



# FREQUENTLY ASKED QUESTIONS

## ARBORETUM WATERWAY MAINTENANCE AND ENHANCEMENT PROJECT

*Phase one of the campus multi-year Arboretum Waterway Maintenance and Enhancement Project will begin the summer of 2016. Below are a set of questions that are frequently asked about this project; we hope you find them helpful.*

### IS THE ARBORETUM WATERWAY THE SAME AS PUTAH CREEK?

No, the Arboretum Waterway is a pond located in the historic channel of the North Fork of Putah Creek. It used to be part of the historic, natural Putah Creek, but starting in the 1870's the creek was diverted to the south of campus and city of Davis to prevent frequent flooding of local farms. That is why the Arboretum Waterway is considered part of the historic channel — it is a relic of what used to be. Now, the Arboretum Waterway is essentially a man-made pond — both ends are dammed, its water flow manipulated, and the banks sculpted. It is the lowest spot on campus and now functions as a basin for capturing storm water. All central campus storm drains empty into the waterway. To prevent campus flooding, excess water spills over a weir on the west end; it is then pumped through a pipe to the natural Putah Creek and eventually meets up with the Sacramento River. This flood prevention system only indirectly connects the Arboretum Waterway to Putah Creek.

### WHY IS THE WATERWAY GREEN?

The Arboretum Waterway is green for a number of reasons. The water is stagnant and shallow with ample exposure to the sun, it gets an infusion of nutrients from leaves, dust, other air pollutants as well as large doses of nitrogen and phosphorus-rich recycled water from campus. These are the perfect condition for algae and duckweed to flourish. While these aquatic plants are a natural part of a pond ecosystem, they do not create an environment we want for the core of the campus, nor an environment in which most wildlife benefit.

### WHAT CHANGES WILL OCCUR WITH THIS PROJECT?

The first phase of the project, located from the Wyatt Deck Bridge to the east terminus of the waterway, will have several outstanding features. The banks will be transformed from rock and wire basket gabions to slopes of earth that gradually enter the water. Weirs will be added to create elevation changes within the waterway that, with the addition of a re-circulation pump, will create continuous water flow from the east end to the start of the project at Lake Spafford. Emergent marsh vegetation will be planted next to the weirs, and along the banks, creating a more natural look to the waterway. (See also the FAQ below: "How will the improvement be accomplished?")

In conjunction with the waterway improvements, we will renovate the Arboretum pathway on the south side of this area to meet ADA requirements, eliminate safety hazards, and improve its quality. The brick pathway that begins in the Arboretum GATEway Garden will soon extend all the way to the T. Elliot Weier Redwood Grove.

The inspiration for the design of the waterway is Putah Creek which you can still find as part of the campus's Putah Creek Riparian Reserve located on south campus. Like Putah Creek, there will be vegetation along the waterway, as well as in the water including some naturally-occurring duckweed and algae, albeit much smaller amounts. (To learn more about the Arboretum Waterway's history and lack of connection to Putah Creek read the first FAQ "Is the Arboretum Waterway the same as Putah Creek?")

### WILL THIS PROJECT MAKE THE DUCKWEED GO AWAY?

Yes, within the first phase project area, the large mats of surface algae and duckweed will no longer be floating on the formerly-stagnant water surface. However, since this is the first phase of a multi-year project to complete the entire waterway, you won't see any changes from Lake Spafford to the west after completion of this phase. The phases covering Spafford and the waterway to the west will occur in subsequent years. Meanwhile, we are investigating different manual and mechanical methods of duckweed removal.

### WHY ARE WE DOING THIS PROJECT NOW?

Approximately every 20 years, a buildup of excess sediment in the waterway needs to be removed in order to maintain its storage capacity as part of the campus flood control system. Based on the amount of sediment in the east end of the waterway, we are now at one of those times. However, in addition to addressing standard maintenance issues, we are also redesigning the waterway to function better from a stormwater collection standpoint, as well as from an ecological and aesthetic standpoint. With funding secured, nearby pathway improvements needed, and increased visitor interest in the waterway, now is the time to get this project started.

### HOW WILL THE MAINTENANCE AND ENHANCEMENTS BE ACCOMPLISHED?

**Dam creation:** Within the waterway, next to the Wyatt Deck, a coffer dam will be constructed, and the project channel will be pumped dry. During this phase, fish and turtles will be moved to Lake Spafford, on the other side of the coffer dam. This will take place under the supervision of a wildlife biologist.

**Sediment dredge:** the waterway requires periodic dredging to remove sediment and organic matter that flows in during rainstorms and blows in during periods of wind. The last dredging was 20 years ago, and in some areas the normally 1.5+ foot deep channel is only 6-inches deep. After the water is pumped out of the project area, the accumulated sediment and organic matter will be removed and the channel graded to the new shape.

