

TIDAL MARSH *PHRAGMITES* MANAGEMENT: BLACKLOCK DRONE APPLICATION

By: Desmond Mackell (SRCD) and Gina Darin (DWR)



Figure 1. A Leading Edge Aerial Technologies Precision Vision 35 spray drone flies over one of the Blacklock Marsh Phragmites treatment areas.

The California Department of Water Resources (DWR) has taken a significant step in the ongoing battle against invasive species by partnering with the Suisun Resource Conservation District (SRCD) to adaptively manage non-native *Phragmites australis* within the tidal marsh areas of Suisun Marsh. The project aims to utilize an unoccupied aerial vehicle (UAV), hereafter referred to as a drone, for the precise and targeted application of herbicides in sensitive tidal marsh habitat (Figure 1).

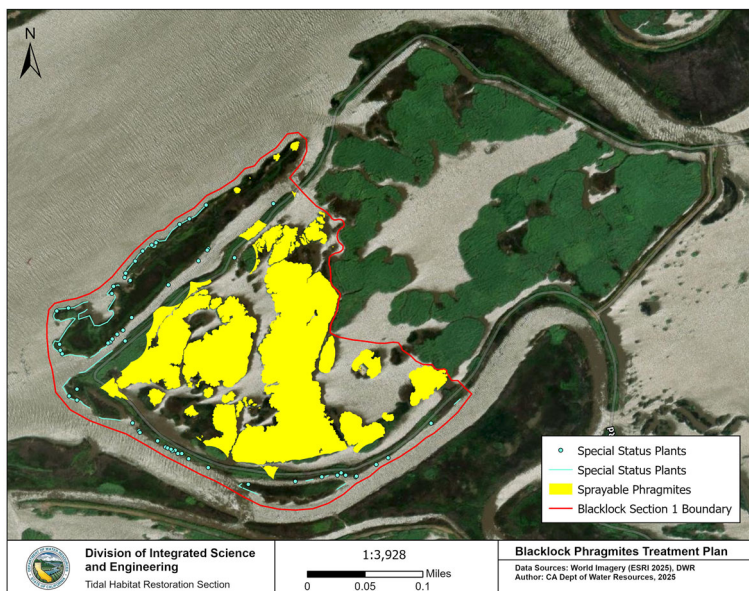


Figure 2. The Blacklock *Phragmites* Treatment Plan ensured targeted spraying, limiting herbicide drift, and a buffer to protect sensitive plants in an effort to preserve ecosystems that contain rare native vegetation while targeting invasive species.

This summer, the research team successfully completed the first phase of a six-year treatment plan at the Blacklock Marsh tidal restoration site. Spanning approximately 90 acres, Blacklock Marsh is located along Nurse Slough in the northeast corner of Suisun Marsh. Prior to launching this treatment initiative, DWR conducted a series of preliminary test treatments from 2019 to 2022. These earlier studies aimed to assess the potential impacts of treatments on native vegetation and water quality within the marsh area. The initiative represents a pioneering effort to address the unchecked expansion of *Phragmites* in these vital tidal ecosystems that support native fish and wildlife. In undertaking this project, DWR and SRCD are not only working towards the immediate removal of invasive plant species, but are also striving to simplify the permitting processes that other marsh managers might face when aiming to tackle the challenge of invasive *Phragmites* in tidal environments. [Blacklock, Cont. on Pg. 4]

Land of the West Wind

Quarterly Newsletter
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**SRCD's Board Meetings are on the
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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.



Comings and Goings at the Suisun Resource Conservation District

In memory of Jim Waters, 1947-2025

It is with great sadness that we must inform our readers of the passing of long-time SRCD Board Member Mr. James Waters. Jim passed away unexpectedly on August 25th in Walnut Creek, California. Jim served on the SRCD Board of Directors for almost 22 years, beginning in September of 2003. Over the years, Jim served as Chair of both the SRCD Legal and Agency Committees, where he helped shape policies and programs that advanced the Suisun Marsh landowners' conservation mission. A lifelong supporter of CWA, Ducks Unlimited, and the Mzuri Wildlife Foundation, Jim also served two terms on the CWA Board of Directors and played a key role in the development of the California Outdoor Heritage Alliance.



