

Breeding Bird Populations and Trends on Yerba Buena Island versus Treasure Island in San Francisco Bay Josiah Clark, Consulting Ecologist April 2019

Introduction:

Breeding activities were confirmed for a total of thirty-one (31) terrestrial bird species on Yerba Buena Island and Treasure Island over the course of three survey seasons totaling 18 surveys between spring 2016 and spring 2019.

Methods:

During each survey the observer walked through representative breeding bird habitats on the islands, identifying by sight and sound and counting individuals of all bird species present in the area. Survey efforts focused on visiting the most robust and diverse land bird breeding habitats known on each island during the breeding season. Confirming breeding activities, gauging the relative abundance of species and estimating populations of breeding species was the goal for all species and in all areas.

Significantly more survey time was spent on the more vegetated and diverse Yerba Buena Island than, however access was limited around the active construction sites on Yerba Buena Island. Regular survey visits were also made to the much more simplified and predictable habitats of Treasure Island during the breeding seasons. In an effort to find the most species possible on Treasure Island, many different areas were explored and included office parks, playing fields, community gardens and neighborhoods.

Findings:

Twenty-seven (27) species of land birds were recorded on the heavily wooded Yerba Buena Island compared with only sixteen (16) land bird species confirmed breeding on the more open and developed Treasure Island. Rock Pigeon, Eurasian Collared Dove, House Sparrow and Northern Mockingbird were noted only on Treasure Island and are typical of open, urban areas with sparse vegetation. Of these four, all but the latter are introduced, non-native species.

In keeping with the simpler habitats, breeding bird communities on the flat, man-made Treasure Island were simpler, more predictable, and less diverse than the breeding avifauna of Yerba Buena Island.

The results among these breeding bird surveys were quite consistent over the three years, with all the more common species on Yerba Buena Island and Treasure Island found on virtually every visit. No additional breeding species were found on Yerba Buena Island after the first year. On Treasure Island a lone pair of Bushtits found on Treasure Island in year 3 was the only additional breeding species discovered there.

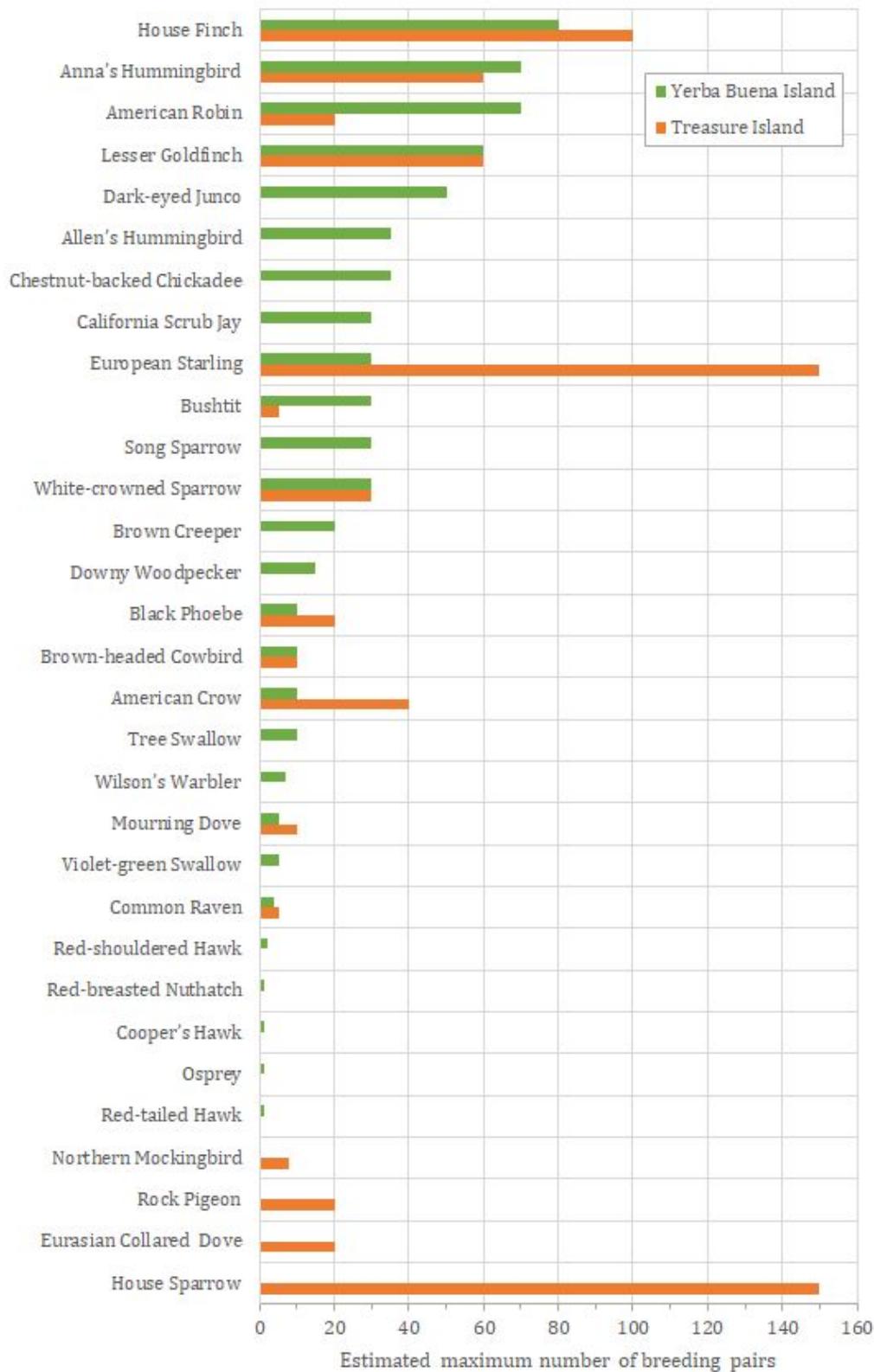
On Yerba Buena Island Cooper's Hawk, Mourning Dove, Red-breasted Nuthatch and Osprey were noted breeding in 2016 but could not be confirmed in subsequent years, perhaps due to changes in habitat there. The breeding status of Hooded Oriole and Great-blue Heron for the islands remains hypothetical, as birds were detected during the breeding season but no nests nor young were discovered during the course of the surveys.

