



Blackberry Farm Golf Course Urban Wildland Restoration Feasibility Study



Prepared for: **The City of Cupertino**

Prepared by: **MIG**
2055 Junction Avenue, Suite 205
San Jose, CA 95131

February 2022

Introduction

This feasibility study describes a habitat restoration scenario for the Blackberry Farm Golf Course if use of the golf course is discontinued. Restoration of the Blackberry Farm Golf Course parcel would focus on converting the golf course to a natural park, including a diverse ecosystem with native oak woodland and grassland plant communities that existed in this part of Santa Clara County over a hundred years ago. Local examples of the successful restoration and maintenance of urban wildlands include the nearby McClellan Ranch Preserve and Guadalupe Oak Grove Park in San Jose.

The restoration that is proposed in this plan includes both active and passive restoration actions, and development of trails for public access. Benefits include reduced water use, reduced greenhouse emissions and air pollution, increased habitat, increased public access to nature, and new educational opportunities to enhance existing park programs. There are additional opportunities for future park amenities to further encourage park use.

PART 1 – SITE ASSESSMENT

Setting

The 14.5-acre Blackberry Farm Golf Course is surrounded by residential development to the north and east. It is part of the Stevens Creek Corridor Park, which includes the golf course, the historic Stocklmeir Orchard, Blackberry Farm Park, and McClellan Ranch Preserve. The Stevens Creek Trail and riparian corridor borders the western edge of the Stevens Creek Corridor Park. The Blackberry Farm Park is immediately south of the golf course and includes buildings, pools, and picnic areas. South of the park is the McClellan Ranch Preserve, an 18-acre natural preserve that houses a 4-H program, environmental education facilities, and the offices of the Santa Clara Valley Audubon and the Friends of the Stevens Creek Trail. The preserve is separated from the open space areas in the Santa Cruz Mountains by less than a mile of residential development, which includes the Deep Cliff Golf Course that is located immediately south of McClellan Ranch. “Golf course” in this study refers to the Blackberry Farm Golf Course, unless otherwise noted.

Stevens Creek is 22 miles long. It originates in the Santa Cruz Mountains on the western flank of Black Mountain in the Monte Bello Open Space Preserve and drains an area of approximately 46 square miles. From its headwaters the creek flows into Stevens Creek Reservoir. Past the reservoir, the creek flows north through dense residential and commercial development in Cupertino, Los Altos, Sunnyvale, and Mountain View before emptying into San Francisco Bay at Whisman Slough. The creek watershed has been modified, and currently includes a portion of the Permanente Creek Watershed, due to the Permanente diversion channel that connects the two creeks downstream of Fremont Avenue. In addition, flows in Stevens Creek are affected by a dam at Stevens Creek Reservoir less than a mile upstream of the Blackberry Farm Golf Course.

Stevens Creek Trail is a 9.4-mile multi-use recreation trail that is planned to extend along Stevens Creek from the Santa Cruz Mountains to San Francisco Bay, and which is substantially built, including 1.3 miles in Cupertino.

The project area is mainly flat with elevations ranging from approximately 297 feet to 347 feet North American Vertical Datum of 1988 (NAVD88) (Google Inc. 2021).

The City of Cupertino, in partnership with the Santa Clara Valley Water District, completed an award-winning restoration project along Stevens Creek through McClellan Ranch and Blackberry Farm in 2008. The project included improvements to Stevens Creek for steelhead trout, and restoration of adjacent riparian and upland habitats. Restoration of the golf course would complement these past efforts.

Existing Habitat Conditions

Methods

The methods used to evaluate the existing biological resources present at the site include a database and literature review, field survey, an assessment of plant communities and wildlife habitats and corridors, an assessment of sensitive habitats and aquatic features, and a habitat evaluation for the presence of special-status species.

Data Review

Available background information pertaining to the biological resources on and near the site was reviewed prior to conducting field surveys. Information was compiled and subsequently compared against site conditions during the site visit. The following sources were consulted:

- California Natural Diversity Data Base (CNDDDB) record search for 9-quadrangles including: *Lick Observatory, Isabel Valley, Eylar Mountain, Mount Day, Calaveras Reservoir, San José East, Santa Teresa Hills, Morgan Hill, and Mount Sizer* (CNDDDB 2021).
- California Native Plant Society (CNPS) Rare Plant Program *Inventory of Rare and Endangered Plants of California* record 9-quadrangle search, including: *Lick Observatory, Isabel Valley, Eylar Mountain, Mount Day, Calaveras Reservoir, San José East, Santa Teresa Hills, Morgan Hill, and Mount Sizer* (CNPS 2021). Quadrangle-level results are not maintained for CRPR 3 and 4 species, so we also conducted a search of the CNPS Inventory records for these species occurring in Santa Clara County (CNPS 2021).
- California Department of Fish and Wildlife (CDFW) CNDDDB for natural communities of special concern that occur within near or in the site (CNDDDB 2021).
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool (USFWS 2021).
- Other relevant scientific literature, technical databases, resource agency reports, and Federal Register notices and other information published by the USFWS and National

Marine Fisheries Service (NMFS) to assess the current distribution of special-status plants and animals in the vicinity of the site.

Field Survey

A site visit was conducted by MIG senior biologist Tay Peterson and MIG senior biologist David Gallagher on December 2, 2021. During the site visit, MIG biologists assessed the existing biotic habitats and plant and animal communities at the golf course and in adjoining areas, assessed the potential for special-status species and their habitats to occur in the golf course area, and identified potential jurisdictional habitats (e.g., waters of the U.S./state), and other sensitive biological resources that could trigger the need for permits from state and federal agencies.

Limitations

This feasibility study is based on one site visit to the golf course and surrounding areas, research, and the author's knowledge of the area. It did not include any protocol surveys or multiple season surveys, but these are not necessary for this site, based on the conditions observed and our familiarity with the habitats. The feasibility study provides a concept, which would need to be developed further with a formal restoration plan. Cost estimates are at a rough order of magnitude and will require refinement once a site design and a detailed restoration plan are developed.

General Site Description

Existing Land Uses, Vegetation Communities, and Habitats

The golf course is developed with tees and fairways and trees planted to separate the fairways; it currently lacks natural vegetation communities. Most of the golf course is turf grass that is regularly watered and mowed. There are numerous mature trees present within the site, including planted coast redwood (*Sequoia sempervirens*), which do not naturally occur in the Santa Clara Valley. The site is regularly cleared of understory vegetation to maintain the golf course, which precludes the establishment of native vegetation and wildlife habitat in this area.

The golf course currently provides low-quality habitat for wildlife species because it is primarily maintained as turf suitable for golfing and does not provide forage or nesting habitat for most species. The wildlife most often associated with developed areas are those that tolerate human disturbance, such as raccoons, opossums, geese, and several common urban birds. However, the Stevens Creek riparian corridor is species-rich, so a wider variety of wildlife, not generally associated with urban areas, may forage in, or move through the golf course, and would certainly occupy restored habitat in this location.

Stevens Creek is an unusual creek on the San Francisco Peninsula because it has been protected along most of its length, and therefore forms a continuous riparian buffer from its headwaters until it enters tidal marsh in San Francisco Bay. It has been protected as a riparian corridor for at least a century, and its value as a wildlife corridor has only increased over time due to the urban development that surrounds the corridor. Continuous riparian buffers provide important wildlife migration corridors, which are critical "movement highways" for

terrestrial species such as mammals and reptiles as well as for water dependent species such as amphibians and waterfowl. Wildlife corridors counter habitat fragmentation and therefore, are essential to wildlife survival and diversity.

The creek supports a mixed riparian woodland, with mature trees as an overstory and a diversity of shrubs as an understory. Mixed riparian woodland habitats in California generally support animal communities that contribute disproportionately to landscape-level species diversity. The presence of seasonal water and abundant invertebrate fauna provide foraging opportunities for many species, and the diverse habitat structure provides cover and breeding opportunities. The mixed riparian woodland habitat adjacent to the golf course provides cover and foraging habitat for a wide variety of terrestrial vertebrates (e.g., amphibians, reptiles, and mammals), as well as several guilds of birds, including insectivores (e.g., warblers, flycatchers), seedeaters (e.g., finches), and raptors. Cavity-nesting birds (e.g., swallows and woodpeckers) may nest in the large trees in this habitat type.

Soils

The National Resource Conservation Service (NRCS) soils map of the golf course identified one soil unit, *171-Elder fine sandy loam, 0 to 2 percent slopes, rarely flooded* (NRCS 2021). The Elder series consists of very deep, well drained soils that formed in alluvium from mixed rock sources and occur in flood plains and is often subject to overflow during severe storms.

