Suisun Resource Conservation District

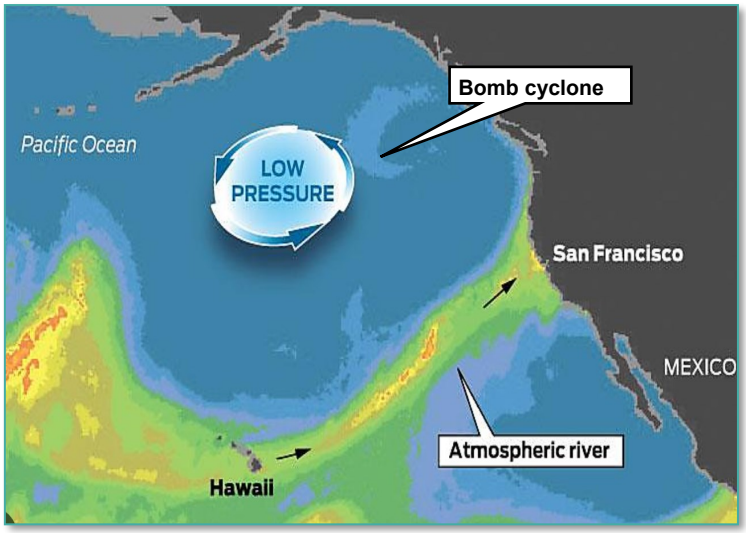
Land of the West Wind

January 2023 Volume 23 Issue 1

From Drought to Floods — Managing Wetlands in Suisun Marsh

Overtopping of a Suisun Marsh Levee on January 6, 2023

One of the predictions for effects of a changing climate in our region is more extreme events including droughts and floods. Under drought conditions, wetland plants and their associated habitats and wildlife are in poorer condition in response to elevated applied water salinities and soil salinities. Under flood conditions, the wetland levees and water infrastructure are challenged by heavy rainfall and winds, especially during high tides or king tides. It is possible to have drought during the summer and floods during the winter, and this year, we have experienced both of these events.



In early January, California experienced bomb cyclone and atmospheric river events which can and did overlap. A bomb cyclone (a term first coined in the 1940s) occurs when explosive storm events are associated with a rapid drop in air pressure (>24 mb drop in 24 hours). There are about 45 bomb cyclone events in the northern hemisphere annually that result in a lot of rain or snow.

[DROUGHT TO FLOODS, Cont. on Pg. 2]

Land of the West Wind

Quarterly Newsletter
Suisun Resource Conservation District
2544 Grizzly Island Road
Suisun, CA 94585

Main Office: (707) 425-9302
Water Manager Office: (707) 426-2431
E-mail: srcd@suisunrcd.org
Website: www.suisunrcd.org

SRCD's public meetings are every second Wednesday of each month at the 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. It's 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. With cooperation from landowners and various agencies, SRCD develops new programs aimed at protecting and improving the Suisun Marsh for future generations.

[*DROUGHT TO FLOODS*, Cont. from Pg. 1]

In contrast, atmospheric rivers, identified and named in the late 1990s by Massachusetts Institute of Technology scientists, are narrow corridors of water vapor or "rivers in the sky" that may carry more water than the Mississippi River. Warmer air from the tropics moves toward the north pole ahead of storm fronts, and water vapor may be transported for thousands of miles in the mid-latitudes most commonly near jet streams. These systems are typically more than 1,000 miles long, less than 62 miles wide, and average 1.8 miles in depth and last 20 hours over the coast where they may cause extreme rain, snow, and flooding. They are often called a "pineapple express" in our region when they originate below the jet stream near Hawaii, and they most often occur when there is an El Niño pattern in the Pacific, although this year was a El Niño exception.

In Suisun Marsh, the likelihood of increasing climate extremes suggests that landowners should prepare in advance for more frequent summer droughts (improving infrastructure for leaching, irrigating early when salinity is lower, focusing on appropriate saline-tolerant plants) while increasing their preparedness for winter extreme events (upgrading levees, conducting surveys with storms, pre-positioning flood-fighting equipment, stockpiling sandbags and plastic sheeting).

Despite Drought, A Decent Hunting Year for the Marsh

With limited areas holding water this fall, Californian hunters who typically hunt on private lands are flocked to public wildlife areas with sufficient water. At the same time, some of the federal refuges delayed the opening weekend by a month, shortening their waterfowl seasons by 39% from 44 days to 27 hunt days. Tule Lake and Lower Klamath National Wildlife Refuges remain closed for the season with no water supply for the Refuge, reducing opportunities this year for hunting on public areas in northern California.

