SAN PABLO BAY

A large complex of tidal and freshwater wetlands, dominated by the Petaluma and Napa marshes, extends along the northern shore of San Pablo Bay. Conservation efforts in this subregion have restored substantial amounts of diked pasture and salt evaporation ponds to tidal wetland conditions.

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<tr>
<th>Site #</th>
<th>Colony Site</th>
<th>Great Blue Heron</th>
<th>Great Egret</th>
<th>Snowy Egret</th>
<th>Black-crowned Night-Heron</th>
<th>Cattle Egret</th>
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</table>
Bel Marin Keys

This heronry is located off of Bel Marin Keys Boulevard, east of Novato. The property is owned by a yoga retreat center. In 2004, building renovation was undertaken 75 m from the colony, but no disturbance was observed. The colony can be viewed from public trails atop the levees on the south side of the boulevard, west of Bermuda Harbor. The colony site is 130 m south of Novato Creek and 3 km west of San Pablo Bay.

Ownership: private
Public observation areas: levee trail
Latitude / Longitude: N 38.0800 / W 122.5262

Nest survivorship (± SE)

Colony site description
Topography: hillside
Length x width: 27 m x 12 m
Nest substrate: Eucalyptus sp.
Average nest height: 24 m
Trees (dbh): 3 (10-50 cm), 3 (50-100 cm), 4 (100-150cm)
Maximum tree canopy height: 33 m
Vegetation cover: tree 45%, shrub 0%, ground 14%

Evidence of disturbance
None recorded.

Land use

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<th>Distance from colony site (m)</th>
<th>0-100</th>
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* n<10 and n<50% of total nests.
Black Point

This colony site is east of Black Point where the Petaluma River meets San Pablo Bay. Great Blue Herons nest in a single eucalyptus in the backyard of a private residence, 60 m south of the Petaluma River and 1 km from San Pablo Bay. The Highway 37 Bridge spanning the Petaluma River is 0.9 km to the northwest.

Ownership: private
Public observation areas: boat
Latitude / Longitude: N 38.1101 / W 122.4991
Channel Drive

This site is a stand of eucalyptus surrounded by old farm fields and newer residential homes, about 1.2 km north of the hamlet of Black Point. A seasonal pond is 20 m from colony and the Petaluma River is 0.5 km to the east. A line of high voltage power towers is 110 m away. One pair of Great Egrets nested here in 1998.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.1164 / W 122.5163

Colony site description
Topography: flood plain
Length x width: 18 m x 9 m
Nest substrate: Eucalyptus sp.
Average nest height: 19 m
Trees (dbh): 7 (3-10 cm), 4 (50-100 cm), 1 (100-150 cm)
Maximum tree canopy height: 28 m
Vegetation cover: tree 31%, shrub 27%, ground 13%

Evidence of disturbance
Common Raven: potential source
Human activity (construction): potential source

Possible disturbance suggested by published accounts (see references in Methods).

Land use

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</table>

*n<10 and n<50% of total nests.
Congress Valley

This colony of Great Blue Herons is in a dense stand of eucalyptus trees on the property of a home for developmentally disabled people, about 2 km east of the City of Napa and 3 km west of the Napa River. The grounds are a farm with gardens, ponds, and livestock, surrounded by a mixture of vineyards and residential homes.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.2831 / W 122.3284

Colony site description
Topography: hillside
Length x width: 54 m x 21 m
Nest substrate: *Eucalyptus* sp. (live and dead branches)
Average nest height: 27 m
Trees (dbh): 3 (3-10 cm), 8 (10-50 cm), 14 (50-100 cm)
Maximum tree canopy height: 34 m
Vegetation cover: tree 32%, shrub 0%, ground 19%

Evidence of disturbance
Resident ravens: behavioral response
Red-shouldered Hawk: potential source a

Land use

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<td>Grazing</td>
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aPossible disturbance suggested by published accounts (see references in Methods).
Hagen Road