Flood Hazard

According to the Federal Emergency Management Agency's (FEMA) National Flood Insurance Rate Program (NFIP) Flood Insurance Rate Map (FIRM) for Santa Clara County, California, and unincorporated areas (Map Number 06085C0208H, May 18, 2009), much of the Blackberry Farm Golf Course is within a Special Flood Hazard Area subject to inundation by the 1% annual chance flood, also known as the 100-year flood. See the attached floodway graphic, *Blackberry Farm Golf Course: Regulatory Floodway*. The 1% annual flood (also known as the 100-year flood, or the base flood), is the flood that has a 1% chance of being equaled or exceeded in any given year.

Special-Status Plants

The CNPS (2021) and CNDDDB (2021) identify 74 special-status plant species as potentially occurring in the nine 7.5-minute quadrangles containing and/or surrounding the golf course. All 74 of those potentially occurring special-status plant species were determined to be absent from the golf course for at least one of the following reasons: (1) a lack of specific habitat (e.g., freshwater marsh) and/or edaphic requirements (e.g., serpentine soils) for the species in question, (2) the geographic range of the species does not overlap the site, (3) the species is known to be extirpated from the site vicinity, and/or (4) the habitats within the site are too impacted to reasonably expect any special-status species to occur there.

Special-Status Animals

Based on a review of the USFWS and CNDDDB databases, the biologists' knowledge of sensitive species, and an assessment of the types of habitats within the site, it was determined that three wildlife species could potentially occur within or adjacent to the site. This determination was made due to the presence of essential habitat requirements for the

species, the presence of known occurrences within five miles of the site, and/or the site's location within the species' known range of distribution. The legal status and likelihood of occurrence of special-status animal species in the project area are discussed in greater detail below.

Special-status animal species that are not expected to occur in the golf course because of the lack of suitable habitat, or the site is outside the known range of the species, and/or the site is isolated from the nearest known extant populations by development or otherwise unsuitable habitat include Central California Coast Steelhead (*Oncorhynchus mykiss irideus*), California giant salamander (*Dicamptodon ensatus*), California tiger salamander (*Ambystoma californiense*), foothill yellow-legged frog (*Rana boylei*), Santa Cruz black salamander (*Aneides flavipunctatus niger*), San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), burrowing owl (*Athene cunicularia*), long-eared owl (*Asio otus*), peregrine falcon (*Falco peregrinus*), white-tailed kite (*Elanus leucurus*), yellow warbler (*Setophaga petechia*), pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*).

Because the site is adjacent to Stevens Creek, three special-status species have the potential to be present in the developed portions of the site: California red-legged frog, western pond turtle, and San Francisco dusky-footed woodrat. In addition, the project site provides potential habitat for nesting birds and bats that are protected by California Fish and Game code. These resources are discussed in detail below.

California Red-legged Frog (*Rana draytonii*). Federal status: Threatened; State status: Species of Special Concern. The California red-legged frog was federally listed as threatened in June 1996 (USFWS 1996) based largely on a significant range reduction and continued threats to surviving populations. Critical habitat was most recently designated in March 2010 (USFWS 2010). Designated critical habitat is not present in the project area. The historical distribution of the California red-legged frog extended from the city of Redding in the Central Valley and Point Reyes National Seashore along the coast, south to Baja California, Mexico. The species' current distribution includes isolated locations in the Sierra Nevada and the San Francisco Bay area, and along the central coast (USFWS 2002).

The California red-legged frog inhabits freshwater pools, streams, and ponds throughout the Central California Coast Range and isolated portions of the western slope of the Sierra Nevada (Fellers 2005). Its preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). However, red-legged frogs will also breed in small, shallow pools as well as intermittent streams. Non-breeding frogs may be found adjacent to streams and ponds and may travel up to two miles from their breeding locations across a variety of upland habitats to other suitable non-breeding habitats (Bulger et al. 2003; Fellers and Kleeman 2007). However, the distance moved is highly site-dependent and is influenced by the local landscape (Fellers and Kleeman 2007). California red-legged frogs generally disperse during the wet season from mid-October to mid-April.

The Stevens Creek corridor contains suitable aquatic breeding habitat (i.e., long-lived pools or slow-moving streams with emergent vegetation or other egg mass attachment sites) for the

California red-legged frog. Additionally, the riparian corridor along Stevens Creek provides suitable foraging and dispersal habitat. Because of the proximity of the Stevens Creek corridor, red-legged frogs have the potential to disperse through the site. The nearest known breeding populations of red-legged frogs are in Permanente Creek in Rancho San Antonio County and Open Space Preserve, approximately one mile west of the site; and in the upper reaches of Stevens Creek, near Stevens Creek Reservoir, approximately three miles upstream of the site. However, there are no documented occurrences of red-legged frog in the urbanized reaches, including the entire downstream section of Stevens Creek (CNDDDB 2021).

Even though the site contains suitable dispersal habitat for California red-legged frog, it is highly unlikely that red-legged frogs would currently occur in the golf course, due to active management of the golf course. It is also extremely unlikely that an individual from Permanente Creek and the remote upstream portions of Stevens Creek would disperse downstream as far as the site. If the site were restored in the future, it is feasible that red-legged frogs could find upland refuge there.

Western Pond Turtle (*Actinemys marmorata*). Federal status: None; State status: Species of Special Concern. The western pond turtle occurs in ponds, streams, and other wetland habitats in the Pacific slope drainages of California (Bury and Germano 2008). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats, in clay or silty soils in unshaded areas. Juveniles occur in shallow aquatic habitats with emergent vegetation and ample invertebrate prey. Nesting habitat is typically found within 600 feet of aquatic habitat (Jennings and Hayes 1994), but if no suitable nesting habitat can be found close by, adults may travel overland considerable distances to nest.

The Stevens Creek corridor contains suitable aquatic habitat for western pond turtle. Also, if present in Stevens Creek, western pond turtle could potentially move into the adjacent upland areas within the developed, grassy areas of the golf course. The nearest known documented occurrences of western pond turtle are from Saratoga Creek near its confluence with Calabazas Creek at Guadalupe Slough; the salt ponds, marshes, and channels along the Bay Trail to the west, both approximately nine miles downstream of the site; and Stevens Creek County Park, approximately three miles upstream of the site. There are no documented occurrences of western pond turtle in the urbanized reaches of Stevens Creek (CNDDDB 2021).

Even though the open grassy areas of the site contain suitable upland habitat for western pond turtle, it is highly unlikely that pond turtles would currently disperse into the site from the Stevens Creek corridor due to the high levels of disturbance. Furthermore, it is extremely unlikely that an individual from the downstream areas near the San Francisco Bay and the remote upstream portions of Stevens Creek would disperse into the golf course. If the area was restored to oak savanna habitat, it is feasible that western pond turtles could nest there.

San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*). Federal status: None; State status: Species of Special Concern. The San Francisco dusky-footed woodrat occurs in a variety of woodland and scrub habitats throughout San Mateo County and the adjacent

Central Coast Range, south to the Pajaro River in Monterey County (Hall 1981, Zeiner et al. 1990). San Francisco dusky-footed woodrats prefer riparian and oak woodland forests with dense understory cover, or thick chaparral habitat, and build large, complex houses of sticks and other woody debris, which may be maintained by a series of occupants for several generations (Carraway and Verts 1991; Lee and Tietje 2005). Also, they will often build these stick houses in the canopy of trees. Woodrats also use human-made structures, and can nest in electrical boxes, sheds, pipes, abandoned vehicles, wooden pallets, and portable storage containers. The breeding season for dusky-footed woodrat begins in February and sometimes continues through September, with females bearing a single brood of one to four young per year (Carraway and Verts 1991).

The Stevens Creek corridor contains suitable habitat for dusky-footed woodrat and woodrats may occasionally forage in the golf course, but the site does not currently contain suitable habitat to support woodrat houses. Woodrats would be expected to colonize riparian woodland, habitat islands, or oak trees on a restored site.

Bat Colonies. Bats are protected under Sections 4150-4155 of the California Fish and Game Code. Bats tend to forage and roost near freshwater sources. Stevens Creek provides a seasonal source of freshwater, and cavities within trees and structures may provide suitable day and maternity roost habitat for many species of bats. The trees on the golf course may provide habitat for bats that roost in foliage but are not likely to provide habitat for cavity roosting bats. It is unlikely that the golf course supports a bat maternity colony, although bats may forage over the golf course from roosts in the adjacent Stevens Creek corridor.

