

# TRACKS

A Publication of the Newport Bay Naturalists & Friends

March-May  
2009

## Who's Cleaning the Bay?

The answer may surprise you! But if you have attended our Marine Life Inventories and participated in analyzing the mud samples, you probably have some clues. The bottom of the Bay supports huge populations of numerous kinds of invertebrates, most of which live by filter feeding. The most abundant are various types of bivalve mollusks (clams, mussels and oysters) and polychaete worms. They filter out and consume huge amounts of phytoplankton, as well as bacteria and other particles, thereby making an enormous contribution to maintaining water quality. There are also sponges, anemones, sea squirts, and many kinds of crustaceans, many of which also live by filter feeding and so help to maintain the bay's water quality.

The mussel has a wide incurrent siphon (on the left of this image) and a smaller, oval excurrent siphon (in the center).



There are two kinds of filter feeders, which I will call internal and external filter feeders.

Internal filter feeders have a basket-like filter inside a body cavity which opens to the outside through two siphons. They bring in water through one opening (the "incurrent siphon"), pump it through the filter to remove microscopic food particles, and discharge it through another opening (the "excurrent siphon"). The food particles are moved from the filter itself to the animal's mouth by specialized cell processes called cilia.

Mussels are among the most important of the internal filter feeders. Their shells close up when they are left dry by the tide, but when submerged they spread apart the two halves of the shell (the two "valves" in the bivalve) to reveal a wide incurrent siphon surrounded by pink tentacles that prevent the entry of items that are too large. Inside the shell, the gills do the job of filtering out food particles, and then the water is discharged through a smaller, oval, excurrent siphon. The water is moved through the animal by a poorly understood "bivalve pump" with the pumping force generated by bands of lateral cilia that run along the sides of the gill filaments. The food is wiped off the gills by a pair of appendages called palps, and is then transferred to the mouth deep inside the shell. Similar arrangements can be seen in the oysters and

scallops. Studies have shown that an individual mussel or oyster can filter over a gallon of water per hour.

In many other bivalves, especially the burrowing ones including all the clams, both siphons are simple tubes, and in some cases they are much longer than the rest of the animal. This allows the animal to live in safety deep in the mud while the siphons emerge above the surface (although those siphons are often nibbled by hungry fish and other carnivores!). Bivalves feed on plankton, as well as benthic algae and detritus, and in turn they provide food for echinoderms, fish, birds and other animals.

Other filter feeders use an external filter. This strategy is used by all the barnacles, both acorn and goose, as well as several kinds of polychaete worms. Barnacles are actually greatly modified crustaceans, in effect standing on their heads and using their legs for filtering. But instead of pumping water over the filter, these animals use a grasping motion, rhythmically extending their feet upwards into the water, and then quickly bringing them back inside the shell along with any captured food.

A similar external but retractable filter is used in the tube-dwelling polychaete worms, often called "feather dusters". Some of these live in tubes made of mucus and sand; others make a harder, calcified tube. They are able to retract and close a door (operculum) when threatened by low tide or predation.

A unique type of filter feeding has evolved in a species called the Fat Innkeeper Worm. This animal constructs and lives in a U-shaped burrow, and it secretes a net of slime that filters out food as the worm pumps water through the tube. When the net is fully loaded with food, the worm swallows the food along with the net, and then makes a new net. The burrow of the Fat Innkeeper Worm makes an excellent home for a variety of commensal animals, including a small fish called a goby, a pea crab, a clam and a scale worm, all of which feed on the Innkeeper's leftovers. The regular presence of these guests is what gives the animal its name!

Some of our filter feeders are colonial, and the individual members of a colony often make amazingly regular patterns. In the bryozoans (also called ectoprocts or moss animals), the individuals (called zooids) are microscopic and in perfectly regular arrays. One of these colonial animals is responsible for the gray patches you often (continued on page 2)

- NBNF Mission:**
- ¥ To *preserve* and *restore* the ecosystems of Upper Newport Bay.
  - ¥ To *educate* the public about the ecological value of the Bay and its watershed and help ensure compatible public use.