This heronry is about 5 km northwest of the City of Napa at the end of Hagen Road. Great Blue Herons nest in rows of tall eucalyptus lining a private, gated lane. The trees are on vineyard property, near a parking lot and equipment garage. The Napa River is 3.5 km west of the site.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.3239 / W 122.2345

Colony site description
Topography: flood plain
Length x width: 59 m x 14 m
Nest substrate: *Eucalyptus* sp. (live and dead branches)
Average nest height: 30 m
Trees (dbh): 5 (50-100 cm), 5 (100-150 cm)
Maximum tree canopy height: 31 m
Vegetation cover: tree 20%, shrub 6%, ground 26%

Evidence of disturbance
American Crows: potential source *
Common Raven: potential source *
*Possible disturbance suggested by published accounts (see references in Methods).

Land use

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Las Gallinas

Herons and egrets nest on a series of small, shrub-covered islands at the wastewater treatment complex near the east end of Smith Ranch Road, just north of San Rafael. The area surrounding the treatment plant is a public park with well-maintained paths that provide excellent opportunities for viewing herons, egrets and many other species of birds.

Ownership: public
Public observation areas: levee at pond edge
Latitude / Longitude: N 38.0272 / W 122.5161

Nest survivorship (± SE)

Pre-fledging brood size (± SE)

Peak number of active nests

* n<10 and n<50% of total nests.

(continued)
Las Gallinas (continued)

Colony site description
South subcolony
Topography: islands (without bridge)
Length x width: 67 m x 50 m
Nest substrate: shrubs
Average nest height: 1 m
Trees (dbh): none
Maximum tree canopy height: no canopy
Vegetation cover: tree 0%, shrub 45%, ground 0%

North subcolony
Topography: islands
Length x width: 72 m x 55 m
Nest substrate: shrubs
Average nest height: 1 m
Trees (dbh): none
Maximum tree canopy height: no canopy
Vegetation cover: tree 0%, shrub 50%, ground 0%

Evidence of disturbance
Common Raven: potential source
Coyote: potential source

aPossible disturbance suggested by published accounts
(see references in Methods).

Land use

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Leslie Salt Pond

This heronry as well as the next site listed ("Leslie Salt Pond North") are on California Department of Fish and Game property just south of Buchli Station. The complex of former salt evaporation ponds and levees is being converted to parkland. The Napa River about 2 km to the east and San Pablo Bay is 7.2 km to the south. Double-crested Cormorants have also nested at this site.

Ownership: public
Public observation areas: park trail
Latitude / Longitude: N 38.2004 / W 122.3385

Nest survivorship (± SE)

Pre-fledging brood size (± SE)

Peak number of active nests

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Colony site description
Topography: wetland
Length x width: 20 m x 10 m
Nest substrate: snag
Average nest height: 15 m
Trees (dbh): 3 (10-50 cm), 7 (50-100 cm)
Maximum tree canopy height: no canopy
Vegetation cover: tree 0%, shrub 0%, ground 0%

Evidence of disturbance
Wind damage to tree limbs: nest failure

Land use

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1. n=1.
Leslie Salt Pond North

Great Blue Herons nested in snags very near the previous site (“Leslie Salt Pond”). Both sites are in old salt evaporation ponds on California Department of Fish and Game property south of Buchli Station and are being converted to parkland. The Napa River is 1.8 km to the east and San Pablo Bay shore is 8 km to the south. Great Horned Owls and Double-crested Cormorants have also nested at this site.

