

# CONSERVATION



The natural resources in the Town and surrounding area form an important part of Tiburon's unique character and quality of life. These resources include cultural resources, biological resources, air quality, geology and soils, mineral and energy resources, hydrology and water quality, and aesthetic resources. These resources are described in relation to the Town and the General Plan Planning Area, which includes the Town, its Sphere of Influence (SOI), and land in the Planning Area outside of the SOI.

## Topics:

- 1 **Cultural and Historic Resources**
- 2 **Biological Resources**
- 3 **Air Quality**
- 4 **Geology, Soils, and Seismicity**
- 5 **Mineral and Energy Resources**
- 6 **Hydrology and Water Quality**
- 7 **Aesthetics and Visual Resources**

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# 1 CULTURAL AND HISTORIC RESOURCES

These resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archeological, cultural, including tribal cultural, or scientific importance. Preservation of Tiburon's cultural heritage should be considered when planning for the future.

## KEY TERMS

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**Archeology.** The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

**Complex.** A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archeological culture.

**Ethnography.** The study of contemporary human cultures.

**Midden.** A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

**Paleontology.** The science of the forms of life existing in former geologic periods, as represented by their fossils.

## REGULATORY FRAMEWORK

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### FEDERAL

#### National Historic Preservation Act

Most regulations at the Federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for Federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any Federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

#### American Indian Religious Freedom Act and Native American Graves and Repatriation Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

#### Other Federal Legislation

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archeological sites. It established a system of permits for conducting archeological studies on Federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archeological sites on Federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

## STATE

### California Register of Historic Resources

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the California Register of Historic Resources (CRHR). Historic properties listed, or formally designated for eligibility to be listed, on the National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

### California Environmental Quality Act

CEQA requires that lead agencies determine whether projects may have a significant effect on archeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as “unique,” “important,” listed on the CRHR, or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process. CEQA emphasizes avoidance of archeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources,
- evaluate the significance of the cultural resources found,
- evaluate the effects of the project on cultural resources, and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

Historical resources are considered part of the environment and a project that may cause a substantial adverse effect on the significance of a historical resource is a project that may have a significant effect on the environment. CEQA Guidelines Section 15064.5 defines what constitutes a historical resource, including: (1) a resource determined by the State Historical Resources Commission to be eligible for the California Register of Historical Resources (including all properties on the National Register); (2) a resource included in a local register of historical resources, as defined in Public Resources Code (PRC) Section 5020.1(k); (3) a resource identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (4) any object, building, structure, site, area, place, record, or manuscript that the City determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the City's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered to be historically significant if it meets the criteria for listing on the California Register.

Furthermore, AB 52 amended CEQA to: (1) define an adverse change to a Tribal Cultural Resource as a “significant impact;” and, (2) require consultation with affected California Native American Tribes prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project.

“Tribal Cultural Resources” as defined by CEQA include “sites, features, places, cultural landscapes, sacred places, and objects with a cultural value to a California Native American Tribe” that are included or eligible for inclusion in the California

Register of Historical Resources, or in a local register of historical resources. “Tribal Cultural Resources” also include cultural landscapes, historical resources, and non-unique archaeological resources that meet these criteria. A lead agency has discretion to designate a resource as a “Tribal Cultural Resource.”

### **State Laws Pertaining to Human Remains**

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-Federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

### **Senate Bill 18 (Chapter 905, Statutes 2004)**

Senate Bill (SB) 18 requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places (“cultural places”) through local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §65352.4, and §65562.5 to the Government Code; also requires the Governor’s Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments on how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

### **Assembly Bill 52 (Chapter 532, Statutes of 2014)**

Assembly Bill (AB) 52 establishes a formal consultation process for California tribes as part of CEQA and equates significant impacts on “tribal cultural resources” with significant environmental impacts (PRC Section 21084.2). AB 52 defines a “California Native American Tribe” as a Native American tribe located in California, and included on the contact list maintained by the Native American Heritage Commission. AB 52 requires formal consultation with California Native American Tribes prior to determining the level of environmental document if a tribe has requested to be informed by the lead agency of proposed projects. AB 52 also requires that the consultation address project alternatives and mitigation measures, for significant effects, if requested by the California Native American Tribe, and that consultation be considered concluded when either the parties agree to measures to mitigate or avoid a significant effect, or the agency concludes that mutual agreement cannot be reached.

## **LOCAL**

### **Tiburon General Plan**

The existing Tiburon General Plan Open Space & Conservation Element and Downtown Element identifies the following goals, policies, and implementing programs related to cultural resources:

### **Open Space and Conservation Element**

#### **Goals**

The Open Space and Conservation Element does not establish any goals specific to cultural resources.

#### **Policies**

OSC-47: The Town shall protect significant geological, ecological, archeological, and paleontological resources and historic sites.

OSC-48: The Town will strive to preserve and protect structures and properties which have historical, cultural, aesthetic, or other special character or interest to the Town.

### Implementing Programs

OSC-h: The Town shall create and adopt an overlay zone for the area containing the Town's Inventory of Local Historical Buildings and adopt additional protection measures for the structures identified in the Inventory.

OSC-i: The Town shall either establish an inventory of sites which have known archaeological sites or the possibility of containing archaeological sites; or enter into an agreement with an outside entity which can provide similar services. Where sites have the possibility of containing archaeological resources, project sponsors shall be required to notify contractors to cease construction activities upon encountering archaeological artifacts or human remains until proper authorities have been notified and a mitigation plan is developed.

### Downtown Element

#### Goals

DT-A: To preserve and enhance the historical attributes and small-town village character of Downtown that exists on Main Street and Ark Row.

#### Policies

DT-19: **Throughout Downtown** Character defining elements of buildings listed on the Town's Inventory of Local Historical Buildings (Resolution No. 07-2001 as amended) shall be retained, preserved, and restored whenever feasible.

DT-23: **Ark Row** Public and private improvements (including signs) shall be compatible with and shall not compromise Ark Row's historic resources and its unique character.

DT-24: **Ark Row** The historic arks, cottages, and other resources of Ark Row shall be retained and rehabilitated consistent with recommended actions provided in applicable sections of The Secretary of Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings.

### Implementing Programs

DT-g: The Town shall adopt a resolution designating the former Northwest Pacific Railroad Yard palm tree as a protected tree.

### Town of Tiburon Municipal Code

Chapter 13 – Historic Landmarks. The purpose of this chapter is to promote the general and economic welfare of the town by preserving, enhancing, or perpetuating those places, buildings, structures, works of art and other objects having a special historical interest or value for their use, education, and view of the general public.

## ENVIRONMENTAL SETTING

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Cultural resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archeological, cultural, or scientific importance. Preservation of the Tiburon's cultural heritage should be considered when planning for the future.

### PREHISTORY

Humans are believed to have resided in southern Marin County for the past 13,000 years. Archeologists who have studied these past cultures have uncovered evidence of widespread activities that allowed them to divide these previous 13,000 years into periods or phases based on the kinds of subsistence behaviors practiced.

Six periods have been identified with locally defined phases and regional cultures added to the mix. The six periods are:

- Early Holocene (Lower Archaic), 8000 - 3500 B.C
- The Early Middle Period (Middle Archaic), 3500 B.C. - 500 B.C.
- The Lower Middle Period (Initial Upper Archaic), 500 B.C. – A.D. 430
- Upper Middle Period (Late Upper Archaic), A.D. 430 – A.D. 1050
- Initial Late Period (Lower Emergent), A.D. 1050 – A.D. 1550
- Terminal Late Period: Protohistoric Ambiguities, A.D. 1550 – 1775 (Milliken et al. in Jones and Klar 2007).

### **Early Holocene (Lower Archaic), 8000 B.C. – 3500 B.C.**

Few Bay Area sites have been discovered to represent this time period. A pattern of generalized mobile foraging with artifacts such as the milling slab and hand stone (mano and metate), and large wide stem and leaf shaped projectile points common.

### **The Early Middle Period (Middle Archaic), 3500 B.C. – 500 B.C.**

New technological advances involving the use of the mortar and pestle first appear during this period as does the first evidence for the manufacture of shell beads. Researchers suggest increased sedentism occurred as did an expansion in trade.

### **The Lower Middle Period (Initial Upper Archaic), 500 B.C. – A.D. 430**

A dramatic shift in the types of shell beads being manufactured is observed at sites with components dating to this period. New types of bone tools, such as the barbless fishhooks, first appeared indicating an increasing exploitation of the immediate environment, probably brought on by increasing populations pressures.

### **Upper Middle Period (Late Upper Archaic), A.D. 430 – A.D. 1050**

A.D. 430 witnessed another dramatic shift in the selection of bead styles and the way people were buried. What caused this dramatic cultural upheaval is uncertain. The formally popular style of shell beads became obsolete with new, smaller varieties becoming widespread.

### **Initial Late Period (Lower Emergent), A.D. 1050 – A.D. 1550**

Populations continued to increase as did resource exploitation and with it a whole new level of the manufacture of numerous, finely made grave goods that were buried with the dead. Social stratification can also be observed in the differing amounts of grave goods interred with a particular individual. The bow and arrow appeared in the area around A.D. 1250 causing among other things, a shift in the procurement of rock types and sources used in the manufacture in this new technological innovation.

### **Terminal Late Period: Protohistoric Ambiguities, A.D. 1550 – 1775**

Once again, the style of shell beads abruptly changed throughout the Bay Area. Grave goods became less common and some researchers have suggested that populations were faced with increasing stress by over population and perhaps the early introduction of European-based diseases.

## **ETHNOLOGY**

### **COAST MIWOK**

The voyages of Drake in 1579 and Cermeño in 1595 resulted in sketchy accounts of the life of the Coast Miwok prior to disruption of the native culture. The Coast Miwok traditional way of life disappeared rapidly after the founding of the mission at San Francisco in 1776 and the later missions at San Rafael and Sonoma. Forced movement of Coast Miwok to the missions and the determination of the friars to convert the natives to Christianity and destroy all vestiges of their former life, along with epidemic diseases of the whites, soon left few natives that could remember the pre-contact culture. The Russian colony at Fort Ross used Bodega Bay in Coast Miwok territory as a port, but the Russian policy was to interfere with Indian life only to the extent necessary to harvest the maximum number of sea otter pelts.

The Coast Miwok occupied what is now Marin County and part of Sonoma County, as far north as the vicinity of Sebastopol. There is extensive coastline in this territory and resources from the sea and salt marshes were important in Coast Miwok subsistence; however, the resources available in the interior of their territory were by no means ignored. Sea mammals were not part of the diet, but various species of fish were taken with nets, seines, weirs, spears, and line-with-gorge technologies. Even more important in the diet were clams and some species of mussel, resulting in the characteristic coastal shell middens familiar through archeology.

The most important food resource, as with most California Indians, was the acorn. It was leached to remove most of the tannic acid and then ground into meal and prepared in various ways. It was particularly valuable because the meal could be stored against times of shortage of other foods. Kelp was collected, dried, and stored as another hedge against seasonal shortages. The interior of the territory provided, in addition to acorns, the many mammals and rodents that were hunted or trapped. Birds, both interior and coastal, were netted and a wide variety of vegetable foods were collected. Despite the relative abundance of their food sources, winter and early spring were still times of short food supply, and stored acorns and kelp were then the primary foods (Kelly 1978).

Villages were situated so as to be handy to food resources at various times of year. The Coast Miwok moved among residences on the coast, around salt or freshwater marshes and on interior streams so that they would be close to the most abundant food supply available at a particular season. Dwellings were conical brush-on-frame structures capable of sheltering up to ten individuals. Other structures included semi-subterranean sweathouses, that served as something of a men's club, and--at major villages--a dance house for religious ceremonies. The dance house was basically the same construction as the sweathouse only larger. An excavation about two feet deep and fifteen in diameter formed the floor and a timber framework supported a brush dome capped with earth (Kroeber 1925).

Archeology has provided an extensive collection of the stone tools that were used, but it is clear from ethnology that basketry and cordage were used for the majority of utilitarian objects. These materials do not preserve well, so they are uncommon in archeological sites. Basket making was a highly developed skill and baskets were woven tightly enough to hold water and cooking of acorn mush was accomplished by dropping hot rocks into baskets containing the mush. Cordage was used for the variety of nets used in taking fish, birds, and small mammals.

In terms of socio-political organization, the term Coast Miwok is primarily a convenience for anthropologists, denoting a group speaking the same language and occupying a contiguous territory. In fact, there was no overall political control of this group and the real basis of social organization was the main village. Major villages were occupied by a group of related families under the authority of a headman. Even at this level the powers of the headman were limited and, basically, advisory. No overall authority for Coast Miwok was recognized, and village groups were sometimes on better terms with their Pomo or Patwin neighbors than with other Coast Miwok village groups. Within the village group, close ties were maintained through the extensive religious/ceremonial life and through kinship ties (Kelly 1978).

Through much of aboriginal California, shell beads served as a form of currency. As a coastal people, the Coast Miwok had access to the raw material and bead manufacture was an important industry because it provided currency to trade for goods from neighboring groups. This allowed the Coast Miwok to import obsidian from the Wappo to the north to use in making arrowheads and other edged tools. Chert was used to form more utilitarian edged implements, but obsidian was the preferred material. Yellow ocher was also obtained from the Wappo for paint and venison and magnesite cylinders were obtained from the Pomo (Kelly 1978). Despite their access to clam shell, the trade relationships of the Coast Miwok do not appear to have been very extensive. Perhaps this reflects the relative abundance of resources available in their own territory.

## HISTORIC PERIOD

Tiburon is a community that has had extensive documentation over the years and remains committed to the preservation and protection of resources through the Belvedere-Tiburon Landmarks Society, a non-profit group founded in 1959. Until

the Covid-19 pandemic caused closures, the Landmarks Society maintained the Landmarks History Collection with two archivists, and published articles and books on the local history, as well as creating videos.

The Landmarks Society maintains a website providing access to all of these resources to the public. Of particular value is the detailed timeline of events for the community. The Landmarks Society manages and maintains the Old St. Hilary's Landmark and the surrounding wildflower preserve, the China Cabin (in Belvedere), the Railroad Ferry & Depot Museum, and the Landmarks Art and Garden Center.

Many pictorial books have been published on the history of the community, with photographs documenting buildings within Tiburon, including:

Fanning, Branwell

2006 *Images of America: The Tiburon Peninsula*. Arcadia Publishing, Charleston.

2010 *Then & Now: Tiburon and Belvedere*. Arcadia Publishing, Charleston.

Fanning, Branwell and William Wong

2007 *Images of America: Angel Island*. Arcadia Publishing, Charleston.

Heig, James, editor.

1984 *Pictorial History of Tiburon: A California Railroad Town*. Scottwell Associates, San Francisco.

A number of other publications document different aspects of the community and economy of the Town.

The land of the Tiburon Peninsula was first awarded by the Mexican government to John Thomas Reed in 1834 as the Rancho Corte de Madera del Presidio. An Irish sailor, Read had arrived in the area in 1826, and became a Mexican citizen in 1834. His widow and four children applied for confirmation of the grant of 7,845 acres; it was finally awarded to the family in 1884. Dairying and cod fishing were two major industries in the area.

Angel Island, first named by early arrivals in San Francisco Bay in 1775, has been called by its current name since the arrival of the Americans in the region. It is the largest island in San Francisco Bay, and has served as a cattle ranch, part of the coastal defense system, the West Coast immigration station (1910-1940), a prisoner of war camp, and a Nike missile base. Since 1962, the island has been a California State Park.

In 1882, Peter Donahue made a deal with the Reed family for a railroad right-of-way for the North Pacific Railroad (name later changed to Northwestern Pacific). The railroad company built a railroad yard and ferry terminal, with ferries taking commuters and vehicles to San Francisco and Sausalito. Barges hauled loaded freight cars to San Francisco and Richmond. In the 1970s, the abandoned railroad was removed, and the right-of-way purchased by Tiburon for the waterfront path. The railyards were used for housing and commercial projects.

Other enterprises in the Town included the U.S. Navy Coaling Station where ships refueled, beginning operations in 1904 until 1931. That site became the California Maritime Academy until World War II and was converted to the manufacture of anti-submarine nets. Later, research facilities were established at the site.

For many years, most of the land of the peninsula were controlled by descendants of the Reed family and used for cattle ranching. Development began after the War on smaller tracts. Eventually, the primary landowners finalized a Master Plan in 1956.

In 1961, Richardson Bay Audubon Center became established, representing a culmination of a seven-year local campaign to protect bay and shoreland from real estate development. The Center includes the Rose Verrall gift of nine shoreland acres

and the wildlife sanctuary of nine hundred tideland acres. This was followed by the dedication of Old St. Hillary's Historic Preserve, which was the first hillside open space conserved with wildflower acreage as part of Marin County parks system.

There were attempts to incorporate a city of Tiburon, opposed by the large landowners. In 1964, the incorporation became official and included Angel Island. The citizens elected a city council, and a city manager engaged. Open space became a priority. A major preservation effort was launched to revitalize Main Street and Downtown Tiburon. New buildings have been added to provide community services.

In 1971, the Richardson Bay Path and lineal park was established on an old railroad right-of-way along the shoreline. This was followed by the acquisition of the Belvedere Cove waterfront by the Town for open space, panoramic vista and preservation of China Cabin. In the many years after in 1983, the Ring Mountain Preserve was dedicated under ownership and management of The Nature Conservancy.

**CULTURAL RESOURCES**

**Northwest Information Center**

One hundred and forty-two cultural resources have been identified within the Town’s General Plan Planning Area, according to files maintained by the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS). The one hundred and forty-two recorded cultural resources represent both the prehistoric and historic periods (see Table 1-1).

Most of the prehistoric period resources were identified in the early part of the 20<sup>th</sup> century by archeologist Nels Nelson who recorded over 400 shell mound midden sites along the Bay Area’s shorelines during this period (thirty-two in the Planning Area). Many of these shell mound middens were the result of simple shellfish processing and do not possess artifacts or features that indicate habitation while others are connected with more permanently inhabited prehistoric village sites, some of which continued to be occupied well into the early Spanish Period. In addition to the prehistoric resources identified by Nelson, 11 other prehistoric sites, including prehistoric rock art, habitation, and lithic scatter have been identified in the Planning Area. Historic resources include a preponderance of historic period resources relates to Angel Island’s military installations and immigration station, as well as assorted historic foundations, walls, and buildings in the Planning Area.

**TABLE 1-1: RESOURCES LISTED WITH THE NORTHWEST INFORMATION CENTER FILE DIRECTORY**

PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
P-21-000055 / CA-MRN-000024	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 24
P-21-000056 / CA-MRN-000025	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 25
P-21-000057 / CA-MRN-000026	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 26
P-21-000058 / CA-MRN-000027	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 27
P-21-000059 / CA-MRN-000028	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 28
P-21-000060 / CA-MRN-000029	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 29
P-21-000061 / CA-MRN-000030	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 30
P-21-000062 / CA-MRN-000031	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 31
P-21-000063 / CA-MRN-000032	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 32

PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
P-21-000064 / CA-MRN-000033	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 33
P-21-000065 / CA-MRN-000034	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 34
P-21-000066 / CA-MRN-000035	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 35
P-21-000067 / CA-MRN-000036	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 36
P-21-000068 / CA-MRN-000037	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 37
P-21-000069 / CA-MRN-000038	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 38
P-21-000072 / CA-MRN-000042	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 42
P-21-000073 / CA-MRN-000043	Not Listed	Prehistoric Habitation/Quarry	Nelson No. 43
P-21-000074 / CA-MRN-000044	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 44
P-21-000075 / CA-MRN-000045	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 45
P-21-000076 / CA-MRN-000046	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 46
P-21-000077 / CA-MRN-000047	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 47
P-21-000078 / CA-MRN-000048	Not Listed	Prehistoric Habitation/Shell Midden	Nelson No. 48
P-21-000079 / CA-MRN-000049	Not Listed	Prehistoric Habitation/Shell Midden	Nelson No. 49
P-21-000080 / CA-MRN-000050	Not Listed	Prehistoric Habitation/Shell Midden	Nelson No. 50
P-21-000081 / CA-MRN-000051	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 51
P-21-000082 / CA-MRN-000052	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 52
P-21-000083 / CA-MRN-000053	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 53
P-21-000084 / CA-MRN-000054	Not Listed	Prehistoric/Historic Habitation/Shell Midden	Nelson No. 54
P-21-000085 / CA-MRN-000055	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 55
P-21-000086 / CA-MRN-000056	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 56
P-21-000087 / CA-MRN-000057	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 57
P-21-000088 / CA-MRN-000058	Not Listed	Prehistoric Habitation/ Shell Midden	Nelson No. 58
P-21-000267 / CA-MRN-000281	Not Listed	Prehistoric/Historic Habitation	Not Listed
P-21-000371 /	Not Listed	Prehistoric Habitation	Not Listed

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PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
CA-MRN-000405			
P-21-000385 / CA-MRN-000423	Not Listed	Prehistoric Rock Art	Not Listed
P-21-000386 / CA-MRN-000425	Not Listed	Prehistoric Rock Art	Not Listed
P-21-000407 / CA-MRN-000453	Not Listed	Prehistoric Habitation	Lee's Shell Mound
P-21-000408 / CA-MRN-000454	Not Listed	Prehistoric Habitation	Not Listed
P-21-000409 / CA-MRN-000455	Not Listed	Prehistoric Habitation	Not Listed
P-21-000415 / CA-MRN-000461	Not Listed	Prehistoric Habitation	Not Listed
P-21-000530 / CA-MRN-000604	Not Listed	Prehistoric Lithic Scatter	Not Listed
P-21-000531 / CA-MRN-000605	Not Listed	Prehistoric Lithic Scatter	Not Listed
P-21-000545 / CA-MRN-000407	Not Listed	Prehistoric Habitation	Not Listed
P-21-000576 / CA-MRN-000617H	Not Listed	Historic Foundations	Not Listed
P-21-000577 / CA-MRN-000618H	Angel Island	Historic Military Property	Battery Wallace, Building 89
P-21-000578 / CA-MRN-000619H	Not Listed	Historic Cemetery	Not Listed
P-21-000579 / CA-MRN-000620H	Not Listed	Historic Foundations	Not Listed
P-21-000580 / CA-MRN-000621H	Not Listed	Historic Refuse Scatter/Wall	Not Listed
P-21-000581 / CA-MRN-000622H	Not Listed	Historic Foundations	Not Listed
P-21-000582	Not Listed	Historic Concrete Rubble	Not Listed
P-21-000583	Not Listed	Historic Foundation	Not Listed
P-21-000584	Not Listed	Historic Water Conveyance Feature	Not Listed
P-21-000585	Not Listed	Historic Cistern	Not Listed
P-21-000586	Not Listed	Historic Refuse Scatter	Not Listed
P-21-000587/ CA-MRN-000623H	Not Listed	Historic Foundation	Not Listed
P-21-000588	Not Listed	Historic Foundations/Landscape	Not Listed
P-21-000589	Not Listed	Historic Building	Not Listed
P-21-000590	Angel Island	Historic Improved Spring Feature	Stone Spring Box
P-21-0005891	Angel Island	Historic Water Tanks	Concrete Tank Site
P-21-000592	Angel Island	Historic Water Tank	Redwood Tank Site
P-21-000595 / CA-MRN-000627	Not Listed	Prehistoric Isolated Artifact	Not Listed

PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
P-21-000625 / CA-MRN-000641	Not Listed	Prehistoric Lithic Scatter	Not Listed
P-21-001091	13 Main Street, Tiburon	Historic Commercial Building	Not Listed
P-21-001092	Not Listed	Historic Single Family Property	Railway Employees Houses/Sharktown
P-21-001093	Not Listed	Historic Single Family Property	Grant House
P-21-001094	Not Listed	Historic Wetland Feature	Downtown Marsh
P-21-001099	Angel Island	Historic District	Angel Island District
P-21-002436	Angel Island	Historic Military Property	Bachelors Officer's Quarters
P-21-002437	Angel Island	Historic Military Property	Residence Building
P-21-002438	Angel Island	Historic Military Property	Residence Building
P-21-002439	Angel Island	Historic Military Property	Residence Building
P-21-002440	Angel Island	Historic Military Property	Old Hospital Building, Building 316
P-21-002441	Angel Island	Historic Military Property	Company Officer's Quarters
P-21-002442	Angel Island	Historic Military Property	Field Officer's Quarters
P-21-002443	Angel Island	Historic Military Property	General Shafter Quarters
P-21-002444	Angel Island	Historic Military Property	Non-Commissioned Officer's Quarters
P-21-002445	Angel Island	Historic Military Property	Company Officer's Quarters
P-21-002446	Angel Island	Historic Military Property	Quartermaster's Storehouse
P-21-002447	Angel Island	Historic Military Property	Detention Barracks, Building 317
P-21-002448	Angel Island	Historic Military Property	Power House, Building 314
P-21-002449	Angel Island	Historic Military Property	Stable/Mule Barn, Building 313
P-21-002450	Angel Island	Historic Military Property	Carpentry Shop
P-21-002451	Angel Island	Historic Military Property	WWII Barracks, Building 241
P-21-002452	Angel Island	Historic Military Property	WWII Barrack, Building 242
P-21-002453	Angel Island	Historic Military Property	WWII Mess Hall, Building 233
P-21-002454	Angel Island	Historic Military Property	Sentry Tower
P-21-002455	Angel Island	Historic Military Property	Monument
P-21-002456	Angel Island	Historic Military Property	Bell
P-21-002457	Angel Island	Historic Military Property	Immigration Station Site
P-21-002541	Angel Island	Historic Military Property	Angel Island Telegraph
P-21-002553	Not Listed	Prehistoric Habitation	Gilmartin Mound
P-21-002630	Not Listed	Historic Rock Wall	Not Listed
P-21-002636	Angel Island	Historic Road/Trail	Perimeter Road/Perle's Beach Trail
P-21-002654	Not Listed	Prehistoric Habitation	Not Listed
P-21-002655	Not Listed	Prehistoric Habitation	Not Listed
P-21-002662	20- 22 Main Street, Tiburon	Historic Commercial Building	Harbor Light
P-21-002664 / CA-MRN-684H	Not Listed	Historic Refuse Scatter	Not Listed
P-21-002859	Rock Hill Drive & Del Mar Drive, Tiburon	Historic Commercial Building	Belvedere Tennis Club

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PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
P-21-002912	Paradise Park Marina, Tiburon	Historic Wharf	El Campo Resort/Monticello Grove
P-21-003019	Angel Island	Historic District	Camp Reynolds District
P-21-003021 / CA-MRN-00754/H	Not Listed	Prehistoric Habitation	Not Listed
P-21-003022	Angel Island, West Garrison	Historic Military Property	600 Man Barracks
P-21-003023	Angel Island, West Garrison	Historic Military Property	Captain's Quarters, Building 54
P-21-003024	Angel Island, West Garrison	Historic Military Property	NCO Quarters, Building 55
P-21-003025	Angel Island, West Garrison	Historic Military Property	Chapel, Building 59
P-21-003029	Angel Island, West Garrison	Historic Military Property	NCO Quarters, Building 58
P-21-003030	Angel Island, West Garrison	Historic Military Property	Mule Barn, Building 69
P-21-003031	Angel Island, West Garrison	Historic Military Property	NCO Quarters, Building 70
P-21-003032	Angel Island, West Garrison	Historic Military Property	NCO Quarters, Building 71
P-21-003033	Angel Island, West Garrison	Historic Military Property	NCO Quarters, Building 79
P-21-003034	Angel Island, West Garrison	Historic Military Property	Office and Barracks/West garrison Hospital
P-21-003035	Angel Island, West Garrison	Historic Military Property	Latrine, Building 86
P-21-003036	Angel Island, West Garrison	Historic Military Property	West Garrison Flagpole/Camp Reynolds Flagpole
P-21-003037	Angel Island, West Garrison	Historic Military Property	Quarters/Duplex, Building 95
P-21-003038	Angel Island, West Garrison	Historic Military Property	NCO Quarters, Building 72
P-21-003045	Angel Island, North Garrison	Historic Military Property	Fire Station, Building 231
P-21-003046	Angel Island	Historic Military Property	Cable Vault/Subterranean Cable Vault
P-21-003064	Angel Island	Historic Military Property	Battery, Building 88
P-21-003066	Angel Island, East Garrison	Historic Military Property	Administration Building
P-21-003067	Angel Island, East Garrison	Historic Military Property	Hospital/Hospital Annex, Building 23
P-21-003068	Angel Island, East Garrison	Historic Military Property	Post Exchange, Building 19
P-21-003069	Angel Island, East Garrison	Historic Military Property	Guard House, Building 20
P-21-003070	Angel Island, East Garrison	Historic Military Property	Mess & Drill Hall, Building 22
P-21-003071	Angel Island, East Garrison	Historic Military Property	N.C.O. Quarters, Building 24
P-21-003072	Angel Island, East Garrison	Historic Military Property	N.C.O. Quarters, Buildings 25-28
P-21-003073	Angel Island, East Garrison	Historic Military Property	Officer's Club, Building 29
P-21-003074	Angel Island, East Garrison	Historic Military Property	Tennis Courts
P-21-003075	Angel Island, East Garrison	Historic Military Property	N.C.O. Quarters, Buildings 32, 34-37
P-21-003076	Angel Island, East Garrison	Historic Military Property	Bowling Alley, Building 38
P-21-003077	Angel Island, East Garrison	Historic Military Property	PX Tailor Shop, Building 40
P-21-003078	Angel Island, East Garrison	Historic Military Property	Commissary Warehouse, Building 41
P-21-003079	Angel Island	Historic Military Property	Battery Drew Mortar Hill, Building 87
P-21-003080	Angel Island, East Garrison	Historic Military Property	Barrack, Building 103
P-21-003081	Angel Island, North Garrison	Historic Military Property	Barrack, Building 222
P-21-003082	Angel Island, North Garrison	Historic Military Property	Dental Clinic, Building 224
P-21-003083	Angel Island, North Garrison	Historic Military Property	Wharf & Dock Storehouse, Buildings 315 and 319

PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
P-21-003084	Angel Island, East Garrison	Historic Military Property	Electric Sub-station
P-21-003088	Not Listed	Historic Building	Garage
P-21-003090 / CA-MRN-757/H	Not Listed	Prehistoric Habitation	Not Listed
P-21-005505	Angel Island	Historic NRHP District	Angel Island District
P-21-005553	Angel Island, East Garrison	Historic Military Property	600 Man Barracks
P-21-005568	Angel Island, East Garrison	Historic Military Property	Commissary Warehouse, Building 41

SOURCE: NORTHWEST INFORMATION CENTER, CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM, CALIFORNIA STATE UNIVERSITY, SONOMA

### National Register of Historic Places

The National Register of Historic Places (NRHP) lists five properties for the Town’s General Plan Planning Area as of November 27, 2020. These include:

- Angel Island, U.S. Immigration Station;
- San Francisco and North Pacific Railroad Station House-Depot (Peter Donahue Building);
- Lyford’s Stone Tower; Benjamin and Hilarita Lyford House (Lyford House); and
- St. Hilary’s Mission Church (Old St. Hilary’s Church).

Two NRHP Districts, the Camp Reynolds District and the Angel Island District are also on record.

### Local and Regional Directories and Studies

Forty buildings were evaluated in 1999 for the Downtown Tiburon Historic Resources Study (Mathews 1999) and are identified on the Marin County Built Environment Resources Directory, as shown on Table 1-2. Some resources appear on multiple directories (NWIC list of resources/Marin County Built Environment Resources Directory). Three significance ratings were assigned to the forty buildings by Mathews (1999, Appendix D):

- Significant, which are structures that have retained their historic integrity and have the highest importance in maintaining the historic character of the neighborhood;
- Complementary, which are structures that are not deserving of individual architectural merit, but which have enough architectural quality that they support the pervasive historical character established by significant structures; and
- Non-Complementary, which are structures that have since been substantially altered and thus no longer maintain architectural qualities or character typical of the time they were built.

Of the buildings evaluated in 1999 for the Downtown Tiburon Historic Resources Study, 17 buildings were designated Significant, another 17 buildings were designated Complementary, and 6 buildings were designated Non-Complementary.

TABLE 1-2: HISTORIC RESOURCES FROM THE DOWNTOWN TIBURON HISTORIC RESOURCES STUDY AND THE MARIN COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

SIGNIFICANCE RATING	ADDRESS	YEAR BUILT	BUSINESS NAME
Significant	20 Main Street	1910	Harbor Light
Significant	21A Main Street (Ark)	Unknown	Not Listed
Significant	26 Main Street	1912	Mark Rueben Gallery
Significant	27 Main Street	1920	Sam’s Café Anchor Restaurant
Significant	32 Main Street	1921	Junelles Gifts
Significant	34 Main Street	1921	Han Syi Studio/Masson Real Estate
Significant	38 Main Street	1900	Rooney’s Café and Grill

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SIGNIFICANCE RATING	ADDRESS	YEAR BUILT	BUSINESS NAME
Significant	55 Main Street	1925	Not Listed
Significant	72 Main Street	1918	Windsor Vineyards
Significant	104 Main Street	1895	Switzer Galleries/Attorney
Significant	106 Main Street	1920	Schoenberg Guitars
Significant	108 Main Street	1920	Not Listed
Significant	110 Main Street	1920	Tiburon Deli
Significant	112 Main Street	1890	Residential/Ed's Garage Antique Car Display
Significant	114 Main Street	1930	Servino Restaurant
Significant	116 Main Street	1906	Ark Angels
Significant	118-120 Main Street	1880	Alterations & Dressmaking by Trudy
Complementary	5-7 Main Street	1965	Guyamas/Boudin/Candy Store
Complementary	9 Main Street	1975	Tutto Mare
Complementary	10 Main Street, 1700 and 1704 Tiburon Boulevard	1969	Little Angels/Portofino/St. Angelo's
Complementary	15-17 Main Street	1886	Waypoint Pizza/Silk, Satin & Lace/Old Gold Jewel
Complementary	16 Main Street	1916	St. Angelo's
Complementary	31 Main Street	1929	Store
Complementary	35 Main Street	1925	Sweden House Bakery
Complementary	40 Main Street	1958	Tiburon Playhouse
Complementary	42 Main Street	1955	Not Listed
Complementary	44 Main Street	1955	For Her
Complementary	46 Main Street	1962	Westerly Tea
Complementary	74-76 Main Street	1972	Giftique/Ruth Livingston Interior
Complementary	80 Main Street	1965	Attorney/Creature Comforts/Abaya/Bucky's Place
Complementary	82-100 Main Street	1970	Tiburon Books/Parsley's/Stephens Antiques/Tiburon Shoe Repair/The Attic/Still Life/Office/Tiburon Mail Service/For Paws/Tiburon Physical Therapy/Tiburon Thrift Shop/Business Services
Complementary	122 Main Street	1870	Just Nailed Manicuring/Next Salon
Complementary	130 Main Street	1920+	Main Street Properties
Complementary	1696 Tiburon Boulevard	1936	New Morningside Café and Paradise
Non-Complementary	21 Main Street	Unknown	Main Treat
Non-Complementary	23-25 Main Street	1961	Bird & Hound General Store
Non-Complementary	28 Main Street	1918	Watch Store
Non-Complementary	30 Main Street	1916	R.J. Sax
Non-Complementary	39 Main Street	1926	National Emergency Services
Non-Complementary	41 Main Street	1930	Tiburon Tommies (was Pharmacy)

SOURCE: DOWNTOWN TIBURON HISTORIC RESOURCES STUDY, APPENDIX D (MATHEWS 1999), MARIN COUNTY BUILT ENVIRONMENT RESOURCES DIRECTORY

In 2001, a second study, *Intensive Survey of Downtown Historic Resources* (3D Visions), supplemented the work of Mathews (1999) by providing additional construction and cultural details concerning 23 properties with the goal of eliminating requirements of the State's Title 24 Building Code for these properties. The Town prepared a list of buildings eligible for the State's Historical Building Code, *Buildings in Downtown Eligible for State Building Code (as of June 8, 2016)*. The list includes: (Main Street Lower) 13, 15, 17, 19 Main Street; 16, 18 Main Street; 21A Main Street (on pier); 24, 26 Main Street; 27, 29 Main Street; 30 Main Street; 31, 33 Main Street; 32 Main Street; 34, 36 Main Street; 35 Main Street; 38 Main Street; 55 Main Street; (Main Street Upper, aka Ark Row) 72 Main Street; 104 Main Street; 106 Main Street; 108 Main Street; 110 Main Street; 112 Main Street; 116 Main Street; 188, 120 Main Street; and, 122 Main Street.

The Town also prepared a list of local historic landmarks, *Town of Tiburon Local Historic Landmarks (as of June 8, 2016)*. The list has five properties:

- Peter Donahue Building, 1920 Paradise Drive
- Lyford's Stone Tower, 2034 Paradise Drive
- Old St. Hilary's Church, 201 Esperanza Drive
- Brick Kiln Bunkhouse, 841 Tiburon Boulevard
- Lyford House, 376 Greenwood Beach Road

## **CONSULTATION**

In November 2020, the Native American Heritage Commission had provided a list of tribes located within the boundaries of Marin County. This included the Federated Indians of Graton Rancheria and the Guidiville Indian Rancheria. Peak & Associates contacted representatives of the tribes requested to be contacted pursuant to AB 52. However, to date, no responses have been received.