Jim was born on November 22, 1947, in Los Angeles, California. He attended Daniel Murphy High School before moving to the San Francisco Bay Area to begin his college studies at Saint Mary's College in Moraga, California. It was during his time at Saint Mary's that Jim discovered his passion for waterfowl hunting, as a guest at the Grizzly Duck Club on Grizzly Island in the nearby Suisun Marsh. Although he would go on to hunt in many places around the world, the Suisun Marsh remained the anchor of his sporting life, where he was a proud member of the Rich Island Duck Club for more than 30 years.

Jim was an unwavering advocate for the preservation of the Suisun Marsh, as well as California's wetlands and waterfowl resources. Active before the California State Legislature and the California Fish and Game Commission, he promoted policies that protected landowner rights while ensuring that the Marsh's wetlands and wildlife were maintained and enhanced through SRCD programs and the stewardship of private landowners.

Jim is survived by his sister, Peggy, her husband, Jack, and his nephews, Scott and Wyatt Russ.



Assembly Bill 764 - Take of Invasive Mute Swans



California State Governor Gavin Newsom has recently signed Assembly Bill 764, which is set to take effect on January 1, 2026. This legislation permits hunters to harvest and possess non-native Mute Swans within the state. The primary objective of this measure is to adopt a proactive approach in managing the rapid proliferation of this invasive species that poses a threat to California's delicate wetland ecosystems.

Mute Swans, originally indigenous to Europe and Asia, were brought to North America in the late 1800s as an ornamental species. Since then, many individuals have escaped into the wild, resulting in a substantial increase in their breeding populations. According to data from the California Breeding Population Survey, the estimated population of Mute Swans surged from approximately 1,500 to over 12,000 between 2022 and 2025 (Figure 1). This alarming growth further underscores the urgent need for effective population management.

The Suisun Marsh and Delta regions, known for their ecologically important wetlands, are particularly noted for their high concentrations of Mute Swans. While these majestic birds are captivating in appearance, they are also notorious for their aggressive behavior. Their presence can have detrimental effects on native wildlife, as they often engage in fierce competition with local species for resources and territory. Additionally, Mute Swans can overgraze vegetation, leading to significant ecological damage. Consequently, the impact of Mute Swans on the local environment raises critical concerns for conservation efforts aimed at preserving the native flora and fauna of the region.

In light of the new Assembly Bill, it is crucial to clearly distinguish Mute Swans from California's two native swan species: the Tundra Swan and the Trumpeter Swan. While the Trumpeter Swan is considered rare within the state, Tundra Swans can be regularly observed throughout the winter months. Importantly, both native species are illegal to harvest in California. Mute Swans are larger than Tundra Swans and can be identified by their distinctive orange bill, which features a large black knob on top. In contrast, Tundra Swans have a black bill, often with a yellow spot at the base (Figure 2). By understanding these differences, hunters can responsibly contribute to the protection of California's native wildlife.

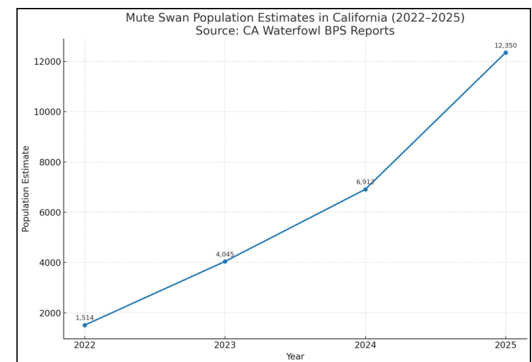


Figure 1. Graph from the California Breeding Population Survey shows surge in the Mute Swan population over the past 3 years.

