



BETWEEN THE Tides

FEATURED



**MARSH SPECIES HIGHLIGHT:
SALT MARSH BIRDS BEAK**



**WATERSHED WATCH:
TRACKING IMPACTS FROM
WINTER STORMS**



**MUTTS FOR THE BAY
DISPENSER SPONSORSHIP**



MORRO BAY
NATIONAL ESTUARY PROGRAM

FALL LETTER FROM THE DIRECTOR



I often run and explore the trails through the Elfin Forest in Los Osos. This small preserve borders the Morro Bay estuary and is home to a remarkable number of plant and animal species. Most notable are the native coast live oaks (*Quercus agrifolia*). The oaks in this area have adapted over the centuries to the local environment, and while this same species growing elsewhere may tower at heights of up to 50 feet, the oaks in the Elfin Forest are pygmy trees ranging from 4 to 20 feet. Entering the Elfin Forest can feel a little like stepping through Narnia's closet into a magical fairytale.

The paths through the Elfin Forest emerge into several overlooks that provide stunning sunset views when the weather cooperates. The view from one of these spots provides a panorama of the bay. To the east, Chorro and Los Osos Creeks feed the bay with fresh water, and you can clearly see how dynamic the estuary is. The tides from the Pacific Ocean flush in and out to expose habitats like eelgrass beds, tidal marsh, and mudflats.

To the west towards Morro Rock (known as Lisamu' by the Chumash and Lesa'mo' by the Salinan), the estuary transitions into deeper channels, and a unique sand spit and coastal dune system buffers our communities from ocean waves. The otters, steelhead trout, black brant, and so many other species also call this place home. This is a fantastic spot to experience the natural beauty of the Morro Bay estuary and being there reminds me of how grateful I am to call this place home.

As stewards of the Morro Bay estuary and watershed, we all have a responsibility to preserve special places like this for future generations. Stewardship begins with developing a relationship with nature, so I urge you all to explore these areas with childlike curiosity. Watch as the tides come in and out, as the plants flower with seasons, as the birds come to over winter in the bay. To learn more about the Elfin Forest please visit www.elfin-forest.org, and to learn more or volunteer with the Estuary Program visit www.mbnep.org.

-Melodie Grubbs, Executive Director

MARSH SPECIES HIGHLIGHT: SALT MARSH BIRD'S BEAK

This year's record rainfall was particularly beneficial for one rare plant in the Morro Bay estuary, the salt marsh bird's beak (*Chloropyron maritimum* ssp. *maritimum*). This small velvety plant lives within the salt marsh habitat and is a hemi-parasite, which means it uses a specialized root system to latch onto host plants such as pickleweed, saltgrass, and jaumea. This provides its water and some of its nutrients in addition to creating its own food through photosynthesis.

Salt marsh bird's beak also can excrete salt, which allows it to thrive during the summer after other annual plants have died back for the season. It grows in the upper elevation areas of the tidal marsh that are only inundated with salt water during the higher tides of the year.

Because salt marsh bird's beak only thrives in limited locations, it is particularly vulnerable to habitat loss from pollution, sea level rise, coastal development, and invasive species like ice plant and European sea lavender. Salt marsh bird's beak is currently on the federal and state endangered species lists and restoration efforts (e.g., removing invasive plants, reseeding, etc.) to re-establish its preferred habitat are on-going in Southern California estuaries like Newport Bay.

The Estuary Program's Restoration staff mapped the extent of the bay's salt marsh bird's beak in July and August to see if its range has expanded since a 2019 survey and to identify areas for possible restoration. Some sites saw an increase in species cover, while others remained similar to what was found in 2019. Across all the sites in the estuary, the estimated cover of salt marsh bird's beak increased by 12.7% since 2019.

Protecting and restoring salt marsh bird's beak habitat benefits tidal marsh habitat biodiversity and will be a continued priority for the Estuary Program in the future, especially with increasing impacts of sea level rise and invasive species.