Table 1. Relative Abundance Estimates of Breeding Land Birds of YBI and TI

YBI Breeders by abundance	YBI Breeding pop. Estimate	Years confirmed Breeding on YBI	TI Breeding Estimate 17'-18'
1) House Finch	40-80 pairs	16',17',18'	40-100 pairs
2) American Robin	40-70 pairs	16',17',18'	5-20 pairs
3) Anna's Humm.	40-70 pairs	16',17',18'	30-60 pairs
4) Lesser Goldfinch	30-60 pairs	16',17',18'	30-60 pairs
5) Dark-eyed Junco	30-50 pairs	16',17',18'	Absent
6) Nutall's White-crowned Sparrow	20-30 pairs	16',17',18'	20-30 pairs
7) Song Sparrow	20-30 pairs	16',17',18'	Absent
8) Bushtit	20-30 pairs	16',17',18'	1-5 pairs
9) Eur. Starling	20-30 pairs	16',17',18'	40-150 pairs
10) Chestnut-backed Chickadee	15-35 pairs	16',17',18'	Absent
11) Allen's Humm.	15-35 pairs	16',17',18'	Absent
12) Ca. Scrub Jay	10-30 pairs	16',17',18'	Absent
13) Brown Creeper	8-20 pairs	16',17',18'	Absent
14) Downy Woodpecker	8-15 pairs	16',17',18'	'Absent
15) Tree Swallow	5-10 pairs	16',17',18'	Absent
16) Am. Crow	5-10 pairs	16',17',18'	20-40 pairs
17) Brown-headed Cowbird	5-10 pairs	16',17',18'	5-10 pairs
18) Black Phoebe	4-10 pairs	16',17',18'	8-20 pairs
19) Wilson's Warbler	3-7 pairs	16',17',18'	Absent
20) Com. Raven	2-4 pairs	16',17',18'	2-5 pairs
21) Violet-green Swallow	1-5 pairs	16'	Absent
22) Mourning Dove	1-5 pairs	16'	2-10 pairs
23) Red-sh. Hawk	1-2 pairs	17', 18'	Absent
24) Red-tailed Hawk	1 pair	17', 18'	Absent
25) Osprey	1 pair	16', 17'	Absent
26) Cooper's Hawk	1 pair	16'	Absent
27) Red-breasted Nuthatch	1 pair	16'	Absent
28) House Sparrow	Absent		50-150 pairs
29) Eur. Coll. Dove	Absent		10-20 pairs
30) Rock Pigeon	Absent		10-20 pairs
31) N. Mockingbird	Absent		3-8 pairs

@ * Symbols to denote: Species present but not breeding, x=Definitely breeding P=Probable breeder but nest not found

Figure 1. Relative Abundance Estimates of Breeding Lands Birds



Discussion:

This study compares the breeding avifauna of two islands located side by side inside San Francisco Bay. The climate and proximity to the mainland is essentially the same on the two islands. Other than their location and climate, these islands however are very different.

Comparing the islands' habitats and bird diversity

Yerba Buena Island is a natural island comprised of native soils and its varied topography was formed through local geologic processes. Yerba Buena Island, formerly known as "Goat Island" retains many of its native plant communities including coastal scrub, Coast Live Oak Woodlands and Willow Riparian. This island was also planted extensively with Blue-Gum Eucalyptus (*Eucalyptus globulus*), which are now a significant piece of the island's ecology. This natural island covers about 150 acres and at least 50% of the island is covered by vegetation.