Low water availability in the Sacramento Valley tends to concentrate more migrating birds south of the Sacramento Valley into areas like Grizzly Island Wildlife Area (GIWA) and can potentially increase the chances of more successful hunts in these areas. This phenomenon can be seen for GIWA in the summary table below and figure 1 on Page 5.

Fall Opening Week Harvest Numbers

Sites	Acres	#Hunters	#Ducks + Geese			Total	Averages		
			Sat	Sun	Wed		Sat	Sun	Wed
GIWA — Suisun Marsh									
Grizzly Island	8,380 ac	709	1382	380	336	2098	3.4	2.2	2.5
Goodyear	670 ac	55	14	14	9	37	0.6	1.1	0.5
Joice*	2,137 ac	55	54	47	54	155	2.3	3.6	3.0
State — Central Valley									
Yolo	16,000 ac	561	899	455	657	2011	4.3	2.6	3.8
Gray Lodge	9,100 ac	507	908	504	387	1799	4.7	2.6	3.3
San Luis	902 ac	236	267	153	114	534	2.3	2.4	2.0
Federal— Sacramento Valley									
Sacramento	10,819 ac	530	827	210	297	1334	3.9	1.3	2.0
Delevan	5,877 ac	356	776	223	481	1480	5.8	2.4	3.8
Colusa	5,077 ac	239	491	175	254	920	5.3	2.4	3.5

* indicates Sunday Hunts Only

[*New Year, New GIWA,* Cont. on Pg. 5]

[*DESPITE DROUGHT,* Cont. from Pg. 3]

