



Land of the West Wind

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Suisun Marsh *Phragmites* Research Project

Estuary News magazine recently featured the work of Team *Phragmites*, SRCD's partnership with Chapman University, Purdue University, Santa Clara University, and Utah State University. Our project seeks to

- (1) understand how *Phragmites* has spread through the marsh over the past two decades,
- (2) how we can use native vegetation to provide desirable ecosystem functions (resistance to *Phragmites*, salinity and drought tolerance, and waterfowl habit) while hopefully minimizing *Phragmites* reinvasion, and
- (3) how we can work towards managing *Phragmites* collectively across the marsh.



Controlled burn for planting treatment group

In the article, journalist Michael Adamson's rich prose brings to life the landscape we know so well. He highlights the beauty, history, and cultural heritage of the marsh, but also the complexity in its management. In addition to talking with our team about our research into *Phragmites*, he also spoke with Kent Hansen of the Goodyear Land Company about the multifaceted challenges facing Suisun landowners including managing to control invasive species such as *Phragmites* and Russian Thistle (*Salsola soda*), and the sheer amount of resources that go into maintaining a duck club.



Phragmites crew conducting revegetation study

The article explains why "one size fits all" solutions are not likely to be effective in a complex landscape like in Suisun Marsh. Landowners manage different wetlands with a variety of goals, and each has their own unique set of competing priorities and obstacles to achieve desired outcomes. However, *Phragmites* is a common thorn in the side of many landowners across the marsh. Analysis of historic aerial imagery conducted by SRCD's Jason Hagani has shown a steady increase in the plant for the last 20 years. We hope that our research study can shed light on ways to achieve more desirable habitats and encourage landowner collaboration to ensure more effective control of *Phragmites*.

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Quarterly Newsletter of the Suisun
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SRCD's public meetings are
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Solano County Supervisors Chambers
675 Texas Street
Fairfield, CA 94533

SRCD represents private landowners of the Suisun Marsh at the Federal, State, and local levels. Its historic goal has been to achieve a water supply of adequate quality so that preferred wetland habitat values will be retained through appropriate management practices. Through cooperation with landowners and various agencies, SRCD seeks to develop new programs aimed at protecting and improving the Suisun Marsh for future generations.

Waterfowl Breeding Conditions of the Sacramento Valley

The annual California Department of Fish and Wildlife waterfowl breeding population survey has been conducted since 1948. The survey methodology was redesigned and updated in 1991 and has been conducted in its current form since 1992. The purpose of the survey is to estimate waterfowl populations in major concentration areas of the state to inform conservation and management. Data from the survey were incorporated into the U.S. Fish and Wildlife Service Adaptive Harvest Management framework for western mallards in 2008 and has since been an integral part of duck harvest management (bag and season lengths) in the Pacific Flyway.

This spring was the third consecutive year of exceptional drought conditions throughout the state; spring precipitation totals ranged from 66%–89% below average at all stations. Persistent drought and lack of adequate breeding habitat throughout California continues to drive the decline of local breeding duck populations.

Breeding habitat conditions were poor because of below normal winter precipitation across the entire survey area. Central Valley water storage is below average, and water allocations for wetland management this summer and into the fall will be significantly reduced. Snow-water content in northeastern California also was below average resulting in poor habitat conditions in both unmanaged and managed wetlands. At the time of this report, the estimated extent of planted rice is 250,000 acres occurring mainly on the east side of the Sacramento Valley. Water allocations in the west side of the Sacramento Valley will be severely reduced. South of the Delta, water allocations of nearly 75% are expected at this time. Water availability for the managed wetlands in the Klamath Basin is extremely limited, and managers expect minimal water deliveries throughout the summer and the fall.

Total breeding ducks in the survey area decreased 19% from 2019 to 2022

Planning Hydrology Regimes Based on the Water Year

How long is too long to keep water on your property? The duration depends on the pond, but it also depends on the water salinity which will affect the types of plants you can grow. A summary of wetland plant salinity tolerances is provided in the table on the right.

In early July, the Belden's Landing salinity station has reached salinities of over 17 mS/cm, indicating salinities are too high for growth of many wetland plants (see Table, p. 3).

SRCD has salinity meters to test soil and water salinities on your property. For more information about salinities on your property, contact your SRCD water manager.