Ownership: public
Public observation areas: park trail
Latitude / Longitude: N 38.2064 / W 122.3343

Nest survivorship (± SE)

Pre-fledging brood size (± SE)

Peak number of active nests

Colony site description
Topography: wetland
Length x width: 30 m x 10 m
Nest substrate: snag
Average nest height: 15 m
Trees (dbh): 34 (10-50 cm), 10 (50-100 cm)
Maximum tree canopy height: no canopy
Vegetation cover: tree 0%, shrub 0%, ground 0%

Evidence of disturbance
Wind damage to tree limbs: nest failure
Resident Great Horned Owl: potential source

Land use

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\(^a\) Possible disturbance suggested by published accounts (see references in Methods).
Mare Island

This colony site is on the former Mare Island Naval Reservation, southwest of Vallejo. The base is being converted to a multi-use facility. Prior to 2003, Great Blue Herons nested in a patch of eucalyptus beside a small reservoir. Since then, herons have nested in small subcolonies around the pier area, building nests atop light poles and pilings.

Ownership: public
Public observation areas: boat
Latitude / Longitude: 
N 38.0769 / W 122.2536 (Eucalyptus subsite)

Colony site descriptions

Eucalyptus subsite
Topography: ridge top
Length x width: 29 m x 17 m
Nest substrate: *Eucalyptus* sp.
Average nest height: 17 m
Trees (dbh): 28 (3-50 cm), 28 (50-100 cm), 4 (100-150 cm)
Maximum tree canopy height: 21 m
Vegetation cover: tree 53%, shrub 3%, ground 5%

Spruce subsite
Topography: ridge top
Length x width: 10 m x 8 m
Nest substrate: spruce (*Picea* sp.)
Average nest height: 20 m
Trees (dbh): 1 (50-100 cm)
Maximum tree canopy height: 23 m
Vegetation cover: tree 33%, shrub 0%, ground 15%

North Light Pole subsite
Topography: pier
Length x width: 2 m x 1 m
Nest substrate: light pole
Average nest height: 19 m
Trees (dbh): none
Maximum tree canopy height: no canopy
Vegetation cover: tree 0%, shrub 0%, ground 0%

*Continued*
Mare Island (continued)

Evidence of disturbance
Resident ravens: nest failure
Resident Ospreys: nest failure
Red-tailed Hawk: behavioral response
Human activity (truck traffic and maintenance work): behavioral response
Golden Eagle: potential source

Possible disturbance suggested by published accounts
(see references in Methods).

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Napa State Hospital

This important heronry is on the grounds of the Napa State Hospital psychiatric detention center in the City of Napa. A 4 m high fence surrounds the entire complex. The hospital compound has a college campus feel, with lawns, dorms, and sports fields. In 2003, nesting occurred in 17 trees, mostly bay laurel and live oak, near roads, paths, and buildings.

Ownership: public
Public observation areas: none
Latitude / Longitude: N 38.2723 / W 122.2685
Napa State Hospital (continued)

Colony site description
Topography: flood plain
Length x width: 185 m x 141 m
Nest substrate: *Eucalyptus* sp., live oak (*Quercus agrifolia*),
    bay laurel (*Umbellularia californica*)
Average nest height: 15 m
Trees (dbh): 2 (10-50 cm), 29 (50-100 cm), 1 (100-150 cm)
Maximum tree canopy height: 26 m
Vegetation cover: tree 15%, shrub 0%, ground 45%

Evidence of disturbance
Golden Eagle: potential source
American Crows: potential source
Human activity (traffic, maintenance crews): behavioral response

*Possible disturbance suggested by published accounts
(see references in Methods).

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<tr>
<td>Sports field</td>
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North San Pedro Road #1

Great Blue Herons have nested in two locations near China Camp State Park. The original colony site was in valley oak trees in the yard of a farmhouse. In 1992, a second colony site was established in a grove of redwoods halfway up the ridge behind the house. Private and state-owned oak forest surround the site.

