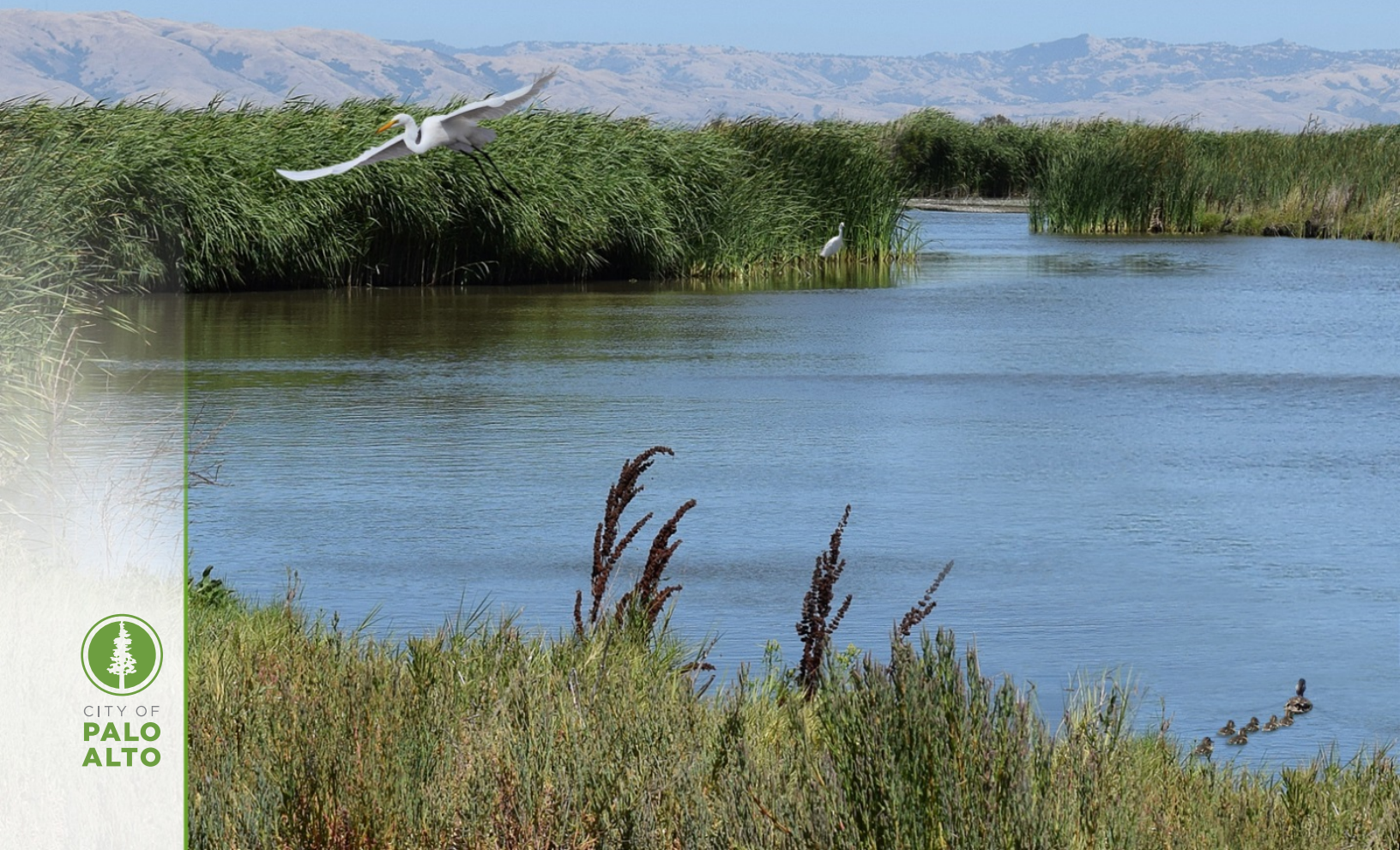
Palo Alto Baylands

Byxbee Park Master Plan Final

Prepared for:

City of Palo Alto

March 2019



CITY OF PALO ALTO

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Prepared for:

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City of Palo Alto
Open Space, Parks and Golf Administration
Daren Anderson, Project Manager, Division Manager

Prepared by:

AECOM

2020 L Street, Suite 400
Sacramento, CA 95811

Contact:

Petra Unger, Project Manager
Diana Edwards, Deputy Project Manager

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Acronyms and Other Abbreviations

Baylands	Palo Alto Baylands
CalRecycle	California Department of Resources Recycling and Recovery
City	City of Palo Alto
psi	pounds per square inch
RWQCP	Regional Water Quality Control Plant

Byxbee Park Master Plan

1 Overview

The 137-acre former City of Palo Alto (City) landfill was closed, capped, dedicated as parkland, and opened to the public in phases as the landfill's refuse disposal capacity was reached. Final landfill closure and cap construction was completed and Byxbee Park opened to the public in 2015. This Byxbee Park Master Plan provides guidance for improving and managing habitat, and includes park improvements including habitat expansion, trails, benches, signage, and parking.