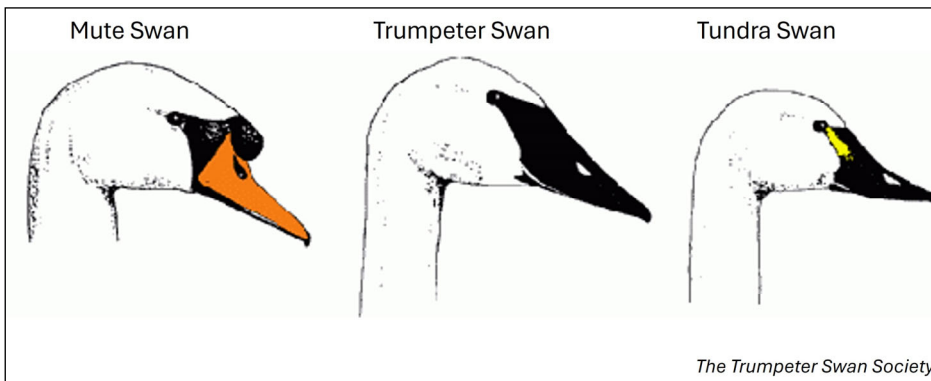


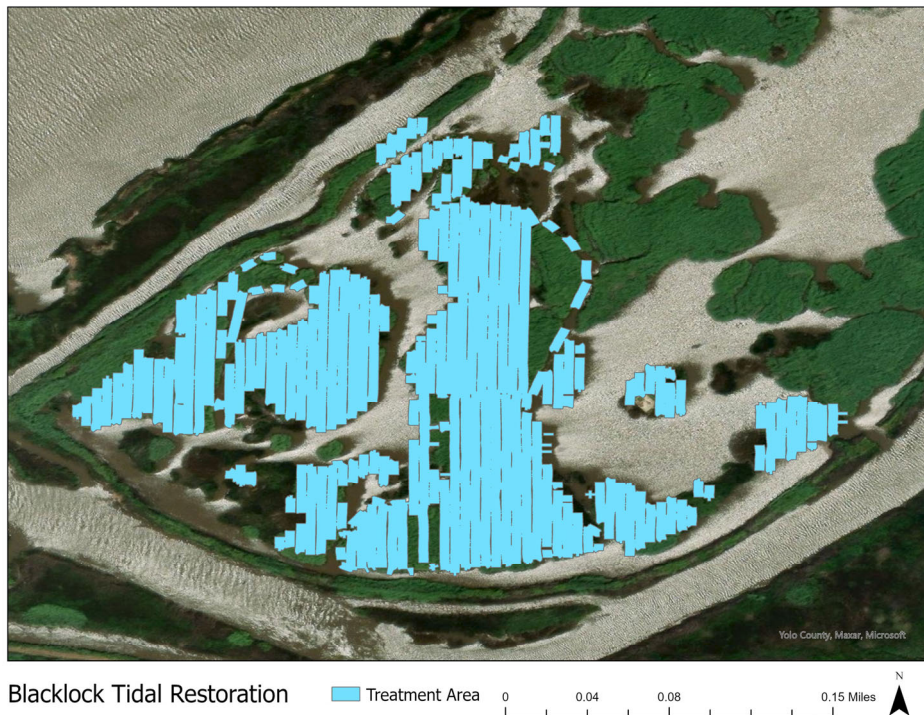
Figure 2. Taking is strictly limited to Mute Swans only - the taking of other swans is not permitted by AB 764.

Significant precautions were taken during the treatment process, particularly given the sensitive nature of the habitat. Efforts were made to ensure targeted spraying, limit herbicide drift, and protect sensitive plants as the treatment occurred over water and within an area that could contain rare native vegetation (Figure 2). This careful approach included collaboration with both the State Water Resources Control Board, the US Bureau of Reclamation, and the United States Fish and Wildlife Service to meet permitting requirements and obtain environmental permits, emphasizing the project's commitment to preserving native ecosystems while addressing invasive species.



