Appendix D - Avian Collision Risk Assessment Report



620 Airport Boulevard Redevelopment Project

Avian Collision Risk Assessment Report

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TABLE OF CONTENTS

<u>Section</u>

Page

EXECUT	IVE SUN	1MARY ES-1
1.0	INTROD	DUCTION
	1.1 1.2	Site Location and Description
2.0	STUDY	METHODS
	2.1 2.2 2.3 2.4	DataBase Analysis2Avian Use Assessment Survey2Project Design Review2Bird Safe Building Ordinance/Guidelines32.4.1City of Burlingame Design Principles for Bayfront Commercial Zoning District32.4.2San Francisco Planning Department: Standards for Bird-Safe Buildings3
3.0	RESULT	S
	3.1 3.2 3.3	Database Analysis3Existing Conditions43.2.1Vegetation Communities and Land Cover43.2.2Avian Use of Existing Site5Proposed Conditions6
	3.4	 3.3.1 Assessment of Collision Risk 3.3.2 Lighting 3.3.3 Landscaping 9 City of Burlingame Design Principles for Bayfront Commercial Zoning District 9
4.0	CONCLU	JSIONS AND RECOMMENDATIONS9
	4.1	Recommendations 10 4.1.1 Lighting 10 4.1.2 Glass 11
5.0	REFERE	NCES

LIST OF APPENDICES

- A Figures
- B USFWS, CNDDB, and eBird Lists of Regionally Occurring Avian Species
- C Representative Site Photos

ACRONYMS AND ABBREVIATIONS

amsl APN	above mean sea level Assessor Parcel Number
BCDC	San Francisco Bay Conservation and Development Commission
CDFW CNDDB	California Department of Fish and Wildlife California Natural Diversity Database
HELIX	HELIX Environmental Planning, Inc.
IPaC	Information for Planning and Consultation
USFWS	U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

HELIX Environmental Planning, Inc. (HELIX) prepared this Avian Collision Risk Assessment for the proposed 620 Airport Boulevard Redevelopment Project (Project) located in the City of Burlingame (City), San Mateo County (County), California. The site is located on an unsectioned portion of the *San Mateo, CA* 7.5-minute USGS quadrangle map. The approximate center of the project site is at latitude 37.590060 N. and longitude -122.344547 W., NAD 83.

This document analyzes the design of the proposed buildings and associated lighting, the potential for lighting hazards and the risk of avian collisions associated with project development. Mitigation measures are proposed to reduce impacts to avian species that could occur as a result of the proposed project.

The 7.01-acre project site is currently developed as an asphalt metered parking lot to serve the nearby San Francisco International Airport. The project site is situated in an urban area of San Mateo County and is surrounded by commercial and industrial development. Ornamental landscaping is present around the perimeter of the parking lot. The Study Area consists of the 7.01-acre project site with a 500-foot buffer that includes developed areas (35.91 acres) and estuarine/open water habitat (14.83 acres). The Study Area includes a portion of Anza Lagoon and the shoreline San Francisco Bay Trail. The project has incorporated bird friendly design features into the building to reduce the likelihood of collisions by avian species in the region per the City of Burlingame. Additional recommendations for bird friendly design are provided to further reduce the likelihood for avian collisions with the proposed buildings.



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1.0 INTRODUCTION

HELIX Environmental Planning, Inc. (HELIX) prepared this Avian Collision Risk Assessment for the proposed 620 Airport Boulevard Redevelopment Project (Project) located in the City of Burlingame (City), San Mateo County (County), California. This document addresses the on-site physical features, habitat types/land covers present, and evaluates the project building design and lighting presented in renderings and engineering plans as they relate to the potential for avian collision hazards. Mitigation measures are proposed to reduce impacts to avian species that could occur as a result of the proposed project.

1.1 SITE LOCATION AND DESCRIPTION

The approximately 7.01-acre project site is located on the north side of Airport Boulevard, between Anza Boulevard and Bay View Place (Appendix A, Figure 1). The project site is comprised of Assessor Parcel Number (APN) 026-342-330 currently developed as an asphalt metered parking lot to serve the nearby San Francisco International Airport. The project site is situated in an urbanized portion of the City of Burlingame, San Mateo County and is surrounded by commercial and industrial development and public land. The site is located on an unsectioned portion of the *San Mateo, CA* 7.5-minute USGS quadrangle map. The approximate center of the Study Area is at latitude 37.590060 N. and longitude -122.344547 W., North American Datum (NAD) 83 (Appendix A, Figure 2). An aerial map is provided (Appendix A, Figure 3) to show the surrounding area.

For this analysis, the Study Area is defined as the 50.74-acre area that includes the 7.01 project site with a 500-foot buffer that includes habitat outward 500 feet from the project site boundary that consists of developed areas (35.91 acres) and estuarine habitat (14.83 acres). The Study Area includes a portion of the tidally influenced Anza Lagoon and the San Francisco Bay Trail which is part of a 350-mile network of trails that passes through several cities and parks around San Francisco Bay. The Study Area is situated directly south of Anza Lagoon and San Francisco Bay Trail that skirts the shoreline. The open waters of San Francisco Bay lie approximately 600 feet to the north, and Burlingame Lagoon is located approximately 350 feet to the south.

1.2 **PROJECT DESCRIPTION**

The project proponent is proposing to redevelop the existing asphalt metered parking lot by building a new life science/office development on the 7.01-acre project site. The approximately 484,000 square foot project concept consists of two 9-story buildings (6-stories of commercial uses and 3-stories of inbuilding parking) over partially subterranean podium-level parking with approximately 868 on-site parking spaces. An option for additional parking spaces may be available through a shared parking agreement with the adjacent hotel. Riprap, stabilized crushed rock, and unstabilized crushed rock will be placed in Anza Lagoon to stabilize the shoreline as part of the proposed project. The top of the proposed podium is designed to be an integrated plaza level where ground floor activities, building lobbies, amenities, and physical connection to the shoreline will be placed. The maximum height of the development is proposed at approximately 163 feet. The project has incorporated bird-friendly treatments into both building designs and on all sides of each building. Exterior glazing composed of 45 percent opaque glazing is proposed. The exterior glazing system utilizes shadow boxes (recessed surfaces) to the variegate exterior appearance and break up the glass surface. Mullion extensions are provided in a random pattern to break up exterior expanses of glass, with the exception of mullion



extensions at the middle bay. External lighting will be minimized and shielded to reduce spill out light and uplighting into adjacent habitat. Level 1 is recessed from the upper floors and consists of clear glass.

2.0 STUDY METHODS

The purpose of this avian collision risk assessment is to analyze current site conditions (i.e., pre-project condition) and compare those with post-project conditions, analyze the current project design and its components including lighting, and evaluate the adherence of the project's design to current local, city, county and/or state avian strike deterrence guidelines. The assessment included a review of previous studies of the proposed and adjacent sites, wildlife databases, and project design engineering plans and renderings. Biological studies conducted for this report consisted of a special-status species evaluation that included a desktop review and database queries to identify known biological resources in the Study Area and vicinity as well as a biological field survey which was previously documented in a biological resources evaluation prepared by HELIX in August 2022 (HELIX 2022).

2.1 DATABASE ANALYSIS

To evaluate avian species and/or their habitats with potential to occur in the Study Area and/or be impacted by the proposed project, HELIX obtained lists of regionally occurring avian species from the following information sources:

- California Department of Fish and Wildlife (CDFW). 2022. *California Natural Diversity Database* (CNDDB); For: *San Francisco South, San Leandro, Hunters Point, Montara Mountain, San Mateo, Redwood Point, Half Moon Bay, Woodside, and Palo Alto* USGS 7.5-minute series quadrangles, Sacramento, CA. Accessed December 23, 2022;
- Cornell Lab of Ornithology. 2022. eBird. <u>http://www.ebird.org/</u>. Accessed December 23, 2022; and
- U.S. Fish and Wildlife Service (USFWS). 2022. *Information for Planning and Consultation* (IPaC) *the Proposed Project.* Accessed December 23, 2022.