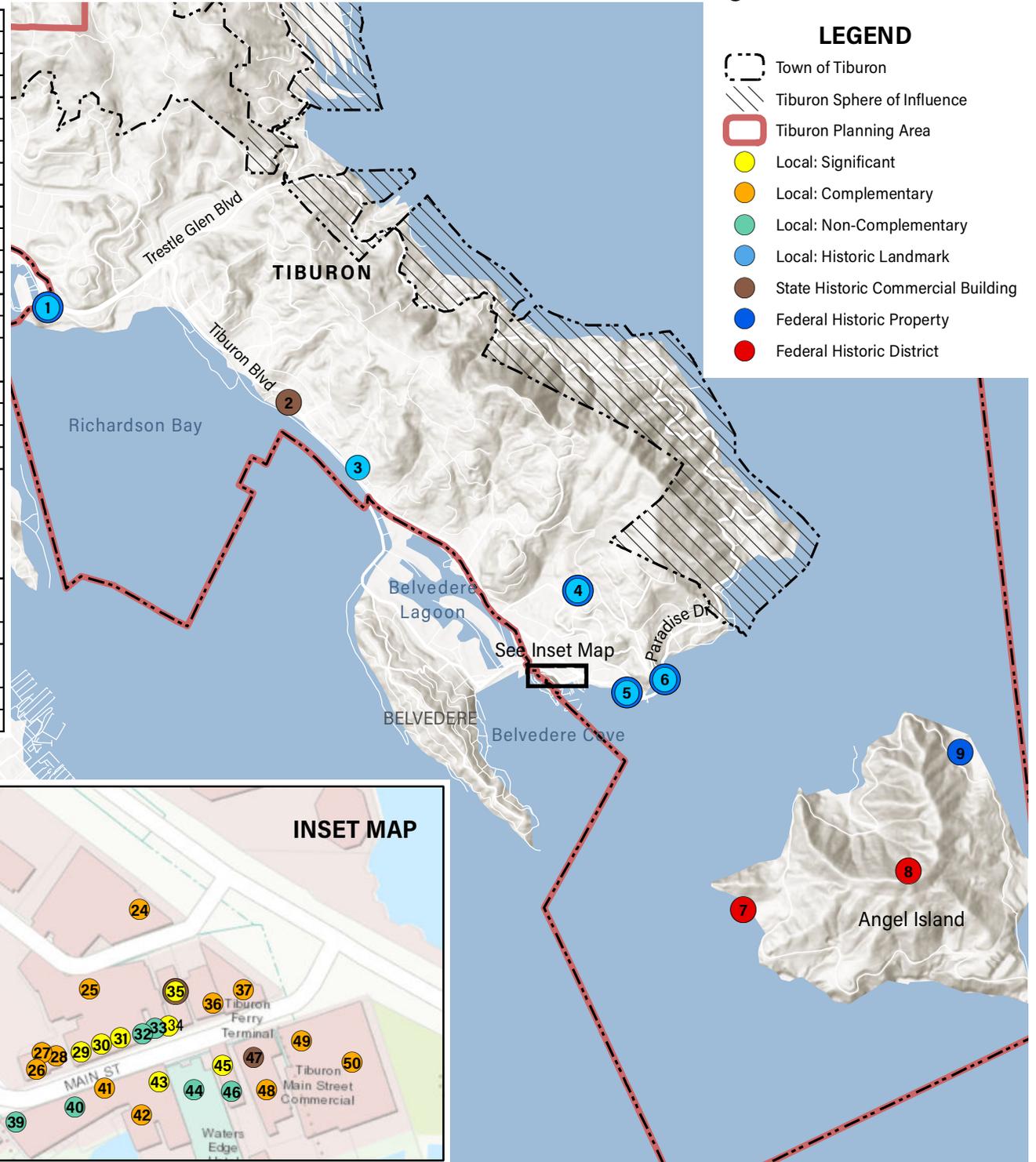
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- 3D Visions. 2001. Intensive Survey of Downtown Historic Resources. Ms. on file, Town of Tiburon, Marin County, California.

Figure 1-1: Historic Sites

ID	Name	ID	Name
1	Benjamin and Hilarita Lyford House	26	Westerly Tea
2	Belvedere Tennis Club	27	For Her
3	Brick Kiln Bunkhouse	28	Not Listed
4	St. Hilary's Mission Church	29	Rooney's Café and Grill
5	SFNP Railroad Station House-Depot	30	Han Syi Studio/Masson Real Estate
6	Lyford's Stone Tower	31	Junelles Gifts
7	Camp Reynolds NRHP District	32	R.J. Sax
8	Angel Island	33	Watch Store
9	Angel Island U.S. Immigration Station	34	Mark Rueben Gallery
10	Main Street Properties	35	Harbor Light
11	Just Nailed Manicuring/Next Salon	36	St. Angelo's
12	Alterations & Dressmaking by Trudy	37	Little Angels/Portofino/St. Angelo's
13	Ark Angels	38	Not Listed
14	Servino Restaurant	39	Tiburon Tommies (was Pharmacy)
15	Residential/Ed's Garage Antique Car Display	40	National Emergency Services
16	Tiburon Deli	41	Sweden House Bakery
17	Not Listed	42	Store
18	Schoenberg Guitars	43	Sam's Café Anchor Restaurant
19	Switzer Galleries/Attorney	44	Bird & Hound General Store
20	Tiburon Books/Parsley's/Stephens Antiques/Tiburon Shoe Repair/The Attic/Still Life/Office/Tiburon Mail Service/For Paws/Tiburon Physical Therapy/Tiburon Thrift Shop/Business Services	45	Not Listed
21	Attorney/Creature Comforts/Abaya/Bucky's Place	46	Main Treat
22	Giftique/Ruth Livingston Interior	47	Not Listed
23	Windsor Vineyards	48	Waypoint Pizza/Silk, Satin & Lace/Old Gold Jewel
24	New Morningside Café and Paradise	49	Tutto Mare
25	Tiburon Playhouse	50	Guyamas/Boudin/Candy Store



Sources: ArcGIS Online World Hillshade Map Service; Town of Tiburon; National Register; Northwest Information Center. Map date: March 1, 2021.

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## 2 BIOLOGICAL RESOURCES

This section describes biological resources in the Planning Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect biological resources in the Planning Area.

### KEY TERMS

The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

**Hydric Soils.** One of the three wetland identification parameters, according to the Federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

**Hydrophytic Vegetation.** Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

**Sensitive Natural Community.** A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, State, or Federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Wildlife (CDFW) tracks sensitive natural communities in the California Natural Diversity Database (CNDDDB).

**Special-Status Species.** Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by Federal, State, or other agencies. Some of these species receive specific protection that is defined by Federal or State endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term "special status" includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- State listed or proposed for listing under the California Endangered Species Act (CESA) (14 CCR 670.5);
- Species listed by the USFWS as a species of concern or by the CDFW as a rare species or species of special concern;
- Fully protected animals, as defined by the State (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);
- Plants listed as rare or endangered under the California Native Plant Protection Act (NPPA) (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik 1994).

**Waters of the U.S.** The Federal government defines waters of the U.S. as "lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows" [33 C.F.R. §328.3(a)]. Waters of the U.S. exhibit a defined bed

and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” [33 C.F.R. §328.3(e)].

**Wetlands.** Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The Federal government defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” [33 C.F.R. §328.3(b)]. Wetlands require wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to waters of the U.S.

## REGULATORY FRAMEWORK

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There are a number of regulatory agencies whose responsibility includes the oversight of the natural resources of the State and nation including the CDFW, the USFWS, the U.S. Army Corps of Engineers (USACE), and the National Marine Fisheries Service (NMFS). These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the Federal, State, and local regulations that are applicable to General Plan implementation.

### FEDERAL

#### Federal Endangered Species Act

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed, it is fully protected from a “take” unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

#### Migratory Bird Treaty Act

To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

#### Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Section 668) protects these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews Federal agency actions that may affect these species.

#### Clean Water Act – Section 404

Section 404 of the Clean Water Act (CWA) regulates all discharges of dredged or fill material into Waters of the United States (WOTUS). Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §323.2(f)]. The USACE is the agency responsible for administering the permit process

for activities that affect WOTUS. Executive Order 11990 is a Federal implementation policy, which is intended to result in no net loss of wetlands.

### **Clean Water Act – Section 401**

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board (RWQCB). To obtain the water quality certification, the RWQCB must indicate that the proposed fill would be consistent with the standards set forth by the State.

### **Department of Transportation Act - Section 4(f)**

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

*It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of a historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.*

### **Rivers and Harbors Act of 1899**

The Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States. The Act requires authorization from the USACE for any excavation or deposition of materials into these waters or for any work that could affect the course, location, condition, or capacity of rivers or harbors.

### **San Francisco Bay Area Habitat Conservation Plan**

Habitat conservation plans ensure there is adequate minimizing and mitigating of the effects non-federal activities have on threatened and endangered species, as required under Section 10 of the Endangered Species Act. The San Francisco Bay Area Habitat Conservation Plan was prepared by the Pacific Gas and Electric Company (PG&E) to address its activities in the 402,440-acre Plan area, which includes portions of California's Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. USFWS issued PG&E a 30-year incidental take permit and approved the Plan to establish strategies to avoid, minimize, and offset potential direct, indirect, and cumulative effects of PG&E's operations, maintenance, and minor new construction activities on 32 species federally listed as threatened or endangered.

## **STATE**

### **Fish and Game Code Sections 2050-2097 - California Endangered Species Act**

The CESA protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated through official listing by the California Fish and Game Commission.

### **Fish and Game Code Sections 1900-1913 - California Native Plant Protection Act**

In 1977, the State Legislature passed the NPPA in recognition of rare and endangered plants of the State. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFW 10 days in advance of approving a building site.

### **Fish and Game Code Sections 3503, 3503.5, 3800 - Predatory Birds**

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called "raptors," are protected. The law indicates that it is unlawful to take, possess, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

### **Fish and Game Code Sections 1601-1603 – Streambed Alteration**

Under the California Fish and Game Code, CDFW has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a "Streambed Alteration Agreement" from CDFW prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFW may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements are usually initiated through the local CDFW warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

### **Public Resources Code Section 21000 - California Environmental Quality Act**

Public Resources Code Section 21000 of the California Environmental Quality Act (CEQA) establishes standards and regulations necessary for the maintenance and protection of the natural environment. It also identifies that a species that is not listed on the Federal or State endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e., candidate or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of "Species of Special Concern," developed by the CDFW. Additionally, the California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

### **California Oak Woodland Conservation Act**

The California Legislature passed Assembly Bill 1334, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodlands character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation

Board. The legislation provides funding and incentives to ensure the future viability of California's oak woodlands resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the State.

### **California Wetlands Conservation Policy**

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and Federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

### **Natural Community Conservation Planning Act**

The Natural Community Conservation Planning Act provides long-term protection of species and habitats through regional, multi-species planning before the special measures of the CESA become necessary.

### **Porter-Cologne Water Quality Control Act**

The Porter-Cologne Water Quality Control Act authorizes the SWRCB to regulate state water quality and protect beneficial uses.

## **LOCAL**

### **Tiburon General Plan**

The Tiburon General Plan contains the following goals, policies, and implementing programs related to biological resources.

### **Open Space and Conservation Element**

#### **Goals**

OSC-A: To maximize, protect, preserve and enhance the Town's unique open space and natural beauty.

OSC-B: To provide and permanently preserve as much open space as possible to protect shorelines, open water, wetlands, significant ridgelines, streams, drainageways, riparian corridors, steep slopes, rock outcroppings, special status species and their habitat, woodlands, and areas of visual importance, such as views of and views from open space.

OSC-C: To permanently protect to the maximum extent feasible, the unique open space character of the Town which is attributable to its large amounts of undeveloped land and open water.

OSC-D: To permanently protect as conservation areas, to the maximum extent feasible, all lands and other areas in the public trust.

OSC-E: To manage the Town's open spaces for the benefit of the entire community.

OSC-F: To preserve and improve the quality of the environment through resource restoration and conservation, management, and pollution control.

### **Policies**

OSC-7: Where possible, land that is proposed for preservation as permanent open space shall be contiguous to existing open space and/ or open space areas that may in the future be permanently preserved.

OSC-8: Where appropriate, greenbelts shall be required to separate development areas or to link open space areas.

OSC-14: Use of open water shall be limited to landings for boats; boating, swimming, fishing; and parks.

OSC-16: The Town shall preserve and enhance the diversity of wildlife and aquatic habitats found in the Planning Area bayfront lands, including tidal marshes, seasonal marshes, lagoons, wetlands, and low-lying grasslands over historical marshlands.

OSC-17: Development shall not encroach into sensitive wildlife habitats, limit normal range areas, or create barriers to wildlife that cut off or substantially impede access to food, water, or shelter, or cause damage to fisheries or fish habitats. Access to environmentally sensitive marshland and adjacent habitat shall be restricted, especially during spawning and nesting seasons.

OSC-18: Freshwater habitats in the bayfront areas associated with freshwater streams and small former marshes should be preserved and/ or expanded so that the circulation, distribution, and flow of the fresh water supply are facilitated.

OSC-19: Those areas underlain by deposits of "young muds" should be reserved for water-related recreational opportunities, habitat, open space, or limited development subject to approval by the Corps of Engineers and other trustee agencies.

OSC-20: Buffer zones of at least 100 feet shall be provided, to the maximum extent feasible, between development and wetland areas.

OSC-21: Development and construction shall comply with all federal and state regulations regarding jurisdictional waters and wetlands.

OSC-22: In its review of applications for development, the Town shall require open space buffers of at least 50 feet on each side of the top of the bank of perennial, intermittent, and ephemeral streams on properties less than five acres and of at least 100 feet on each side of the top of the bank on properties greater than five acres, to minimize disturbance of natural vegetation and maintain the environmental and scenic attributes of the corridor. Where modification of corridors is required for flood control or crossings, such modification shall be made in an environmentally sensitive manner that enhances, replaces, or retains vegetation.

OSC-25: A diversity and abundance of wildlife and marine life shall be protected and maintained. The Town shall strive to preserve and protect to the greatest extent feasible wildlife habitat in the open spaces, shoreline, marshes, mudflats, and other biologically sensitive areas.

OSC-26: To the maximum extent feasible, and as required by federal and state laws, development and construction shall not affect special status species or special communities.

OSC-33: Protected trees, as defined in the Municipal Code, tree stands, and tree clusters shall be preserved to the maximum extent feasible.

OSC-34: The Town shall protect natural habitat, and natural wooded areas shall be preserved to the maximum extent feasible.

OSC-64: The use of native plants for landscaping shall be encouraged and the planting of invasive, exotic species shall be discouraged.

OSC-65: The removal of invasive, exotic species, such as broom and pampas grass, shall be required as a condition of approval for new developments.

OSC-66: New developments shall be required to ensure ongoing removal of invasive, exotic species through home owners associations, covenants, conditions, and restrictions (CC&Rs), or other appropriate mechanisms.

OSC-67: The Town shall encourage homeowners associations to disseminate information about the harmful effects of invasive exotic species in landscaping.

### **Implementing Programs**

OSC-a: Applicants shall be required to demonstrate that proposals for development minimize environmental impacts and comply with the General Plan and applicable regulations, ordinances, and guidelines. The Town shall require that an assessment of environmental constraints and Prime Open Space characteristics be prepared prior to the submittal of Precise Development Plan applications for large undeveloped parcels. Revise the Town's water conservation ordinance when required by changes in MMWD' s water conservation ordinance.

OSC-b: The Town shall review development applications that are submitted to the County and that are within the Town's sphere of influence and areas of interest in order to encourage conformance with Town policies, including minimizing the visual impact of development on surrounding hills visible from the Town.

OSC-c: The Town shall require an environmental assessment for development proposed on sites that may contain sensitive biological resources, including wetlands, occurrences of special status species and sensitive natural communities, native wildlife nurseries and nesting locations, and native wildlife movement corridors. The assessment shall be conducted by a qualified professional to determine the presence or absence of any sensitive resources which could be affected by proposed development, shall provide an assessment of the potential impacts, and shall define measures for protecting the resource and surrounding buffer habitat.

OSC-d: Where hillslope stabilization is proposed as part of development proposals, or wherever such stabilization is required by the Town to protect public safety, the Town shall require the project to evaluate all slope repair-related modifications such as the secondary impacts of subsurface drainage on site and watershed ecological communities, including special-status species, sensitive natural communities, and wetlands. In the event impacts are likely, modifications to the proposed project shall be considered. In the event avoidance and project modification are infeasible, appropriate on- or off-site habitat mitigation shall be required prior to project approval, as mandated by the State and federal regulatory agencies.

OSC-e: The Town shall establish a clearinghouse of information for public use related to protection of sensitive biological and wetland resources, maintain contacts for agencies responsible for their protection, and encourage programs dedicated to the restoration and management of the remaining natural area.

OSC-f: The Town shall consider revising and expanding the Tiburon Tree Ordinance to provide protection of both individual trees and native woodlands. Factors to consider in expanding the current ordinance include the importance of protecting smaller sapling trees and balancing their protection against those of designated "protected trees", defining critical management guidelines necessary to maintain healthy woodlands, and methods to encourage natural regeneration in woodland habitats.

### **Town of Tiburon Municipal Code**

Chapter 15 Trees. The Tiburon Municipal code establish standards and regulations related to the protection of "protected trees" (heritage trees, oak trees, and dedicated trees), and the removal of potentially hazardous trees.

### **San Francisco Bay Conservation and Development Commission**

The San Francisco Bay Conservation and Development Commission (BCDC), established to both protect and direct development of the Bay and its shoreline, is a commission which regulates development along the waters of the Bay. Altogether, the Commission is charged with:

- Regulating all filling and dredging in San Francisco Bay (which includes San Pablo and Suisun Bays, sloughs and certain creeks and tributaries that are part of the Bay system, salt ponds and certain other areas that have been diked-off from the Bay);
- Protecting the Suisun Marsh, the largest remaining wetland in California, by administering the Suisun Marsh Preservation Act in cooperation with local governments;
- Regulating new development within the first 100 feet inland from the Bay to ensure that maximum feasible public access to the Bay is provided;
- Minimizing pressure to fill the Bay by ensuring that the limited amount of shoreline area suitable for high priority water-oriented uses is reserved for ports, water-related industries, water-oriented recreation, airports, and wildlife areas.
- Pursuing an active planning program to study Bay issues to ensure that Commission plans and policies are based upon the best available current information.
- Leading regionwide adaptation planning in light of rising sea level;
- Administering the federal Coastal Zone Management Act within the San Francisco Bay segment of the California coastal zone to ensure that federal activities reflect Commission policies.
- Participating in the regionwide program to administer a Long Term Management Strategy (LTMS) to ensure appropriate dredging and dredged materials disposal in San Francisco Bay; and,
- Participating in California's oil spill prevention and response planning program.

### **San Francisco Bay Plan**

The San Francisco Bay Plan (Bay Plan) guides BCDC's planning and actions for the area within its jurisdiction. The Bay Plan includes two primary parts: the policies to guide future uses of the Bay and shoreline, and the maps that apply these policies to the present Bay and shoreline. The Bay Plan addresses the following matters as specifically required by the law:

1. The results of the Commission's detailed study of the Bay;
2. The comprehensive plan adopted by BCDC for the conservation of the water of San Francisco Bay and the development of its shoreline;
3. BCDC's recommendation of the appropriate agency to maintain and carry out the Bay Plan;
4. BCDC's estimate of the approximate amount of money that would be required to maintain and carry out the provisions of the Plan for the Bay; and
5. Other information and recommendations BCDC deemed desirable.

BCDC has jurisdiction over five areas: the San Francisco Bay, a 100-foot shoreline band, salt ponds, managed wetlands, and certain waterways. The provisions of the Bay Plan pertaining to areas outside of the 100-foot shoreline band are advisory. In the Tiburon Planning Area, the Bay Plan applies to activities within San Francisco Bay and activities along the 100-foot shoreline band. The provisions of the Bay Plan pertaining to areas outside of the 100-foot shoreline band are advisory. There are no salt ponds, managed wetlands, or waterways under BCDC's jurisdiction in the Tiburon Planning Area.

Permit requirements are detailed in Title 7.2 of the California Government Code and Title 14, Division 5 of the California Code of Regulations. BCDC has the authority to approve projects with conditions that must be carried out as a part of the

authorized project. According to BCDC's website, typical permit conditions include requirements to construct, guarantee, and maintain public access to the Bay, plan review requirements that must be met before construction can begin, and mitigation requirements to offset the adverse environmental impacts of proposed projects.

The Bay Plan establishes seven policies related to biological resources that address conservation of the Bay's tidal resources and native species and specifically address placement of fill and sediment. The Tiburon Planning Area is located within the area addressed by Plan Map 4, which refers to the area as Central Bay North area. The Bay Plan establishes the following policies which apply to specific areas within the Planning Area:

30. Harbor Seal Haul-Out - Protect harbor seal haul-out and pupping site where harbor seals rest, give birth and nurse their young. Projects allowed only if protective of harbor seals and other sensitive wildlife.
31. Harbor Seal Haul-Out - Protect harbor seal haul-out and pupping site where harbor seals rest, give birth and nurse their young. Projects allowed only if protective of harbor seals and other sensitive wildlife.
32. Angel Island State Park - Use only for camping, picnicking, water-oriented recreation. Access by boat only. Preserve boat slips and mooring buoys at Ayala Cove. No commercial uses except for convenience needs of park visitors. Preserve and interpret cultural, historical, and natural features of the island. Protect harbor seal haul-out and pupping site where harbor seals rest, give birth and nurse their young. Projects allowed only if protective of harbor seals and other sensitive wildlife.
33. Romberg Tiburon Center for Environmental Studies - If and when not needed by San Francisco State University, acquire, and develop for park. Expansion of Romberg Tiburon Center should be compatible with park use. Romberg Tiburon Center lands outside of the shoreline band should be developed consistent with recreation policy 4-b. Provide public access through the site to the shoreline.

### **Richardson Bay Special Area Plan**

Richardson Bay provides a wide range of aquatic and wildlife habitats for abundant and diverse populations of fish and wildlife. Because of its location sheltered from strong tides and winds and close proximity to the Pacific Ocean, Richardson Bay is an area of high value for fish that spend part of their life in the ocean and part in an estuary, and for sea birds and migratory waterfowl as a refuge during winter storms. It is estimated that over 350,000 birds seek refuge during the winter months in the Audubon Society's wildlife sanctuary alone. Because of the shallowness of the Bay's water, many acres of mudflats are exposed at low tide providing important feeding areas for shorebirds and habitat for algae and small crustaceans. Moreover, Richardson Bay is one of the few areas in the San Francisco Bay system in which harbor seals reside and haul out.

Because of this, the BCDC recognized that the Richardson Bay is a unique and irreplaceable resource to the region. However, Richardson Bay has experienced increasing problems over the past years related to the protection of sensitive biological species and natural environments. In order to identify these problems to biological resources and offer recommended solutions, the Richardson Bay Special Area Plan was prepared to establish standards for development along the shores of Richardson Bay. Policies within the Richardson Bay Special Area Plan include:

1. The open water, marshes, and mud flats of Richardson Bay are particularly valuable wildlife habitat and should be afforded maximum protection. Eelgrass beds, important to herring spawning and for production of detritus, should also receive maximum protection.
2. Future shoreline developments adjacent to mud flats or tidal or diked marshes should provide a natural landscaped buffer area between the development and the shoreline. The buffer area should be a minimum of 20 to 40 feet wide, depending on the sensitivity of the wildlife and the density and intensity of development, and should be planted with native shrubs and trees such as coyote brush, toyon, and coast live oak.
3. The harbor seal haul-out area on Strawberry Spit should be further protected by buoys placed offshore of the haul-out site during the haul-out season (November to April).

4. Open areas of Richardson Bay used as resting and feeding areas by migratory waterfowl during the winter should be protected from speeding boats through continued patrolling of the Audubon Society Sanctuary and by posting of notice of boat speed restrictions in upper Richardson Bay.
5. Any development within Richardson Bay should avoid destruction of marshes, mud flats, shellfish beds, and eelgrass beds. If such losses are unavoidable, the project should be authorized only if the minimum amount of habitat disturbance necessary to accomplish the purpose of the project occurs and the habitat loss is mitigated to the fullest extent. Mitigation should be within Richardson Bay, preferably at the development site, or if that is not feasible, at a site identified in the Tidal Restoration and Marsh Enhancement section of the Special Area Plan.

### Town of Tiburon Open Space Resource Management Plan

The Town of Tiburon owns and manages approximately 250 acres of open space distributed among 21 parcels. These open space areas vary considerably in size, vegetation, occurrence of special-status species, and proximity to residences. Nearly all of the parcels were either purchased outright by the Town for preservation purposes or were acquired as a result of open space dedications required by the Town for new development projects. The primary emphasis of the Open Space Resource Management Plan is management of vegetation and protection from non-native, invasive species of vegetation. Other topic areas such as erosion, fire hazard management, and passive recreation are also addressed in the Open Space Management Plan.

### Town of Tiburon Guide to Policies for Trees Located on Town Property

The Guide was prepared in 2003 by the Town as a guide to the Town's policies and procedures involving trees. The Guide includes criteria for Town review of applications involving trees and shrubs on Town property; a sidewalk area diagram; and a procedure for tree alteration, removal, or planting.

The Guide establishes the policies with respect to trees and shrubs on Town property, including but not limited to parks, open spaces, and public street rights-of-way (including medians and islands). The Town's overarching policy is that trees and shrubs on Town property are resources that will not generally be removed or substantially altered without good cause. The Guide identifies conditions that warrant removal, including public safety hazards, disease, and damage to utilities and establishes a process for pruning of trees and shrubs.

## ENVIRONMENTAL SETTING

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### BIOREGION

Tiburon is located within the Bay Area/Delta Bioregion. The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras counties. The bioregion is bounded by the Klamath/North Coast on the north and the Central Coast Bioregion to the south. The Bay Area/Delta Bioregion is one of the most populous areas of the state, encompassing the San Francisco Bay Area and the Sacramento-San Joaquin River Delta. The water that flows through the Delta supplies two-thirds of California's drinking water, irrigating farmland, and sustaining fish and wildlife and their habitat. The bioregion fans out from San Francisco Bay in a jagged semi-circle that takes in all or part of 12 counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, and parts of Sacramento and Yolo. The habitats and vegetation of the Bay Area/Delta Bioregion are as varied as the geography.

### VEGETATION

Vegetation occurring within the Planning Area primarily consists of agricultural, ruderal, riparian, and landscaping vegetation. Because of the urban nature of the developed areas within Tiburon, there is limited undisturbed natural vegetation. Common plant species observed in the region include: wild oat (*Avena barbata*), rip-gut brome (*Bromus diandrus*), softchess (*Bromus hordeaceus*) alfalfa (*Medicago sativa*), Russian thistle (*Salsola tragus*), Italian thistle (*Carduus pycnocephalus*), rough pigweed (*Amaranthus retroflexus*), sunflower (*Helianthus annuus*), tarragon (*Artemisia dracuncululus*), coyote brush (*Baccharis pilularis*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), sow thistle (*Sonchus asper*),

telegraph weed (*Heterotheca grandiflora*), barley (*Hordeum* sp.), mustard (*Brassica niger*), and heliotrope (*Heliotropium curassavicum*).

**WILDLIFE**

Agricultural and ruderal vegetation in the Planning Area provides habitat for both common and special-status wildlife populations. For example, some commonly observed wildlife species in the region include: California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), American killdeer (*Charadrius vociferus*), gopher snake (*Pituophis melanoleucus*), garter snake (*Thamnophis species*), and western fence lizard (*Sceloporus occidentalis*), as well as many native insect species. There are also several bat species in the region. Bats often feed on insects as they fly over agricultural and natural areas.

Locally common and abundant wildlife species are important components of the ecosystem. Due to habitat loss, many of these species must continually adapt to using agricultural, ruderal, and ornamental vegetation for cover, foraging, dispersal, and nesting.

**PLANT COMMUNITIES**

Agricultural and natural plant communities provide habitat for a variety of biological resources in the region. Sensitive habitats include those that are of special concern to resource agencies or those that are protected under a Habitat Conservation Plan, Natural Community Conservation Plan, CEQA, the Fish and Game Code, or the Clean Water Act (CWA). Additionally, sensitive habitats are usually protected under specific policies from local agencies. Figure 2-1 illustrates the plant communities (land cover types) in the vicinity of the Planning Area.

**California Wildlife Habitat Relationship System**

The California Wildlife Habitat Relationships (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly occurring birds, mammals, reptiles, and amphibians. When first published in 1988, the classification scheme had 53 habitats. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

The CWHR System identified 16 cover types (wildlife habitat classifications) in the Planning Area out of the 59 types in the State. These include: Annual Grassland, Barren, Closed-Cone Pine-Cypress, Coastal Oak Woodland, Coastal Scrub, Eucalyptus, Fresh Emergent Wetland, Lacustrine, Montane Hardwood-Conifer, Perennial Grassland, Saline Emergent Wetland, Urban, Valley Foothill Riparian, Valley Oak Woodland, Water, and Wet Meadow.

Table 2-1 identifies the total area by acreage for each cover type (classification) found in in the Planning Area. Figure 2-1 illustrates the location of each cover type (classification). A brief description of each cover type follows.

**TABLE 2-1: COVER TYPES - CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM**

COVER TYPE	TOWN OF TIBURON	SOI (ACRES)	PLANNING AREA	GRAND TOTAL
Annual Grassland	407.93	76.82	139.59	624.34
Barren	45.58	0.67	1.11	47.36
Closed-Cone Pine-Cypress	74.05	0.00	0	74.05
Coastal Oak Woodland	552.06	294.36	34.72	881.14
Coastal Scrub	192.15	73.56	47.61	313.32
Eucalyptus	167.51	20.52	1.68	189.72
Fresh Emergent Wetland	1.56	5.78	0.22	7.56
Lacustrine	143.32	30.91	0.00	174.24

COVER TYPE	TOWN OF TIBURON	SOI (ACRES)	PLANNING AREA	GRAND TOTAL
Montane Hardwood-Conifer	0.00	35.80	0.00	35.80
Perennial Grassland	58.96	8.52	87.49	154.96
Saline Emergent Wetland	5.74	0.00	0.00	5.74
Urban	1,366.48	281.65	36.31	1,684.44
Valley Foothill Riparian	1.33	0.00	0.00	1.33
Valley Oak Woodland	3.78	0.00	0.00	3.78
Water	6,745.48	118.31	0.00	6,863.80
Wet Meadow	<0.01	<0.01	0.22	0.22

SOURCE: CASIL GIS DATA, 2021.

### Developed Cover Types

**Urban** habitats are not limited to any particular physical setting. Three urban categories relevant to wildlife are distinguished: downtown, urban residential, and suburbia. The heavily developed downtown is usually at the center, followed by concentric zones of urban residential and suburbs. There is a progression outward of decreasing development and increasing vegetative cover. Species richness and diversity is extremely low in the inner cover. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species. Within the Planning Area, there are 1,650.34 acres of urban habitat.

### Herbaceous Cover Types

**Annual Grassland** habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost-free season averages 250 to 300 days. Annual precipitation is highest in northern California. Within the Planning Area, there are 484.74 acres of annual grassland habitat.

**Fresh Emergent Wetland** habitats occur on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed. In some areas organic soils (peat) may constitute the primary growth medium. Climatic conditions are highly variable and range from the extreme summer heat to winter temperatures well below freezing. Within the Planning Area, there are 7.33 acres of fresh emergent wetland habitat.

**Saline Emergent Wetland** habitat occur along the margins of bays, lagoons, and estuaries sheltered from excessive wave action. At their lower margin they are exposed once every 24 hours; whereas, at their upper margin, submergence is short and infrequent, followed by weeks or months of continuous exposure. Characteristic or distinctive vascular plant species ranging from lower saline sites to higher or brackish sites are cordgrass, pickleweed, Humboldt cordgrass, glasswort, saltwort, jaumea, California seablite, seaside arrowgrass, alkali heath, seashore saltgrass, spearleaf saltweed, shoregrass, the endangered birdsbeak, common glasswort, sea-lavender, brass-buttons, saltmarsh dodder, gumweed, salt rush, tufted hairgrass, Pacific alkali bulrush, Olney bulrush, tule bulrush, California bulrush, common cattail, tropical cattail, cinquefoil, and coast carex. Frost-free days range from 330 to 365. Within the Planning Area, there are 5.74 acres of saline emergent wetland habitat.

**Perennial Grassland** habitat typically occurs on ridges and south-facing slopes, alternating with forest and scrub in the valleys and on north-facing slopes. Perennial Grassland habitats are most often found on Mollisols. These soils may grade into Inceptisols to the north, with higher precipitation allowing for leaching of the mollic horizon, and into Alfisols to the south, under drier conditions. On the north coast, Perennial Grassland habitat may occasionally be found on Ultisols which formerly

supported Douglas-fir habitats, but which have been cleared by humans. Climatic conditions are under strong maritime influence. Perennial Grassland habitat of the coastal prairie form occurs along the California coast from Monterey County northward. It is found below 3,280 feet in elevation and seldom more than 62 miles from the coast. Relic perennial grasses within annual grassland habitat occur in patches throughout the state. Within the Planning Area, there are 67.48 acres of perennial grassland habitat.

**Wet Meadow** habitat occurs where water is at or near the surface most of the growing season, following spring runoff. Hydrologically, they occupy lotic, sunken concave, and hanging sites. Lotic sites are those with main input flow (other than precipitation) from upstream sources; at least early in the growing season, water flows across them at depths of 4-8 inches. They frequently occur on rather steep slopes, and downstream runoff is the main output flow. Surface flows, although constant, are usually no more than 0.4-inch deep. Wet Meadows occur throughout virtually every forest type of the Sierra and Pacific Northwest floristic provinces and as inclusions in the northern coastal prairie and sagebrush steppe. Where conditions are favorable, Wet Meadows occur in the Transverse and Peninsular ranges of Southern California. In the Sierra Nevada and Cascade ranges, Wet Meadows usually occur above 3,940 feet in the north and above 5,900 feet in the south. In the Klamath Mountains, Wet Meadows occur in the California red fir zone at 4,600 feet to 6,400 feet elevation. Swales in the valley and foothill grasslands occasionally provide conditions suitable for Wet Meadow species. Within the Planning Area, there are less than .01 acres of wet meadow habitat.

### Tree-Dominated Cover Types

**Coastal Oak Woodland** habitats are common to mesic coastal foothills of California where moisture conditions are more favorable, such as north facing slopes and canyons, or higher elevations. Coastal oak woodlands occupy a variety of mediterranean type climates that vary from north to south and west to east. (The climate becomes hotter and drier toward the south and east.) Precipitation occurs in the milder winter months, almost entirely as rainfall, followed by warm to hot, dry summers. Near the coast, the summers are tempered by fogs and cool, humid sea breezes. Mean annual precipitation varies from about 40 inches in the north to about 15 inches in southern and interior regions. Mean minimum winter temperatures are 29 to 44 degrees Fahrenheit (F), and the mean maximum summer temperatures are 75 to 96 F. The growing season ranges from six months (180 frost-free days) in the north to the entire year in mild coastal regions to the south. The soils and parent material on which coastal oak woodlands occur are extremely variable. Within the Planning Area, there are 846.41 acres of Coastal Oak Woodland habitat.

**Closed-Cone Pine-Cypress** habitats are typically found on sites that are rockier and more infertile than the surrounding soils. Many stands are found on serpentine soils. Although, typically found at low elevations, due to the coastal distribution of much of this habitat type, interior stands may be found at elevations up to 6550 feet. Closed-cone pine-cypress occurs in patches as an interrupted forest along coastal California from southern San Diego county north to Oregon. Inland, the distribution is a few widely scattered locations in the Peninsular and Coast Ranges and in the North and Central Sierra Nevada. Landforms are gentle to steep slopes where stands occur in interior California and coastal terraces or bluffs where distributed along coastal California. Within the Planning Area, there are 74.04 acres of Closed-Cone Pine-Cypress habitat.

**Eucalyptus** habitats generally adjoin a number of other wildlife habitats and are found at low elevations, where freezing is not a problem. Most eucalyptus have been artificially established, usually in and around urban/rural areas. Other habitats found in proximity to eucalyptus include cropland, valley foothill riparian, Orchard-vineyard, Coastal Scrub, Chamise Redshank Chaparral, Annual Grass, Pasture and Residential Park. Eucalyptus occurs in California from San Diego and Imperial counties in the south, usually at elevations below 1500 feet, but it has been found up 2100 feet; and to Shasta in the north. Most eucalyptus, however, is found around populated areas of southern and central California. Eucalyptus habitats have been extensively planted throughout the state since their introduction in 1856 with large-scale planting operations beginning in 1870. As such, they are found in locations with highly variable site characteristics. Generally, they are found on relatively flat or gently rolling terrain, occasionally in the foothills. Climatic conditions are typically referred to as Mediterranean, characterized by hot, dry summers and cool, mild winters. Precipitation ranges from approximately 12 inches

to 24 inches. Temperature regimes in areas of eucalyptus groves range from a mean monthly low of 43 F in January to 73 F in August, with low temperatures occasionally reaching 32 to 25 F and high temperatures typically exceeding 100 F. Eucalyptus demonstrates the ability to withstand many temperature conditions, with the exception of prolonged cold or freezing weather. Within the Planning Area, there are 74.04 acres of Eucalyptus habitat.

