



THE TERN TIDE

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Lands Pass Program Coming Soon to the Bolsa Chica Ecological Reserve

By Kelly O'Reilly, California Department of Fish and Wildlife Land Manager

What? New Lands Pass Program and Visitor Fees at Bolsa Chica.

Why? The California Department of Fish and Wildlife (CDFW) was required to expand the Lands Pass Program by a statute that was adopted by the legislature a few years ago. New regulations pertaining to the Lands Pass Program include the following subsections of Title 14 of the California Code of Regulations:

- 550(b)(8): ““Lands Pass” is defined as a proof of payment of a fee for entry for authorized uses other than hunting that is required of visitors who are not carrying a valid hunting, fishing or trapping license on Department lands listed in subsections 551(w) and 630(c).” (Note: Section 551(w) pertains to Wildlife Areas and Section 630(c) pertains to Ecological Reserves (see below).

- 630(c): “Ecological Reserves That Require a Daily or Annual Lands Pass for Authorized Uses other than

Hunting: Pursuant to subsection 550(c) and 550.5(c) of these regulations, it shall be unlawful for a visitor to enter any ecological reserve or portion thereof listed in this section without carrying a valid Lands Pass or a valid hunting, fishing, or trapping license on their person. A Lands Pass must be purchased in advance. Information on how to purchase a Lands Pass and exceptions to this requirement are provided in subsection 550.5(c).” (Bolsa Chica Ecological Reserve is listed in this section.)

Currently, the majority of funding used to manage CDFW lands is generated from the sale of hunting and fishing licenses. Other funding sources are shrinking. The expansion of the Lands Pass Program will generate additional revenue from all types of visitors in support of the lands they appreciate.

When? On January 1, 2018, Lands Pass signs will be posted in each of the public parking lots on the Bolsa

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Amigos Environmental Club for Teens: Ready for 2017-2018

By Rachael Lloyd

Amigos de Bolsa Chica will once again be sponsoring an Environmental Club for teens that will be meeting monthly from fall 2017 through spring 2018. This group will be led by last year's Segerstrom High School teacher of the year, Mr. Thomas Pfeifer. The Amigos met Thomas Pfeifer last year when he approached us to be his environmental partner in a grant from the Picerne Foundation. In order to qualify a group of his honors students for an all-expense paid trip to a South African game preserve each student would have to donate 40 hours of work toward an Orange County environmental organization. With help from Amigos volunteers Jerry Donohue, Jeanne Lapowsky and Rachael Lloyd the group did in fact fulfill this requirement by working toward rejuvenating the native plant garden surrounding the Bolsa Chica State Beach Headquarters. The students removed dead brush, participated in building reinforcements to stabilize eroding garden slopes and a step path, and planted native plants they raised themselves. In addition to their work duties the teens enjoyed many recreational learning events such as bird identification tours through the Bolsa Chica Ecological Reserve located directly across the street from the state beach. As if working close to nature was not reward enough for the teens they also received credit toward the volunteer hours they need to graduate from high school.

The Picerne Foundation grant was only valid for one year so the opportunity to go to South Africa will not be part of this year's agenda. Yet many of the teens who participated last year have asked to continue and credit will still be given to participants who need volunteer hours for high school graduation. This year's group is open to all and promises to be just as rewarding as last

year. Any local teen, and in fact any person, young or old, is welcome to come out and share in the activities. The Environmental Club will meet one Saturday a month from 9:00 a.m. to Noon at the Bolsa Chica State Beach Headquarters Building. Parents who would like to have their teen participate can contact Amigos at (714) 840-1575 or info@amigosdebolsachica.org to sign up. Adults who want to join in can sign up the same way. The tentative schedule for the coming year:

September 16, 2017

Bolsa Chica Ecological Reserve / Beach Clean-up

October 28, 2017

Bolsa Chica Ecological Reserve tour

November 18, 2017

FLOW / Native Plants / Garden

December 16, 2017

Bird Identification Tour / Native Plants

January 20, 2018

FLOW / Native Plants / Garden

February 24, 2018

Bolsa Chica Conservancy/Land Trust/Tour or Plant Day

March 24, 2018

FLOW / Native Plants / Garden

April 21, 2018

EARTH Day Amigos De Bolsa Chica / Bolsa Chica Conservancy

May 19, 2018

FLOW / Native Plants / Garden - Last Day

First Saturday of the Month Tour:

Free tours on the first
Saturday of each month
from 9:00 a.m.
to 10:30 a.m.

Last Saturday of the Month Tour:

FREE bird talk and
nature walk at the Bolsa Chica
Ecological Reserve. Led by
Amigos docents. 9:00 am.

Free monthly tours are on a first come, first served basis. Carpooling is encouraged as parking at the Bolsa Chica Ecological Reserve is limited.