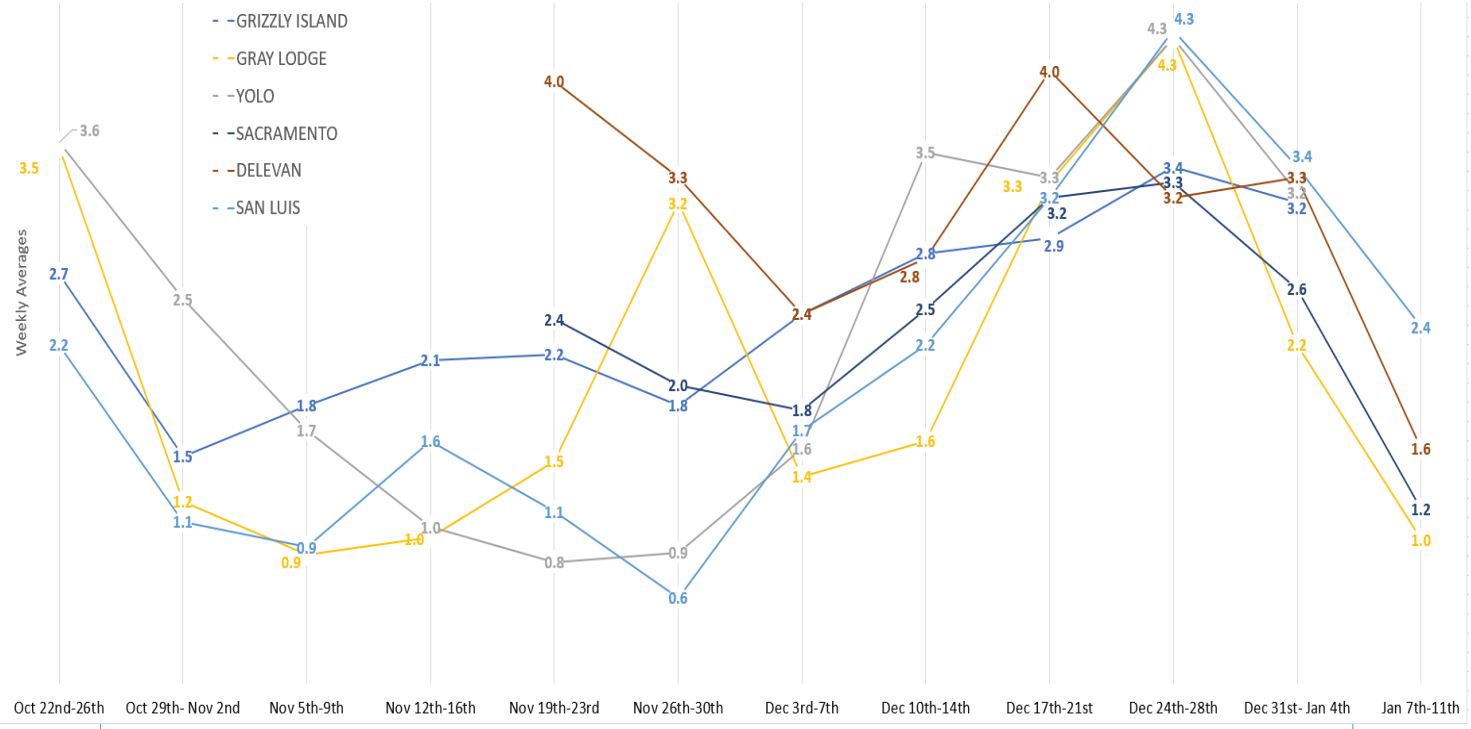


Figure 1. Birds taken per hunter by week in the fall harvest at several state and federal wildlife areas in the Valley.

New Year, New GIWA

—SRCD PUBLICATION—

California Department Fish and Wildlife (CDFW) is investing close to $9 million on Grizzly Island Wildlife Area (GIWA) on various projects to improve interior and exterior infrastructures, to allow easier routine maintenance, and to bring added habitat benefits for wildlife. Starting a few years back with a *Phragmites* control project, GIWA begin receiving grants from both the Wildlife Conservation Board (WCB) and the North American Wetland Conservation Act (NAWCA) for habitat and infrastructure improvements. Grant funding included $4.3 million from WCB, $300,000 from NAWCA and another $4 million raised within CDFW to fund the improvement projects on GIWA. California Waterfowl Association (CWA) is assisting CDFW use the funding to conduct projects across the GIWA. CWA's regional manager is confident that more support will be forthcoming, since GIWA is a fundamental and drought resilient wetland for the Pacific Flyway.

The ongoing investment into GIWA infrastructure is large, but it will leave the wildlife area in much better condition and allow for easier management for the CDFW staff in the future. Within the last decade, the CDFW staff have battled wildfires and overtopping floods while managing with broken pumps, electrical outages, worn-out equipment, and unsafe walkways. These maintenance deficiencies slowed the progress on routine maintenance work like ditch cleaning or pond grading. In the last few years, GIWA has struggled to stay flooded during the hunting season or dry during the work season, leaving an overwhelming amount of uncompleted work to accomplish habitat goals. Improvements are planned on 12,900 acres over the next 5 to 6 years to better equip GIWA to manage their habitats more effectively. Here is what is the pipeline of project updates:

[*New GIWA,* Cont. on Pg. 5]