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# Thanks to our wonderful volunteers!

Congratulations to all our active volunteers. With the hours you have so far submitted for 2008 we are now above a cumulative total of over 100,000 documented hours of volunteer time!

## Active Naturalists with over 1,000 hours of documented volunteer service through 12/31/08

Connie Bean	Erik Katzmaier	Amy Litton	Dick Newell	Peter Ridley
Dennis Baker	Jack Keating	Roger Mallett	Bob Oberlin	Vikki Swanson
Donna Carroll	Marilyn Labollita	Rita McCoy	Arline Parker	Jean Whitaker
Giovanni Cirocco	Sue Lau	Don Millar	Rita Phillips	Ray Williams
Betsy Flynn				

## Active Naturalists with between 100 and 1,000 hours of documented volunteer service through 12/31/08

Stan Ashbaugh	Evalie DuMars	Joan Kempik	Dennis Litton	Paul Scionti
Penne Atcha	Lois Edmonson	Russ Kerr	Sheri Long	Shafi Siddiqi
Leigh Baker	Molly Fawcett	Lori Kiesser	Sylvia Marson	Birgitta Skoldquist
Alex Balaz	Rosemary Flynn	Joan Kitchens	Peggy Maradudin	Bert Smith
Linda Barker	Marilyn Frenz	Lane Koluvek	Monica Mehta	Bob Smith
Sherry Bass	Holly Fuhrer	Linda Koluvek	Peg Montgomery	Merwyn Smith
Janice Bernabucci	Peter Fuhrer	Dick Kust	Tom Mooers	Pat Spooner
Cathey Bertot	Chuck Gilbert	Norman	Barry Nerhus	Joan Steiner
Judy Booth	Shirley Greene	Lacourciere	Chuck Nichols	Iris Timmons
Connie Calvert	Sheila Griffin	Dean Lambert	Donna Nichols	Mary Thornton
Lane Calvert	John Harris	Mark Lambert	Ruth Orem	Uyen Tran
Carolyn Clark	Irwin Haydock	Linette Lina	Christy Porter	Gale Whitaker
Jim Cokas	Lucille Hill	Andrea Lingle	Roger Reinke	Ken Yamagata
Francis Cork	Margit Ischovitsch	Bryan Litton		

## Active Naturalists with less than 100 hours of documented volunteer service through 12/31/08

Jim Andre	Frank Feller	Jerold Kappel	Patrick McCaffrey	Wesley Siufanua
Rand Albers	Shirley Feller	Susen Kay	Allison Meyer	Jeff Story
Blake Anderson	Susan Fisher	Marie Kontos	Jim Morrison	Nikki Tachiki
LuAnn Baker	Walt Fisher	Wendy Jung	Tara Nathan	Tani Trost
Niki Breznock	Red Fraser	Eddie Kaye	Niki Patterson	Angie Vazarian
Peter Bryant	Shari Fraser	Susan Kramer	Marjorie Page	Frederick Welch
Jack Cannon	Greg Griffin	Dean Lambert	Cheryl Powers	Joyce Woods
Howard Cork	Lynn Hayes	Marianne	Jessica Pratt	Lucinda Wright
Sharon DePriester	Virginia Hayter	Martineau	Win Rhodes	Matt Yurko
Susan Donovan	Spencer Jackson	Larry McKenney	Sue Sieveke	

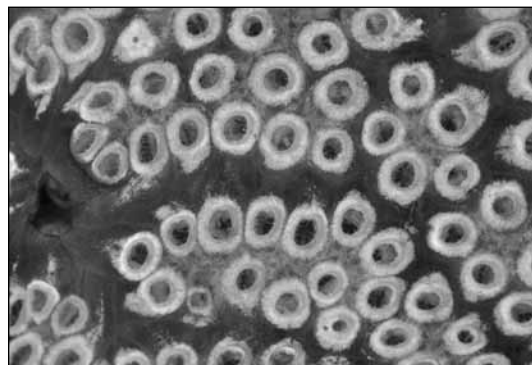
*A special thanks too to the following people not listed above who graciously donated time to conduct training classes and give continuing education presentations this past year:*

Diane Bridgford-Nielen, Phil Hughes, Warren Inouye, Jack Skinner, Katherine Suding, Stacy Thompson, Joel Weintraub, Janet Yamaguchi, Dick Zembal.