Treasure Island in contrast is a flat manmade island, made from bay fill, sand and concrete. As a manmade Island, there are few native plants and no native plant communities that have evolved here. Ornamental landscape plants, lawns, street trees and the occasional garden comprise the vegetation. Treasure Island covers about 405 acres. An estimated 15% of the island is covered by vegetation.

Several species appear especially tied to the abundance of taller trees and wooded character of Yerba Buena Island; Downy Woodpecker, Chestnut-backed Chickadee, Brown Creeper, Red-tailed Hawk and Red-shouldered Hawk. None of these species were noted on the more open, less forested Treasure Island.

Yerba Buena Island has contiguous stands of low, dense cover in the form of coastal scrub and willow riparian. Breeding species that use this vegetation structure on Yerba Buena Island include Allen's Hummingbird, Wilson's Warbler and Song Sparrow. Treasure Island lacks this habitat type and the associated breeding bird species.

Island biogeography

Lessons from E.O. Wilsons studies on Island Biogeography revealed the following about island populations of organisms.

- 1) "Islands closer to the mainland have a greater diversity of species than islands further from the mainland."

It should be noted these two islands are essentially the same distance from the mainland. Yerba Buena Island has been the source population for many of the bird species now present as breeders on the man made Treasure Island.

2) "Larger Islands had more species than smaller islands"

It is noteworthy that Treasure Island is nearly four times larger than Yerba Buena Island but 14 fewer breeding species were detected there. This lower number can be attributed to the simplified, sparse and fragmented vegetation present on the man made island.

3) "Smaller islands had higher rates of extinction than larger islands"

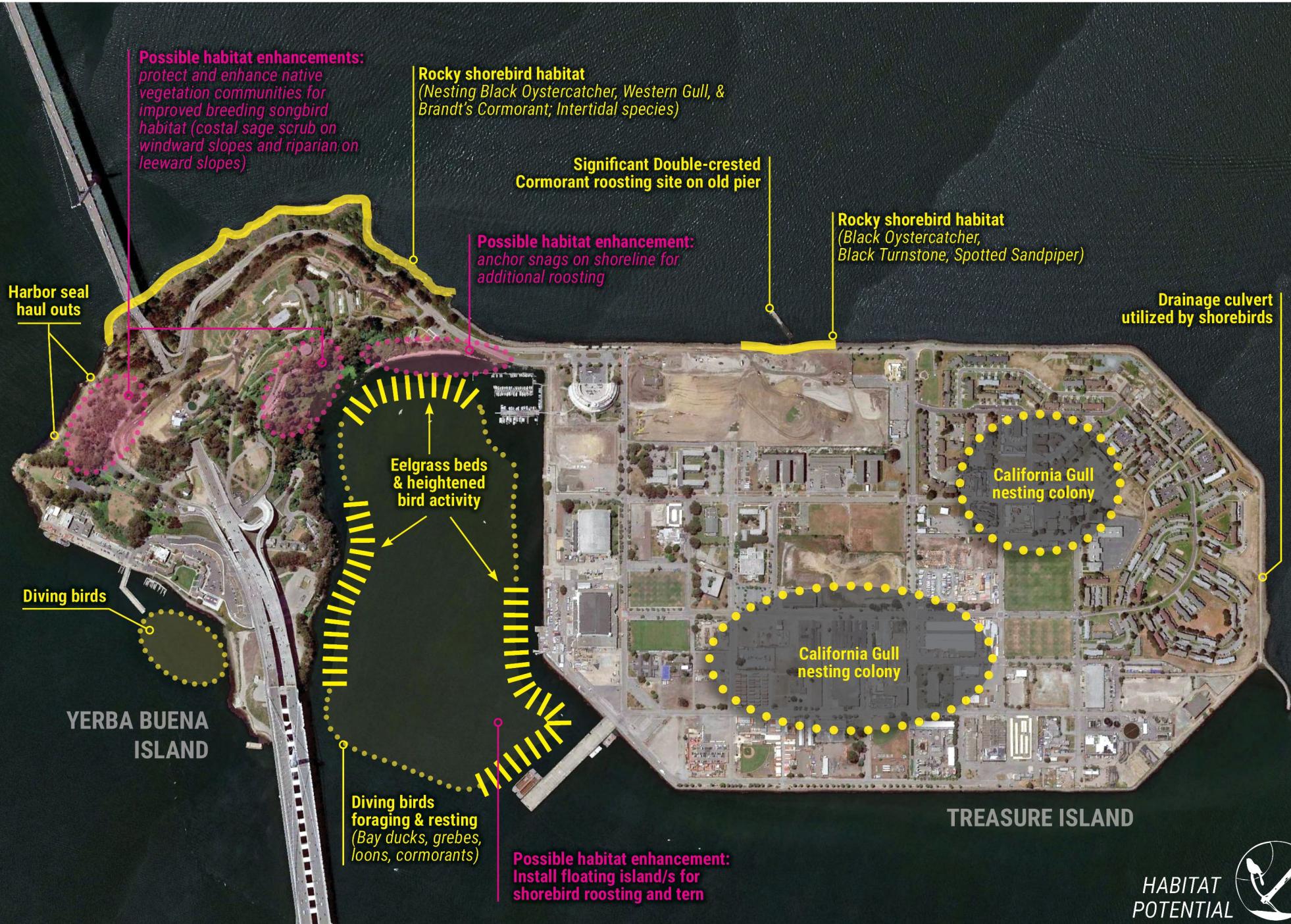
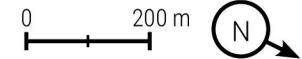
Species with small populations on Yerba Buena Island only are those most vulnerable to local extinctions. Species that do not migrate are the ones least likely to return to the island. Scrub Jay, Nuttall's White-crowned Sparrow, Downy Woodpecker, Bushtit, Chestnut-backed Chickadee.