**Valley Foothill Riparian** habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly, or rocky soils more or less permanently moist, but probably well aerated. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). This habitat is characterized by hot, dry summers and mild and wet winters. Temperatures range from 75 to 102 F in the summer to 29 to 44 F in the winter. Average precipitation ranges from 6 to 30 inches, with little or no snow. The growing season is 7 to 11 months. Within the Planning Area, there are 1.33 acres of valley foothill riparian habitat.

**Valley Oak Woodland** habitat occurs in a wide range of physiographic settings but is best developed on deep, well-drained alluvial soils, usually in valley bottoms. Most large, healthy valley oaks are probably rooted down to permanent water supplies. Stands of valley oaks are found in deep sills on broad ridge-tops in the southern Coast Range. Where this type occurs near the coast, it is usually found away from the main fog zone. The climate is Mediterranean, with mild, wet winters and hot, dry summers. Remnant patches of this habitat are found in the Sacramento Valley from Redding south, in the San Joaquin Valley to the Sierra Nevada foothills, in the Tehachapi Mountains, and in valleys of the Coast Range from Lake County to western Los Angeles County. Usually, it occurs below 2000 feet. Within the Planning Area, there are 3.78 acres of valley oak woodland habitat.

**Montane Hardwood-Conifer** habitats range throughout California mostly west of the Cascade-Sierra Nevada crest. East of the crest, it is found in localized areas of Placer, El Dorado, Alpine and San Bernardino Counties. A typical montane hardwood habitat is composed of a pronounced hardwood tree layer, with an infrequent and poorly developed shrub stratum, and a sparse herbaceous layer. On better sites, individual trees or clumps of trees may be only to 13 feet apart. On poorer sites, spacing increases 26 to 33 feet. Where trees are closely spaced, crowns may close but seldom overlap. Elevations range from 300 feet near the Pacific Ocean. Annual precipitation varies from 110 inches in the northern Coast Range to 36 inches. Within the Planning Area, there are 35.01 acres of montane hardwood habitat.

### Shrub-Dominated Cover Types

**Coastal Scrub** habitats occur discontinuously in a narrow strip throughout the length of California. Two types of northern Coastal Scrub are usually recognized. The first type (limited in range) occurs as low-growing patches of bush lupine and many-colored lupine at exposed, oceanside sites. The second and more common type of northern Coastal Scrub usually occurs at less exposed sites. Here, coyote bush dominates the overstory. Within the Planning Area, there are 265.71 acres of coastal scrub habitat.

### Aquatic Cover Types

**Lacustrine** habitats are inland depressions or dammed riverine channels containing standing water. These habitats may occur in association with any terrestrial habitats, Riverine, or Fresh Emergent Wetlands. They may vary from small ponds less than one acre to large areas covering several square miles. Depth can vary from a few inches to hundreds of feet. Typical lacustrine habitats include permanently flooded lakes and reservoirs, and intermittent lakes and ponds (including vernal pools) so shallow that rooted plants can grow over the bottom. Most permanent lacustrine systems support fish life; intermittent types usually do not. Within the Planning Area there are 174.60 acres of lacustrine habitat.

**Water** habitat is similar to the marsh habitat. water habitats are home to a variety of plants, fish, and wildlife. Within the Planning Area there are 6,867.15 acres of water habitat.

**Other Cover Types**

**Barren** habitat is defined by the absence of vegetation. Any habitat with less than 2 percent total vegetation cover by herbaceous, desert, or non-wildland species and less than 10 percent cover by tree or shrub species is defined this way. The physical settings for permanently barren habitat represent extreme environments for vegetation. An extremely hot or cold climate, a near-vertical slope, an impermeable substrate, constant disturbance by either human or natural forces, or a soil either lacking in organic matter or excessively saline can each contribute to a habitat being inhospitable to plants. Within the Planning Area, there are 46.25 acres of barren habitat.

**SPECIAL-STATUS SPECIES**

The following discussion is based on a background search of special-status species that are documented in the California Department of Fish & Wildlife CNDDDB. The background search was regional in scope and focused on the documented occurrences within 5 and 15 miles (16 U.S. Geological Survey [USGS] Quadrangles) of Tiburon.

**Special-Status Plants**

The search revealed documented occurrences of 64 special status plant species within 5 miles of the Planning Area. The search revealed documented occurrences of 91 special status plant species within approximately 15 miles of the Planning Area.

Tables 2-2 and 2-3 provide a list of special-status plant species that are documented within 5 and 15 miles of the Planning Area, and their current status. Figure 2-2 illustrates the special status species located within approximately 5 miles of the Planning Area. Figure 2-3 illustrates the special status species located within 9 quadrangles, approximately 15 miles, of the Planning Area.

**TABLE 2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT (5 MILE)**

PLANTS SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Astragalus tener</i> var. <i>tener</i>	<i>alkali milk-vetch</i>	<i>None</i>	<i>None</i>
<i>Layia carnosa</i>	<i>beach layia</i>	<i>Endangered</i>	<i>Endangered</i>
<i>Carex comosa</i>	<i>bristly sedge</i>	<i>None</i>	<i>None</i>
<i>Gilia capitata</i> ssp. <i>chamissonis</i>	<i>blue coast gilia</i>	<i>None</i>	<i>None</i>
<i>Calystegia purpurata</i> ssp. <i>saxicola</i>	<i>coastal bluff morning-glory</i>	<i>None</i>	<i>None</i>
<i>Coastal Brackish Marsh</i>	<i>Coastal Brackish Marsh</i>	<i>None</i>	<i>None</i>
<i>Coastal Terrace Prairie</i>	<i>Coastal Terrace Prairie</i>	<i>None</i>	<i>None</i>
<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	<i>Choris' popcornflower</i>	<i>None</i>	<i>None</i>
<i>Hemizonia congesta</i> ssp. <i>congesta</i>	<i>congested-headed hayfield tarplant</i>	<i>None</i>	<i>None</i>
<i>Gilia millefoliata</i>	<i>dark-eyed gilia</i>	<i>None</i>	<i>None</i>
<i>Helianthella castanea</i>	<i>Diablo helianthella</i>	<i>None</i>	<i>None</i>
<i>Arctostaphylos franciscana</i>	<i>Franciscan manzanita</i>	<i>Endangered</i>	<i>None</i>
<i>Cirsium andrewsii</i>	<i>Franciscan thistle</i>	<i>None</i>	<i>None</i>
<i>Fritillaria liliacea</i>	<i>fragrant fritillary</i>	<i>None</i>	<i>None</i>
<i>Plagiobothrys glaber</i>	<i>hairless popcornflower</i>	<i>None</i>	<i>None</i>
<i>Horkelia cuneata</i> var. <i>sericea</i>	<i>Kellogg's horkelia</i>	<i>None</i>	<i>None</i>
<i>Spergularia macrotheca</i> var. <i>longistyla</i>	<i>long-styled sand-spurrey</i>	<i>None</i>	<i>None</i>
<i>Navarretia rosulata</i>	<i>Marin County navarretia</i>	<i>None</i>	<i>None</i>
<i>Fritillaria lanceolata</i> var. <i>tristulis</i>	<i>Marin checker lily</i>	<i>None</i>	<i>None</i>
<i>Polygonum marinense</i>	<i>Marin knotweed</i>	<i>None</i>	<i>None</i>

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PLANTS SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Arctostaphylos virgata</i>	Marin manzanita	None	None
<i>Hesperolinon congestum</i>	Marin western flax	Threatened	Threatened
<i>Microseris paludosa</i>	marsh microseris	None	None
<i>Arenaria paludicola</i>	marsh sandwort	Endangered	Endangered
<i>Streptanthus glandulosus ssp. pulchellus</i>	Mt. Tamalpais bristly jewelflower	None	None
<i>Arctostaphylos montana ssp. montana</i>	Mt. Tamalpais manzanita	None	None
<i>Cirsium hydrophilum var. vaseyi</i>	Mt. Tamalpais thistle	None	None
<i>Amorpha californica var. napensis</i>	Napa false indigo	None	None
<i>Pleuropogon hooverianus</i>	North Coast semaphore grass	None	Threatened
<i>Carex praticola</i>	northern meadow sedge	None	None
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	None	None
<i>Polemonium carneum</i>	Oregon polemonium	None	None
<i>Horkelia marinensis</i>	Point Reyes horkelia	None	None
<i>Clarkia franciscana</i>	Presidio clarkia	Endangered	Endangered
<i>Arctostaphylos montana ssp. ravenii</i>	Presidio manzanita	Endangered	Endangered
<i>Leptosiphon rosaceus</i>	rose leptosiphon	None	None
<i>Collinsia corymbosa</i>	round-headed Chinese-houses	None	None
Serpentine Bunchgrass	Serpentine Bunchgrass	None	None
<i>Trifolium hydrophilum</i>	saline clover	None	None
<i>Chorizanthe cuspidata var. cuspidata</i>	San Francisco Bay spineflower	None	None
<i>Silene verecunda ssp. verecunda</i>	San Francisco champion	None	None
<i>Collinsia multicolor</i>	San Francisco collinsia	None	None
<i>Grindelia hirsutula var. maritima</i>	San Francisco gumplant	None	None
<i>Lessingia germanorum</i>	San Francisco lessingia	Endangered	Endangered
<i>Triphysaria floribunda</i>	San Francisco owl's-clover	None	None
<i>Plagiobothrys diffusus</i>	San Francisco popcornflower	None	Endangered
<i>Stebbinsoseris decipiens</i>	Santa Cruz microseris	None	None
<i>Holocarpha macradenia</i>	Santa Cruz tarplant	Threatened	Endangered
<i>Silene scouleri ssp. scouleri</i>	Scouler's catchfly	None	None
<i>Kopsiopsis hookeri</i>	small groundcone	None	None
<i>Symphyotrichum lentum</i>	Suisun Marsh aster	None	None
<i>Streptanthus batrachopus</i>	Tamalpais jewelflower	None	None
<i>Calamagrostis crassiglumis</i>	Thurber's reed grass	None	None
<i>Calochortus tiburonensis</i>	Tiburon mariposa-lily	Threatened	Threatened
<i>Lessingia micradenia var. micradenia</i>	Tamalpais lessingia	None	None
<i>Quercus parvula var. tamalpaisensis</i>	Tamalpais oak	None	None
<i>Horkelia tenuiloba</i>	thin-lobed horkelia	None	None
<i>Eriogonum luteolum var. caninum</i>	Tiburon buckwheat	None	None
<i>Streptanthus glandulosus ssp. niger</i>	Tiburon jewelflower	Endangered	Endangered
<i>Castilleja affinis var. neglecta</i>	Tiburon paintbrush	Endangered	Threatened
<i>Trifolium amoenum</i>	two-fork clover	Endangered	None

PLANTS SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Valley Needlegrass Grassland</i>	<i>Valley Needlegrass Grassland</i>	<i>None</i>	<i>None</i>
<i>Pentachaeta bellidiflora</i>	<i>white-rayed pentachaeta</i>	<i>Endangered</i>	<i>Endangered</i>

SOURCE: CDFW/CNDDDB 2020.

TABLE 2-3: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT (15 MILE)

PLANTS SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Sanicula maritima</i>	<i>adobe sanicle</i>	<i>None</i>	<i>Rare</i>
<i>Astragalus tener var. tener</i>	<i>alkali milk-vetch</i>	<i>None</i>	<i>None</i>
<i>Malacothamnus arcuatus</i>	<i>arcuate bush-mallow</i>	<i>None</i>	<i>None</i>
<i>Layia carnosa</i>	<i>beach layia</i>	<i>Endangered</i>	<i>Endangered</i>
<i>Amsinckia lunaris</i>	<i>bent-flowered fiddleneck</i>	<i>None</i>	<i>None</i>
<i>Gilia capitata ssp. chamissonis</i>	<i>blue coast gilia</i>	<i>None</i>	<i>None</i>
<i>Suaeda californica</i>	<i>California seablite</i>	<i>Endangered</i>	<i>None</i>
<i>Isocoma arguta</i>	<i>Carquinez goldenbush</i>	<i>None</i>	<i>None</i>
<i>Senecio aphanactis</i>	<i>chaparral ragwort</i>	<i>None</i>	<i>None</i>
<i>Plagiobothrys chorisianus var. chorisianus</i>	<i>Choris' popcornflower</i>	<i>None</i>	<i>None</i>
<i>Calystegia purpurata ssp. saxicola</i>	<i>coastal bluff morning-glory</i>	<i>None</i>	<i>None</i>
<i>Coastal Brackish Marsh</i>	<i>Coastal Brackish Marsh</i>	<i>None</i>	<i>None</i>
<i>Coastal Terrace Prairie</i>	<i>Coastal Terrace Prairie</i>	<i>None</i>	<i>None</i>
<i>Cirsium occidentale var. compactum</i>	<i>compact cobwebby thistle</i>	<i>None</i>	<i>None</i>
<i>Hemizonia congesta ssp. congesta</i>	<i>congested-headed hayfield tarplant</i>	<i>None</i>	<i>None</i>
<i>Gilia millefoliata</i>	<i>dark-eyed gilia</i>	<i>None</i>	<i>None</i>
<i>Lathyrus jepsonii var. jepsonii</i>	<i>Delta tule pea</i>	<i>None</i>	<i>None</i>
<i>Helianthella castanea</i>	<i>Diablo helianthella</i>	<i>None</i>	<i>None</i>
<i>Fritillaria liliacea</i>	<i>fragrant fritillary</i>	<i>None</i>	<i>None</i>
<i>Allium peninsulare var. franciscanum</i>	<i>Franciscan onion</i>	<i>None</i>	<i>None</i>
<i>Arctostaphylos franciscana</i>	<i>Franciscan manzanita</i>	<i>Endangered</i>	<i>None</i>
<i>Cirsium andrewsii</i>	<i>Franciscan thistle</i>	<i>None</i>	<i>None</i>
<i>Fritillaria biflora var. ineziana</i>	<i>Hillsborough chocolate lily</i>	<i>None</i>	<i>None</i>
<i>Plagiobothrys glaber</i>	<i>hairless popcornflower</i>	<i>None</i>	<i>None</i>
<i>Horkelia cuneata var. sericea</i>	<i>Kellogg's horkelia</i>	<i>None</i>	<i>None</i>
<i>Hoita strobilina</i>	<i>Loma Prieta hoita</i>	<i>None</i>	<i>None</i>
<i>Spergularia macrotheca var. longistyla</i>	<i>long-styled sand-spurrey</i>	<i>None</i>	<i>None</i>
<i>Northern Coastal Salt Marsh</i>	<i>Northern Coastal Salt Marsh</i>	<i>None</i>	<i>None</i>
<i>Carex praticola</i>	<i>northern meadow sedge</i>	<i>None</i>	<i>None</i>
<i>Northern Maritime Chaparral</i>	<i>Northern Maritime Chaparral</i>	<i>None</i>	<i>None</i>
<i>Pleuropogon hooverianus</i>	<i>North Coast semaphore grass</i>	<i>None</i>	<i>Threatened</i>
<i>Sidalcea hickmanii ssp. viridis</i>	<i>Marin checkerbloom</i>	<i>None</i>	<i>None</i>
<i>Navarretia rosulata</i>	<i>Marin County navarretia</i>	<i>None</i>	<i>None</i>
<i>Polygonum marinense</i>	<i>Marin knotweed</i>	<i>None</i>	<i>None</i>
<i>Hesperolinon congestum</i>	<i>Marin western flax</i>	<i>Threatened</i>	<i>Threatened</i>
<i>Microseris paludosa</i>	<i>marsh microseris</i>	<i>None</i>	<i>None</i>
<i>Arenaria paludicola</i>	<i>marsh sandwort</i>	<i>Endangered</i>	<i>Endangered</i>
<i>Fritillaria lanceolata var. tristulis</i>	<i>Marin checker lily</i>	<i>None</i>	<i>None</i>
<i>Lilaeopsis masonii</i>	<i>Mason's lilaeopsis</i>	<i>None</i>	<i>None</i>
<i>Arctostaphylos montaraensis</i>	<i>Montara manzanita</i>	<i>None</i>	<i>None</i>

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<i>Streptanthus glandulosus</i> ssp. <i>pulchellus</i>	<i>Mt. Tamalpais bristly jewelflower</i>	None	None
<i>Arctostaphylos montana</i> ssp. <i>montana</i>	<i>Mt. Tamalpais manzanita</i>	None	None
<i>Cirsium hydrophilum</i> var. <i>vaseyi</i>	<i>Mt. Tamalpais thistle</i>	None	None
<i>Amorpha californica</i> var. <i>napensis</i>	<i>Napa false indigo</i>	None	None
<i>Monardella sinuata</i> ssp. <i>nigrescens</i>	<i>northern curly-leaved monardella</i>	None	None
<i>Polemonium carneum</i>	<i>Oregon polemonium</i>	None	None
<i>Viburnum ellipticum</i>	<i>oval-leaved viburnum</i>	None	None
<i>Arctostaphylos pacifica</i>	<i>Pacific manzanita</i>	None	Endangered
<i>Arctostaphylos pallida</i>	<i>pallid manzanita</i>	Threatened	Endangered
<i>Centromadia parryi</i> ssp. <i>parryi</i>	<i>pappose tarplant</i>	None	None
<i>Sidalcea calycosa</i> ssp. <i>rhizomata</i>	<i>Point Reyes checkerbloom</i>	None	None
<i>Horkelia marinensis</i>	<i>Point Reyes horkelia</i>	None	None
<i>Chloropyron maritimum</i> ssp. <i>palustre</i>	<i>Point Reyes salty bird's-beak</i>	None	None
<i>Clarkia franciscana</i>	<i>Presidio clarkia</i>	Endangered	Endangered
<i>Arctostaphylos montana</i> ssp. <i>ravenii</i>	<i>Presidio manzanita</i>	Endangered	Endangered
<i>Lilium pardalinum</i> ssp. <i>pitkinense</i>	<i>Pitkin Marsh lily</i>	Endangered	Endangered
<i>Chorizanthe robusta</i> var. <i>robusta</i>	<i>robust spineflower</i>	Endangered	None
<i>Leptosiphon rosaceus</i>	<i>rose leptosiphon</i>	None	None
<i>Collinsia corymbosa</i>	<i>round-headed Chinese-houses</i>	None	None
<i>Trifolium hydrophilum</i>	<i>saline clover</i>	None	None
<i>Arctostaphylos imbricata</i>	<i>San Bruno Mountain manzanita</i>	None	Endangered
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	<i>San Francisco Bay spineflower</i>	None	None
<i>Silene verecunda</i> ssp. <i>verecunda</i>	<i>San Francisco champion</i>	None	None
<i>Collinsia multicolor</i>	<i>San Francisco collinsia</i>	None	None
<i>Grindelia hirsutula</i> var. <i>maritima</i>	<i>San Francisco gumplant</i>	None	None
<i>Lessingia germanorum</i>	<i>San Francisco lessingia</i>	Endangered	Endangered
<i>Triphysaria floribunda</i>	<i>San Francisco owl's-clover</i>	None	None
<i>Plagiobothrys diffusus</i>	<i>San Francisco popcornflower</i>	None	Endangered
<i>Extriplex joaquinana</i>	<i>San Joaquin spearscale</i>	None	None
<i>Stebbinsoseris decipiens</i>	<i>Santa Cruz microseris</i>	None	None
<i>Holocarpha macradenia</i>	<i>Santa Cruz tarplant</i>	Threatened	Endangered
<i>Silene scouleri</i> ssp. <i>scouleri</i>	<i>Scouler's catchfly</i>	None	None
<i>Serpentine Bunchgrass</i>	<i>Serpentine Bunchgrass</i>	None	None
<i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>	<i>short-leaved evax</i>	None	None
<i>Kopsiopsis hookeri</i>	<i>small groundcone</i>	None	None
<i>Chloropyron molle</i> ssp. <i>molle</i>	<i>soft salty bird's-beak</i>	None	None
<i>Symphyotrichum lentum</i>	<i>Suisun Marsh aster</i>	None	None
<i>Streptanthus batrachopus</i>	<i>Tamalpais jewelflower</i>	None	None
<i>Lessingia micradenia</i> var. <i>micradenia</i>	<i>Tamalpais lessingia</i>	None	None
<i>Quercus parvula</i> var. <i>tamalpaisensis</i>	<i>Tamalpais oak</i>	None	None
<i>Horkelia tenuiloba</i>	<i>thin-lobed horkelia</i>	None	None
<i>Eriogonum luteolum</i> var. <i>caninum</i>	<i>Tiburon buckwheat</i>	None	None
<i>Streptanthus glandulosus</i> ssp. <i>niger</i>	<i>Tiburon jewelflower</i>	Endangered	Endangered
<i>Calochortus tiburonensis</i>	<i>Tiburon mariposa-lily</i>	Threatened	Threatened
<i>Castilleja affinis</i> var. <i>neglecta</i>	<i>Tiburon paintbrush</i>	Endangered	Threatened
<i>Calamagrostis crassiglumis</i>	<i>Thurber's reed grass</i>	None	None

<i>Trifolium amoenum</i>	two-fork clover	Endangered	None
<i>Valley Needlegrass Grassland</i>	Valley Needlegrass Grassland	None	None
<i>Heteranthera dubia</i>	water star-grass	None	None
<i>Dirca occidentalis</i>	western leatherwood	None	None
<i>Pentachaeta bellidiflora</i>	white-rayed pentachaeta	Endangered	Endangered

SOURCE: CDFW/CNDDDB 2020.

### Special-Status Animals

The search revealed documented occurrences of 45 special status animal species within 5 miles of the Planning Area. The search revealed documented occurrences of 83 special status animal species within approximately 15 miles of the Planning Area. While the CNDDDB does not contain any official documented occurrences of bald eagles (*Haliaeetus leucocephalus*) within 5 miles or 15 miles of the Planning Area, it is noted that there have been recent sightings within Marin County, including the Tiburon Peninsula<sup>1</sup>.

Tables 2-4 and 2-5 provide a list of the special-status animal species that are documented within 5 miles and 15 miles of the Planning Area, and current status. Figure 2-2 illustrates the location of documented occurrences within 5 miles, and Figure 2-3 shown documented occurrences within 15 miles of the Planning Area.

TABLE 2-4: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT (5 MILE)

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<b>AMPHIBIANS</b>			
<i>Dicamptodon ensatus</i>	California giant salamander	None	None
<i>Rana draytonii</i>	California red-legged frog	Threatened	None
<i>Rana boylei</i>	foothill yellow-legged frog	None	Endangered
<b>CRUSTACEANS</b>			
<i>Vespericola marinensis</i>	Marin hesperian	None	None
<i>Tryonia imitator</i>	mimic tryonia (=California brackishwater snail)	None	None
<i>Gonidea angulata</i>	western ridged mussel	None	None
<b>REPTILES</b>			
<i>Emys marmorata</i>	western pond turtle	None	None
<b>FISH</b>			
<i>Thaleichthys pacificus</i>	eulachon	Threatened	None
<i>Spirinchus thaleichthys</i>	longfin smelt	Candidate	Threatened
<i>Eucyclogobius newberryi</i>	tidewater goby	Endangered	None
<b>INSECTS</b>			
<i>Plebejus icarioides missionensis</i>	Mission blue butterfly	None	None
<i>Danaus plexippus pop. 1</i>	monarch - California overwintering population	None	None
<i>Bombus caliginosus</i>	obscure bumble bee	None	None
<i>Adela oplerella</i>	Opler's longhorn moth	None	None
<i>Cicindela hirticollis gravida</i>	sandy beach tiger beetle	None	None
<i>Microcina tiburona</i>	Tiburon micro-blind harvestman	None	None
<i>Bombus occidentalis</i>	western bumble bee	None	Candidate Endangered

<sup>1</sup> Bartlett, Amanda. 2020. "Here's why you might see more bald eagles in the Bay Area right now". Available at: <https://www.sfgate.com/local/article/more-bald-eagles-bay-area-marin-county-15165134.php#taboola-2>

CONSERVATION

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<b>BIRDS</b>			
<i>Melospiza melodia pusillula</i>	Alameda song sparrow	None	None
<i>Falco peregrinus anatum</i>	American peregrine falcon	None	None
<i>Nycticorax nycticorax</i>	black-crowned night heron	None	None
<i>Laterallus jamaicensis coturniculus</i>	California black rail	None	Threatened
<i>Rallus obsoletus</i>	California Ridgway's rail	Endangered	Endangered
<i>Hydroprogne caspia</i>	Caspian tern	None	None
<i>Accipiter cooperii</i>	Cooper's hawk	None	None
<i>Phalacrocorax auritus</i>	double-crested cormorant	None	None
<i>Ardea herodias</i>	great blue heron	None	None
<i>Ardea alba</i>	great egret	None	None
<i>Circus hudsonius</i>	northern harrier	None	None
<i>Geothlypis trichas sinuosa</i>	saltmarsh common yellowthroat	None	None
<i>Melospiza melodia samuelis</i>	San Pablo song sparrow	None	None
<i>Asio flammeus</i>	short-eared owl	None	None
<i>Egretta thula</i>	snowy egret	None	None
<i>Elanus leucurus</i>	white-tailed kite	None	None
<b>MAMMALS</b>			
<i>Taxidea taxus</i>	American badger	None	None
<i>Scapanus latimanus insularis</i>	Angel Island mole	None	None
<i>Lasiurus cinereus</i>	hoary bat	None	None
<i>Erethizon dorsatum</i>	North American porcupine	None	None
<i>Antrozous pallidus</i>	pallid bat	None	None
<i>Zapus trinotatus orarius</i>	Point Reyes jumping mouse	None	None
<i>Reithrodontomys raviventris</i>	salt-marsh harvest mouse	Endangered	Endangered
<i>Sorex vagrans halicoetes</i>	salt-marsh wandering shrew	None	None
<i>Microtus californicus sanpabloensis</i>	San Pablo vole	None	None
<i>Enhydra lutris nereis</i>	southern sea otter	Threatened	None
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	None	None

SOURCE: CDFW CNDDDB 2020.

TABLE 2-5: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT (15 MILE)

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<b>AMPHIBIANS</b>			
<i>Dicamptodon ensatus</i>	California giant salamander	None	None
<i>Rana draytonii</i>	California red-legged frog	Threatened	None
<i>Rana boylei</i>	foothill yellow-legged frog	None	Endangered
<b>REPTILES</b>			
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake	Threatened	Threatened
<i>Thamnophis sirtalis tetrataenia</i>	San Francisco gartersnake	Endangered	Endangered
<i>Emys marmorata</i>	western pond turtle	None	None

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<b>FISH</b>			
<i>Oncorhynchus kisutch</i> pop. 4	coho salmon - central California coast ESU	Endangered	Endangered
<i>Hypomesus transpacificus</i>	Delta smelt	Threatened	Endangered
<i>Thaleichthys pacificus</i>	eulachon	None	None
<i>Mylopharodon conocephalus</i>	hardhead	None	None
<i>Spirinchus thaleichthys</i>	longfin smelt	Candidate	Threatened
<i>Archoplites interruptus</i>	Sacramento perch	None	None
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	None	None
<i>Eucyclogobius newberryi</i>	tidewater goby	None	None
<b>CRUSTACEANS AND MOLLUSKS</b>			
<i>Caecidotea tomalensis</i>	Tomales isopod	None	None
<i>Helminthoglypta nickliniana bridgesi</i>	Bridges' coast range shoulderband	None	None
<i>Vespericola marinensis</i>	Marin hesperian	None	None
<i>Tryonia imitator</i>	mimic tryonia (=California brackishwater snail)	None	None
<i>Pomatiopsis binneyi</i>	robust walker	None	None
<i>Gonidea angulata</i>	western ridged mussel	None	None
<b>INSECTS</b>			
<i>Banksula incredula</i>	incredible harvestman	None	None
<i>Microcina leei</i>	Lee's micro-blind harvestman	None	None
<i>Calicina diminua</i>	Marin blind harvestman	None	None
<i>Microcina tiburona</i>	Tiburon micro-blind harvestman	None	None
<i>Talanites ubicki</i>	Ubick's gnaphosid spider	None	None
<i>Plebejus icarioides missionensis</i>	Mission blue butterfly	None	None
<i>Danaus plexippus</i> pop. 1	monarch - California overwintering population	None	None
<i>Bombus caliginosus</i>	obscure bumble bee	None	None
<i>Adela oplerella</i>	Opler's longhorn moth	None	None
<i>Cicindela hirticollis gravida</i>	sandy beach tiger beetle	None	None
<i>Microcina tiburona</i>	Tiburon micro-blind harvestman	None	None
<i>Bombus occidentalis</i>	western bumble bee	None	None
<i>Euphydryas editha bayensis</i>	Bay checkerspot butterfly	Threatened	None
<i>Lichnanthe ursina</i>	bumblebee scarab beetle	None	None
<i>Speyeria callippe</i>	callippe silverspot butterfly	Endangered	None
<i>Bombus crotchii</i>	Crotch bumble bee	None	Candidate Endangered
<i>Hydroporus leechi</i>	Leech's skyline diving beetle	None	None
<i>Callophrys mossii marinensis</i>	Marin elfin butterfly	None	None
<i>Callophrys mossii bayensis</i>	San Bruno elfin butterfly	Endangered	None
<i>Trachusa gummifera</i>	San Francisco Bay Area leaf-cutter bee	None	None
<i>Ischnura gemina</i>	San Francisco forktail damselfly	None	None
<i>Speyeria zerene sonomensis</i>	Sonoma zerene fritillary	None	None

CONSERVATION

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Dufourea stagei</i>	<i>Stage's dufourine bee</i>	None	None
<b>BIRDS</b>			
<i>Melospiza melodia pusillula</i>	<i>Alameda song sparrow</i>	None	None
<i>Falco peregrinus anatum</i>	<i>American peregrine falcon</i>	None	None
<i>Nycticorax nycticorax</i>	<i>black-crowned night heron</i>	None	None
<i>Laterallus jamaicensis coturniculus</i>	<i>California black rail</i>	None	Threatened
<i>Rallus obsoletus obsoletus</i>	<i>California Ridgway's rail</i>	Endangered	Endangered
<i>Hydroprogne caspia</i>	<i>Caspian tern</i>	None	None
<i>Accipiter cooperii</i>	<i>Cooper's hawk</i>	None	None
<i>Phalacrocorax auritus</i>	<i>double-crested cormorant</i>	None	None
<i>Ardea herodias</i>	<i>great blue heron</i>	None	None
<i>Ardea alba</i>	<i>great egret</i>	None	None
<i>Circus hudsonius</i>	<i>northern harrier</i>	None	None
<i>Geothlypis trichas sinuosa</i>	<i>saltmarsh common yellowthroat</i>	None	None
<i>Melospiza melodia samuelis</i>	<i>San Pablo song sparrow</i>	None	None
<i>Asio flammeus</i>	<i>short-eared owl</i>	None	None
<i>Egretta thula</i>	<i>snowy egret</i>	None	None
<i>Elanus leucurus</i>	<i>white-tailed kite</i>	None	None
<i>Riparia riparia</i>	<i>bank swallow</i>	None	Threatened
<i>Nycticorax nycticorax</i>	<i>black-crowned night heron</i>	None	None
<i>Athene cunicularia</i>	<i>burrowing owl</i>	None	None
<i>Pandion haliaetus</i>	<i>osprey</i>	None	None
<i>Charadrius alexandrinus nivosus</i>	<i>western snowy plover</i>	Threatened	None
<i>Coturnicops noveboracensis</i>	<i>yellow rail</i>	None	None
<i>Xanthocephalus xanthocephalus</i>	<i>yellow-headed blackbird</i>	None	None
<b>MAMMALS</b>			
<i>Taxidea taxus</i>	<i>American badger</i>	None	None
<i>Scapanus latimanus insularis</i>	<i>Angel Island mole</i>	None	None
<i>Lasiurus cinereus</i>	<i>hoary bat</i>	None	None
<i>Erethizon dorsatum</i>	<i>North American porcupine</i>	None	None
<i>Antrozous pallidus</i>	<i>pallid bat</i>	None	None
<i>Zapus trinotatus orarius</i>	<i>Point Reyes jumping mouse</i>	None	None
<i>Reithrodontomys raviventris</i>	<i>salt-marsh harvest mouse</i>	Endangered	Endangered
<i>Sorex vagrans halicoetes</i>	<i>salt-marsh wandering shrew</i>	None	None
<i>Microtus californicus sanpabloensis</i>	<i>San Pablo vole</i>	None	None
<i>Enhydra lutris nereis</i>	<i>southern sea otter</i>	Threatened	None
<i>Corynorhinus townsendii</i>	<i>Townsend's big-eared bat</i>	None	None
<i>Scapanus latimanus parvus</i>	<i>Alameda Island mole</i>	None	None
<i>Nyctinomops macrotis</i>	<i>big free-tailed bat</i>	None	None
<i>Eumetopias jubatus</i>	<i>Steller (=northern) sea-lion</i>	None	None
<i>Sorex ornatus sinuosus</i>	<i>Suisun shrew</i>	None	None

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	None	None
<i>Lasiurus blossevillii</i>	western red bat	None	None

SOURCE: CDFW CNDDDB 2020.

### SENSITIVE NATURAL COMMUNITIES

The California Department of Fish and Wildlife (CDFW) considers sensitive natural communities to have significant biotic value, with species of plants and animals unique to each community. The CNDDDB search revealed four sensitive natural communities within 15 miles of Tiburon, as shown on Figure 2-4. This includes coastal brackish marsh, salt marshes where a significant freshwater influx dilutes the seawater to brackish levels of salinity; coastal terrace prairie, a grassland plant community found along the Pacific Coast; and northern coastal salt marsh, a non-tidal, non-forested wetland that is continuously or frequently flooded and contains saltwater; and serpentine bunchgrass.

All of these community types were once more widely distributed throughout California, but have been modified or destroyed by grazing, cultivation, and urban development. Since the remaining examples of these sensitive natural communities are under continuing threat from future development, CDFW considers them “highest inventory priorities” for future conservation.

### WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are a strip of natural habitat connecting populations of wildlife otherwise separated by cultivated land, roads, etc. A variety of wildlife corridors are identified in the Planning Area including but not limited to:

**Riparian habitat.** Riparian habitat often serves as essential wildlife corridors between habitat patches in an otherwise fragmented, urbanized landscape. For many animals, it is not only the quality of one patch of habitat, but also the ability to move among multiple habitat patches for example from uplands through the valley floor, that makes survival possible.

**Foothill access.** Foothill access to adjacent upland habitat or corridors for movement up and downstream is essential for many wildlife species, including amphibians that live in upland habitats but must move to aquatic habitats to breed. For example, California red-legged frogs and California newts make their way from upland habitats to ponds or slow-flowing streams to breed. Foothill yellow-legged frogs, a close relative of the California red-legged frog, also utilizes perennial, rocky stream; however, it is never found far from water.

**Streams.** Streams convey, filter, and store sediments and nutrients. Their floodplains recharge groundwater aquifers and control flooding. They also provide critical wildlife-movement corridors between important habitats for both water and land animals.

### WILDLIFE REFUGES

The purpose of wildlife refuges is to preserve lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations.