Upper Bounds of Salinity Tolerance for Desirable Marsh Plants



Fat Hen <i>(Atriplex prostrata)</i>	<ul style="list-style-type: none"> tolerate salinity of 13-49 parts per thousand total dissolved solids (ppt TDS) or 20-77 milliSiemens/cm (mS/cm) (DWR 2001), but optimum growth is between 30 mS/cm and 45 mS/cm (SRCD 1998)
Lamb's Quarters <i>(Chenopodium album)</i>	<ul style="list-style-type: none"> tolerates salinities up to 62 mS/cm (SRCD 1998)
Brass Buttons <i>(Cotula coronopifolia)</i>	<ul style="list-style-type: none"> tolerates salinities from 9-30 ppt TDS (14-48 mS/cm) (DWR 2001)
Swamp Timothy <i>(Crypsis schoenoides)</i>	<ul style="list-style-type: none"> requires the freshest conditions (<5 mS/cm) and is uncommon in Suisun Marsh
Smartweed <i>(Polygonum spp.)</i>	<ul style="list-style-type: none"> found where soil salinities do not exceed 5 mS/cm (DWR 2001)
Sago Pondweed <i>(Stuckenia pectinata)</i>	<ul style="list-style-type: none"> can tolerate water salinity of 9-12 ppt (14.0-18.7 mS/cm) (DWR 2001)
Watergrass <i>(Echinochloa crusgalli)</i>	<ul style="list-style-type: none"> can grow in soils with salinities between 4-6 mS/cm
Wigeongrass <i>(Ruppia maritima)</i>	<ul style="list-style-type: none"> can survive in extremely high water salinities (up to 390 mS/cm)
Pickleweed <i>(Salicornia virginica)</i>	<ul style="list-style-type: none"> grows in soils between 31-67 ppt (48-105 mS/cm) salinity
Alkali Bulrush <i>(Bolboschoenus maritimus)</i>	<ul style="list-style-type: none"> can tolerate salinity up to 42 mS/cm (SRCD 1998)
Sea Purslane <i>(Sesuvium portulacastrum)</i>	<ul style="list-style-type: none"> tolerates high salinities up to 100 mS/cm (SRCD 1998)
Cattail <i>(Typha latifolia)</i>	<ul style="list-style-type: none"> up to 15 mS/cm salinity

Early Morning in the Marsh: Mouse Trapping

By Jason Hagani, SRCD Spatial Analyst and Biological Technician

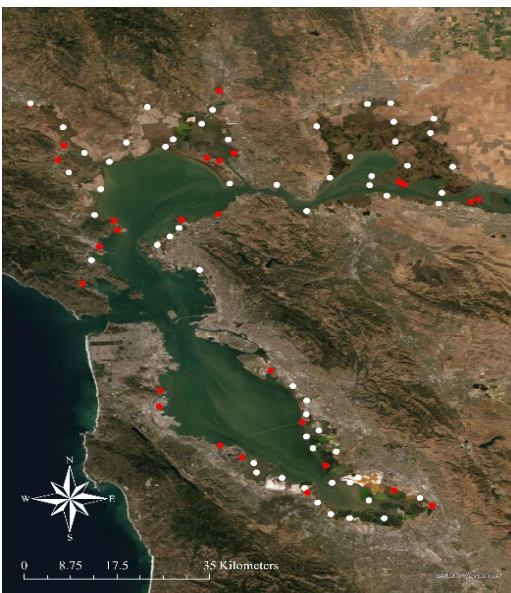
It's sunrise in Suisun Marsh. Dawn breaks over the horizon, blinding light piercing the still, cool morning. Blinking away the brightness of dawn, a small crowd has gathered at the Peytonia Slough Ecological Preserve. Warm greetings are exchanged, muck boots are pulled on, and supplies are dragged out of trucks into overstuffed backpacks. This drowsy group of scientists has descended upon Peytonia for the second session of mouse trapping, training in preparation the summer's events. Despite the early start – a 4:00 am wake-up call for some – spirits are high, and the group begins its march into the marsh.

Why the early morning training sessions?

For the first time in over 50 years, a coordinated, range-wide survey of the Salt Marsh Harvest Mouse (SMHM) is being conducted in the San Francisco Bay estuary. This summer, an ambitious partnership between government agencies, non-government organizations, and private entities will attempt to study SMHM throughout their geographic range. For seven weeks at over 80 sites across Suisun, San Pablo, and San Francisco Bays, researchers will collect a variety of demographic and genetic data on SMHM in order to better understand the species' populations.



A recently tagged salt marsh harvest mouse enjoys the view from a bouquet of pickleweed



Locations of planned trapping grids (white) and eDNA stations (red) for the 2022 SMHM Regionwide Survey in the SF Bay estuary

This herculean effort is being led by the Suisun Resource Conservation District, California Department of Fish and Wildlife, WRA Inc., and U. C. Davis will involve two types of sites: trapping grids and eDNA sites. At the 59 proposed trapping grids dispersed across the estuary, SMHM and other rodents will be captured in baited traps, tagged, measured, and released. Researchers will return to each trapping grid for three consecutive days. Data collected at these trapping grids will provide important information about the population sizes and dynamics of SMHM throughout the estuary. An additional 29 eDNA sites were chosen in areas where little is known about the SMHM population. At these sites, mouse droppings will be collected at bait stations over the course of one week, allowing genetic researchers to

determine whether mice are present in from the DNA in their droppings.