2.2 AVIAN USE ASSESSMENT SURVEY

Initial biological reconnaissance surveys were conducted by HELIX biologists on September 2, 2021, and August 9, 2022. A follow up avian survey was conducted on December 13, 2022, to identify avian species and their use of the Study Area. Biological communities were mapped during previous studies (HELIX 2022) and are presented in Appendix A, Figure 4 with the addition of a 500-foot buffer around the project site. The Study Area was systematically surveyed on foot to ensure total search coverage. The adjacent Anza Lagoon was also surveyed. Binoculars were used to further extend site coverage and identify species observed. All avian species observed on-site during the surveys were recorded and are discussed below in Section 3.2.1.2.

2.3 PROJECT DESIGN REVIEW

Project designs have been provided by the project proponent that include the review of exterior features, such as lighting, landscaping, building facades, project renderings were reviewed for bird



friendly design and compared to bird safe building design ordinances of the City of Burlingame and guidelines described in Section 2.4. Bird friendly design features of the project design will be highlighted and discussed below in Section 3.0. Features of the project design that are not bird friendly will be discussed in Section 3.0 and mitigation measures will be provided to improve bird friendly design in Section 4.1.

2.4 BIRD SAFE BUILDING ORDINANCE/GUIDELINES

For this study current local, city, county and/or state avian strike deterrence guidelines were reviewed, relative to the current project design. Below are descriptions of the City of Burlingame Design Principles for Bayfront Commercial Zoning District (City of Burlingame 2019) and The Standards for Bird-Safe Buildings (San Francisco Planning Department 2011) that were reviewed for this study.

2.4.1 City of Burlingame Design Principles for Bayfront Commercial Zoning District

Chapter 25.12 of the Burlingame Municipal Code regulates the design of new development to incorporate bird friendly design to avoid impacts to birds. All development shall incorporate bird-friendly design that minimizes potential adverse impacts to native and migratory birds, such as fritted or patterned glass, projecting architectural features, lighting design, and screening with trees.

2.4.2 San Francisco Planning Department: Standards for Bird-Safe Buildings

The *Standards for Bird-Safe Buildings* (San Francisco Planning Department 2011) serves as the Planning Commission's policy document for Section 139 of the Planning Code in the City of San Francisco. The controls described within this publication aim to identify high-risk features in an urban setting and regulate these situations to the best of current scientific understanding. In areas where the risks are less well known, the Department does not propose to apply controls, but instead recommends project sponsors use the checklist contained in the *Standards for Bird-Safe Buildings* (San Francisco Planning Department 2011) as an educational tool to increase their understanding of potential dangers of new development to birds and how to mitigate these dangers through bird safe building design. The *Standards for Bird-Safe Buildings* (San Francisco Planning Department 2011) also serves as guidelines to other regions with requirements for bird safe design, such as the City of Burlingame.

3.0 RESULTS

3.1 DATABASE ANALYSIS

HELIX reviewed lists of regionally occurring avian species from eBird (Cornell Lab of Ornithology 2022), CNDDB (CDFW 2022), and the USFWS (USFWS 2022) to identify avian species that would use habitats in the Study Area and/or be impacted by the proposed project. CNDDB is limited to species that CNDDB tracks, which are primarily species with special-status ranking, and excludes other more common species documented by observers in eBird (Appendix B).

Bird density in the Study Area and the surrounding region has been provided in Appendix A, Figure 5. Data showing bird density has been provided by CNDDB (CDFW 2023) and eBird (Cornell Lab of Ornithology 2023). Bird density in the region of the project site is highest along the coast of San



Francisco Bay that includes Anza Lagoon where the project is situated and other coastal habitats (Cornell Lab of Ornithology 2023; CDFW 2023). Other inland bird hotspots are present in areas that appear to be developed. However, bird density along the coast is a continuous band of high-density areas where birds have been observed and documented. Bird density data from eBird displays where most bird observations have been documented and may be biased towards where birds are most observable or where observers frequent the most compared to other locations.

3.2 EXISTING CONDITIONS

The Study Area is generally flat and level, with a slope along the southern border leading from the edge of the parking lot up to the sidewalk along Airport Boulevard. Elevation on the site ranges from approximately five feet above mean sea level (amsl) in the north to approximately 12 feet amsl in the south. The Study Area is situated adjacent to the Anza Lagoon and the San Francisco Bay in the San Francisco Bay Estuaries Hydrological Unit (HUC12 180500041001). Based on topographical maps, the Study Area was formerly an integral part of San Francisco Bay, and a breakwater, levee and fill were constructed between 1965 and 1969 (NETR Online 2022). Anza Lagoon is a small man-made lagoon north of the Study Area that was constructed between 1975 and 1980 (NETR Online 2022). The lagoon has limited aquatic vegetation surrounding it and the shoreline is armored with rock slope protection. Anza Lagoon is hydrologically connected to San Francisco Bay via a channel along the northern border of the lagoon. A segment of the San Francisco Bay Trail, a popular paved, recreational trail, runs along the southern border of Anza Lagoon.

The Study Area and surrounding area have a history of commercial use to support nearby San Francisco International Airport and many of the nearby parcels are developed as hotels and parking lots. Based on a review of historic aerial imagery (NETR Online 2022), the Study Area was developed as a parking lot in 2005. Previous to 2005, the Study Area was a vacant field. Appendix A, Figure 3 is an aerial map of the Study Area.

3.2.1 Vegetation Communities and Land Cover

The Study Area consists entirely of developed land and estuarine/open water habitat (Appendix A, Figure 4). These habitat types are discussed below and were previously described in the biological resources evaluation prepared for the project in 2022 (HELIX 2022). Representative site photographs are included in Appendix C.

3.2.1.1 Developed

Within the Study Area, a total of 35.91 acres of developed land is present. Developed land is where permanent structures, pavement, hardscape, roads, or other land uses prevent the establishment of vegetation, or where vegetation is associated with maintained landscaping. The project site consists of 5.05-acres developed land, which consists of an asphalt metered parking lot to serve nearby San Francisco Airport. Ornamental landscaping is present around the perimeter of the parking lot and is dominated by blue gum trees (*Eucalyptus globulus*), bank catclaw (*Acacia redolens*), and New Zealand Christmas tree (*Metrosideros excelsa*). Non-native grasses and forbs were scattered along the edges of the project site, including ice plant (*Carpobrotus edulis*), Bermuda grass (*Cynodon dactylon*), and field bindweed (*Convolvulus arvensis*). The developed land cover does not provide any significant habitat value for wildlife including avian species. Species that could use developed habitat include species that have adapted to take advantage of habitats that are altered by humans and tend to be generalist



species that have a varied diet and may use ornamental landscapes or altered habitats. Species that could occur in developed habitat include species such as house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), gulls (*Larus* sp.), rock dove (*Columbia livia*), American crow (*Corvus brachyrhynchos*), and California scrub jay (*Aphelocoma californica*).

3.2.1.2 Estuarine/Open Water (Anza Lagoon/Burlingame Lagoon/San Francisco Bay)

Within the Study Area, a total of 14.83 acres of estuarine/open water habitat is present as Anza Lagoon, San Francisco Bay and Burlingame Lagoon. The project site consists of approximately 1.96 acres of estuary/open water, that consists entirely of Anza Lagoon. This community is dominated by open waters that are subject to periodic or permanent flooding and open water areas of semi-enclosed coastal waters where tidal seawater is diluted by fresh water. The estuarine habitat in the Study Area has been significantly altered by previous construction of an artificial peninsula and Anza Lagoon which were both formerly located in the San Francisco Bay. Anza Lagoon is currently an enclosed portion of the San Francisco Bay. Construction of a breakwater has reduced flow between the two water bodies. Anza Lagoon is mostly an open water habitat with rock armored shorelines and a mudflat bottom. Estuarine habitat in the Study Area occurs along the northern and western side of the Study Area. This community is dominated by species such as California cordgrass (Spartina foliosa) and perennial pickleweed (Salicornia pacifica) and is a part of San Francisco Bay subject to the ebb and flow of the tide. Estuarine habitats provide for reproduction, feeding, resting, and cover for many species of wildlife including birds. Estuarine habitat provides shelter for large numbers of water birds, especially during periods of inclement weather or rough seas. Avian species that may use this habitat during periods of high tide include mallard (Anas platyrhynchos), green-winged teal (Anas crecca), common goldeneye (Bucephala clangula), American coot (Fulica americana), American wigeon (Mareca americana), ruddy duck (Oxyura *jamaicensis*), and northern shoveler (*Spatula clypeata*). During low tide, shorebirds such as dunlin (Calidris alpina), western sandpiper (Calidris mauri), (Calidris minutilla), and black-necked stilt (Himantopus mexicanus) could occur foraging on mud flats in Anza Lagoon.