Figure 3. SRCD staff assisted DWR with site logistics which included clearing a *Phragmites* plot where the drone could take-off and land from and transporting the necessary equipment via a barge that held a generator, flight equipment, batteries, and spray equipment, including chemical. LEAT drone pilot, Bill Reynolds, provided flight expertise for this initial phase of the project.

For the current phase of the project, the team utilized a Leading Edge Aerial Technologies (LEAT) Precision Vision 35 spray drone (Figure 3) to effectively treat approximately 12 acres of *Phragmites* with herbicide (Figure 4). Over the next two years, the site will continue to receive drone-based treatments as the project expands into additional sections of Blacklock Marsh. Water quality tests indicated non-detectable herbicide concentrations during the treatment period, which is excellent news for the project's future progress. (Figure 5). The early indicators are promising and suggest minimal negative impacts on the surrounding environment.



Blacklock Tidal Restoration



Treatment Area

0 0.04 0.08 0.15 Miles



Figure 4. This map highlights the areas of Blacklock Marsh that were treated with glyphosate (blue). The team effectively treated approximately 12 acres of *Phragmites*.

To further monitor the effectiveness of the treatment interventions, aerial imagery collected by DWR's survey drone will play a crucial role in tracking changes in vegetation. The project team is hopeful that, as treatment progresses, native plant species—such as tule—will begin to repopulate areas that were previously dominated by the invasive *Phragmites*. This transition aims not only to restore the ecological balance of the marsh but also to support the diverse wildlife that depends on these habitats for survival. Overall, the Blacklock Marsh *Phragmites* removal project stands as a testament to proactive measures being undertaken to safeguard California's rich natural resources for future generations.

DWR and SRCD are excited for next year's work [Blacklock, Cont. on Pg. 5]



Figure 5. Gina Darin, Senior Environmental Scientist (DWR), collects a water quality sample adjacent to the drone treatment area. Early analysis results confirmed non-detectable herbicide (glyphosate) on the day of treatment.

combating *Phragmites* expansion in the marsh. The Sacramento-San Joaquin Delta Conservancy funded the initial study and the State Water Project funds the full-scale implementation. The multi-agency approach to tackling this issue showcases the collaborative effort to restore and protect California's delicate ecosystems.

Thank you to our team of collaborators and funders!

DWR: Gina Darin, Laurel Richardson, Krista Hoffman, JT Casby, & Madison daSilva

Suisun RCD: Steve Chappell, Desmond Mackell, Tim Edmunds, Marque Mouton, & Jesirae Collins

Fieldwork & Lab: SOLitude Lake Mgmt, UC Davis, DWR's Bryte Chem Lab, Weck Lab, & Leading Edge

Funders & Collaborators: SSJDC Prop 1 Grant, DWR Fish Restoration Program, & USBR



SACRAMENTO-SAN JOAQUIN
DELTA CONSERVANCY



Plan Ahead

KING TIDES

Be Prepared:
November 4 - 8, 2025
December 3 - 7, 2025
Dec 30, 2025 - Jan 6, 2026



King tides are the highest and most extreme tides of the year. The position and distance of the moon and sun affect our tides.



When they align

When the sun, moon, and earth align, solar gravity combines with lunar gravity, creating very high tides, King Tides.



King Tide

PC: Dept. of Ecology, State of Washington



Grizzly Island Wildlife Area Updates



- Grizzly Island staff banded 187 mallards, 1 cinnamon teal this year
- USGS staff attached telemetry backpacks to 9 mallards
- Public Hunter Meeting: The Grizzly Island and Yolo Wildlife Areas held their fall public hunter meeting on August 21st.
- Elk Season: The fundraiser tag hunt began on August 2nd and a bull was shot on August 16th. The bull was a 9x9 and weighed 693 pounds! General hunts began on August 12th and ended on September 26th. A total of 38 animals were harvested.
- Grizzly Island has started flooding up and has flooded about 3000 acres already.
- Work on the Grizzly Ditch Fish Screen Intake Project has resumed and is expected to be completed by November 15th.
- Pump #7 was repaired with additional support to the discharge pipe. This work was completed in time to flood the pond 12 closed zone.
- The Suisun Marsh Salinity Control Gates suspended tidal operations at the conclusion of the Summer-Fall Action on August 25th. Tidal operations resumed on September 5 due to the 7-day extension of the Summer-Fall Action under the ITP. Gates are currently in the open position.