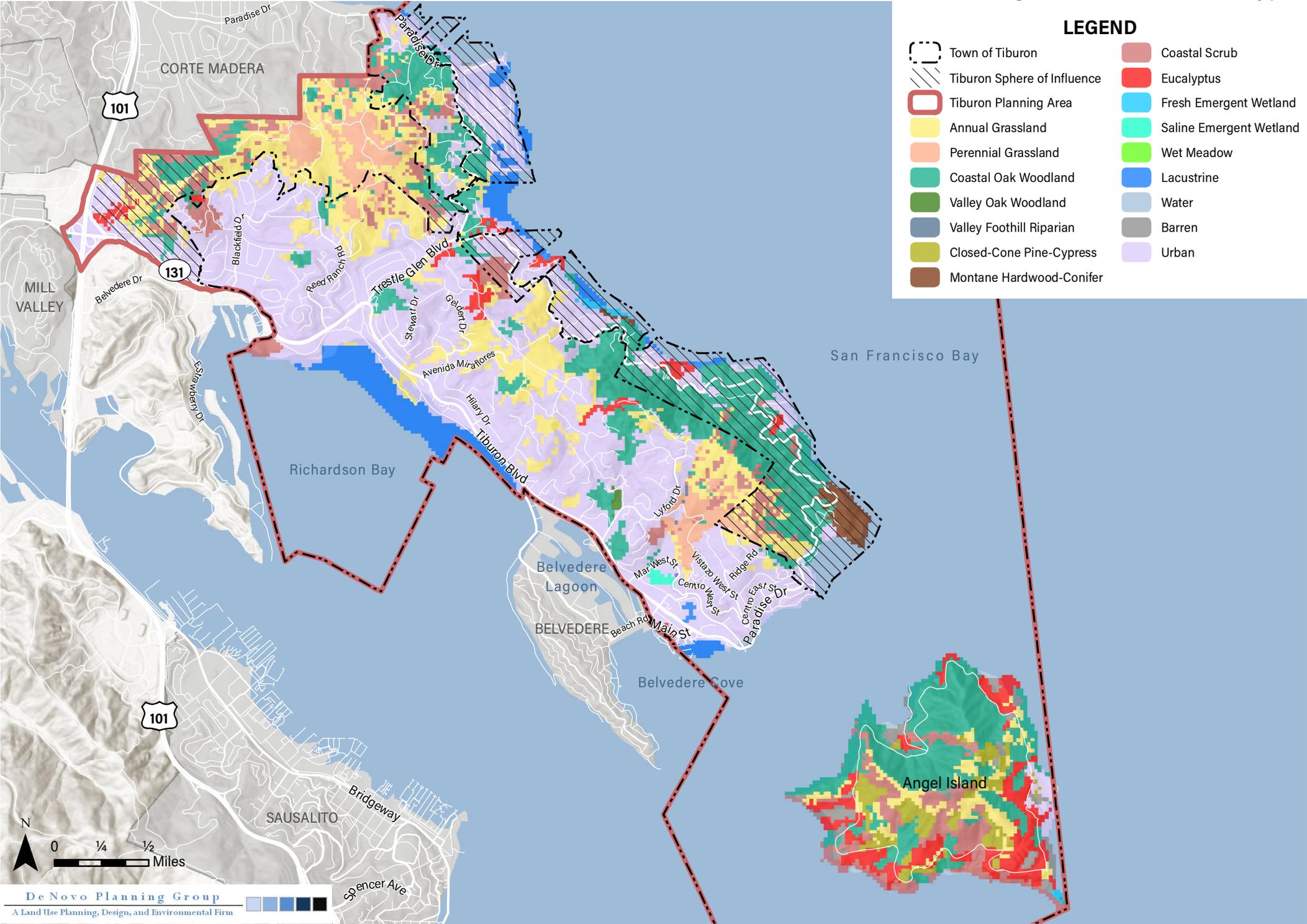
The Richardson Bay Audubon Center & Sanctuary is a wildlife refuge located in the Planning Area along Richardson Bay and is comprised of 10.5 acres of uplands and 900 acres of subtidal bay, the center supports a variety of ecosystems. The sanctuary provides vital habitat for migratory waterbirds and other wildlife. The sanctuary is also part of many National Audubon Society nature centers, chapters, and programs focused on bird conservation and public engagement.

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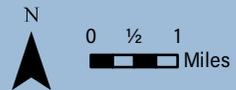
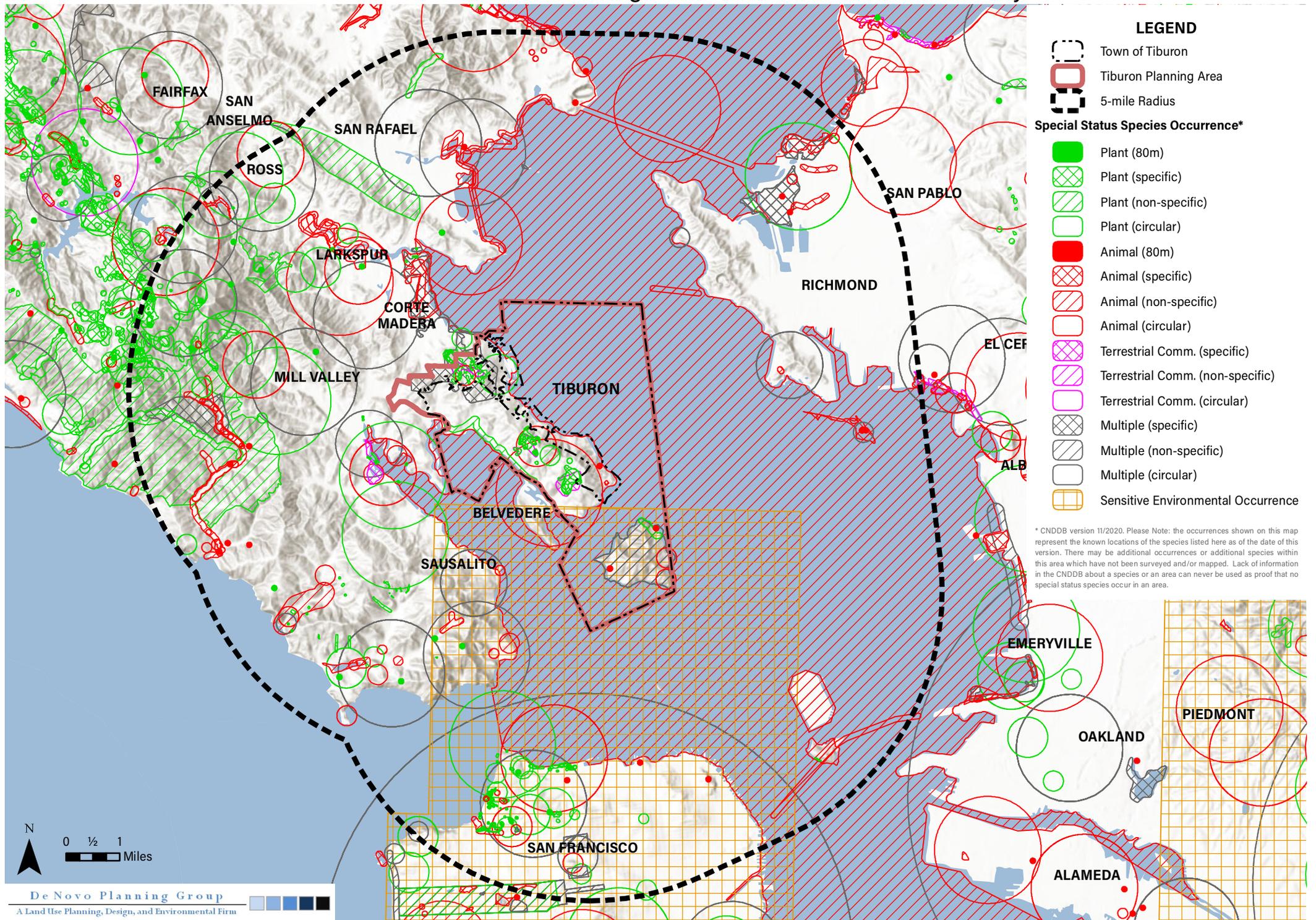
Figure 2-1: Land Cover Types



Sources: ArcGIS Online World Hillshade Map Service; CALFIRE-FRAP, fveg15\_1, 2015. Map date: March 1, 2021.

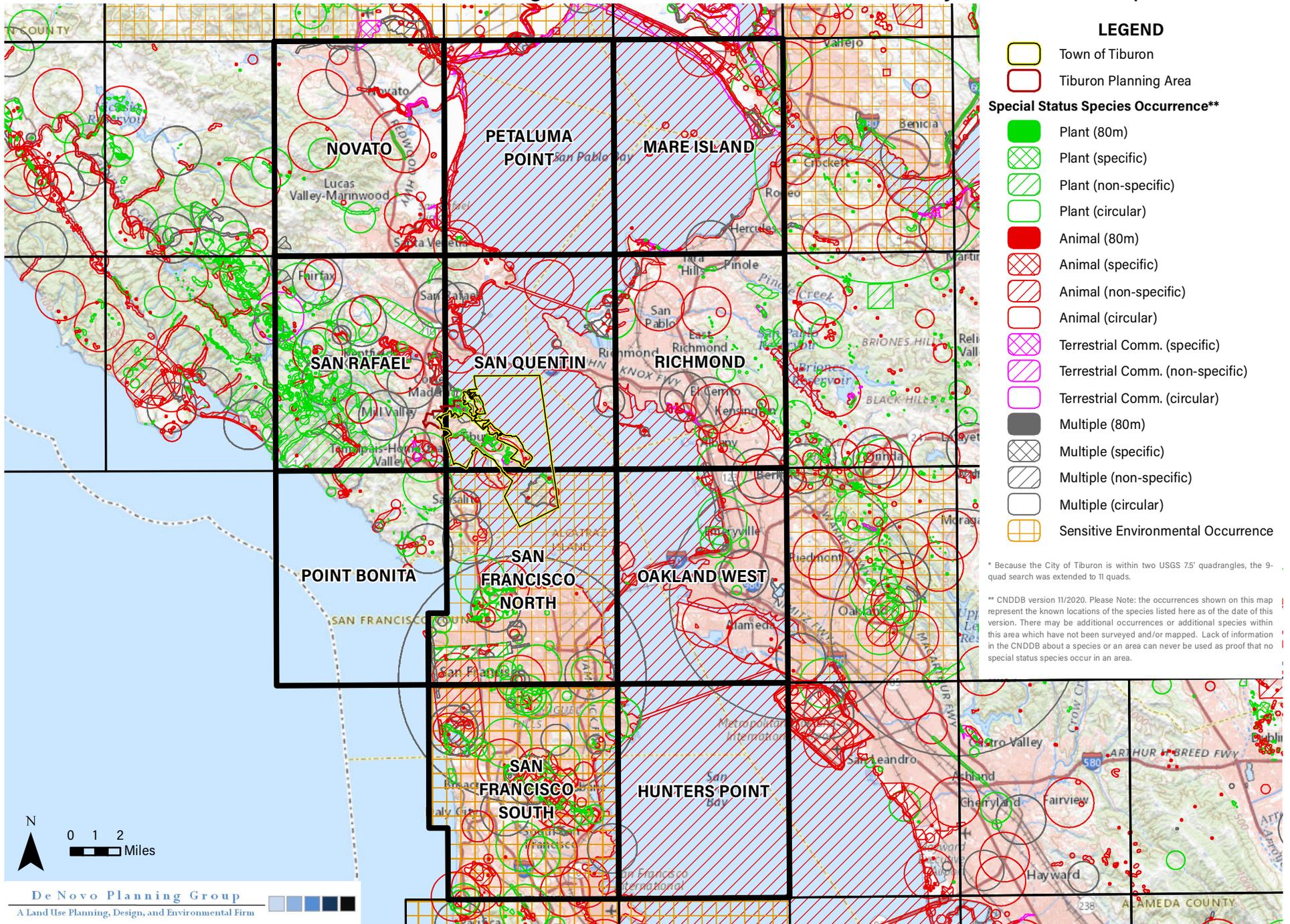
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Figure 2-2: California Natural Diversity Database - 5-mile Search



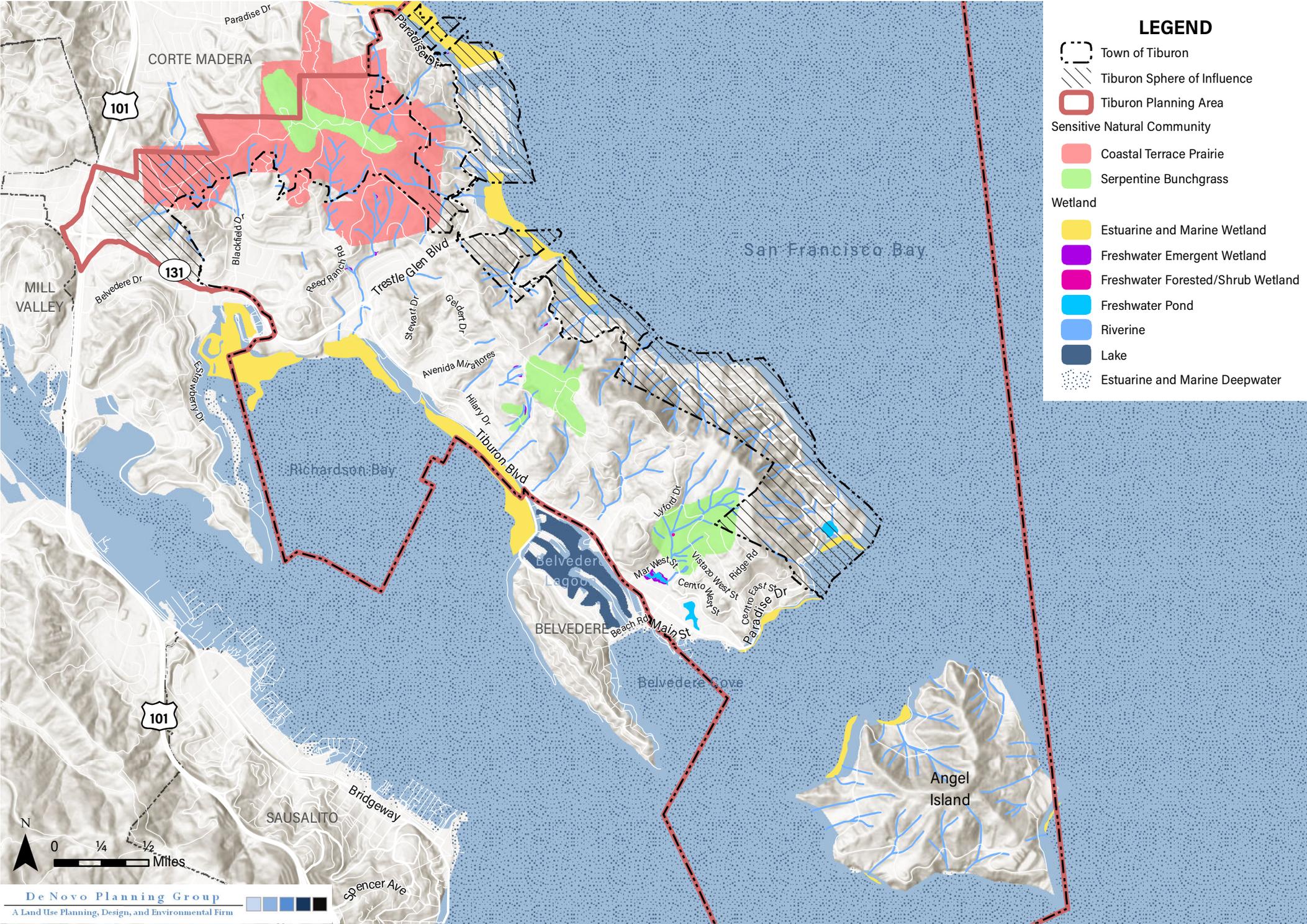
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Figure 2-3: California Natural Diversity Database - 9-quad\* Search



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Figure 2-4: Sensitive Natural Communities and Wetlands



Sources: ArcGIS Online World Hillshade Map Service; Marin County GeoHub; City of Tiburon General Plan; California Natural Diversity Database; National Wetlands Inventory. Map date: March 1, 2021.

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### 3 AIR QUALITY

This section discusses the regulatory framework, regional climate, air pollution potential, and existing ambient air quality for criteria air pollutants, toxic air contaminants, odors, and dust. Information presented in this section is based in part on information gathered from the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (CARB).

#### REGULATORY FRAMEWORK

##### FEDERAL

###### Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The Environmental Protection Agency (EPA) is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction. The state and federal primary standards for major pollutants are shown in Table 3-2.

The law recognizes the importance for each state to locally carry out the requirements of the FCAA, as special consideration of local industries, geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the EPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A SIP is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. CARB is the state agency that is responsible for preparing the California SIP.

One particular aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically also created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

###### Federal Hazardous Air Pollutant Program

Title III of the FCAA requires the EPA to promulgate national emissions standards for hazardous air pollutants (NESHAPs). The NESHAP may differ for major sources than for area sources of HAPs (major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources). The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology (MACT). For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA is required to promulgate health risk–based emissions standards were deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards. The FCAA required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to

benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

## **STATE**

### **California Clean Air Act**

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [Section 39606(b)], which are similar to the federal standards. The Bay Area Air Quality Management District is one of 35 air quality management districts that have prepared air quality management plans to accomplish a five percent annual reduction in emissions documenting progress toward the state ambient air quality standards.

### **Air Quality Standards**

States have the authority to set standards that are more stringent than the federal NAAQS. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM<sub>10</sub>, and lead. In addition, California has created standards for pollutants that are not covered by federal standards. The state and federal primary standards for major pollutants are shown in Table 3-2.

### **CARB Mobile-Source Regulation**

The State is responsible for controlling emissions from the operation of motor vehicles in California. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which required auto manufacturers to phase in less polluting vehicles.

### **Tanner Air Toxics Act**

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs. Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Air Toxics Hot Spots Information and Assessment Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low-sulfur diesel-fuel

requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

### **Transport of Pollutants**

The California Clean Air Act, Section 39610 (a), directs the CARB to “identify each district in which transported air pollutants from upwind areas outside the district cause or contribute to a violation of the ozone standard and to identify the district of origin of transported pollutants.” The information regarding the transport of air pollutants from one basin to another was to be quantified to assist interrelated basins in the preparation of plans for the attainment of State ambient air quality standards. Numerous studies conducted by the CARB have identified air basins that are impacted by pollutants transported from other air basins (as of 1993). Among the air basins affected by air pollution transport from the San Francisco Bay Area Air Basin (SFBAAB) are the North Central Coast Air Basin, the Mountain Counties Air Basin, the San Joaquin Valley Air Basin, and the Sacramento Valley Air Basin. The SFBAAB was also identified as an area impacted by the transport of air pollutants from the Sacramento region.

## **LOCAL**

### **Bay Area Air Quality Management District**

The BAAQMD is responsible for attaining and maintaining air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA, FCAAA, and the CCAA.

The BAAQMD has regulated TACs since the 1980s. At the local level, air pollution control or management districts may adopt and enforce CARB’s control measures. Under Regulation 2-1 (General Permit Requirements), Regulation 2-2 (New Source Review), and Regulation 2-5 (New Source Review), all nonexempt sources that possess the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The BAAQMD limits emissions and public exposure to TACs through several programs. The BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. In addition, Regulation 11 Rules 2 and 14 address asbestos demolition renovation, manufacturing, and standards for asbestos containing serpentine.

### **BAAQMD Air Quality Plans**

As stated above, the BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. The BAAQMD prepares ozone attainment plans (OAP) for the national ozone standard and clean air plans (CAP) for the California standard both in coordination with the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG).

With respect to applicable air quality plans, the BAAQMD prepared the 2017 Clean Air Plan to address nonattainment of the national 1-hour ozone standard in the SFBAAB. The 2017 Clean Air Plan is a roadmap for regional efforts to reduce air pollution and protect public health and the global climate. The 2017 Plan identifies potential rules, programs, and strategies to reduce GHG emissions and other harmful air pollutants in the Bay Area. The 2017 Plan complements and supports other important regional and state planning efforts, including Plan Bay Area and the State of California’s 2030 Scoping Plan.

This Plan lays out 85 distinct control measures to decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs and other pollutants. Numerous measures reduce multiple pollutants simultaneously, while others focus on a single type of pollutant - for example, “super-GHGs” like methane and black carbon.

The goals of the 2017 Clean Air Plan are to:

1. Protect local air quality and health at the regional and local scale
  - a. Attain all state and national air quality standards
  - b. Eliminate the disparities among Bay Area communities in cancer health risk from toxic air contaminants; and
2. Protect the climate:
  - a. Reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050

**BAAQMD Thresholds of Significance**

BAAQMD has adopted project-level and plan-level advisory thresholds of significance for air pollutants, pollutant precursors, and GHG emissions. BAAQMD’s plan-level thresholds of significance are shown in Table 3-1.

**TABLE 3-1: STAFF RECOMMENDED CEQA THRESHOLDS OF SIGNIFICANCE**

POLLUTANT	CONSTRUCTION-RELATED	OPERATION-RELATED
<b>PROJECT LEVEL</b>		
<b>PLAN LEVEL</b>		
Criteria Air Pollutants and Precursors (Regional and Local)	<i>Consistency with Current Air Quality Plan control measures Rate of VMT increase or vehicle trips is less than rate of increase in population</i>	
GHGs	<i>No Threshold Recommended</i>	<i>Qualified Climate Action Plan Meets or Exceeds AB 32 or EO S-03-05 targets OR 6.7 MT CO2e/capita/yr; 4.6 MT CO2e/SP/yr;</i>
Risks and Hazards/Odors	<i>Overlay zones around existing and planned sources of TACs (including adopted Community Risk Reduction Plan areas) and odors Overlay zones of at least 500 feet from all freeways and high volume roadways</i>	
Accidental Release of Acutely Hazardous Air Pollutants	<i>No Threshold Recommended</i>	<i>No Threshold Recommended</i>

SOURCE: BAY AREA QUALITY MANAGEMENT DISTRICT

**BAAQMD CEQA Guidelines**

The BAAQMD published CEQA Air Quality Guidelines in 2017 to assist lead agencies in evaluating air quality impacts of projects and plans proposed in the SFBAAB. The Guidelines contain instructions on how to evaluate, measure, and mitigate air quality impacts generated for project-level and plan-level activities. The Guidelines focus on criteria air pollutant, greenhouse gas (GHG), toxic air contaminant, and odor emissions generated from plans or projects. The Guidelines are intended to help lead agencies navigate through the CEQA process. The Guidelines offer step-by-step procedures for a thorough environmental impact analysis of adverse air emissions in the Bay Area.

**BAAQMD CARE Program**

The BAAQMD CARE Program aims to identify locations with high toxic emissions and sensitive populations, and to use the information to help the Air District establish policies for the use of its incentive funding, regulatory authority, and other programs to reduce toxic emissions in areas with high TAC exposures and sensitive populations.

Figure 3-1 shows the areas within the Planning Area that are designated by the CARE Program. As shown, no portions of the Planning Area are designated by the CARE Program.

**CALGreen and Building Energy Efficiency Standards**

The California Green Building Standards Code (CALGreen) is a set of mandatory green building standards for new construction. CALGreen was first developed by the California Building Standards Commission in an effort to meet the goals

of A 32, which established a comprehensive program of cost-effective reductions of greenhouse gases (GHG) to 1990 levels by 2020. CALGreen applies to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure on a statewide basis unless otherwise indicated. Additions and alterations to existing buildings which increase the building's conditioned area, interior volume, or size are also covered by the scope of CALGreen.

The California Building Standards Commission has the authority to propose CALGreen standards for nonresidential structures that include, but are not limited to, new buildings or portions of new buildings, additions and alterations, and all occupancies where no other state agency has the authority to adopt green building standards applicable to those occupancies.

Additionally, on May 9, 2018, the California Energy Commission adopted the 2019 Title 24, Part 6 Energy Code updates that took effect January 1, 2020. The cost-effective 2019 Building Energy Efficiency Standards focus on four key areas: smart residential photovoltaic systems, updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa), residential and nonresidential ventilation requirements, and nonresidential lighting requirements.

### Town of Tiburon General Plan

The existing Tiburon General Plan includes the following goals, policies, and implementing programs related to air quality:

#### Resource Conservation Element

##### Goals

OSC-F: To preserve and improve the quality of the environment through resource restoration and conservation, management, and pollutant control.

##### Policies

OSC-55. The Town shall participate in efforts to voluntarily reduce activities that pollute on Spare the Air days and help publicize Spare the Air day activities.

OSC-56. The Town shall promote the reduction of particulate matter from construction sites, roads, parking lots, and other sources through best management practices (BMPs).

OSC-57. The Town shall require the use of feasible control measures to reduce PM10, NOx, and diesel particulate matter related to construction activities.

OSC-58. The Town shall, through implementation of Circulation Element policies, encourage the reduction of the number of single-occupant vehicle trips and cumulative emissions that result from auto use.

##### Implementing Programs

OSC-l: Consider the adoption of a wood smoke ordinance to reduce the emission of particulate matter into the air.

OSC-m: The Town shall pursue the gradual replacement of the Town's vehicle fleet with zero or low emission vehicles, where appropriate.

## ENVIRONMENTAL SETTING

### **SAN FRANCISCO BAY AREA AIR BASIN (SFBAAB)**

Tiburon is located within the SFBAAB, which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the southern portion of Sonoma County, and the southwestern portion of Solano County. Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the

presence of existing air pollution sources and ambient conditions. These factors along with applicable regulations are discussed below.

### **TOPOGRAPHY**

The topography of the SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays. This complex terrain, especially the higher elevations, distorts the normal wind flow patterns in the SFBAAB. The greatest distortion occurs when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common in the summertime.

The only major break in California's Coast Range occurs in the SFBAAB. Here the Coast Range splits into western and eastern ranges. Between the two ranges lies San Francisco Bay. The gap in the western coast range is known as the Golden Gate, and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the SFBAAB and the Central Valley.

### **CLIMATE**

The SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. Climate of the SFBAAB is determined largely by a high pressure system, as discussed below. Within the Town, temperatures range from an average low of 47 degrees to an average high of 87 degrees.

#### **High Pressure Cell**

During the summer, the large-scale meteorological condition that dominates the West Coast is a semi-permanent high pressure cell centered over the northeastern portion of the Pacific Ocean. This high pressure cell keeps storms from affecting the California coast. Hence, the SFBAAB experiences little precipitation in the summer months. Winds tend to blow on shore out of the north/northwest.

The steady northwesterly flow induces upwelling of cold water from below. This upwelling produces a band of cold water off the California coast. When air approaches the California coast, already cool and moisture-laden from its long journey over the Pacific, it is further cooled as it crosses this bank of cold water. This cooling often produces condensation resulting in a high incidence of fog and stratus clouds along the Northern California coast in the summer.

Generally in the winter, the Pacific high pressure cell weakens and shifts southward, winds tend to flow offshore, upwelling ceases, and storms occur. During the winter rainy periods, inversions (layers of warmer air over colder air; see below) are weak or nonexistent, winds are usually moderate, and air pollution potential is low. The Pacific high pressure cell does periodically become dominant, bringing strong inversions, light winds, and high pollution potential.

#### **Wind Patterns**

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more directly from the west as they stream through the Golden Gate. This channeling of wind through the Golden Gate produces a jet that sweeps eastward and splits off to the northwest toward Richmond and to the southwest toward San Jose when it meets the East Bay hills.

Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, the Golden Gate, or the San Bruno gap. For example, the average wind speed at San Francisco International Airport in July is about 17 knots (from 3 p.m. to 4 p.m.), compared with only 7 knots at San Jose and less than 6 knots at the Farallon Islands.

The air flowing in from the coast to the Central Valley, called the sea breeze, begins developing at or near ground level along the coast in late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity

while spreading inland. The depth of the sea breeze depends in large part upon the height and strength of the inversion. If the inversion is low and strong, and hence stable, the flow of the sea breeze will be inhibited, and stagnant conditions are likely to result.

In the winter, the SFBAAB frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds. Winter stagnation episodes are characterized by nighttime drainage flows in coastal valleys. Drainage is a reversal of the usual daytime air-flow patterns; air moves from the Central Valley toward the coast and back down toward the Bay from the smaller valleys within the SFBAAB.

### Temperature

Summertime temperatures in the SFBAAB are determined in large part by the effect of differential heating between land and water surfaces. Because land tends to heat up and cool off more quickly than water, a large-scale gradient (differential) in temperature is often created between the coast and the Central Valley, and small-scale local gradients are often produced along the shorelines of the ocean and bays. The temperature gradient near the ocean is also exaggerated, especially in summer, because of the upwelling of cold ocean bottom water along the coast. On summer afternoons the temperatures at the coast can be 35°F cooler than temperatures 15 to 20 miles inland. At night this contrast usually decreases to less than 10°.

In the winter, the relationship of minimum and maximum temperatures is reversed. During the daytime the temperature contrast between the coast and inland areas is small, whereas at night the variation in temperature is large.

### Precipitation

The SFBAAB is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly from one part of the SFBAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys.

During rainy periods, ventilation (rapid horizontal movement of air and injection of cleaner air) and vertical mixing are usually high, and thus pollution levels tend to be low. However, frequent dry periods do occur during the winter where mixing and ventilation are low and pollutant levels build up.

## AIR POLLUTION POTENTIAL

The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air. The topographic and climatological factors discussed above influence the atmospheric pollution potential of an area. Atmospheric pollution potential, as the term is used here, is independent of the location of emission sources and is instead a function of factors described below.

### Wind Circulation

Low wind speed contributes to the buildup of air pollution because it allows more pollutants to be emitted into the air mass per unit of time. Light winds occur most frequently during periods of low sun (fall and winter, and early morning) and at night. These are also periods when air pollutant emissions from some sources are at their peak, namely, commute traffic (early morning) and wood burning appliances (nighttime). The problem can be compounded in valleys, when weak flows carry the pollutants upvalley during the day, and cold air drainage flows move the air mass downvalley at night. Such restricted movement of trapped air provides little opportunity for ventilation and leads to buildup of pollutants to potentially unhealthful levels.

### **Inversions**

An inversion is a layer of warmer air over a layer of cooler air. Inversions affect air quality conditions significantly because they influence the mixing depth (i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground). The highest air pollutant concentrations in the SFBAAB generally occur during inversions.

There are two types of inversions that occur regularly in the SFBAAB. One is more common in the summer and fall, while the other is most common during the winter. The frequent occurrence of elevated temperature inversions in summer and fall months acts to cap the mixing depth, limiting the depth of air available for dilution. Elevated inversions are caused by subsiding air from the subtropical high pressure zone, and from the cool marine air layer that is drawn into the SFBAAB by the heated low pressure region in the Central Valley.

The inversions typical of winter, called radiation inversions, are formed as heat quickly radiates from the earth's surface after sunset, causing the air in contact with it to rapidly cool. Radiation inversions are strongest on clear, low-wind, cold winter nights, allowing the build-up of such pollutants as carbon monoxide and particulate matter. When wind speeds are low, there is little mechanical turbulence to mix the air, resulting in a layer of warm air over a layer of cooler air next to the ground. Mixing depths under these conditions can be as shallow as 50 to 100 meters, particularly in rural areas. Urban areas usually have deeper minimum mixing layers because of heat island effects and increased surface roughness. During radiation inversions downwind transport is slow, the mixing depths are shallow, and turbulence is minimal, all factors which contribute to ozone formation.

Although each type of inversion is most common during a specific season, either inversion mechanism can occur at any time of the year. Sometimes both occur simultaneously. Moreover, the characteristics of an inversion often change throughout the course of a day. The terrain of the SFBAAB also induces significant variations among subregions.

### **Solar Radiation**

The frequency of hot, sunny days during the summer months in the SFBAAB is another important factor that affects air pollution potential. It is at the higher temperatures that ozone is formed. In the presence of ultraviolet sunlight and warm temperatures, reactive organic gases and oxides of nitrogen react to form secondary photochemical pollutants, including ozone. Because temperatures in many of the SFBAAB inland valleys are so much higher than near the coast, the inland areas are especially prone to photochemical air pollution.

In late fall and winter, solar angles are low, resulting in insufficient ultraviolet light and warming of the atmosphere to drive the photochemical reactions. Ozone concentrations do not reach significant levels in the SFBAAB during these seasons.

### **Sheltered Terrain**

The hills and mountains in the SFBAAB contribute to the high pollution potential of some areas. During the day, or at night during windy conditions, areas in the lee sides of mountains are sheltered from the prevailing winds, thereby reducing turbulence and downwind transport. At night, when wind speeds are low, the upper atmospheric layers are often decoupled from the surface layers during radiation conditions. If elevated terrain is present, it will tend to block pollutant transport in that direction. Elevated terrain also can create a recirculation pattern by inducing upvalley air flows during the day and reverse downvalley flows during the night, allowing little inflow of fresh air.

The areas having the highest air pollution potential tend to be those that experience the highest temperatures in the summer and the lowest temperatures in the winter. The coastal areas are exposed to the prevailing marine air, creating cooler temperatures in the summer, warmer temperatures in winter, and stratus clouds all year. The inland valleys are sheltered from the marine air and experience hotter summers and colder winters. Thus, the topography of the inland valleys creates conditions conducive to high air pollution potential.

## Pollution Potential Related to Emissions

Although air pollution potential is strongly influenced by climate and topography, the air pollution that occurs in a location also depends upon the amount of air pollutant emissions in the surrounding area or transported from more distant places. Air pollutant emissions generally are highest in areas that have high population densities, high motor vehicle use, and/or industrialization. These contaminants created by photochemical processes in the atmosphere, such as ozone, may result in high concentrations many miles downwind from the sources of their precursor chemicals

## CRITERIA AIR POLLUTANTS

The EPA uses six "criteria pollutants" as indicators of air quality and has established for each criteria pollutant a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). CARB has monitored the gaseous criteria pollutants carbon monoxide, nitrogen dioxide, ozone, and sulfur dioxide since its inception in 1968. Monitoring is performed to demonstrate attainment or non-attainment of national and state ambient air quality standards.

Each criteria pollutant and its associated health effects is described below.

**Ozone (O<sub>3</sub>)** is a photochemical oxidant and the major component of smog. While O<sub>3</sub> in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O<sub>3</sub> at ground level are a major health and environmental concern. O<sub>3</sub> is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O<sub>3</sub> levels occur typically during the warmer times of the year. Both VOCs and NO<sub>x</sub> are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops, and other sources using solvents.

The reactivity of O<sub>3</sub> causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O<sub>3</sub> not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O<sub>3</sub> for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

**Carbon monoxide (CO)** is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks.

**Nitrogen dioxide (NO<sub>2</sub>)** is a brownish, highly reactive gas that is present in all urban atmospheres. NO<sub>2</sub> can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to O<sub>3</sub> and acid rain and may affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO<sub>2</sub> in the atmosphere is the oxidation of the primary air pollutant NO<sub>x</sub>. NO<sub>x</sub> plays a major role, together with VOCs, in the atmospheric reactions that produce O<sub>3</sub>. NO<sub>x</sub> forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

**Sulfur dioxide (SO<sub>2</sub>)** affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children, and the elderly. SO<sub>2</sub> is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings, and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large

parts of the country. This is especially noticeable in national parks. Ambient SO<sub>2</sub> results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters.

**Particulate matter (PM)** is not a single pollutant, but rather is a mixture of many chemical species. It is a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. Particles vary widely in size, shape and chemical composition, and may contain inorganic ions, metallic compounds, elemental carbon, organic compounds, and compounds from the earth's crust. Particles are defined by their diameter for air quality regulatory purposes. PM includes dust, dirt, soot, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO<sub>2</sub> and VOCs are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO<sub>2</sub>) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature death.

**Respirable particulate matter (PM<sub>10</sub>)** consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter is caused primarily by dust from grading and excavation activities, from agricultural uses (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning, and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM<sub>10</sub> causes a greater health risk than larger particles, since these small particles can more easily penetrate the defenses of the human respiratory system.

**Fine particulate matter (PM<sub>2.5</sub>)** consists of small particles, which are less than 2.5 microns in size. Similar to PM<sub>10</sub>, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM<sub>10</sub>, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer.

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly, and children. Particulate matter also soils and damages materials and is a major cause of visibility impairment.

**Lead (Pb)** exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil, or dust. Excessive Pb exposure can cause seizures, mental retardation, and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

## ODORS

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word “strong” to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

### SENSITIVE RECEPTORS

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals, and schools.

### AMBIENT AIR QUALITY

Both the EPA and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

The federal and California state ambient air quality standards are summarized in Table 3-2 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM<sub>10</sub>.

In 1997, new national standards for PM<sub>2.5</sub> were adopted for 24-hour and annual averaging periods. The current PM<sub>10</sub> standards were to be retained, but the method and form for determining compliance with the standards were revised. The CARB regularly reviews scientific literature regarding the health effects and exposure to air pollutants. On May 3, 2002, CARB staff recommended lowering the level of the annual standard for PM<sub>10</sub> and establishing a new annual standard for PM<sub>2.5</sub>. The new standards became effective on July 5, 2003, with another revision on November 29, 2005. Revised standards for O<sub>3</sub> and NO<sub>2</sub> went into effect on May 17, 2006 and March 20, 2008, respectively.

TABLE 3-2: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	AVERAGING TIME	FEDERAL PRIMARY STANDARD	STATE STANDARD
Ozone	1-Hour	--	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.000 ppm	9.00 ppm
	1-Hour	35.00 ppm	20.00 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.03 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	Annual	0.030 ppm	--
	24-Hour	0.140 ppm	0.040 ppm
	1-Hour	0.075 ppm	0.250 ppm
PM <sub>10</sub>	Annual	--	20 µg/m <sup>3</sup>
	24-Hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>

POLLUTANT	AVERAGING TIME	FEDERAL PRIMARY STANDARD	STATE STANDARD
PM <sub>2.5</sub>	Annual	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
	24-Hour	35 µg/m <sup>3</sup>	--
Lead	30-Day Average	--	1.5 µg/m <sup>3</sup>
	3-Month Average	0.15 µg/m <sup>3</sup>	--

NOTES: PPM = PARTS PER MILLION, µG/M<sup>3</sup> = MICROGRAMS PER CUBIC METER

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2016.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within Marin County and the entire SFBAAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

### ATTAINMENT STATUS

In accordance with the CCAA, the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An “attainment” designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A “nonattainment” designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for O<sub>3</sub>, CO, and NO<sub>2</sub> as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For SO<sub>2</sub>, areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

Table 3-2 presents the state and federal standards and attainment status for the BAAQMD.