Habitat enhancement recommendations

There are dozens of ways to preserve, enhance and create habitats for breeding birds, pollinators and other wildlife on both Yerba Buena and Treasure Island. Many of these are outlined in documents from 2017 and 2018, and would be excellent community stewardship opportunities for island residents and visitors.

BIRD & WILDLIFE HABITATS

Yerba Buena Island & Treasure Island, 2016-2019



Species Accounts for the Breeding Birds of Yerba Buena Island and Treasure Island

Canada Goose: Year-round resident, Non-native Population. Nesting appears to take place only on Treasure Island. During summer flocks of 20 or more forage on open lawns and in protected near shore waters on the bay. The population of Canada Goose present in the Bay Area are the sedentary introduced subspecies from the Great Basin. As an introduced species with few predators, Canada Geese populations have undergone a population explosion in the Bay Area. In many cases these large aggressive geese have displaced more specialized native waterfowl, especially breeding activities. This species should be discouraged on these islands as its population could significantly expand with the presence of people and parks.

Great-blue Heron: Year-round Resident, Possible Breeder. This species was observed on most visits. Adult birds seen flying high into Eucalyptus trees above Clipper Cove suggested a possible nesting site somewhere in the trees. The rocky shores to the southwest of the coastguard station are another place this species is often present and a nest could present in this area as well.

Double-crested Cormorant: Year-round Resident, Breeder on Bay Bridge. No nests observed on either YBI or TI but a large, well documented nesting colony is present on parts of the Bay Bridge. The old broken down pier on the west side of Treasure Island has become a significant roosting and resting site for this population throughout the year. Waters all around the island and bridge are regularly foraging sites for this species. During winter flocks of thousands of birds traverse San Francisco Bay following schools of Pacific Herring. Unlike other cormorants this species breeds mostly inland in trees and on structures rather than along rocky shores of the immediate coast.

Brandt's Cormorant: Year-round resident and probable nester on difficult to access remote west facing rocky shores. Adult birds observed foraging offshore throughout the year. Most nesting sites for this species are on or near the immediate coast, generally nests in colonies. Local nesting sites include Alcatraz, North Baker Beach, Land's End and Seal Rock.

Osprey: Breeding resident during spring and summer, uncommon in winter. Birds observed during the 2016 and 2017 breeding seasons foraging and flying above Clipper Cove. A nest was eventually located in Eucalyptus below the Great White buildings in 2017 along the shores of Clipper Cove. This species has only recently begun expanding its breeding areas within San Francisco Bay and this nest constitutes the first recorded breeding of the species on YBI that know of.

Red-tailed Hawk: One pair of year-round residents on Yerba Buena Island observed during the 2017 and 2018 surveys. Nesting site is in the Eucalyptus woodlands on the steep south or west facing slopes of Yerba Buena Island. The nest fledged one young observed with the pair in the summer of 2018. This pair can be elusive at times and are most often observed hunting on the wing over the ridge and south

side of the island. The presence of this species on Yerba Buena and Treasure Islands may be limited by relatively few grassy clearings and associated rodent prey.

Red-shouldered Hawk: One or maybe two year-around resident pairs on Yerba Buena Island. Nesting activities of one pair were observed on the steep western slopes in Eucalyptus Woodlands above the Coastal Bluffs. Adult birds spend much of their time foraging from perches along roadsides near the Bay Bridge onramp, along the western shores and edges of Clipper Cove.

Cooper's Hawk: Winter visitor, fall migrant and uncommon breeder. One pair present and courtship observed by Tower Park during the 2016 breeding season. These birds were not seen again in the 2017 or 2018 breeding seasons and may have been displaced by tree removals in the area. This small hawk of the genus *accipiter* hunts mostly birds. It has become a much more common breeder in the Bay Area in the last decade, with the first San Francisco nest described in the 80's.

Peregrine Falcon: Year-round resident and local breeder. Nests nearby on the Bay Bridge are tracked by Golden Gate Raptor Observatory. A pair was observed soaring over the ridge and hunting along the bluffs and open water on just one occasion, during the 2019 field season. Formerly an endangered species and rare in the Bay Area, this raptor is increasingly common in both urban and natural areas.