Salt marsh bird's beak uses nutrients and water from nearby host plants like Jaumea, sea heath, arrowgrass, and saltgrass to survive in salty soils.



Salt marsh bird's beak flooded during a 5.7-foot high tide in September 2023.



An image of salt marsh bird's beak habitat mapping using GIS. The 2019 survey (in pink) and the 2023 survey (in light blue) indicate an expansion of species cover at the site.



This photo with salt marsh bird's beak on the left and ice plant on the right illustrates the impact of invasive species. Since salt marsh bird's beak can only thrive in areas with specific host plants that are at a particular tidal elevation, removing invasive species like ice plant from its preferred habitat can benefit this vulnerable species.

WATERSHED WATCH: TRACKING IMPACTS FROM WINTER STORMS

A primary goal of our program's monitoring efforts are to track changes over time. With the big storms of the past winter, erosion of creek banks was likely widespread. Once the flows came down, Estuary Program staff with the support of Cal Poly volunteers headed out to conduct stream cross section surveys. This involves using surveying techniques to create a profile (cross-sectional view) of the stream channel. The new profiles can be compared to historic data to see how the creek banks have changed over time.

The stream channels and their habitat characteristics change over time and can be impacted by factors such as storm flows and activities like grazing or construction. The data collected includes slope (steepness) of the channel, the type of materials that make up the creek bottom, water levels, and a cross section of the stream channel. If a portion of a stream bank collapsed due to winter storm flows, the profile of the channel would look quite different. By tracking these types of changes, the Estuary Program can better understand the variables that influence stream habitat and health in the Morro Bay watershed.



To survey a cross section, the team strings a measuring tape across the creek. A team member stands in the creek holding a stadia rod, which is like a large ruler. A second team member looks through an auto-level to read the numbers on the stadia rod. They collect these elevation measurements of the streambed at one-foot intervals, and the data is used to construct a cross-sectional view of the creek channel.

Given the magnitude of flooding this past winter, we expect to see some significant changes in this year's cross section data. Analysis of this data will shed light on how this historic winter influenced stream channels and habitat quality in the watershed.



Dense brush and vegetation can obscure the line of sight between the auto-level and stadia rod. Accurately documenting a cross section is a team effort that requires constant communication and attention to detail



The team takes turns getting their feet wet. Here's a closer look at the team member holding the stadia rod.



Mutts for the Bay

Our Mutts for the Bay program and our dedicated volunteers provide free dog waste bags via a network of 36 dispensers throughout Morro Bay and Los Osos. The program is supported by donations from individuals and local businesses, as well as a generous grant from the Harold J. Miossi Charitable Trust. Each of these dispensers is sponsored by an individual, business, or organization whose generous donation helps keep the dispensers stocked and maintained year-round.



This dispenser located at Anchor Memorial Park is one of eight dispensers currently available for sponsorship!

We currently have eight dispensers available for sponsorship!

- Two dispensers at Lila Keiser Park
- Harbor Walk (end of walk near the Rock)
- Harbor Walk at Beach Street and the Embarcadero
 - Anchor Memorial Park
 - Morro Bay City Park
 - Mariner Memorial Park
- Baywood Pier in Los Osos

You can see each of these locations on our Mutts for the Bay dispenser map, fill out a sponsor interest form, and donate to the program at MBNEP.org/Mutts-for-the-bay.

It's easy to become a sponsor! Fill out an interest form online and a member of our staff will reach out with information including which dispensers are available. We will work with you to design a custom sticker to display on the dispenser, and your donation will be acknowledged on our Mutts for the bay webpage. An annual sponsorship costs \$400, and you can easily set up recurring payments. Another way to support the Mutts for the Bay program is to donate. Contributions of any size help us conduct education and outreach on the importance of eco-friendly dog ownership in our watershed.



