

U.S. Fish & Wildlife Service

# San Pablo Bay

*National Wildlife Refuge*



*San Pablo Bay National Wildlife Refuge can offer stretches of knee-high pickleweed, open bay waters with rafts of canvasback ducks riding the currents, and the timeless ebb and flow of*

*the tidal wetlands. The refuge provides vital habitat for threatened and endangered species, as well as millions of migrating waterfowl, shorebirds and our local resident wildlife.*



# Welcome

More than 300 species of wildlife can be found in the greater San Francisco Bay estuary which includes San Pablo Bay. Most use the estuary as a resting, feeding or wintering stop during their Pacific Flyway migration.

San Pablo Bay National Wildlife Refuge was established in 1974 to conserve, restore and protect bay wetlands for endangered species and migratory birds.

A variety of habitats can be found on the refuge along the north shore of San Pablo Bay, including open bay waters, salt marsh, intertidal mudflats, upland habitat and restored wetlands. These habitats provide a multitude of microscopic creatures which support the food chains that provide nutrients for birds, mammals and fish.

Historically  
**Wetland Marshes**

Less than 150 years ago, the Napa-Sonoma marshes surrounding San Pablo Bay comprised one of the most extensive wetland systems along the Pacific Coast. This system provided habitat for millions of migrating waterfowl and shorebirds as well as resident wildlife. Plants specialized to live in aquatic habitats grew bountifully, sheltering and feeding a rich diversity of species.

*Rafts of Canvasbacks dot the bay during winter months.*



Rapid development in the area began with the discovery of gold in the Sierra Nevada foothills in the 1850s. Hydraulic mining operations contributed huge amounts of sediment to the San Francisco Bay Estuary. For the next one hundred years, the marshes were filled, diked or drained to support the bay's development as a major center for commerce.

More than 300 species of wildlife can be found in the greater San Francisco Bay estuary which includes San Pablo Bay. Most use the estuary as a resting, feeding or wintering stop during their Pacific Flyway migration.

San Pablo Bay National Wildlife Refuge was established in 1974 to conserve, restore and protect bay wetlands for endangered species and migratory birds.

A variety of habitats can be found on the refuge along the north shore of San Pablo Bay, including open bay waters, salt marsh, intertidal mudflats, upland habitat and restored wetlands. These habitats provide a multitude of microscopic creatures which support the food chains that provide nutrients for birds, mammals and fish.

Historically  
**Wetland Marshes**

Less than 150 years ago, the Napa-Sonoma marshes surrounding San Pablo Bay comprised one of the most extensive wetland systems along the Pacific Coast. This system provided habitat for millions of migrating waterfowl and shorebirds as well as resident wildlife. Plants specialized to live in aquatic habitats grew bountifully, sheltering and feeding a rich diversity of species.

*Rafts of Canvasbacks dot the bay during winter months.*



Rapid development in the area began with the discovery of gold in the Sierra Nevada foothills in the 1850s. Hydraulic mining operations contributed huge amounts of sediment to the San Francisco Bay Estuary. For the next one hundred years, the marshes were filled, diked or drained to support the bay's development as a major center for commerce.

By the 1950s, only 25 percent of the historical tidal marshes remained in the estuary. Today, only 15 percent of the bay's historic tidal lands remain.

## Partnerships – Our Roots



*Lower Tubbs Island Unit*

*Aerial view of the refuge showing open bay, tidal wetlands and Mare Island*



*Caltraus, Lynn G. Harrison*

Since the 1960s, conservation agencies, non-profit organizations and local grassroot efforts have worked to protect the Bay for its significance to migratory birds and resident wildlife. The northern Bay's Napa-Sonoma Marshes are jointly managed with the California Department of Fish and Game. The Lower Tubbs Island Unit was acquired with assistance from The Nature Conservancy. While the Solano County Farmlands and Open Space Foundation and California State Coastal Conservancy helped acquire the Cullinan Ranch/Napa Marsh Unit.

Largely comprised of thousands of acres of tidelands leased from the California State Lands Commission, the Refuge's ultimate plans include protection and conservation of more than 20,000 acres of critical wildlife habitat in northern San Pablo Bay.

# Wildlife Calendar

© Anthony Battiste



*Green-winged teal*

Fall, winter and spring offer the best opportunities to observe concentrations of migratory waterfowl, shorebirds, wading birds and raptors. One of the best places to see wildlife is the Lower Tubbs Island Trail which provides a spectacular view of San Pablo Bay, its wildlife habitat and numerous tidal marsh species.