TABLE 3-2: STATE AND NATIONAL ATTAINMENT STATUS

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS <sup>1</sup>		NATIONAL STANDARDS <sup>2</sup>	
		CONCENTRATION	ATTAINMENT STATUS	PRIMARY	ATTAINMENT STATUS
Ozone	8 Hour	0.070 ppm (137µg/m <sup>3</sup> )	Nonattainment <sup>9</sup>	0.070 ppm Primary same as secondary	Nonattainment <sup>4</sup>
	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Nonattainment	--	See Footnote #5
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )	Attainment	9 ppm (10 mg/m <sup>3</sup> )	Attainment <sup>6</sup>
	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	Attainment	35 ppm (40 mg/m <sup>3</sup> )	Attainment

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS <sup>1</sup>		NATIONAL STANDARDS <sup>2</sup>	
		CONCENTRATION	ATTAINMENT STATUS	PRIMARY	ATTAINMENT STATUS
Nitrogen Dioxide (NO <sub>2</sub> )	1 Hour	0.18 ppm (339 µg/m <sup>3</sup> )	Attainment	0.100 ppm See Footnote #11	See Footnote #11
	Annual Arithmetic Mean	0.030 ppm (57 µg/m <sup>3</sup> )	--	0.053 ppm (100 µg/m <sup>3</sup> )	Attainment
Sulfur Dioxide (SO <sub>2</sub> )	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )	Attainment	0.14 ppm (365 µg/m <sup>3</sup> )	See Footnote #12
	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	Attainment	0.075 ppm (196 µg/m <sup>3</sup> )	See Footnote #12
	Annual Arithmetic Mean	--	--	0.030 ppm (80 µg/m <sup>3</sup> )	See Footnote #12
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>	Nonattainment <sup>7</sup>	--	--
Respirable Particulate Matter (PM <sub>10</sub> )	24 Hour	50 µg/m <sup>3</sup>	Nonattainment	150 µg/m <sup>3</sup>	Unclassified
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	Nonattainment <sup>7</sup>	12 µg/m <sup>3</sup> See Footnote #15	Unclassified/Attainment
Fine Particulate Matter (PM <sub>2.5</sub> )	24 Hour	--	--	35 µg/m <sup>3</sup> See Footnote #10	Nonattainment
	24 Hour	25 µg/m <sup>3</sup>	Attainment	--	--
Lead	30 Day Average	1.5 µg/m <sup>3</sup>	--	-	Attainment
	Calendar Quarter	-	--	1.5 µg/m <sup>3</sup>	Attainment
Sulfates	Rolling 3 Month Average <sup>14</sup>	-	--	0.15 µg/m <sup>3</sup>	See Footnote #14
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m <sup>3</sup> )	Unclassified	--	--
Vinyl Chloride	24 Hour	0.010 ppm (26 µg/m <sup>3</sup> )	No information available	--	--
Visibility-Reducing Particle Matter	8 Hour (10:00 to 18:00 PST)	See Footnote #8	Unclassified	--	--

Notes:

mg/m<sup>3</sup> = milligrams per cubic meter; ppm=parts per million; µg/m<sup>3</sup> = micrograms per cubic meter.

- California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.
- National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.070 ppm (70 ppb) or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m<sup>3</sup>. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m<sup>3</sup>. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM10 is met if the 3-year average falls below the standard at every site. The annual PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
- National air quality standards are set by US EPA at levels determined to be protective of public health with an adequate margin of safety.
- On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over three years, is equal to or less than 0.070 ppm. EPA will make recommendations on attainment designations by October 1, 2016, and issue final designations October 1, 2017. Nonattainment areas will have until 2020 to late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.
- The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
- In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
- In June 2002, CARB established new annual standards for PM2.5 and PM10.

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS <sup>1</sup>		NATIONAL STANDARDS <sup>2</sup>	
		CONCENTRATION	ATTAINMENT STATUS	PRIMARY	ATTAINMENT STATUS
8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range. 9. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006. 10. On January 9, 2013, EPA issued a final rule to determine that the Bay Area attains the 24-hour PM <sub>2.5</sub> national standard. This EPA rule suspends key SIP requirements as long as monitoring data continues to show that the Bay Area attains the standard. Despite this EPA action, the Bay Area will continue to be designated as “non-attainment” for the national 24-hour PM <sub>2.5</sub> standard until such time as the Air District submits a “redesignation request” and a “maintenance plan” to EPA, and EPA approves the proposed redesignation. 11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010). The US Environmental Protection Agency (EPA) expects to make a designation for the Bay Area by the end of 2017. 12. On June 2, 2010, the U.S. EPA established a new 1-hour SO <sub>2</sub> standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO <sub>2</sub> NAAQS however must continue to be used until one year following U.S. EPA initial designations of the new 1-hour SO <sub>2</sub> NAAQS. EPA expects to make designation for the Bay Area by the end of 2017. 13. ARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure below which there are no adverse health effects determined. 14. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011. 15. In December 2012, EPA strengthened the annual PM 2.5 National Ambient Air Quality Standards (NAAQS) from 15.0 to 12.0 micrograms per cubic meter (µg/m <sup>3</sup> ). In December 2014, EPA issued final area designations for the 2012 primary annual PM 2.5 NAAQS. Areas designated “unclassifiable/attainment” must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.					

SOURCE: BAY AREA AIR QUALITY MANAGEMENT DISTRICT, 2020.

### SFBAAB MONITORING

The SFBAAB is composed of the counties of Santa Clara, San Mateo, San Francisco, Marin, Napa, Contra Costa, and Alameda, along with the southeast section of Sonoma and the southwest section of Solano counties. BAAQMD and CARB maintain numerous air quality monitoring sites throughout each County in the Air Basin to measure ozone, PM<sub>2.5</sub>, and PM<sub>10</sub>. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. Data obtained from the monitoring sites throughout the SFBAAB between 2017 and 2019 is summarized in Tables 3-3 through 3-5.

TABLE 3-3: SFBAAB AMBIENT AIR QUALITY MONITORING DATA SUMMARY - OZONE

YEAR	MAX. DAYS > STANDARD				1-HOUR OBSERVATIONS			8-HOUR AVERAGES				YEAR COVERAGE	
	STATE		NATIONAL		STATE		NAT'L	STATE		NATIONAL		MIN	MAX
	1-HR	8-HR	1-HR	8-HR	MAX.	D.V. <sup>1</sup>	D.V. <sup>2</sup>	MAX.	D.V. <sup>1</sup>	MAX.	D.V. <sup>2</sup>		
2017	5	6	0	3	0.139	0.11	0.102	0.110	0.087	0.110	0.075	0	100
2018	2	3	0	0	0.099	0.10	0.102	0.080	0.084	0.080	0.073	9	100
2019	4	7	0	1	0.106	0.10	0.104	0.086	0.080	0.085	0.073	75	100

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. THE NATIONAL 1-HOUR OZONE STANDARD WAS REVOKED IN JUNE 2005 AND IS NO LONGER IN EFFECT. STATISTICS RELATED TO THE REVOKED STANDARD ARE SHOWN IN ITALICS. D.V. <sup>1</sup> = STATE DESIGNATION VALUE. D.V. <sup>2</sup> = NATIONAL DESIGN VALUE.

SOURCE: CALIFORNIA AIR RESOURCES BOARD AIR POLLUTION SUMMARIES, ACCESSED DECEMBER 2020.

TABLE 3-4: SFBAAB AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM<sub>2.5</sub>

YEAR	EST. DAYS > NAT'L '06 STD.	ANNUAL AVERAGE		NAT'L ANN. STD. D.V. <sup>1</sup>	STATE ANN. D.V. <sup>2</sup>	NAT'L '06 STD. 98 <sup>TH</sup> PERCENTILE	NAT'L '06 24-HR STD. D.V. <sup>1</sup>	HIGH 24-HR AVERAGE		YEAR COVERAGE	
		NAT'L	STATE					NAT'L	STATE	MIN.	MAX.
2017	13.3	13.7	13.1	10.9	13	54.2	35	199.1	199.1	90	100
2018	16.4	14.4	14.5	12.0	14	82.7	48	197.2	197.2	27	99
2019	1.1	9.4	9.4	11.7	14	20.6	48	35.9	35.9	93	100

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. D.V. <sup>1</sup> = STATE DESIGNATION VALUE. D.V. <sup>2</sup> = NATIONAL DESIGN VALUE

SOURCE: CALIFORNIA AIR RESOURCES BOARD AIR POLLUTION SUMMARIES, ACCESSED DECEMBER 2020.

TABLE 3-5: SFBAAB AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM<sub>10</sub>

YEAR	EST. DAYS > STD.		ANNUAL AVERAGE		3-YEAR AVERAGE		HIGH 24-HR AVERAGE		YEAR COVERAGE
	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	
2017	0	25.8	20.7	22.1	20	22	95.3	98.0	100
2018	2.9	13.1	20.9	23.1	20	23	191.1	201.0	100
2019	0	26.2	18.4	19.1	20	23	75.4	77.1	100

NOTES: THE NATIONAL ANNUAL AVERAGE PM<sub>10</sub> STANDARD WAS REVOKED IN DECEMBER 2006 AND IS NO LONGER IN EFFECT. AN EXCEEDANCE IS NOT NECESSARILY A VIOLATION. STATISTICS MAY INCLUDE DATA THAT ARE RELATED TO AN EXCEPTIONAL EVENT. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. NATIONAL STATISTICS ARE BASED ON STANDARD CONDITIONS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. \* = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE.

SOURCE: CALIFORNIA AIR RESOURCES BOARD AIR POLLUTION SUMMARIES, ACCESSED DECEMBER 2020.

### MARIN COUNTY AIR QUALITY MONITORING

BAAQMD and CARB maintain four air quality monitoring sites in Marin County that collect data for ozone, PM<sub>10</sub>, and PM<sub>2.5</sub> in recent years. Data obtained from the nearest monitoring site to the Town, San Rafael (534 4<sup>th</sup> Street) monitoring site. monitoring station, between 2017 and 2019 is shown in Table 3-6.

TABLE 3-6: AMBIENT AIR QUALITY MONITORING DATA (SAN RAFAEL [534 4<sup>TH</sup> STREET])

POLLUTANT	CAL.	FED.	YEAR	MAX. CONCENTRATION	DAYS EXCEEDED STATE/FED STANDARD
	PRIMARY STANDARD				
Ozone (O <sub>3</sub> ) (1-hour)	0.09 ppm for 1 hour	N/A	2017	0.088	0 / 0
			2018	0.072	0 / 0
			2019	0.096	1 / 0
Ozone (O <sub>3</sub> ) (8-hour)	0.070 ppm for 8-hour	0.075 ppm for 8-hour	2017	0.063	0 / 0
			2018	0.054	0 / 0
			2019	0.080	1 / 1
Particulate Matter (PM <sub>10</sub> )	50 ug/m <sup>3</sup> for 24 hours	150 ug/m <sup>3</sup> for 24 hours	2017	24.0	0 / 0
			2018	166.0	12 / 6
			2019	33.0	* / 0
Fine Particulate Matter (PM <sub>2.5</sub> )	N/A	35 ug/m <sup>3</sup> for 24 hours	2017	74.7	(N/A) / 8
			2018	167.6	(N/A) / 13
			2019	19.5	(N/A) / 0

\* THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE.

SOURCE: CALIFORNIA AIR RESOURCES BOARD AIR POLLUTION SUMMARIES, ACCESSED DECEMBER 2020.

### MAJOR EMITTERS IN TIBURON

CARB maps major emitters and facilities throughout the state. No major emitters were identified by CARB within the Planning Area. However, Figure 3-2 shows major emitters (including refinery, electricity generation, and other combustible sources) that currently exist in the broader region outside of the Planning Area.

Air pollutant emissions are generated in Tiburon by stationary and area-wide sources, such as space and water heating, landscape maintenance from leaf blowers and lawn mowers, consumer products, and mobile sources, primarily automobile traffic. None of the existing uses within Tiburon involve heavy industrial or manufacturing processes that would result in the release of toxic air emissions identified by CARB. Overall, motor vehicles are the primary source of pollutants in the Planning Area.

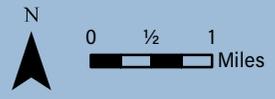
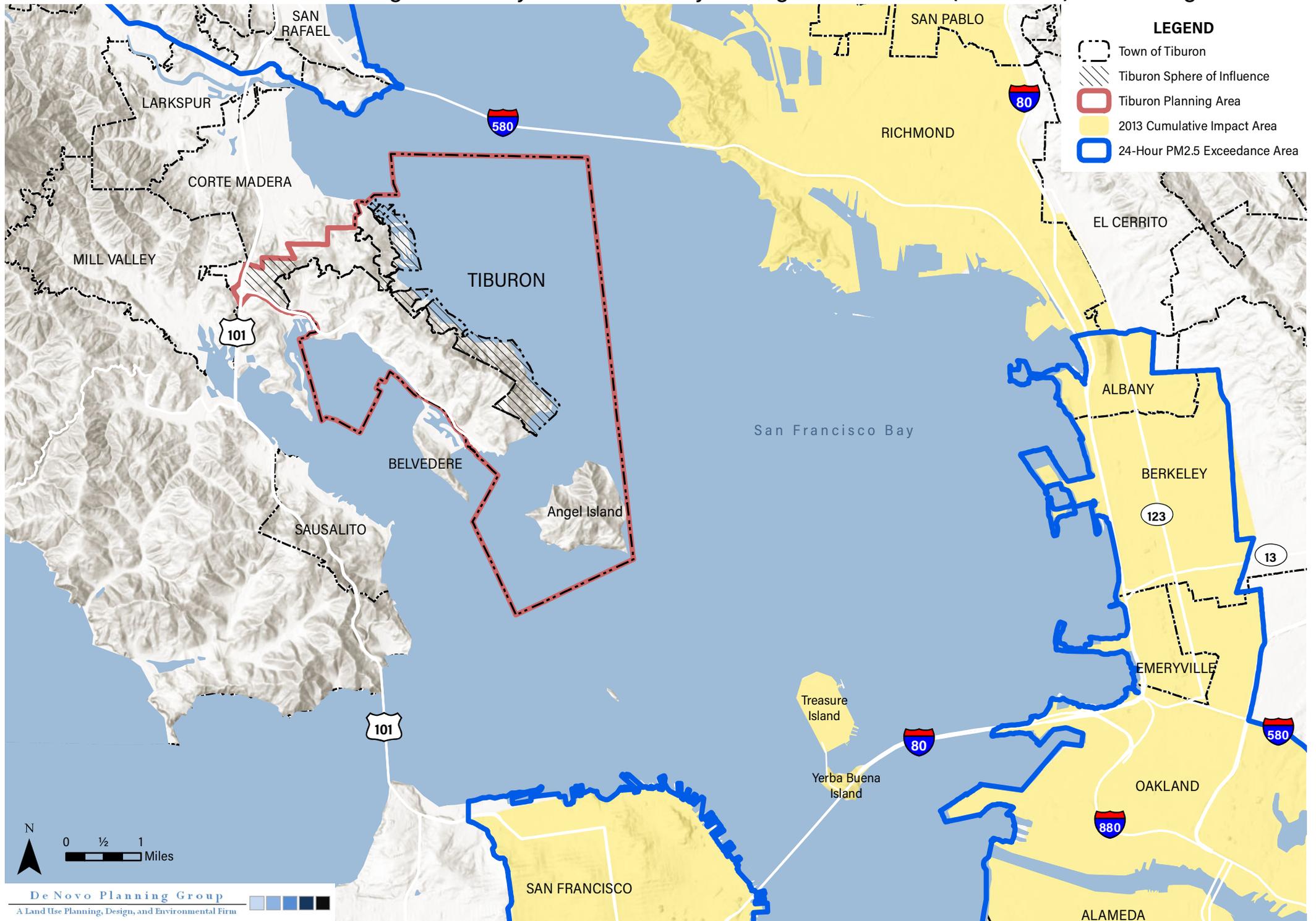
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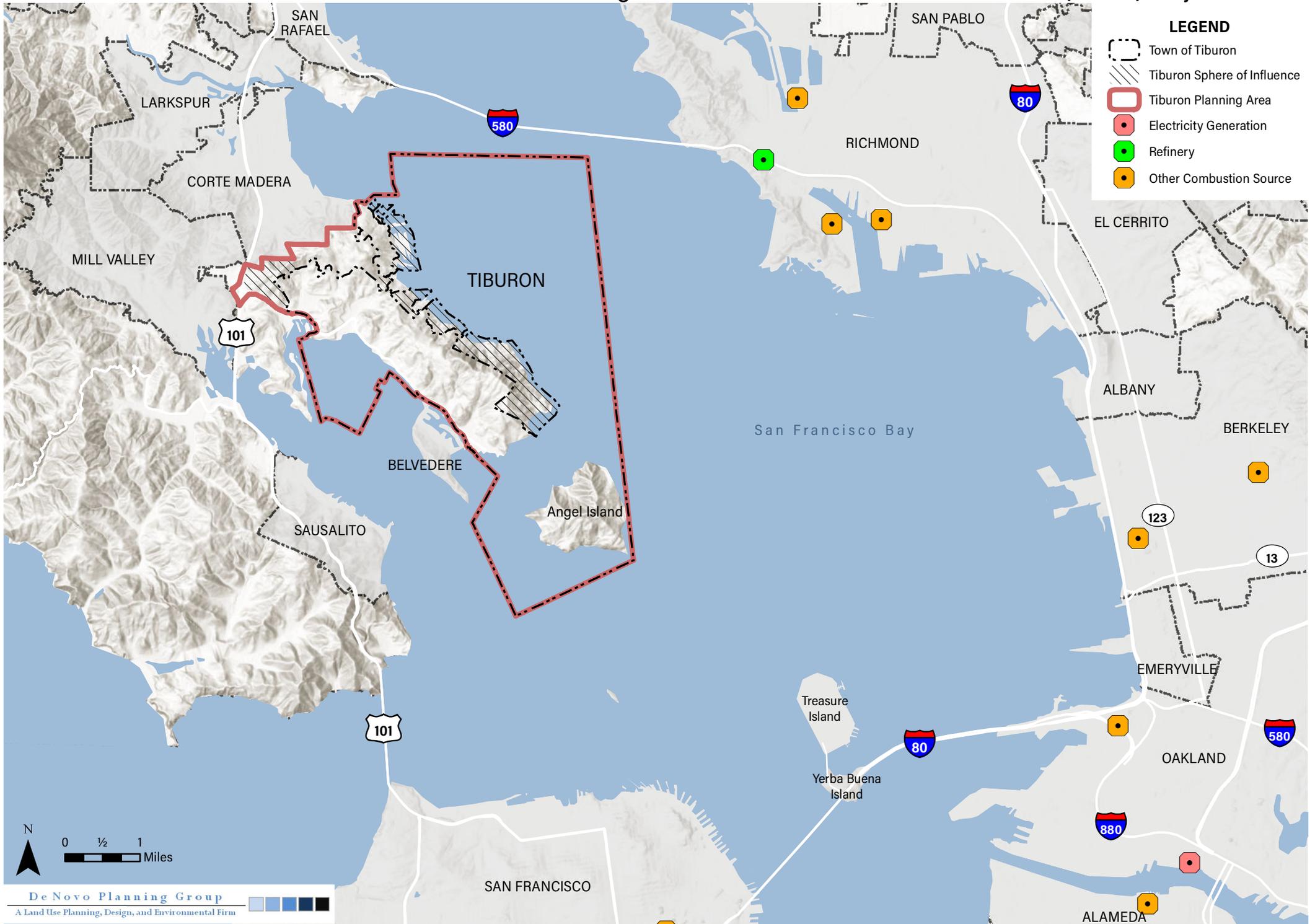
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Figure 3-1: Bay Area Air Quality Management District (BAAQMD) CARE Program Areas



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Figure 3-2: California Air Resources Board (CARB) Major Emitters



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## 4 GEOLOGY, SOILS, AND SEISMICITY

This section addresses seismic and geologic hazards in the Planning Area. For hazards relating to flooding, wildfire, and hazardous materials, see the *Hazards and Safety Existing Conditions Report*.

### REGULATORY FRAMEWORK

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#### STATE

The State has established a variety of regulations and requirements related to seismic safety and structural integrity, including the California Building Standards Code, the Alquist-Priolo Earthquake Fault Zoning Act, and the Seismic Hazards Mapping Act.

#### California Building Standards Code

Title 24 of the California Code of Regulations, known as the California Building Standards Code (CBSC) or simply "Title 24," contains the regulations that govern the construction of buildings in California. The CBSC includes 12 parts: California Building Standards Administrative Code, California Building Code, California Residential Building Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, California Green Building Standards Code (CALGreen Code), and the California Reference Standards Code. Through the CBSC, the State provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design, Chapter 17 addresses structural tests and special inspections, and Chapter 18 addresses soils and foundations. Section 1610 provides structural design standards for foundation walls and retaining walls to ensure resistance to lateral soil loads. Section 1613 provides structural design standards for earthquake loads. Section 1704.7 requires special inspections for existing site soil conditions, fill placement and load-bearing requirements during the construction as specified in Table 1704.7 of this section. Sections 1704.8 through 1704.16 provide inspection and testing requirements for various foundation types, and construction material types. Section 1803.1.1.1 requires each city and county enact an ordinance which requires a preliminary soil report and that the report be based upon adequate test borings or excavations, of every subdivision, where a tentative and final map is required pursuant to Section 66426 of the Government Code. Section 1803.5.3 defines expansive soils and specifies that in areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Section 1803.5.4 specifies that a subsurface soil investigation must be performed to determine whether the existing ground-water table is above or within 5 feet (1524 mm) below the elevation of the lowest floor level where such floor is located below the finished ground level adjacent to the foundation. Section 1803.5.8 provides specific standards where shallow foundations will bear on compacted fill material more than 12 inches (305 mm) in depth. Sections 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Section 1804 provides standards and requirements for excavation, grading, and fill. Sections 1808, 1809, and 1810 provide standards and requirements for the construction of varying foundations.

#### California Environmental Quality Act

Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in a project's area of potential affect, assessment of potential impacts on significant or unique resources, and development of mitigation measures for potentially significant impacts, which may include monitoring combined with data recovery and/or avoidance.

#### State Laws Pertaining to Paleontological Resources

Several sections of the California Public Resources Code protect paleontological resources.

Section 5097.5 prohibits “knowing and willful” excavation, removal, destruction, injury, and defacement of any “vertebrate paleontological site, including fossilized footprints,” on public lands, except where the agency with jurisdiction has granted express permission. “As used in this section, ‘public lands’ means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.”

California Public Resources Code, Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The sections of the California Administrative Code relating to the State Division of Beaches and Parks afford protection to geologic features and “paleontological materials” but grant the director of the State park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the State park system and for State park purposes (California Administrative Code, Title 14, Section 4307 – 4309).

### **Alquist-Priolo Earthquake Fault Zoning Act**

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 sets forth the policies and Criteria of the State Mining and Geology Board, which governs the exercise of governments’ responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults. The policies and criteria are limited to potential hazards resulting from surface faulting or fault creep within Earthquake Fault Zones, as delineated on maps officially issued by the State Geologist. Working definitions include:

- Fault – a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side;
- Fault Zone – a zone of related faults, which commonly are braided and sub parallel, but may be branching and divergent. A fault zone has a significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles;
- Sufficiently Active Fault – a fault that has evidence of Holocene surface displacement along one or more of its segments or branches (last 11,000 years); and
- Well-Defined Fault – a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The geologist should be able to locate the fault in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

“Sufficiently Active” and “Well Defined” are the two criteria used by the State to determine if a fault should be zoned under the Alquist-Priolo Act.

### **Seismic Hazards Mapping Act**

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. Under the Act, seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Earthquake Fault Zoning Act (which addresses only surface fault-rupture hazards) and are outlined below:

The State Geologist is required to delineate the various “seismic hazard zones.”

- Cities and Counties, or other local permitting authority, must regulate certain development “projects” within the zones. They must withhold the development permits for a site within a zone until the geologic and soil conditions of the site are investigated and appropriate mitigation measures, if any, are incorporated into development plans.
- The State Mining and Geology Board provides additional regulations, policies, and criteria, to guide cities and counties in their implementation of the law. The Board also provides guidelines for preparation of the Seismic Hazard Zone Maps and for evaluating and mitigating seismic hazards.

- Sellers (and their agents) of real property within a mapped hazard zone must disclose that the property lies within such a zone at the time of sale.

### **Caltrans Seismic Design Criteria**

The California Department of Transportation (Caltrans) has Seismic Design Criteria (SDC), which is an encyclopedia of new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC adopts a performance-based approach specifying minimum levels of structural system performance, component performance, analysis, and design practices for ordinary standard bridges. The SDC has been developed with input from the Caltrans Offices of Structure Design, Earthquake Engineering and Design Support, and Materials and Foundations. Memo 20-1 outlines the bridge category and classification, seismic performance criteria, seismic design philosophy and approach, seismic demands and capacities on structural components and seismic design practices that collectively make up Caltrans' seismic design methodology.

## **LOCAL**

### **Town of Tiburon General Plan**

The existing Tiburon General Plan includes the following goals, policies, and implementing programs related to geology, soils, seismicity, and paleontological resources:

### **Safety Element**

#### **Goals**

SE-A: To Maintain a safe and healthy community

SE-B: To identify hazardous areas and to discourage to the maximum extent feasible development of areas subject to hazards including, but not limited to, geotechnical hazards, unstable slopes and flood-prone areas.

SE-C: To ensure safe subdivision and building design.

SE-D: To encourage disaster preparedness planning for effective emergency response and to protect public safety.

SE-E: To reduce the impact of hazardous materials exposure and to strive to reduce threats to health, safety, and the environment from hazardous materials.

#### **Policies**

SE-1: The Town shall permit development only in those areas where potential danger to the health, safety, and welfare of the residents of the community can be avoided or adequately mitigated.

SE-2: The Town shall require development and construction to be located, designed, and implemented to avoid, eliminate, or reduce geologic and non-geologic hazards.

SE-3: The Town shall continue to require detailed geotechnical investigations for development proposals. Such investigations shall determine the actual extent of geotechnical hazards, specify adequate repair/ improvement techniques, describe optimum design for structures and improvements, and set forth any special requirements for the sites.

SE-4: Development allowed within areas of potential geologic hazard shall neither be endangered by, nor contribute to, the hazardous conditions on the site or on surrounding properties.

SE-5: Development in areas subject to landsliding shall comply with the Town's Landslide Mitigation Policy. The Town shall require physical improvements to landslides and to potential landslide areas in instances where avoidance is not feasible or appropriate, as determined through the development review process.

SE-6: The Town should actively encourage owners of developed property to repair or improve unstable slopes, install drainage facilities, and take other measures that may reduce potential safety hazards.

SE-7: The Town shall discourage development on slopes exceeding 40% wherever possible.

SE-8: Development located below or in the path of gullies which are highly susceptible to debris flow mudslides shall be strongly discouraged.

### **Implementation Measures**

SE-a: Where possible, the Town should advise residents of the Tiburon Planning Area of ways that they can reduce geologic, fire and flooding hazards.

SE-b: The Town shall require project applicants for new development to prepare a hydraulic and geomorphic assessment of on-site and downstream drainageways that are affected by project area runoff. Characteristics pertinent to channel stability would include bank erosion, excessive bed scour or sediment deposition, bed slope adjustments, lateral channel migration or bifurcation, and the condition of riparian vegetation. In the event existing channel instabilities were noted, the applicant could either propose their own channel stabilization program, or defer to the mitigations generated during the Town's environmental review. Any proposed stabilization measures shall anticipate any project-related changes to the drainageway flow regime.

SE-c: Through the application review process, the Town shall continue to require review by the appropriate Fire District for fire prevention considerations.

SE-d: As part of an Open Space Management program, the Town shall develop a plan, including funding sources and/ or other opportunities, such as volunteer groups, for reducing fire hazards and maintaining fire roads on Town-owned open space.

SE-e: The Town shall continue to review and update the Emergency Operations Plan to ensure that it remains up-to-date.

SE-f: The Town shall adopt a Local Hazard Mitigation Plan to comply with the federal Disaster Mitigation Act of 2000 and maintain eligibility for hazard mitigation funding from FEMA.

SE-g: The Town shall use its best efforts to disseminate emergency preparedness information to the community.

SE-h: The Town shall conduct an immediate post-earthquake assessment of critical facilities and buildings in the Planning Area to determine the extent of damages, if any, to essential Town infrastructure. This should be performed by trained professional(s) utilizing the current state-of-knowledge regarding post-earthquake assessment.

SE-i: The Town shall coordinate with the Marin Municipal Water District to replace the piping and fittings in those water tanks in the Planning Area that are not currently fitted with flexible, earthquake-resistant joints. In addition, the water tanks should be evaluated to ascertain their ability to withstand strong seismic ground shaking.

SE-j: The Town shall create and implement a Seismic Improvement Program. The Program shall include conducting a seismic risk assessment of existing Town infrastructure, which would help to create a list which would prioritize the buildings and equipment that should be retrofitted. Following risk assessment, the Town should adopt a program that would upgrade vulnerable facilities based on the priority list.

SE-k: The Town shall increase education regarding upgrading of buildings using structural and non-structural mitigation measures.

SE-l: The Town shall evaluate the potential impacts related to hazardous materials during the environmental review process for new developments or businesses where the production, use, storage, transport, or disposal of hazardous materials is proposed. The potential impacts should be fully mitigated.

SE-m: The Town shall coordinate hazardous materials with other public agencies.

### Open Space & Conservation Element

#### **Policies**

OSC-47: The Town shall protect significant geological, ecological, archaeological and paleontological resources and historic sites.

#### **Town of Tiburon Municipal Code**

Chapter 13, Article II, Technical Codes, of the Town's Municipal Code adopts the 2019 California Building Code. Section 13-4.1 identifies amendments made to the 2019 California Building Code to address specific issues for the Town of Tiburon.

## ENVIRONMENTAL SETTING

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### **REGIONAL GEOLOGY**

The Planning Area lies within Coast Range Geomorphic Provinces. The Coast Range is a northwest-trending mountain range (2,000 to 4,000, occasionally 6,000, feet elevation above sea level) and set of valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. Strata dip beneath alluvium of the Great Valley. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Range is composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma, and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Pt. Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands.

### **LOCAL SETTING**

#### **Topography**

The topography ranges in elevation from approximately sea level to approximately 790 feet above sea level. Hillside areas of the Planning Area have the highest elevation, while the marine and waterfront areas have the lowest elevation. Figure 5.4-1 shows the USGS Tiburon Quadrangle Topographic view.

Tiburon consists of two general topographic zones: the lowland zone and the hillside zone. The lowland zone corresponds to estuarine and flatland soils, and the hillside zone includes steep slopes and rocky soils.

In the **Lowland Zone**, estuarine (coastal) areas are underlain by Bay Mud, which consists of unconsolidated silt and clay with abundant organic material, local peat, sand, and gravel lenses or discontinuous beds (USGS, 1973). Local deposits of artificial fill occur along the margins of San Francisco Bay and in filled channels. Old fill (generally placed before the 1950s) typically consisted of heterogeneous material. Engineering challenges associated with coastal areas include weak compressible soils and risk of liquefaction. The flatland areas of Tiburon are underlain by alluvial deposits, unconsolidated flood-plain deposits, sand, silt, gravel, and clay, irregularly interstratified.

In the **Hillside Zone**, the hillside areas of Tiburon consist primarily of tilted marine sedimentary and volcanic rocks that range in age from Paleocene to Pliocene. Hillside areas of the Planning Area contain steep slopes, weak bedrock, and local landslide deposits.

## Soils

A Custom Soil Survey was completed for the Planning Area using the NRCS Web Soil Survey program. The NRCS Soils Map is provided in Figure 4-2. Table 4-1 below identifies the type and range of soils found in the Planning Area. As shown in Table 4-1, the majority of soils within the Planning Area consist of clay soils and sandy loams. Below is a brief description of prominent soils within the Planning Area.

**TABLE 4-1: PLANNING AREA SOILS**

NAME	TOWN OF TIBURON	SOI	PLANNING AREA	GRAND TOTAL
Barnabe very gravelly loam, 30 to 50 percent slopes	141.02	0.00	0.00	141.02
Gilroy-Typic Argixerolls-Bonnydoon, 30 to 50 percent slopes	68.66	0.00	0.00	68.66
Henneke stony clay loam, 15 to 50 percent slopes	422.38	59.57	196.05	678.00
Los Osos-Bonnydoon complex, 15 to 30 percent slopes	154.84	46.22	19.53	220.59
Los Osos-Bonnydoon complex, 30 to 50 percent slopes	637.49	122.26	100.52	860.27
Los Osos-Urban land-Bonnydoon complex, 15 to 30 percent slopes	8.94	60.25	3.31	72.50
Los Osos-Urban land-Bonnydoon complex, 30 to 50 percent slopes	196.45	0.00	0.16	196.61
Maymen-Maymen variant gravelly loams. 30 to 75 percent slopes	5.60	0.00	0.00	5.60
Montara clay loam, 15 to 30 percent slopes	14.57	0.00	0.00	14.57
Rock outcrop-Xerorthents complex, 50 to 75 percent slopes	31.17	0.00	0.00	31.17
Saurin-Bonnydoon complex, 30 to 50 percent slopes	20.58	0.00	0.00	20.58
Saurin-Urban land-Bonnydoon complex, 15 to 30 percent slopes	84.30	5.09	0.00	89.39
Saurin-Urban land-Bonnydoon complex, 30 to 50 percent slopes	0.00	0.00	0.03	0.03
Tamalpais-Barnabe variant very gravelly loams, 30 to 50 percent slopes	43.83	0.00	0.00	43.83
Totaloma-McMullin complex, 50 to 75 percent slopes	663.01	388.80	0.00	1,051.81
Totaloma-McMullin-Urban land complex, 30 to 50 percent slopes	2.62	0.00	0.00	2.62
Totaloma-Saurin association, very steep	91.62	37.28	0.00	128.90
Urban land-Xerorthents complex, 0 to 9 percent slopes	22.02	0.00	0.00	22.02
Water	6,903.61	161.07	0.00	7,064.68
Xerorthents, fill	92.91	0.00	0.00	92.91
Xerorthents-Urban land complex	160.33	66.33	29.36	256.02
<b>Total</b>	<b>9,765.95</b>	<b>946.87</b>	<b>348.95</b>	<b>11,061.78</b>

SOURCE: NRCS CUSTOM SOIL SURVEY 2021.

The **Barnabe** series consists of shallow, well drained soils that formed in material from sandstone and shale. Runoff varies from medium to very rapid, and permeability is moderate. These soils are located mostly in the southern portion of Angel Island.

The **Gilroy** series consists of moderately deep, well drained soils that formed in material weathered from basic igneous and metamorphic rocks. Runoff varies from medium to rapid, and permeability is moderately slow. These soils are located on Angel Island.

The **Henneke** series consists of shallow, well drained soils that formed in material weathered from ultramaficserpentinite rocks. Runoff varies from medium to very high, and permeability is moderately slow and slow. These soils are primarily located through the center of Tiburon.

The **Los Osos** series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. Runoff is considered very high and permeability is slow. These soils are primarily located through the western and center portions of Tiburon.

The **Maymen** series consists of shallow, somewhat excessively drained soils that formed in residuum weathered from shale, schist, greenstone, sandstone and conglomerate. Runoff is high to very high runoff; moderate to moderately rapid permeability. A small portion of this soil is located on the central portion of Angel Island.

The **Montara** series consists of shallow well drained soils that formed in material weathered from serpentinitic rocks. Runoff is medium and high, and permeability is moderately slow. Seep areas adjacent to rock outcrops may persist for several months after the end of the rainy season. A small portion of this soil is located on southwestern side of Angel Island.

The **Novato** series consists of very deep, very poorly drained soils that formed in alluvium deposited along the margin of bays. Soil is Very poorly drained and has a low saturated hydraulic conductivity. Water table fluctuates with the tides from 0.5 meter above the surface during very high tides to a depth of 0.5 meter during low tides. These soils are primarily located along the southern shore of the Tiburon Peninsula.

The **Saurin** series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. Runoff is slow to very rapid, and permeability is moderate. This soil is primarily located along the northern and southeastern shore of mainland Tiburon.

The **Bonnydoon** series consists of shallow, somewhat excessively drained soils that formed in material weathered from sandstone and shale. Runoff is medium to very rapid, and permeability is moderate. This soil is primarily located along the northern shore of mainland Tiburon.

The **Tamalpais** series consists of moderately deep, well drained soils that formed in material weathered from igneous rock and sandstone. Runoff is rapid to very rapid and permeability is slow. This soil is primarily located at the southern portion of mainland Tiburon.

The **Tocaloma** series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. Runoff is slow to very rapid and permeability is moderately rapid. This soil is primarily found at the northeastern corner of mainland Tiburon and along the coast of Angel Island.

## FAULTS AND SEISMICITY

### Faults

A fault is a fracture in the crust of the earth along which rocks on one side have moved relative to those on the other side. A fault trace is the line on the earth's surface defining the fault. Displacement of the earth's crust along faults releases energy in the form of earthquakes and in some cases in fault creep. Most faults are the result of repeated displacements over a long period of time.

Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Surface ruptures have been known to extend up to 50 miles with displacements of an inch to 20 feet. Fault rupture almost always follows

preexisting faults, which are zones of weakness. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. Sudden displacements are more damaging to structures because they are accompanied by shaking.

The State designates faults as active, potentially active, and inactive depending on how recent the movement that can be substantiated for a fault. Table 4-2 presents the California fault activity rating system.

**TABLE 4-2: FAULT ACTIVITY RATING**

<i>FAULT ACTIVITY RATING</i>	<i>GEOLOGIC PERIOD OF LAST RUPTURE</i>	<i>TIME INTERVAL (YEARS)</i>
Active (A)	Holocene	Within last 11,000 years
Potentially Active (PA)	Quaternary	11,000-1.6 Million Years
Inactive (I)	Pre-Quaternary	Greater than 1.6 Million

*SOURCE: CALIFORNIA GEOLOGICAL SURVEY*

The U.S. Geological Survey data was used to identify potential earthquake fault lines within 10 miles of the Planning Area. The closest faults include the Hayward Fault Zone located approximately 7 miles to the east of the Planning Area, Morgana Fault located approximately 9 miles east of the Planning Area, and the San Andreas Fault Zone located approximately 9 miles west of the Planning Area. Additionally, the Hayward Fault is within an Alquist-Priolo fault zone. Figure 4-3 provides a map of known area faults.

### Seismicity

The amount of energy available to a fault is determined by considering the slip-rate of the fault, its area (fault length multiplied by down-dip width), maximum magnitude, and the rigidity of the displaced rocks. These factors are combined to calculate the moment (energy) release on a fault. The total seismic energy release for a fault source is sometimes partitioned between two different recurrence models, the characteristic and truncated Gutenberg-Richter (G-R) magnitude-frequency distributions. These models incorporate our knowledge of the range of magnitudes and relative frequency of different magnitudes for a particular fault. The partition of moment and the weights for multiple models are given in the following summary.

Earthquakes are generally expressed in terms of intensity and magnitude. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. By comparison, magnitude is based on the amplitude of the earthquake waves recorded on instruments, which have a common calibration. The Richter scale, a logarithmic scale ranging from 0.1 to 9.0, with 9.0 being the strongest, measures the magnitude of an earthquake relative to ground shaking. Table 4-3 provides a description and a comparison of intensity and magnitude.

**TABLE 4-3: RICHTER MAGNITUDES AND EFFECTS**

<b>MAGNITUDE</b>	<b>EFFECTS</b>
< 3.5	Typically not felt
3.5 – 5.4	Often felt but damage is rare
5.5 – < 6	Damage is slight for well-built buildings
6.1 – 6.9	Destructive potential over ±60 miles of occupied area
7.0 – 7.9	“Major Earthquake” with the ability to cause damage over larger areas
≥ 8	“Great Earthquake” can cause damage over several hundred miles

*SOURCE: UNITED STATES GEOLOGICAL SURVEY, 1997.*

In 2014, the United States Geological Survey updated the 30-year earthquake forecast for California, which concluded that there is a 72% probability of at least one earthquake of magnitude 6.7 or greater striking somewhere in the San Francisco Bay region before 2043. The 72% probability of a magnitude 6.7 or greater earthquake includes the well-known major plate-

boundary faults, lesser-known faults, and unknown faults<sup>2</sup>. As shown in Table 4-3, an earthquake at this magnitude is capable of causing widespread damage to over ±60 miles of occupied area.

The Modified Mercalli intensity scale for earthquakes is summarized in Table 4-4.

**TABLE 4-4: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES**

RICHTER MAGNITUDE	MODIFIED MERCALLI	EFFECTS OF INTENSITY
0.1 – 0.9	I	Earthquake shaking not felt
1.0 – 2.9	II	Shaking felt by those at rest.
3.0 – 3.9	III	Felt by most people indoors, some can estimate duration of shaking.
4.0 – 4.5	IV	Felt by most people indoors. Hanging objects rattle, wooden walls and frames creak.
4.6 – 4.9	V	Felt by everyone indoors, many can estimate duration of shaking. Standing autos rock. Crockery clashes, dishes rattle and glasses clink. Doors open, close and swing.
5.0 – 5.5	VI	Felt by all who estimate duration of shaking. Sleepers awoken, liquids spill, objects are displaced, and weak materials crack.
5.6 – 6.4	VII	People frightened and walls unsteady. Pictures and books thrown, dishes and glass are broken. Weak chimneys break. Plaster, loose bricks and parapets fall.
6.5 – 6.9	VIII	Difficult to stand. Waves on ponds, cohesionless soils slump. Stucco and masonry walls fall. Chimneys, stacks, towers, and elevated tanks twist and fall.
7.0 – 7.4	IX	General fright as people are thrown down, hard to drive. Trees broken, damage to foundations and frames. Reservoirs damaged, underground pipes broken.
7.5 – 7.9	X	General panic. Ground cracks, masonry and frame buildings destroyed. Bridges destroyed and railroads bent slightly. Dams, dikes and embankments damaged.
8.0 – 8.4	XI	Large landslides, water thrown, general destruction of buildings. Pipelines destroyed and railroads bent.
8.5 +	XII	Total nearby damage, rock masses displaced. Lines of sight/level distorted. Objects thrown into air.

SOURCE: UNITED STATES GEOLOGICAL SURVEY, 1997.

The Significant United States Earthquake data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, and geologic effects or were felt by populations near the epicenter. No significant earthquakes are identified within the Planning Area; however, significant earthquakes are documented in the region. The following table presents the significant earthquakes in the region.

**TABLE 4-5: SIGNIFICANT EARTHQUAKES IN THE REGION**

MAGNITUDE	INTENSITY	LOCATION	YEAR
4.1	IV	9 miles south east of Alum Rock	2017
4.0	IV	Piedmont	2015
4.1	IV	6 miles east of Yountville	2015
4.0	IV	2 miles north of Fremont	2015
6.0	VIII	South Napa	2014
5.6	VI	San Jose	2007
5.0	VII	Napa	2000
6.9	IX	Loma Prieta (San Andreas)	1989
5.4	N/A	Santa Cruz County	1989

<sup>2</sup> United States Geological Survey. 2014. Earthquake Outlook for the San Francisco Bay Region 2014-2043. Available at: <https://pubs.usgs.gov/fs/2016/3020/fs20163020.pdf>

MAGNITUDE	INTENSITY	LOCATION	YEAR
6.2	N/A	Morgan Hill	1984
5.8, 5.8	VII	Livermore	1980
5.7	N/A	Coyote Lake	1979
5.7, 5.6	N/A	Santa Rosa	1969
5.3, 4.2	N/A	Daly City	1957
5.4	N/A	Concord	1954
6.5	N/A	Calaveras fault	1911
7.9	IX	San Francisco	1906
6.8	N/A	Mendocino	1898
6.2	N/A	Mare Island	1898
6.3	N/A	Calaveras fault	1893
6.2	VIII	Winters	1892
6.4	N/A	Vacaville	1892
6.8	VII	Hayward	1868
6.5	VIII	Santa Cruz Mountains	1865
6.8	N/A	San Francisco Peninsula	1838

SOURCE: UNITED STATE GEOLOGICAL SURVEY, 2019.

### Alquist-Priolo Special Study Zone

The California legislature passed the Alquist-Priolo Special Studies Zone Act in 1972 to address seismic hazards associated with faults and to establish criteria for developments for areas with identified seismic hazard zones. The California Geologic Survey (CGS) evaluates faults with available geologic and seismologic data and determines if a fault should be zoned as active, potentially active, or inactive. If CGS determines a fault to be active, then it is typically incorporated into a Special Studies Zone in accordance with the Alquist-Priolo Earthquake Hazard Act. Alquist-Priolo Special Study Zones are usually one-quarter mile or less in width and require site-specific evaluation of fault location and require a structure setback if the fault is found traversing a project site. The Planning Area is not within an Alquist-Priolo Special Study Zone. The nearest Alquist-Priolo fault zones are the Hayward Fault Zone and the San Andreas Fault Zone, as shown on Figure 4-3. The Hayward Fault Zone is located approximately 7 miles east of Tiburon and the San Andreas Fault Zone is located approximately 9 miles west of Tiburon.

### Seismic Hazards

#### Seismic Ground Shaking

The potential for seismic ground shaking in California is expected. As a result of the foreseeable seismicity in California, the State requires special design considerations for all structural improvements in accordance with the seismic design provisions in the California Building Code. These seismic design provisions require enhanced structural integrity based on several risk parameters.

#### Fault Rupture

A fault rupture occurs when the surface of the earth breaks as a result of an earthquake, although this does not happen with all earthquakes. These ruptures generally occur in a weak area of an existing fault. Ruptures can be sudden (i.e. earthquake) or slow (i.e. fault creep). The Alquist-Priolo Fault Zoning Act requires active earthquake fault zones to be mapped and it provides special development considerations within these zones. Tiburon does not have surface expression of active faults and fault rupture is not anticipated. Figure 4-3 shown regional faults in relation to Tiburon.

**Liquefaction**

Liquefaction typically requires a significant sudden decrease of shearing resistance in cohesionless soils and a sudden increase in water pressure, which is typically associated with an earthquake of high magnitude. The potential for liquefaction is highest when groundwater levels are high, and loose, fine, sandy soils occur at depths of less than 50 feet. Figure 4-4 provides a map of the liquefaction potential of the soils within the Planning Area and general vicinity. As shown in the figure, portions of Tiburon could be subject to liquefaction during or after an earthquake. The locations in the Town which are prone to liquefaction are located in the hillside areas and the marina and waterfront.

**Lateral Spreading**

Lateral spreading typically results when ground shaking moves soil toward an area where the soil integrity is weak or unsupported, and it typically occurs on the surface of a slope, although it does not occur strictly on steep slopes. Oftentimes, lateral spreading is directly associated with areas of liquefaction. The potential for liquefaction exists in the hillside and waterfront areas; lateral spreading of soils may occur in these areas of the Planning Area.

**Landslides**

Landslides include rockfalls, deep slope failure, and shallow slope failure. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for landslides. Common causes of landslides include heavy rainfall events and construction activity that is associated with road building (i.e. cut and fill). The potential for landslides is moderate to high in the hillside areas of the Planning Area. Figure 4-5 shows Landslide Vulnerability within the Planning Area. As indicated on Figure 4-5, the majority of the Planning Area has a low vulnerability index with a few landslides. Surficial deposits, or areas not vulnerable to landslide are located on the coast on all sides of the Planning Area. The areas with the highest landslide vulnerability are located inland to the northwestern portions of the Planning Area, particularly on the slopes of high elevations.

The Susceptibility to Deep-Seated Landslides map covers the entire state of California and was originally published in May of 2011 as CGS Map Sheet 58. It made use of several data layers of varying scales and formats, such as landslide inventory, geology, rock strength, and slope and identifies classes of landscape susceptibility on a scale of 0 (low) to 10 (high) that reflects the generalization that on very low slopes, landslide susceptibility is low even in weak materials, and that landslide susceptibility increases with slope and in weak rocks. The landslide susceptibility matrix, based on rock strength and slope steepness in degrees, is described in Table 4-6. Landslide susceptibility zones in the Planning Area range from class 0 to 10, as shown on Figure 4-5. Areas with highest landslide susceptibility (classes 9 and 10) are located inland to the northwestern portions of the Planning Area, particularly on the slopes of high elevations. Other areas with moderate to high susceptibility (classes 6 through 8) are located throughout the majority of the Planning Area, particularly on the hills on the north and south side of the Tiburon Peninsula and Angel Island.

**TABLE 4-6: LANDSLIDE SUSCEPTIBILITY MATRIX**

LANDSLIDE SUSCEPTIBILITY CLASS	ROCK STRENGTH	SLOPE STEEPNESS
0 (0)	1	<3 to 10
	2	<3
	3	<3
3 (III)	1	10 to 15
5 (V)	2	3 to 10
6 (VI)	1	15 to 20
7 (VII)	1	20 to 30
	3	3 to 10
8 (VIII)	1	30 to >40
	2	10 to 15
9 (IX)	2	15 to >40

	3	10 to 15
10 (X)	3	15 to >40

SOURCE: CALIFORNIA GEOLOGICAL SURVEY MAP SHEET 58, 2011.

## NON-SEISMIC HAZARDS

### Expansive Soils

Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wet. If structures are underlain by expansive soils, it is important that foundation systems be capable of tolerating or resisting any potentially damaging soil movements. In addition, it is important to limit moisture changes in the surficial soils by using positive drainage away from buildings as well as limiting landscaping watering.

According to the NRCS Web Soil Survey, the soils in the Planning Area soils vary from a low shrink-swell potential to a high shrink-swell potential as shown in Figure 4-6. Portions of the Planning Area with a high expansive soil potential are located in the foothill areas and along the coast of the western Planning Area. The eastern portions of the Planning Area, particularly Angel Island and the western portion of the Tiburon Peninsula, have a low to moderate expansive soil potential with a moderate potential typically with the areas of higher elevation.

### Erosion

Erosion naturally occurs on the surface of the earth as surface materials (i.e., rock, soil, debris, etc.) are loosened, dissolved, or worn away, and transported from one place to another by gravity. Two common types of soil erosion include wind erosion and water erosion. The steepness of a slope is an important factor that affects soil erosion. Erosion potential in soils is influenced primarily by loose soil texture and steep slopes. Loose soils can be eroded by water or wind forces, whereas soils with high clay content are generally susceptible only to water erosion. The potential for erosion generally increases as a result of human activity, primarily through the development of facilities and impervious surfaces and the removal of vegetative cover.

The *Custom Soils Report* identified the erosion potential for the soils in the Planning Area. This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. Soil property data for each map unit component includes the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the surface horizon.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Within the Planning Area, the erosion factor Kf varies from 0.20 to 0.43, which is considered a low to moderate potential for erosion. The wind erosion potential ranges from moderate-to-high during the spring, summer, and fall, however this potential for wind erosion diminish during the winter.

### Collapsible Soils

Collapsible soils undergo a rearrangement of their grains and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. Collapsible soils occur predominantly at the base of mountain ranges, where Holocene-age alluvial fan and wash sediments have been deposited during rapid run-off events. Soils prone to collapse are commonly associated with manmade fill, wind-laid sands and silts, and alluvial fan and mudflow sediments deposited during flash floods. During an earthquake, even slight settlement of fill materials can lead to a differentially settled structure and significant repair costs. Differential settlement of structures typically occurs when heavily irrigated landscape areas are near a building foundation. Examples of common problems associated with collapsible soils include tilting floors, cracking or separation in structures, sagging floors, and nonfunctional windows and doors. Collapsible soils have not been identified in the Planning

Area as an issue. However, in areas subject to potential liquefaction, the potential for liquefaction-induced settlement is present.

### **Subsidence**

Land subsidence is the gradual settling or sinking of an area with little or no horizontal motion due to changes taking place underground. It is a natural process, although it can also occur (and is greatly accelerated) as a result of human activities. Common causes of land subsidence from human activity include: pumping water, oil, and gas from underground reservoirs; dissolution of limestone aquifers (sinkholes); collapse of underground mines; drainage of organic soils; and initial wetting of dry soils. Subsidence has not been identified as an issue in the Planning Area.

### **Naturally Occurring Asbestos**

The term “asbestos” is used to describe a variety of fibrous minerals that, when airborne, can result in serious human health effects. Naturally occurring asbestos is commonly associated with ultramafic rocks and serpentinite. Ultramafic rocks, such as dunite, peridotite, and pyroxenite are igneous rocks comprised largely of iron-magnesium minerals. As they are intrusive in nature, these rocks often undergo metamorphosis, prior to their being exposed on the Earth’s surface. The metamorphic rock serpentinite is a common product of the alteration process. Naturally occurring asbestos is identified within Marin County. There is no naturally occurring asbestos mapped within the Planning Area.

### **Paleontological Resources**

Among the natural resources deserving conservation and preservation are the often-unseen records of past life buried in the sediments and rocks below the pavement, buildings, soils, and vegetation which now cover most of the area. These records – fossils and their geologic context – undoubtedly exist in below the surface in areas in and near Tiburon, and span millions of years in age of origin. Fossils constitute a non-renewable resource: once lost or destroyed, the exact information they contained can never be reproduced.

Paleontology is the science that attempts to unravel the meaning of these fossils in terms of the organisms they represent, the ages and geographic distribution of those organisms, how they interacted in ancient ecosystems and responded to past climatic changes, and the changes through time of all of these aspects.

The sensitivity of a given area or body of sediment with respect to paleontological resources is a function of both the potential for the existence of fossils and the predicted significance of any fossils which may be found there. The primary consideration in the determination of paleontological sensitivity of a given area, body of sediment, or rock formation is its potential to include fossils. Information that can contribute to assessment of this potential includes: 1) direct observation of fossils within the project area; 2) the existence of known fossil localities or documented absence of fossils in the same geologic unit (e.g., “Formation” or one of its subunits); 3) descriptive nature of sedimentary deposits (such as size of included particles or clasts, color, and bedding type) in the area of interest compared with those of similar deposits known elsewhere to favor or disfavor inclusion of fossils; and 4) interpretation of sediment details and known geologic history of the sedimentary body of interest in terms of the ancient environments in which they were deposited, followed by assessment of the favorability of those environments for the preservation of fossils.

The most general paleontological information can be obtained from geologic maps, but geologic cross sections (slices of the layer cake to view the third dimension) must be reviewed for each area in question. These usually accompany geologic maps or technical reports. Once it can be determined which formations may be present in the subsurface, the question of paleontological resources must be addressed. Even though a formation is known to contain fossils, they are not usually distributed uniformly throughout the many square miles the formation may cover. If the fossils were part of a bay environment when they died, perhaps a scattered layer of shells will be preserved over large areas. If on the other hand, a whale died in this bay, you might expect to find fossil whalebone only in one small area of less than a few hundred square feet. Other resources to be considered in the determination of paleontological potential are regional geologic reports, site records on file with paleontological repositories and site-specific field surveys.

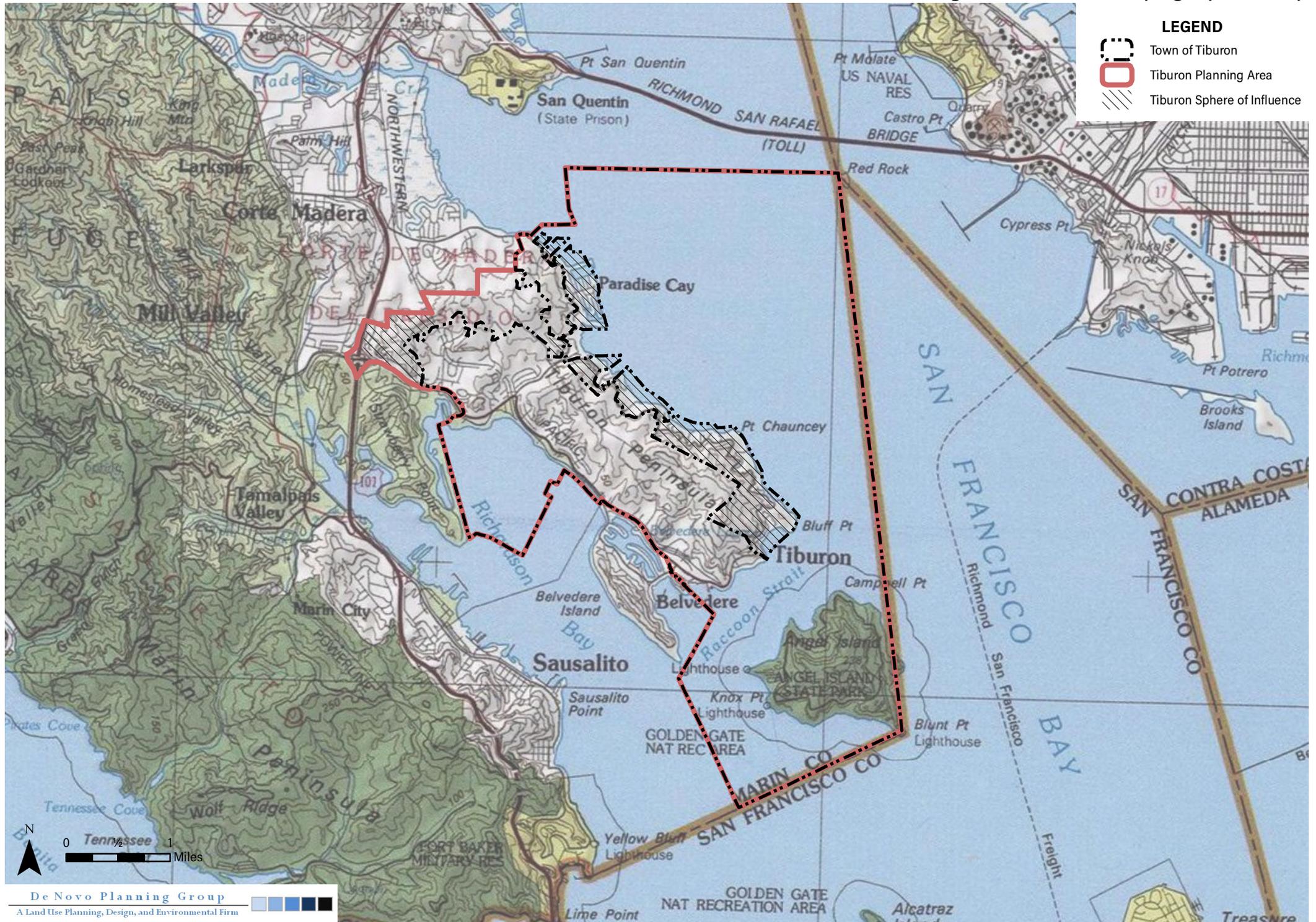
Paleontologists consider all vertebrate fossils to be of significance. Fossils of other types are considered significant if they represent a new record, new species, an oldest occurring species, the most complete specimen of its kind, a rare species worldwide, or a species helpful in the dating of formations. However, even a previously designated low potential site may yield significant fossils. No paleontological resources have been identified in the Planning Area.

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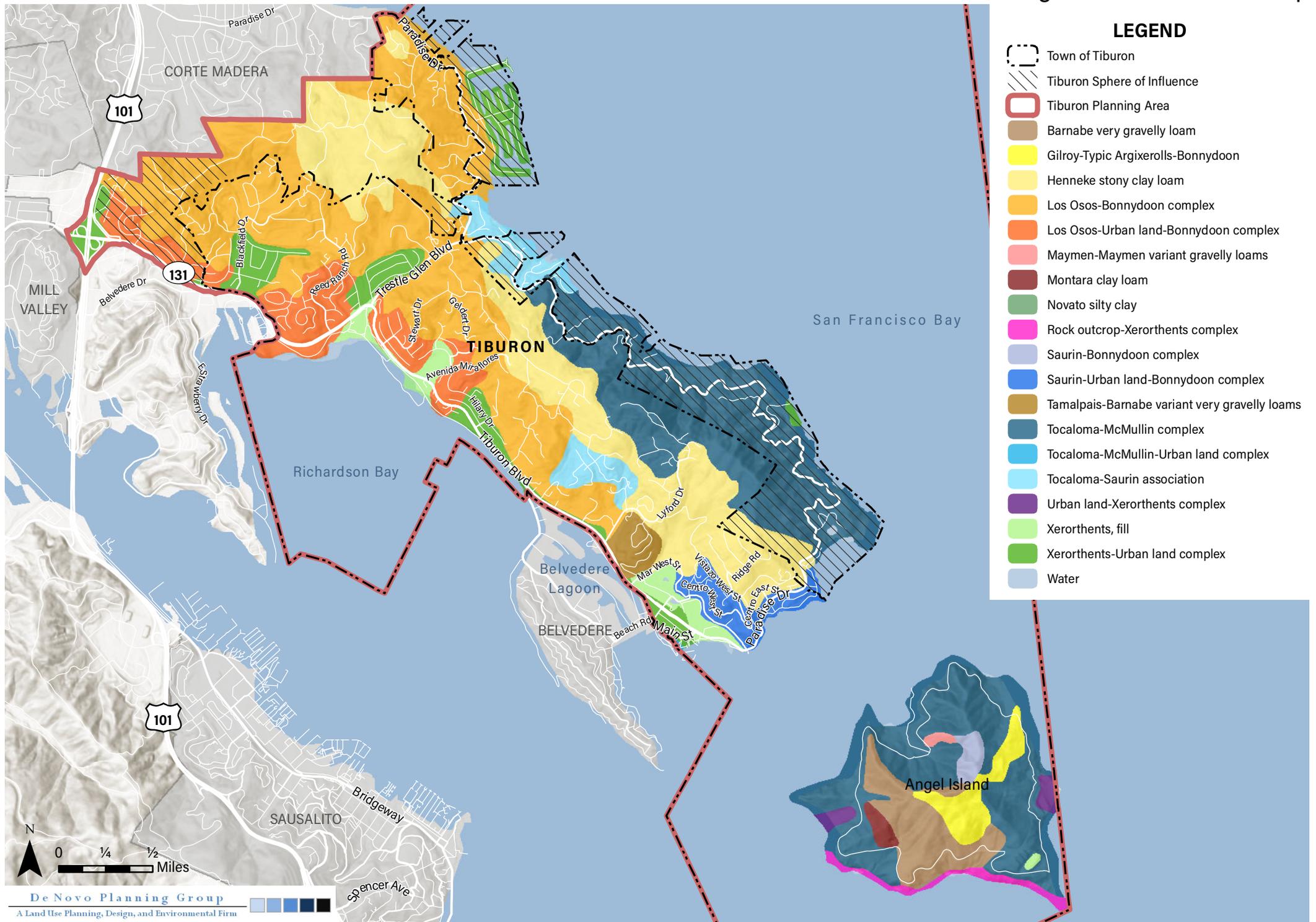
Figure 4-1: USGS Topographic Map



Sources: ArcGIS Online USGS Topographic Map Service. Map date: November 29, 2020. Revised March 2, 2021.

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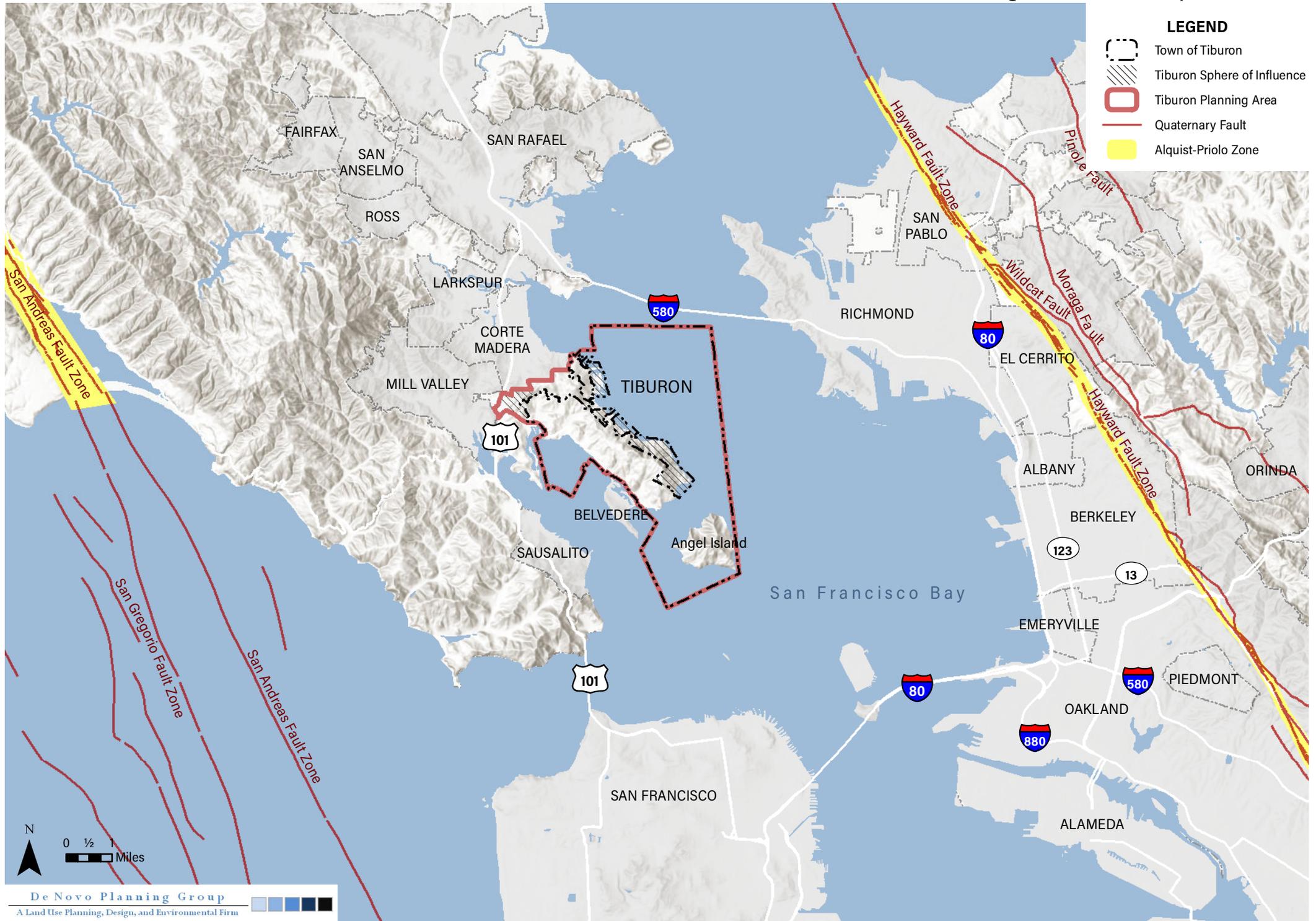
Figure 4-2: NRCS Soil Map



Sources: ArcGIS Online World Hillshade Map Service; NRCS Web Soil Survey, Marin County (CA041) and San Mateo County, Eastern Part/San Francisco County (CA689). Map date: November 30, 2020. Revised March 2, 2021.

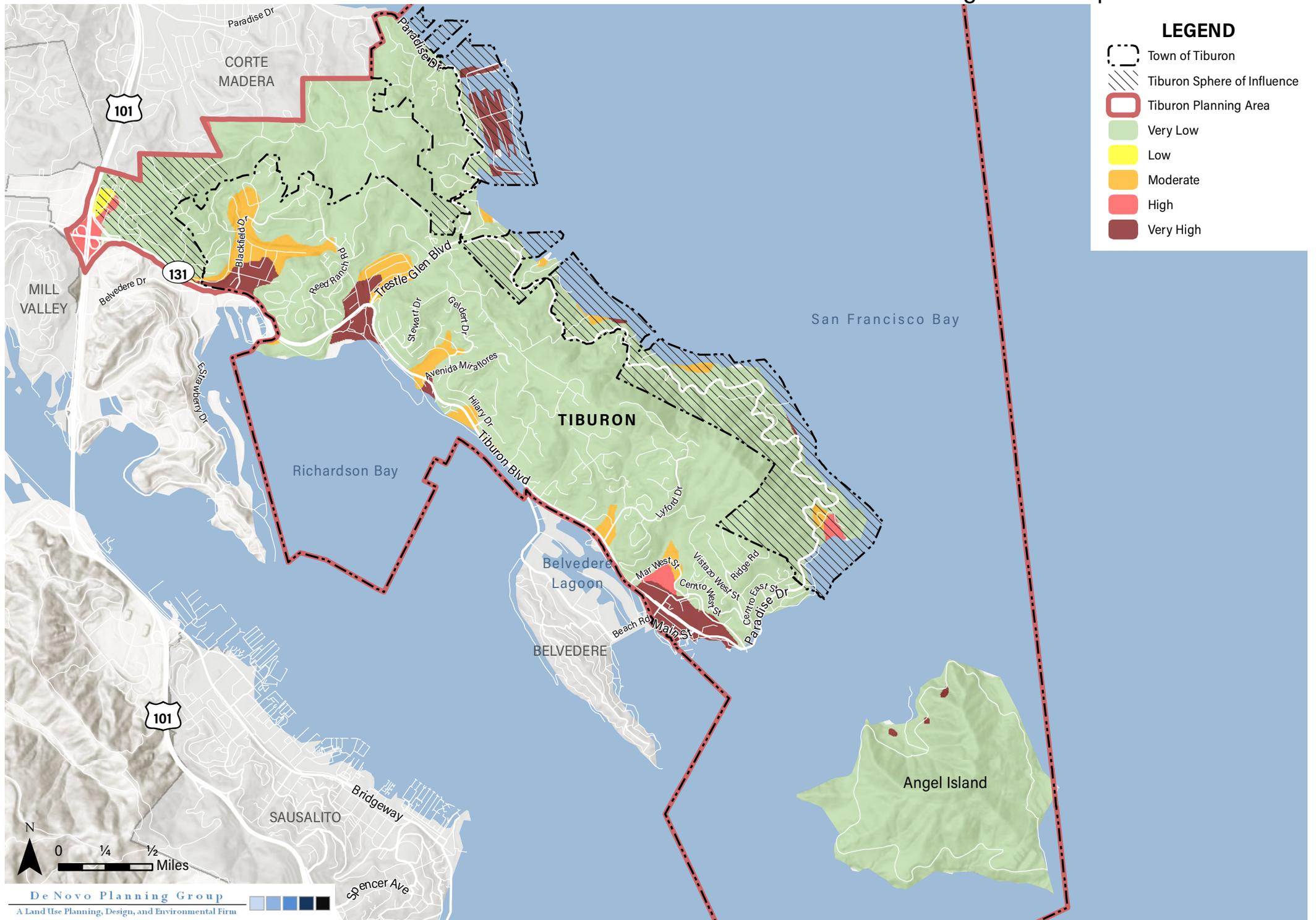
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Figure 4-3: Earthquake Faults



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Figure 4-4: Liquefaction Potential



**LEGEND**

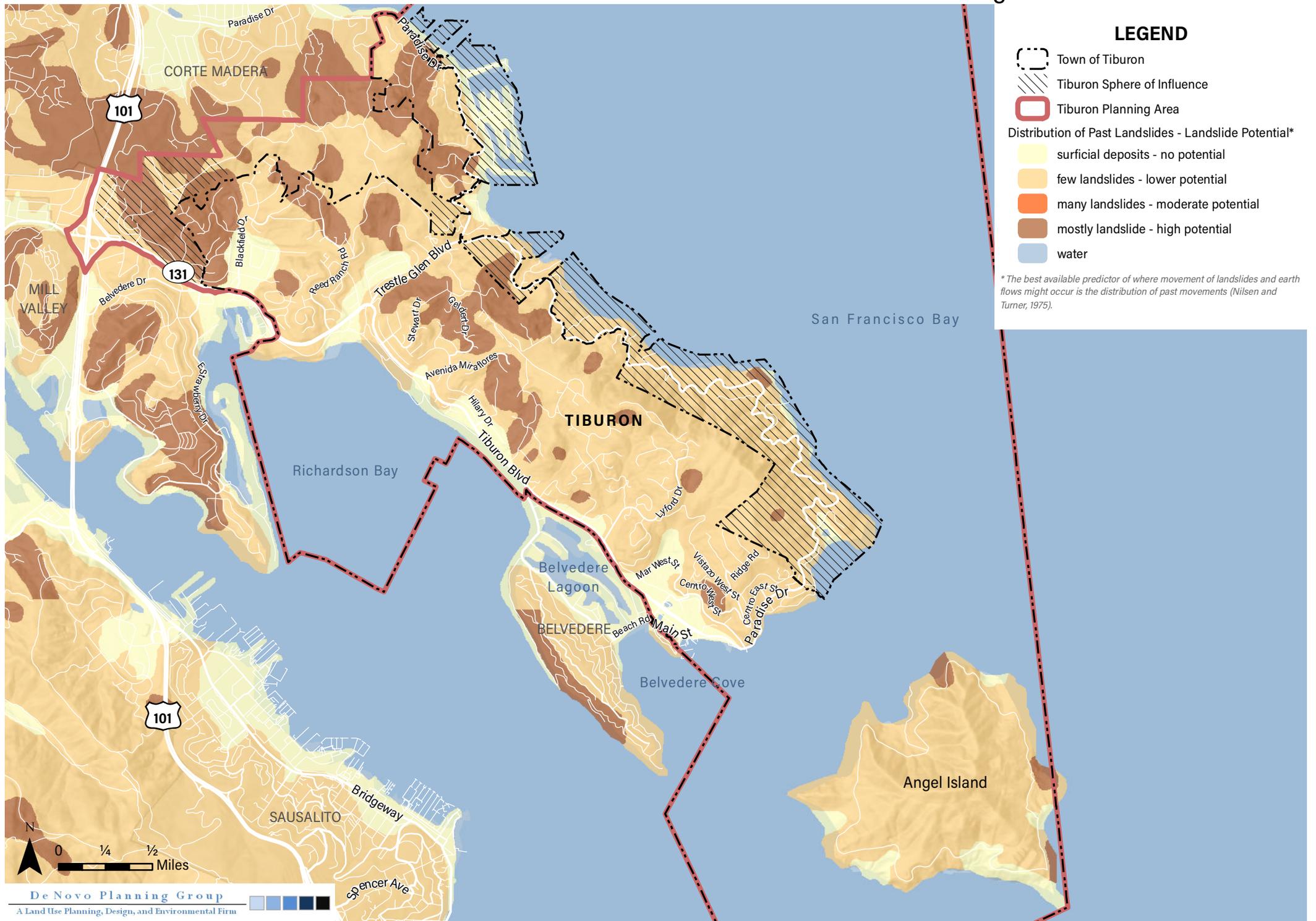
- Town of Tiburon
- Tiburon Sphere of Influence
- Tiburon Planning Area
- Very Low
- Low
- Moderate
- High
- Very High

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Sources: ArcGIS Online World Hillshade Map Service; Marin GeoHub "Liquefaction", 11/10/2020. Map date: November 30, 2020. Revised March 2, 2021.