Ownership: private
Public observation areas: North San Pedro Road
Latitude / Longitude:
N 38.0084 / W 122.5033 (Far Ridge subsite)

Colony site description
Farmhouse subsite
Topography: flood plain
Length x width: not measured
Nest substrate: madrone (*Arbutus menziesii*), valley oak (*Quercus lobata*), bay laurel (*Umbellularia californica*)
Average nest height: not measured
Trees (dbh): not measured
Maximum tree canopy height: not measured
Vegetation cover: not measured

Far Ridge subsite
Topography: ridge top
Length x width: not measured
Nest substrate: coast redwood (*Sequoia sempervirens*)
Average nest height: not measured
Trees (dbh): not measured
Maximum tree canopy height: not measured
Vegetation cover: not measured

Evidence of disturbance
Human activity: behavioral response
Red-tailed Hawk: behavioral response
Common Raven: behavioral response
Golden Eagle: behavioral response

<table>
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<tr>
<td>Low density housing</td>
<td>X</td>
</tr>
<tr>
<td>Grazing</td>
<td>X</td>
</tr>
<tr>
<td>Protected natural area</td>
<td>X</td>
</tr>
</tbody>
</table>
North San Pedro Road #2

This heronry is in a eucalyptus tree along a driveway on private property near San Rafael. Undeveloped woodlands and low-density residential development surround the site. China Camp State Park is 0.6 km to the south.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.0122 / W 122.5065

Colony site description
Topography: hillside
Length x width: 15 m x 10 m
Nest substrate: Eucalyptus sp.
Average nest height: 17 m
Trees (dbh): 2 (50-100 cm)
Maximum tree canopy height: 20 m
Vegetation cover: tree 36%, shrub 0%, ground 22%

Evidence of disturbance
None recorded.

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
<th>1000-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low density housing</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High density housing</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Protected natural area</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n=1.
Old Lakeville Road #3

This colony site is at the intersection of Lakeville Highway and Old Lakeville Road #3. Great Blue Herons nest in a eucalyptus tree in a pasture, 0.6 km east of the Petaluma River. The colony is within 40 m of farm buildings. This colony may have been initiated after the abandonment of a colony site at the Petaluma Wastewater Treatment Plant.

Ownership: private
Public observation areas: Lakeview Highway
Latitude / Longitude: N 38.1710 / W 122.5234

Colony site description
Topography: flood plain
Length x width: 16 m x 12 m
Nest substrate: *Eucalyptus* sp.
Average nest height: 13 m
Trees (dbh): 1 (100-150 cm)
Maximum tree canopy height: 16 m
Vegetation cover: tree 70%, shrub 0%, ground 10%

Evidence of disturbance
Common Raven: nest failure

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Low density housing</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grazing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

1. n=1.
San Pablo Bay

Penngrove

This colony is distributed among several residential lots in the Woodward/Grove St. neighborhood of Penngrove. Local residents report that Black-crowned Night-Herons have nested in this area since the 1930's. Two pairs of Great Egrets nested at this site in 1992 (not included in graphs), but this species has not nested here since then.

Ownership: private
Public observation areas: neighborhood streets
Latitude / Longitude: N 38.2978 / W 122.6639

Colony site description
Topography: suburban
Length x width: 265 m x 215 m
Nest substrate: live oak (Quercus agrifolia), Acacia sp.
Average nest height: 5 m
Trees (dbh): not measured
Maximum tree canopy height: 9 m
Vegetation cover: tree 14 %, shrub 2%, ground 37%

Evidence of disturbance
Barn Owl: nest failure
Resident Ravens: nest failure
Human activity (trees removed): nest failure
Defoliants sprayed on nest trees with chicks: behavioral response
Human activity (heavy equipment): behavioral response
Red-tailed Hawk: potential source
Red-shouldered Hawk: potential source

P: Possible disturbance suggested by published accounts (see references in Methods).