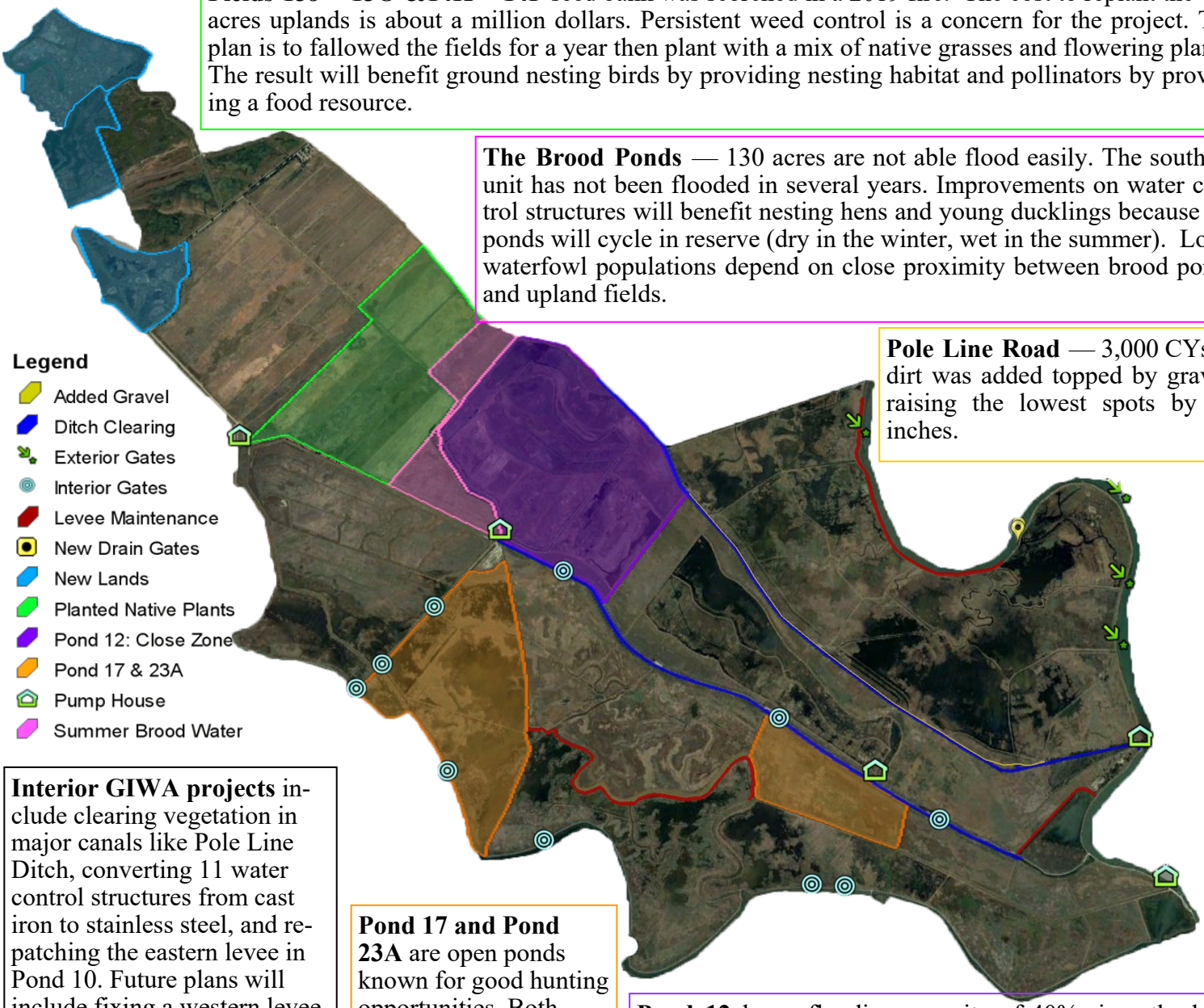
[*New GIWA*, Cont. from Pg. 4]

Long Point, Bent Barrel, and Mendoza clubs were acquired in a land swap trade with the Pacific Flyway Center. Each of them came with many maintenance problems. Long Point was the worst with narrow, 8-ft wide levees and overgrown trees making it particularly difficult to access exterior levees. Improvements on Long Point's existing pump along with the project's plan to connect the neighboring two properties will increase drainage capacity and allow water to flow across the properties including the state-owned Crescent Unit property.

Fields 13J – 13O &14K – 14P seed bank was scorched in a 2019 fire. The cost to replant the 450 acres uplands is about a million dollars. Persistent weed control is a concern for the project. The plan is to fallowed the fields for a year then plant with a mix of native grasses and flowering plants. The result will benefit ground nesting birds by providing nesting habitat and pollinators by providing a food resource.

The Brood Ponds — 130 acres are not able flood easily. The southern unit has not been flooded in several years. Improvements on water control structures will benefit nesting hens and young ducklings because the ponds will cycle in reserve (dry in the winter, wet in the summer). Local waterfowl populations depend on close proximity between brood ponds and upland fields.

Pole Line Road — 3,000 CYs of dirt was added topped by gravel, raising the lowest spots by 20 inches.



Interior GIWA projects include clearing vegetation in major canals like Pole Line Ditch, converting 11 water control structures from cast iron to stainless steel, and repatching the eastern levee in Pond 10. Future plans will include fixing a western levee along Howard Slough and upgrading 5 pump stations with new platforms to better protect against electric outages and weather elements.

Pond 17 and Pond 23A are open ponds known for good hunting opportunities. Both ponds are set to be improved with swale and pond grading, levee maintenance, and replaced infrastructure.

Pond 12 has a flooding capacity of 40% since the last fire. CDFW researchers noticed the failed infrastructure when radio collared geese shifted their behavior in response to changing conditions. Swales and pond grading improved infrastructure and increased flood capacity, expanding wetland acres.

GIWA's exterior levee work included a $3 million project to fix infrastructure on Montezuma Slough. So far, 4 exterior water control structures and 2 drain gates were installed to improve circulation and drainage. In addition, 260 ft of new riprap was placed on four sections of the exterior levee with 24,000 CYs of dredged material to raise the exterior levee. $650,000 of maintenance work will be done along Montezuma Slough within the next 2 years.