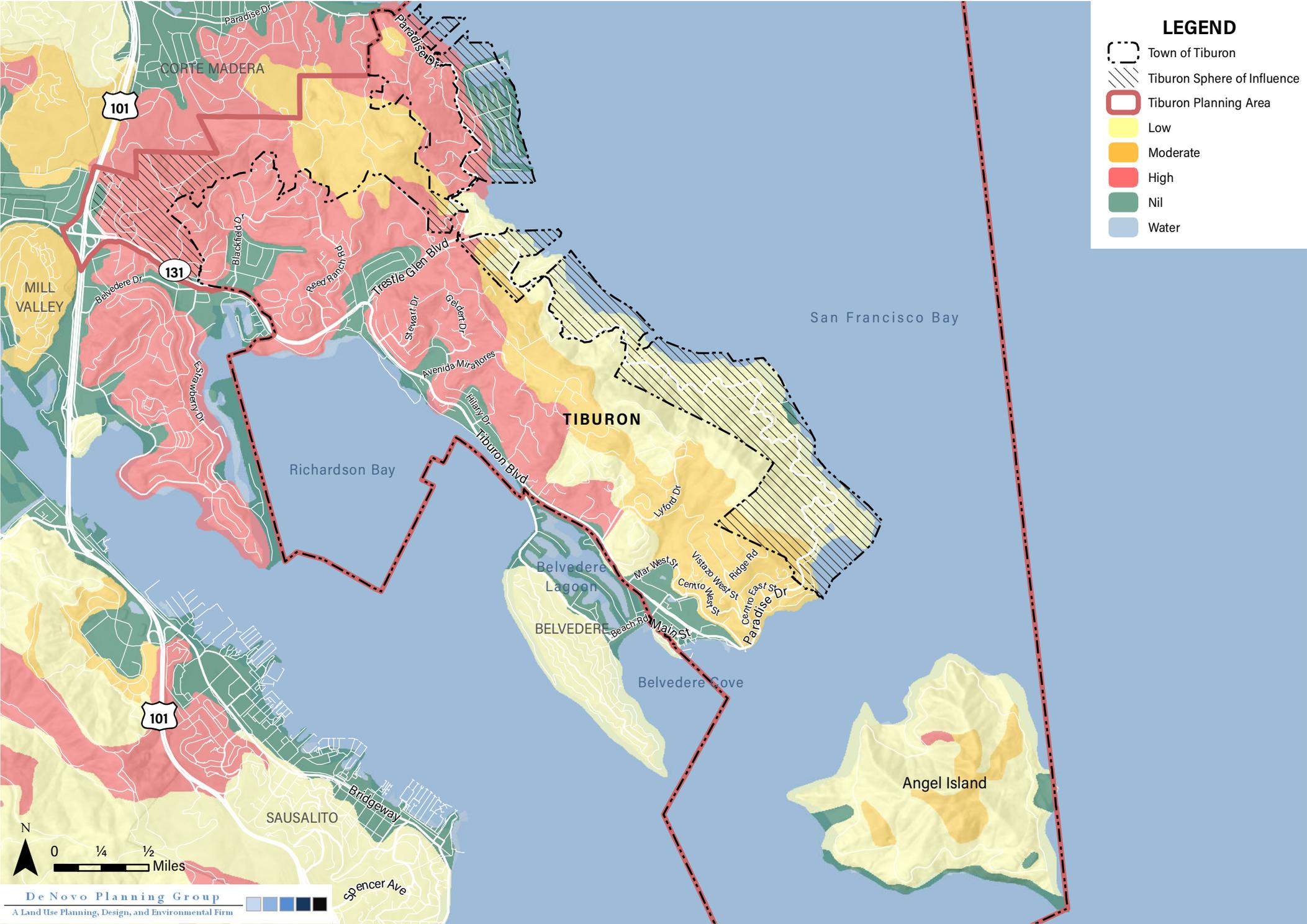
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Figure 4-5: Landslide Potential



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Figure 4-6: Expansive Soil Potential



**LEGEND**

- Town of Tiburon
- Tiburon Sphere of Influence
- Tiburon Planning Area
- Low
- Moderate
- High
- Nil
- Water

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Sources: ArcGIS Online World Hillshade Map Service; Marin GeoHub "Expansive Soil" 11/10/2020. Map date: November 30, 2020. Revised March 2, 2021.

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## 5 MINERAL RESOURCES

This section describes mineral resources in the Planning Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect mineral resources in the Planning Area.

### REGULATORY FRAMEWORK

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#### FEDERAL

##### Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the USEPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The USEPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance. In March 2020, the USDOT's National Highway Traffic Safety Administration (NHTSA) and the EPA released the final Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years (MY) 2021-2026 Passenger Cars and Light Trucks, which sets CAFE and CO<sub>2</sub> emissions standards that increase 1.5% in stringency each year from MY 2021 through 2026. These standards apply to both passenger cars and light trucks, and are intended to continue the United States' progress towards energy independence and carbon dioxide reduction, while recognizing the realities of the marketplace and consumers' interest in buying vehicles that meet all of their diverse needs. In MY 2026, it is projected that 40.4 mpg will be the overall industry average required fuel economy.

##### Energy Policy Act of 1992 (EPAct)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

##### Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

##### U.S. Federal Climate Change Policy

According to the USEPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing

international cooperation. To implement this policy, “the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.” The federal government’s goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including “ENERGY STAR”, “Climate Leaders”, and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

## **STATE**

### **Warren-Alquist Act**

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as CEC. The Act established state policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission (CPUC) regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

### **Energy Action Plan**

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California’s energy markets. The State’s three major energy policy agencies (CEC, CPUC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California’s electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California’s future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 Energy Action Plan II, CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues, and research and development activities. The CEC adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State’s ongoing actions in the context of global climate change.

### **State of California Energy Action Plan**

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The current plan is the 1997 California Energy Plan. The Plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the Plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban design that reduces VMT and accommodates pedestrian and bicycle access.

### **Bioenergy Action Plan – Executive Order #S-06-06**

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

### **Surface Mining and Reclamation Act of 1975**

The California Department of Conservation Surface Mining and Reclamation Act of 1975 (§ 2710), also known as SMARA, provides a comprehensive surface mining and reclamation policy that permits the continued mining of minerals, as well as the protection and subsequent beneficial use of the mined and reclaimed land. The purpose of SMARA is to ensure that adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition and readily adaptable for alternative land uses. The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, wildlife, range and forage, as well as aesthetic enjoyment. Residual hazards to public health and safety are eliminated. These goals are achieved through land use planning by allowing a jurisdiction to balance the economic benefits of resource reclamation with the need to provide other land uses.

If a use is proposed that might threaten the potential recovery of minerals from an area that has been classified mineral resource zone 2 (MRZ-2), SMARA would require the jurisdiction to prepare a statement specifying its reasons for permitting the proposed use, provide public notice of these reasons, and forward a copy of the statement to the State Geologist and the State Mining and Geology Board (Cal. Pub. Res. Code Section 2762). Lands classified MRZ-2 are areas that contain identified mineral resources.

### **Division of Mines and Geology**

The California Division of Mines and Geology (DMG) operates within the Department of Conservation. The DMG is responsible for assisting in the utilization of mineral deposits and the identification of geological hazards.

### **State Geological Survey**

Similar to the DMG, the California Geological Survey is responsible for assisting in the identification and proper utilization of mineral deposits, as well as the identification of fault locations and other geological hazards.

### **Public Resources Code**

Public Resources Code Section 2762(d) and 2763 requires a lead agency to prepare a statement specifying its reasons for permitting a use that would threaten the potential to extract mineral resources either 1) in an area that has been designated in its general plan as having important minerals to be protected, or 2) if the use is proposed in an area with significant resources pursuant to Section 2761(b)(2) and the lead agency has not yet acted on the State's designation. Public Resources Code Section 2763 requires that lead agency land use decisions involving areas designated as being of regional significance shall be in accordance with the lead agency's mineral resource management policies and shall also, in balancing mineral values against alternative land uses, consider the importance of these minerals to their market region as a whole and not just their importance to the lead agency's area of jurisdiction.

## **ENVIRONMENTAL SETTING**

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### **STATEWIDE RESOURCES**

In 2012, the California Geological Survey identified that approximately 4 billion tons of permitted aggregate reserves lie within the 31 aggregate study areas in California. These permitted aggregate reserves have been determined to be acceptable for commercial use, exist within properties owned or leased by aggregate producing companies, and have permits allowing mining of aggregate material. Sand, gravel, and crushed stones are construction materials that are collectively referred to as construction aggregate. These materials provide the bulk and strength to Portland cement concrete (PCC), asphaltic concrete (AC), plaster, and stucco. Other uses include road base, subbase, railroad ballast, and fill.

From 1981 to 2010, California consumed an average of about 180 million tons of construction aggregate (all grades) per year. (CGS, 2012)

## REGIONAL SETTING

The North Bay region, comprising Sonoma, Marin, and Napa Counties, places an ongoing demand on crushed stone and alluvial deposits for construction materials, including asphaltic concrete, aggregate, road base and sub-base, and Portland cement concrete. Eight sites in Marin County have been designated by the State as having significant mineral resources for the North Bay region; these include Ring Mountain, Novato Conglomerate – Black Point, Franciscan Complex Sandstone-San Pedro Hill, Sonoma Volcanics Andesite-Burdell Mountain, Franciscan Complex Serpentinite-Bowman Canyon Quarry, Sonoma Volcanics Andesite-Burdell Mountain Open Space Preserve. These sites contain deposits that qualify as marketable commodities by meeting a threshold value based on gross sales price. Four of these sites should be considered for removal from State listing because they have been purchased for public open space, are already subdivided and used for residential purposes, or are highly environmentally sensitive. In addition, there are mineral resource sites not designated by the State that have County approved operating permits and reclamation plans.

Total consumption of mineral resources to 2030 in Sonoma, Marin, and Napa counties is estimated at 478 million tons. Although the volume of deposits remaining in local quarries has not been determined, it is expected that mined commodities will still need to be transported from outside the County. Consumption level may vary if growth patterns change, and unforeseen events such as disaster reconstruction could dramatically increase the need for materials. Fine sand and gravel suitable for producing Portland cement concrete is already limited in supply locally. Efforts to reduce demand for mineral resources, including minimizing waste of mined materials and using fly ash as a constituent in concrete, can help conserve resources and limit the need for additional extraction.

In some areas of the county, quarry operations, including truck transportation and blasting, have resulted in substantial conflicts with nearby residential and recreational uses. One example of this is the noise and truck traffic experienced by neighbors of the San Rafael Rock Quarry, which operates under a permit granted in 1972.

## MINERAL RESOURCE CLASSIFICATION

Pursuant to the Surface Mining and Reclamation Act of 1975 (SMARA), the California State Mining and Geology Board oversees the Mineral Resource Zone (MRZ) classification system. The MRZ system characterizes both the location and known/presumed economic value of underlying mineral resources. The mineral resource classification system uses four main MRZs based on the degree of available geologic information, the likelihood of significant mineral resource occurrence, and the known or inferred quantity of significant mineral resources. The four classifications are described in Table 5-1 below.

TABLE 5-1: MINERAL RESOURCE CLASSIFICATION SYSTEM

CLASSIFICATION	DESCRIPTIONS
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated.
MRZ-4	Areas where available information is inadequate for assignment to any other MRZ classification.

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION DIVISION OF MINES AND GEOLOGY, ACCESSED DECEMBER 2016.

## LOCAL MINERAL RESOURCES

All of the Marin County mineral resource sites are identified by the State as MRZ-2 and MRZ-3, except for Ring Mountain, which is located within the Planning Area. Ring Mountain is considered a Scientific Resource Zone (and therefore not a production site) due to the presence of rare geologic formations.

Figure 5-1 shows mineral resource zones within and near the Planning Area. As shown on Figure 5-1, the majority of the central portion of the Planning Area is designated MRZ-1 indicating areas where no significant mineral deposits are present or there is little likelihood for their presence. Tiburon also contains areas designated MRZ-3. These areas are located mainly in the northern portion of the Planning Area near the coast and the Northwestern corner of the Planning Area. There are no areas designated MRZ-2 or MRZ-4 within the Planning Area. Tiburon's current General Plan does not identify other significant mineral deposits or active mining operations in the Planning Area.

## REFERENCES

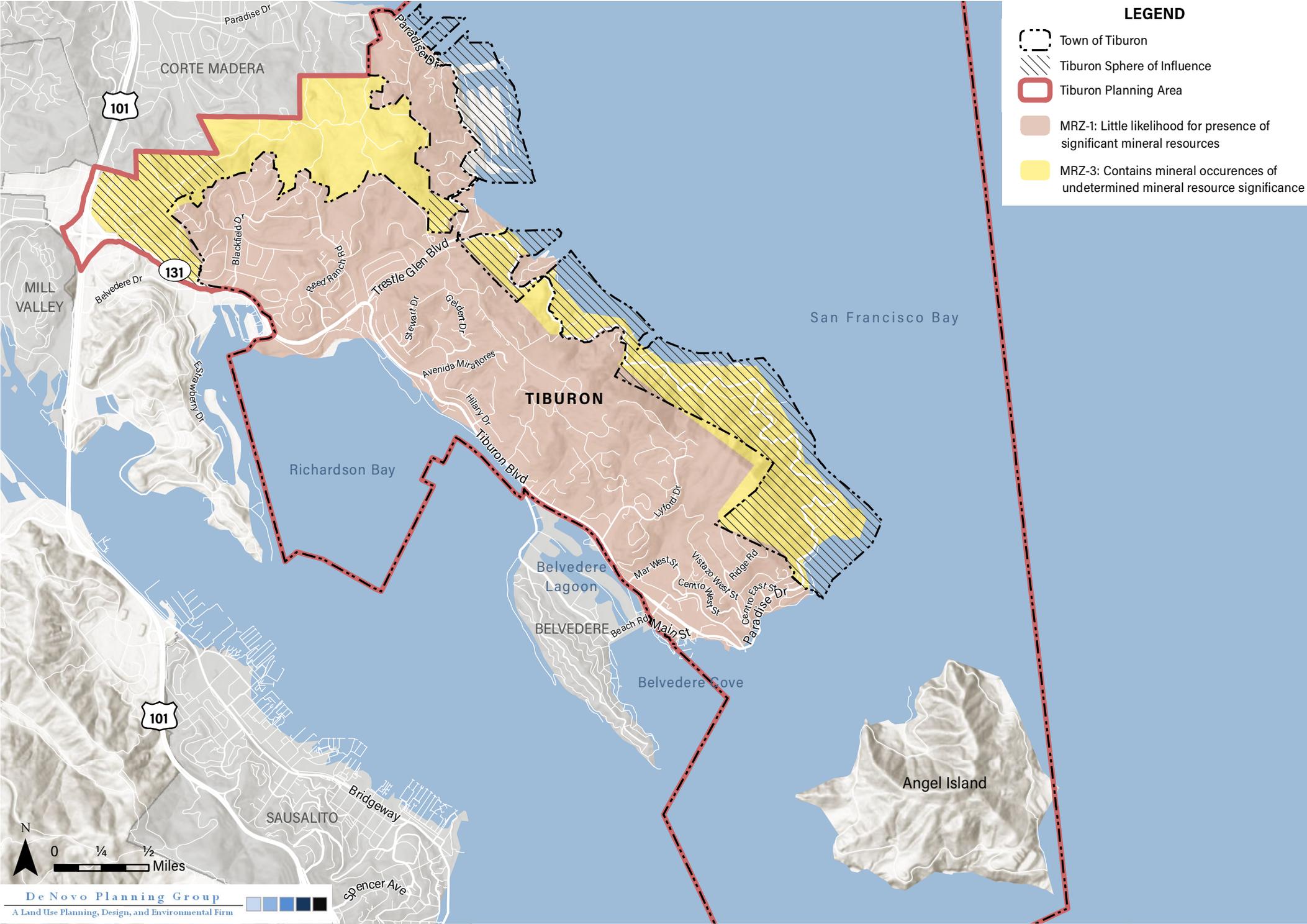
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California Department of Conservation. 2002. California Geological Survey, Note 36.

California Department of Conservation, Division of Mines and Geology. 1987. Special Report 146 Part II, Classification of Aggregate Resource Areas South San Francisco Bay Production-Consumption Region, Plates 2.25, 2.26, 2.29, 2.31.

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Figure 5-1: Mineral Resource Zones



Sources: ArcGIS Online World Hillshade Map Service; California Geological Survey, SR205: Updated Mineral Lands Classification Map for Portland Cement Concrete-Grade Aggregate in the North San Francisco Bay Production-Consumption Region, Marin, Napa, Sonoma, and Southwestern Solano Counties, California, Platela, 2013. Map date: March 2, 2021.

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## 6 HYDROLOGY AND WATER QUALITY

This section provides an overview of hydrology and water quality within the Planning Area and the vicinity. For information on flood-related issues and flood safety, see the Flooding chapter of the Existing Conditions Safety Report.

### REGULATORY FRAMEWORK

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#### FEDERAL AND STATE

##### Clean Water Act

The Clean Water Act (CWA), initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for stormwater discharges (individual permits and general permits). The SWRCB elected to adopt a Statewide General Permit (Water Quality Order No. 2013-001-DWQ-DWQ).

##### Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) was passed in 1972. This act, administered by the National Oceanic and Atmospheric Administration, provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

The CZMA outlines three national programs: the National Coastal Zone Management Program, the National Estuarine Research Reserve System, and the Coastal and Estuarine Land Conservation Program (CELCP). The National Coastal Zone Management Program aims to balance competing land and water issues through state and territorial coastal management programs, the reserves serve as field laboratories that provide a greater understanding of estuaries and how humans impact them, and CELCP provides matching funds to state and local governments to purchase threatened coastal and estuarine lands or obtain conservation easements.

##### California Water Code

The Clean Water Act places the primary responsibility for the control of surface water pollution and for planning the development and use of water resources with the states, although this does establish certain guidelines for the States to follow in developing their programs and allows the Environmental Protection Agency to withdraw control from states with inadequate implementation mechanisms.

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The

Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Water Code Section 13260 requires all dischargers of waste that may affect water quality in waters of the state to prepare and provide a water quality discharge report to the RWQCB. Section 13260a-c is as follows:

- (a) Each of the following persons shall file with the appropriate regional board a report of the discharge, containing the information that may be required by the regional board:
  - (1) A person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system.
  - (2) A person who is a citizen, domiciliary, or political agency or entity of this state discharging waste, or proposing to discharge waste, outside the boundaries of the state in a manner that could affect the quality of the waters of the state within any region.
  - (3) A person operating, or proposing to construct, an injection well.
- (b) No report of waste discharge need be filed pursuant to subdivision (a) if the requirement is waived pursuant to Section 13269.
- (c) Each person subject to subdivision (a) shall file with the appropriate regional board a report of waste discharge relative to any material change or proposed change in the character, location, or volume of the discharge.

### **National Pollutant Discharge Elimination System (NPDES)**

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the EPA, subject to review and approval by the EPA Regional Administrator. The terms of these NPDES permits implement pertinent provisions of the Clean Water Act and the Act's implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the Clean Water Act.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the SWRCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from industrial and construction sites statewide. Stormwater discharges from industrial and construction activities in the San Francisco Bay Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB. Tiburon is within the jurisdiction of the San Francisco Bay RWQCB.

The SWRCB and RWQCBs enforce State of California statutes that are equivalent to or more stringent than the Federal statutes. RWQCBs are responsible for establishing water quality standards and objectives that protect the beneficial uses of various waters. In 2003, smaller (less than 100,000 population) municipalities and unincorporated counties were required to obtain coverage under a statewide NPDES Municipal General Stormwater Permit (Phase II Permit) issued by the State Water Resources Control Board. In Marin County, the County and all Marin's municipalities, including Tiburon, are subject to the conditions of the regulations described in the current 2013 Phase II Permit. The Marin County Permittees are currently subject to National Pollutant Discharge Elimination System (NPDES) Permit No. CAS000004, issued by Order No. WQ 2018-

0007-EXEC on March 13, 2019, which pertains to stormwater runoff discharge from storm drains and watercourses within their jurisdictions.

### **Assembly Bill 3030 - Groundwater Management Act**

In 1992, the State Legislature provided for more formal groundwater management with the passage of Assembly Bill (AB) 3030, the Groundwater Management Act (Water Code Section 10750, et seq.). Groundwater management, as defined in DWR's Bulletin 118 Update 2003, is the planned and coordinated monitoring, operation, and administration of a groundwater basin, or portion of a basin, with the goal of long-term groundwater resource sustainability. Groundwater management needs are generally identified and addressed at the local level in the form of Groundwater Management Plans (GMP). The Act provides local water agencies with procedures to develop a GMP to enable those agencies to manage their groundwater resources efficiently and safely while protecting the quality of supplies. Under the Act, development of a GMP by a local water agency is voluntary.

### **Sustainable Groundwater Management Act**

The Sustainable Groundwater Management Act (SGMA) established a framework for sustainable, local groundwater management. SGMA requires groundwater-dependent regions to halt overdraft and bring basins into balanced levels of pumping and recharge. With passage of the SGMA, the Department of Water Resources launched the Sustainable Groundwater Management (SGM) Program to implement the law and provide ongoing support to local agencies around the state. The SGMA defines "sustainable groundwater management" and requires that a Groundwater Sustainability Plan be adopted for the most important groundwater basins in California as a means to empower local agencies to manage basins sustainably. The SGMA establishes basic requirements for the Groundwater Sustainability Plans as well as a timetable for the adoption of the plans.

### **Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary**

The watershed of the Bay-Delta Estuary provides drinking water to two-thirds of the State's population and water for a multitude of other urban uses, and it supplies some of the State's most productive agricultural areas, both inside and outside of the Estuary. The Bay-Delta Estuary itself is one of the largest ecosystems for fish and wildlife habitat and production in the United States.

The Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Basin Plan) includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term "water quality standards," as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The RWQCB regulates waste discharges to minimize and control their effects on the quality of the region's ground and surface water. Permits are issued under a number of programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code and the Clean Water Act

## LOCAL

### San Francisco Bay Conservation and Development Commission (BCDC) San Francisco Bay Plan (Bay Plan)

The San Francisco Bay Conservation and Development Commission (BCDC) is a California state planning and regulatory agency with regional authority over the San Francisco Bay, the Bay's shoreline band, and the Suisun Marsh. BCDC was created in 1965 and is the nation's oldest coastal zone agency.

Its mission is to protect and enhance San Francisco Bay and to encourage the Bay's responsible and productive use for this and future generations. State law requires sponsors of projects that propose to fill or extract materials from the Bay to apply for a BCDC permit. In addition to minimizing any fill required for an appropriate project and ensuring that the project is compatible with the conservation of Bay resources, BCDC is tasked with requiring maximum feasible public access within the Bay's 100-foot shoreline band. In addition, BCDC leads the Bay Area's ongoing multi-agency regional effort to address the impacts of rising sea level on shoreline communities and assets.

The San Francisco Bay Plan (Bay Plan) was completed and adopted by the BCDC in 1968 and has been updated regularly with the most recent revisions approved by BCDC in 2019. Essential parts of the Bay Plan include policies to guide future uses of the Bay and shoreline, and the maps that apply these policies to the present Bay and shoreline. The Bay Plan addresses the following matters as specifically required by the law:

1. The results of the Commission's detailed study of the Bay;
2. The comprehensive plan adopted by the Commission for the conservation of the water of San Francisco Bay and the development of its shoreline;
3. The Commission's recommendation of the appropriate agency to maintain and carry out the Bay Plan;
4. The Commission's estimate of the approximate amount of money that would be required to maintain and carry out the provisions of the Plan for the Bay;
5. Other information and recommendations the Commission deemed desirable.

The Bay Area Plan includes findings and policies related to hydrology/ water quality. The hydrology/ water quality section of the Bay Area Plan includes polices the implementation of programs for controlling pollution, including stormwater management plans, Total Maximum Daily Load implementation plans, construction site stormwater runoff and erosion, sediment controls, establishing best management practices, such as site planning or structural controls, new technologies, project siting criteria, and operating methods.

### Marin County Stormwater Pollution Prevention Program

Formed in 1993, Marin County Stormwater Pollution Prevention Program (MCSTOPPP). MCSTOPPP is a joint effort of Marin's cities, towns and unincorporated areas. Their goal is to:

- prevent stormwater pollution
- protect and enhance water quality in creeks and wetlands
- preserve beneficial uses of local waterways
- comply with State and Federal regulations

Though the County and each of the eleven cities and towns carry out their own individual stormwater pollution prevention programs, MCSTOPPP provides for the coordination and consistency of approaches between the individual participants and documents their efforts in annual reports. These reports include information on illegal discharges, street cleaning efforts, creek maintenance, new development, and other issues of concern. MCSTOPPP prepared the Action Plan 2010 in May 2005, which serves as a stormwater management plan per the NPDES permit requirements and describes planned MCSTOPPP activities for the period July 2005 through June 2010. MCSTOPPP has also prepared a planning and design

guide for post-construction best management practices. While MCSTOPPP provides guidance for compliance with NPDES permitting, permit compliance is administered by the specific municipality in which the project is proposed.

### **Town of Tiburon General Plan**

The existing Tiburon General Plan includes the following goals, policies, and implementing programs that address water quality, supply, and conservation.

#### **Resources Conservation Element**

OSC-52. Water quality should be maintained or enhanced in order to promote the continued environmental health of natural waterway habitats.

OSC-53. The Town shall continue to be an active member agency of the Marin County Stormwater Pollution Prevention Program (MCSTOPPP) to reduce pollution being conveyed through storm water systems to the Bay and to comply with federal and state water quality regulations.

OSC-54. The Town shall promote the adoption and implementation of Start at the Source-Design Guidance Manual for Stormwater Quality Protection and the most recent follow-up publication Using Site Design Techniques to Meet Development Standards for Stormwater Quality: A Companion Document, both of which apply to new development and redevelopment projects. These documents stress the incorporation of runoff and other pollutant source controls into the project design process.

### **Town of Tiburon Municipal Code**

Chapter 13E Water Efficient Landscape. As mandated under State Government Code Section 65595(c), certain new construction, remodel, and rehabilitation projects that include landscape and irrigation improvements are required to comply with water-efficient landscape requirements and monitoring of water usage for irrigation. The purpose of this chapter is to comply with this state mandate regarding water-efficient landscaping. The ordinance contains provisions that include but are not limited to, the following:

1. The application and monitoring of a "maximum applied water allowance" that is established for applicable projects.
2. The review of required landscape and irrigation plans, specifications and supportive documents prepared for applicable projects for compliance with water-efficient landscape restrictions, including limitations on the type and amount of landscape materials and plant species.
3. The review, inspection and approval of landscape and irrigation that is installed for applicable projects to ensure compliance with the approved landscape and irrigation plans and specifications.
4. The post-installation monitoring of water usage for irrigation by applicable projects.

Chapter 14A Drainage Areas. This chapter is enacted for the purpose of establishing drainage fees to defray the actual or estimated costs of constructing planned drainage facilities for the removal of surface and storm waters from local or neighborhood drainage areas.

Chapter 17 Harbor and Waterways. This chapter establishes additional standards and regulations related to zoning, parks and recreation and the obstruction, diverting, etc., of watercourses within the Town of Tiburon.

Chapter 20A Urban Runoff Pollution Prevention. The purpose of this chapter is to establish the legal authority required by section E.6.a of the phase II stormwater permit and to ensure the future health, safety and general welfare of the citizens of the Town of Tiburon and to protect and enhance watercourses, fish and wildlife habitat by:

1. Minimizing discharges other than storm runoff to storm drains or watercourses to the maximum extent practicable;

2. Responding to the discharge of spills, preventing and controlling the discharge of spills to storm drains or watercourses and prohibiting dumping or disposal of materials other than stormwater;
3. Reducing pollutants in stormwater discharges to the maximum extent practicable;
4. Requiring operators of construction sites, new or redeveloped land, and industrial and commercial facilities to install, implement, or maintain appropriate best management practices ("BMPs").
5. Requiring development projects to maintain or reduce the volume, velocity, peak flow rate and duration of runoff as compared to the pre-development stormwater runoff and preventing stormwater pollution whenever possible, through stormwater management controls and ensuring that these management controls are properly maintained.
6. Authorizing the town to take the foregoing and all other actions specified by Section E.6.a of the Phase II Small Municipal Separate Storm Sewer System National Pollutant Discharge Elimination System Permit, Water Quality Order No. 2013-0001—DWQ, General Permit No. CAS000004 ("Phase II Stormwater Permit") and subsequent revisions and amendments thereto.
7. The intent of this chapter is to protect and enhance the water quality of our watercourses, water bodies, and wetlands in a manner pursuant to and consistent with the Clean Water Act, the Porter-Cologne Water Quality Control Act (California Water Code section 13000 et seq.), and the phase II stormwater permit and subsequent revisions and amendments thereto.

## ENVIRONMENTAL SETTING

### REGIONAL HYDROLOGY

The Planning Area is located in the Angel Island-San Francisco Bay Estuaries, Arroyo Corte Madera Del Presido-Frontal San Francisco Bay Estuaries, Larkspur Creek-Frontal San Francisco Bay Estuaries, Redwood Creek-Frontal Pacific Ocean, and Richardson Bay-San Francisco Bay watersheds. Elevations on the peninsula range from sea level to about 650 feet, and it is drained by multiple small watersheds on the north and south sides. Raccoon Strait is present to the southeast of the peninsula (separating it from Angel Island), Richardson Bay lies to the west and southwest, Belvedere Lagoon and Cove to the South, and San Francisco Bay to the northeast.

### CLIMATE

The Tiburon peninsula is located in the Mediterranean-type climate zone typical of coastal central California. This zone is characterized by cool, wet winters and warm, dry summers, with almost all rain falling between the months of October and April. The mean annual precipitation (MAP) in the region ranges from up to 50 inches at the highest points of Mount Tamalpais to roughly 24 inches near the Town of Bolinas, with an average value of about 23 inches near Tiburon.

### WATERSHEDS

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special-status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 6-1 shows the primary watershed classification levels used by the State. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

**TABLE 6-1. STATE WATERSHED HIERARCHY NAMING CONVENTION**

WATERSHED LEVEL	APPROXIMATE SQUARE MILES (ACRES)	DESCRIPTION
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES, 2012.

### Hydrologic Region

Tiburon is located in the San Francisco Bay Hydrologic Region. The San Francisco Bay Hydrologic Region covers approximately 2.88 million acres (4,500 square miles) and includes all of San Francisco and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. Significant geographic features include the Santa Clara, Napa, Sonoma, Petaluma, Suisun-Fairfield, and Livermore valleys; the Marin and San Francisco peninsulas; San Francisco, Suisun, and San Pablo bays; and the Santa Cruz Mountains, Diablo Range, Bolinas Ridge, and Vaca Mountains of the Coast Range.

The San Francisco Bay Hydrologic Region has 28 identified groundwater basins. Despite the tremendous urban development in the region, groundwater use accounts for only about five percent (68,000 acre-feet) of the region’s estimated average water supply for agricultural and urban uses, and accounts for less than one percent of statewide groundwater uses. The Sacramento and San Joaquin rivers flow into the Delta and into San Francisco Bay. The Delta is the largest estuary on the West Coast, receiving nearly 40 percent of the state’s surface water from the Sierra Nevada and the Central Valley. The interaction between Delta outflow and Pacific Ocean tides determines how far salt water intrudes into the Delta. The resulting salinity distribution influences the distribution of many estuarine fish and invertebrates, as well as the distribution of plants, birds, and animals in wetlands areas.

The north lobe of San Francisco Bay is brackish and is known as San Pablo Bay. It is surrounded by Marin, Sonoma, Napa, and Solano counties. Suisun Marsh is between San Pablo Bay and the Delta and is the largest contiguous brackish marsh on the West Coast of North America, providing more than 10 percent of California’s remaining natural wetlands.

### Local Watersheds (Hydrologic Sub-Areas)

Within the San Francisco Bay Hydrologic Region, the Planning Area is located in the Angel Island-San Francisco Bay Estuaries, Arroyo Corte Madera Del Presido-Frontal San Francisco Bay Estuaries, Larkspur Creek-Frontal San Francisco Bay Estuaries, Redwood Creek-Frontal Pacific Ocean, and Richardson Bay-San Francisco Bay watersheds as shown on Figure 6-1.

### LOCAL DRAINAGE

The Department of Public Works is responsible for the maintenance and improvement of all public infrastructure owned and managed by the Town. In addition to normal maintenance operations, they are a key agency in responding to emergencies involving the Town’s infrastructure as well as weather related events and other disasters that have the potential for adverse impacts to public health or the environment. Tiburon is responsible for maintaining the flood control system within the incorporated area. In the unincorporated parts of the Planning Area, responsibility for storm drain maintenance lies with the Marin County Flood Control and Water Conservation District.

The developed portions of the Tiburon Planning Area are primarily within three major watersheds: Angel Island-San Francisco Bay Estuaries, Arroyo Corte Madera Del Presidio-Frontal San Francisco Bay Estuaries, and Larkspur Creek-Frontal San Francisco Bay Estuaries. The Town is drained by multiple small watersheds on the north and south sides of the Peninsula. Primarily water drains to the Town stormwater drainage system that runs under Tiburon Boulevard and outlets to Raccoon Strait near the Ferry Terminal, or the secondary outlet which drains south to Belvedere Lagoon. Other portions of Tiburon drain to Railroad Marsh, a pond/marsh feature that serves as a flood control feature.

Tiburon's creeks are also a key part of the Town's open space network. They are valuable physical, aesthetic, recreational, and ecological assets. Protection of creeks not only preserves surface water quality, but also reduces flood risks, preserves biodiversity and habitat, minimizes erosion of stream banks, and prevents downstream siltation.

## **STORMWATER QUALITY**

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminants in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Urban stormwater runoff was managed as a non-point discharge (a source not readily identifiable) under the Federal Water Pollution Control Amendments of 1972 (PL 92-500, Section 208) until the mid-1980's. However, since then, the Federal Environmental Protection Agency has continued to develop implementing rules which categorize urban runoff as a point source (an identifiable source) subject to NPDES permits. Rules now affect medium and large urban areas, and further rulemaking is expected as programs are developed to meet requirements of Federal water pollution control laws.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

### **303(d) Impaired Water Bodies**

Section 303(d) of the federal Clean Water Act requires States to identify waters that do not meet water quality standards or objectives and thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

San Francisco Bay (Central), with 70,405 assessed acres, and Richardson Bay, with 2,439 assessed acres, are listed by the San Francisco Bay Regional Water Quality Control Board as having limited water quality, as required by the Clean Water Act, Section 303(d). Table 6-2 identifies each pollutant identified for San Francisco Bay (Central) and Richardson Bay, along with the final listing decision, TMDL status, expected TMDL completion date, U.S. EPA TMDL approval date (for approved TMDLs), and potential sources. Pollutants within the Planning Area include Chlordane, a synthetic viscous toxic compound used as an insecticide; DDT (Dichlorodiphenyltrichloroethane), another a synthetic viscous toxic compound used as an insecticide; Dieldrin, another a synthetic viscous toxic compound used as an insecticide; Mercury, a naturally-occurring

chemical element used in the production of other chemicals; Selenium, a mineral found in the soil; Invasive Species, an organism that causes ecological or economic harm in a new environment where it is not native; Dioxin Compounds, a group of highly toxic chemical compounds that are harmful to health; Furan Compounds, a heterocyclic organic compound used in the creation of other chemicals that can be harmful to the immune system and reproductive development; and PCBs (Polychlorinated biphenyls), which are highly toxic industrial compounds that pose serious health risks to fetuses, babies and children, who may suffer developmental and neurological problems from prolonged or repeated exposure.