Combined, the regionwide survey will yield the most comprehensive understanding of SMHM in a single season. As a federally listed endangered species and the only native obligate salt marsh mammal, the protection of the SMHM is a priority for wetland managers throughout the San Francisco Bay estuary.



An eDNA bait station rests atop pickleweed in Suisun Marsh (photo: Cody Aylward)

Mouse Trapping, Continued (From Page 4)

The results of this survey will proactively guide a resilient response to rapidly changing SMHM habitat and promote effective conservation of this endangered species for years to come. Furthermore, this survey will provide information supporting several goals within the Tidal Marsh Recovery Plan – the federal guiding document which dictates many management decisions within the estuary.

A few hours later, the Peytonia group takes a tally. Three house mice, two small voles, and thirteen “salties” – as they’re known. Not bad for a morning’s work. The group trudges back to their cars, dreaming about a hot breakfast at Bab’s Delta Diner and looking forward to a summer of mouse trapping.



SRCD Update

Helicopter Applications for Phragmites Control

SRCD will work with a contractor to conduct aerial herbicide applications on Phragmites in the month of August. Those who would like to treat their *Phragmites* patches will be responsible for providing a map of their property to identify the areas that need treatment. Please contact Tim Edmunds at SRCD to participate in the program.

PAI Program 2022

The final round of PAI projects for the 2022 work year were due in June 30th. If you submitted a project, you will hear back from the panel which met on July 11th to review the eligibility and scope of proposed projects. The approved projects will be submitted to the Department of Water Resources for funding approval.

Fall Science Landowner Workshop

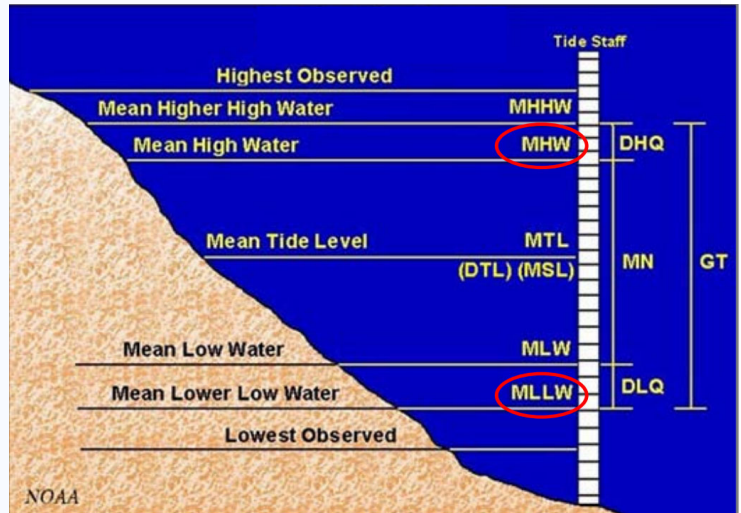
Landowner workshop will be Wednesday, September 21th at F.P. Smith Parts & Equipment, 3190 Ramsey Rd Fairfield. The workshop will feature a variety of talks with a focus on recent findings in Suisun Marsh, the San Francisco Bay estuary, the Pacific Flyway and beyond.

Phelan McKinney, Water Manager *Departing from SRCD after 5 Years*

I started at SRCD in October 2017, roughly a month after finishing my final course for my degree from UC Davis. In the technical portion of the interview, I was asked “what hydrology regime would you run in order to facilitate the growth of pickleweed in a managed wetland pond?” At the time, I had some experience with waterfowl but virtually no experience managing wetlands. I was not sure what pickleweed was. Now, an obvious answer occurs to me: Why would you want to grow a pond full of pickleweed? All jokes aside, I have learned a tremendous amount in the last five years and developed relationships that I am sure I will maintain despite leaving Suisun Marsh to work with Ducks Unlimited. I am very grateful to the mentors, partners, and friends that have helped me learn and grow during my tenure at SRCD. I bid SRCD and Suisun Marsh a very fond farewell.

Tidal Datum

The estuary is defined by the rising and falling of its tidal waters, yet the way that we measure and the datum we use to discuss the water height in tidal areas remains a source of confusion. Datums are simply different references for measurements used to describe tides. Most engineering projects reference the North American Vertical Datum of 1988 (NAVD88) which replaced the earlier North Geodetic Vertical Datum of 1929 (NGVD29). These measurements apply models of the shape of the earth to establish height relative to the average land surface elevation.