SUISUN MARSH



CAT INITIATIVE

Help us protect native species—report cat sightings in the marsh.

Domestic cats are prevalent in Suisun Marsh, and staff from the Suisun Resource Conservation District (SRCD) and the California Department of Fish and Wildlife (CDFW) are working hard to monitor and manage their populations. While beloved as pets, free-roaming cats are one of the world's most ecologically damaging invasive species, having contributed to the extinction of at least 63 species of birds, mammals, and reptiles.

In Suisun Marsh, these cats depredate sensitive wildlife, including the state- and federally-endangered salt marsh harvest mouse, lizards, snakes, and ground-nesting waterfowl. As part of ongoing efforts to protect these vulnerable species, we have safely removed 18 cats from the Marsh to date.

To support this work, we're asking the public to report cat sightings in the Marsh. Scan the QR code below to complete a short, anonymous survey. To report sick or injured cats or kittens, please email:

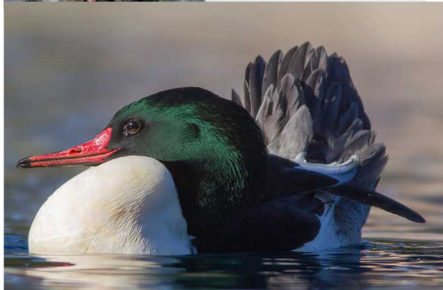
GrizzlyIsland@Wildlife.ca.gov.



Interested in supporting the program? Donations can be made through the link at the QR code.

Your involvement makes a difference—thank you for helping us protect local wildlife!

Common Merganser ~ *Mergus merganser*



- With an average body size equal to a Mallard or Sea Gull, this fish-eating duck avoids dense marshes and muddy waters and prefers to be along wooded lakes and rivers.
- Like wood ducks, female Mergansers will lay eggs inside riparian tree cavities with a fresh water source near by. Females have also laid eggs in each other's nest and will sometimes lay an egg or two in a completely different species nest like a wood duck's nest.
- Merganser ducklings eat mostly aquatic insects but in adulthood, mergansers will dive, swim underwater and forage on small fish, shrimps, and salamanders. They rarely consume plant material like other diving ducks.
- In fact, their bills are very narrow with a serrated red beak that has hooked tips, a unique adaptation to catch fish prey. Adult males are even known to swallow fish more than a foot long! Because of this feature, these birds are sometimes called sawbills.
- Common mergansers are the largest of 3 merganser species in the U.S. The other two are the Hooded Merganser and the Red-Breasted Merganser.

2025—2026 Waterfowl Hunting Regulations

The following is a summary of 2025-2026 regulations. The Fish and Game Commission's website has the actual language adopted on July 28, 2025. In California, the Balance of the State Zone's regular season starts on October 18, 2025 and ends on January 28, 2026. This zone, including Suisun Marsh, has a 7-duck daily limit that can include: 7 mallards (2 hens), 3 pintail, 2 canvasback, 2 redheads, 2 scaup, and a goose bag limit of 30 birds (20 White, 10 Dark).

Important Waterfowl Dates:

Oct 18th: Suisun Marsh Opening Day

Nov 4th: Scaup season opens

Nov 22nd: Free Hunting Day

Dec 1st: Powered spinning-winged decoys opens

Jan 25th: Balance of State Goose season closes

Jan 28th: Suisun Marsh Regular Season Ends

Jan 31st-Feb 1st: Veterans and Active Military Personnel Waterfowl Hunting Days

Feb 7th-8th: Youth Waterfowl Hunting Days

Feb 14th-15th: Late Canada Goose Weekend

Feb 14th-18th: Late White-fronted Goose and White Goose Season

Upland Game Species Dates:

Oct 18th– Feb 1st: Snipe season (8 per day)

Nov 8th-Dec 21st: Pheasant season (3 males per day after the first two days of the season)

[*King Tides*, Cont. from Pg. 5]

The exterior levees of Suisun Marsh serve as a vital defense for one of California's largest managed wetland habitats. Their stability and integrity are crucial for preventing costly damage and breaches during the winter.