Roost sites for bats are critical resources for mating, hibernation, rearing young, conserving energy, and protection from adverse weather and predators. Bat selection of roost sites is influenced by distribution and abundance of food resources, risks of predation, as well as the physical attributes of the roost itself. Roost selection is paramount to the success of a species and the removal of roost habitat could adversely impact species survivorship (Kunz 1982). Maternity roosts are particularly important and vulnerable to impacts.

The removal of non-native trees may temporarily impact roosting bats but will not be significant due to the presence of higher quality roosting habitat in the nearby Stevens Creek corridor. The planting of native oak trees, including restoring native grassland habitat and expansion of the riparian habitat along Stevens Creek will increase the amount of available high-quality foraging habitat. Additionally, native oaks, once mature will provide higher quality roosting habitat for bats.

Nesting Birds. Birds may nest within the trees, shrubs, dense stands of vegetation, and man-made structures in and around the site. All bird species are protected under California Fish and Game code and the California Migratory Bird Protection Act; and most are protected under the federal Migratory Bird Treaty Act.

Sensitive and Regulated Plant Communities and Habitats

Natural communities have been considered part of the Natural Heritage Conservation triad, along with plants and animals of conservation significance since the state inception of the

Natural Heritage Program in 1979. CDFW determines the level of rarity and imperilment of vegetation types; and tracks sensitive communities in its Rarefind database (CNDDDB 2021).

In addition to tracking sensitive natural communities, CDFW also ranks vegetation alliances, defined by repeating patterns of plants across a landscape that reflect climate, soil, water, disturbance, and other environmental factors (Sawyer et al. 1995). CDFW provides the Vegetation Classification and Mapping Program's (VegCAMP) currently accepted list of vegetation alliances and associations and denotes which alliances are classified as sensitive (CDFW 2021).

Natural Communities of Special Concern. There are no CDFW classified sensitive natural communities within the golf course.

Sensitive Vegetation Alliances. There are no CDFW classified sensitive plant communities within the golf course.

CDFW Stream/Riparian Habitat. California Fish and Game Code includes regulations governing the use of, or impacts to, many of the state's fish, wildlife, and sensitive habitats, including the bed and banks of rivers, lakes, and streams. Stevens Creek and its associated riparian habitat up to the top of bank is subject to CDFW jurisdiction under Section 1600 et seq. of State Fish and Game Code. However, Stevens Creek and its associated riparian habitat is entirely outside of the site.

Waters of the U.S./State. Stevens Creek meets the definition of waters of the U.S./state, which is under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB). However, Stevens Creek is entirely outside of the golf course (see the Concept Plan). Also, the USFWS's National Wetlands Inventory (NWI) map of the site identified Stevens Creek as a seasonally flooded forested/shrub wetland. The NWI also shows three additional jurisdictional features, including two freshwater ponds and a freshwater emergent wetland (NWI 2021). These features correspond to water features that are part of the landscaping but are not currently maintained because they no longer hold water. During the site visit, no water or wetland vegetation were observed in all three features. Additionally, the three features were not hydrologically connected to the Stevens Creek corridor.

NWI maps are based on interpretation of aerial photography, limited verification of mapped units, and/or classification of wetland types using the classification system developed by Cowardin et al. (1979). These data are available for general reference purposes and do not necessarily correspond to the presence or absence of jurisdictional waters. If restoration of the golf course impacts the former ponds (e.g., grading), a formal wetland delineation would be required to determine if these features meet the definition of Waters of the U.S.

Critical Habitat/Essential Fish Habitat (EFH). There is no designated critical habitat or essential fish habitat within the site, but Stevens Creek is designated critical habitat for Central California Coast Steelhead (NMFS 2005). Additionally, Stevens Creek has been identified as a priority for steelhead population restoration by the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE), which includes federal, state, and local stakeholders. The FAHCE

is in the process of developing a Fish Habitat Conservation Plan for three local watersheds, including Stevens Creek.

Central California Coast Steelhead are known to occur in Stevens Creek (Leidy et al. 2005, Leidy 2007; CNDDDB 2021); However, the status of steelhead populations in coastal San Francisco Bay streams, including Stevens Creek, remains highly uncertain, and it has been determined that sections of upper Stevens Creek, including the project site, are periodically inaccessible due to passage barriers (Domenichelli & Associates 2017; Williams et al. 2016).

Permits

There are no regulated habitats within the boundaries of the Blackberry Farm Golf Course. The riparian zone of Stevens Creek does not extend into the golf course and the depressions within the golf course that may have been ponds in the past do not currently exhibit the parameters to meet the definition of waters of the U.S./state. No activities envisioned in this feasibility study would extend into the jurisdiction of the resource agencies and trigger Clean Water Act, Porter Cologne Water Protection Act, or California Fish and Game Code permit requirements.

Historic Habitat Conditions

Research on the historical ecology (pre-European settlement) of the region revealed that oak savanna was likely the dominant vegetation community at the site (SFEI 2015). Oak savannah woodland has a low density of oaks with a mostly open canopy. The understory was likely an annual grassland with scattered shrubs and perennial grasses. Based on the proximity of the site to Stevens Creek and soil type (the soil texture at the site is fine sandy loam), coast live oak (*Quercus agrifolia*) was likely the dominant tree in the savannah woodland. Coast live oaks occur on a wide range of soils derived from diverse parent materials and having a variety of textures from sandy loam to clay. Coast live oak generally occur on mesic (wet) sites, including slopes, savannas, alluvial terraces, canyon bottoms, and along streambanks (Sawyer and Keeler-Wolf 1995).

Of the other native oak species known to historically occur in Santa Clara Valley, black oak (*Quercus kelloggii*) may have been interspersed with coast live oak, especially farther away from Stevens Creek, since black oaks are most common on dry, well-drained soils with sandy loam to gravelly clay loam textures. Black oak generally occurs from level valley floors to alluvial slopes, rocky ridges, and steep slopes, with steep slopes the most typical. Valley oak (*Quercus lobata*) and blue oak (*Quercus douglasii*) were likely absent from the site based on the soil type at the site. Valley oaks generally occur in deep, rich soils with silty to sandy clay loam textures typical of floodplains and valley floors. They also depend on water-table access. Furthermore, in the SF Bay Area, soil textures identified as fine-loamy and loamy were positively correlated with valley oak presence, while fine, fine-silty, and sandy soil textures were significantly negatively correlated with valley oaks (Grossinger et. al 2008; Sawyer and Keeler-Wolf 1995). Blue oak generally occurs on dry soils characterized by a claypan or a clay-rich subsoil layer, which is lacking at the site (Borchert et al. 1993).

Climate Change

Climate change refers to any significant change in the measures of climate lasting for an extended period, including major changes in temperature, precipitation, or wind patterns, among other effects, which occur over several decades or longer. Over the past century, human activities have released large amounts of carbon dioxide and other greenhouse gases into the atmosphere. Greenhouse gases trap energy from the sun in the Earth's atmosphere and cause it to warm. Trend projections indicate that atmospheric concentrations of GHG emissions will continue to increase throughout this century. The specific effects of these increases will vary by location, but in general average temperatures are projected to increase, resulting in changes in precipitation, sea level rise, and increased risks of extreme weather events, flooding, droughts, and wildfires. The following changes are projected to occur in the coming decades over the Santa Clara Valley:

- Even with substantial global efforts to reduce greenhouse gas emissions, the Santa Clara Valley will likely see a significant temperature increase by mid-century, based on modeling through Cal-Adapt (2021).
- Precipitation in the Santa Clara Valley will continue to exhibit high year-to-year variability with very wet and very dry years. The Bay Area's largest winter storms will likely become more intense, and potentially more damaging, in the coming decades (Cal-Adapt 2021).
- Future increases in temperature, regardless of whether total precipitation goes up or down, will likely cause longer and deeper California droughts, posing major problems for water supplies, natural ecosystems, and agriculture (Cal-Adapt 2021).

Climate change will likely influence the types of plant communities that will do well at the golf course, as some plant species may thrive in the changing conditions while others may decline. In particular, the increased temperatures and changes in rainfall pattern are likely to affect growing conditions on the golf course. Native species adapted to the projected increased temperature ranges as well as to longer dry periods punctuated by shorter periods of heavy precipitation and possible flooding would generally do well at the site under projected climate change scenarios. The habitat restoration scenario outlined below—of allowing the riparian corridor to naturally expand, and to foster the development of oak savanna on the golf course—is compatible with predicted climate change effects.