Western Gull: Year-round resident and local breeder. Several nests were noted on Yerba Buena Island the rocks visible from the entrance to Treasure Island. Adult birds could be seen incubating and feeding chicks on flat parts of steep rocks. The remains of more nests were observed by kayak after the breeding season along the inaccessible portions of Yerba Buena Island, especially near the Coast Guard facility. Along the edges of Treasure Island many scattered nests were present on pilings and old piers. This gull is common year-round on and near both islands. Most individuals observed here probably breed on Alcatraz or the Farrallon islands.

California Gull: Year-round resident and local breeder. Treasure Island only, a colony of perhaps a hundred or more California Gulls nest atop warehouses on the north and east sides of the island.. This species generally breeds in inland saline lakes including Mono Lake. This species has recently begun to breed in San Francisco Bay in much greater numbers, and the population on Treasure Island appears to be relatively new and little known.

Black Oystercatcher: Year-round resident and local breeder. One pair appears to nest on the inaccessible rocky shores below the western Coastal bluffs, towards the Coast Guard Facility.. Nest was not visible from survey areas, but adult birds were observed sporadically through the breeding season. In the fall, a pair with fledged young were observed by the wastewater outfall on the eastern side of Treasure Island. This species breeds along the immediate coast of the Pacific from Baja to Alaska. This species is non-migratory, limited in distribution and rare. The world

population is less than 10,000 individuals, making this the most imperiled bird species to occur on these islands.

Rock Pigeon: Year-round resident, introduced. Locally common breeder on Treasure Island on man-made structures and under piers. Also nests under Bay Bridge. Not recorded on Yerba Buena Island. Abundant in urban areas nearby, but this species was not seen commuting over the bay suggesting the population here is a local one.

Eurasian Collared-Dove: Year-round resident and migrant, introduced. Common breeder on Treasure Island in open areas and neighborhoods with scattered trees, with nests and young observed. This non-native species has not been noted breeding on the more densely wooded Yerba Buena Island. Not present in the Bay Area until the late 1990's, since that time it has become one of the most common birds of the region.

Mourning Dove: Uncommon Year-round resident and seasonal migrant. Confirmed breeder on Yerba Buena Island only during the surveys, but it likely breeds in small numbers somewhere on Treasure Island. At least one pair with young were observed in June 2016 by trees and clearing around Tower Park. Just one individual was observed in March of 2017 but no breeding confirmed. The species was not noted during the 2018 bird surveys.

Anna's Hummingbird: Year-round resident. Very common breeder on Yerba Buena and Treasure Island all years. Found in both native and non-native plant communities, with the highest density of birds found among flowering Eucalyptus. This species has been noted breeding every month of the year in San Francisco. Anna's Hummingbirds are present even in the most open, developed areas of Treasure Island. On Treasure Island this pollinator species was most numerous around stands Scarlet Flowering Eucalyptus that grow as street trees on that island.

Allen's Hummingbird: Fairly common breeder in spring and summer on Yerba Buena Island only with breeding confirmed during all years. This species is subdominant to the larger and more common Anna's Hummingbird and has a more specialized habitat requirement. This species favors willow riparian and coastal scrub communities but also utilizes the blossoms of Blue Gum Eucalyptus. The global distribution of this species is very small, as it lives primarily in areas that have coastal fog.

Downy Woodpecker: Year-round resident, non-migratory, YBI only. This is the only woodpecker to breed on Yerba Buena Island, where it is present but uncommon in all woodland types. Breeding was confirmed every year, with territories fairly evenly distributed through the Willows, Oaks and Eucalyptus woodlands. It requires dead, relatively soft wood for it to excavate a nesting cavity. As a creator of nesting cavities used by other breeding species on the island, this is a "keystone species". Secondary cavity obligates that use including chestnut-backed chickadee, tree swallow and violet-green swallow do not make their own cavities and rely heavily on woodpeckers to create nesting sites. This species does not migrate long

distances, nor over large bodies of water. No records on the Farrallon Islands for example.

Black Phoebe: Year-round resident. A few breeding pairs were noted on Yerba Buena Island all years. Their mud nests were found in the eaves of both occupied and condemned structures. This flycatcher is a year-round resident and common breeder in neighborhoods throughout the Bay Area. On Treasure Island Black Phoebes were also noted nesting along the bay under piers.

California Scrub Jay: Year-round resident, non-migratory, breeding species. Fairly common to uncommon on Yerba Buena Island only. Highest density of birds seems to be on the slopes above Clipper Cove and the Western Coastal Bluffs, where they prefer Oak Woodlands, Coastal Scrub and Willow Riparian. They are far less common in areas of only eucalyptus. It is noteworthy that Scrub Jays on the more remote Santa Cruz Island have evolved into their own species, now recognized as Island Scrub Jays. This illustrates the extent to which this species has insular, non-migratory populations (ie. no Farrallon Island records). It has been postulated that the Santa Cruz Island population may have been originated from captive birds brought from the mainland by the local Chumash Indians.