This master plan builds on the 2015 Byxbee Park Hills Interim Concepts, which were developed for the final closure of the landfill. This plan is intended to be used as a guide when finalizing park features and elements, including a final parking plan. This plan achieves key goal 1 of the Baylands Comprehensive Conservation Plan: "Finalize the 2015 Interim Byxbee Park Master Plan, which includes guidance for the completion of interpretive signage, incorporates policies for appropriate management of wildlife and native habitats, contains plans for trail connections to the former ITT Property/Emily Renzel Wetlands, and completes plans for parking at Byxbee Park." Specifically, it plans for trail connections and loops, expanded habitats, and opportunities to include burrowing owl habitat. As part of the landfill closure, the City is required by law to monitor the landfill for potential hazards such as landfill gas, leachate, and settling.

Proposed elements of the master plan were developed from interviews with City staff and stakeholders, research, and site visits.

2 Site History

Byxbee Park is located on the site of a former landfill that operated from the 1930s until 2011, when operations ceased. The landfill closure and conversion to parkland began in 1990 and was conducted in four phases—Phases I, IIA, IIB, and IIC—starting from the northwest end of the park and proceeding southeast. Each phase was completed and made available for park use while construction continued in other unfinished segments, which were closed to the public. For 30 years, the City is mandated to monitor hazards associated with former landfills including refuse settlement and release of landfill gas and leachate, using a system of

groundwater, leachate, and gas monitoring wells. Post-closure activities are regulated by state agencies including the California Department of Resources Recycling and Recovery (CalRecycle) and its local enforcement agency (Santa Clara County), the Bay Area Air Quality Management District, and the San Francisco Bay Regional Water Quality Control Board.

The original plan for Byxbee Park was developed by Hargreaves and Associates in 1991, which envisioned a pastoral park after landfill closure (City of Palo Alto 2008). In 2015, the City adopted the Byxbee Park Hills Interim Park Concepts (City of Palo Alto 2015), which included guidance on habitat management, management of burrowing owl habitat, trails, benches, interpretive signage, and other park amenities. Some parts of the plan, including parking, were not finalized.

3 Existing Conditions

Byxbee Park is a hilly part of the Palo Alto Baylands (Baylands) near their outer border with San Francisco Bay. It is vegetated by annual grasslands, and includes many trails that connect the park to other parts of the Baylands, and to Shoreline Park in Mountain View. The park is typically used for walking, hiking, biking, wildlife viewing, and dog-walking.

Byxbee Park has several public art installations, and has been identified as a site for potential future public art (City of Palo Alto 2016). Both interpretive and wayfinding signage is provided in the park. Benches are present throughout the park, at the tops of hills, and along perimeter trails. Vegetated islands were installed in Byxbee Park in 2016 and are irrigated from a 2,000-gallon water tank, using reclaimed water from the Palo Alto Wastewater Treatment Plant.

The main purpose of management and maintenance activities in Byxbee Park is to guard public safety, enhance recreational opportunities in the area, protect the landfill cap, and minimize impacts on air and water quality from potential landfill gas and leachate. Key management activities include importing soil and regrading areas of excessive settlement to avoid water ponding and seepage that could damage the clay cap. Imported soil is to be added to an approximately 10-acre area each year in portions of the park that have settled and need to be brought back to grade. Other maintenance activities include inspection of monitoring wells, sumps, and monitoring equipment, and upkeep of vegetation and recreational amenities. As a condition of the permits required for landfill closure, ground squirrel abatement is implemented in Byxbee Park to protect the clay cap layer that seals the buried refuse and contains the methane within the sealed area.

Because of the phased closure of the landfill, there are two soil profiles in Byxbee Park: a minimum 4-foot-thick layer of fine-grained soil in Phase IIC, and soils a minimum of 4 feet thick comprising a vegetative soil layer, a compacted clay layer, and a compacted soil foundation layer in Phases I, IIA, and IIB.

4 Byxbee Park Hills Interim Park Concepts

In 2015 the *Palo Alto Baylands Preserve, Byxbee Park Hills Interim Park Concepts Narrative* (City of Palo Alto 2015) was developed to guide management and improvement of park habitats, management of burrowing owls, and development of a trail system that would allow safe public access without affecting wildlife. The plan was developed with measures intended to enable the closed landfill to meet all regulatory requirements. Many

components of the plan were implemented and constructed, including vegetated islands, swales, benches, the compass rose, and pedestals for signage.

