The Corte Madera Marshes

by Roger Harris
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Vast by today's standards, the marshes surrounding the mouth of Corte Madera Creek are but a shadow of their former magnificence. Corte Madera Creek, now channelized, straightened, and otherwise tamed, once was a meandering tidal slough. Adjacent marshlands extended in a band roughly 400–1000 feet on either side of the slough radiating to an expansive tidal wetland at the mouth.

Tidal waters once lapped the shores of where the Corte Madera Town Hall and College of Marin now stand. Redwood High School was sited on an historic low-lying island, and adjacent tidal marshland is now parking lots and athletic fields. Likewise Marin General Hospital' foundation is on historic upland, but the surrounding parking lots were once inundated by daily tides. The Village and Town Center shopping centers in Corte Madera are both on former bayland, as is Corte Madera Town Park.

Marta's Marsh is part of the more than 200-acre Corte Madera Marsh Ecological Reserve, a restored tidal wetland managed by the California Department of Fish and Game. Charles Kennard photo

Marshland has not only been whittled away by diking, draining, and filling, but by erosion. As the figure illustrates, the outer approximately 400 feet of the Corte Madera Marshes have been lost to erosion caused by ferry and other boat wakes along with natural currents and wave processes.

The bayside portions of the Corte Madera Marshes are in part artifacts of historic human activity. From around 1853 until hydraulic gold mining was banned in California in 1884, enormous amounts of sediment were washed out of the mountains and foothills of the state, carried into the Bay, and deposited to form, among other features, the outer marshes of Corte Madera Creek. These marshes no longer have the deep sinuous and branched channels that a less perturbed system has. (I recommend a visit to Bahia Magdalena in Baja California to anyone planning marsh restoration in the San Francisco Bay to see a comparable system, but in a much better preserved condition.)

Marshlands, even under pristine conditions, are dynamic geographic features forever shrinking and swelling, growing and disappearing, as they undergo a continuing process of erosion and deposition. The Corte Madera Marshes are fed by the Bay, itself fed by the combined waters of the Sacramento and San Joaquin river systems laden with sediment. Twice daily the incoming tides carry sediment-laden waters into the marsh, where some of the load is deposited, building up the marsh over time. By the same token, the daily ebb tides carry water out, eroding portions of the marsh.

The faster water flows, the greater is its erosive force; the slower currents deposit suspended sediment. San Clemente Creek in Corte Madera illustrates this principle. The so-called creek—actually a tidal slough—was once surrounded by a tidal marsh. About sixty years ago when Marina Village was

built over the former tidal marsh, the homeowners along San Clemente Creek enjoyed waterfront property with navigable access to the Bay for their pleasure boats. But not for long, as the slough became filled with sediment. Prior to building the houses, the tidal prism (the volume of water covering the marsh between low and high tide) was large enough to scour the slough to maintain a deep channel. Once the marsh was filled, the tidal prism was dramatically reduced, tidal currents slackened, and deposition became dominant over erosion.

Tidal action was restored in the mid-1970s to Muzzi Marsh when the outer levees were breached after decades of use as pastureland. Corte Madera Shorebird Marsh was formerly tidal marsh that had been diked and was highly degraded and filled with construction rubble. It was restored to muted tidal flow in 1983–1984 as mitigation for the Village Shopping Center and was designed for two compatible purposes: to provide wildlife habitat and flood control capacity.

Egret and bulldozer. Photo by Charles Kennard

Other marshlands have been restored, and much more could and should be. But restoration is inevitably a pale substitute for preservation. A properly and fully functioning marsh takes millennia of natural processes to develop and for all the pieces to operate in harmony.

Certain new pieces—invasive exotic organisms—are sometimes inadvertently introduced into our natural eco-systems in the restoration effort. Restoration projects with their temporary disturbance of the substrate are particularly vulnerable to invasion by weedy non-natives. The danger posed by invasive exotic organisms is not that they are nonnative *per se*, but that they threaten to convert entire native landscapes to ones inhospitable to native flora and fauna.

A case in point is non-native cordgrass (*Spartina* sp.). According to the Invasive Spartina Project, 56 of 96 recent tidal restorations in the San Francisco Bay have become infested with non-native cordgrass. Invasive non-native cordgrass can smother productive tidal mudflats in a mono-culture of dense vegetation, making them inaccessible to shorebirds and other marsh denizens.

Control of noxious invasives is a major and on-going task in both restored and existing marshland. Pampas grass and French broom should be controlled on marshland margins. More recently the marshes of Corte Madera Creek have been invaded by opposite-leaf Russian thistle *(Salsola soda*), and coming soon may be the noxious stinkwort *(Dittrichia graveolens),* which has a redolence suggestive of Noxzema.

Although much of our environmentally valuable marshland has been lost to development and some to invasive plants, much has also been preserved due to the actions of citizen activists. If birds are any indication, the protection, enhancement, and re-creation of Corte Madera Creek marshes has been a conservation success story.

The dean of California ornithology, Joseph Grinnell, wrote in 1915 about the plight of the California clapper rail, which "occurred formerly…on the San Francisco Bay shores of Marin.…(N)ow with the reclamation of marshlands… and as subject to concentrated pursuit by hunters, the species seems destined to early extinction." Contrary to Grinnell's dire prediction, the clapper rail is today a thriving breeding species in the Corte Madera Marshes, although its overall at-risk status places it on state and federal endangered species lists.

Writing as he did in the early part of the twentieth century, Grinnell had observed the effects of market hunting of wild birds, filling of marshlands, and harvesting of primary forests, all of which had major impacts on avian populations. (Corte Madera means “cut wood” in Spanish.) Today, due to conservation measures protecting wetlands and sensitive species, more bird species breed in the Corte Madera Marshes and environs than a century ago. Conversely, all the species regularly breeding back then continue to thrive to this time.