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Pacific Pickleweed and California Cordgrass: Key Plants of the Saltmarsh



By Rachael Lloyd

Lining the watery edges of the saltmarsh stand two ubiquitous plant guardians, Pacific Pickleweed and California Cordgrass. Pickleweed sends up spires of bumpy strands from its roots under water. Cordgrass often mixes its smooth rigid blades into the stands of Pickleweed. Each species sometimes stands alone and sometimes clusters together. They are joined by the fact that they each thrive in a very narrow band of habitat just offshore in the shallow intertidal areas of a salt marsh. Both are known as halophytes, plants that can process seawater and survive where few others can. Though they occur together in a common plant zone known as the salt marsh ecosystem they each employ distinct biological processes to survive in this harsh environment.

Fall in the Pickleweed Patch

I'm standing as all of us who love Bolsa Chica often do on our cherished footbridge viewing the change of seasons in a salt march. The early morning air tastes now more of winter's cold bite than the cooling caresses of summer. Each year around September after the terns have flown south with the young they raised here in Bolsa Chica a pinkish red autumnal glow spreads across our vast Pickleweed meadows. Now crimson patches create a mosaic among what would otherwise be a palette of green stems providing us with our own version of "fall color". Prior to the development of the fall color this remarkable native plant spent late summer opening miniscule white blossoms keen on the production of tiny seeds. Two hundred years ago if we were Native Americans we would gather those seeds to grind as food. Not that the Pickleweed would mind the loss of its seed.

It prefers to reproduce by sending underground roots called runners through the salty mud and popping up new green shoots in shallow waters protected from wave action.

Each of these new shoots consists of scale like leaves laid along plump, fleshy stems featuring joints called nodes. As with any living organism the structure of Pickleweed is built up cell by cell. One defining feature of a plant is the presence of a large central vacuole

inside individual cells. Vacuoles are essentially enclosed compartments which are filled with water. These vacuoles are like large storage tanks separated from other plant cells by a membrane. Different plants isolate a diversity of elements inside these cellular storage units depending on their unique biological functions. Pickleweed packs its vacuole with sodium ions, a key element in salt processed from the water in which it lives. High salt concentrations will kill cells and when sufficient cells die the whole plant will die as a result.

As fall arrives and the succulent stems of Pickleweed turn pink or red, Pickleweed will purge its water and its salt. Its flesh will shrivel, the stem ends will break off at the nodes, and the deceased tissue with its salt will



It is thought the common name Pickleweed was given for two reasons, the plants' salty taste (it is edible), and the pudgy, bumpy texture of the succulent stems. Photo by Rachael Lloyd.

be recycled into the marsh where the nutrients will be dissolved and reused. The tiny seeds will be released at the same time. And so once again the perennial Pickleweed will ready itself for a new season of growth.

California Cordgrass

Cordgrass is a tall reedy grass, usually higher than the other plants and the easiest plant to identify in the salt marsh. The rigid spires of California cordgrass

Pickleweed and Cordgrass, continued on page 6

Meet the New FLOW Program Manager

Next FLOW Training Event October 6, 1:30 pm, Bolsa Chica State Beach

By Thomas Anderson

Amigos de Bolsa Chica is excited to be able to introduce you to our new FLOW program manager, Michelle Miller. Michelle is no stranger to FLOW. During the months of December 2015 through April 2016, she learned about the FLOW program and volunteered for several Fridays, a class visit, and the Earth Day celebration. Although she currently works at Trader Joe's in Tustin, she remains passionate about marine conservation, Amigos' mission, and staying involved in environmental education.

Michelle has a Bachelor's Degree in Environmental

Studies from UCI and extensive experience as a Volunteer Coordinator and Program Assistant for the STEM education nonprofit, Science@OC. When she began at Science@OC, its volunteer program was at its beginning stages. She built its volunteer positions, policies, and program structure. She recruited volunteers for the STEMCorps and in one year more than tripled the amount of their STEMCorps members. The STEMCorps is a group of STEM professionals that regularly volunteer at various Orange County middle schools. They involve students in experiments relating to their areas of expertise. She has trained professional scientists and engineers how to be volunteers, she has collaborated with teachers, and she has kept students engaged.

In addition to volunteering with Amigos, she has also volunteered as a naturalist associate with the

Newport Bay Conservancy and most recently has been a museum docent at the Environmental Nature Center in Newport Beach. She is looking forward to continuing to build the FLOW program's relationships with science teachers, as well as meeting, training and mentoring our prized citizen scientists.



Michelle Miller, new FLOW Program Manager, is looking forward to working with Citizen Scientists and visiting classrooms while helping Amigos de Bolsa Chica achieve its mission. Photo by Thomas Anderson.

