Berkeley Unified School District

A Schoolyard Forest Case Study

Berkeley Unified School District's forwarding-thinking approach to sustainability, gardens, and schoolyard greening has won the district international recognition. The district's decades-long experience planting and maintaining living schoolyards and schoolyard forests provides us with a range of ideas on how school districts can adapt best practices to fit their unique needs.

Overview

Berkeley Unified School District (BUSD) is host to 17 gardens and half a dozen schoolyard forests that range across its 17 campuses. Its schoolyard forests vary greatly in age, size, and cost—ranging from the nation's oldest child-planted schoolyard forest to pint-sized "pocket forests" planted using state-of-the-art arboriculture techniques.

Uniquely, BUSD funds the maintenance needs of its living schoolyard assets through a city-wide parcel tax, in effect since 2000. This funding provides the district with the resources needed to manage and maintain its living schoolyards and schoolyard forests, including hiring and training grounds maintenance staff and other expenses associated with tree and plant maintenance.

Driven by its commitment to sustainable practices, the district continues to both create new schoolyard forests and broaden the everyday uses of its schoolyard forests as spaces for learning, exploration, and play. In the near term, BUSD is working to better integrate its outdoor living schoolyard assets, including schoolyard forests, into district-wide academic curriculum.

DISTRICT INFORMATION

Name: Berkeley Unified School District

Location: Berkeley, California

Climate: Mediterranean

Type: Urban, Public School District

Grades: K-12

Number of Schools: 16

Number of Students: 9,559

% of Students Qualifying for FRPMs: 32.43%*

**FRPMs: Free and Reduced-Price Meals*

District-Wide Vision

BUSD established the very first child-planted schoolyard forest at Washington Elementary in the 1970s through a grassroots effort by teachers, students, and several University of California, Berkeley professors to improve the conditions of that school's barren blacktop schoolyard. BUSD's approach to schoolyard forests has evolved in the decades since, and the district now prioritizes dynamic, green, multi-use schoolyards. This priority was spelled out in BUSD's 2018 Sustainability Plan, a document that contains a section dedicated to schoolyards and schoolyard greening. In 2021 alone, the district planted over 3,300 saplings of 54 different native tree species.

BUSD's vision, articulated in the Sustainability Plan, is that all Berkeley students have access to healthy, green school buildings and grounds and hands-on environmental and outdoor education. This vision is being put into place through a Sustainability Program, which leads district-wide sustainability initiatives and actively informs and solicits feedback from community stakeholders. Hosting a regular speaker series, distributing an email listserv, and working with local organizations and institutions, including UC Berkeley, the Sustainability Program concentrates the district's efforts under a single umbrella.

Mature redwood trees at Washington Elementary.

From Planning to Planting

Planning and conceptualization of new schoolyard forest projects follow a community design philosophy in which the district's maintenance department works closely with students, families, teachers, and administrators to identify needs and assess the scope of prospective projects. At John Muir Elementary, for instance, BUSD maintenance manager Steve Collins noticed that an open creek space and an adjacent redwood grove lacking appropriate seating and access were nonetheless being used as outdoor classrooms by some teachers. Collins and his team of 11 full-time grounds crew staff worked with a local landscape architect, teachers, students, and the school's administration to design and build new outdoor classrooms and a deck within the redwood grove.

> **Creating a schoolyard forest can be done in many ways. There's not one-size-fits-all for this kind of work.**
>
> Steve Collins, Maintenance Manager
> BERKELEY UNIFIED SCHOOL DISTRICT

At BUSD, schoolyard greening projects are most commonly initiated by the maintenance department itself. After an initial plan is put together, the department welcomes public comments, questions, and advice before proceeding with permitting and construction. Maintenance staff, external contractors, students, and adult volunteers all participate in the building and planting process. BUSD often contracts with local landscape architecture firms to design new green schoolyard projects. Depending on the cost and scale of the project, the district may first need to seek school board approval before beginning construction.

The timeline and details of the planting of each schoolyard forest differ. However, in each case, students are directly involved in the process of planting and caring for trees when possible. In addition, the district leverages its well-developed family and community volunteer network to provide on-the-ground help. Other sources of support have included local businesses and nonprofits, such as SUGi, an afforestation organization dedicated to promoting the use of the Miyawaki planting method.