Land use

<table>
<thead>
<tr>
<th>Land use</th>
<th>Distance from colony site (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-</td>
</tr>
<tr>
<td>Mid-density housing</td>
<td>X</td>
</tr>
</tbody>
</table>
Petaluma Wastewater Plant

This heronry is between Lakeville Highway and the Petaluma River at the U. S. Filter Wastewater Treatment Plant. The colony site borders a series of water treatment ponds and is surrounded by a fence, beyond which lies pasture. It was abandoned by herons and egrets in 2003 but was re-colonized in 2005. The Petaluma River is 1.1 km to the west.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.2222 / W 122.5804

---

*Great Blue Heron*  
*Great Egret*  
*Snowy Egret*

---

**Nest survivorship (± SE)**  

![Graph showing nest survivorship](image)

**Pre-fledging brood size (± SE)**  

![Graph showing pre-fledging brood size](image)

**Peak number of active nests**  

![Graph showing peak number of active nests](image)
Petaluma Wastewater Plant (continued)

Colony site description
Topography: flood plain
Length x width: 37 m x 18 m
Nest substrate: *Eucalyptus* sp. (live and dead branches)
Average nest height: 18 m
Trees (dbh): 1 (50-100 cm), 1 (> 150 cm)
Maximum tree canopy height: 28 m
Vegetation cover: tree 51%, shrub 4%, ground 76%

Evidence of disturbance
Golden Eagles: colony abandonment
Red fox consuming fallen chicks: nest failure
Observer disturbance: behavioral response
Common Raven: potential source
Red-tailed Hawk: potential source

*Possible disturbance suggested by published accounts (see references in Methods).

Land use

<table>
<thead>
<tr>
<th>Land use</th>
<th>Distance from colony site (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-</td>
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<tr>
<td>Low density housing</td>
<td></td>
</tr>
<tr>
<td>Grazing</td>
<td></td>
</tr>
</tbody>
</table>
Redwood Landfill

Located on a levee beside a tide channel off San Antonio Creek, this colony site is close to a sanitary landfill and municipal dump. The right-of-way of the Northwest Pacific Railroad, currently not in service, runs directly beneath the nesting trees. Tidal wetlands of the Petaluma Marsh are approximately 0.5 km east of this site.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.1732 / W 122.5715

Nest survivorship (± SE)  

Pre-fledging brood size (± SE)  

Peak number of active nests  

Colony site description
Topography: levee
Length x width: 22 m x 22 m
Nest substrate: *Eucalyptus* sp.
Average nest height: 14 m
Trees (dbh): 5 (3-10 cm), 3 (10-50 cm), 4 (> 150 cm)
Maximum tree canopy height: 20 m
Vegetation cover: not measured

Evidence of disturbance
None recorded.

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
<th>1000</th>
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</thead>
<tbody>
<tr>
<td>Land use</td>
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</tr>
<tr>
<td>Industrial</td>
<td>X</td>
<td>200</td>
<td>500</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Grazing</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Russ Island

On the northern tip of Russ Island, Great Blue Herons and Double-crested Cormorants nest in a long line of eucalyptus snags running parallel to the levee. The trees are surrounded by standing water, and have very few branches. Many of the former salt evaporation ponds in the vicinity are being restored to tidal marsh habitats.

Ownership: public
Public observation areas: none
Latitude / Longitude: N 38.1892 / W 122.3304

Nest survivorship (± SE)

Pre-fledging brood size (± SE)

Peak number of active nests

Colony site description
Topography: wetland
Length x width: 400 m x 3 m
Nest substrate: Eucalyptus sp. (dead branches)
Average nest height: 4 m
Trees (dbh): not measured
Maximum tree canopy height: no canopy
Vegetation cover: none

Evidence of disturbance
None recorded.

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
</tr>
</thead>
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<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Protected natural area</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1 n=1.
Schellville

This colony site is on vineyard property, southeast of Schellville. The surrounding area is a mixture of vineyards and single-family homes on large lots. Schell Creek is 1.3 km to the west and the San Pablo Bay shore is 9.7 km south of the colony site. In 2003, a pair of Snowy Egrets nested at this site (not included in graphs), but subsequent nesting by this species has not occurred.