3.2.2 Avian Use of Existing Site

Due to the disturbed nature of the Study Area, wildlife habitat is of very low quality, and wildlife species observed using the site are generally limited to urban-adapted species tolerant of regular human disturbance. Wildlife observed in the Study Area in ornamental vegetation during biological surveys included common bird species such as California gull (*Larus californicus*), white-crowned sparrow (*Zonotrichia leucophrys*), California towhee (*Melozone crissalis*), American crow, and black phoebe (*Sayornis nigricans*). Despite the low-quality vegetation present on the project site, high numbers of migrant birds are expected to occur on and/or fly past the site, given its position relative to important bird habitats such as the Anza Lagoon, San Francisco Bay, Burlingame Lagoon, and Coyote Point.

Over 250 species of birds have been documented using San Francisco Bay, a part of the Pacific Flyway which is used by millions of migrating birds during peak migrations (USFWS 2021). Some of these species are listed as threatened or endangered, including species such as western snowy plover (*Charadrius nivosus nivosus*) and least tern (*Sterna antillarum browni*). Many species of warblers, vireos, flycatchers, swallows, and other landbirds occur along the edge of the Bay in the Study Area during migration.

Anza Lagoon along the northern boundary of the Study Area is tidally influenced with a shoreline armored by imported riprap, placed against a levee that consists of fill. Anza Lagoon has the potential to support a high number of birds, particularly species associated with open water and tidal marsh habitat,



as observed during the avian survey and previous site visits. The online database -eBird -where bird enthusiasts report observations, has documented hundreds of bird species in and around Anza Lagoon over the years which include migrant and wintering birds, year-round residents, and birds associated with shoreline habitats.

During high tides, Anza lagoon provides open-water foraging habitat for waterbirds. The following species were observed during the December 2022 site visit: double-crested cormorant (*Nannopterum aruitum*), mallard, surf scoter (*Melanitta perspicillata*), greater scaup (*Aythaya marila*), lesser scaup (*Aythya affinis*), common goldeneye, bufflehead (*Bucephala albeola*), northern shoveler (*Spatula clypeata*), and American coot, which occur in flocks of varying size during winter and migration. During low tide, the lagoon provides foraging habitat for small numbers of shorebirds, including the American avocet (*Calidris mauri*), whimbrel (*Numenius phaeopus*), semi-palmated plover (*Calidris pusilla*), and least sandpiper (*Calidris minutilla*). Anza Lagoon supports a very limited amount of tidal marsh habitat, with a more naturalized shoreline amongst the riprap, but likely does not provide adequate forage, cover, or nesting locations for special-status species known to occur in the region. Species such as Alameda song sparrow (*Melospiza melodia pusillula*), a California Species of Special Concern that is associated with salt marsh habitats around the San Francisco Bay, nests and forages in the marsh vegetation along this tidal marsh shoreline year-round but would be unlikely to occur in the very restricted tical marsh habitat present along the margins of Anza Lagoon.

Burlingame Lagoon is approximately 350 feet south of the project site and the shoreline of the San Francisco Bay is within 600 feet of the project site; both areas consist of similar shoreline and open water habitats as that present in Anza Lagoon. Due to the restricted nature of natural habitats, these two areas provide limited habitat for tidal marsh species, but open water foraging habitat and low tide foraging habitat on mud flats is present for species that utilize those habitats (partially listed above). Many of these birds will fly over the Study Area while moving between the San Francisco Bay and Burlingame Lagoon and other nearby lagoons or similar aquatic habitats.

3.3 **PROPOSED CONDITIONS**

3.3.1 Assessment of Collision Risk

Tall buildings with reflective surfaces such as large clear windows pose a hazard to migrating and resident birds, as trees and sky reflected in the glass are indistinguishable from actual trees and sky. As a result, birds fly into the reflective surface thinking it is just more trees and sky and do not recognize the reflective glass as a hard barrier. Further, transparent windows that are opposite each other on a building may be perceived by avian species as a flight route rather than an obstacle.

Because birds do not necessarily perceive glass as an obstacle, their first encounter with glass is often at full speed and therefore fatal (Sheppard and Phillips 2015), especially when glass structures reflect the sky and trees, or potential habitat is visible through the glass. The location of the building, landscaping types, natural areas, glass type, lighting, and various properties of each structure are all determining factors contributing to or mitigating for the risk of bird collisions. Bird collisions with buildings can be a significant source of mortality; however, incorporating bird friendly designs can significantly reduce bird injury and mortality. The City of Burlingame General Plan requires projects in the Bayfront area to incorporate design measures into the development review process that promote bird safety as a means of minimizing adverse effects on native and migratory birds.



Resident birds are abundant in the Study Area and currently utilize the current landscaping for shelter, foraging, and nesting. It would be expected that resident birds will similarly utilize the proposed landscaping design. Since resident birds do not migrate and are present year-round, buildings and landscape features will become familiar to the residents and will be less likely to pose an avian collision risk (Sheppard and Phillips 2015). Fledgling birds are more naïve to hazards and are more likely to collide with glass when compared to adults. Although adult birds are often more familiar with their surroundings, there remains some frequency of collisions with glass particularly when startled and birds have limited time to plan their intended flight path to avoid glazed facades. As a result, a moderate number of resident birds may collide with the project buildings over time.

Migrant birds are less familiar with the local area conditions and are expected to be attracted to the project vicinity during migration periods in the spring and fall, especially along the shoreline of Anza Lagoon where landscaping currently exists that will be replaced by the proposed project. Migrating birds typically arriving need food and shelter fairly urgently and thus are less likely to be aware of risks (e.g., glass barriers) as compared to resident birds that are more familiar with their surroundings. As migrant birds seek suitable resting and foraging resources, they may be more susceptible to collisions with the buildings if they cannot detect the glass structures as solid objects. Further, migrant birds, such as swifts and swallows, that use structures for roosting and foraging habitat will be vulnerable to collisions if they perceive building interiors as potential habitat and attempt to gain entry to the building interiors through the glass. Foggy conditions, such as the San Francisco Bay region frequently experiences, may increase collision risk, as birds may be less able to perceive that glass is present.

The greatest risk of avian collisions with glazed building facades is in the area from 1 to 60 feet above ground level and within 300 feet of an Urban Bird Refuge (San Francisco Planning Department 2011), because this is the area in which most bird activity occurs (San Francisco Planning Department 2011). An Urban Bird Refuge is defined by the San Francisco Planning Department as open spaces two acres or larger dominated by vegetation such as vegetated landscaping, forest, meadows, grassland, water features, wetlands, open water, and green rooftops. Therefore, we would expect collision risk on the proposed building to be highest within approximately 60 feet of the ground where landscaped vegetation or Anza Lagoon occurs adjacent to the proposed glass buildings on the north, east, and west-facing sides of the proposed buildings (Appendix A, Figure 6). These sides of the buildings are in closest proximity to Anza Lagoon and are adjacent to landscaped areas and thus are at greatest risk of avian collision at 60 feet and below. The south sides of the two proposed buildings are within 300 feet of Anza Lagoon, however, these sides face away from Anza Lagoon and are less likely to result in avian collisions. Nonetheless, all sides of the buildings are relatively close to Anza Lagoon and the risk of avian collision is still possible on all sides of the buildings. In addition, because the proposed buildings are located within 300 feet of natural areas, proposed landscaped areas, and open-water areas in Anza Lagoon and surrounding areas in the San Francisco Bay and Burlingame Lagoon, high numbers of birds are expected to travel through the Study Area airspace over while migrating or dispersing through habitats. Thus, collision risk may also be relatively high with glazed facades on the building's upper levels if this glazing is either transparent such that areas of the sky are visible from one side of the building to the other, or reflective such that sky or water is reflected in the glazing.

