the water, and the surroundings seemed to make no difference in the number of species found.

The other species in the Gerridae family were in the genus Metrobates. Metrobates was less common than Gerris, but found in the same types

of area.

Four other species of Hemiptera were found, all belonging to the family of Corixidae. Three species were commonly found in the same general area, up-stream from the Capistrano drive bridge. The three species were only in the area where the creek flows through the concrete duct. The shallow water flows slowly over the algae covered sand.

The fourth species of Corixidae was collected twenty yards below the Sanchez School bridge. The species was found rare in the aquatic plants in moderately flowing water, at a depth of one foot. The bottom in the area was found high in hydrocarbons.

The Caddisflies, order Trichoptera, showed to be the highest represented order of aquatic insects collected in San Pedro Creek. Sixteen Trichoptera species were collected. All the Trichoptera larvae were found up-stream of the entry of the north fork, and in no other places. Two families Limnephilidae, and Rhyacophilidae together made up for seventy-five percent of the total Trichoptera species found.

Limnephilidae species were all very commonly found in various areas of the upper parts of the creek. Five of the six species were found cased in hollowed out twigs. They could be found in moderately and slow flowing currents which move over the piled up organic material, leaves, twigs, roots etc. in which they live. Some of the larger species could only be found in slow moving currents of the larger riffles and pools.

Six species of Rhyacophilidae were found in the creek. Five were of the genus Rhyacophilia, and one in the genus Glossosona. All six species were very commonly found in shallow fast moving water.

Glossosoma was the only species of the Rhyacophilidae family found which build a case and live on the under sides of rocks. The Rhyacophila species were all free living in piles of leaves and other debris.

Two species of the family Hydropsychidae were found. Both common in the swift, shallow water, attached to the bottom surfaces of rocks. Their means of attachment was by nets which were camouflaged with small pieces of plant debris.

Also common was the family of Lepidostomatidae, genus Lepidostoma. All were found on the down-stream sides of large rocks.

The two least common found Trichoptera larvae were of the families Limnephilidae, and Leptoceridae. In the family Limnephilidae, Neophylax was uncommon, it was found in moderately flowing currents, attached to rocks. The one species of Leptoceridae was rare and only found at the last point of the creek where collecting was done, one hundred yards up-stream of the pump station. It was found in a large pool in the bottom debris, where a weak current flowed over.

Second to the order Odonata in least amount of one order collected in San Pedro Creek was the order Coleoptera, the beetles. Three species of Coleoptera were found, two being in the Dytiscidae family. The smallest of the two species was not commonly found, in the area between the Sanchez School bridge and the Adobe drive bridge, in deep slow flowing pools. The larger Dytiscidae was found in the slow moving water fifteen feet down-stream from the north fork entry, but was rare.

The third Coleoptera, Gyrinus in the family Gyrinidae was rare and found only at the slow flowing water at the mouth of the creek.

The last order of aquatic insects found was the order Diptera. Two

different families were found, with the family Chironomidae having the greater amount of abundance. Two species of Chironomidae were abundant through out the creek. They were both abundantly found in slow moving water, and could be commonly found in the faster moving water. When the Chironomidae species were most abundantly found a sandy or silty bottom with a high concentration of trapped hydrocarbons was generally present.

Seven species of the family Tipulidae, commonly know as Crane Flies, were collected. Six were collected commonly up-stream of the north fork entry. All were found in the bottom sand in areas with moderate flow.

The seventh Tipulidae species was rare and found only fifty yards up-stream from the Sanchez School bridge. It was found in the bottom sand in moderately flowing water.

A distinct pattern in San Pedro Creek was found by the aquatic insects that were collected. There was a difference in the insects found below and above the north fork tributary entry. The number of insects of insects found below the entry point was eleven, mostly from the orders Ephemeroptera, Odonata, Hemiptera, and Coleoptera. The insects which were found above the entry point numbered twenty-six, with the most species coming from the orders Trichoptera, Diptera, and Plecoptera. Six species were collected from both down-stream and up-stream of the north fork entry. Even though there is a great difference in the aquatic insects found on the two sides of the north fork entry, there is no one point in any part of the creek studied that has no aquatic insect life.

