

The Lake Merritt Institute

LAKE TRASH REMOVAL, FOUNTAINS, EDUCATION, LAKE MANAGEMENT EXPERTISE

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VOLUME X

"TIDINGS" - FEBRUARY, 2005

ISSUE II

COVEL FAMILY STILL TEACHING ABOUT NATURAL SCIENCE: If you go down to the Monterey Bay Aquarium, say hello to James Covell. Son of Paul Covell (the legendary naturalist at Lake Merritt for many years) James is following in his father's footsteps as Interpreter Programs Manager for the Aquarium. He joins Jim Carlton (now teaching at Mystic College) on the list of national experts who grew up studying our downtown estuary.

Who knows how many other folks who started at Lake Merritt are now working as a professional in this field? If you are aware of anyone who was inspired by our Lake and is now making a living because of it, let the Institute know. Perhaps we can start an alumni association.



WIREEED FOUND IN DEEP WATER: A quick search in deeper areas of the Lake revealed that wireweed (see last month's newsletter for details) is growing in at least two locations in water 8 – 9 feet deep. Although January's runoff dropped Lake salinity as low as four parts per thousand for several days and most of the wireweed in shallow water looked dead, there were also several healthy plants remaining in the shallows.



A dried specimen of Wireweed from Lake Merritt. Although only about ten inches are shown here, the plant is capable of reaching 6.5 feet in length.

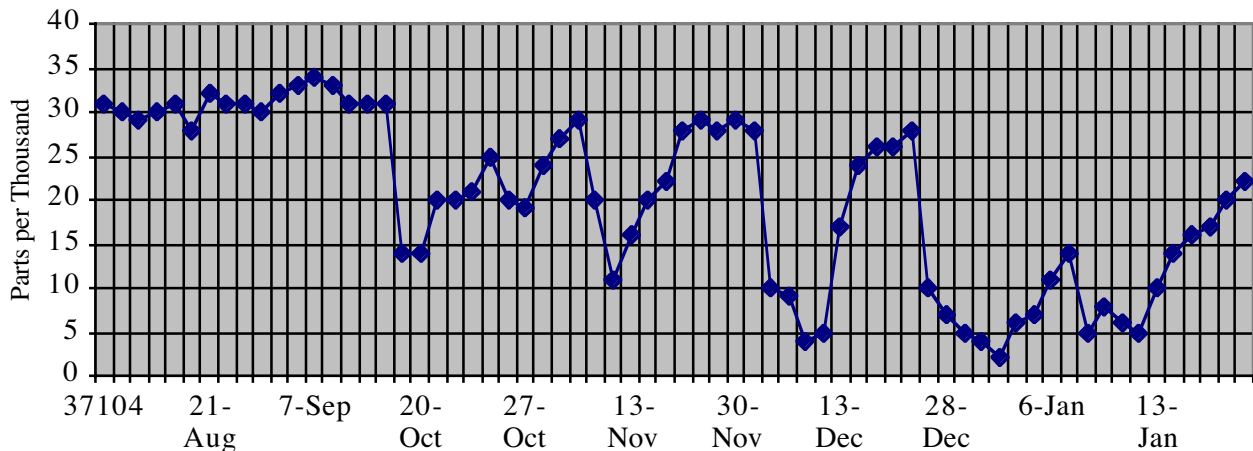
We have been assisted in our investigation of this alien invader by Lynda Goff, a Professor of Marine Biology at UC Santa Cruz, but now living near the Lake. As past president of both the US and International Algal Scientific Societies, she has done a considerable amount of research on introduced weedy species. Lynda informs us that there have been many reports of it in San Francisco Bay, including Alameda. She writes it "is a terrible nuisance weed throughout the Scandinavian countries and in the British Isles – where local committees of volunteers from fishing villages throughout Ireland, Scotland, Wales and England, scour the inter-tidal regions and physically remove these pests..." "It is considered a nuisance because it grows so quickly that it effectively out-competes many good native species including other brown algal – kelps and sea-grasses. Both of these

are very important forming habitats for fish fingerlings, mature fish and invertebrates. It out competes other desirable plants by shading them and by taking up nutrients other species require.”

As day length and temperature increase, we may expect to see more (perhaps a lot more) of this plant. Finding it at the bottom of offshore areas indicates that it has the potential to grow over most of the Lake, but this remains to be seen. It is also possible that it may use nutrients typically taken up by plankton, resulting in clearer water. This usually occurs in May and June when widgeon grass takes over the Lake bottom. Casual observations indicate less murky water this winter, but no definitive observations are being evaluated.