Ownership: private
Public observation areas: none

Colony site description
Topography: flood plain
Length x width: 12 m x 10 m
Nest substrate: Eucalyptus sp. (live and dead branches)
Average nest height: 16 m
Trees (dbh): 2 (10-50 cm), 1 (50-100 cm)
Maximum tree canopy height: 27 m
Vegetation cover: tree 50%, shrub 0%, ground 10%

Evidence of disturbance
Resident Red-tailed Hawk: behavioral response
Resident Great Horned Owl: behavioral response
Human activity (nest trees in western grove removed): behavioral response

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low density housing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Vineyard</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*\(n<10\) and \(n<50\%) of total nests; \(^n=1.\)
Shollenberger Park

This heronry is on the west shore of the Petaluma River, across from Shollenberger Park. The nesting trees are within 100 m of various dwellings and sheds, between Highway 101 and the Petaluma River. The walking path in Shollenberger Park affords excellent vantage points for viewing the nesting birds.

Ownership: private
Public observation areas: Shollenberger Park
Latitude / Longitude: N 38.2213 / W 122.6060

---

Nest survivorship (± SE)

![Graph showing nest survivorship]

*no data

Pre-fledging brood size (± SE)

![Graph showing pre-fledging brood size]

*no data

Peak number of active nests

![Graph showing peak number of active nests]

*no data

---

(continued)
Shollenberger Park (continued)

Colony site description
Topography: flood plain
Length x width: 38 m x 13 m
Nest substrate: *Eucalyptus* sp.
Average nest height: 24 m
Trees (dbh): 3 (3-10 cm), 5 (10-50 cm), 8 (50-100 cm)
Maximum tree canopy height: 39 m
Vegetation cover: tree 67%, shrub 16%, ground 28%

Evidence of disturbance
None recorded.

<table>
<thead>
<tr>
<th>Land use</th>
<th>Distance from colony site (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-</td>
</tr>
<tr>
<td>Low density housing</td>
<td>X</td>
</tr>
<tr>
<td>Mid-density housing</td>
<td></td>
</tr>
<tr>
<td>Protected natural area</td>
<td>X</td>
</tr>
<tr>
<td>Sports field</td>
<td></td>
</tr>
</tbody>
</table>
Skaggs Island Eucalyptus

Great Blue Herons nest in a patch of eucalyptus trees adjacent to the levee road along Hudeman Slough, on the west side of the Skaggs Island Naval Reservation. The property could eventually be transferred to the San Pablo Bay National Wildlife Refuge. Much of the original marshland near the colony is diked and farmed for hay.

Ownership: public
Public observation areas: none
Latitude / Longitude: N 38.1928 / W 122.3908

Colony site description
Topography: flood plain
Length x width: 19 m x 8 m
Nest substrate: Eucalyptus sp.
Average nest height: 21 m
Trees (dbh): 11 (3-10 cm), 4 (10-50 cm), 5 (50-100 cm)
Maximum tree canopy height: 30 m
Vegetation cover: tree 58%, shrub 16%, ground 7%

Evidence of disturbance
Resident Red-tailed Hawk: behavioral response

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
<td></td>
<td></td>
<td>100</td>
<td>200-</td>
</tr>
<tr>
<td>Farming</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Nest survivorship (± SE)

Prefledging brood size (± SE)

Peak number of active nests
Skaggs Island Sewage Ponds

This colony is on Skaggs Island Naval Reservation, 15 km northwest of Vallejo. Black-crowned Night-Herons nest in an old sewage pond approximately 2.5 ha in extent, with 30% open water, 60% cattail (*Typha* spp.), and 10% tules (*Scirpus* spp.). The heron nests are concentrated in tules. The pond is surrounded by seasonal wetlands, diked farmland, and tidal sloughs.