The *Palo Alto Baylands Preserve, Byxbee Park Hills Interim Park Concepts Narrative* includes a management plan for the western burrowing owl (City of Palo Alto 2015). This plan identifies three areas that can be designed to enhance burrowing owl nesting habitat. The plan calls for nesting habitat that includes artificial burrows seeded with grasses. However, because this plan requires burrowing into the landfill cap, the City will only be able to construct these burrowing owl areas if it receives permission from all regulatory agencies, including CalRecycle. Such approval has not yet been forthcoming. The City will continue to seek permission from CalRecycle to construct the burrowing owl habitat areas.

5 Conceptual Plan Design Elements

The conceptual design for Byxbee Park incorporates feedback from park users, interviews with staff, multiple site tours, and a thorough review of existing conditions reports and previous designs for the park, and from a design charrette with the Stakeholder Advisory Group in December 2017. These planning sessions provided insight into the complexity of the site and the diversity of stakeholder ideas and perspectives. Input was incorporated into conceptual design that was provided to the City and stakeholders for additional review and feedback.

When developing the Byxbee Park conceptual plan, both City staff and stakeholders expressed the necessity for a balance between public use, ecological integrity, and efficient use of park staff time. The following specific objectives guided design decisions during the engagement process:

- Enhance ecological diversity of native habitat.
- Avoid impacts on existing ecological corridors and habitat.
- Improve circulation and wayfinding within the park.
- Limit concepts that increase park maintenance to alleviate unnecessary park staff maintenance tasks.
- Add necessary amenities to improve the park user experience.
- Increase the park's capacity by creating additional parking without affecting natural resources and valuable habitat in the park.
- Capitalize on design elements that have proven successful in the past.
- Incorporate lessons learned.

The conceptual plan (Figure 1) maintains the delicate balance between public access and the park's natural areas with trail loops, additional regular and backless benches, increased parking capacity, and additional interpretive and wayfinding signage. Streamlined irrigation measures and naturalistic management zones are proposed to reduce the number of maintenance tasks and ensure an ecosystem that will work in harmony with existing site conditions. Additionally, areas identified for burrowing owl nesting habitat were retained.

5.1 Loop Trails

Navigating the existing 150-acre park is generally a challenge for both returning visitors and newcomers because of the size of the area and the homogeneous nature of the

existing vegetation. City staff and stakeholders asked that the number of trails be reduced. Many of the original park trails have been eliminated to simplify the landscape and reduce human impacts on ecological systems. The remaining trails are the minimum number needed for staff to reach key maintenance areas in the park.

Palo Alto Baylands Byxbee Park

Concept

Observation Decks

Pole Field

Mayfield Slough

Wind Wave

Chevron

Group Meeting Area

Byxbee Park Hills

Parking Lot

Hydrological Connection with the San Francisco Bay

Hydrological Connection with Matadero Creek

Embarcadero Rd.

Mayfield Slough Remnant

Regional Water Quality Control Plant

Enhanced Vegetative Cover for Ecological Corridor

Hydrological Connection with Renzel Wetlands

Emily Renzel Wetlands

0 150 300 FEET

SCALE: 1" = 150'

Legend:

- Management Zone - Coastal Prairie
- Management Zone - Tidal Marsh
- Management Zone - Coastal Scrub
- Management Zone - Trail buffer
- Vegetated Island & Expansion
- Potential Borrowing Owl Habitat
- Enhanced Vegetative Cover for Ecological Corridor
- Rock Swale
- Pole Field loop, .75mi
- Vista Loop, 1.5 mi
- Renzel Marsh Loop, 1.4 mi
- Remnant Slough Loop, 0.7 mi
- Existing Adobe Creek Trail
- Proposed & Existing Benches with View Direction
- Proposed Backless Benches
- Proposed & Existing Interpretative Sign
- Proposed & Existing Current Trail Marker
- Existing Drinking Fountain
- Existing Foraging Island
- Existing Bridge Bench Seating
- Existing Defibrillator
- Existing Bike Parking

The four proposed loop trails provide a hiking experience that highlights the various vistas, outdoor artwork, and native ecology. They connect to the larger Baylands Preserve and the Adobe Creek Trail. Additionally, the loop trails pass through high and low elevations of Byxbee Park, thus providing a tour of several distinct management zones for native plant communities, along with diverse views of the park and South Bay landscapes, both close up and far away.

5.1.1 Pole Field Loop

The Pole Field Loop Trail begins at the expanded main parking lot at Byxbee Park, making a ¾-mile loop at the northeast end of the park. Visitors gain approximately 40 feet in elevation while passing two of the park's original art installations, *Chevrons* and *Pole Field*. The Pole Field Loop passes through the Coastal Prairie and Trail Buffer management zones and connects to the Renzel Marsh Loop and the existing Adobe Creek Trail.

5.1.2 Renzel Marsh Loop

The Renzel Marsh Loop also begins at the Byxbee Park parking lot, where visitors can choose to head either east into the Byxbee Park hills or west toward the Emily Renzel Wetlands. The 1.4-mile loop traverses the park's highest and lowest elevations, providing views of both the Byxbee Park hills and the Emily Renzel Wetlands, and connects to all of the proposed loop trails. The Renzel Marsh Loop is located primarily within the proposed Coastal Scrub Management Zone, providing visitors with a unique view of this shrubby plant community that is now rare in the lowlands of the San Francisco Bay Area.