However, water heights in tidal areas vary depending on the hydrology and geography of the region. On the Pacific coast, the tides off San Diego are a few feet less than the tides in Seattle and several feet less than Anchorage's Turnagain Arm. The tides within the San Francisco Bay estuary vary from south to the north and from the Golden Gate inland to Sacramento, so specific areas in the estuary have a different tidal range. In addition, tide patterns may vary including diurnal (one high and low per day, Gulf Coast), semi-diurnal (two high and low tides each day, Atlantic Coast), and mixed semidiurnal (two high and low tides of different heights, Pacific coast).

Tide levels vary through time, and observations are standardized to a 19-year datum "epoch" or period of measurement that relates to moon cycles. In addition, spring tides (aka King Tides) are not tides in the spring, but instead are higher tides that "spring" forth on the new and full moon. Conversely, neap tides occur 7 days after a spring tide and are moderate tides when the sun and moon are at right angles. The effect of the tides on the ecology of wetlands and wildlife are often better referenced to datum that report water level relative to average local water heights which range from Mean Lower Low Water (MLLW) to Mean Higher High Water (MHHW). Also, specific datum may be used to determine property boundaries including state owned tidelands in California that are defined as areas below Mean Higher Water (MHW).

Thus, it is critically important to establish which datum are referenced for any project or discussion in the estuary, since use of different datums may have unfortunate consequences — the mistake of confusing meters and feet in a project comes to mind. Water heights may be measured over time with staff gauges (gages if you are a hydrologist) or automated water level loggers to derive the estimates at a particular location. Estimates for some areas are included in tide logs, but these are often based on models and may not be very accurate. However, there is usually a reference station with continuously recorded data in an area such as Port Chicago for Suisun Bay and the Golden Gate station in San Francisco Bay which since 1854 is the oldest station operating continuously in the Western Hemisphere.

So, the next time someone tells you the tide height at their club is at 6 feet, ask them "in which datum?!"

Preparedness for Fire Season in Suisun Marsh

We are into the third consecutive year of drought, and although we often discuss the consequences that dry conditions have for ducks and duck clubs, it is also important to remember to take precautions to protect yourself and your property from the increased threat of fire in the dry late summer months.

A recent fire on June 19th near the Gum Tree Farms Club was first spotted in the afternoon by an SRCD caretaker. When the fire was called in, SRCD was able to give detailed directions on the location of the fire and how to access the area. Within an hour of the report, fire trucks from Suisun City Fire Department, Suisun Fire Protection District, Cordelia, Vacaville, Montezuma, Fairfield, and even Napa and Travis Airforce Base were on the scene.

No structures were burned and only one vehicle was damaged. However, these events do not always turn out so well. Few of the original clubhouses in the marsh still stand, and the response may not always be as swift as it was for this particular fire. It is still important to make preparations for possible fires before they happen.

Defensible Space



Cal Fire has detailed online guides on defensible space zones. Although not all steps to protect your property will apply in Suisun Marsh, some useful tenets of defensible space are:

- Use hardscape like gravel, pavers, concrete and other noncombustible mulch materials. Do not use combustible bark or mulch around your property.
- Remove all dead and dying weeds, grass, plants, shrubs, trees, branches and vegetative debris. Check your roofs, gutters, decks, porches, and stairways to clear potential fuel.
- Remove all branches within 10 feet of any chimney or stovepipe.
- Limit plants growing close to your structures to low growing, nonwoody, properly watered and maintained plants.
- Disk fire line around clubhouse areas



SRCD encourages its constituents to keep information on the location of clubhouses, the nearest emergency centers, and a list of who to call if something goes wrong.



Suisun Marsh Emergency Contacts Club# _ _ _
Lat: 38. _ _ _ Lon: 12 _ _ _
Solano County Sheriff Dispatch 707-421-7090
Benicia Police Department 707-745-3412
Fairfield Police Department 707-428-7300
Suisun City Police Department 707-421-7373
Suisun Fire Protection District 707-425-3605
Cordelia Fire Protection District 707-864-0468
Montezuma Fire Protection District 707-374-5962
Solano County Animal Control 707-784-4733
Poison Control 800-222-1222
U. S. Coast Guard 415-399-3547

Land Of The West Wind
SRCD Newsletter

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I would like to RSVP for the SRCD Annual Landowner Workshop Sept. 21, 2022.

****Please remit to: SRCD @ 2544 Grizzly Island Rd., Suisun, CA. 94585**

Email or call Kelli Perez for payment options (Kperez@suisunrkd.org)

Phone: (707) 425-9302 (ext. 6)

Name: _____ **Club #:** _____

Phone: _____

Name: _____ **Club #** _____

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