HOW SALTY IS LAKE MERRITT? As shown in the graph below, our Lake is a “seasonal” estuary, remaining mostly marine (influenced by sea water) during much of the year. As a reference, fresh water such as we obtain from our taps has a salinity of about zero ppt (parts per thousand) and sea water has an average salinity of 35 ppt. The graph shows that unless it has rained recently, the Lake is typically 28 – 34 ppt, which is adequate for many marine forms of life such as clams, mussels, shrimp, sponges etc. When the heavy rains come, salinity levels drop to near that of fresh water, but quickly climb back up in the near marine range when high tides are allowed back into the Lake. Frequent rainfall depresses salinity even further, and causes salt levels to remain about half that of sea water for longer periods of time.

SURFACE SALINITY



As shown above, surface salinity is clearly effected by rainfall events. Rainfall of over half an inch occurred on: Sept. 19; October 19, 20 and 26; November 11/12; December 7,8,27, 28 and 31, and January 1, 3, 7/8, 9 and 11.

But NOTE, this data is surface salinity only. Since salty water is more dense than fresh water, it sinks. Salinity at the bottom of the Lake is typically much higher. These differing salinities at the surface and bottom create separate layers of water, and impede mixing. During rainfall events the flood control gates are closed during incoming (high) tides, and open during outgoing (low) tides. When the gates are open, only the surface layer flows out because the outfall is several feet higher than the Lake bottom. As a result, the bottom layer often becomes stagnant and devoid of oxygen.

Impact of Salinity Stratification on Oxygen Levels: Because salinity differences inhibit mixing of Lake waters, State Water Board monitoring probes found that 75 – 88 % of the bottom samples were below the 5 mg/L oxygen standard during early October (when heavy rains occurred). Oxygen was not just below 5 mg/L. At the bottom, mid Lake station, the median of many observations was 1.6 mg/L. This means that half of the observations were below 1.6, during which time most life forms unable to move away were killed. Also, when oxygen drops to zero, odorous chemicals can form, which is not good. Clearly we need an aeration mixing system to mix these bottom waters with the more oxygenated surface waters.

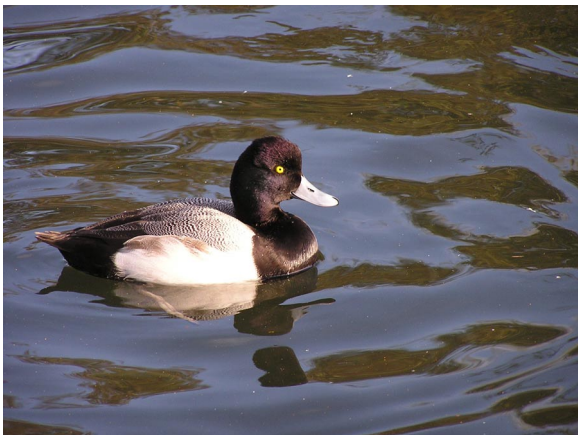
GOLDEN GATE AUDUBON TOURS INCLUDE BIRDS OF LAKE MERRITT

A Great Egret (left) searches for fish alongside a Snowy Egret (right) by the Bandstand Beach at Lake Merritt.

Great egrets are larger, and have a yellow beak and black feet. Snowy's have a black beak and yellow feet (golden slippers).



Mark your calendars. On Saturday, February 19th and Wednesday, February 23rd, our local chapter of the Audubon Society will check out the birds at the nation's oldest wildlife refuge. The Saturday trip will focus on ducks and other waterfowl. Meet at 8 am by the geodesic dome cage next to the Junior Center of Art and Science. Beginners are welcome. The Wednesday trip will identify birds at the Nature Center, Garden Center (warblers, sparrows and woodpeckers, oh my!) and open waters of the refuge. Meet at 9:30 on the Lake side of the Nature Center at the intersection of Perkins and Bellevue streets.



LAKE MERRITT VOTED BY DUCKS AS:

"THE BEST LITTLE LAKE ON EARTH."

They like the ample food; resting areas where boats are prohibited; warm, shallow waters; friendly people with binoculars; and absence of predators. But you know, a wetland would be nice.

LAKE MERRITT FEATURED IN OAKLAND CITY MAGAZINE: Pick up a copy of the January / February issue and read all about your Lake on the last page. But note: our telephone number is **510-238-2290** and clean ups and held every Tuesday and Saturday, but not on Sundays.

The Lake Merritt Institute is sponsored and supported by the Oakland Public Works Agency and members like you.