Ownership: public
Public observation areas: none
Latitude / Longitude: N 38.1885 / W 122.3795

Colony site description
Topography: wetland
Length x width: 80 m x 50 m
Nest substrate: *Scirpus* sp.
Average nest height: 1 m
Trees (dbh): none
Maximum tree canopy height: 0 m
Vegetation cover: tree 0%, shrub 100%, ground 100%

Evidence of disturbance
None recorded.

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
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<tbody>
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<td>Land use</td>
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<td>200</td>
<td>500</td>
</tr>
<tr>
<td>Farming</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Peak number of active nests

Nest survivorship (± SE)

Pre-fledging brood size (± SE)
South Kelly

South of the City of Napa, near the intersection of Highways 29 and 12, Great Blue Herons nest in a row of eucalyptus paralleling South Kelly Road. The nest trees are adjacent to a vineyard, and about 100 m from a golf course, driving range, and large equipment sheds.

Ownership: private
Public observation areas: South Kelly Road
Latitude / Longitude: N 38.2204 / W 122.2534

Colonial site description
Topography: hillside
Length x width: 105 m x 7 m
Nest substrate: *Eucalyptus* sp.
Average nest height: 30 m
Trees (dbh): 37 (50-100 cm), 8 (100-150 cm), 4 (>150 cm)
Maximum tree canopy height: 40 m
Vegetation cover: tree 20%, shrub 3%, ground 0%

Evidence of disturbance
None recorded.

Land use

<table>
<thead>
<tr>
<th>Land use</th>
<th>Distance from colony site (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-100</td>
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<tr>
<td>Low density housing</td>
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</tr>
<tr>
<td>Vineyard</td>
<td>X</td>
</tr>
<tr>
<td>Sports field</td>
<td>X</td>
</tr>
</tbody>
</table>

*\(n<10\) and \(n<50\%\) of total nests.
Stafford Lake

Great Blue Herons nested on an island in Stafford Lake, a reservoir in the North Marin Water District west of Novato. In 1994, the water level in the reservoir was lowered for repairs and all nests in the colony were destroyed, apparently by raccoons that crossed the temporary land bridge to the island. (Records prior to 1990 are from Shuford 1993.)

Ownership: public
Public observation areas: Hicks Valley Road
Latitude / Longitude: N 38.1152 / W 122.6410

Nest survivorship (± SE)

Pre-fledging brood size (± SE)

Peak number of active nests

Colony site description
Topography: island (without bridge)
Length x width: not measured
Nest substrate: live oak (*Quercus agrifolia*)
Average nest height: not measured
Trees (dbh): not measured
Maximum tree canopy height: 14 m
Vegetation cover: tree 70%, shrub 5%, ground 0%

Evidence of disturbance
Raccoons: colony abandonment
Golden Eagle: potential source
*Possible disturbance suggested by published accounts (see references in Methods).*

Land use

<table>
<thead>
<tr>
<th>Land use</th>
<th>Distance from colony site (m)</th>
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</thead>
<tbody>
<tr>
<td>Protected natural area</td>
<td>0-</td>
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<tr>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

x = no data.
Stanley Ranch

This heronry is on a levee along Horseshoe Bend in the Napa River, about 3.5 km south of the City of Napa. The Napa County Flood Control and Water Conservation District manages the property. Great Blue Herons have nested in a large eucalyptus overhanging the Napa River. The diked fields that surround the colony grow hay and grapes.

Ownership: public
Public observation areas: none
Latitude / Longitude: N 38.2505 / W 122.2927

Colony site description
Topography: levee
Length x width: 17 m x 15 m
Nest substrate: Eucalyptus sp. (live and dead branches)
Average nest height: 20 m
Trees (dbh): 1 (100-150 cm)
Maximum tree canopy height: 24 m
Vegetation cover: tree 35%, shrub 0%, ground 58%

Evidence of disturbance
Human activity (observer): behavioral response
Red-tailed Hawk: potential source*
Red-shouldered Hawk: potential source*

*Possible disturbance suggested by published accounts (see references in Methods).