[*New GIWA,* Cont. on Pg. 6]

[*New GIWA*, Cont. from Pg. 5]

A *Phragmites* control project was proposed to treat 2,200 acres of *Phragmites* through fire, chemical, and mowing treatments. A total of 1,800 acres of *Phragmites* was treated over the last 3 years despite unforeseen circumstances like electrical pump failure that prevented chemical re-application along with a 4x increase in chemical cost reducing the total acreage of effort.

Figure 2: Yellow indicates *Phragmites* treatment area:

Goodyear, Island Slough, and Joice Island Wildlife Area are also included in the wave of improvements. Two exterior water control structures will be replaced at Goodyear, and another water control structure will be placed at Joice Island. Finally, a slightly bigger project at Island Slough will redesign its drainage system by removing a pump and replacing pipes under Grizzly Island Road. Other projects in planning include replacing West Family Unit's infrastructure and improving Joice Island's pump after upgrading the Joice Island Bridge.

Feathered Notes

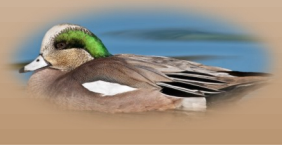
American Wigeon

Mareca americana

♦This "bald pate" bandit is known for its brazen habit of snatching meals from diving ducks like Canvasbacks and Redheads. It does so by shadowing the diver species like a pilot fish trailing a shark. The clever bird anticipates where the unwitting diver will surface and then steals a quick reward. This behavior is unique, landing the species "The Poacher Duck" title.

♦The American Wigeon has a short bill and legs positioned forward on its body. These body features allow the duck to waddle through fields plucking upland grasses as would a flock of grazing geese.

♦The species are the first to arrive at their breeding grounds in North America's Boreal Forest. The monogamous pair will build a nest together and stay together until the 2nd week of incubation. The males will then depart to the South, and the females will depart 6 weeks later, once the ducklings have feathers. Unlike other dabbling hens, wigeon will not adopt displaced ducklings. However, the mother wigeon is among the few ducks that use an injured-wing display to lead predators away from her ducklings.



20 Years of Invasion:

Assessing the Historic Spread of *Phragmites australis* in Suisun Marsh

By Jason Hagani

The common reed *Phragmites australis* has been a persistent invasive plant concern for landowners and agencies in Suisun Marsh for >20 years. Efforts to eradicate *Phragmites* have been extensive - disking, mowing, burning, herbicide treatments, and grazing have all been used to manage the invasive species. Yet at the same time, it is apparent that marsh-wide, *Phragmites* has continued to increase. To adapt to the growing threat of invasive species in Suisun Marsh, a better understanding of how *Phragmites* is distributed and how it has expanded over time could help target management efforts. To that end, biologists at SRCD recently completed a historical analysis of *Phragmites* in Suisun Marsh from 2003 to 2020. Using publicly-accessible aerial imagery, the distribution of *Phragmites* was modelled and mapped to a high degree of accuracy and at fine-scale resolution. The models revealed that, unsurprisingly, *Phragmites* has expanded substantially throughout Suisun Marsh.

Between 2003 and 2018, the area covered by *Phragmites* increased by 234% from 1144 acres to 3823 acres. That dramatic expansion includes a 266% increase in *Phragmites* in managed wetlands, and a 190% increase in tidal wetlands. Even on Lower Joice Island, where SRCD has treated *Phragmites* with both helicopter and hand-spraying every year since 2000, the invasive species has spread in the managed wetlands from 10 acres in 2003 to 264 acres in 2020. These results reinforce the difficulties in combatting *Phragmites* in Suisun Marsh and highlight the importance of new strategies including cooperative management to tamp down on invasive species expansion. This research will help SRCD work with landowners to manage Phragmites more effectively on their properties. In the future, updated models on new aerial imagery will allow for continuous monitoring of the invasive species and help identify current areas in which *Phragmites* is increasing. Furthermore, fine-scale models can help pinpoint emergent *Phragmites* and allow for a rapid response to minimize expansion early. Lastly, this research will support innovative strategies for managing *Phragmites*, such as SRCD's spray drone. Our hope is that in the not-so-distant future, this pervasive invasive will be less of a problem.