PART 2 – RESTORATION OPPORTUNITY

Creating an Urban Wildland

Open natural spaces are increasingly important for both humans and native wildlife as an escape from urbanization and isolation. The concept of an urban wildland is to integrate natural landscapes in the urban environment as a different type of recreational open space than well-manicured parks. Both children and adults need natural areas to explore and have close contact with nature, and that are accessible in the city. Urban wildland spaces also provide essential habitat patches and corridors to ensure the survival of native species in the human-dominated landscape. Reconceptualizing urban parks and recreation areas to include natural habitats, or urban wildlands, therefore has multiple health and environmental benefits. Urban wildlands are a new and important habitat type within the urban landscape (Lundholm and Richardson 2010).

Cities are challenging locations for native restoration projects since urban habitats tend to be fragmented and frequently disturbed, and resources are limited. The soils have typically been greatly disturbed and no longer provide an optimum growing environment. Restoring native habitats in an urban landscape requires incorporating land management principles and activities aimed at returning a damaged or degraded ecosystem back to ecosystem health and sustainability. Many restoration projects look to ecological conditions present before the time of European settlement as the landscape that should be restored because these are the landscapes that are adapted to the prevailing environmental conditions.

Urban wildlands often need to balance the goals of ecological restoration and access for outdoor recreation. Given that the Stevens Creek Corridor Park will remain a regional recreational resource, restoration planning and goals will need to include pathways that encourage active exploration of nature, while also maintaining ecologically intact habitats.

A successful urban wildland will give users a stronger connection with nature, which can be further enhanced with trails, benches, and an outdoor classroom to help foster outdoor education and stewardship. Future development of interpretive features and a nature play area could further promote a healthy lifestyle and foster multi-cultural connections, as these elements may attract a subset of the public focused on those activities. While connections to nature may not have been their initial goal, they may be drawn in to enjoy the site's natural areas.

Ecological Benefits

The Blackberry Farm Golf Course land was formerly an oak savannah adjacent to the riparian corridor of Stevens Creek (SFEI 2015). An oak savannah is essentially a grassland dotted with oak trees. Oak woodlands and savannahs have the greatest species richness of any vegetation community in California and are especially rich and diverse when adjacent to riparian corridors (Sawyer and Keiler-Wolf 1995). A suite of locally native species, particularly birds, are strongly associated with oaks, including white-breasted nuthatches (*Sitta carolinensis*), oak titmice (*Baeolophus inornatus*), and acorn woodpeckers (*Melanerpes formicivorus*). Annual grasslands

are species rich with native forbs that increase floral resource abundance and diversity for native insect floral visitors, some of which are important pollinators, as well as naturalized honeybees (*Apis mellifera*).



Photo 1. An oak woodland savannah with recreation trails at Guadalupe Oak Grove Park in San Jose.

Grasslands are particularly important since populations of important pollinators have been declining throughout much of North America over the past couple of decades. Beekeepers in the U.S. have been suffering from unusually high rates of colony loss of the naturalized honeybee. The abundance of several bumblebee species in the western U.S. has declined dramatically, with at least one species now believed to be extinct. And both the eastern and western populations of the monarch butterfly have declined precipitously, with the eastern population reaching a new record low in recent years.

Re-establishing a natural ecosystem at the Blackberry Farm Golf Course would maximize long-term sustainability at the site by using native plants that are adapted to the specific climate conditions of the region and the cycles of heat and drought that are common in the Santa Clara Valley. Once established, native oaks and native shrubs will need no irrigation and the mixture of trees and shrubs will provide robust root systems that will prevent erosion and substantially increase runoff infiltration and uptake of excess nutrients and other pollutants carried by urban stormwater runoff, which will also improve aquatic habitat for steelhead in Stevens Creek. These habitat types are also resilient to periodic flooding, which could occur in the flood zone areas mapped in the area.

Natural ecosystems in urban environments can also significantly reduce greenhouse emissions by helping to store carbon, as well as reducing urban air pollution. This will help California to reach its targets for greenhouse gas emission reductions, adding to our state's leadership model around the world in slowing and reversing the rate of climate change. Climate change models for the region predict a continued warming trend, less annual rainfall, and an increase in the frequency and magnitude of extreme weather events. A natural ecosystem will mediate heat island effects generated by heat absorption in and reflection by surrounding urban areas that are dominated by asphalt, concrete, and buildings; and will compensate for swings in local weather exacerbated by climate change.

Restoration Approach

Because the Blackberry Farm Golf Course is relatively small, highly disturbed, and surrounded by an urban landscape, there are significant restrictions on what native ecological conditions can be restored. For example, a full conversion of the existing grassland to a native grassland is not a realistic goal because many non-native grasses are naturalized, and it is unlikely that such grasses could be eradicated in a sustainable way from the site except at enormous cost and effort. Instead, the restoration should focus on recovering or reintroducing the key flora of oak woodland savanna and annual grassland communities. Furthermore, natural ecosystems are spatially and temporally dynamic with shifting boundaries and species composition. This natural state of flux, driven by natural ecosystem processes, is critical to the long-term health of natural ecosystems. Because of the urban setting of the Blackberry Farm Golf Course, some natural ecosystem processes will need to be suppressed or eliminated, which will require alternative methods to maintain sustainable native habitats. For example, oak woodland will naturally displace annual grassland through the process of ecological succession, so to maintain grassland habitat, management actions that are suitable in an urban environment, such as mowing or managed grazing, will be needed. While fire has historically served this purpose it is no longer suitable to use in this location.

Restoration of natural habitats is a complex, long-term process that requires the development of a restoration plan with planning, implementation, and monitoring components. The restoration plan will provide a robust framework that identifies short- and long-term restoration goals, effective and appropriate designs to meet restoration goals, regular evaluation of restoration efforts to determine whether goals are being met, and contingency and adaptive management measures if goals are not being met. Based on our assessment of the site conditions at the Blackberry Farm Golf Course, the following should be considered if the site is restored to a native ecosystem.

Overview

The recommended approach is shown on the attached graphic, *Blackberry Farm Golf Course: Urban Wildland Restoration Approach*, and includes the following elements:

- Delineate a riparian regeneration zone to allow the Stevens Creek riparian corridor to naturally invade portions of the existing golf course. Manage the vegetation to foster native species growth.
- Establish wildflower meadows in an already existing open area of the golf course.
- Establish habitat islands similar to those in McClellan Ranch, including flowering shrubs and native oaks that support wildlife species, including pollinators.
- Areas not selected for restoration will be transitioned to low maintenance zones, managed as annual grasslands.
- Allow the existing coastal redwood trees to remain.
- Incorporate sustainable management practices.
- Incorporate fire resiliency management practices using defensible space principles.
- Plan for a minimum three-to-five-year establishment period.
- Establish accessible walking trails that connect with the Stevens Creek Trail and develop other visitor amenities, such as seating, an outdoor education area, and Ranger space.
- Allow for future recreation development along the trails, such as additional seating and gathering areas, interpretive elements, an exercise par course, and nature play area.

These are discussed in further detail below:

Riparian Regeneration Zone. The riparian corridor along Stevens Creek will naturally expand into the existing landscaped areas. The extent of this expansion is unknown but will be influenced by the existing hydrology and soil composition at the site. Therefore, a 50-foot riparian regeneration zone (buffer) is proposed to allow the riparian corridor to naturally expand into the existing landscaped area. Invasive shrub and tree species will be removed in this area until native species become established. The budget includes an option of planting 100 5-gallon shrubs in this area if desired.



Photo 2. Existing riparian corridor along Stevens Creek. The proposed restoration approach includes a riparian regeneration zone, which would allow the Stevens Creek riparian corridor to naturally invade portions of the existing golf course.

Establish Wildflower Meadows. A wildflower meadow is an open area where herbaceous flowering annuals and perennial bunchgrasses are dominant. Woody species are absent or present in low numbers. A wildflower meadow is a complex and diverse interactive plant community that provides important habitat for pollinators and other wildlife. Once a wildflower meadow becomes a well-established plant community, it is less susceptible to weed invasions and requires very little regular maintenance. However, long-term management is important to maintain a meadow over time since most meadows are only a transitional stage and will be replaced by shrubs and trees. Establishment of a wildflower meadow would involve selecting an existing area free of woody vegetation, removal of the non-native turf grasses by natural methods (e.g., grazing using goats), tilling of the site, and then hydroseeding or seed drilling a diverse, locally sourced native wildflower and grass mix.