Tree Swallow: Spring migrant and uncommon breeder YBI only.. Adult birds are regularly seen foraging over the ridge and wooded areas. This "secondary cavity obligate" requires an existing cavity to put its nest in. One nest was observed in an abandoned apparent Downy Woodpecker nest cavity in a dead eucalyptus branch in Tower Park in 2016. With so much wind the swallows that are observed most often in the sheltered eastern edge of the island where their flying insect prey are more common.

Violet-green Swallow: Spring migrant and suspected uncommon summer breeder observed on Yerba Buena Island only. Adult birds were present in spring, joined by immature birds later in the summer. Requires cavities to nest in, usually made by woodpeckers. Also nests in cavities in human structures including under roof tiles.

Barn Swallow: Fairly common in spring and summer on both islands. Several pairs nest in structures on both Yerba Buena and Treasure Island. This species almost always nests on human structures, where at least two nests fledged young from the eaves of condemned buildings near the summit during the 2016 breeding season. Adult and young birds were observed flying over Clipper Cove, ridges and wooded areas on Yerba Buena Island. On Treasure Island an old nest was observed on a structure by the Little League Softball field in the summer of 2018. Adult birds were observed foraging over the nearby fields.

Chestnut-backed Chickadee: Uncommon resident breeding bird on Yerba Buena Island only. This sedentary species is not known to cross large bodies of water (ie. no Farallon Island records) and its colonization on Yerba Buena Island is a bit surprising. Chickadees are secondary cavity obligates, requiring either woodpeckers or nuthatches to make nesting sites for them. This flocking songbird is known as a

“nucleus species”, with wintering and migratory species glomming onto and learning from the local chickadee flocks.

Bushtit: Fairly common resident breeder on Yerba Buena Island. Only one sighting for Treasure Island, where a pair was observed building a nest in the spring of 2019 in the Treasure Island Community Garden. This species also appears the result of a rare colonization event, as it is a weak flyer not known to cross large bodies of water. This species has never been recorded on the Farallon islands for example. .

Red-breasted Nuthatch: The only nuthatch observed during all the surveys. At least one pair of this highly migratory species was noted breeding in the Monterey Pines at Tower Park during the 2016 breeding season. The following season it was noted in spring but not summer. This breeding event was a bit of a fluke among the pattern of occurrence in the Bay Area, and was clearly tied to the large pines that provide both food and nesting sites.. There have been few recent nesting records in the Bay Area anywhere near sea level, as it prefers the conifer covered ridges higher upslope.

Brown Creeper: Uncommon resident and breeder on Yerba Buena Island only, where it forages and nests in large, mature trees. The shaggy bark along the trunks of Blue-Gum Eucalyptus are among the most common nesting sites for this species in nearby San Francisco. This species occurs in low densities, with relatively few individuals scattered over a specialized habitat type.

American Robin: Highly migratory species with wintering and breeding summer populations comprised of different birds. Breeds on Yerba Buena Island only, where it is among the most common breeding birds. On Yerba Buena Island it breeds in all the wooded areas and forages on fruit, especially English Ivy and Blue Elderberry. Its role as a disperser of seed cannot be overstated and underscores the need for planting of native fruit on the islands. On Treasure Island, American Robins are present as a wintering bird found on lawns and in neighborhoods with fruiting trees.

Northern Mockingbird: Uncommon breeder on Treasure Island only. Prefers neighborhoods and open dry areas with scattered vegetation. At least 3 pairs are resident on Treasure Island, where they hide their nests in dense bushes and hedges. Myoporum, ficus and English Ivy appear to be local food sources for this largely frugivorous bird. Observed on Yerba Buena once in fall, suggesting that migrants regularly pass through the area.

European Starling: Common breeder on both Treasure and Yerba Buena Islands, with flocks present during winter. Uses both natural and man-made cavities for breeding and is re-known for its habit of aggressively taking over the nests of native cavity nesting birds. During surveys on Yerba Buena Island this species observed mostly around the buildings and clearings. This species is a prolific eater and disperser of invasive English Ivy, and is often observed singing from the tops of Ivy covered Eucalyptus trees. It was seldom observed in native habitats on YBI . On

Treasure Island this species is ubiquitous, with breeding taking place in most of the abandoned and condemned buildings. For nesting boxes, all entry holes should be less than 1 and 9/16th inches in diameter to exclude the larger starlings.

House Finch: The most common native breeding bird species on both Yerba Buena and Treasure Islands and a specialist at living among humans. Present year-round and as a breeder in almost all terrestrial habitat types including disturbed areas, neighborhoods, weedy fields, planted woodlands, industrial areas and abandoned buildings. It was less commonly observed in native coastal scrub, willow riparian and oak woodlands. Cup-shaped nest often placed in human structures as well as vegetation. The largest flocks in summer and fall are often associated with fields of radish, where they eat the seeds, flowers and foliage.