## Fall & Winter

Starting in September, waterbirds begin to arrive from their northern breeding grounds. From November through January, peak numbers of

*Marbled Godwits and other shorebirds*



© Anthony Battiste

USFWS



*Semi-palmated Plovers*

diving ducks and shorebirds, including canvasback, scaup, scoter, bufflehead, ruddy duck, goldeneyes, sandpipers, plovers, dowitchers, willets, godwits and curlews, can be seen using the bay's wetlands.

*Dowitchers*



USFWS

USFWS



*White-tailed kite*

Raptors, such as red-tailed hawks, white-tailed kites, northern harriers and American kestrels, are abundant from November through February. They can be seen hunting over the refuge's marshes and on adjacent agricultural fields. A sharp observer may spot a peregrine falcon pursuing a shorebird on the edge of the bay.

## Spring & Summer

© Anthony Battiste



*Barn swallows*

By May, most of these migrants move north to nest, while residents and visitors from the south nest on the refuge. Nesting species on the refuge include black-necked stilt, mallard, and gadwall. Migrant nesters from the south include Caspian terns and barn swallows. A variety of resident gulls, herons, egrets and perching birds can be seen year-round nesting on or adjacent to the refuge. Non-breeding

USFWS



*White pelican*

white pelicans are commonly observed during summer and stay into the fall. Established trails at the Tolay Creek and Cullinan Ranch units provide the best wildlife observation and photography opportunities during these seasons.

*Snowy egret and Great blue heron*

USFWS



## Watching Wildlife

*Spot a*

Dawn and dusk are the best times to see wildlife. Use binoculars or spotting scopes for a closer look and observe from the sidelines.

Quick movements and loud noises will scare away most wildlife. Staying quietly in one location will let wildlife adjust to your presence. Many animals that have hidden will reappear once they think you are gone.

Be aware of sounds and smells. Often you will hear more than you will see.

Look for traces of animals including tracks, scat, feathers and nests that tell interesting stories. Please leave this evidence for others to observe.

*Harbor seal*



*Monarch butterfly*  
or



*Roy Lowe, FWS*



*Avocet nest*

Leave young animals alone. Even though you may think they are abandoned, a parent is probably close by waiting for you to leave.

Do not feed wildlife. It disrupts their digestive systems and compromises their natural instinct for survival.

Always walk quietly in designated areas. Other wildlife watchers will appreciate your consideration.

*a stilt mother and chicks looking for a meal on the tidal mudflat*



*Mike Boylan, FWS*





## San Pablo Bay National Wildlife Refuge

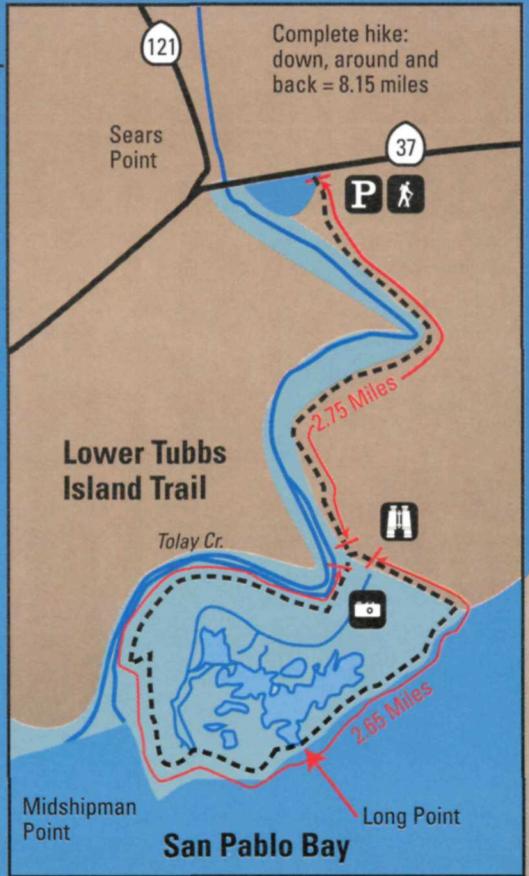
	Headquarters		Photography
	Parking Area		Hunting
	Restrooms		Fishing
	Accessible		Boat Launch
	Wildlife Viewing		Trail