Photo 3. *The proposed restoration approach includes the creation of a wildflower meadow, which could be nestled between the existing rows of redwood trees.*

Creation of Habitat Islands. Habitat islands are defined areas where focused restoration efforts would take place. They can include upland refugia habitats for native amphibian and reptile species when Stevens Creek experiences high flows from winter storms, and habitats focused on pollinator conservation, which includes high density planting of a diverse array of flowering native shrubs and herbaceous annuals. They are a manageable size for restoration

efforts, both in terms of cost and chances of successful establishment within the 3-to-5-year time period. It is recommended that the composition of the islands follow three styles: islands with oaks and grasses, islands with flowering shrubs and no oaks, and islands with a combination of oaks and flowering shrubs.

Creation of a habitat island would involve the removal of non-native grasses, herbs, and woody species by natural methods (e.g., hand removal and soil solarization), followed by seeding and planting of native species. These areas are typically fenced temporarily to allow establishment of the planted vegetation and weeds are suppressed using mulch. Generally, downed vegetation, including trimmings and thatch (organic matter) are left in place to provide cover for wildlife.



Photo 4. A native habitat restoration site at McClellan Ranch Preserve, south of Blackberry Farm is an example of a habitat island with diverse flowering plants. The Stevens Creek riparian corridor is in the background.

The creation of habitat islands can occur over time to allow focused use of resources, provide an educational element so that visitors can see how the restoration process proceeds over time (e.g., use interpretive signage to highlight habitat islands created in the first year, second year, etc.), and to determine what species grow best in the conditions present at the golf course (e.g., if a species dies in the first year then it can be removed from the planting palette and replaced with a more suitable species).

Low Maintenance Zones, and Potential Bioswale Planting areas. The areas outside of restored habitat islands and wildflower meadows will be transitioned to low maintenance zones. The turf grass in these zones will be allowed to grow naturally (i.e., no irrigation or fertilizer) and will be grazed by goats or mowed once or twice a year. These areas can be restored to native habitats in the future if desired or as determined in an approved detailed restoration plan.

Existing Coastal Redwood Trees. Since coastal redwood trees are not adapted to the hot and fog-free summers found in the Santa Clara Valley, some of the existing redwoods will likely die-off without the supplemental water provided from irrigation of the turf grass. It is impossible to know how many and when they may die-off since some may be tapped into the water table associated with Stevens Creek and could persist for many more years. Therefore, it is recommended that the existing redwood trees remain in place and be monitored yearly for signs of overall health. Trees then can be removed on an individual basis over time and the wood recycled for restoration purposes (e.g., downed trees can be converted to mulch for use in the habitat islands) or for building park benches and/or other structures.



Photo 5. The proposed restoration includes keeping the existing redwood trees, which can be incorporated into a trail network, nature play areas, and gathering spaces.

Sustainable Management Practices. Cost-saving and sustainable management practices can be incorporated into the restoration plan, including native plant landscaping practices (e.g., leaving plant litter in place, minimal pruning and shearing, no fertilizers, etc.), mulching, and goat/sheep grazing to control invasive species. Irrigation systems placed on the surface will be used during the establishment period, and then will be removed, reducing the long-term need for irrigation. The existing topography of the site can be incorporated into the restoration plan, so that mass grading is not proposed. For example, the dry ponds can be planted with native vegetation and used as bioswales to naturally capture and filter urban runoff, including run-off from a trail network and the existing parking areas. A wildflower meadow could be installed on the current fairways and habitat islands could be installed on the fairways, tees and greens.



Photo 6. The proposed restoration approach includes using the existing depression from the dry pond as a bioswale to collect run-off from a trail system as well as existing parking areas. The fencing will be removed.

Fire Resiliency. Standard defensible space management practices should be incorporated into the restoration design and the regular maintenance plan. These practices will assure that grasses are trimmed annually, that space with low growing vegetation is kept between the habitat islands, and that trimming of lower branches that can transfer fire into the canopy is

completed on a regular basis. Grasses will be trimmed annually, but branch trimming is typically every 3-5 years, depending on conditions.

Establishment Period. Natural habitats often require three to five years to become established. Temporary irrigation systems are provided during the establishment period and are removed once the vegetation is established. To ensure success of native restoration, long-term management practices, including annual funding, need to be addressed in the restoration plan.

Trails and Visitor Amenities. This new urban wildland will provide the community with passive recreation experiences, educational opportunities, and connections to nature close to home. Accessible walking trails are proposed to connect with the Stevens Creek Trail and existing buildings. The decomposed granite paths will loop through the site, with occasional benches, encouraging low-impact exploration of the area.

Outdoor education opportunities in the area could be enhanced by better on-site space for Park Rangers and development of an outdoor education area. This could consist of decomposed granite paving and log benches, possibly salvaged from the Redwoods on site. The outdoor education area is best placed towards the North end of the site, which has an existing parking lot off an arterial road and a restroom in the golf/restaurant building that could be open to the public from an exterior door. The current golf pro shop is proposed as office space for the Park Rangers, with some minimal interior improvements, such as flooring and paint. An existing storage shed just south of the building can serve as storage and an informal meetup space for the Rangers.

There is a desire for additional parking at the South end of the existing golf course. An additional row of parking and drive aisle is proposed, with several additional accessible parking spaces located near the new trail. The vehicle, bicycle, and pedestrian access from the south entrance along San Fernando Avenue is currently being studied separately, by others (see *Blackberry Farm Entrance Road Improvements Feasibility Study* by Underwood & Rosenblum, Inc., August 2020).

Future Recreation Development Opportunities. The restoration plan should allow for future recreation to be developed along the trails. Some possibilities include:

- Exercise Par Course
- Nature Play Area
- Bus Turnaround at the North End
- Additional Seating and Gathering Areas
- Art and Interpretive Elements
- Larger Renovation of the Golf Pro Shop/Restaurant Building to support educational activities and operation of the natural area.

Estimated Costs

See the attached Rough Order of Magnitude Costs for the estimated costs to implement the above restoration approach. Specific assumptions used to develop cost line items are noted in the cost table. General cost assumptions include the following:

- Cost estimates are at a rough order of magnitude and will require refinement once a site design and detailed restoration plan are developed.
- A topographic survey and additional site studies are required to assess required ADA upgrades at the existing building and parking area.
- Site preparation does not require mass grading.
- The sand traps and existing trees will be left as is.
- Existing fencing and netting along the west and south edges of the golf course will be removed, including the footings.
- Four of the extra-large timber fence poles adjacent to the south parking lot (at Blackberry Farm Park) are assumed to be removed for parking lot work while the rest will remain for bird habitat. If desired, the remaining poles could be partially cut at different heights for variation.
- Goats will be used to remove/prepare the existing fairway grasses for restoration, and to help with removal of invasive species on the slope on the east side of the golf course.
- Annual maintenance will be limited to weeding and selective mowing around plantings in the habitat islands/riparian zone, and mowing/grazing grasses in the wildflower meadow, low maintenance areas, and bioswales in the first 3 to 5 years. After that the annual maintenance is expected to decrease as plants become established. Every 5 years a more intensive defensible space trimming plan will be implemented to address low hanging branches and shrub spacing.
- There will be eight habitat islands. The habitat islands will be planted with oak trees and perennial plants and will be seeded with native grasses and forbs. Temporary fencing will be installed to protect most of the plants from deer browse until they are established, then the fence will be removed.
- Where hydroseeding is noted, it will occur annually over three years with a native wildflower meadow mix.
- Irrigation to the habitat islands will be via temporary surface pipes and is expected to be removed once the plants are established in 3 to 5 years.
- The existing irrigation system at the backflow valve is suitable for re-use. All pipes will be abandoned in place, but the risers will be capped.
- A detailed restoration and management plan will be prepared prior to preparing construction drawings and will be subject to City review. It is not currently included in the budget.
- There will be ten years of monitoring and adaptive management to assure the plan is well-implemented. Since there are not permits, the monitoring period is flexible, but five years is the minimum.
- A more intensive restoration approach involving tree removal, soil restoration, and additional plantings is not desired.
- No permits from state or federal resource agencies are required.