5.1.3 Vista Loop

The Vista Loop begins at the art installation *Windwave*, which offers a 360-degree view of the surrounding area including Mayfield Slough, the Palo Alto Flood Control Basin, and the Emily Renzel Wetlands. The 1.5-mile loop traverses the highest point of the park with minimal elevation change, and passes through all vegetation management zones. Directional signs along the trail direct visitors to the group meeting area, where they can gather and rest.

5.1.4 Remnant Slough Trail

The Remnant Slough Trail is the shortest loop, at 0.7 mile. It travels along the upland edge of the marsh, maintaining the same elevation throughout. In addition to providing views of the Remnant Slough Basin, this trail provides views of the Palo Alto Flood Control Basin, Matadero Creek, and Mayfield Slough.

5.2 Benches

The northeast end of Byxbee Park has several lookout areas where benches and observation decks provide opportunities for rest and reflection. In contrast, the newly completed area at the park's west end lacks observation points despite great views and places of respite along the trails. Eight additional benches are proposed in this area at points with exceptional vistas, with opportunities for wildlife viewing, to provide visitors with a convenient rest area after they complete a steep climb. One additional bench is proposed for the eastern edge of the park to capture views of the park's south end. Bench aesthetics should align with the naturalistic settings. In a number of cases, vegetated islands with berms are placed around benches to protect users against the wind.

Park benches are intentionally absent from areas that the stakeholders have identified as ecological corridors: the Renzel Marsh Loop between Byxbee Park and the former ITT Property/Emily Renzel Wetlands, and between Byxbee Park and the Palo Alto Regional Water Quality Control Plant (RWQCP). Stakeholders have expressed concern that

placing benches in these areas would promote prolonged human presence, thus potentially distressing wildlife that use these corridors.

The park staff has reported a buildup of guano on existing benches from birds perching on the backs of benches. To alleviate this issue, a small number of backless benches is proposed at various ridge locations to both prevent avian perching and allow for the 360-degree view.

5.3 Parking

Figure 2 depicts the proposed expanded parking plan for Byxbee Park. To accommodate current and future traffic needs at the park, the proposed concept expands the total parking area to 68 stalls: three Americans with Disabilities Act–accessible stalls (one of which is van parking), three motorcycle stalls, 10 compact vehicle stalls, one bus stall, and 54 standard stalls. Parking is divided into a large main lot and a smaller overflow lot. In the main parking area, circulation is a one-way loop that accommodates vehicle sizes up to a Type C school bus. The overflow parking lot provides parking spaces for compact and standard vehicles and motorcycles.

Bioretention areas in and adjacent to the parking area provide space for shade trees and vegetation to slow, capture, and filter stormwater runoff, and to reduce the potential for concentrated runoff flows during storms that could cause erosion and gullying. The gentle slope of the parking area allows water to sheet flow into these bioretention areas instead of directly into San Francisco Bay. The downstream edges of the paved parking areas are designed without curbs so that rainwater runoff can sheet flow into the bioretention areas along their entire length without concentrated flows.

5.4 Signage

Signs proposed in Byxbee Park consist of interpretive signage and trail markers. All panels, bases, and frames should follow National Park Service standards (NPS 2009).

5.4.1 Trail Markers

To enhance wayfinding at Byxbee Park, additional trail markers are proposed at five key locations in the park where multiple trails or paths converge. Each sign indicates the visitor's current location relative to paths, trail loops, and major nodes including the parking lot, the group meeting area, and the Emily Renzel Wetlands.

5.4.2 Interpretive Signage

Two new interpretive signs are proposed for Byxbee Park: one at the south end of the park nearest to the Tidal Marsh Management Zone, and the other at the park's highest point, at the border between the Coastal Prairie and Coastal Scrub management zones. Themes for these panels include the development of anthropogenic soil horizons, plant communities growing on them, and the wildlife dependent on the habitats created by the corresponding management zones. Information regarding current seasonal park management activities can also be posted at these locations, providing details about management activities necessary to establish and maintain these natural management zones, and suggestions on how visitors could contribute to their preservation and upkeep.