TABLE 6-2. PLANNING AREA IMPAIRED WATER BODIES

POLLUTANT	FINAL LISTING DECISION	TMDL STATUS <sup>1</sup>	EXPECTED TMDL COMPLETION <sup>2</sup>	USEPA TMDL APPROVAL DATE <sup>3</sup>	POTENTIAL SOURCES
<b>SAN FRANCISCO BAY CENTRAL</b>					
<b>PESTICIDES</b>					
Chlordane	Do Not Delist from 303(d) list	5A	2013		Unknown
DDT (Dichlorodiphenyltrichloroethane)	Do Not Delist from 303(d) list	5A	2013		Unknown
Dieldrin	Do Not Delist from 303(d) list	5A	2013		Unknown
<b>Metals/Metalloids</b>					
Mercury	Do Not Delist from 303(d) list (USEPA approved TMDL)	5B		2008-02-12	Atmospheric Deposition, Industrial Point Sources, Municipal Point Sources, Natural Sources, Nonpoint Sources, Resource Extraction
Selenium	Do Not Delist from 303(d) list (USEPA approved TMDL)	5B		2016-08-23	Unknown
<b>Miscellaneous</b>					
Invasive Species	List on 303(d) list	5A	2019		Unknown
<b>Other Organics</b>					
Dioxin compounds (including 2,3,7,8-TCDD)	List on 303(d) list	5A	2019		Unknown
Furan Compounds	List on 303(d) list	5A	2019		Unknown
PCBs (Polychlorinated biphenyls)	Do Not Delist from 303(d) list (USEPA approved TMDL)	5B		2010-03-29	Unknown
<b>Trash</b>					
Trash	List on 303(d) list	5A	2021		Unknown
<b>RICHARDSON BAY</b>					
<b>Pesticides</b>					
Chlordane	List on 303(d) list	5A	2013		Unknown
DDT (Dichlorodiphenyltrichloroethane)	List on 303(d) list	5A	2013		Unknown
Dieldrin	List on 303(d) list	5A	2013		Unknown
<b>Other Organics</b>					
Dioxin compounds (including 2,3,7,8-TCDD)	List on 303(d) list	5A	2019		Unknown
Furan Compounds	List on 303(d) list	5A	2019		Unknown

PCBs (Polychlorinated biphenyls)	List on 303(d) list (being addressed by USEPA approved TMDL)	5B		2010-03-29	Unknown
PCBs (Polychlorinated biphenyls) (dioxin-like)	List on 303(d) list (being addressed by USEPA approved TMDL)	5B		2010-03-29	Unknown
PCBs (Polychlorinated biphenyls) (dioxin-like)	List on 303(d) list (being addressed by USEPA approved TMDL)	5B		2010-03-29	Unknown
Miscellaneous					
Invasive Species	List on 303(d) list	5A	2019		Unknown
Fecal Indicator Bacteria					
Indicator Bacteria	List on 303(d) list (being addressed by USEPA approved TMDL)	5B		2009-12-18	Unknown
Metals/Metalloids					
Mercury	List on 303(d) list (being addressed by USEPA approved TMDL)	5B		2008-02-29	Unknown

1: TOTAL MAXIMUM DAILY LOAD (TDML)

2: DETERMINATION THE LOADING CAPACITY OF THE WATERBODY AND ALLOCATION OF LOAD AMONG DIFFERENT POLLUTANT SOURCES.

3: APPROVED TMDL WASTELOAD ALLOCATIONS GENERALLY BECOME IMPLEMENTED THROUGH EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS UNDER CWA SECTION 402.

SOURCE: STATE WATER RESOURCES CONTROL BOARD, FINAL 2014/2016 CALIFORNIA INTEGRATED REPORT (CLEAN WATER ACT SECTION 303(D) LIST / 305(B) REPORT)

## Groundwater

According to the California Department of Water Resource's Groundwater Basin Boundary Assessment Tool, there are no groundwater basins identified within the Tiburon Planning Area. Therefore, the Tiburon Planning Area is not considered a groundwater recharge area. The nearest groundwater basin to the Tiburon Planning Area is the Ross Valley Groundwater Basin located approximately 0.5 miles northwest of Ring Mountain.

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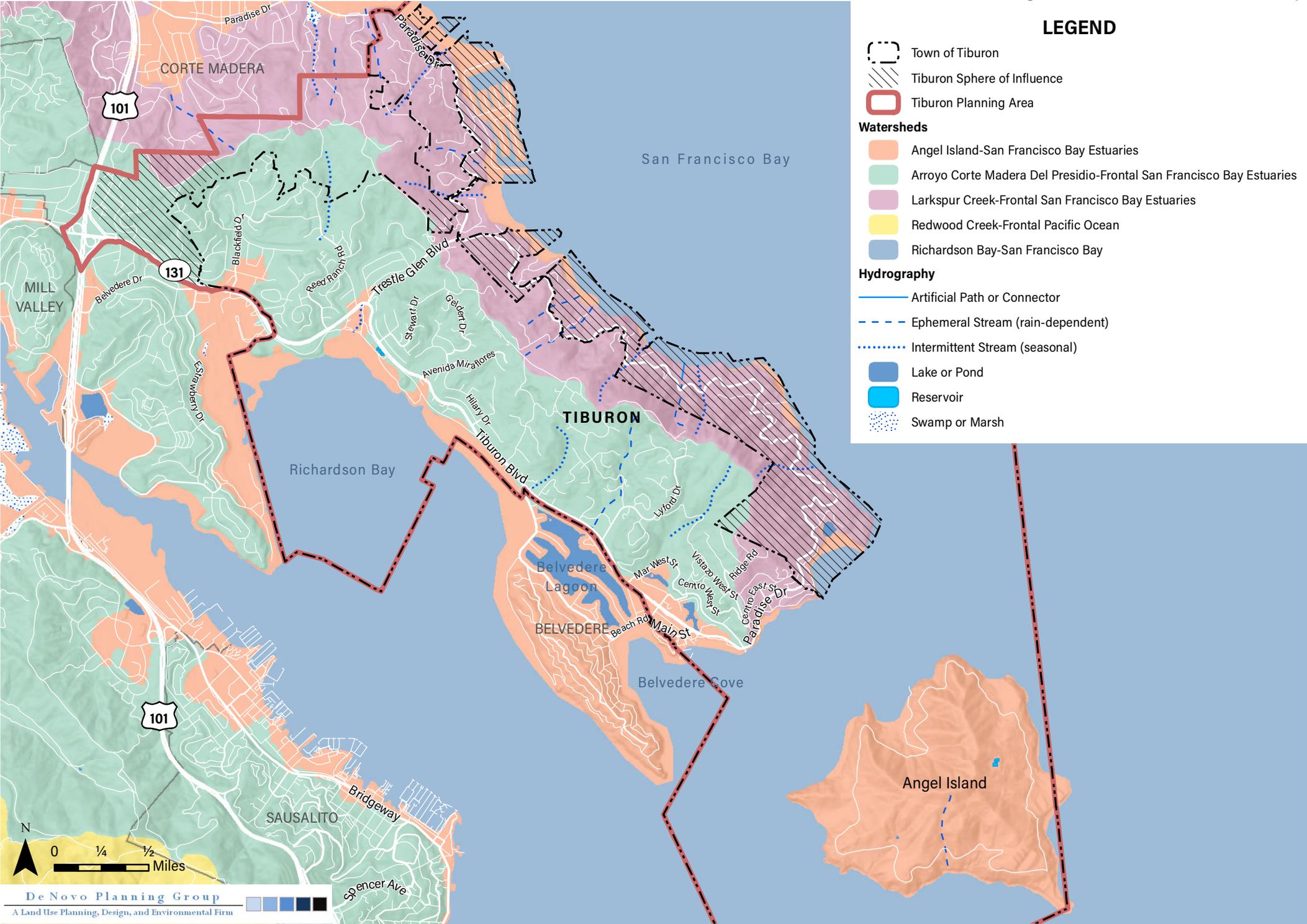
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Figure 6-1: Watersheds Map



Sources: ArcGIS Online World Hillshade Map Service; USGS Watershed Boundary Dataset; USGS National Hydrography Dataset. Map date: January 4, 2021. Revised March 2, 2021.

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## 7 AESTHETICS AND VISUAL RESOURCES

This section provides an overview of the visual character, scenic resources, views, and scenic highways that are encountered within the Planning Area and the vicinity. For information on historical structures and resources, see Section 1 (Cultural and Historic Resources).

### KEY TERMS

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**Scenic Highway Corridor.** The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

**Scenic Highway/Scenic Route.** A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. Until the mid-1980's, General Plans in California were required to include a Scenic Highways Element.

**View Corridor.** A view corridor is a highway, road, trail, or other linear feature that offers travelers a vista of scenic areas within a city or county.

### REGULATORY FRAMEWORK

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#### STATE

##### California Department of Transportation – California Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code.

#### LOCAL

##### Town of Tiburon General Plan

The Tiburon General Plan sets forth policy guidelines for decision making on issues related to development and conservation in the Town. Goals and policies related to aesthetics are contained in the Open Space and Conservation Element of the Tiburon General Plan. Additionally, the Downtown Element contains goals and policies related to aesthetics that are specific to the Downtown area. Public and private open space designated by the General Plan are shown in Figure 7-1.

In addition to the goals, policies, and implementing programs listed below, the Open Space and Conservation Element establishes Significant Ridgelines as shown on Figure 7-2 to implement Resolution 2859 (see following discussion).

##### Open Space and Conservation Element

###### Goals

OSC-A: To maximize, protect, preserve and enhance the Town's unique open space and natural beauty.

OSC-C: To permanently protect to the maximum extent feasible, the unique open space character of the Town which is attributable to its large amounts of undeveloped land and open water.

OSC-E: To manage the Town's open spaces for the benefit of the entire community.

**Policies**

OSC-1: The Town shall strive to permanently preserve through setbacks, dedication, purchase, easement, or other appropriate means exceptional structures, sites, open space and sensitive environmental resources. The Town shall strongly encourage the permanent protection of open space through conveyance of fee title to an appropriate government agency or land trust; by easement; deed restriction; or other appropriate mechanism acceptable to the Town.

OSC-2: In considering whether open space land shall be dedicated to the Town or other public entity, the benefits to the community of public ownership shall be weighed against the costs of management efforts and other liabilities associated with owning the land.

OSC-3: The Town shall strive to secure, through trail easements that connect to other public trails or through other appropriate mechanisms, public access to those portions of open space land most appropriate for public use.

OSC-4: Public or private open space shall be permanently protected. It is the Town's general policy that publicly-owned open space land will not be traded or sold.

OSC-5: The Town hereby establishes a goal that a minimum of 50% of the area of lands designated as Planned Development - Residential shall be preserved as permanent open space.

OSC-6: The Town prefers clustering of lots in new subdivision design to maximize the preservation of open space to the greatest extent feasible. However, where the Town determines that a project would better conform to the goals and policies of the General Plan, "estate lot" type development (i.e., large homes on large lots) may be considered. Easement, deed restriction, or other appropriate mechanism acceptable to the Town shall be used to preserve open space within common areas or individual lots.

OSC-7: Where possible, land that is proposed for preservation as permanent open space shall be contiguous to existing open space and/ or open space areas that may in the future be permanently preserved.

OSC-8: Where appropriate, greenbelts shall be required to separate development areas or to link open space areas.

OSC-9: Undeveloped ridgelines have overriding visual significance to the Town. In balancing open space interests with development interests, the protection of predominantly undeveloped ridgelines shall have the highest priority.

OSC-10: Development and the construction of buildings and yard improvements associated with development, including landscaping and trees, shall be set back a minimum of 150 horizontal feet of either side of Tiburon Ridge.

OSC-11: Development and the construction of buildings and yard improvements associated with development, including landscaping and trees, shall be set back a minimum of 50 vertical feet of either side of Tiburon Ridge, measured from the highest point of the roofline of a structure or tree.

OSC-12: Development shall be set back from Significant Ridgelines. Setbacks shall be based on an evaluation of the following characteristics: Local and regional visual prominence, ability to connect to existing or potential open space, potential to act as a neighborhood separator, views of and views from, length, height, presence of trees, presence of unusual physical characteristics, highly visible open slopes, significant vegetation, sensitive habitat, special silhouette or back-drop features, difficulty of developing or accessing, and integrity of the ridgeline land form.

OSC-13: Roads and utilities constructed along or across the Tiburon Ridge or Significant Ridgelines shall be strongly discouraged. If no other vehicular access is viable, crossing of ridges shall be minimized and shall be as near to perpendicular to the ridgeline as possible.

OSC-28: Principal vistas, viewpoints, and view corridors on land subject to development shall be identified and preserved to the maximum extent feasible.

OSC-29: Open space views from key roadways, including Tiburon Boulevard, Trestle Glen Boulevard, and Paradise Drive, shall be protected through the permitting process.

OSC-30: Development shall be encouraged in areas where it least interferes with views of and views from open space to the maximum extent feasible.

OSC-31: The preservation of visual qualities, views, and the view potential of the natural and built environment shall be a major consideration of the Town in any development project review.

OSC-32: The Town shall protect visual access to the bayfront and scenic vistas of water and distinct shorelines through its land use and development review procedures, to the greatest extent feasible.

### **Downtown Element**

#### **Goals**

DT-A: To preserve and enhance the historical attributes and small-town village character of Downtown that exists on Main Street and Ark Row.

DT-C: To encourage greater pedestrian activity and enjoyment of life in Downtown while respecting surrounding residential uses.

#### **Policies**

DT-11: Maintain Shoreline Park's historic Donahue Building (currently the Railroad/Ferry Museum) as a public use.

DT-13: In order to encourage pedestrian use and enjoyment of the street, the Town shall discourage commercial office uses from occupying street-fronting ground floor space suitable for retail and restaurants in new or redeveloped buildings in the Upper Tiburon Boulevard area.

DT-16: In order to encourage pedestrian use and enjoyment of Main Street, the Town shall discourage commercial office uses from occupying ground floor space suitable for retail and restaurants on Main Street and Ark Row.

DT-17: Throughout Downtown. New buildings or alterations to existing buildings in the Downtown should substantially adhere to the guidelines set forth in the Downtown Tiburon Design Handbook.

DT-18: Throughout Downtown. Street furniture and street lighting shall be high quality and consistent with the guidelines established in the Site Furnishings Supplement to the Downtown Tiburon Design Handbook, and shall be installed only in locations that will enhance use and enjoyment of sidewalks, parks, pedestrian corridors, plazas and other public areas.

DT-19: Throughout Downtown. Character defining elements of buildings listed on the Town's Inventory of Local Historical Buildings (Resolution No. 07-2001 as amended) shall be retained, preserved, and restored wherever feasible.

DT-20: Throughout Downtown. Encourage public art in those locations in Downtown where it is appropriate.

DT-21: Main Street. New construction and remodeling of buildings shall be architecturally compatible with, and contribute to, the village character of Main Street, the principal features of which are described in the Downtown Tiburon Design Handbook.

DT-22: Main Street. New construction and remodeling shall respect both the well-defined streetscape of Main Street and the street's maritime environment.

DT-23: Ark Row. Public and private improvements (including signs) shall be compatible with and not compromise Ark Row's historic resources and its unique character.

DT-24: Ark Row. The historic arks, cottages, and other resources of Ark Row shall be retained and rehabilitated consistent with recommended actions provided in applicable sections of The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings.

DT-25: Tiburon Boulevard. New buildings shall observe a setback of 25 to 30 feet from the curb, with entrances visible to the motorist and welcoming to the pedestrian, to create an engaging, pedestrian-friendly environment. Where possible, frontage improvements including wider sidewalks and street trees on both sides of the street should be installed consistent with the Downtown Tiburon Design Handbook.

DT-27: Tiburon Boulevard. The visual presence and location of on-site parking spaces are to be made secondary to building storefronts, entrances, and street orientation. Locating parking behind buildings will be required wherever possible.

DT-28: Tiburon Boulevard. A mix of two- and three-story buildings is encouraged for new construction.

DT-29: Point Tiburon. The prevailing design theme and sign program established at the Point Tiburon Plaza should be retained to ensure a harmonious and consistent appearance within this commercial center.

### **Implementation Measures**

DT-a: The Tiburon Zoning Ordinance shall be revised to be consistent with the goals and policies of this Element and to implement the guidelines of the Downtown Tiburon Design Handbook.

DT-b: Adopt a property maintenance ordinance for Downtown that will require that public and private improvements (including signs) be kept in good repair.

DT-d: Over the long-term, implement installation of streetscape improvements to Tiburon Boulevard's public right-of-way as described in the Downtown Tiburon Design Handbook. These improvements may include, but are not limited to, widening sidewalks to a minimum of eight feet; providing a landscaped planter strip between sidewalks and streets on both sides of Tiburon Boulevard; installing new street trees in these planter strips; and replanting the existing median strip with lower-growing vegetation.

DT-e: Facilitate the long-term future improvement of the four corner properties at the intersection of Tiburon Boulevard and Beach Road and adjacent sites.

DT-f: The Town shall adopt a street furniture/ outdoor seating plan for Main Street, with possible future extension of the plan to other areas of Downtown.

DT-g: The Town shall adopt a resolution designating the former Northwestern Pacific Railroad Yard palm tree as a protected tree.

DT-h: Consider installation of a Downtown Tiburon entry sign/ planter area at an appropriate location.

DT-i: Consider adoption of a public art ordinance and establishment of a community program to encourage public art where appropriate.

### **Town of Tiburon Municipal Code**

Chapter 15 - View and Sunlight Obstruction from Trees. The purposes of this chapter are to establish standards and regulations in order to preserve views from unreasonable obstruction and establish a process by which impacted persons may seek restoration of obstructed views by growth of trees.

Chapter – 16a Signs. The provisions of this chapter establish and regulate the location, size, type and number of signs allowed within the Town of Tiburon, and guide the design, aesthetics, materials, and illumination of signs within the Town of Tiburon.

Section 16.30.070, Lighting, establishes standards and regulations related to exterior lighting. This section is to ensure lighting does not invade the privacy of other properties or produce glare or light pollution.

Section 16-52.020, Site Plan and Architectural Review, of the Tiburon Municipal Code provides standards for a Design Review process for development in the Town. The purpose of site plan and architectural review is to ensure that the design of proposed construction and new land uses assists in maintaining and enhancing Tiburon's character. Specifically, the site plan and architectural review process ensures that new uses and structures are compatible with the surrounding neighborhood; retains and strengthens the visual quality and character of the Town; and ensures that construction complies with all applicable Town standards and guidelines, and does not adversely affect community health, safety, aesthetics, or natural resources.

Section 16-23.060, Historic Protection Overlay Zone Allowable Uses and General Development Standards, of the Tiburon Municipal Code provides standards for development within the HPO (Historic Protection Overlay) Zone. The purpose of the HPO zone is to protect, maintain and enhance historic structures in the downtown area that are included in the Town's local historic inventory of buildings located in downtown Tiburon ("Inventory"), as adopted by resolution of the Town Council and amended from time to time. The HPO zone is intended to safeguard the Town's heritage as embodied and reflected in the buildings listed in the inventory.

### **Town Council Resolution 2859**

In 1992, the Town Council adopted a Resolution (2859) which affirmed that "in balancing open space interests with development interests decision-makers shall consider the protection of ridgelines to the maximum extent feasible to be of the highest priority." The Resolution also designated other Significant Ridgelines to be subject to General Plan and Zoning Ordinance policies and regulations concerning "ridgelines, significant ridgelines, and secondary ridgelines." The Significant Ridgelines designated by Town Council Resolution 2859 are shown on Figure 7-2.

### **Downtown Tiburon Design Handbook**

The Downtown Tiburon Design Handbook is intended to serve as a guide for the retention, revitalization, and new construction of buildings, storefronts, and streetscapes in Downtown Tiburon. The Handbook consists of goals, basic design concepts, and design guidelines. While the guidelines address many specific design elements, they differ from absolute standards found in ordinances, and are nonprescriptive in nature. Their major objective is to promote the development of recognizable building designs and site furnishings consistent through the Downtown and responsive to Tiburon's historic legacy.

## ENVIRONMENTAL SETTING

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### **REGIONAL SCENIC RESOURCES**

Visual resources are generally classified into two categories: scenic views and scenic resources. Scenic views are elements of the broader viewshed such as mountain ranges, valleys, and ridgelines. They are usually mid-ground or background elements of a viewshed that can be seen from a range of viewpoints, often along a roadway or other corridor. Scenic resources are specific features of a viewing area (or viewshed) such as trees, rock outcroppings, and historic buildings. They are specific features that act as the focal point of a viewshed and are usually foreground elements.

Aesthetically significant features occur in a diverse array of environments within the region, ranging in character from urban centers to rural agricultural lands to natural water bodies. Features of the built environment that may also have visual significance include individual or groups of structures that are distinctive due to their aesthetic, historical, social, or cultural

significance or characteristics. Examples of the visually significant built environment may include bridges or overpasses, architecturally appealing buildings or groups of buildings, landscaped freeways, and a location where a historic event occurred.

Within the greater regional context of Marin County, there are 3 federal parks, 7 state land parks, 459 acres of County-owned parks, and 1,491 acres of local parks owned by local municipalities. Approximately 85 percent of the park land is provided by the Point Reyes National Seashore and the Golden Gate National Recreational Area federal lands. There are also a handful of facilities operated by private non-profit organizations. In addition, 464 linear miles of trails are open to the public, including 26 miles of paved pathways. Marin County has many open space and watershed lands that are generally protected for environmental purposes and are not available for active recreation. However, these lands provide valuable open space visual resources of the world-famous Pacific Ocean coastline, redwood forests, and natural landforms. The county and local municipality-owned parks situated within the built environment offer natural areas, trails, water features, and visual breaks within urban environments.

Marin County has 34 open space preserves providing 14,675 acres of ridglands, baylands, and environmentally sensitive lands with 175 miles of trails and fire roads available for public use. Many of these open space lands are located near residential communities providing not only habitat for wildlife but visual resources for the nearby communities.

Tiburon is located on the Tiburon Peninsula, surrounded on three sides by the San Francisco Bay, Raccoon Straits, and Richardson Bay. From the San Francisco Bay, the Tiburon Peninsula rises steeply to the Tiburon Ridge, which extends from Ring Mountain (elevation 602 feet) at the western edge of the Town through Mount Tiburon (elevation 748 feet) in the eastern part of the Tiburon Peninsula. Angel Island, a State Park located within the Town limits, rises from San Francisco Bay to a height of 788 feet at Mount Livermore. The southwest facing side of the Tiburon Peninsula, overlooking Richardson Bay, consists primarily of open spaces and sloping grasslands. The north-facing side, overlooking San Francisco Bay and San Pablo Bay is sparsely developed and steep with dense tree cover over much of the area. The central spine of the Tiburon Ridge is an important feature that defines the geographic context of the Town.

## SCENIC HIGHWAYS AND CORRIDORS

Scenic highways and corridors make major contributions to the quality of life enjoyed by the residents of a region. The development of community pride, the enhancement of property values, and the protection of aesthetically pleasing open spaces reflecting a preference for the local lifestyle are all ways in which scenic corridors are valuable to residents.

Scenic highways and corridors can also strengthen the tourist industry. For many visitors, highway corridors will provide their only experience of the region. Enhancement and protection of these corridors ensures that the tourist experience continues to be a positive one and, consequently, provides support for the tourist-related activities of the region's economy.

**Scenic Highways:** A scenic highway is generally defined by Caltrans as a public highway that traverses an area of outstanding scenic quality, containing striking views, flora, geology, or other unique natural attributes. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

**Scenic Corridors:** A scenic corridor is the view from the road that may include a distant panorama and/or the immediate roadside area. A scenic corridor encompasses the outstanding natural features and landscapes that are considered scenic. It is the visual quality of the man-made or natural environments within a scenic corridor that are responsible for its scenic value. Commonly, the physical limits of a scenic corridor are broken down into foreground views (zero to one quarter mile) and distant views (over one quarter mile). In addition to distinct foreground and distant views, the visual quality of a scenic corridor is defined by special features, which include:

- Focal points - prominent natural or man-made features which immediately catch the eye.

- Transition areas - locations where the visual environment changes dramatically.
- Gateways - locations which mark the entrance to a community or geographic area.

Many of the roadways throughout Marin County and within proximity to Tiburon offer views of some of the County's most scenic resources. There are currently no designated State Scenic Highways or National Scenic Byways within the Planning Area. However, the entire stretch of State Route 1 and sections of U.S. 101 running through Marin County, and within a mile of the Planning Area, are eligible to be a State Scenic Highway. The criteria for official designation and eligibility includes the scenic quality of the landscape, how much of the natural landscape can be seen by travelers, and to the extent to which development intrudes upon the traveler's enjoyment of the view. The Planning Area is visible from both roadway segments.

### **RIDGELINES**

Ridgelines are defined as a line formed along the highest points of a mountain ridge, or as an area of higher ground separating two adjacent streams or watersheds. Besides water, ridgelines are the most visually defining open space attribute in the Planning Area. Ridgelines also provide the greatest opportunity for community scenic value. Public access to the Tiburon Ridge and Significant Ridgelines in the Planning Area, as designated by the Resolution 2859 by the Town Council and as shown on Figure 7-2, allows community members to enjoy unique views within the Town. Significant ridgelines, including these at the end of the Tiburon Peninsula, have been identified by the Town and their protection has been given the highest priority in the Open Space & Conservation Element of the Town's General Plan.

### **OPEN SPACE AND OTHER SCENIC RESOURCES AREAS**

Public parklands and open space land uses largely contribute to the visual environment of Tiburon and Marin County. However, the community character of the built environment also plays a crucial role in defining the visual environment. While Mount Tamalpais State Park encompasses the most dominant natural landform in the county, other visually prominent ridgelines are designated within the Ridge and Upland Greenbelt areas. Restrictions are placed on development in these areas to protect the visual quality of the ridgelines, hills, and view corridors. This includes Angel Island and hillside areas within the Planning Area.

Communities within Marin County, including Tiburon, have traditionally strived to design compact villages, towns and cities that blend with the surrounding natural and agricultural landscapes. By encouraging residential development near city or town centers, walkable neighborhoods maintain a pedestrian-scale heritage, such as Tiburon with its urban waterfront areas, designed to promote public use with residential communities nearby. Tiburon has a special visual character that benefits from attractive building design and layouts. County and local ordinances have protected nearby ridgeline and viewsheds. By regulating urban and rural design standards, new structures, additions, lighting, signs, landscaping, infrastructure and other design elements can offer visual resources by complementing existing character and the surrounding natural environment and view corridors. When the scenic qualities of the built environment are protected, residents and visitors can enjoy a distinctive visual environment.

Tiburon has a unique visual environment with an attractiveness and diversity of landscape that includes views of open space, ocean vistas, Richardson Bay shoreline, San Francisco Bay shoreline, hills and ridgelines, agriculture lands, stands of various types of trees and other natural features. The Railroad Marsh area, Old Saint Hilary's Open Space Preserve, Middle Ridge, Ring Mountain Open Space Preserve, and other areas within Tiburon are designated as Public Open Space by the Tiburon General Plan. As previously described, ridgelines are also described in the Tiburon General Plan as the most visually defining open space attribute and greatest opportunity for community scenic value in the Tiburon Planning Area. Figure 7-1 shows public and private open space and parks and recreation areas within the Planning Area.

Water and shoreline resources are important visual resources that draw tourists to the area for recreational opportunities, provide critical habitat, and provide for scenic areas within and surrounding urban areas. The most visually significant water bodies in the Planning Area are the Richardson and San Francisco Bays which forms the southwestern and northern

boundaries of the Tiburon Peninsula, respectively. The appearance of the Bay, and people's enjoyment of it as a scenic resource, contribute to the enjoyment of daily life in the Bay Area. As a special kind of open space, the Bay acts as both the unifying element of the entire Bay region and as a physical divider of its parts. The wide surface of the Bay, and the distant vistas it affords, offer relief from the crowded, often chaotic, urbanized scene and help to create a sense of psychological well-being.

Another one of the visual attractions of San Francisco Bay is its abundance of wildlife, particularly birds and other special status species which are constantly moving around the Bay waters, marshes, and mudflats in search of food and refuge. Wildlife refuges like the Audubon Society Wildlife Refuge, located in the Planning Area, provide scenic areas where wildlife can congregate and move freely.

Trees and woodland areas are important natural resources which provide habitat for birds and shaded, protected areas for other animals; and help to stabilize hillsides. Trees and wooded areas also contribute to the visual character of the community. Trees and woodlands are valued by the Town for their ecological importance, their visual enhancement of the community, and their contribution to residential privacy and quiet.

Wetlands are not only important for habitat; sediment, erosion and pollution control; flood storage; water recharge; recreation and scientific research; and education; but also, for their scenic value. Wetlands are among the most important land-based qualities of open space because they offer their abundance of unique ecosystems and wildlife. In addition, views from or across water give the Planning Area a regional open space value.

Furthermore, for the same reasons, streams and riparian habitat are an important scenic resource and are a critical component of high quality habitat. Woody vegetation provides shade that keeps water temperatures within tolerable ranges for aquatic organisms, stabilizes streambanks and floodplains, and provides protective cover for wildlife. They also offer unique areas to recreate and explore.

Overall, the Town has approximately 1,309 acres of open space within the Planning Area. Figure 7-2 provides an overview of visual and scenic characteristics of the Planning Area, including ridge and upland greenbelt areas, areas with significant tree cover, Tiburon Ridge and significant ridgelines, streams, and wetland/riparian features.

## **LOCAL VIEW CORRIDORS**

The Open Space and Conservation Element specifically contains policies that call for the protection and preservation of view corridors and open space views from key roadways, including Tiburon Boulevard, Trestle Glen Boulevard, and Paradise Drive. These roadways are identified on Figure 7-2.

## **REFERENCES**

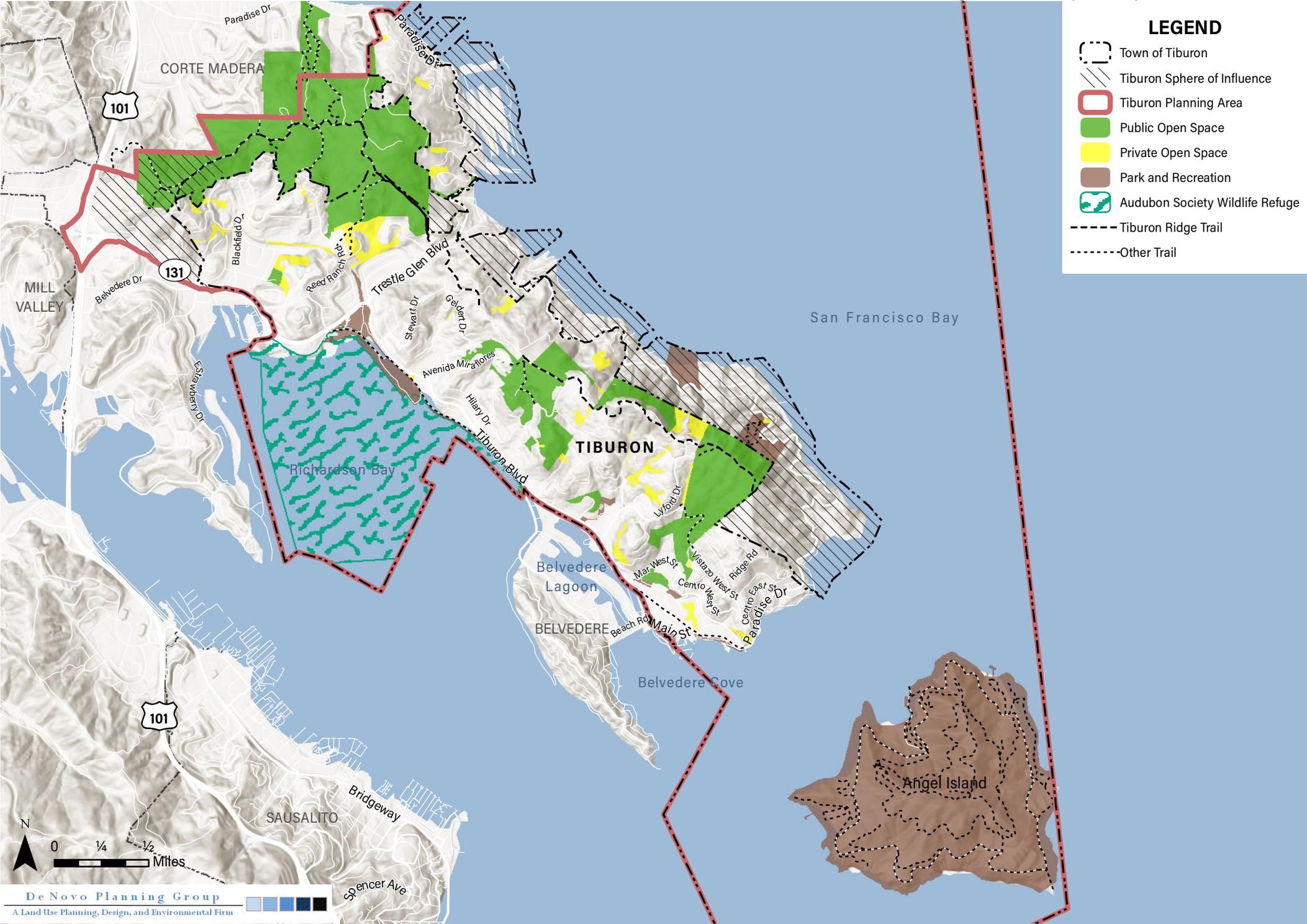
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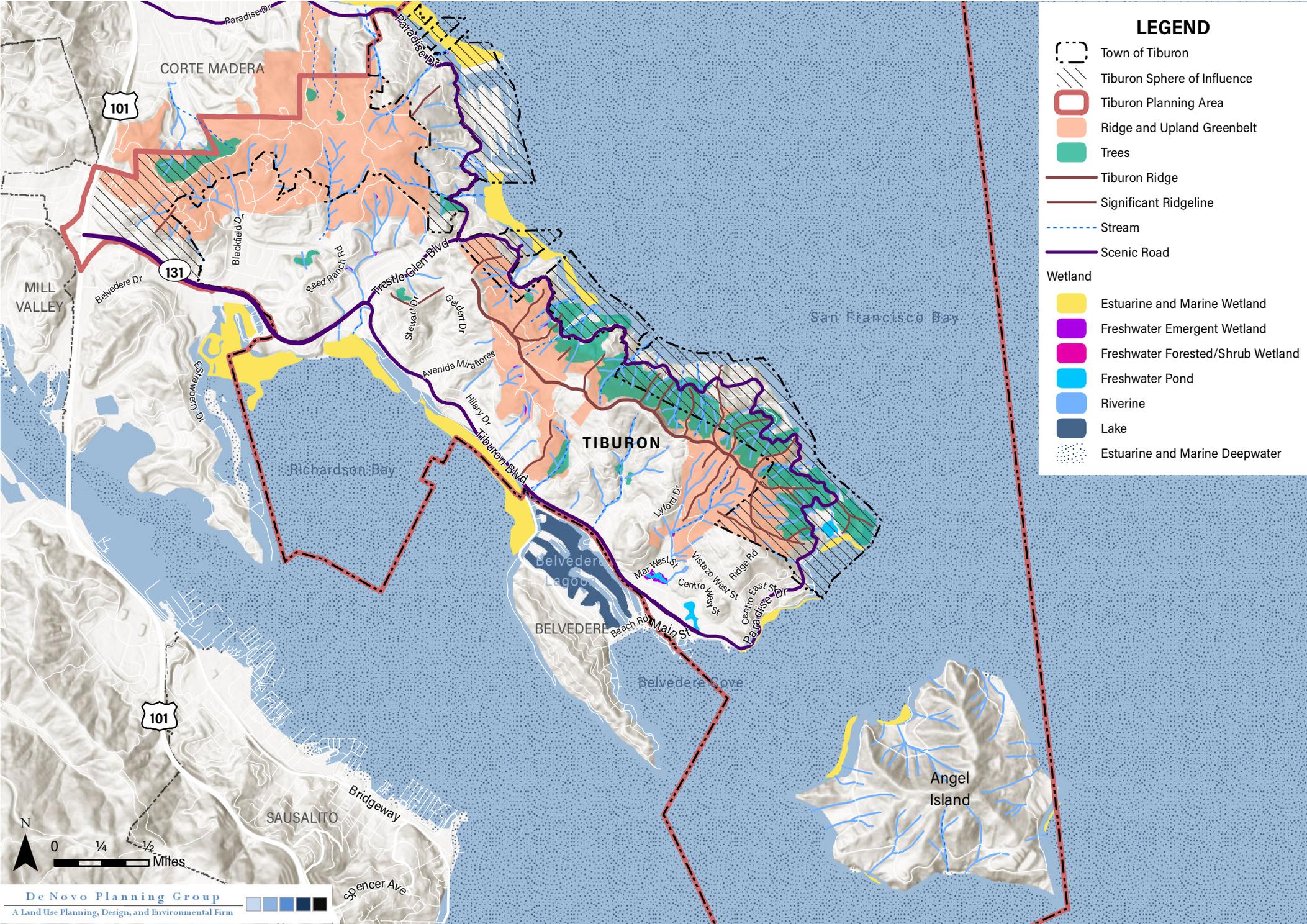
Figure 7-1: Open Space Resources



Sources: ArcGIS Online World Hillshade Map Service; Marin County GIS. Map date: November 29, 2020. Revised March 2, 2021.

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Figure 7-2: Visual and Scenic Characteristics



Sources: ArcGIS Online World Hillshade Map Service; Marin County GeoHub; City of Tiburon General Plan. Map date: December 22, 2020. Revised March 2, 2021.

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