

# The Lake Merritt Institute

A COMMUNITY BASED, NON-PROFIT CORPORATION

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**Drones, Robotic Rovers and Citizen Scientists Join Forces to Sample Lake Merritt:** Although scattered water quality information and limited data on what lives in our lagoon does exist in the files, the only on-going (since 1997) monitoring of such things is done by the Oakland High School Environmental Academy which meets here weekly. That changed on February 23<sup>rd</sup> when 97 people showed up for the first Lake Merritt bioblitz, a highly organized effort to identify the things that live, breed and die in the waters and parkland of Lakeside Park. Using high tech drones, underwater cameras and old fashioned buckets, the group compiled the first complete list of Lake Merritt species since soon-to-be famous Jim Carlton cataloged marine life here in 1966 (at least it is the only such list that I know of, exceptions being bird counts of course). Although conducted in early spring before warmer water species enter the Lake, it was highly successful. A list of species identified can be found at:

<https://docs.google.com/spreadsheets/d/1D6vIayNDZ8nrgTHh5KcyxSVzxxv28vVbqTX0ZO4hUWzs/edit?usp=sharing>

Included were: 67 species of birds, which can be seen at: <http://bit.ly/1hr9zjU> (note - these may take a short while to load onto your computer). Also seen were: 4 species of reptiles and amphibians <http://bit.ly/1hrcjhc>, 17 species of insects: <http://bit.ly/1hr9Ljh> 89 species of plants <http://bit.ly/1lmTHTm> 7 species of crustaceans (crabs, shrimp and such critters) <http://bit.ly/1hjACow> 3 species of polychaete (multi-limbed) worms <http://bit.ly/1mErup9> 12 species of mollusks (clams, mussels and the like) <http://bit.ly/1eyDHVS> 3 species of sea squirts (primitive things with structures resembling a backbone) <http://bit.ly/1hVlhWl> and 1 specie each of sponges, bryozoans (colonial animals that look like plants) and cnidarians (jellyfish, comb jellies). Hey, where are the fish?

So successful was the bioblitz that it was written up in Scientific American in the February 27 issue: <http://www.scientificamerican.com/article/drones-robotic-rovers-and-citizen-scientists-join-forces-to-sample-a-lakee28099s-biodiversity/>



An oriental shrimp  
*Observer: sea-kangaroo*

A polychaete worm  
*Photo by Damon Tighe  
(some rights reserved)*



What does it mean? It means that, despite all the urban runoff pollution, tidal restrictions, low oxygen, limited marshland and everything else that civilization has thrown at it, Merritt's lagoon is still home to a thriving assemblage of life. We have been given a treasure; let's learn all we can about it so we can take

better care of it.

What's next? Hopefully the organizers can compare this new list to what Jim Carlton found here almost 50 years ago to see what we might have lost, what new species have shown up, and what is non-native. It would also be useful to be able to equip the drone and ROV with oxygen sampling equipment so that they could further elucidate this on-going problem which limits what can live here and when. Also, why not build on this early spring event by repeating it in late August when different species are likely to be here?

A hearty thanks to the individuals and organizations that made this possible, including Wild Oakland, the Oakland High Environmental Academy, Laney College, the Rotary Nature Center, iNaturalist, the California Academy of Sciences, Nerds for Nature, OpenROV and the Oakland Museum of California.

**MORE BAD PLASTICS:** Tiny, perfectly round beads of plastic are being found in water quality samples, including one from Lake Erie, as shown here, and their size might hold a clue about the source of particles. “The cosmetics industry uses plastic micro-beads in soaps, toothpaste and other products. Because the products are not designed for ingestion, they don’t have to test for this. It’s completely unregulated and may be a significant source of micro-plastics finding their way into the environment.”

This and other interesting articles can be found at National Geographic’s “News Watch” – Lisa Borre’s blog. Go to: <http://newswatch.nationalgeographic.com/author/lborre/>



**REMEMBER:** For timely details on what is happening at Lake Merritt, go to: [www.lakemerritt.org](http://www.lakemerritt.org)

**BIRD COLUMN** – Short Showery Run Through Lake Merritt:

Fourth Wednesday in March made February's walk look like a dry stroll, so we skipped the park side of Bellevue and the garden entirely -- the birds that live in the trees, unlike the ones on the lake and the single intrepid birder who joined the walk, mostly have the sense to stay out of the pouring rain. We did see a big flock of Cedar Waxwings (the masked and crested fruit bandits) in one of the tall sycamores by the lake, though, and were treated to the once-in-my-lifetime sight of a California Towhee (or a brown bird of similar size and shape) plunging upward on the tail of a Rock Pigeon (your basic park pigeon) with what certainly looked like intent to close the last few inches between them and start pulling pieces off the pigeon. The pair disappeared behind a tree before the conclusion, leaving a strong sense of What Was That All About?! floating in the air....