Palo Alto Baylands Byxbee Park parking area

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Concept

68 Parking stalls
51 standard, 2 standard ADA, 1 van access ADA,
10 compact, 3 motorcycle, 1 bus

Drought tolerant native tree

C Compact Parking

No parking/accessible parking sign

Existing utility pole

Two Way circulation with dead end drive aisle

One way circulation in main parking area

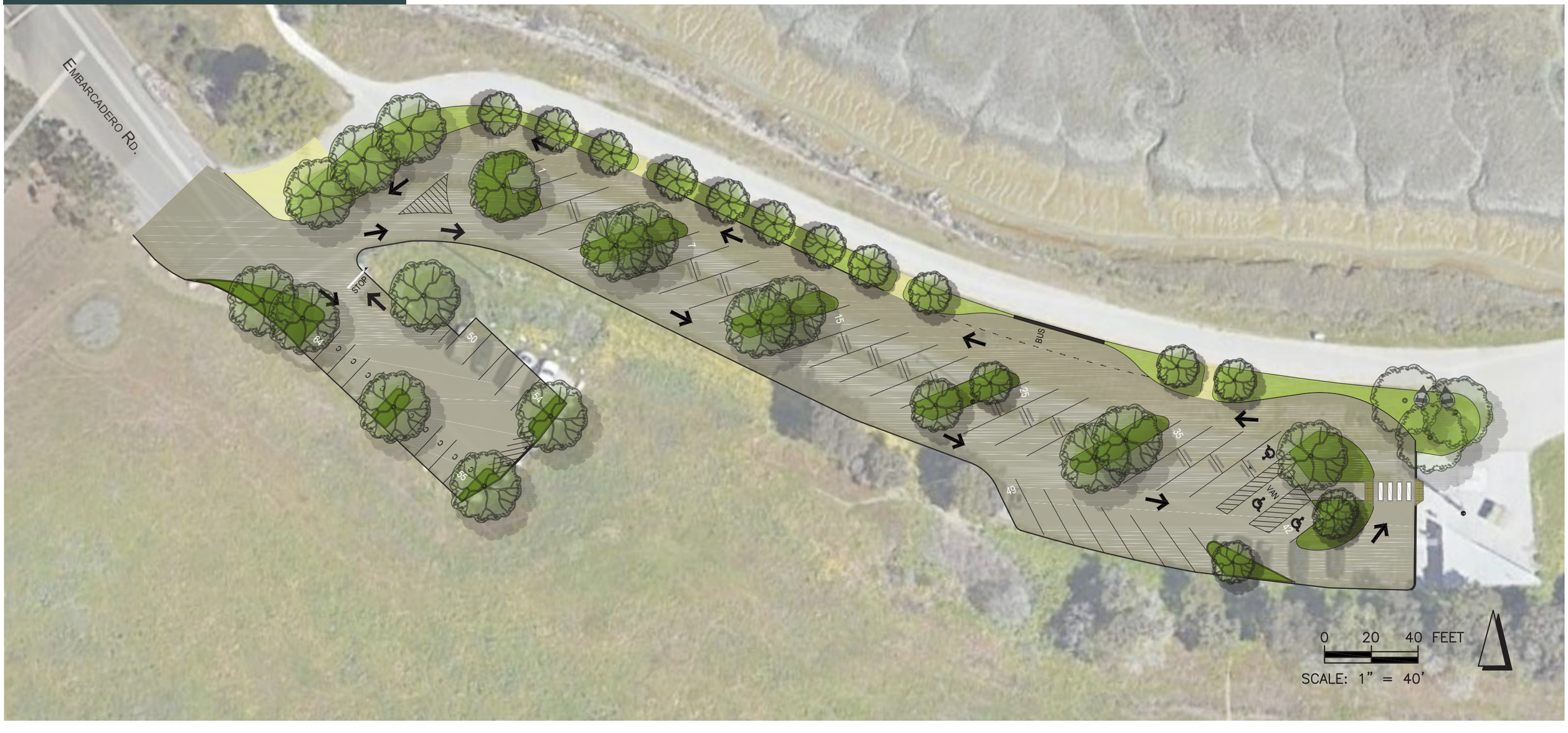
Wheel stop

Relocated pearson and dehlinger benches

Bioretention Areas

Pathway

Parking lot area where stormwater runoff is directed to bioretention and vegetated areas



5.4.3 Deferred Amenities

The design process focused heavily on feedback from stakeholders and the City. Because of a lack of consensus and/or feasibility, not every idea is included in the final conceptual plan. However, the unincorporated suggestions are included below so they can provide input for future discussions regarding the park. The City can either note lessons learned or can move forward with these ideas if constraints are eliminated.

Many visitors use Byxbee Park for exercise. Stakeholders expressed interest in expanding opportunities for exercise by adding a staircase to provide a challenging cardiovascular activity. However, several commenters expressed concern that if the staircase were installed, the ongoing and substantial landfill settling may damage it, thus rendering it an inaccessible liability. The park staff is currently determining whether there are areas of the park where future settling will be minimal.

A conceptual shade structure was proposed for the site. Staff members requested that the shade structure be located close to the parking area to provide accessibility and avoid affecting other areas of the park. Conceptual shade structures over benches were also proposed. However, a majority of stakeholders and staff members disapproved of shade structures, either because of general preference or out of concern about potential resting spots for predatory birds. Therefore, shade structures were not included in the plan.