(Above) The goose barnacle rhythmically extends its feet upwards into the water, and then quickly brings them back inside its shell along with any captured food.

(Below) Each member of the colony in this colonial tunicate has its own incurrent siphon (the white rings) but a group of individuals shares an excurrent siphon (small hole far left).



## Who's Cleaning the Bay? (continued)

see on seaweeds washed up on the beach, but other bryozoans form patches on mussels, sea squirts and other solid surfaces. Each zooid has a ring of tentacles that are withdrawn into a box-shaped skeleton when the colony is taken from the water; but when the zooid is submerged the tentacles are extended to trap food particles and pass them into the central mouth. Some sea squirts (tunicates) are also colonial, but they take the colonial philosophy one step further: they have individual incurrent siphons, but a group of animals shares a single excurrent siphon.

Like many other bays and estuaries, Upper Newport Bay is affected by a condition called *eutrophication*. This refers to a process where the bay receives excess chemical nutrients (nitrates and phosphates, usually from fertilizer runoff) that fertilize the growth of excess phytoplankton. The phytoplankton eventually sinks to the bottom and provides fuel for bacterial decomposition, leading to anoxic conditions in bottom waters.

Since filter feeders consume phytoplankton, they play an enormously important role in limiting eutrophication and maintaining water quality.

Water clarity is attractive, of course, but we need to remember that when water is completely clear it may not be providing a healthy and appropriate level of phytoplankton to support the filter feeders. The long-term ecological health of Newport Bay and every other estuary will depend critically on the survival of active populations of benthic filter feeders, especially bivalves, as well as appropriate levels of phytoplankton. The filter feeders are also a major food source for many kinds of fish and birds, so they are critically important for the bay's functions as a nursery for fish and as a feeding station for huge numbers of migratory birds.

Peter Bryant, Board Member  
Newport Bay Naturalists and Friends

Learn more! Look up the Intertidal Life of Orange County, California at  
<http://nathistoc.bio.uci.edu/Intertidal.htm>



# Upper Newport Bay Calendar of Events

March–May 2009

## Kayak Tours—Every Saturday, 10:00 a.m.–noon at the Dunes

Join a trained naturalist for a guided kayak tour of the Back Bay. Meet at the Newport Dunes Resort. \$20/person, 8 & up. \$10/NBNF members. Be prepared to get wet. Reservations (949) 923-2269. Location code: NDR

## Kayak Tours—Every Sunday, 10:00 a.m.–noon at the NAC

Join a trained naturalist for a guided kayak tour of the Back Bay. Meet at the Newport Aquatic Center. \$20/person, 8 and up. \$10/NBNF members. Be prepared to get wet. Reservations (949) 923-2269. Location code: NAC

## Voyage to Shellmaker Island—Saturday, May 2, 1:00–4:00 p.m.

Join a trained Naturalist for a voyage on a 25-passenger pontoon boat from the Newport Sea Base to the Back Bay Science Center on Shellmaker Island and into the Ecological Reserve. \$25/person. Parents accompanied by children 7 and up. Reservations required. Call (949) 642-5031. Location code: Sea Base

## Twilight Canoe Tour & BBQ—Saturday, May 30, 4:00–7:00 p.m.

Join a trained Naturalist for a guided canoe tour of the Back Bay, then enjoy a barbeque on the shore courtesy of the Newport Sea Base. \$30/person. Reservations required. Call (949) 642-5031. Location code: NAC

## Walking Tour—Saturday, Mar. 7, Apr. 4, May 2, 9:00 a.m.

Join a trained Naturalist for a 2 hour walk along the Bay. Bring binoculars and sun protection. Free. No reservations needed. For information call (949) 923-2269. Location code: BBSC

## Friends of Newport Bay Walking Tour—Saturday, Mar. 14, 9:00, 9:15, 9:30, 10:00, 10:15 a.m.

Walk along the Back Bay listening to Naturalists and visiting Interpretive Stations featuring natural history specialists. Free. No reservations required. For information call (949) 923-2269. Location code: VP

## Big Canyon Walking Tour—Saturday, Mar. 21, Apr. 18, May 16, 9:00 a.m.

Join a trained Naturalist for a 2 hour walk along Big Canyon Trail and the bay. Bring binoculars and sun protection. Free. No reservations needed. For information call (949) 923-2269. Location code: Big Canyon parking lot.