Curriculum Integration

BUSD has a long history of commitment to building and maintaining green schoolyards. Currently, teachers regularly use the district's outdoor classrooms and schoolyard forests per their discretion. The district continues to work to integrate schoolyard forest spaces consistently in its academic curriculum. In 2021, the school board demonstrated its continued commitment by passing a Climate Literacy Resolution, which established an Environmental Literacy Working Group. More than 20 teachers are participating in this Working Group to study the ways in which BUSD may develop eco-literacy curriculum by grade-level bands in targeted areas such as science, history, and social studies. This will include curricular opportunities for bringing students outside. As of 2023, the Working Group is in the process of gathering materials such as lesson plans and activity guides as it prepares to outline the implementation of the district-wide eco-literacy initiative. BUSD also envisions its schoolyard forests being used in Career Technical Education (CTE) courses to teach career-focused environmental stewardship and arborist skills.

Martin Luther King Jr. Middle School's lush interior courtyard provides students with a calming retreat throughout the schoolday.

BUSD also has a well-established Gardening and Cooking Program, a remarkable example of the district's efforts to not only build and maintain green schoolyards but also to utilize these spaces for the academic, physical, emotional, and social development of its students. The district's comprehensive Garden and Cooking Program curriculum engages students from preschool through high school in hands-on activities covering topics ranging from nutrition, soil health, and garden design to watersheds, water conservation, and composting. In addition, the district leverages its gardens in CTE courses offered in middle and high school, year-long professional development classes in which gardens and the food pantries they supply are used as laboratories to learn real-life skills such as program facilitation and problem solving.

A deck constructed in an existing redwood grove at John Muir Elementary School transformed the forest into a flexible outdoor learning space.

> **The hands-on learning our students receive in the school garden builds valuable, life-long skills that emphasize responsibility, communication, teamwork, and leadership.**

BUSD Gardening and Cooking Program Mission Statement

Maintenance

The frequency, cost, and approach of BUSD's tree care and maintenance protocols are dictated by the age and size of individual trees, along with the type of planting (i.e., traditional or Miyawaki method).

In the first three years after a tree is planted, the "establishment period," BUSD provides regular watering of several gallons once or twice per week. Watering is accomplished by (1) automatic irrigation lines installed within new, major schoolyard redevelopment projects or (2) hand watering, often by teachers who are recruited by BUSD maintenance to "adopt" a tree and water it once or twice a week. In addition, BUSD's grounds maintenance staff regularly prune juvenile trees to promote healthy, upright growth.

After the three-year establishment period, however, BUSD's trees need only infrequent pruning and are otherwise maintenance-free. Pruning is carried out by maintenance staff for trees shorter than 20 feet and by professional, contracted arborists for trees taller than 20 feet.

To track and catalog its inventory of 2,500 trees, BUSD contracted with ArborPro, a company that GPS-tagged each of the district's trees and entered them into an application-accessible database. From this application, BUSD maintenance staff track tree vitals, mark them for in-house or contracted maintenance, and add or remove trees from the inventory as needed.

The district's commitment to abstain from using chemical herbicides has facilitated different expectations on how schoolyard landscaping should look. At BUSD, the occasional weed is seen as a natural and to-be-expected result of its adherence to ecological groundskeeping practices.

> **There's upfront cost and effort to plant and water a forest for two or three years. If you've taken care of that, they're almost maintenance free for the rest of their life.**

Steve Collins, Maintenance Manager
BERKELEY UNIFIED SCHOOL DISTRICT

Funding

BUSD's grounds maintenance department is funded by a city-wide parcel tax. Generating around $7.7 million per year in revenue, the tax has allowed the department to hire more staff and focus more of its attention on schoolyard upkeep and improvement.

BUSD leverages volunteerism to engage directly with the community and simultaneously lower its operating costs. A well-developed network of family and community volunteers provides the district with reliable support for schoolyard projects, large and small. In addition, students are directly engaged in tree planting on "planting days" in which teachers, families, students, and maintenance staff work together to put saplings into the ground.

Finally, BUSD has worked with nonprofits such as SUGi and Voice for Nature as well as Bay Area corporations such as AllBirds to secure additional funding for its schoolyard greening projects.