There was a discussion about repurposing one or two of the most interesting antennae that are earmarked for removal from the former ITT Property/Emily Renzel Wetlands. A potential location for the structures was on the northwest hill where the four trails converge. However, this idea was rejected because of concern that the antennae could provide a perching opportunity for raptors in an area where burrowing owl habitat may be present. Repurposing the existing antennae poles as nesting sites on the former ITT Property/Emily Renzel Wetlands was also dismissed, for the same reason.

The current number of trails at Byxbee Park is the minimum needed to maintain the basic functions of the former landfill. However, stakeholders have requested fewer trails in the park to simplify circulation. The City and the Stakeholder Advisory Group discussed closing off two trails and marking them as “maintenance only.” However, they agreed that if the trails are present, they should be publicly accessible.

5.5 Vegetated Islands

5.5.1 Expansion

The vegetated islands, installed in 2016, are proposed for expansion and irrigation with recycled water that would come directly from a point of connection at the Palo Alto RWQCP. The proposed islands are strategically placed to provide wind protection, a reoccurring theme expressed by stakeholders and park users. Evergreen plant species that provide some height and consistent cover would be added to the proposed vegetated island palette. As the management zones become established, these vegetated islands would blend into the plant community and potentially act as a future seed source.

5.5.2 Irrigation

The vegetated islands are currently irrigated using water that is held in multiple water tanks within the park. The water tanks must be filled multiple times every month, which has proven to substantially increase the workload of park maintenance staff. Recycled water from the adjacent Palo Alto RWQCP would be used to irrigate the expanded

islands, allowing maintenance personnel to focus other important activities.

Currently, the recycled water main provides 90 pounds per square inch (psi) of pressure at the Palo Alto RWQCP's point of connection. At this pressure, irrigation water would be delivered at approximately 40–50 psi at the top of the hills in Byxbee Park, which would be sufficient to operate most sprinklers and drip emitters in the park. Irrigation water would regain pressure where the irrigation lines run downhill.

During review of the Palo Alto RWQCP in the 2017 Annual Recycled Water Report (City of Palo Alto 2018), it was noted that the critical qualities of the recycled/reclaimed water for vegetation (total dissolved solids/salts, sodium adsorption ratio, boron and chloride content, and pH) are within acceptable limits; however, sodium levels are elevated. For this reason, plants selected for Byxbee Park management zones are typically adapted to salt spray and higher soil salinity. Toyon (*Heteromeles arbutifolia*), saltbush (*Atriplex lentiformis*), and Catalina cherry (*Q. durata*) are examples of salt tolerant species that can also provide wind protection. Deeper soils are typically preferred by taller vegetation. Without deep soil, the root system cannot sufficiently stabilize larger plants. At Byxbee Park, taller vegetation is limited to the Coastal Scrub Management Zone because of the deep soils in that area. Additionally, larger plants cannot be planted in areas with a shallowly covered clay cap, because their roots could penetrate through the cap into the landfill.

5.6 Management of Vegetation and Wildlife Habitats

5.6.1 Burrowing Owl Habitat

No park amenities are proposed for the three areas identified in the Byxbee Park Hills Interim Park Concepts for potential enhancement of burrowing owl nesting habitat, to ensure that these proposed habitat areas are considered in any future proposed design elements to the park.

5.6.2 Soils

Before becoming a landfill, the footprint of what is now called Byxbee Park was primarily a low-lying floodplain. Today, Byxbee Park is a highly engineered landscape with biotic conditions that are influenced by anthropogenic design. Despite the underlying complexity, attributes such as the soil, local morphology, aspect, and slope can create conditions that mimic ecological communities and provide a solid base for a regenerating ecological system.

According to the *Final Closure and Postclosure Maintenance Plan* (City of Palo Alto 2013), the phased closure of the landfill created two very different soil profiles, each resulting from the closure cover system used. Phases I, IIA, and IIB have the minimum prescriptive standard cover required. This cover consists of a 1-foot-thick vegetative soil cover atop a 1-foot-thick compacted clay layer with a 2-foot-thick compacted soil foundation layer. Because of shortages of reliable and cost-effective regional borrow sources for clay, the Phase IIC design, which addressed the most recent and last area to be capped in Byxbee Park, uses an evapotranspirative soil cover consisting of a minimum 4-foot-thick layer of fine-grained soil.

The Coastal Prairie community has a similar soil profile to that of the closure cover system used in Phases I, IIA, and IIB of the Byxbee Park landfill. The Coastal Prairie has typically shallow soils with a hard clay layer or bedrock underneath. This is similar to the 1-foot-thick soil cover layer installed over the compacted clay cap of the closure cover system used in that

area. If these areas are irrigated, they will rely on recycled water, which is high in sodium. The soils of the Coastal Prairie are typically also high in sodium. The characteristic plants of this plant community can similarly thrive in this saline environment.