**Weir building:** Five weirs will be constructed, giving a total of a 15-inch drop from the east end to the Wyatt bridge. The elevation difference will allow the water to cascade over the weirs, keeping the water flowing and creating conditions that are less favorable to algae and duckweed growth. After the waterway is dredged and rough graded, these weirs will be constructed. The weirs will be concrete with a steel lip over which the water will

flow. Only about six inches of the weir will be visible above the water, so they will be small relative to the creek banks. Both upstream and downstream of the weirs, there will be emergent marsh plants installed, creating a soft, natural look.

**Pump installatiion:** The water re-circulation will be made possible through the installation of a pump and water line that will bring the water from Lake Spafford to the far east end, fill up the area behind each weir, allowing it to cascade over. The pump will be in a vault, and will not be audible.

**Bank building:** Some parts of the banks will require additional soil to cover the gabions that currently buttress the sides of the waterway. This dirt will also provide a place for emergent marsh plantings to grow.

**Plant establishment and care:** Vegetation will be planted upstream and downstream of the weirs, including along the re-graded banks. This will be emergent marsh and wetland vegetation at the water's edge to protect against erosion and provide habitat. The plants along the banks of the waterway will be installed as part of our student Learning by Leading Program. There will also be opportunities for community plantings in future phases of the Arboretum Waterway Maintenance and Enhancement Project. Prior to construction, some areas of the banks will need to be cleared of vegetation, some plants will be transplanted, and some trees will be pruned to allow equipment access.

#### **WHAT CAN I EXPECT DURING CONSTRUCTION?**

During construction, the lower pathways will be inaccessible. Detours for bikes and pedestrians will be in place during construction. There is the possibility of some odor of decaying material as the work area is drying out. Through the use of pumps to remove the water quickly, odors will be minimized by speeding the drying.

#### **WHEN IS CONSTRUCTION STARTING?**

As of this June 2016, the construction time frame for this project is mid-August to January. However, multiple variables outside of our control affect this timeline. We will keep you informed our progress and any changes to these dates via our e-newsletter The Leaflet. Sign up to receive it here.

#### **WHAT IS GOING TO HAPPEN TO THE WILDLIFE?**

The wildlife that can't move on their own, such as fish, turtles, and crayfish, will be moved — under the supervision of wildlife experts — to Lake Spafford which will still be filled with water during construction. Birds, and other wildlife that can move quickly on their own, will migrate to adjacent areas naturally. An exclusion fence will prevent turtles from re-entering the construction area. After construction is complete, animals will naturally repopulate the east end of the waterway.

#### **WHAT IS THE LONG-TERM PLAN FOR THE WATERWAY?**

The long-term plan (over the next 4 years) is to create the same type of re-circulation and weir system to the west, continuing to the Putah Creek Lodge. From the Putah Creek Lodge to the western terminus of the waterway, the plan is to create an emergent marsh, open water, and riparian forest habitat area which will increase the wildlife habitat dramatically. This area is also planned to have a boardwalk and viewing platforms.

#### **WHERE CAN I FIND OUT MORE INFORMATION ABOUT THIS PROJECT?**

**Online:** Updates about the project will be available on the UC Davis Arboretum and Public Garden website at [publicgarden.ucdavis.edu/waterway](http://publicgarden.ucdavis.edu/waterway).

**Email:** To stay informed about this project and its progress, as well as future phases of the Arboretum Waterway Maintenance and Improvement Project, please be sure you are signed up to receive The Leaflet, the UC Davis Arboretum and Public Garden's e-newsletter.

If you have any specific questions about the project, please contact Andrew Fulks at [amfulks@ucdavis.edu](mailto:amfulks@ucdavis.edu).

#### **WHERE DOES THE FUNDING COME FROM?**

The financing for this, and many other projects on campus and throughout the UC System, comes from bond funding. Last year the University of California took advantage of its strong credit rating and low financing rates to offer bonds that allow UCs the opportunity to invest in maintaining and improving important components of their campus infrastructure.

#### **HOW CAN I HELP?**

**Volunteer:** After the first phase of construction is completed, Arboretum and Public Garden staff, student interns, and volunteers will plant and care for wetland plants along the edges of the waterway.

**Become a member:** The Friends of the UC Davis Arboretum and Public Garden, our member non-profit organization, supports the ongoing work of the Arboretum and Public Garden, including horticultural, curatorial, and educational programs. Becoming a member helps fund the improvements to our gardens and collections as well as our programs. LEARN MORE about becoming a member and the many benefits.

**Stay in touch:** Learn more about the Arboretum Waterway Maintenance and Enhancement Project, volunteer opportunities and more by reading e-newsletter, The Leaflet. Send an email to [arboretum@ucdavis.edu](mailto:arboretum@ucdavis.edu) with the subject "newsletter" to sign up.