The proposed building design has incorporated several bird-friendly design elements that would reduce the frequency and likelihood of avian collisions (Appendix A, Figure 7). The building will incorporate exterior glazing on Levels 2-8, which is composed of 45 percent opaque glazing that will reduce the transparency of the glass and gives it the appearance of an opaque surface similar to frosted glass. This treatment reduces the transparency of the windows thus increasing the likelihood that birds will



perceive the glass treatment as a barrier. Opaque glass, by nature also reduces the transmission of light outside of the glass and will reduce spill out and up lighting that may attract birds. Additionally, the glazing system that will be utilized will incorporate shadow boxes or recessed surfaces to breakup solid surfaces of glass. Mullion extensions will be used in random patterns to breakup expanses of glass, with the exception of the middle bay of the buildings on the south-facing side. In addition, louvers and screening are in place on Level 1 which will help break up the glass portions and reduce the risk of avian collisions. Column cladding and aluminum cladding will also break up the glass exterior on all levels.

The renderings of the buildings in Figure 4 depict the expected appearance of the constructed buildings with reasonable accuracy, such that the overall appearance of the buildings, as well as the tint of the glazing, will be a cool grey color that markedly contrasts with the sky behind it; and the glazing will not be transparent or cast extensive reflections of sky, clouds, and water. Based on this design intent, it is our opinion that the majority of birds traversing the airspace on the project site would be able to distinguish the building as a solid structure at a distance, and collision risk with Levels 2-8 of the building will be relatively low.

The project design shows the use of clear glass on the ground level in close proximity to vegetation, with vegetation visible in the design rendering through the portion of the building that will use clear glass (Appendix A, Figure 7). Although clear or transparent glass will reduce reflections of vegetation onto the glass, clear glass as designed poses a feature hazard per the Standards Bird Safe Buildings (San Francisco Planning Department 2011) since birds do not perceive glass in the same manner as humans (Sheppard and Phillips 2015). Birds will attempt to pass through the glass to reach vegetation visible on the other side or, reflections of adjacent vegetation will be visible on the glass surface and birds may attempt to access the reflected vegetation. Gelb and Delacretaz (2009) analyzed data from Audubon's Project Safe Flight in Manhattan from 1997 to 2008 analyzed critical contributing factors for structures with the largest number of bird fatalities and found that the frequency of collisions is highest along façades that have lush exterior vegetation and either reflective or transparent windows (Gelb and Delacretaz 2009).

3.3.2 Lighting

Limited information regarding the project's proposed lighting design was available for review for this assessment. The project has proposed to limit exterior lighting and shield lighting to prevent uplighting and spill lighting that would illuminate surrounding habitats and the night sky. The project design has also incorporated 45 percent opaque glass glazing across a majority of the buildings structure, which will reduce interior lighting from illuminating exterior habitats. Although the existing site supports lighting for the parking lot, the project will create new sources of lighting on the site and replace existing lighting, which was observed to be oriented downwards, a bird-friendly design to prevent uplighting.

Lighting would be provided by light fixtures illuminating the buildings, building architectural lighting, and pedestrian lighting along pathways or for vehicular traffic at the drop-off location. The installation of new lighting can potentially spill into adjacent natural areas, thereby resulting in an increase in lighting compared to existing conditions. However, existing buildings in the area that already produce lighting are already a potential attractant to migratory birds. Areas immediately to the south, west, and east of the project site are primarily developed urban areas that do not support avian communities that would be affected by project lighting. However, birds inhabiting vegetated areas adjacent to the building or in newly vegetated areas along Anza Lagoon to the north may be affected by an increase in lighting. Lighting from the project also has some potential to attract and/or disorient birds, especially during inclement weather migrating birds may descend to lower altitudes. As a result, some birds moving along



the San Francisco Bay at night may be attracted to the site, where they are more likely to collide with buildings or be disoriented by night lighting, potentially causing them to collide with the buildings.

Certain migrant bird species that use structures for roosting and foraging would be vulnerable to collisions if they were to perceive illuminated building interiors as potential roosting habitat and attempt to enter the buildings through glass walls. Similarly, migrant and resident birds would be vulnerable to collisions if they perceive vegetation within buildings as potential habitat and attempt pass through glass walls. The project site is located in the immediate vicinity of open water areas along the San Francisco Bay, especially Anza Lagoon immediately north of the site, lighting associated with the project has a greater potential to spill northwards into sensitive habitats along Anza Lagoon, and attract or disorient migrating birds during migration, compared to other nearby buildings further inland.

3.3.3 Landscaping

The project proposes to remove existing vegetation and replace it with a mixture of California native, local native and nonnative tree, shrub, and herbaceous plant species, which will provide foraging, nesting and sheltering resources for birds (Appendix A, Figures 8 and 9). The existing vegetative cover is a similar mixture of native and nonnative vegetation which birds currently use; however, the project design incorporates a Bayshore Upland zone, and an intertidal zone in addition to native plantings in the plaza which will also incorporate nonnative plantings currently not found in the Study Area. The continuing presence and enhancement of these resources will provide ecological value for the site to migrant birds, wintering birds, year-round resident birds, and birds associated with shorelines compared to existing conditions. Based on the proposed extent of vegetation on the site, as well as the native vegetation and trees included in the planting plan, this vegetation is expected to provide higher quality habitat for both resident birds and migrating birds, compared to existing conditions. Thus, a moderate increase in the abundance of resident birds and a larger increase in the abundance of migrating birds is expected because of the proposed landscaping. Waterbirds are not expected to be attracted to the site's landscaping or to change in abundance or distribution as a result of the project.

3.4 CITY OF BURLINGAME DESIGN PRINCIPLES FOR BAYFRONT COMMERCIAL ZONING DISTRICT

The project design has incorporated bird friendly designs as recommended by *Standards for Bird-Safe Buildings* (San Francisco Planning Department 2011) and *Bird Friendly Building Design* (Sheppard and Phillips 2015). Additional measures have been provided below to clarify the project design regarding the use of clear glass in proximity to vegetation, the reflectance of glass in proximity to vegetation and to further measures to address lighting regarding the project design. The project design and additional mitigation measures are expected to reduce the potential risk of bird collisions with the building per the City of Burlingame Design Principles for Bayfront Commercial Zoning District (City of Burlingame 2019).

4.0 CONCLUSIONS AND RECOMMENDATIONS

The project design has incorporated bird friendly designs as recommended by *Standards for Bird-Safe Buildings* (San Francisco Planning Department 2011) and *Bird Friendly Building Design* (Sheppard and Phillips 2015) and birds using habitats on the site and in adjacent areas should be expected to be able to perceive these buildings as a solid structure from a distance, decreasing the potential for collisions with these buildings which have been designed to be constructed mostly with an opaque glass glaze exterior.



Additional measures have been provided below to clarify project design regarding the use of clear glass, the placement of vegetation, the reflectance of the opaque glass in proximity to vegetation and to provide additional lighting measures to reduce spill out and up lighting of adjacent habitats and sky. The project design and these additional mitigation measures are expected to reduce the potential for bird collisions with the buildings per the City of Burlingame Design Principles for Bayfront Commercial Zoning District (City of Burlingame 2019).

4.1 **RECOMMENDATIONS**

4.1.1 Lighting

As required by the City of Burlingame General Plan, bird-friendly designs should be incorporated into the project to reduce impacts to migrating birds and birds in general due to collisions with the buildings and other infrastructure. Bird-friendly design features include limiting or avoiding the use of glassy material in the building's design, using protective coatings on windows to avoid reflecting the open water, the sky and surrounding vegetation, incorporating visual cues into reflective facades to make them visible to birds, avoiding or reducing light emissions at night, and pointing building lights downward. Bird friendly design should take into account potential impacts to bird species using Anza Lagoon at night and reduce nighttime lighting impacts by directing lighting downward and away from the lagoon on any poles or structures adjacent to the lagoon.