Phase IIC has an entirely different soil type and profile and therefore can support a different plant community. The deep, fine-grained, and fairly uniform soil layer of the evapotranspirative cover allows for the preservation of water. The Coastal Scrub community is typically composed of drought tolerant native shrubs that thrive in the mild climate of the San Francisco Bay Area. Unlike the species of the Coastal Prairie, plants in this community typically have deeper rooting systems; however, in fine soils because of lack of aeration, the roots do not penetrate much beyond 2 feet into the soil (Harrison et al. 1971; Bakker 1972). This can be a safeguard against any harm to the closure cover system in this area.

5.6.3 Management Zones

Coastal scrub, coastal terrace prairie/coastal foothill grasslands, and tidal marsh are the best herbaceous native plant analogue communities for Byxbee Park's topography, hydrology, and climate. The trail buffer habitat is a mixture of the coastal grassland and scrub habitats. These salt-adapted plant communities provide an excellent blueprint for a successful native landscape that will provide high-quality native habitat for a diversity of wildlife such as burrowing owl, resident and migratory songbirds, raptors, and sensitive species including the endangered salt marsh harvest mouse. Table 1 summarizes typical restoration and management activities required to establish these zones and keep them in a healthy condition. Additional site-specific input regarding soil texture, nutrient availability, compaction, irrigation availability, and other data will be needed to develop a set of detailed landscape construction plans and specifications for each proposed zone.

Table 1. Restoration and Management Activities by Management Zone

Activity	Tidal Marsh	Trail Buffer	Coastal Prairie	Coastal Scrub
Design	-Begin at least 2 years before implementation. -Incorporate native nitrogen fixers in the plant palette, such as Spanish clover and tule pea. -Rely primarily on plugs and diverse seed; minimize use of container plants more than 1 gallon.	-Begin 1–2 years before implementation. -Analyze soils for texture and nutrients. -Incorporate native nitrogen fixers in the plant palette. -Rely primarily on irrigated container plants for quick effect.	-Begin 1–2 years before implementation. -Analyze soils for texture and nutrients. -Incorporate native nitrogen fixers in the plant palette. -Rely primarily on diverse seed; no container plants necessary.	-Begin 1–2 years before implementation. -Analyze soils for texture and nutrients. -Incorporate native nitrogen fixers in the plant palette. -Rely primarily on diverse seed; minimize use of container plants.

Activity	Tidal Marsh	Trail Buffer	Coastal Prairie	Coastal Scrub
Plant Material Procurement	-Contract for plant materials more than 1 growing season ahead. -Collect seed from existing native areas and/or use pest-free, disease-free, and weed-free, deep container plants sourced from the San Francisco Bay Area.	-Contract for plant materials more than 1 growing season ahead. -Collect seed from existing native areas and/or use pest-free, disease-free, and weed-free, deep container plants sourced from the San Francisco Bay Area.	-Contract for plant materials more than 1 growing season ahead. -Collect seed from existing native areas and/or use pest-free, disease-free, and weed-free, deep container plants sourced from the San Francisco Bay Area.	-Contract for plant materials more than 1 growing season ahead. -Collect seed from existing native areas and/or use pest-free, disease-free, and weed-free, deep container plants sourced from the San Francisco Bay Area.
Protection of Existing Native Vegetation	-Identify and avoid areas dominated by natives.	-Identify and avoid areas dominated by natives.	-Identify and avoid areas dominated by natives (if any).	-Identify and avoid areas with native shrubs; avoid ripping/tilling within 5 feet of shrubs or the tree canopy.
Weed Removal	-Limited along vegetated edges.	-Extensive in proposed planting area, by pre-germ/till and/or solarization; weed manually in native-dominated areas.	-Extensive in entire planted area, by pre-germ/till and/or solarization.	-Extensive in entire planted area, by pre-germ/till and/or solarization; manual weeding around natives.
Irrigation Installation	None.	-Extend existing irrigation system, if feasible given existing piping diameter/ controller.	-Irrigate only if summer dormancy is not desirable. -Select dominant grasses accordingly.	-Irrigate temporarily to greatly benefit the establishment of vegetation.
Soil Preparation	-Preserve or restore dendritic channels; grade with close attention to vertical datum.	-Decompact by 6-inch-deep tilling only in areas with more than 80% relative compaction.	-Decompact by 6-inch-deep tilling only in areas with more than 80% relative compaction. -Consider soil imprinting for flat and gently sloping areas.	-Decompact by 12–18 inches in areas with more than 80% relative compaction. -Consider soil imprinting for flat and gently sloping areas.
Amendment of Soil	None.	-Amend soil with slow-release fertilizers only if strongly recommended by soil testing laboratory for “native vegetation”; otherwise avoid. -Use soil mycorrhizal inoculants.	-Amend soil with slow-release fertilizers only if strongly recommended by soil testing laboratory for “native vegetation”; otherwise avoid. -Use soil mycorrhizal inoculants.	-Amend soil with slow-release fertilizers only if strongly recommended by soil testing laboratory for “native vegetation”; otherwise avoid. -Use soil mycorrhizal inoculants.
Seeding	-Disperse with bellygrinders or hydroseeder and prevent loss caused by tidal action using erosion fabric.	-Disperse with bellygrinders or hydroseeder.	-Disperse with bellygrinders or hydroseeder. -Plant 25–100 pure live seeds per square foot with a smaller proportion of large seeded competitive grasses.	-Disperse with bellygrinders or hydroseeder. -After grass establishment, place shrub seeds in a shallow depression created during imprinting.

