

Water Education at Bushy Lake

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When you're at Bushy Lake, start by looking around and counting how many examples of water you can find around you. There are many! Getting to know this unique urban "waterscape," and how we are connected to it, is what this flyer is all about. Water is essential to life, both to yours and to the lives of plants and animals that live around Bushy Lake. Learning about the different examples of water around us – what they do and how they interact – helps us understand how precious resources like water are shared and why it's so important to take care of them.

Let's start with **Bushy Lake** itself, but to understand the lake we need to understand its historical relationship with the **American River**, which passes by about a quarter-mile to the south. The American River is not only an important recreational attraction for the Sacramento region, it is also a primary source of our **drinking water**. Water is drawn out of the river just upstream from the Sac State campus, where it is treated and sent into the city's distribution system (see Figure 1). About 100 million gallons is supplied to the city every day, half of which comes from the American River (SDU 2016). The next time you see the American River, think about your drinking water; and the next time you turn on the tap, think of the American River!



Figure 1: Sacramento water intake on American River (Photo: Chris Lock).

Bushy Lake is related to the river because it is located within the lower American River **floodplain**. Historically, the river channel would meander and shift from year-to-year within this floodplain. (Castaneda and Simpson, 2013). The depression that forms Bushy Lake may have been originally shaped at a time when a bend in the river (sometimes called an "oxbow") passed much closer to this site. When the river level would rise during the spring **flood** season and overtop its banks, the area around and including Bushy Lake would become inundated, sometimes under several feet of water. As the floodplain would gradually drain, Bushy Lake would remain filled for some time after, possibly well into the summer.

Seasonal creeks from the northeast – like Chicken Ranch and Strong Ranch Sloughs that pass through the Arden-Arcade area – may also have contributed to water levels in Bushy Lake into the summer. Today, these creeks have been channelized and lined with concrete to collect **storm water** and convey it quickly into the American River. This is why it's important not to allow trash or anything besides water to go down the gutter and into storm drains: it all goes into the river that we use for drinking water and recreation.



Figure 2: Bushy Lake area with Chicken Ranch and Strong Ranch Sloughs

With storm drains, streets, houses, and the overall urbanization of these drainages, we have also seen an increase in how quickly storm water flows into the American River. This is because impervious surfaces like asphalt and concrete don't allow rainwater to soak into the soil. Instead, this runoff is quickly collected in the detention pond to the east of Bushy Lake and must be pumped through the levee into the American River.

Since **Folsom dam** was built in the middle of the last century, water releases to the lower American River have been controlled to protect Sacramento residents from flooding, which used to happen more regularly (Castaneda and Simpson, 2013). As a consequence, water levels no longer rise high enough to fill the historic floodplain. Still, Bushy Lake retains many riparian characteristics (see other flyers) that demonstrate its ongoing relationship with the American River.



Figure 3: Outlet pipe into Bushy Lake from Cal Expo.

Nowadays, the water that feeds Bushy Lake comes mostly from a **groundwater** well on the Cal Expo side of the levee. This water is pumped through a pipe which lets out at the east end of Bushy Lake (see Figure 3). Cal Expo operates the pump to maintain the lake level in accordance with the Bushy Lake Preservation Act of 1976 (CSMSA 2008). Groundwater comes from deep underground **aquifers**, which are like sponges that store water in the tiny spaces between soil particles. When groundwater is pumped out, water from other parts of the aquifer migrates to fill its place, sometimes taking water from other wells or even affecting streams and other surface waters (Phillips et al.,

2015). Many people share aquifers, and many habitats depend on them. That's why it's important to manage groundwater withdrawals collectively while keeping other species in mind. Using groundwater also requires a lot of energy to run the well pumps. The electricity transmission lines overhead are a reminder that an important part of our region's electricity, about 15%, comes from **hydropower** in the Sierra Nevada mountain range, where tributaries of the American River have been dammed (SMUD 2015).

What other examples of water have you noticed?

High above Cal Expo you might have seen the **water tower**. Water towers and storage tanks can be seen all around Sacramento, and are an important part of our urban drinking water system. After American River water is treated, it is pumped high up into the water towers; the water's weight up there provides pressure that pushes water through the whole system. This way, the water that reaches our homes comes out of the tap strong enough to take showers and water our yards with sprinklers.

You might also have noticed **Raging Waters** just over the levee inside Cal Expo. Raging Waters is a water theme park where we can cool off and have fun on a hot day. Thousands of gallons are circulated through pools, fountains, and waterslides, and this water can be treated and reused many times. Some water evaporates and has to be replaced with piped water from the water tower. This system is a reminder that water should not be wasted and can often be used for several purposes before it is treated as wastewater and returned to the environment.

Reusing water and reducing our water use in the first place are ways that we can reduce our impact on local water sources, such as the American River. This has been especially true in recent years as California has gone through one of the worst droughts in recorded history (CDWR 2015). There are many ways to reduce our impact on the American River: replacing lawns with drought-tolerant landscapes or letting them go brown in the summer; using drip irrigation for plants instead of sprinklers; taking shorter showers; washing our cars less at home; replacing inefficient appliances. The City of Sacramento has lots of water-saving tips and guidelines at www.SpareSacWater.org.

When we experience how precious and refreshing water can be – whether cooling off at Raging Waters or in the American River – we should also be reminded that other species also share the urban environment and need water, too. Bushy Lake is very important for this reason, serving as a water source and a



Figure 4: Wood Duck family at Bushy Lake.

riparian habitat for plant and animal species, many of which have made this area their home for much longer than we humans have. By building our flood defense systems – the levees along the river and dams upstream in the American River basin – we have controlled water and made a safe home for ourselves. Still, we are all connected to Bushy Lake through this unique urban waterscape that you have observed. As you move on and encounter other examples of water in your daily life, try to think of how it fits into the waterscape and the ways that water is shared with the plants and animals that live here, too.

References

California Department of Water Resources (CDWR). 2015. *Drought in California*.

Available at:

http://www.water.ca.gov/waterconditions/docs/DWR_DroughtBroch_070815-web.pdf

Castaneda, C.J., and L.M.A. Simpson. 2013. *River City and valley life: an environmental history of the Sacramento region*. University of Pittsburgh Press: Pittsburgh, Pa.

County of Sacramento Municipal Services Agency (CSMSA). 2008. *American river parkway plan 2008*. Available at: http://www.per.saccounty.net/PlansandProjectsInProgress/Documents/ARPP06-021909_sm.pdf

Phillips, S.P., Rogers, L.L., Faunt, C.C. 2015. *Sustainable groundwater management in California: U.S. Geological Survey Fact Sheet 2015-3084*. Available at:

<http://dx.doi.org/10.3133/fs20153084>

Sacramento Department of Utilities (SDU). 2016. *2015 Urban Water Management Plan*.

Available at:

<http://www.cityofsacramento.org/~media/Corporate/Files/DOU/Reports/City%20of%20Sacramento%20Final%202015%20UWMP%20June%202016.pdf>

Sacramento Municipal Utility District (SMUD). 2016. *2015 Annual Report*. Available at:

<https://www.smud.org/assets/documents/pdf/2015-annual-report.pdf>