References

- Barnhart, R.A. 1986. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Pacific Southwest) - Steelhead. U.S. Fish and Wildlife Service Biol. Rep. 82(11.60). U.S. Army Corps of Engineers TR EL-82-4.
- Borchert, M.I., N.D. Cunha, P.C. Krosse, and M.L. Lawrence. 1993. Blue oak plant communities of southern San Luis Obispo and northern Santa Barbara Counties, California. Gen. Tech. Rep. PSW-GTR-139. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.
- Bulger, J.B., N.J. Scott, Jr., and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. Biological Conservation 110: 85-95.
- Bury, R.B. and D.J. Germano. 2008. *Actinemys marmorata* (Baird and Girard 1852) - western pond turtle, Pacific pond turtle in G.J. Rhodin, C.H. Pritchard, P.P. van Dijk, R.A. Saumure, K.A. Buhlmann, and J.B. Iverson, editors. Conservation biology of freshwater turtles and tortoises: A compilation project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs.
- Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. National Marine Fisheries Service. NOAA Tech. Memo. NMFS-NWFSC-27.
- Cal-Adapt. 2021. Local Climate Change Snapshot for 22100 Stevens Creek Boulevard, Cupertino, California 95014, United States. Cal-Adapt was developed by the Geospatial Innovation Facility at the University of California, Berkeley with funding and advisory oversight by the California Energy Commission and the California Strategic Growth Council. Accessed December 27 at: <https://cal-adapt.org/>
- Carraway L.N. and B.J. Verts. 1991. *Neotoma fuscipes*. Mammalian Species No. 386, The American Society of Mammalogists. 10 pp.
- [CDFW] California Department of Fish and Wildlife. 2021. VegCAMP Natural Communities Lists. Accessed December 2021 from <https://www.wildlife.ca.gov/data/vegcamp/natural-communities>.
- [CNDDB] California Natural Diversity Data Base. 2021. Results of electronic records search. Rarefind 5. California Department of Fish and Wildlife, Biogeographic Data Branch. Accessed December 2021 from <http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>.
- [CNPS] California Native Plant Society. 2021. Inventory of Rare, Threatened, and Endangered Plants of California. Version 8-02. Accessed December 2021 from <http://www.rareplants.cnps.org/advanced.html>.
- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U. S. Department of the Interior, Fish and Wildlife

Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. (Version 04DEC98).

Domenichelli and Associates. 2017. Stevens Creek Steelhead Passage Improvement Project Feasibility Report. Prepared for Friends of Stevens Creek Trail. November 2017.

Fellers, G.M. 2005. *Rana draytonii* California red-legged frog. In M. Lannoo, ed. Amphibian Declines: The Conservation Status of United States Species. University of California Press. CA: Berkeley. Pp 552-554.

Fellers, G.M. and P.M. Kleeman. 2007. California red-legged frog (*Rana draytonii*) movement and habitat use: implications for conservation. *Journal of Herpetology* 41(2): 276-286.

[FEMA] Federal Emergency Management Agency. 2009 (May 18). National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM) for Santa Clara County, California, and Unincorporated Areas. Map Number 06085C0208H.

Fukushima, L. and E.W. Lesh. 1998. Adult and juvenile anadromous salmonid migration timing in California streams. *California Fish and Game* 84:133-145.

Google Inc. 2021. Google Earth Pro (Version 7.1.5.1557) [Software]. Available from earth.google.com.

Grossinger, R. M., E. E Beller, M. N Salomon, A. A Whipple, R. A Askevold, C. J Striplen, E. Brewster, and R. A Leidy. 2008. South Santa Clara Valley Historical Ecology Study, including Soap Lake, the Upper Pajaro River, and Llagas, Uvas-Carnadero, and Pacheco Creeks. Prepared for the Santa Clara Valley Water District and The Nature Conservancy. A Report of SFEI's Historical Ecology Program, SFEI Publication #558, San Francisco Estuary Institute, Oakland, CA.

Hall, E.R. 1981. *The Mammals of North America*. 2nd edition. Volume II. John Wiley and Sons, New York, New York.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Inland Fisheries Division.

Kunz, T.H. 1982. Chapter 1 Roosting Ecology of Bats. In, T.H. Kunz, editor. *Ecology of Bats*. Plenum Publishing Corporation, New York, New York

Lee, D.E. and W.D. Tietje. 2005. Dusky-footed woodrat demography and prescribed fire in a California oak woodland. *Journal of Wildlife Management* 69(3):1211-1220.

Leidy, R.A. 2007. Ecology, Assemblage Structure, Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California (Report). San Francisco Estuary Institute.

Leidy, R.A., G.S. Becker, and B.N. Harvey. 2005. Historical distribution and current status of steelhead/rainbow trout (*Oncorhynchus mykiss*) in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, Oakland, CA.

Lundholm J.T. and Richardson P.J. 2010. Habitat analogues for reconciliation ecology in urban and industrial environments. *Journal of Applied Ecology* 47:966–975.

[NMFS] National Marine Fisheries Service. 2005. Endangered and Threatened species: Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Steelhead and Salmon in California. Final rule. *Federal Register* 70:52488-52626.

[NWI] National Wetlands Inventory. 2021. Wetlands Mapper. U.S. Fish and Wildlife Service Accessed December 2021 from <http://www.fws.gov/wetlands/Wetlands-Mapper.html>.

[NRCS] Natural Resources Conservation Service. 2021. Web Soil Survey. U.S. Department of Agriculture. Accessed December 2021 from <http://websoilsurvey.nrcs.usda.gov>.

[SFEI] San Francisco Estuary Institute. 2015. "Santa Clara Valley Historical Ecology GIS Data version 2" Accessed [date retrieved]. <http://www.sfei.org/content/santa-clara-valley-historical-ecology-gis-data>.

Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society. Sacramento, CA.

Shapovalov, L., and A.C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. DFG Bulletin No. 98.

Szewczak, J.M. 2013. The Ecology and Conservation of California Bats. San Francisco State University. SFSU Field Campus. August 5–9 2013.

[USFWS] U.S. Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-legged Frog. *Federal Register* 61:25813-26833.

[USFWS] U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Region 1.

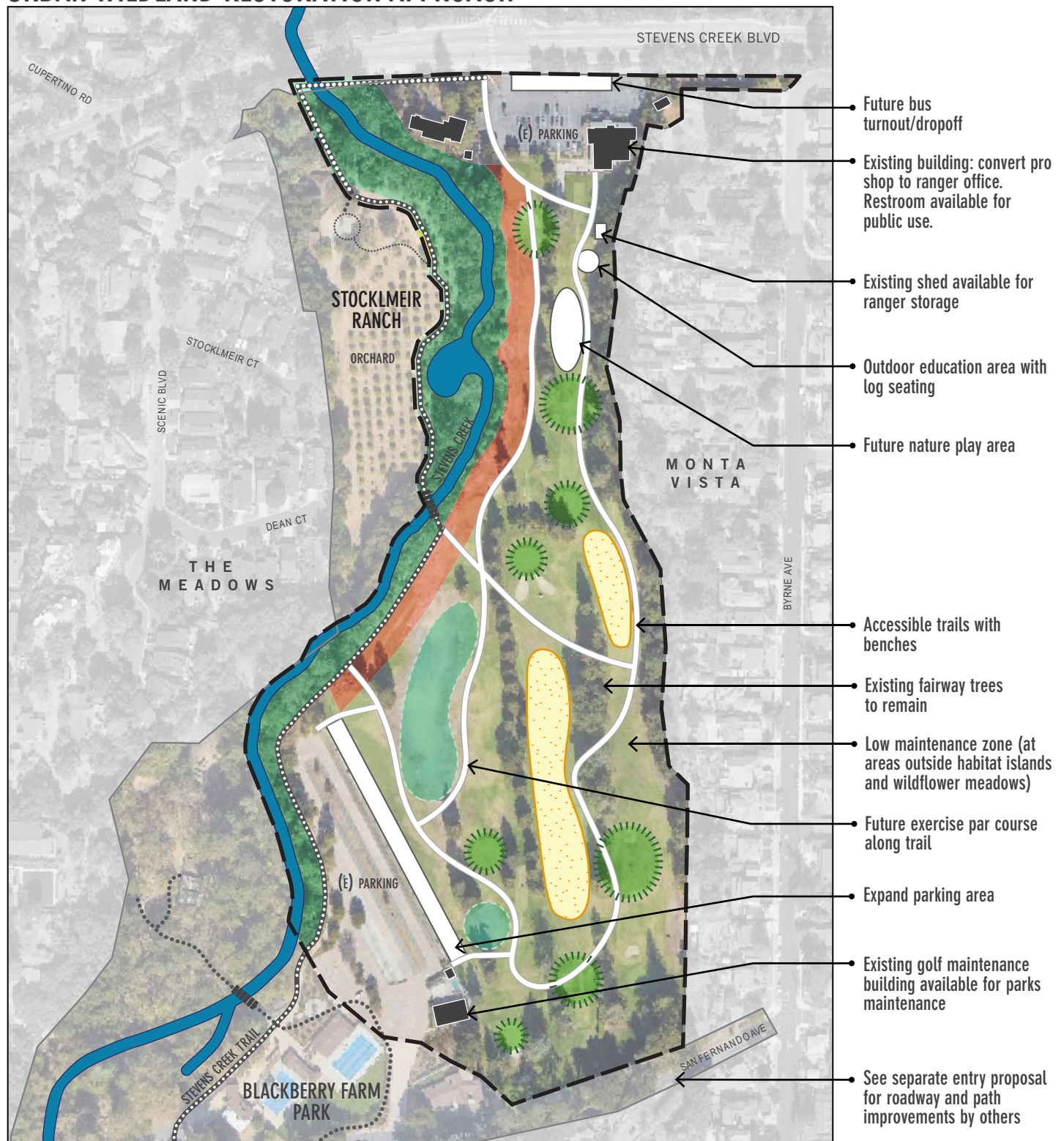
[USFWS] U.S. Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for California Red-legged Frog; Final Rule. *Federal Register* 75:12815-12959.