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
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<tbody>
<tr>
<td>Land use</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Vineyard</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

[x, no data, n=1]
Vigilante Road

Great Blue Herons nest in tall redwoods on the west side of the Valley of the Moon, about 8 km northwest of the City of Sonoma, on the property of a private community. About 30 m from the colony, a 1.5 ha area has been cleared to build a house. Sonoma Creek is 2.2 km to the east.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.3350 / W 122.5292

Colony site description
Topography: flood plain
Length x width: 28 m x 17 m
Nest substrate: coast redwood (Sequoia sempervirens, live and dead branches)
Average nest height: 32 m
Trees (dbh): 24 (50-100 cm)
Maximum tree canopy height: 35 m
Vegetation cover: tree 45%, shrub 5%, ground 0%

Evidence of disturbance
Human activity (house construction):
  behavioral response
Common Raven: potential source*
*Possible disturbance suggested by published accounts (see references in Methods).

Land use

<table>
<thead>
<tr>
<th>Distance from colony site (m)</th>
<th>0-</th>
<th>100-</th>
<th>200-</th>
<th>500-</th>
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</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Low density housing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Colony Sites with Limited Activity

Fairview Terrace

For at least two years Snowy Egrets and Black-crowned Night-Herons nested in a live oak (*Quercus agrifolia*) in a residential area of southwestern Petaluma.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.2247 / W 122.6287

<table>
<thead>
<tr>
<th>Species</th>
<th>Years known to be active (number of active nests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black-crowned Night-Heron</td>
<td>1996 (2), 1997 (4)</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>1996 (8), 1997 (14)</td>
</tr>
</tbody>
</table>

Mare Island Pier 35

In 2002, a Great Blue Heron successfully nested on a light pole at the end of Pier 35. In 2003, a pair of Ospreys harassed the herons early in the breeding season and took over the nest for their own use. Herons returned to nest at this site in 2005.

Ownership: public
Public observation areas: boat
Latitude / Longitude: N 38.0694 / W 122.2517

<table>
<thead>
<tr>
<th>Species</th>
<th>Years known to be active (number of active nests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Blue Heron</td>
<td>2002 (1), 2005 (1)</td>
</tr>
</tbody>
</table>

McNear Channel

In 2005, Great Blue Herons were discovered nesting in conifers on the east bank of the Petaluma River, near downtown Petaluma.

Ownership: unknown
Public observation areas: boat
Latitude / Longitude: N 38.2319 / W 122.6255

<table>
<thead>
<tr>
<th>Species</th>
<th>Years known to be active (number of active nests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Blue Heron</td>
<td>2005 (5)</td>
</tr>
</tbody>
</table>
Colony Sites with Limited Activity

Napa Marsh N-3

This colony was located in a stand of eucalyptus trees on a levee bordering a former salt evaporation pond, 0.8 km from a freshwater marsh. In 1992, this colony became the first reported instance of Great Egrets breeding in Napa County.

Ownership: public (California DFG)
Public observation areas: trails along levees
Latitude / Longitude: N 38.2073 / W 122.3519

<table>
<thead>
<tr>
<th>Species</th>
<th>Years known to be active (number of active nests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Blue Heron</td>
<td>1992 (4), 1993 (3)</td>
</tr>
<tr>
<td>Great Egret</td>
<td>1992 (2)</td>
</tr>
</tbody>
</table>

Schultz Slough

Great Blue Herons nested in a mixed grove of eucalyptus, cypress and pine atop a rise 170 m west of the Petaluma River, overlooking the Petaluma Marsh. The property, a former farm, was purchased in 2004 and converted to a private nature preserve.

Ownership: private
Public observation areas: none
Latitude / Longitude: N 38.2084 / W 122.5865

<table>
<thead>
<tr>
<th>Species</th>
<th>Years known to be active (number of active nests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Blue Heron</td>
<td>2004 (unknown)</td>
</tr>
</tbody>
</table>