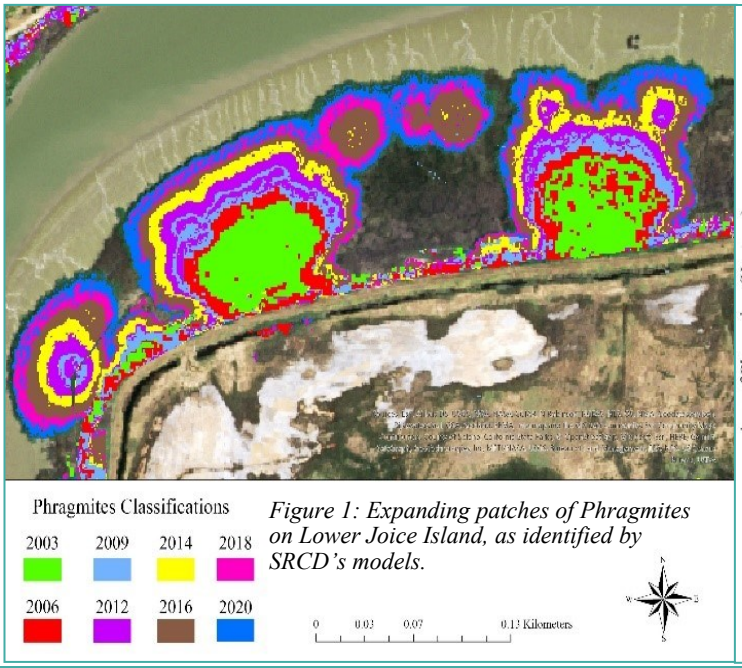


Figure 1: Expanding patches of Phragmites on Lower Joice Island, as identified by SRCD's models.

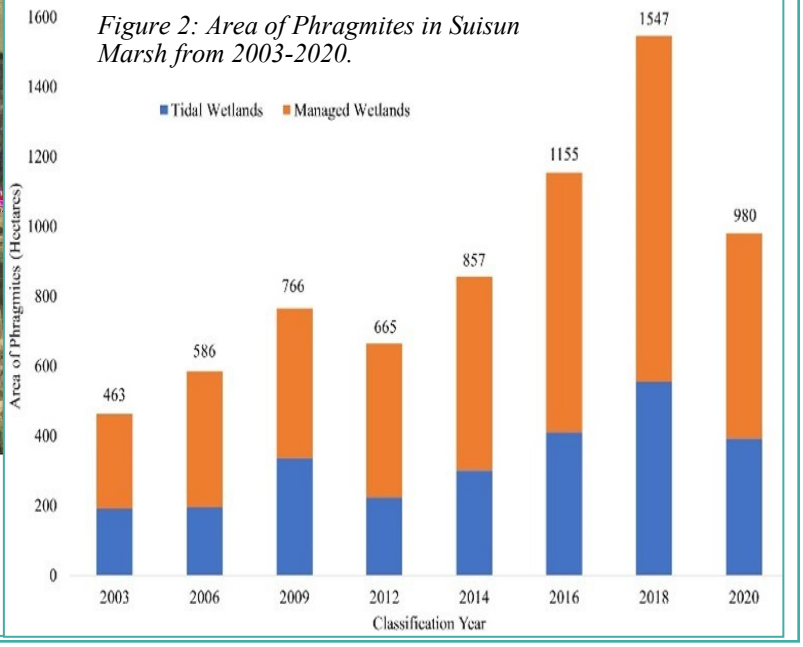


Figure 2: Area of Phragmites in Suisun Marsh from 2003-2020.

Land Of The West Wind
SRCD Newsletter

2544 Grizzly Island Road
Suisun CA 94585

Address Correction Requested

Suisun Resource Conservation District

PRESORTED NONPROFIT
U.S. POSTAGE PAID
SUISUN, CA 94585
PERMIT NO. 124

Address Correction Requested

Upcoming Events & Reminders

- The new 2023 Regional General Permit #3 will be released by the end of January!
  Landowners interested in storm damage repairs or summer maintenance work should contact your Water Manager with details of which activities your club needs and get permits in early
- CA Ridgeway Rail restrictions on exterior levee work take effect **February 1 through August 31, 2023**
- Please enjoy us at the Spring Landowner Workshop on **April 19, 2023**
- Look out for the SRCD 60th Anniversary Celebration Announcement! - coming soon
- Club Contact List Updates Request
  Individuals interested in receiving SRCD general mail or landowners interested in updating their club contact list, please email mguzman@suisunrcd.org
- Fall Chinook Salmon Gate Restrictions still in effect until **January 31, 2023**
  Intake gates along designated sloughs are still under restriction period. Gates are allowed 25% capacity!
  Spring Salmon gate closures go into effect **February 21, 2023**
- Office of the Delta Watermaster
  Water use reports for the recent water year, October 1, 2021 through September 30, 2022 are due **February 1, 2023**