Eliminating unnecessary lighting is one of the easiest ways to reduce bird collisions, with the added advantage of saving energy and expense. As much as possible, lights should be controlled by motion sensors. Building operations can be managed to eliminate or reduce night lighting from activities near windows. Minimize perimeter and vanity lighting and consider filters or special bulbs to reduce red wavelengths where lighting is necessary. Strobe lighting is preferable to steady-burning lights. Exterior light fixtures should be designed to minimize light escaping upwards. Motion detectors are thought to provide better security than steady burning lights, because lights turning on provide a signal, and because steady lights create predictable shadows.

To raise bird awareness of building occupants, building owners may supply tenants with copies of this booklet. Building occupants can help make buildings bird-safe through the following good practices:

- Interior plants should be moved so as not to be visible from the outside;
- Consider limiting nighttime building use by combining motion-operated light sensor with daytime cleaning services. This combination will reduce light pollution and increase energy conservation;
- Consider seasonal migration needs. Unneeded interior and exterior lighting should be turned off from dusk to dawn from February 15 through May 31 and August 15 through November 30; and
- Where interior lighting is used at night, window coverings should be closed to block light transmission adequately.



4.1.2 Glass

Buildings located inside of or within a clear flight path from an Urban Bird Refuge or other similar habitat shall implement the following applicable treatments for façades adjacent to a bird refuge or suitable habitat for birds, such as open water habitat in Anza Lagoon.

- Bird-Safe Glazing Treatment is required such that the Bird Collision Zone consists of no more than 10 percent untreated glazing. Building owners are encouraged to concentrate permitted transparent glazing on the ground floor and lobby entrances to enhance visual interest for pedestrians.
- Placement of trees or tall shrubs: should be located directly adjacent to glazing (within 3 feet) to slow birds down on approach or placed far enough away to avoid reflecting canopies in the glazing.
- Reduction of bird strikes with new buildings can be achieved with simple and cost-effective means. Creating a visual signal, or "visual noise barrier," that alerts the birds to the presence of glass objects can be achieved with relatively little additional cost. Fritting, the placement of ceramic lines or dots on glass, is one method of creating a visual noise barrier. People inside the building see through the pattern, which has little effect on the human-perceived transparency of the window. Fritting can also reduce air conditioning loads by lowering heat gain, while still allowing enough light transmission for day-lighting interior spaces. There is now a commercially available insulated glass with ultra-violet patterns that are designed to deter birds while largely being imperceptible to humans.
 - Bird-safe glazing treatment may include fritting, netting, permanent stencils, frosted glass, exterior screens, physical grids placed on the exterior of glazing, or UV patterns visible to birds. To qualify as Bird-Safe Glazing Treatment, vertical elements of the window patterns should be at least 1/4 inch wide at a maximum spacing of 4 inches, or have horizontal elements at least 1/8 inch wide at a maximum spacing of 2 inches (Klem 2009).
 - We recommend including fritting or other similar design on the ground level to ensure that birds perceive the glass as a barrier on that level.



5.0 **REFERENCES**

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Appendix A

620 Airport Boulevard Project





Site and Vicinity Map





USGS Topographic Map





Aerial Map





Biological Communities



HELIX Environmental Planning

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Bird Density Map



Sources: RJA, 2022

Site Plan





Sources: DGA planning, 2022

HELIX Environmental Planning

Bird Safe Building Design



Sources: cmg, 2022

Planting Plan









Tree Plan

Appendix B

USFWS, CNDDB, and eBird Lists of Regionally Occurring Avian Species



United States Department of the Interior

FISH AND WILDLIFE SERVICE Sacramento Fish And Wildlife Office Federal Building 2800 Cottage Way, Room W-2605 Sacramento, CA 95825-1846 Phone: (916) 414-6600 Fax: (916) 414-6713



December 23, 2022

In Reply Refer To: Project Code: 2022-0071900 Project Name: 620 Airport Boulevard Redevelopment Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/ executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building 2800 Cottage Way, Room W-2605 Sacramento, CA 95825-1846 (916) 414-6600

Project Summary

Project Code:	2022-0071900
Project Name:	620 Airport Boulevard Redevelopment Project
Project Type:	Commercial Development
Project Description:	The project proponent is proposing to redevelop the existing airport
	parking surface lot with a new life science/office development.

Project Location:

Approximate location of the project can be viewed in Google Maps: <u>https://www.google.com/maps/@37.5902484,-122.34477228554726,14z</u>

	Robert E Woolley Peninsula Park	
-	Anza Lagoon	Anza Lagoon
Airport Blvd		Hiton-San Francisco Arprt Bayfront
	1	
		-

Counties: San Mateo County, California

Endangered Species Act Species

There is a total of 16 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse <i>Reithrodontomys raviventris</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/613</u>	Endangered
Birds NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/4240</u>	Endangered
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/8104</u>	Endangered
Marbled Murrelet Brachyramphus marmoratus Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <u>https://ecos.fws.gov/ecp/species/4467</u>	Threatened
 Western Snowy Plover Charadrius nivosus nivosus Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <u>https://ecos.fws.gov/ecp/species/8035</u> 	Threatened

Reptiles	
NAME	STATUS
Green Sea Turtle <i>Chelonia mydas</i> Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/6199</u>	Threatened
San Francisco Garter Snake <i>Thamnophis sirtalis tetrataenia</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/5956</u>	Endangered
NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <u>https://ecos.fws.gov/ecp/species/2891</u>	Threatened
Fishes NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <u>https://ecos.fws.gov/ecp/species/321</u>	Threatened
Insects NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/9743</u>	Candidate

Flowering Plants

NAME	STATUS
California Seablite Suaeda californica Population: No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/6310</u>	Endangered
Fountain Thistle Cirsium fontinale var. fontinale No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/7939</u>	Endangered
Marin Dwarf-flax <i>Hesperolinon congestum</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/5363</u>	Threatened
San Mateo Thornmint Acanthomintha obovata ssp. duttonii No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/2038</u>	Endangered
San Mateo Woolly Sunflower <i>Eriophyllum latilobum</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/7791</u>	Endangered
White-rayed Pentachaeta <i>Pentachaeta bellidiflora</i> No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/7782</u>	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	HELIX Environmental Planning, Inc.
Name:	Patrick Martin
Address:	11 Natomas Street
Address Line 2:	Suite 155
City:	Folsom
State:	CA
Zip:	95630
Email	patrickm@helixepi.com
Phone:	9163658700





Query Criteria: Quad IS (San Francisco South (3712264) OR Montara Mountain (3712254) OR Half Moon Bay (3712244) OR San Mateo (3712253) OR Hunters Point (3712263) OR Woodside (3712243) OR San Leandro (3712262) OR Redwood Point (3712252) OR Palo Alto (3712242))
br /> AND Taxonomic Group IS (Birds)



Selected Elements by Scientific Name California Department of Fish and Wildlife California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii	ABNKC12040	None	None	G5	S4	WL
Cooper's hawk						
Ardea herodias	ABNGA04010	None	None	G5	S4	
great blue heron						
Asio flammeus	ABNSB13040	None	None	G5	S3	SSC
short-eared owl						
Athene cunicularia	ABNSB10010	None	None	G4	S3	SSC
burrowing owl						
Brachyramphus marmoratus	ABNNN06010	Threatened	Endangered	G3	S2	
marbled murrelet						
Charadrius nivosus nivosus	ABNNB03031	Threatened	None	G3T3	S3	SSC
western snowy plover						
Circus hudsonius	ABNKC11011	None	None	G5	S3	SSC
northern harrier						
Coturnicops noveboracensis	ABNME01010	None	None	G4	S1S2	SSC
yellow rail						
Elanus leucurus	ABNKC06010	None	None	G5	S3S4	FP
white-tailed kite						
Falco columbarius	ABNKD06030	None	None	G5	S3S4	WL
merlin						
Falco peregrinus anatum	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
American peregrine falcon						
Geothlypis trichas sinuosa	ABPBX1201A	None	None	G5T3	S3	SSC
saltmarsh common yellowthroat						
Haliaeetus leucocephalus	ABNKC10010	Delisted	Endangered	G5	S3	FP
bald eagle						
Laterallus jamaicensis coturniculus	ABNME03041	None	Threatened	G3T1	S1	FP
California black rail						
Melospiza melodia pusillula	ABPBXA301S	None	None	G5T2T3	S2S3	SSC
Alameda song sparrow						
Nannopterum auritum	ABNFD01020	None	None	G5	S4	WL
double-crested cormorant						
Nycticorax nycticorax	ABNGA11010	None	None	G5	S4	
black-crowned night heron						
Rallus obsoletus obsoletus	ABNME05011	Endangered	Endangered	G3T1	S1	FP
California Ridgway's rail						
Riparia riparia	ABPAU08010	None	Threatened	G5	S2	
bank swallow						
Rynchops niger	ABNNM14010	None	None	G5	S2	SSC
black skimmer					_	
Sternula antillarum browni	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
California least tern						