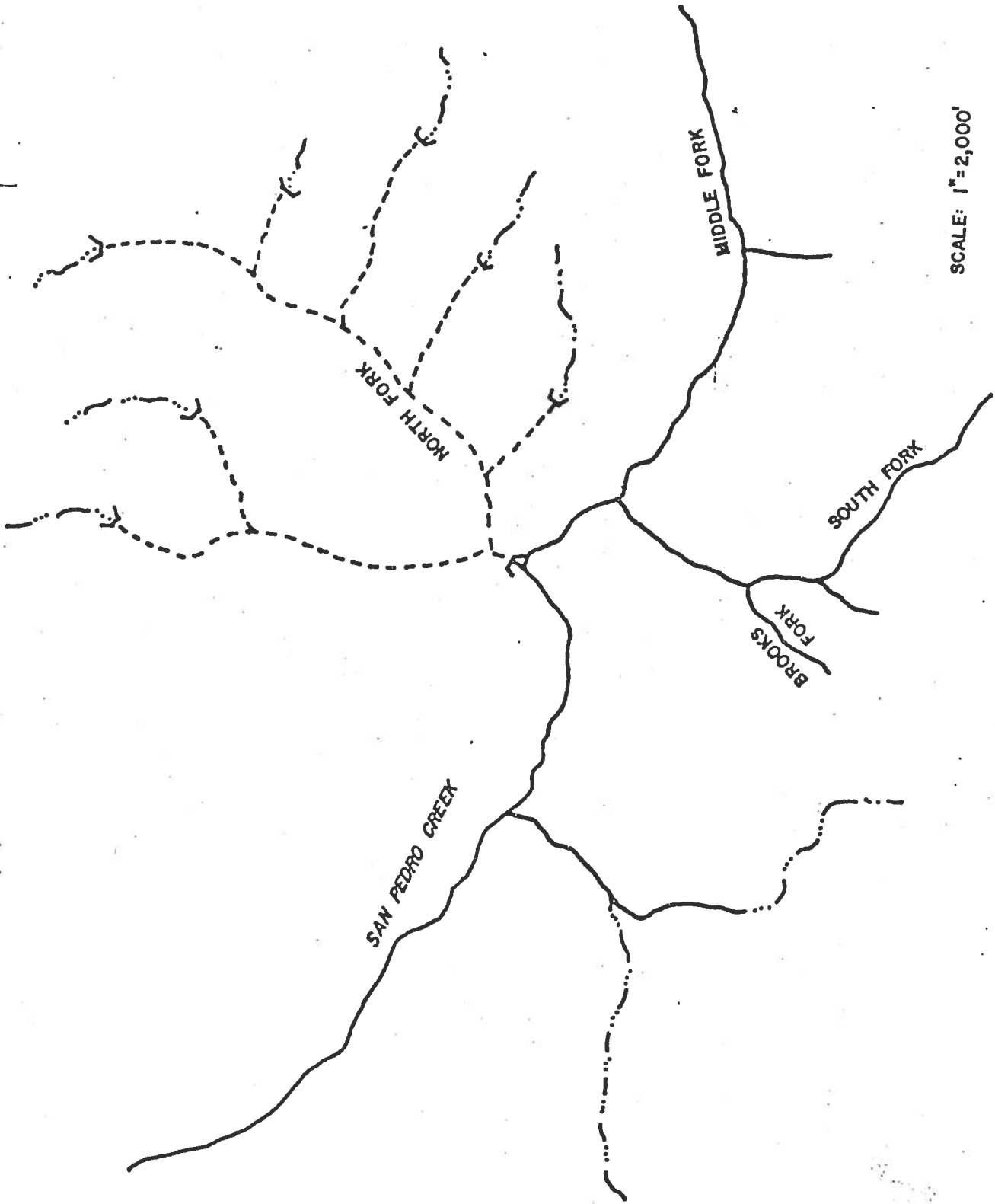
There is a difference between the two sides of the north fork entry. The lower side has a more populated area around the creek. This

may cause the change in the insects living in that part of the creek. Since it is more populated, the creek contains more hydrocarbons, concrete, inorganic and organic wastes, more dams, and also the plants are not native to the area. The introduced plants could have a lot to do with the lack of Trichoptera larvae found in the lower parts of the creek. The water from the north fork may also be a large factor in the reduced insect life. The north fork comes from the underground pipes from the Park Pacifica and Terra Nova areas.

The creek up-stream of the north fork entry area has almost no housing, small amounts of concrete, only one dam, little or no wastes, no street run off so no hydrocarbons, and the plants are all native.

If people don't start to realize that life is still present in the creek and protection is not put on the creek soon, more species of aquatic insects will die and offset the balance of the creek. Soon the animals that depend on the aquatic insects will die or move. Animals like the steelhead trout, reptiles, and birds are very dependent on the aquatic insects of San Pedro Creek.

An even faster upset could come to the creek if the pump station starts to take out more water than the creek can afford. I see no reason why one of the last natural creeks in the Bay Area should be dried up and killed.



SCALE: 1"=2,000'



A Species List of the Aquatic Insects in San Pedro Creek

Order Ephemeroptera

Baetidae
Baetinae
Baetis sp.

Baetidae
Siphonurinae
Isonychia sp.

Baetidae
Leptophlebiinae
Paraleptophebia sp.

Heptageniidae
Heptagenia sp.

Order Odonata

Zygoptera
Coenagrionidae
Argia sp.

Order Plecoptera

Setipalpia
Paraperlinae sp.

Filipalpia
Nemouridae
Leuctrinae
Leuctra sp.

Perlidae
Acronetria
california

Setipalpia
Clässenia sp.

Order Hemiptera

Gerridae
Gerris sp.

Gerridae
Metrobates sp.

Corixidae
four species

Order Trichoptera

Limnephilidae
five species

Limnephilidae
Neohylax sp.

Rhyacophilidae
Rhyacophila five species

Rhyacophilidae
Glossosoma sp.

Lepidostomatidae
Lepidostoma sp.

Leptoceridae
one species

Hydropsychidae
two species

Order Coleoptera

Dytiscidae
two species

Gyrinidae
Gyrinus sp.

Order Diptera

Chironomidae
two species

Tipulidae
seven species