## Sunset Stroll—Saturday, Mar. 21 (6:30 p.m.), Apr. 11 (7:00 p.m.), May 23 (7:30 p.m.)

Join park staff for a 90-minute twilight nature walk and discover the wonders that nighttime brings to our nature preserve. Then, create your own nocturnal critter to take home! May be re-scheduled due to weather. Dress warmly for the evening chill. All ages. \$3/person. Pre-registration required. (949) 923-2275 or email unbic@ocparks.com. Location code: IC

## Shellmaker Discovery Tour—Saturday, Mar. 28, Apr. 25, May 23, 9:00–10:30 a.m.

Join a Naturalist to learn about Shellmaker Island's rich history; the future of the Back Bay Science Center; and discover unusual and endangered plants, birds and crab habitats. No reservations required. No latecomers. Free. For information call (949) 640-9956. Location code: BBSC

## Steward Days—Every Wednesday, 9:00–11:00 a.m.

Support the Bay's unique genetics at our restoration sites by collecting seeds & propagating plants. Learn how to grow natives in your backyard, attract wildlife and conserve water. For information call (949) 640-0286. Location code: BBSC

## ROOTS Restoration Teamwork—Saturday, Mar. 28, Apr. 25, May 23, 9:00 a.m.–noon

Help restore Back Bay habitat by installing and maintaining native plants while learning about wetland ecology. Reservations required. Refreshments, tools provided. Call (949) 640-0286 for information, reservations and location.

## 2nd Sundays Restoration Program—Mar. 8, Apr. 5, May 17, 9:00 a.m.–noon

Join the staff at the IC to enhance the Nature Preserve habitat with non-native plant removal, native plantings and Butterfly Garden maintenance. Note April/May dates. Pre-registration required. (949) 923-2295. Location code: IC

## Marine Life Inventory—Saturday, Mar. 28, Apr. 25, May 23 Fully booked

Marine biology students ages 8 and up are invited to participate in a variety of hands-on marine life monitoring programs in Newport Bay with the Dept. of Fish and Game. Children under 18 must be accompanied by an adult. Free. Reservations (949) 640-9956. Location code: BBSC

## Scout Programs—Tuesday through Saturday upon request

Join a Naturalist for a 2-hour Brownie or Junior Girl Scout Try-it or badge program, or a Tiger cub, Bear Cub or Webelo badge program. \$7/child including patch. Call (949) 923-2269 or email scoutssi@sbcglobal.net. Location code: IC or BBSC.

## Train for a Day, Volunteer at the Bay!—Saturday, Mar. 21, May 9 9:00 a.m.–3:00 p.m.

Become a part of this dynamic estuary! Learn about the habitats and wildlife of the bay. Participate in habitat restoration and special events. Assist with tours. Greet and educate visitors. Registration (949) 923-2296. Location code: IC

**For all of the following, call (949) 923-2275 to register or email unbic@ocparks.com. \$5 per child. (Conservation Club free)  
Location code: IC**

### Tidelands Tots (Ages 2–5)

10:30–11:15 a.m. for ages 2–5 years. Join staff for a fun-filled parent and child experience that may include arts and crafts, story telling, hands-on activities or outdoor nature walks. Come prepared for an exciting outdoor experience!

“Nature’s Calendar”—Wednesday, Mar. 11

“Blossom Bounty”—Wednesday, Mar. 18

“Hoppin’ Down the Nature Trail”—Wednesday, Apr. 8

“Fluttering Fun”—Wednesday, May 13

“Mud Grub”—Wednesday, May 20

### Wild! Tales (Ages 2–7)

10:30–11:15 a.m. Visit with staff for story-telling fun! After a story, learn more about the natural history of the Bay through crafts, hands-on activities and nature walks. Come prepared for an exciting outdoor experience!