Lesser Goldfinch: Common and widespread year-round with breeding taking place on both islands. On Yerba Buena and Treasure Island this seed eating bird is common in open areas, clearings and woodland edges. This species is a specialist on small seeds, and the seeds of composite flowers, including thistles and asters are important foods. Nests are placed low to the ground, especially in California Blackberry, coastal scrub and in overgrown fields. This species is a mimic, and is easily confused with other songbirds. This species is much more common on these islands than it is in San Francisco, where it is generally uncommon and local.

Dark-eyed Junco: Fairly common breeder and year-round resident confined to wooded areas on Yerba Buena Island only. Breeding was documented all years with, with singing birds on territory scattered across all wooded parts of the island. This species makes a cup-shaped nest, usually on the ground among under trees with low groundcover. The nests and young of this species are especially vulnerable to disturbance by off trail hikers, pets and ground predators.

Nuttall's White-crowned Sparrow: Fairly common year-round resident and breeder in semi-open areas on both Yerba Buena and Treasure Islands. Coastal Scrub habitat of the fog belt is the signature plant community for this sedentary subspecies of the otherwise highly migratory, white-crowned sparrow. On Yerba Buena Island this species breeds in native vegetation along western coastal bluffs, the slopes along the beach above Clipper Cove and in low dense vegetation in clearings around buildings and roadsides. During the 2016 and 2017 breeding season there were several males on territory near the summit, where they favored stands of California Blackberry that were removed during the 2018 construction period. Just one bird was noted on territory near the summit in the spring of 2019. Fortunately for this seed eating species, it has been a successful pioneer in the disturbed and developed areas on Treasure Island, where it is present with sufficient vegetation. In San Francisco this subspecies was at the heart of many in depth studies by Dr. Louis Baptista at CalAcademy. Studies revealed highly specialized song dialects throughout the city. The island populations of this taxa are insular, and the birds on these islands definitely have their own local dialect. Formerly abundant on the mainland in San Francisco, this subspecies has become

much less common in recent years due to habitat simplification. Retaining them on Yerba Buena and Treasure Island is possible and should be a targeted goal. It must be noted that large wintering flocks of white-crowned sparrows are comprised of other subspecies that breed further north, namely *Pugetensis* and *Gamebelli*.

Nuttall's White-crowned Sparrows

Song Sparrow: Fairly common resident and year-round breeder on Yerba Buena Island only. Territories are confined to low, dense stands of scrub and willows with most territories being noted in willow riparian and scrub habitats with California Blackberry above Clipper Cove and along the western coastal bluffs. Territories were also noted in stands of fennel and Himalayan Blackberry. The local *Heermannii* subspecies present on YBI is generally non-migratory (ie. no records on the Farallon Islands), suggesting the island population here is an insular one with little genetic flow from mainland populations.

Hooded Oriole: Uncommon migrant in spring and fall. Possible breeder on Treasure Island in areas with scattered palm trees but not confirmed. This recent colonist requires palm fibers to construct their hanging nests. This species gets more secretive in areas with large numbers of crows and ravens.

Brown-headed Cowbird: Fairly common breeder in vegetated areas on both Yerba Buena and Treasure Islands. This brood parasite places its eggs in the nests of other birds, to the detriment of the host species. Cowbirds were noted in the areas with breeding territories of Nuttall's White-crowned Sparrows, Song Sparrows, Wilson's Warbler and Dark-eyed Juncos, which are the most common cowbird hosts on these islands. This is the only native songbird that should be discouraged from the islands.

Wilson's Warbler: Uncommon breeder and fairly common migrant on Yerba Buena Island only. A few pairs were noted breeding every year in the moist ravines above Clipper Cove where like on the mainland, willows and California Blackberry are among the most important plants for nesting habitat. This is the only warbler known to breed on Yerba Buena Island. As native plant revegetation efforts continue on Yerba Buena Island, the small breeding population of this species could expand in years to come.

House Sparrow: Introduced non-native breeder present year-round on both Yerba Buena and Treasure Islands. Most common and expected in developed areas. Especially abundant on Treasure Island, where it is one of the most common species. Nests placed in cavities in human structures, street lamps and crevices, less commonly in holes in trees.

Appendix A- Site Photographs:



Figure A1. View west from southwest side of Yerba Buena Island, 6/28/2018.
[37.8096, -122.3708]