On the lake, some of the Ruddy Ducks were ruddy enough to glow through the curtain of falling water (males in breeding plumage are utterly unmistakable, with backs the color of auburn human hair, black heads, white cheeks, and bright blue bills), and the Eared Grebes were donning their party clothes of steel and copper, with bright gold fans around their ruby eyes. The black-and-white Bufflehead drakes were doing weird head dances to attract their brown female companions. The rusty-headed Canvasbacks were all gone, but one female Common Goldeneye hadn't gotten the departure order. The Tufted Duck was still in attendance, swimming down about three-quarters of the way from the nature center to the El Embarcadero fountain.

Black-crowned Night-Herons were fishing and strolling in normal numbers, and the American Coots were thick on the ground and water -- enough to make up a substantial share of the lake's biomass. The trees were

full of Double-crested Cormorant nests, and many of the residents were ignoring the rain and fishing in flotillas, somewhat surprisingly, given the lack of sun to dry their feathers. (Or perhaps they knew the sun would be blazing by noon; we certainly didn't when we packed it in around 10:45.)

Otherwise, counts of other species continued low, as reported for the past few months. Whatever it is that's changed for the lake, I wish it would change back -- but it was still, rain and all, a good day at Lake Merritt, where, when all's said and done, every day is a good day.

**PSSST – WANT SOME GREAT LAKE ART?** Art.com brings you a selections from the “Lake Art Gallery” a collection of drawings and photographs available at reasonable prices.



This and other lake art available is from: <http://www.worldlakes.org/lakeart.asp>

**CLIMATE CORNER - Ocean Acidification, Climate Change's Equally Evil Twin:** Elizabeth Kolbert (who writes for the New Yorker magazine) has written a new book entitled *The Sixth Extinction*. In it she describes five, major, ancient extinction events such as the one that destroyed the dinosaurs and the one that eliminated most ocean life and led to the age of fishes. Some of the conditions that preceded these periods of time (they mark the boundaries of epochs, periods and eras) when much of life on Earth died off, do not apply to our time. For example, between the Ordovician (which ended 444 million years ago) and Silurian periods, the continents were one land mass (Gondwana). Ocean currents and wind patterns (and thus climate) were obviously very different from those of today.

However, one condition does show up as part of several mass extinction events, and that is ocean acidification. Why would this be so? Well as stated in the book, when the acid (pH) level of the ocean changes, it affects such basic processes as metabolism, enzyme activity and protein function. It will change the makeup of microbial communities and alter the availability of key nutrients, like iron and nitrogen. It will also alter photosynthesis and can alter the compounds formed by dissolved metals, in some ways that could be poisonous. In short, acidification impacts the fundamental processes of life.

It thus very frightening (or at least should be if you understand what is at risk) to realize that because of all the carbon dioxide mankind has put into the atmosphere, much of which enters the seas, the oceans are now thirty percent more acidic than they were in 1800. Under the business-as-usual scenario (which we are now exceeding in terms of greenhouse gas output) surface oceans in 2100 will be at pH 7.8 (150% more acidic than at the start of the industrial revolution).

What does this mean for our lifetimes and those of our children and grandchildren? Studies of places where oceans are more acid (such as where carbon dioxide naturally bubbles up and in laboratory tests) have found that an ocean pH of 7.8 is a tipping point where the ecosystem starts to crash. Whole food chains are at risk. Consider what Kolbert found out when she interviewed scientists studying coral reefs. They said things like:

- “It is likely that reefs will be the first major ecosystem in the modern era to become ecologically extinct.”
- Some give reefs until the end of the century, others less time even than that.
- “If the current trends continue, then by around 2050 visitors to the Great Barrier Reef will arrive to find rapidly eroding rubble banks.”
- “A recent study by a team of Australian researchers found that coral cover in the Great Barrier Reef has declined by fifty percent just in the last thirty years.”
- “...coral cover in the Caribbean has in recent decades declined by close to eighty percent.”

Considering that ocean acidification has been involved in mass extinctions of life in the past, and that it is happening now with unprecedented rapidity (like running geological history at warp speed) it seems obvious that we are fooling around with creating another, human caused, mass extinction. In a special issue of the journal *Oceanography* devoted to acidification, Lee Krump and Andy Ridgwell said that continuing down this path much longer:

“is likely to leave a legacy ... as one of the most notable, if not cataclysmic events in the history of our planet.”

Much of the text above can be found at: *The Sixth Extinction*. Elizabeth Kolbert. 2014. H. Holt & Company.

**ASH TRAY PROJECT** – The first outdoor ash trays have been installed in Lakeside Park. Congratulations to Parks & Recreation Director Audree V. Jones-Taylor and to Rebecca Tuden, Office of Public Works, for recognizing a problem, having the courage and fortitude to do something about, and getting it done. Thanks also to city staff for a great job on the installation. Monitoring of their use will continue for two more months.



## RECENT SCENES FROM THE LAKE



*Found on March 10<sup>th</sup> at the Merritt Boulevard beach, this dead striped bass was about 40 inches long. Like others this size we have found at this location, it probably grew too large to exit the Lake through trash rack bars (which have a maximum opening of 7.5 inches) at the flood control station. It likely succumbed to low oxygen during tide gate closure for flood control during February rains, which cause the Lake to stratify into top and bottom layers.*

*Photo by Lee Aurich*

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