Michelle says: "People forget that wetlands help reduce the severity of storms and natural disasters. Wetlands absorb carbon dioxide and turn it into plant matter, which in turn helps us breathe! There are so many reasons why wetlands are important, but there are less than 10% of natural wetlands left in existence. That is what we are defending and what the volunteers before

us fought so hard to conserve. It is what inspires me every day and is why I want to devote my career to marine conservation. Thank you for standing with me in our mission to save and share the Bolsa Chica."

The Amigos are lucky to have found someone so enthused about our work here at Bolsa Chica.

To meet Michelle and find out more about what Amigos' growing Citizen Science movement is all about, **join us at Bolsa Chica State Beach on Friday, October 6 at 1:30 pm.** In becoming a Citizen Scientist, you will learn to identify potentially harmful plankton species; measure water quality variables such as temperature, salinity, pH and nutrients; help in teaching middle, high school and community college students about environmental

FLOW continued on next page

President's Tern

The Importance of Citizen Science

By Jerry Donohue



As autumn returns the ducks again are heading to the wetlands from their summer adventures in the north. We Amigos begin looking toward school groups coming for tours of the wetlands or FLOW. Our docent training class has begun with renewed enthusiasm. One relatively new face and a more familiar face will play significant roles on the road ahead. Michelle Miller was hired in August as FLOW Program Manager with an added emphasis on social media. Michelle comes from an association with Science OC which connects educational institutions with science related companies. Some of us got to know her as a FLOW volunteer from the previous year. We are looking to use her skills to network with a variety of organizations throughout the year. Our second individual has been with us for over six years but has recently agreed to serve on our board of directors. Joana Tavares was first hired those six years ago to create a program called "It's All Connected." Over the years that has evolved into FLOW. She is currently in the PhD program at UCI with a special emphasis on Citizen Science.

I have attended several conferences over the past two years that focus on the important role Citizen Science plays today and the even greater role it will play in the future. Government funding for scientific research, especially at the federal level is declining. Furthermore, the media wants to show balance in presenting scientific information which usually has opposing sides given equal time to present their arguments. While this may seem fair, sound bites and false equivalencies

FLOW continued from previous page

quality; and be part of a network of citizen scientists that collect data all over the state and nation. As part of California Department of Public Health's regional Marine Biotxin Monitoring Program, FLOW's water quality samples are sent each week to the CDPH laboratory for possible detection of increases in toxin-producing species before shellfish and other seafood resources are impacted. This effort allows CDPH to focus additional attention on those coastal areas experiencing an increase in toxin-producing phytoplankton or an increase in toxins in shellfish.

predominate over factual information in these abbreviated science segments.

Our FLOW program has trained community volunteers to perform certain operations from which data is collected and sent to the California Department of Public Health where state biologists determine if the public should be notified about health concerns. In the near future, a state biologist will come to visit our site and observe how we collect plankton and if changes need to be made. Citizens collect data using established protocols and state biologists decide what the data shows. On September 29, the Amigos again went to Golden West College where young students become Citizen Scientists for an evening and their parents get informal training as to how such a program could work.

Amigos is not insular in its approach to the environment. I am attending a Groundwater conference put on by the Orange County Water District. A Meet Up group that uses iNaturalist is coming to Bolsa Chica for a tour in October. Their leader is the Educational Director at the Aquarium of the Pacific. Amigos docents are going to Crystal Cove in November to view their Citizen Science programs. Amigos still maintains a vigilant attitude toward maintaining the wetlands. The search for funds for dredging of the tidal inlet is a continual challenge, and the imposition of a day use fee will confront us shortly. Joana is correct: *it's all connected*. Stay tuned.

Why Phytoplankton?

Phytoplankton form the basis of virtually all aquatic food webs on Earth; assist in regulating the climate system by accounting for half of all photosynthetic activity; and cycle elements between species in the ocean. Humans, marine mammals and seabirds depend upon a healthy food web, but can also be harmed by toxins produced by a few species of phytoplankton when they accumulate in the food chain. By shadowing Citizen Scientists, FLOW increases student's awareness of phytoplankton's importance and it allows them to examine an array of water quality related topics such as the effects of urban runoff on the watershed and the potential impacts of climate change on the marine food web. Using scientific tools and techniques to gain information, FLOW uniquely illustrates the impact human activities have upon the planet.

State Lands Pass, continued from page 1

Chica Ecological Reserve.

Who must buy and carry a Lands Pass?

All visitors except the following:

- Everyone under 16-years of age;
- School (pre-school through grade 12 and college) classes or youth groups, including accompanying adults;
- Any researcher carrying a valid Access Letter allowing them to conduct research on the reserve;
- Visitors carrying a valid California fishing or hunting license in their own name; and,
- Volunteers while they are working on the property.

How much?