Record Count: 21

eBird

Target Species

Based on 149,059 complete checklists

485 species observed in San Mateo County, California, US (region/US-CA-081) that you need for your San Mateo County Life List

1. Anna's Hummingbird	40.66% frequency	
2. American Crow	37.76%	
3. Chestnut-backed Chickadee	36.47%	
4. House Finch	33.55%	
5. Dark-eyed Junco	33.20%	
6. Black Phoebe	33.06%	
7. Common Raven	32.00%	
8. California Scrub-Jay	28.23%	
9. California Towhee	28.15%	
10. White-crowned Sparrow	27.80%	
11. Spotted Towhee	25.55%	
12. Song Sparrow	25.11%	
13. Bewick's Wren	24.73%	
14. Western Gull	23.76%	
15. American Robin	23.67%	
16. Red-tailed Hawk	22.92%	
17. Lesser Goldfinch	22.23%	
18. Steller's Jay	20.44%	
19. Mourning Dove	20.09%	
20. Yellow-rumped Warbler	19.61%	
21. Turkey Vulture	19.49%	
22. Bushtit	19.20%	
23. Golden-crowned Sparrow	19.14%	
24. European Starling	18.52%	
25. Mallard	18.28%	
26. California Gull	17.98%	
27. Double-crested Cormorant	17.52%	
28. Wrentit	16.19%	
29. Brown Pelican	15.80%	
30. Northern Flicker	15.21%	
31. Oak Titmouse	14.86%	
32. American Coot	14.67%	
33. Canada Goose	14.61%	
34. Red-shouldered Hawk	14.60%	
35. Snowy Egret	13.83%	
36. Brewer's Blackbird	13.05%	<u>Go to top</u>

37. Ruby-crowned Kinglet	12.23%
38. Acorn Woodpecker	12.10%
39. Great Blue Heron	11.72%
40. Rock Pigeon	11.67%
41. Pygmy Nuthatch	11.29%
42. Nuttall's Woodpecker	11.16%
43. Band-tailed Pigeon	11.11%
44. Red-winged Blackbird	11.00%
45. Hutton's Vireo	10.82%
46. Willet	10.62%
47. Surf Scoter	10.57%
48. Purple Finch	10.15%
49. Bufflehead	10.13%
50. Eurasian Collared-Dove	9.97%
51. Barn Swallow	9.57%
52. Hermit Thrush	9.50%
53. Pacific-slope Flycatcher	9.33%
54. California Quail	9.24%
55. Hairy Woodpecker	9.14%
56. Great Egret	8.98%
57. Western Bluebird	8.74%
58. Wilson's Warbler	8.58%
59. Townsend's Warbler	8.30%
60. Orange-crowned Warbler	8.19%
61. White-breasted Nuthatch	8.10%
62. American Goldfinch	7.99%
63. Ruddy Duck	7.72%
64. Western Grebe	7.66%
65. Brandt's Cormorant	7.59%
66. Violet-green Swallow	<mark>7.52</mark> %
67. Whimbrel	7.42%
68. Marbled Godwit	7.38%
69. American Avocet	7.36%
70. Heermann's Gull	7.29%
71. Killdeer	7.15%
72. White-tailed Kite	6.92%
73. House Sparrow	6.89%
74. Glaucous-winged Gull	6.86%
75. Northern Shoveler	<u>6.81</u> %
76. Black-bellied Plover	6.51%
77. Ring-billed Gull	6.51%

78. Savannah Sparrow	6.28%	
79. Fox Sparrow	<u>6.24</u> %	
80. Pied-billed Grebe	6.24%	
81. Common Yellowthroat	6.22%	
82. Caspian Tern	<u>6.1</u> 1%	
83. Pacific Wren	6.02%	
84. Black Oystercatcher	5.97%	
85. Black-necked Stilt	5.89%	
86. Great Horned Owl	5.89%	
87. Least Sandpiper	5.87%	
88. Downy Woodpecker	5.74%	
89. Pine Siskin	5.64%	
90. Black-headed Grosbeak	5.56%	
91. Brown Creeper	5.52%	
92. Northern Harrier	5.43%	
93. Forster's Tern	<u>5.3</u> 8%	
94. Common Goldeneye	5.38%	
95. American Wigeon	<u>5.1</u> 3%	
96. Pelagic Cormorant	<u>5.1</u> 2%	
97. American Kestrel	<u>4.9</u> 7%	
98. Green-winged Teal	<u>4.9</u> 0%	
99. Black Turnstone	<u>4.8</u> 8%	
100. Say's Phoebe	<u>4.8</u> 0%	
101. Sanderling	<u>4.7</u> 8%	
102. Western Sandpiper	<u>4.7</u> 7%	
103. Allen's Hummingbird	<u>4.6</u> 9%	
104. Brown-headed Cowbird	<u>4.6</u> 4%	
105. Greater Scaup	<u>4.6</u> 4%	
106. Common Murre	<u>4.6</u> 2%	
107. Eared Grebe	<u>4.6</u> 0%	
108. Northern Mockingbird	<u>4.4</u> 3%	
109. Swainson's Thrush	<u>4.4</u> 0%	
110. Cedar Waxwing	<u>4.4</u> 0%	
111. Long-billed Curlew	<u>4.3</u> 6%	
112. Canvasback	<u>4.2</u> 5%	
113. Cooper's Hawk	4.22%	
114. Greater Yellowlegs	4.02%	
115. Herring Gull	3.98%	
116. California Thrasher	3.83%	
117. Western Meadowlark	3.83%	<u>Go to top</u>
118. Clark's Grebe	<u>3.</u> 71%	

119. Common Loon	3.62%	
120. Gadwall	3.59%	
121. Warbling Vireo	3.52%	
122. Cliff Swallow	3.52%	
123. Belted Kingfisher	3.47%	
124. Elegant Tern	3.45%	
125. Short-billed Gull	3.33%	
126. Wild Turkey	<u>3.</u> 30%	
127. Lincoln's Sparrow	<u>3.</u> 18%	
128. Red-throated Loon	<u>3.</u> 01%	
129. Black-crowned Night-Heron	2.96%	
130. Dunlin	2.79%	
131. Spotted Sandpiper	2.77%	
132. Peregrine Falcon	2.69%	
133. Horned Grebe	<u>2</u> .67%	
134. Lesser Scaup	2.65%	
135. Northern Pintail	2.61%	
136. Semipalmated Plover	2.51%	
137. Pigeon Guillemot	2.36%	
138. Tree Swallow	2.34%	
139. Golden-crowned Kinglet	2.33%	
140. Northern Rough-winged Swallow	2.29%	
141. Pacific Loon	2.17%	
142. House Wren	2.01%	
143. Blue-gray Gnatcatcher	1.98%	
144. Olive-sided Flycatcher	1.96%	
145. Red-breasted Merganser	1.95%	
146. Sooty Shearwater	1.92%	
147. Short-billed Dowitcher	<u>1</u> .91%	
148. Surfbird	<u>1</u> .91%	
149. Marsh Wren	1.89%	
150. Yellow Warbler	1.83%	
151. Green Heron	1.76%	
152. American White Pelican	<u>1</u> .73%	
153. Osprey	1.68%	
154. Ash-throated Flycatcher	1.62%	
155. American Pipit	<u>1</u> .60%	
156. Cinnamon Teal	1.60%	
157. Long-billed Dowitcher	<u>1</u> .60%	
158. Western Screech-Owl	1.54%	Go to top
159. Varied Thrush	1.54%	P