[USFWS] U.S. Fish and Wildlife Service. 2021. IPaC Information for Planning and Conservation. Accessed December 2021 from <https://ecos.fws.gov/ipac/t69>.

Williams, T.H., B.C. Spence, D.A. Boughton, R.C. Johnson, L.G. Crozier, N.J. Mantua, M.R. O'Farrell, and S.T. Lindley. 2016. Viability assessment for Pacific salmon and steelhead listed under the Endangered Species Act: Southwest. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-564.

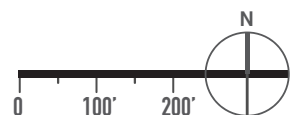
Zeiner, D.C., W.F. Laudenslayer Jr., K.E. Mayer, and M. White, editors. 1990. California's Wildlife. Volume III: Mammals. California Department of Fish and Game, Sacramento, California.

BLACKBERRY FARM GOLF COURSE URBAN WILDLAND RESTORATION APPROACH



MAP LEGEND

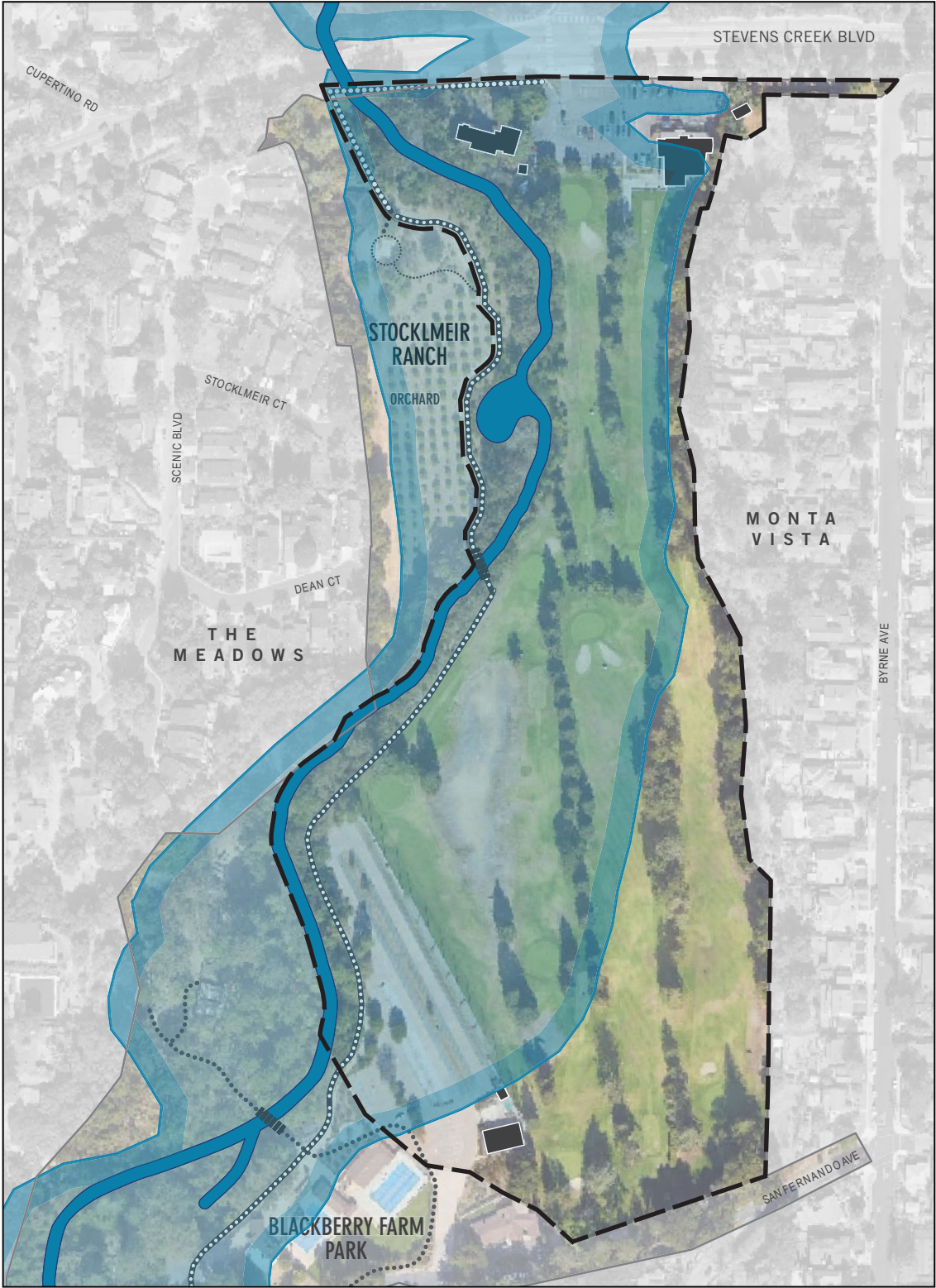
	STUDY AREA		CREEK		RIPARIAN REVEGETATION ZONE
	PARK BOUNDARY		PROPOSED PATHS		DRY POND - POTENTIAL BIOSWALE PLANTING
	(EXISTING) BUILDING / STRUCTURE		PROPOSED BUILT FEATURE		HABITAT ISLAND
	(E) STEVENS CREEK TRAIL		EXISTING RIPARIAN CORRIDOR		WILDFLOWER MEADOW
	(E) PATHS				
	(E) BRIDGE				



FEBRUARY 2022

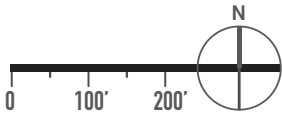


BLACKBERRY FARM GOLF COURSE
REGULATORY FLOODWAY



MAP LEGEND

- STUDY AREA
- PARK BOUNDARY
- (EXISTING) BUILDING / STRUCTURE
- ⋯ (E) STEVENS CREEK TRAIL
- ⋯ (E) PATHS
- ▬ (E) BRIDGE
- CREEK
- AE - REGULATORY FLOODWAY



FEBRUARY 2022



Blackberry Farm Golf Course Restoration - Feasibility Study
Cupertino, CA

OPINION OF PROBABLE COSTS

Rough Order of Magnitude

March 2022 by MIG, Inc.