“Where Butterflies Grow”—Tuesday, Mar. 17

“An Egg is Quiet”—Tuesday, Apr. 7

“Is Your Mama a Llama?”—Tuesday, May 12

### Bayside Buddies (Ages 5–8)

3:30–4:30 p.m. Calling all junior naturalists! Discover our amazing natural world at the Bay through hands-on activities, crafts and nature walks. Come prepared for an exciting outdoor experience!

“Enter the Tidal Zone”—Tuesday, Mar. 10

“Ring in Spring”—Tuesday, Mar. 24

“Tracking Trivia”—Tuesday, Apr. 14

“The Trick of Being Metamorphic”—Tuesday, Apr. 21

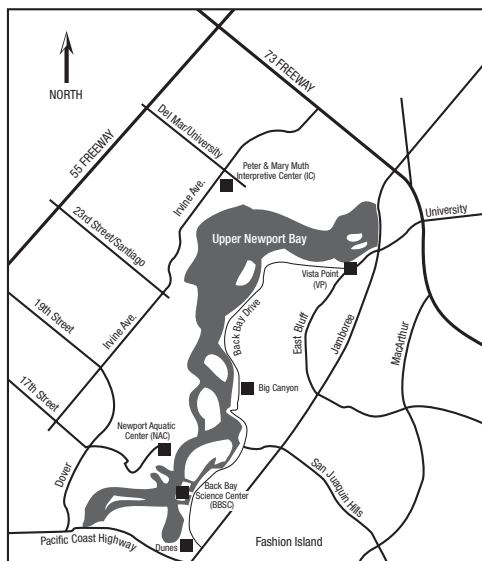
“Help the Kelp!”—Tuesday, May 12

“The Science of Smell”—Tuesday, May 19

### Conservation Club (Ages 3–12)

3:30–4:30 p.m. Ready to dig in and get dirty? Come work with staff to establish healthy habitat for Bay wildlife. Learn the importance of native plants as we clear and protect our own special plot of land. Activities may include weeding, watering, planting and debris clearing. Adult guardian required with participants. Older students welcome also. Free.

Tuesday afternoon—Mar. 31, Apr. 28, May 26



**WEB SITES**

Newport Bay Naturalists & Friends: [www.newportbay.org](http://www.newportbay.org)  
 Peter & Mary Muth Interpretive Center: [www.ocparks.com/unbic](http://www.ocparks.com/unbic)  
 Back Bay Science Center: [www.backbaysciencecenter.org](http://www.backbaysciencecenter.org)  
 California Coastal Commission: [www.coastal.ca.gov](http://www.coastal.ca.gov)

**LOCATION KEY**

Peter and Mary Muth Interpretive Center (IC) 2301 University Drive Newport Beach, CA 92660	Back Bay Science Center (BBSC) 600 Shellmaker Newport Beach, CA 92660	Newport Aquatic Center (NAC) 1 Whitecliff's Drive Newport Beach, CA 92660
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**TRACKS CREDITS**

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Join us for these exciting events, coming this Spring!

**Upper Newport Bay Earth Day**

*Learning from Nature*



**Free admission and activities!**

**When:** Sunday, April 26, 10:00 am to 4:00 pm

**Where:** Peter and Mary Muth Interpretive Center  
 2301 University Drive (at Irvine Ave.)

Scavenger hunt, interpretive programs, live sharks and rays, science discovery and craft booths, environmental exhibits, Newport Beach Film Festival films and much more.  
 Refreshments available.

**Upper Newport Bay Estuary Awareness Day**

*Connecting You to the Ocean*

**When:** Saturday, May 30, 10:00 am to 4:00 pm

**Where:** Back Bay Science Center  
 600 Shellmaker Rd. (at Back Bay Drive)

Boat tours of Back Bay, interactive educational activities, touch tanks, aquarium exhibits and much more.



**Free admission and activities!**