The 36 dispensers in our network provided over 280,000 bags in 2022! Your organization or business logo on a dispenser is a great way to show the community that you are helping keep Morro Bay's waters clean.

Blog Recap

In case you missed them the first time around, here are highlights from our most popular blogs of the past few months.



HARMFUL ALGAE BLOOMS & THEIR IMPACTS ON MARINE MAMMALS

July 21

In this blog, we share information on Harmful Algae Blooms (HABs) and their impact on wildlife, specifically marine mammals. This summer, many places in coastal California were impacted by HABs.

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WEATHERING THE STORMS: A RESTORATION UPDATE ON THE CHORRO CREEK ECOLOGICAL RESERVE

August 25

This blog shared some insights on how the Chorro Creek Ecological Reserve fared after the winter storms and some drone mapping efforts of the Reserve.

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DOG POOP BAGS: BREAKING DOWN HOW DOG WASTE BAGS BREAK DOWN

September 1

Have you ever wondered what happens to the dog waste bags you use to pick up after your dog? This blog breaks down how different kinds of waste bags break down in a landfill.

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SEPTEMBER 2023 FIELD UPDATES: MORRO BAY FISH MONITORING

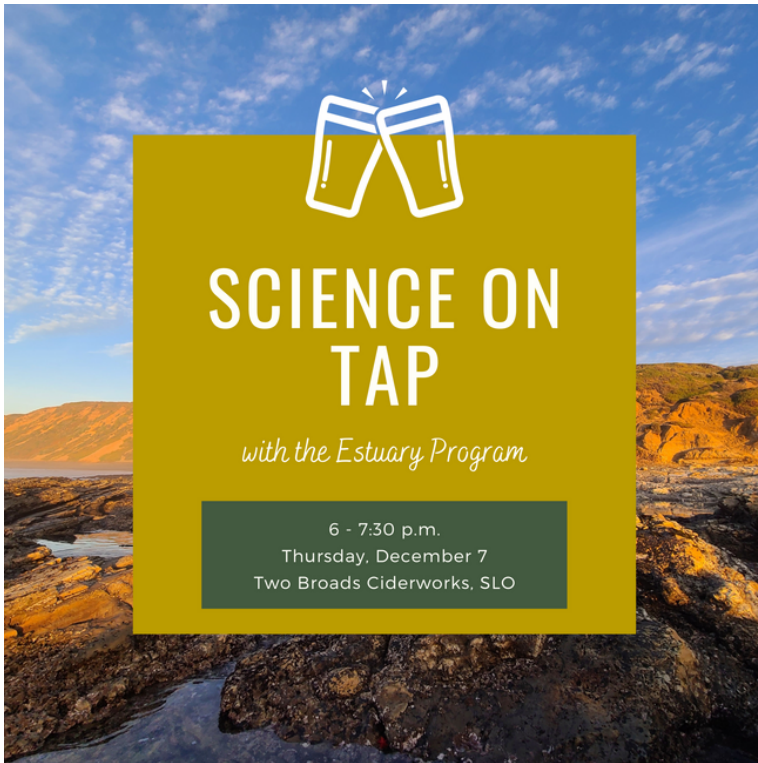
October 13

Learn about the Morro Bay estuary fish monitoring project that our staff and partners have been doing in the bay.

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Upcoming Events

Join us! Learn more at MBNEP.org/events and register for limited-capacity events at MBNEP.Eventbrite.com



Thursday, December 7

6-7:30 p.m.

Join us for our next Science on Tap event hosted at Two Broads Ciderworks in San Luis Obispo! This science talk will focus on climate change in our area and the potential impacts on the Morro Bay estuary.

Starting Giving Tuesday through the end of the year!

Help the Estuary Program through the end of the year by donating. Donations of all sizes help us to protect and restore the Morro Bay estuary and watershed.

Donations help us with our restoration projects, monitoring efforts, and providing many materials for our education and outreach efforts.

END-OF-YEAR FUNDRAISER

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