Docks and Ducks

by Nicholas Salcedo
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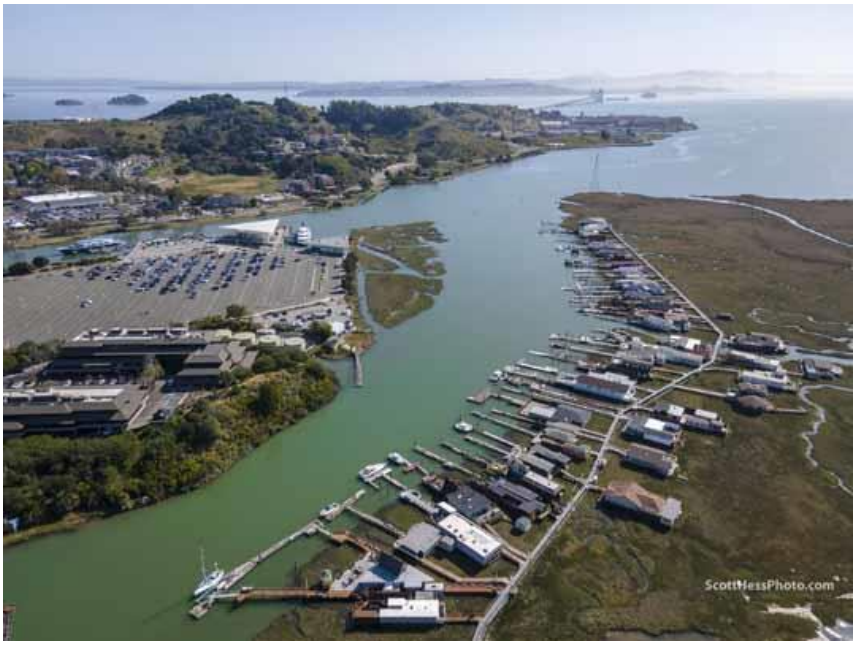
An interesting conversation developed the other day, when I was talking about lower Corte Madera Creek. It came out of a misheard word.

"I thought you said dock."

"No, I said duck."

Turns out there are quite a few of both in this part of the creek, the tidal portion below Bon Air Bridge down to the mouth of the creek, where it enters San Francisco Bay by the Larkspur Ferry Terminal. The beginning of the conversation revolved around what's a dock. Then it turned to what actually is a duck, and eventually finished with thanks for some new-found knowledge and appreciation of just a couple more things that are Corte Madera Creek.



Greenbrae Boardwalk's docks extend into Corte Madera Creek, opposite Wood Island and the Ferry Terminal. Photo © Scott Hess

First up came docks, specifically for boats, including sculls, canoes, kayaks and the like. A boat dock is basically a place where a boat parks on the water. Docks can be fixed or floating, or a combination of the two, and can be made of concrete, metal, rubber/foam/plastic, or wood. They are often treated with chemicals to retard deterioration, a necessity in salty water. Fortunately, one of the worst offenders, creosote, is no longer permitted, but many creosote docks or their remnants persist.

Not all docks function in the same way. The small one at the end of Piper Park, currently closed while the City of Larkspur evaluates whether it can be repaired or must be replaced, is seldom used. On the other hand, the larger US Coast Guard-inspected Larkspur–San Francisco ferry docks see regularly scheduled activity every day. Maintenance, including dredging, is a necessity. Private docks, like those at Larkspur Marina and Greenbrae Boardwalk, fall somewhere in between. But it's safe to say, the bigger the dock, the more intensive the activities and maintenance. Boat and dock use also disturbs wildlife, particularly those waterfowl (and other bird species) resting and refueling during their migration. Responsible boating and dock use helps minimize this impact.

Dock use also varies by season. While some docks are used year-round, like the ferry docks or Marin Rowing Association dock, their use picks up during summer. Not only is it the longer days and warmer weather, it's also the increase in events.

In this classic, shallow estuarine environment, to reach navigable water at all tides, docks need to extend far from the shoreline or necessitate regular dredging, or both, which increase the open water, mud flat and marsh area impact. A Google Earth view in this two-mile section revealed 175–180 docks. If the

average size of a dock and gangway is 750 square feet, for 175 docks that's over three acres of aquatic habitat directly impacted. The Ferry Terminal, including its associated gangways, landings and buildings, adds at least another acre to this impact, not including dredging.

Tidal marshes serve as the base of the food web, filter and process nutrients and contaminants, protect against erosion, and provide important habitat for fish and shellfish. A dock blocks the amount of light that reaches the underlying area, which can lead to a reduction in plant density. A reduction in the number of plants under docks can also have secondary effects. Fewer plants can lead to increased soil erosion. Reduced plant density also decreases the amount of food available to the animals in the marsh.