Activity	Tidal Marsh	Trail Buffer	Coastal Prairie	Coastal Scrub
Planting	-Install plugs through biodegradable erosion fabric.	-Install container plants in areas where a quick effect is desired.	None.	-Install container shrubs and small trees to create a local microclimate/ habitat.
Mulching	None.	-Place 4-inch-deep mulch around shrubs and herbaceous perennials.	None.	-Place 4- to 6-inch-deep mulch around shrubs and small trees. -Place small amounts of soil and litter from undisturbed native areas around roots where mycorrhizae are absent.
Establishment of Irrigation	None.	-Drip irrigate.	-Overhead irrigate daily for 30 days after seeding, then reduce based on evapotranspiration (Et_0) and vegetation type.	-Temporarily overhead irrigate the first year or two to establish grasses, then drip irrigate shrubs.
Establishment Weeding	-Remove invasive exotics as soon as they are recognized. -Prevent weeds from shading native vegetation. -Do not wait for flower or seed.	-Remove invasive exotics as soon as they are recognized. -Prevent weeds from shading native vegetation. -Do not wait for flower or seed.	-Remove invasive exotics as soon as they are recognized. -Prevent weeds from shading native vegetation. -Do not wait for flower or seed. -Mow early and high (late March) to control invasive annual grasses.	-Remove invasive exotics as soon as they are recognized. -Prevent weeds from shading native vegetation. -Do not wait for flower or seed.
Long-Term Maintenance	-Pay primary attention to removal of invasive exotic vegetation and revegetation of areas with poor establishment.	-Remove invasive exotic vegetation, trim dead plant parts, replenish mulch, inspect the irrigation system, and test soil salinity if recycled water is in use.	-Remove invasive exotic vegetation, mow grass depending on species and desired look, maintain the irrigation system, and test soil salinity if recycled water is in use.	-Remove invasive exotic vegetation, mow grass depending on species and desired look, and apply water sufficient to wet the soil profile to a depth below the rooting zone, wetting to progressively greater depths at extending intervals.
Typical Plant Species	-Salt grass, alkali heath, pickleweed, cordgrass, saltbush, and gumplant.	-Species are relative to ecological community surrounding trail.	-California oatgrass, red fescue, seashore bentgrass, tufted hairgrass, California meadow sedge, blue-eyed grass, gumplant, suncups, phacelia, yarrow, pacific aster, bee plant, soap plant.	-Coyote brush, California yerba santa, California sagebrush, black sage, yellow bush lupine, blue-eyed grass, Douglas iris.

Tidal Marsh

Tidal marsh is a wetland community of the diurnally flooded zone between the land and the sea. Tidal marshes are highly dynamic, productive ecosystems that experience many overlapping cycles, including diurnal and semi-diurnal tides, large temperature fluctuations, spring neap tides, seasonal vegetation growth and decay, and runoff from upland areas. Tidal marshes provide habitat for numerous wildlife species, including special-status species such as the salt marsh harvest mouse and Ridgway's rail. Vegetation growing in this zone is fully adapted to saline and anoxic soil conditions, resulting in a very restrictive growing environment and low plant species diversity.

Coastal Prairie

California coastal prairie is a mesic coastal grassland, a mosaic of cool-season, native perennial grasses mixed with a rich assemblage of native perennial wildflowers. Coastal prairie in California supports the highest plant diversity of any grassland in the U.S. It is an appropriate community for the shallow soil areas of the eastern part of Byxbee Park. The coastal foothill grassland plant community intergrades with the coastal terrace prairie throughout central coastal California and is also a cool-season grassland adapted to California's Mediterranean climate. This plant community is more suitable for sloped areas with deeper soils because of improved drainage. At Byxbee Park, this is an area where the shallow soil-covered clay cap transitions into the deep soil cap.

Coastal Scrub

Coastal scrub is typically found near the ocean along Northern California's coastline with the San Francisco Bay as the transition from the northern coastal scrub to the southern sage coastal scrub. This is an assemblage of low-growing, drought and salt tolerant, often aromatic shrubs with a perennial herb/subshrub understory, adapted to the Mediterranean climate of California's coastal lowlands. It is a rich plant community fitting for the conditions at Byxbee Park.

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