DESCRIPTION	QUAN.	UNIT	COST	ITEM TOTAL	TOTAL	COMMENTS
DEMOLITION & CLEARING					\$114,340	
Remove Existing Golf Facilities - tee markers, cups at greens, small windmill pump structure	1	LS	\$15,000	\$15,000		Sand traps to remain
Cap/shut down existing irrigation valve/heads and risers	1	LS	\$25,000	\$25,000		Assuming existing 100 valve-in-head sprinklers to be capped if existing rotors are not re-useable
Partial fencing removal at South parking area	1	LS	\$25,000	\$25,000		Remove 4 Large wood poles and footings at south parking area, lower section of chainlink fence and upper section of netting
Fencing removal along Stevens Creek	1	LS	\$18,000	\$18,000		Includes fencing/footings along bike trail & driving range/cage
Initial Goat grazing/clearing	11	AC	\$1,000	\$11,340		
Invasive tree removal (with root grinding on some species)	1	ALLOW	\$20,000	\$20,000		Includes one-time removal of invasive Privet (existing). Fairway trees to remain as is.
Assumes no other utility work						
IRRIGATION					\$101,223	
Riparian Revegetation Zone - Install temporary drip irrigation system with above-ground lines (no mowing or goats)	50,723	SF	\$0.50	\$25,362		Includes battery operated controllers, valves, on-grade piping, fittings, on-grade poly tubing and emitters at Riparian Revegetation Zone
Habitat Islands - Install temporary drip irrigation system with above-ground lines (no mowing or goats)	41,715	SF	\$0.50	\$20,858		Includes battery operated controllers, valves, on-grade piping, fittings, on-grade poly tubing and emitters at each Habitat Island area
Wildflower Meadows - Install temporary rotor irrigation system with buried lines (due to mowing and goats)	44,388	SF	\$0.75	\$33,291		Includes battery operated controllers, valves, piping, fittings, rotors, nozzles and swing joints at each Wildflower Meadow area
Field verify and install water points of connection to existing irrigation system main line piping.	12	EA	\$500	\$6,000		
Short-term Maintenance of Irrigation by installation contractor (assume 6 months)	136,826	SF	\$0.06	\$8,210		Square footage represents Irrigated Areas only
Ongoing tree maintenance: Yearly removal of dangerous limbs or trees		ALLOW	\$7,500	\$7,500		Per Lisa's comment: What might ongoing tree maintenance look like? Tay: line item with explanation
SEEDING & LANDSCAPE					\$225,325	

Blackberry Farm Golf Course Restoration - Feasibility Study
Cupertino, CA

OPINION OF PROBABLE COSTS

Rough Order of Magnitude

March 2022 by MIG, Inc.

DESCRIPTION	QUAN.	UNIT	COST	ITEM TOTAL	TOTAL	COMMENTS
Note: Overall area of work not including hillside trees to remain and existing parking area	494,132	SF				
Riparian Revegetation Zone - sparse planting, mainly letting the riparian corridor enlarge on its own.	1	LS	\$10,000	\$10,000		Approx. 50' wide
Riparian Revegetation Zone - mulch	50,723	SF	\$0.50	\$25,362		
Habitat Islands - planting	41,715	SF	\$1	\$41,715		Planting mixture of 2 (5) gallon trees, 30 (5) gallon shrubs, (27) mix of 1 gallon oaks and perennials on each island for estimating purposes (assuming islands of the same size).
Habitat Islands - mulch	41,715	SF	\$0.50	\$20,858		
Habitat Islands - temporary fencing	2,000	LF	\$10	\$20,000		Assume metal stakes and plastic deer netting
Native Wildflower Meadow - hydroseeding	44,388	SF	\$1	\$44,388		
Low Maintenance Zone (annual grasslands) including Bioswale areas - no planting, see maintenance section	329,604	SF				Remainder areas (excluding special areas noted above and decomposed granite surfacing)
Short-term Maintenance of Riparian Reveg. Zone, Habitat Islands & Wildflower Meadows by installation contractor (assumes 6 months)	1	LS	\$18,000	\$18,000		Weeding around new plants, check irrigation is working
Soil Samples & Testing for Habitat Islands	1	LS	\$5,000	\$5,000		
Soil Amendment for Habitat Islands	1	ALLOW	\$40,000	\$40,000		
VISITOR AMENITIES					\$814,325	
<u>Trails</u> - Pedestrian Stabilized Decomposed Granite Trail	26,892	SF	\$16	\$430,272		Assume agg. Base, 6' wide with wood edging to maintain accessibility
<u>Ranger office space</u> - Allowance for Minimal Upgrades at Pro Shop	1	ALLOW	\$35,000	\$35,000		New flooring, interior paint, approx. 1050 sf
<u>Outdoor Education Area</u>						
Pedestrian Stabilized Decomposed Granite with wood edging	900	SF	\$20	\$18,000		Assumes ~30x30' area
Log Benches	1	ALLOW	\$35,000	\$35,000		May be possible to salvage from onsite redwoods
<u>Site Furnishings</u>						
Benches along Trail with DG pullout	8	EA	\$3,000	\$24,000		Drinking Fountain - NIC

Blackberry Farm Golf Course Restoration - Feasibility Study
 Cupertino, CA

OPINION OF PROBABLE COSTS
Rough Order of Magnitude
 March 2022 by MIG, Inc.

DESCRIPTION	QUAN.	UNIT	COST	ITEM TOTAL	TOTAL	COMMENTS
Bike Racks near North parking lot	1	ALLOW	\$8,000	\$8,000		
Trash and Recycling Receptacles	6	EA	\$2,000	\$12,000		
<u>South Parking Area</u> - Additional parking row and drive aisle	1	ALLOW	\$150,000	\$150,000		<i>Including wheel stops, parking signage, striping and some concrete at ADA spaces and exits to path system</i>
<u>Misc. Signage</u> - Simple laminated "Restoration zone" signs, etc.	1	ALLOW	\$15,000	\$15,000		<i>More extensive Interp/Educational Signage - NIC, future</i>

Blackberry Farm Golf Course Restoration - Feasibility Study
Cupertino, CA

OPINION OF PROBABLE COSTS

Rough Order of Magnitude

March 2022 by MIG, Inc.

DESCRIPTION	QUAN.	UNIT	COST	ITEM TOTAL	TOTAL	COMMENTS
Design Fees (Design & Permitting, public outreach, CDs, Bid/Award 4-6 SITE VISITS, RFIs, etc)			\$87,050	\$87,050		
				SUB TOTAL	\$1,255,213	
				Design Contingency (20% of construction subtotal)	\$251,045	This number is included to allow for clarifications, refinements, and revisions that take place during the design phase.
				Mobilization (5%)	\$62,762	
				General Conditions + O&P (10%)	\$125,522	
				Construction Contingency (15%)	\$188,284	
CONSTRUCTION ESTIMATE TOTAL*					\$1,882,825	

MAINTENANCE & MONITORING					\$242,500	
Year 1-3						
Hand weeding & Selective Mowing of Riparian Revegetation Zone & Habitat Islands (monthly)	3	YEAR	\$9,600	\$28,800		
Mowing/Grazing for Wildflower Meadows, once annually	3	YEAR	\$1,200	\$3,600		
Mowing/Grazing for Low Maintenance Area and Bioswales	3	YEAR	\$7,000	\$21,000		
Irrigation Maintenance for Riparian Area, Habitat Islands & Wildflower Meadows	3	YEAR	\$8,000	\$24,000		
Monitoring	3	YEAR	\$18,000	\$54,000		
Years 4-10						
Min. Hand weeding & Selective Mowing of Riparian Revegetation Zone & Habitat Islands	7	YEAR	\$2,000	\$14,000		
Mowing/Grazing for Wildflower Meadows, once annually	7	YEAR	\$2,000	\$14,000		
Mowing/Grazing for Low Maintenance Area and Bioswales	7	YEAR	\$1,000	\$7,000		
Irrigation Maintenance - years 4 and 5, if needed (final years)	2	YEAR	\$4,200	\$8,400		Increased maintenance due to age of equipment- may require more equipment replacement than years 1-3
Irrigation decommissioning/removal of backflow preventer (cap water supply), on-grade piping, drip tubing and emitters, valves, and controllers.	1	EA	\$5,000	\$5,000		Remove backflow, remove/cap meter, remove remote control valves and controllers, remove on-grade drip systems.
Monitoring	7	YEAR	\$6,000	\$42,000		

Blackberry Farm Golf Course Restoration - Feasibility Study
Cupertino, CA

OPINION OF PROBABLE COSTS
Rough Order of Magnitude
March 2022 by MIG, Inc.

DESCRIPTION	QUAN.	UNIT	COST	ITEM TOTAL	TOTAL	COMMENTS
Pruning for Defensible Space (Every 5 years, Twice during 10 year period)	2	EA	\$6,600	\$13,200		
Irrigation decommissioning in Riparian Revegetation Zone & Habitat Islands	1	EA	\$7,500	\$7,500		

* Cost Notes/Assumptions:

Costs based on Feb. 2022 Feasibility Study by MIG and accompanying site graphic, Urban Wildland Restoration Approach.

Does not include review of existing irrig. system, topographic or utility surveys or additional studies.

Does not include additional work to existing ADA parking, access, restrooms, etc. (topo and existing conditions survey needed).

Assumes an allowance of \$7500/year for tree removal. Reduced irrigation may result in more trees lost in the first ten years, so costs may not be spread evenly.

See final page of the Feasibility Study for a comprehensive list of cost assumptions.

Design Contingency" stated above? We will want to know this estimate. Tay: Design fees note removed from here and fees are included on line 64