Docks can change the flow of water around them, with increased erosion around pilings. Floating docks that rest on the mud at low tide disrupt the algae that live on the surface of the mud as well as the animals living in the sediment that eat the algae. Floating docks made of Styrofoam can break apart and release bits of foam to the environment; these are notoriously indestructible and contribute to the microplastic load in the environment. Anyone who has participated in a cleanup along the tidal portion of the creek has encountered chunks of crumbling foam in the wrack.

Holiday-makers at a dock in the vicinity of today's Bon Air Bridge. Photo courtesy of the Ross Historical Society.

Docks can have other impacts on water quality: pressure-treated lumber, impregnated with chromated copper arsenate (CCA), is a very common construction material for both the submerged pilings and the decking of piers and elevated walkways. Leaching of these three metals (chromium, copper, and arsenic) is fairly rapid in sea water; however, the metals tend to accumulate more in fine sediments, like the silt and clay common in the tidal reaches of Corte Madera Creek, than in sand. The metals then can accumulate in vegetation growing in the fine sediment and in the organisms eating the vegetation. High tidal flushing reduces these impacts.

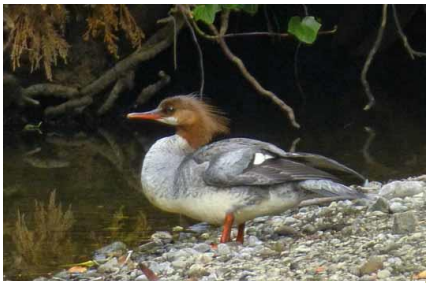
Fuel for boats with motors poses a particular risk to water quality. The polyaromatic hydrocarbons in fuel are acutely and chronically toxic to plants and animals. Because many of the boats used in Corte Madera Creek do not have motors, fuel spills are probably rare in Corte Madera Creek. However, they cannot be entirely prevented. Additionally, if boats are cleaned or repaired near the creek, detergents, antifouling paints, and debris can enter the water, degrading water quality. The California Coastal Commission publishes several documents with recommendations for boat maintenance, as does the Environmental Protection Agency and San Francisco Department of Public Health.

It would be remiss if we didn't equally discuss ducks. They are a type of waterfowl, part of the family Anatidae, that also includes swans and geese. Generally, ducks, with the exception of those classified as whistling ducks, are in the subfamily Anatinae, and range from perching ducks like the beautiful wood duck, to dabbling or puddle ducks, best represented by the ubiquitous mallard, to diving ducks, often referred to as bay ducks, like the stately canvasback, or sea ducks, like the cute little bufflehead or the elegant merganser.

Ducks' morphology and behaviors are what help set them apart. For example, perching ducks have sharp, strong claws with legs set more forward. A dabbling duck's legs are more centrally placed, while a diving duck's legs are set far back on the body to facilitate diving. Distinct behaviors include the wood duck's preference for wetlands with adjacent woodlands, for they nest in tree cavities. And there are different

feeding behaviors. Dabbling ducks customarily feed by tipping up, so their tails show above water, while diving ducks go completely underwater in search of food. Some ducks are known to dive over 100 feet deep!

Ducks are most numerous in Corte Madera Creek during the winter. There are also significant numbers during the fall and spring as they stop over to refuel during migration, as Corte Madera Creek is part of the San Francisco Bay estuary hot spot in the Pacific flyway. Cornell Lab's eBird listed over 20 different waterfowl species observed last year in Corte Madera Creek. Audubon's 2023 Marin Christmas Count recorded 16 different waterfowl species in our estuary. Those recorded at that time in the highest numbers (over 100 for each) were wigeon, northern shoveler, green-winged teal, scaup, and bufflehead.



Female merganser, photographed by Gary Leo

Lower Corte Madera Creek has habitats for all of these ducks. Probably most important is the fact that this reach of creek is tidal, so the mud flats and marshes are accessible to different ducks at different stages of the tide. Also, the College of Marin's Ecology Study Area, at the upper end of tidal action (and preserving the historic alignment of Corte Madera Creek), is a wetland with adjacent woodlands, one of the few remaining in the watershed.

Where did this conversation all lead? Problems were the first topic—habitat loss, disturbance of feeding birds, and pollution from the docks. But then we switched to joy. I mean, who doesn't love ducks and ducklings? Watching a duck glide in and make a waterski landing on a glassy water surface is always exhilarating.

And who doesn't love going out on the water in a boat? A ferry ride to San Francisco is always a treat and often spectacular. It's been said that to fully understand the environment, one needs to experience it by land, air and sea. Or maybe it's just by sitting on a dock by the bay, watching the tide roll away? Surely ducks love to sit on docks, too.