Amongst the ducks, the gadwall was not known to breed in the Bay Area until recent decades. This year, gadwall chicks outnumbered mallards at Corte Madera Shorebird Marsh. Hunting for bird plumes in the late 1800s and early 1900s for the millinery trade had extirpated snowy egrets, great egrets, and great blue herons from the Bay Area. Under protection, these showy species began a comeback in the mid twentieth century and today forage in the marshes in large numbers.

Black-necked stilts first nested in our marshes in the mid-1960s, followed by American avocets in 1984. Both species benefited from the creation of salt ponds in the South Bay and both now nest in high densities in Shorebird Marsh.

Recovering after the banning of DDT use in the US, which caused egg-shell thinning, increasing numbers of ospreys and brown pelicans forage in the open waters of our marshes. In 1996, Forster’s terns nested in Corte Madera Shorebird Marsh and have returned ever since. Prior to then, the species was not known to nest in Marin County.

Writing in 1927, Grinnell and his colleague Margaret Wythe counted northern spotted owl, northern saw-whet owl, pileated woodpecker, and red-breasted nuthatch as absent, although they may have been breeding somewhere in Marin in very low numbers. As the native forests above the headwaters of Corte Madera Creek have regenerated under the protection of park, open space, and watershed designations, these four species have returned as regular breeders. Likewise once uncommon riparian inhabitants such as Nuttall’s woodpecker and red-shouldered hawk are now regularly found in suitable habitat along Corte Madera Creek.

The number of breeding bird species using Corte Madera Creek marshes and environs has not been higher in our lifetimes than it is now our lifetimes than it is now. This is due to conservation efforts along with natural range expansions by birds themselves.

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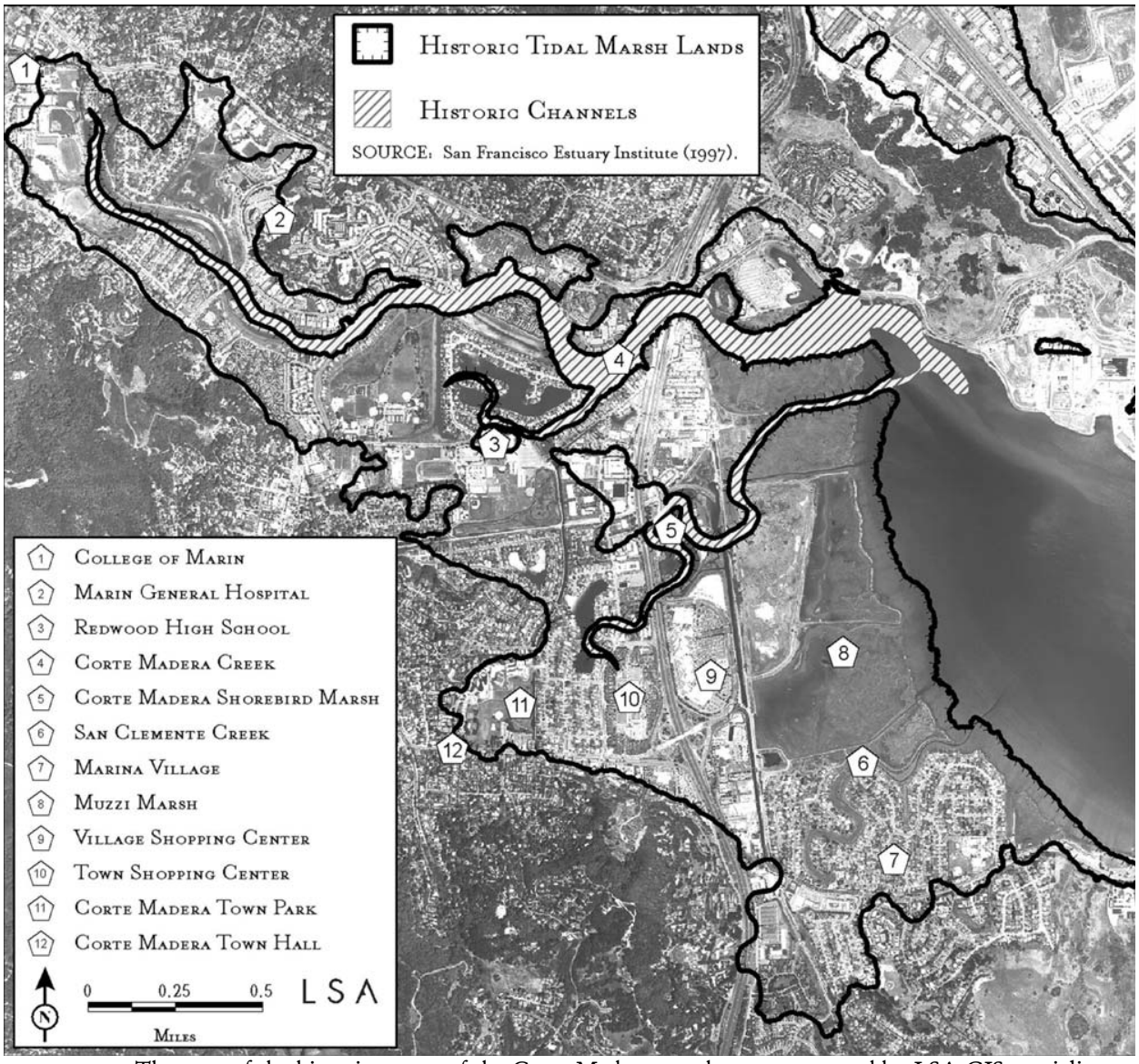

The map of the historic extent of the Corte Madera marshes was prepared by LSA GIS specialists.

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