- Daily Lands Pass: \$4.32
- Annual Lands Pass: \$24.33

Pickweed and Cordgrass, continued from page 3

(*Spartina foliosa*), which can reach four and one half feet in height, are nearly always submerged in water at the base. Its roots take in seawater and later the saltwater is pumped out through special pores in the leaves. The sun evaporates the water and the salt



Blades of female California Cordgrass showing the array of stigmas along the edges waiting to receive pollen. Photo by Rachael Lloyd.

crystals left behind are sometimes visible on the grass blades. The rise and fall of the tides works with winter rains to clean away the salt crystals.

California cordgrass reproduces sexually and asexually

How to purchase a Lands Pass?

- On-line at www.wildlife.ca.gov/licensing/Lands-Pass
- By phone at (800) 565-1458 or
- In-person at CDFW license counters (see locations at www.wildlife.ca.gov/licensing; >Find a CDFW Sales Office)

The nearest license counter to the Bolsa Chica Ecological Reserve is the Los Alamitos Field Office, located at 4665 Lampson Avenue, Suite C, Los Alamitos, CA 90720. The license counter is open Monday through Friday from 8:00am to 11:30am and 12:30pm to 4:30pm. The phone number is (562) 342-7100. For more information about the Lands Pass Program, please go to www.wildlife.ca.gov/licensing/

with asexual reproduction being the most successful for this species. Asexual propagation occurs year-round as new blades are fabricated through an extensive root system buried under the salt marsh mud. In addition, California Cordgrass flowers from June through September. Male flowers produce a small quantity of pollen. The pollen is distributed by wind or water to meet up with the tiny stigmas lining the edges of female plant blades. The resulting seeds drop into seawater and much of it is lost. When cordgrass dies back at the end of the summer nutrients dissolved from dead leaves enrich marsh waters for the use of many microorganisms.

The coastal wetland habitats cordgrass depends on for survival have been largely filled in for urban use or transformed through dredging into marinas. So while its habitat areas have been severely reduced, California Cordgrass nearly always occurs in any remaining habitat. Its range extends along the California coast to Baja California, Mexico, and southeastern United States. These plants are an important habitat for year round saltmarsh resident the endangered Light-footed Ridgeway's Rail, (*Rallus obsoletus levipes*), which lives its entire life and builds its nest within cordgrass forests. Cordgrass blades provide food for another avian saltmarsh visitor, the Canada goose, *Branta canadensis*.

2017 California Coastal Cleanup Snapshots

September 16, 2017: Amigos de Bolsa Chica welcomed 66 volunteers to the annual, statewide event; 33 children and 33 adults collected 194 lbs of trash. Four people brought their own supplies. Amigos de Bolsa Chica used yellow buckets to collect trash, therefore no plastic bags were used in the collection. Photos by Jennifer Robins and Michelle Miller.



2017 Western Snowy Plover and California Least Tern Breeding Season Results

By Kelly O'Reilly, California Department of Fish and Wildlife Land Manager

Plovers:

The first plover nest was established on 12 March and the last chicks fledged on 7 September. A total of 127 nests were established during 2017; the highest on record at Bolsa Chica. A total of 340 chicks hatched and 152 of them fledged. This is the highest fledgling count on record for Bolsa Chica.

Terns:

	Nest Site 1	Nest Site 2	Nest Site 3	South Tern Island	Cell 10	TOTALS
Start Date	9-May-17	11-May-17	11-May-17	9-May-17	8-May-17	
End Date	10-Jul-17	27-Jun-17	27-Jun-17	23-May-17	25-Jun-17	
Nests	28	104	36	5	4	177
Eggs	41	173	66	0	6	286
Chicks	17	123	25	0	5	170
Fledglings	5	1	0	0	0	6



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AMIGOS DE BOLSA CHICA MEMBERSHIP APPLICATION

I support the specific and primary purpose of Amigos de Bolsa Chica, which is to advocate the preservation, restoration and maintenance of the Bolsa Chica, to encourage the public acquisition of all the wetlands and sufficient surrounding open space to create a viable ecosystem, and to provide education about the importance of wetlands.

ANNUAL DUES

- \$ 10 Student
- \$ 25 Individual
- \$ 40 Family
- \$100 Sustaining
- \$1000 Life Member

Name: _____

Address: _____

City: _____ State: ____ Zip: _____

Email: _____

Phone: _____

Additional Contribution:

\$ _____ Fund operational expenses \$ _____ Fund education projects \$ _____ Total enclosed

Please check if you are interested in volunteering for:

Education outreach __ Grantwriting __ Social media __ Wetlands cleanup __ Leading tours __ Fundraising __

All contributions to Amigos de Bolsa Chica are tax-deductible as allowed by law under IRS Code Section 501(c)3.
No goods or services were provided in consideration of this gift.

Return application to: Amigos de Bolsa Chica, P.O. Box 1563, Huntington Beach, CA 92647