For waterfowl hunters, forecasts of high winds and rain often bring excitement, as these conditions can enhance the hunting experience and lead to memorable days in the blind. However, when a series of factors align, such as floodwater runoff from the valley, potential high winds, and seasonal king tides, serious challenges can arise for the landowners reliant on the marsh's protective levees.

Suisun RCD holds the necessary permits to maintain and repair levees, with most work traditionally completed before the waterfowl season begins in October. While urgent repairs can be authorized under an Urgent and Unforeseen permit, securing equipment and accessing the levees often becomes problematic once heavy rains and high tides threaten their integrity.

To mitigate risks, Suisun RCD strongly advises wetland managers to conduct regular inspections of their exterior levees throughout the waterfowl season. By addressing small areas of damage promptly, they can prevent more significant issues from developing. Landowners should be particularly vigilant during the anticipated high tide cycles through the winter, specifically from **November 4th to 8th, December 3rd to December 7th, and December 30th to January 6th**, as these periods pose an increased risk of exacerbating natural weather events.

It's crucial to have flood-fighting equipment ready in advance, as availability tends to dwindle once storms hit. Having sandbags and Visqueen on site, and stockpiling sand can be instrumental in avoiding costly repairs in the 2026 work season. While Suisun RCD keeps a limited supply of these resources at our main office for distribution on a first-come, first-served basis, nearby supplies can also be found at White Cap in Fairfield, CA.

Remember to be prepared and check your exterior levees regularly during high tides and heavy storm events.



Van Sickle Island levee breach
PC: Daily Republic, 12/23/24

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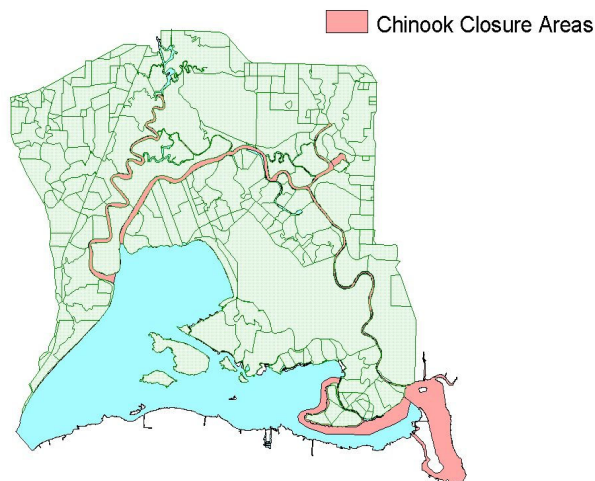
Fall Reminders

Chinook Salmon Gate Monitoring Starts November 1st:

The Suisun Resource Conservation District will begin gate monitoring for the Fall Run of Chinook Salmon starting **November 1, 2025 through January 31, 2026**. During this restriction period, intake gates along the designated sloughs (indicated in pink on adjacent map) can only be opened to 25% capacity. SRCD staff will be inspecting all intake diversions along these areas at various times during the winter months. Below is a conversion table for varying sizes of intake gates.

<u>Diameter of Pipe</u>	<u>25% Open</u>
12 inches	3 inches
18 inches	4 inches
24 inches	6 inches
30 inches	7 inches
36 inches	9 inches
48 inches	12 inches

Should an intake be found out of compliance, SRCD is required to report to the appropriate agencies and the landowner will be contacted and asked to reduce their intake immediately.



Actual Work Reports:

All landowners who applied under the USACE RGP3 permit should report back to their water manager on work that was completed during the summer work season.