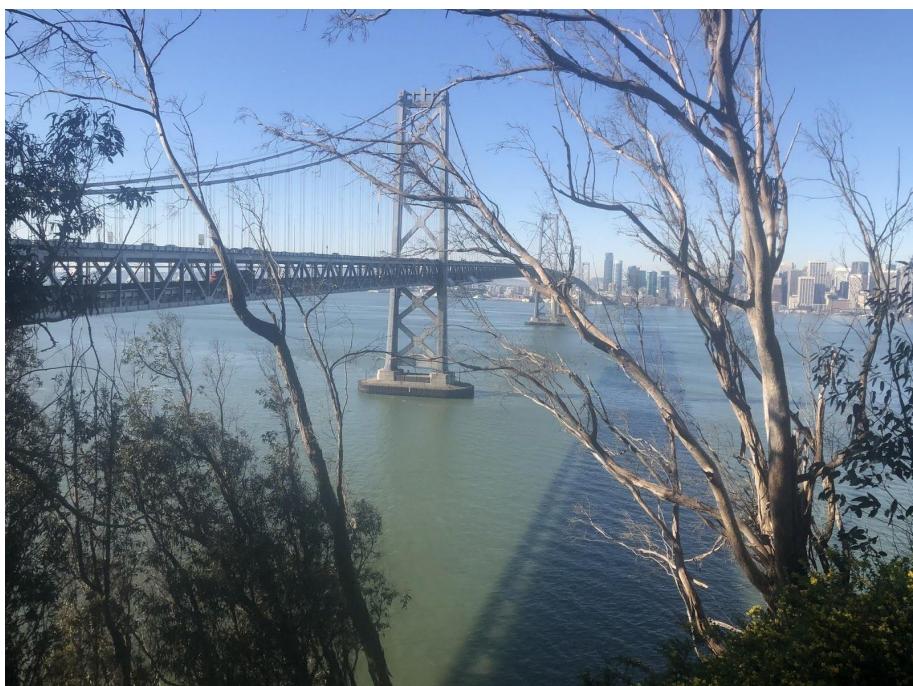


Figure A2. View west from southwest side of Yerba Buena Island, 3/18/2019.
[37.8085,-122.36769]



Figure A3. View east from beach on north side of Yerba Buena Island, 2/20/2019. The plant in the foreground is a willow (*Salix* sp.), growing only a few feet from the saline waters of the Bay. [37.8130,-122.3695]



Figure A4. Sheer eroded slopes on north side of Yerba Buena Island construction area after vegetation removal, heavy machinery use and storms, 2/20/2019. [37.8116,-122.3681]



Figure A5. Potential Willow Riparian and Coastal Scrub Restoration Area- Above shoreline of Yerba Buena Island at west end of Clipper Cove, 2/20/2019. [37.8138, -122.3702]

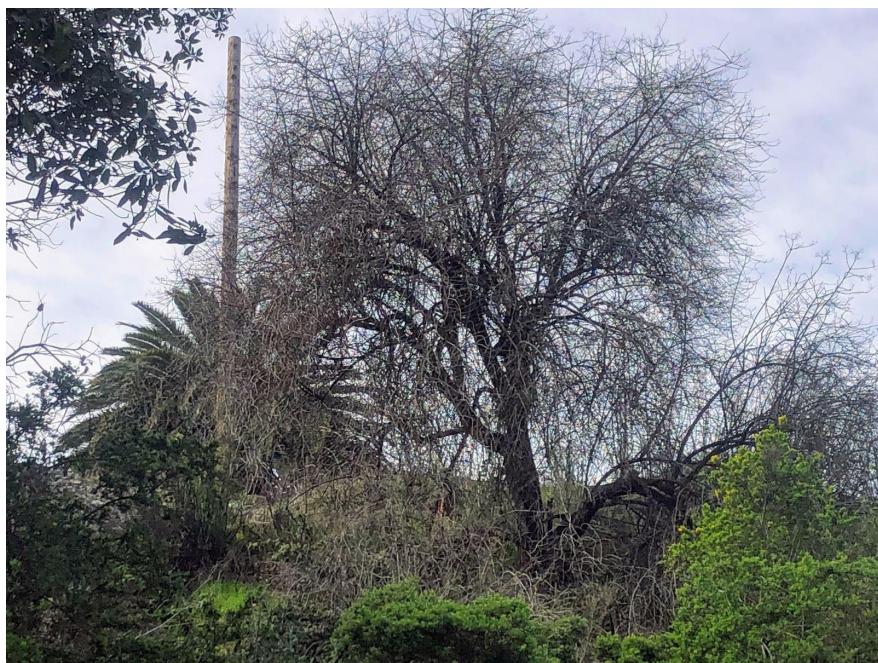


Figure A6. The largest known Blue Elderberry tree on Yerba Buena Island at west end of Clipper Cove, 2/20/2019. This plant species is one of the most important local wildlife resources on the island. It is a source of fruit, nectar and cover [37.8139, -122.3703]



Figure A7. Blue Elderberry tree in fruit near northern shoreline of Yerba Buena Island at Clipper Cove, 8/7/2018. [37.8126,-122.3688]



Figure A8. Coast Live Oak Woodland above Willow Riparian on Yerba Buena Island, 1/23/2019. [37.8118, -122.3679]



Figure A9. Riparian Scrub on north slope of Yerba Buena Island above Clipper Cove, 5/23/2018. [37.8127, -122.3695]



Figure A10. Fast growing Yellow Bush Lupines provide habitat on disturbed western slopes of Yerba Buena Island and provide especially good breeding resources for breeding sparrows and pollinators 4/4/2018. [37.8147, -122.3711]