160. Sharp-shinned Hawk	<u>1</u> .48%
161. Red-necked Phalarope	1.47%
162. Marbled Murrelet	1.45%
163. White-throated Swift	1.39%
164. Iceland Gull	1.38%
165. Hooded Merganser	1.37%
166. Ring-necked Duck	1.34%
167. Pileated Woodpecker	1.31%
168. Common Merganser	1.26%
169. Snowy Plover	1.25%
170. White-throated Sparrow	1.20%
171. Red-breasted Nuthatch	1.20%
172. Hooded Oriole	1.20%
173. Western Wood-Pewee	1.17%
174. Black Skimmer	1.17%
175. MacGillivray's Warbler	1.12%
176. Lazuli Bunting	1.11%
177. Brant	1.06%
178. Merlin	0.9298%
179. Wandering Tattler	0.9178%
180. Rhinoceros Auklet	0.9050%
181. Pink-footed Shearwater	0.9043%
182. Western Tanager	0.9030%
183. Red-breasted Sapsucker	0.8607%
184. Northern Saw-whet Owl	0.8460%
185. Black-throated Gray Warbler	0.8151%
186. Wood Duck	0.7547%
187. Tricolored Blackbird	0.7380%
188. Grasshopper Sparrow	0.7359%
189. Hermit Warbler	0.7125%
190. Red Crossbill	0.6923%
191. Black Scoter	0.6883%
192. Northern Fulmar	0.6863%
193. Blue-winged Teal	0.6816%
194. Ruddy Turnstone	0.6816%
195. Barn Owl	0.6548%
196. Cackling Goose	0.6427%
197. Red Knot	0.6192%
198. Eurasian Wigeon	0.5629%
199. Greater White-fronted Goose	0.5622%
200. Harlequin Duck	0.5468%

201.	Bonaparte's Gull	0.5273%	
202.	Wilson's Snipe	0.5226%	
203.	Northern Pygmy-Owl	0.5052%	
204.	Rock Wren	0.4924%	
205.	Bald Eagle	0.4857%	
206.	Parasitic Jaeger	0.4683%	
207.	Virginia Rail	0.4394%	
208.	Black-footed Albatross	0.4381%	
209.	Cassin's Auklet	0.4334%	
210.	White-winged Scoter	0.4260%	
211.	Western Kingbird	0.4065%	
212.	Red Phalarope	0.3985%	
213.	Pomarine Jaeger	0.3931%	
214.	Ridgway's Rail	0.3911%	
215.	Black-legged Kittiwake	0.3690%	
216.	Sora	0.3609%	
217.	Lesser Yellowlegs	0.3435%	
218.	Vaux's Swift	0.3274%	
219.	Golden Eagle	0.3267%	
220.	Loggerhead Shrike	0.3120%	
221.	Barrow's Goldeneye	0.3113%	
222.	Northern Gannet	0.2999%	
223.	Bank Swallow	0.2925%	
224.	Bullock's Oriole	0.2885%	
225.	Palm Warbler	0.2858%	
226.	Snow Goose	0.2784%	
227.	Ashy Storm-Petrel	0.2751%	
228.	Chipping Sparrow	0.2643%	
229.	Buller's Shearwater	0.2596%	
230.	Lark Sparrow	0.2516%	
231.	Sabine's Gull	0.2475%	
232.	Black-vented Shearwater	0.2475%	
233.	Cassin's Vireo	0.2402%	
234.	Nashville Warbler	0.2247%	
235.	Clay-colored Sparrow	0.2174%	
236.	Ferruginous Hawk	0.2086%	
237.	Glaucous Gull	0.2060%	
238.	Long-tailed Duck	0.2046%	
239.	Tufted Duck	0.2040%	
240.	Tropical Kingbird	0.1932%	Go to top
241.	Rufous Hummingbird	0.1811%	

242. Pectoral Sandpiper	0.1731%	
243. Laughing Gull	0.1697%	
244. Emperor Goose	0.1610%	
245. Red-necked Grebe	0.1597%	
246. Burrowing Owl	0.1590%	
247. Yellow-bellied Sapsucker	0.1563%	
248. Snow Bunting	0.1530%	
249. Baird's Sandpiper	0.1489%	
250. Black-throated Blue Warbler	0.1476%	
251. Tufted Puffin	0.1275%	
252. Black Storm-Petrel	0.1268%	
253. Redhead	0.1261%	
254. Red-footed Booby	0.1241%	
255. Orchard Oriole	0.1234%	
256. Long-tailed Jaeger	0.1161%	
257. South Polar Skua	0.1141%	
258. Great-tailed Grackle	0.1141%	
259. Short-eared Owl	0.1120%	
260. Purple Martin	0.1114%	
261. Swamp Sparrow	0.1067%	
262. Common Tern	0.1060%	
263. Lewis's Woodpecker	0.1053%	
264. White-faced Ibis	0.1033%	
265. Willow Flycatcher	0.1026%	
266. Vermilion Flycatcher	0.1006%	
267. Harris's Sparrow	0.0986%	
268. Ross's Gull	0.0966%	
269. Rose-breasted Grosbeak	0.0966%	
270. Wilson's Phalarope	0.0953%	
271. Least Tern	0.0946%	
272. Scaly-breasted Munia	0.0946%	
273. Lawrence's Goldfinch	0.0946%	
274. Eastern Phoebe	0.0939%	
275. Ancient Murrelet	0.0926%	
276. Prairie Warbler	0.0926%	
277. Black Swift	0.0919%	
278. Ross's Goose	0.0879%	
279. Arctic Tern	0.0879%	
280. Horned Lark	0.0872%	
281. Black-and-white Warbler	0.0865%	top
282. Vesper Sparrow	0.0859%	

283. Fork-tailed Storm-Petrel	0.0839%
284. Brown Booby	0.0798%
285. Pacific Golden-Plover	0.0751%
286. Chestnut-sided Warbler	0.0751%
287. Tennessee Warbler	0.0738%
288. American Dipper	0.0724%
289. Red-naped Sapsucker	0.0711%
290. Yellow-throated Warbler	0.0704%
291. Summer Tanager	0.0691%
292. Hudsonian Godwit	0.0684%
293. Indigo Bunting	0.0664%
294. Tundra Swan	0.0651%
295. White-winged Dove	0.0637%
296. Rough-legged Hawk	0.0637%
297. Blackpoll Warbler	0.0631%
298. Dusky Warbler	0.0604%
299. Yellow-breasted Chat	0.0604%
300. Common Gallinule	0.0597%
301. Bar-tailed Godwit	0.0584%
302. Wilson's Storm-Petrel	0.0577%
303. Slaty-backed Gull	0.0564%
304. LeConte's Sparrow	0.0543%
305. Laysan Albatross	0.0523%
306. Semipalmated Sandpiper	0.0517%
307. Cattle Egret	0.0517%
308. Scripps's Murrelet	0.0510%
309. Northern Waterthrush	0.0503%
310. Mute Swan	0.0476%
311. Red-masked Parakeet	0.0476%
312. Ruff	0.0470%
313. Green-tailed Towhee	0.0470%
314. Magnolia Warbler	0.0436%
315. Ring-necked Pheasant	0.0416%
316. Flesh-footed Shearwater	0.0416%
317. Crested Caracara	0.0416%
318. Mountain Bluebird	0.0416%
319. Common Poorwill	0.0409%
320. Hooded Warbler	0.0409%
321. Bell's Sparrow	0.0402%
322. Scissor-tailed Flycatcher	0.0362% Go to top
323. Sage Thrasher	0.0356%