Maintenence Costs

BUSD's yearly schoolyard maintenence expenditures include:

- ~$1,000,000 per year to employ 11 full-time grounds maintenance staff
- ~$40,000 per year to contract with professional arborists, who provide pruning and tree-care services to trees taller than 20 feet
- ~$9,000 per year to maintain the ArborPro tree inventory database

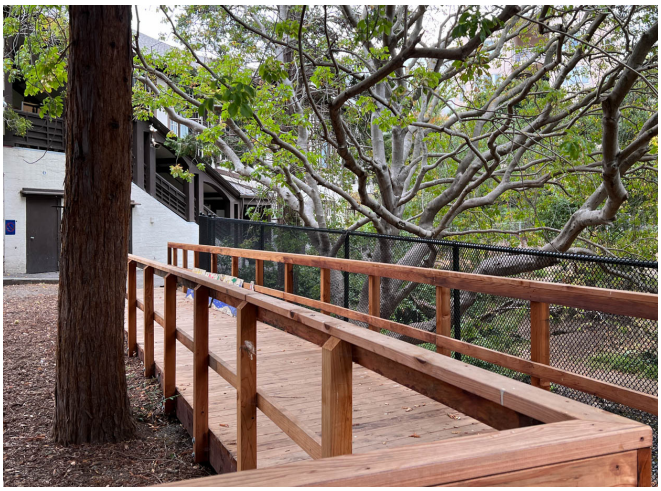
Description of Schoolyard Forests

Below are some examples of schoolyard forests at BUSD. A variety of models and scales show how projects can be tailored and adapted to an individual district's or school site's needs.

Berkeley Arts Magnet's traditional blacktop schoolyard was recently converted into a small schoolyard forest and outdoor classroom during a grounds improvement project. Contractors cut out two areas of the blacktop, one 2,300 square feet in size and another 2,800 square feet in size. One of these areas is now planted with redwood trees and has outdoor seating, boulders, and log rounds. The other area is tree-lined and contains picnic tables and a small hill with no-mow grass. Relatively small and low-cost, this project serves as a prime example of the adaptable model of schoolyard forests.

John Muir Elementary featured an existing old redwood grove and creek at the edge of campus, which fortuitously provided the ingredients for an outdoor classroom and playspace spanning both sides of the creek. After noticing a teacher using the on-site Harwood Creek, BUSD's maintenance manager Steve Collins was inspired to transform the rundown and forgotten corner of the schoolyard into a beautiful outdoor learning space. After contracting with a local landscape architect specializing in sustainable design, Collins and his grounds crew replaced asphalt and a rusty chain-link fence with a redwood boardwalk and deck. On the other side of the creek, they built a large picnic table, a cabinet for teachers to store supplies, and seating areas with log rounds and boulders on an unmowed hill. A pathway going down to the creek allows kids to explore and play.

Schoolyard forest at Berkeley Arts Magnet.



Schoolyard forest at John Muir Elementary (top and bottom).

Ruth Acty Elementary School's small grove of trees were planted in the middle of the schoolyard. This location has resulted in a highly accessible mixed-use schoolyard forest, which is more impactful than its relatively small size might suggest. Outfitted with a redwood deck, the schoolyard forest not only provides a place for kids to play, learn, and explore but also serves as a valuable outdoor teaching resource.

Schoolyard forest at Ruth Acty Elementary School.

Washington Elementary School contains the oldest child-planted schoolyard forest in the United States. Envisioned and planted in the 1970s during a time of rising environmental consciousness across the country, the project replaced half an acre of asphalt with a grove of redwood trees. With enough shaded outdoor space to comfortably accommodate the school's entire student body, kids eat their lunch and play amidst the forest's soaring trees. Over the past 40 years, the forest has both grown and evolved with the changing needs of the school. Outdoor seating has been added, for example, to enable teachers to teach lessons outdoors, and the original design's pond and chickens have been replaced.

Schoolyard forest at Washington Elementary School.

Martin Luther King Jr. Middle School's child-planted forest replaced an ornamental lawn in front of the school, providing the adjacent school building with shade and decreasing the need for air conditioning. The district partnered with afforestation nonprofit SUGi to plant the grove of trees using the Miyawaki method, an innovative technique of planting a diverse range of tree species and plants close together to foster competition and quick growth. The streetside grove is the first Miyawaki forest on a school ground in the United States.

Children plant Martin Luther King Jr. Middle School's Miyawaki forest (top) and the forest six months after planting (bottom).

> **Don't look at the whole thing and feel overwhelmed and do nothing. Take one step at a time. Just plant a tree.**

Steve Collins, Maintenance Manager
BERKELEY UNIFIED SCHOOL DISTRICT

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CALIFORNIA SCHOOLYARD FOREST SYSTEM

The California Schoolyard Forest System℠ seeks to create schoolyard forests across PreK-12 public school grounds statewide to directly shade and protect students from extreme heat and rising temperatures due to climate change. This initiative was founded by Green Schoolyards America in partnership with the California Department of Education, the California Department of Forestry and Fire Protection, and Ten Strands.

For more information, visit: **greenschoolyards.org/ca-forests**

CALIFORNIA Schoolyard Forest System℠

green schoolyards america

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