

## ***Celebrating Corte Madera Marsh***

With Roger Harris, and Meryl Sundove  
Sunday, April 24 from 11:00 am to 1:00 pm.

April captures the height to the waterbird migration on the Pacific Flyway. We will start our visit to this important wetland at Marta's Marsh, which was named after a former Town of Corte Madera town council member.

We will walk to the edge of the San Francisco Bay along San Clemente Creek as we watch waves of sandpipers and other waterbirds fly from the bay mudflats to the high tide refuge of the marsh. Then after the tide has risen further, we will walk to a tidal channel to listen for and perhaps see the endangered Ridgway's Rail, which is common in this marsh. Any number of raptors and ducks can be expected, and maybe even a river otter may show up. In addition to hearing about the remarkable history of this wetland and observing the behavior of wildlife, we will also address coastal ecology.

Total distance walked on level but potentially muddy levees will be about a mile. Heavy rain cancels. Bring your binoculars, if you have a pair. We'll have a spotting scope to share; but if you have one too, please bring. No restroom facilities in the marsh.

From Paradise Drive, turn onto Harbor Drive, and from there take the next right turn onto Yolo Street for 400 feet. Then, turn left onto Channel Drive. We will meet where the road dead ends at the marsh.

**Roger Harris** is a Certified Wildlife Biologist. He is the author of the Department of Fish and Wildlife's resource management plan for the Corte Madera Marsh and author of the Town of Corte Madera's wildlife management plan for the Corte Madera Shorebird Marsh. He is currently on the Marin County Parks and Open Space Commission.

**Meryl Sundove** is an environmental educator, formerly with the National Audubon Society at the Richardson Bay Audubon Center and now with Point Blue's Students and Teachers Restoring a Watershed (STRAW) program. She was last year's recipient of the Terwilliger Environmental Award. She also teaches the popular spring birding by ear class for the Marin Audubon Society.

Roger and Meryl have lived next to and studied the Corte Madera Marsh for over 30 years.

## CORTE MADERA MARSHES

By Roger D. Harris, January 20, 2016

(An earlier version of this article appeared in the January-June 2008 issue of the *Creek Chronicles*, newsletter of the Friends of Corte Madera Creek Watershed.)

### Marsh History

Vast by today's standards, the marshes surrounding the mouth of Corte Madera Creek are but a shadow of their former magnificence (see figure). 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.

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

Marshland is not only being 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 and natural currents and wave processes.

The bayside portions of the Corte Madera Marshes are themselves in part artifacts of historic human activity. From around 1853 until hydraulic gold mining was banned in California in 1884 because of its environmental destructiveness, 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 do not have nearly the development of sinuous channels and dendritic (i.e., branching like a tree) sub-channels that a less perturbed system would have. (I recommend anyone planning marsh restoration in the San Francisco Bay to visit Bahia Magdalena in Baja California to see a very similar system, but in a far more pristine state.)

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 out portions of the marsh.

Faster the flow of water, greater is its erosive force; slower the current, more suspended sediment falls out. San Clemente Creek (bottom right of figure) 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 on fill 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, currents slackened, and deposition became dominant over erosion.

### **Marsh Restoration and Invasive Non-native Organisms**

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 Town Shopping Center and was designed for two compatible purposes – to provide wildlife habitat and flood control capacity.

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 orchestrate 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 perturbation of the substrate are particularly vulnerable to invasion by weedy non-native plants. The danger posed by invasive exotic organisms is not that they are non-native *per se*, but that they threaten to type-convert a native landscape to one inhospitable to native fauna and flora.

A case in point is the 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 denizens of our marshes. Incidentally, Bay-wide control efforts by the Invasive Spartina Project and others are bringing the weed under control, and there is even cause for cautious optimism that in the next few years the non-native cordgrass could be brought under control.

The control of noxious invasives is a major and on-going task in both restored and existing marshland. Pampas grass and jubata grass (*Cortaderia selloana* and *C. jubata*) and French broom (*Genista monspessulana*) 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 Noxema.

### **Birds as Indicators of Environmental Health**

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 the marshlands has been somewhat of a conservation success story.

The dean of California ornithology, Joseph Grinnell, wrote in 1915 about the plight of the Ridgway's rail (*Rallus obsoletus*), 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.” Today the Ridgway's rail is very much a

thriving breeding species in the Corte Madera Marshes, although its overall status places it on the state and federal endangered species lists.

Writing as he did in the early part of the twentieth century, Grinnell had observed the impact of market hunting of wild birds and the harvesting of the primary forests, both 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 of the species breeding back then have continued to thrive to this time.

Amongst the ducks, the gadwall (*Anas strepera*) was not known to breed in the Bay Area until recent decades. This year, gadwall chicks outnumbered mallards (*Anas platyrhynchos*) at Corte Madera Shorebird Marsh. Hunting for bird plumes in the late 1800s and early 1900s for the millinery trade had extirpated snowy egrets (*Egretta thula*), great egrets (*Ardea alba*), and great blue herons (*Ardea herodias*) 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 (*Himantopus mexicanus*) first nested in our marshes in the mid-1960s, followed by American avocets (*Recurvirostra americana*) in 1984. Both species benefited from the creation of salt ponds in the South Bay and both nest now nest in high densities in Corte Madera Shorebird Marsh.

Recovering after the banning of DDT use in the US, which caused egg shell thinning, increasing numbers of ospreys (*Pandion haliaetus*) and brown pelicans (*Pelecanus occidentalis*) forage in the open waters of our marshes. And in 1996, Forster’s terns (*Sterna forsteri*) 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 the 1927, Grinnell and his colleague Margaret Wythe reckoned northern spotted owl (*Strix occidentalis occidentalis*), northern saw-whet owl (*Aegolius acadicus*), pileated woodpecker (*Dryocopus pileatus*), and red-breasted nuthatch (*Sitta canadensis*) 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 (woody streamside) inhabitants such as Nuttall’s woodpecker (*Picoides nuttallii*) and red-shouldered hawk (*Buteo lineatus*) can now be regularly found in suitable habitat along Corte Madera Creek.

The number of breeding bird species using the Corte Madera Creek marshes and environs has never been higher in our lifetimes than now. This is due to conservation efforts, along with natural unaided range expansions by the birds themselves.

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