324. Lucy's Warbler	0.0356%	
325. Yellow-throated Vireo	0.0349%	
326. Short-tailed Shearwater	0.0335%	
327. Lesser Black-backed Gull	0.0322%	
328. Black-throated Sparrow	0.0315%	
329. American Redstart	0.0302%	
330. Black Vulture	0.0289%	
331. Stilt Sandpiper	0.0275%	
332. Townsend's Solitaire	0.0275%	
333. Eastern Kingbird	0.0255%	
334. Yellow-headed Blackbird	0.0248%	
335. Worm-eating Warbler	0.0242%	
336. Graylag Goose	0.0235%	
337. Red-eyed Vireo	0.0235%	
338. Brewer's Sparrow	0.0228%	
339. Cape May Warbler	0.0215%	
340. Evening Grosbeak	0.0208%	
341. Solitary Sandpiper	0.0195%	
342. Thick-billed Kingbird	0.0188%	
343. Franklin's Gull	0.0181%	
344. American Bittern	0.0181%	
345. Canada Warbler	0.0181%	
346. Swainson's Hawk	0.0174%	
347. Barred Owl	0.0174%	
348. Royal Tern	0.0168%	
349. Cassin's Kingbird	0.0168%	
350. Lapland Longspur	0.0168%	
351. Williamson's Sapsucker	0.0161%	
352. Bell's Vireo	0.0161%	
353. Philadelphia Vireo	0.0161%	
354. Gray Catbird	0.0161%	
355. Cook's Petrel	0.0154%	
356. Dusky Flycatcher	0.0148%	
357. Lark Bunting	0.0148%	
358. Blue Grosbeak	0.0141%	
359. Horned Puffin	0.0134%	
360. Kelp Gull	0.0134%	
361. Leach's Storm-Petrel	0.0134%	
362. Murphy's Petrel	0.0134%	
363. Rock Sandpiper	0.0127%	Go to top
364 Mitred Parakeet	0.0127%	<u></u>

365.	Prairie Falcon	0.0121%	
366.	Phainopepla	0.0121%	
367.	Black-chinned Sparrow	0.0121%	
368.	Baltimore Oriole	0.0121%	
369.	Smew	0.0114%	
370.	Blue-footed Booby	0.0114%	
371.	Rusty Blackbird	0.0114%	
372.	Blackburnian Warbler	0.0114%	
373.	Craveri's Murrelet	0.0107%	
374.	Northern Parula	0.0107%	
375.	Hammond's Flycatcher	0.0101%	
376.	Virginia's Warbler	0.0101%	
377.	Hawaiian Petrel	0.0094%	
378.	Muscovy Duck	0.0087%	
379.	Manx Shearwater	0.0081%	
380.	Long-eared Owl	0.0081%	
381.	Indian Peafowl	0.0074%	
382.	Buff-breasted Sandpiper	0.0074%	
383.	Little Gull	0.0074%	
384.	Yellow-green Vireo	0.0074%	
385.	Brown Thrasher	0.0074%	
386.	Sedge Wren	0.0067%	
387.	Yellow-billed Loon	0.0060%	
388.	Masked Booby	0.0060%	
389.	Broad-winged Hawk	0.0060%	
390.	European Goldfinch	0.0060%	
391.	Broad-billed Hummingbird	0.0054%	
392.	Sandhill Crane	0.0054%	
393.	Red-throated Pipit	0.0054%	
394.	American Tree Sparrow	0.0054%	
395.	Prothonotary Warbler	0.0047%	
396.	Black Swan	0.0040%	
397.	Calliope Hummingbird	0.0040%	
398.	Guadalupe Murrelet	0.0040%	
399.	White-chinned Petrel	0.0040%	
400.	Gray Flycatcher	0.0040%	
401.	Rufous-crowned Sparrow	0.0040%	
402.	Bobolink	0.0040%	
403.	Dickcissel	0.0040%	
404.	Costa's Hummingbird	0.0033%	<u>Go</u> to top
405.	Black Tern	0.0033%	<u></u>

406. Kentucky Warbler	0.0033%
407. Black-tailed Gull	0.0027%
408. Gull-billed Tern	0.0027%
409. Great Shearwater	0.0027%
410. Ovenbird	0.0027%
411. Bay-breasted Warbler	0.0027%
412. Yellow-crowned Night-Heron	0.0020%
413. Budgerigar	0.0020%
414. Least Flycatcher	0.0020%
415. Plumbeous Vireo	0.0020%
416. Yellow-billed Magpie	0.0020%
417. Northern Red Bishop	0.0020%
418. Painted Bunting	0.0020%
419. Mandarin Duck	0.0013%
420. Laughing Dove	0.0013%
421. Chimney Swift	0.0013%
422. Black Rail	0.0013%
423. Red-billed Tropicbird	0.0013%
424. Short-tailed Albatross	0.0013%
425. Wedge-tailed Shearwater	0.0013%
426. Swinhoe's White-eye	0.0013%
427. Nelson's Sparrow	0.0013%
428. Helmeted Guineafowl	0.0007%
429. Red Junglefowl	0.0007%
430. Chilean Flamingo	0.0007%
431. Lesser Nighthawk	0.0007%
432. Black-chinned Hummingbird	0.0007%
433. American Golden-Plover	0.0007%
434. Sharp-tailed Sandpiper	0.0007%
435. Curlew Sandpiper	0.0007%
436. Parakeet Auklet	0.0007%
437. Arctic Loon	0.0007%
438. Salvin's Albatross	0.0007%
439. Streaked Shearwater	0.0007%
440. Nazca Booby	0.0007%
441. Least Bittern	0.0007%
442. Cockatiel	0.0007%
443. Yellow-chevroned Parakeet	0.0007%
444. Dusky-capped Flycatcher	0.0007%
445. Sulphur-bellied Flycatcher	0.0007%
446. Northern Shrike	0.0007%

447. Pinyon Jay	0.0007%
448. Red-whiskered Bulbul	0.0007%
449. Canyon Wren	0.0007%
450. Village Weaver	0.0007%
451. Zebra Finch	0.0007%
452. Pin-tailed Whydah	0.0007%
453. Golden-winged Warbler	0.0007%
454. Fulvous Whistling-Duck	0.0000%
455. King Eider	0.0000%
456. Mountain Quail	0.0000%
457. Common Ground Dove	0.0000%
458. Greater Roadrunner	0.0000%
459. Yellow-billed Cuckoo	0.0000%
460. Common Nighthawk	0.0000%
461. Chuck-will's-widow	0.0000%
462. Yellow Rail	0.0000%
463. Mountain Plover	0.0000%
464. Least Auklet	0.0000%
465. Wood Stork	0.0000%
466. Magnificent Frigatebird	0.0000%
467. Little Blue Heron	0.0000%
468. Snowy Owl	0.0000%
469. Spotted Owl	0.0000%
470. Rose-ringed Parakeet	0.0000%
471. Blue-headed Vireo	0.0000%
472. Clark's Nutcracker	0.0000%
473. Mountain Chickadee	0.0000%
474. Bohemian Waxwing	0.0000%
475. White Wagtail	0.0000%
476. Brambling	0.0000%
477. Cassin's Finch	0.0000%
478. Yellow-fronted Canary	0.0000%
479. Chestnut-collared Longspur	0.0000%
480. Rustic Bunting	0.0000%
481. Field Sparrow	0.0000%
482. Connecticut Warbler	0.0000%
483. Black-throated Green Warbler	0.0000%
484. Painted Redstart	0.0000%
485. Scarlet Tanager	0.0000%

Appendix C

Representative Site Photos



Photo 1. View of the existing parking lot and ornamental landscaping along the northern border of the Study Area. September 2, 2021.



Photo 2. View of the parking lot and ornamental landscaping along the southern border of the Study Area. September 2, 2021.



Representative Site Photos



Photo 3. View of gravel fill and chain-link fencing along the northern border of the Study Area. September 2, 2021.



Photo 4. View of the ornamental landscaping and San Francisco Bay Trail surrounding Anza Lagoon. September 2, 2021.



Representative Site Photos



Photo 5. View of a pedestrian bridge spanning the inlet where Anza Lagoon connects with the San Francisco Bay. September 2, 2021.



Photo 6. View of Anza Lagoon and adjacent tall buildings. December 14, 2022.



Representative Site Photos



Photo 7. View of existing vegetation along the northern border of the Study Area. December 14, 2022.



Photo 8. View of snowy egrets foraging in Anza Lagoon. December 14, 2022.



Representative Site Photos