	Power Line
	Railroad
	Refuge Boundary
	Major Road
	Trail/Road
	Creek

	Tidal Marsh		Seasonal Marsh
--	-------------	--	----------------



## Open Bay



San Pablo Bay's open bay waters are a mix of fresh and salt waters. Winds and tidal current mix Pacific Ocean tidal flow and fresh waters from the Sacramento, San Joaquin, Petaluma and Napa rivers in the bay. Fresh water from California's 60,000 square-mile Central Valley also passes through the bay to the sea. Open waters serve as the home or migratory corridor for many species of fish and aquatic invertebrates including herring, anchovy, salmon, steelhead, crabs and shrimp. Open waters also provide important resting and feeding habitat for millions of migratory birds each year.



*Canvasback male*

## Mudflats and Intertidal



*Shorebirds*

Large expanses of fine-grained silt and clay mudflats are found around the bay. Twice daily, tides inundate these mudflats, distributing enormous quantities of nutrients which support an extensive community of diatoms, amphipods, worms, shellfish and algae. Many of these species are burrowers, which protects them from wave action, enemies and from drying out. At high tide, fish feed on the worms, snails, clams and crabs that live in the mud. At low tide, shorebirds and waterbirds forage in the mud for their daily meal.

## Tidal Marsh



Tidal marshes occupy a transition zone between mudflat habitat and drier upland habitat. A variety of tidal marshes including salt marsh, brackish marsh, fully tidal marsh and managed marsh can be found on the refuge. They are some of the most productive habitat types on earth.

Vegetation adapted to living in salty environments, like pickleweed and cordgrass, provide food for the billions of microscopic animals in the marshes and open water of San Pablo Bay. These microscopic



*Salt marsh harvest mouse*

animals are eaten by tiny young fish that grow to reproduce, as well as by larger fish, birds and mammals.

The refuge's marshes also support several rare and endangered animals including the California clapper rail, salt marsh harvest mouse, California black rail and San Pablo Bay song sparrow.

*Perennial Pickleweed*



## Uplands



*Jackrabbit*

Mostly located on levees or land adjacent to marshland, upland habitat is dry land not subject to tidal inundation. Species such as the jackrabbit, California vole, gopher snake, western meadowlark and golden-crowned sparrow inhabit the variety of grasses, shrubs and herbaceous vegetation found in the uplands.

## Refuge Management



*California clapper rail*



*Dodder parasite on pickleweed*

*Rocket netting used in shorebird research program*



Diminishing habitat and introduced non-native plants and animals are threatening the survival of marsh-dependent species, including the endangered California clapper rail, salt marsh harvest mouse and many rare and endemic salt marsh plants. The refuge is engaged in tidal restoration projects critical to the long-term future of these species.

Refuge objectives include: protecting threatened and endangered species; providing wintering habitat for diving ducks; conserving migratory birds and other wildlife; and providing compatible wildlife-dependent recreational opportunities. Local support for habitat conservation and research contributes to our ability to reach our objectives and restore and enhance northern San Pablo Bay lands for the benefit of wildlife and people.

## Environmental Education



### Hands-on Activities

Environmental education is an integral part of the refuge objectives. Teachers, youth group leaders, adult volunteers and students are invited to actively explore the diverse habitats and wildlife of the north San Pablo Bay through educator-led field trips along the marsh on Mare Island. Make arrangements with the refuge in advance to participate in our environmental education programs.

While at the refuge students participate in a variety of activities designed to teach ecological concepts that focus on endangered species, migratory birds and habitat preservation. Refuge educators



use a multi-disciplinary approach to promote investigation, life-long learning and environmental awareness. Students not only learn about the importance of wetland habitats but also about

how their actions at home and at school can affect these habitats.

### Interpretation

All visitors are invited to enjoy interpretative activities at the refuge which include scheduled events and self-guided walks at Tolay Creek and Cullinan Ranch. Walking trails are also being developed near the refuge office on Mare Island to provide more wildlife observation, interpretation and photography opportunities.

Mare Island trails are currently available only to participants enrolled in the refuge's environmental education program.

# Refuge Activities

## Hours



The refuge is open year-round during daylight hours. Check with the refuge office for the latest update on trail closures, wildlife concerns, maintenance and management activities.

## Boating



Boat access to the open water and intertidal areas of San Pablo Bay provide opportunities for fishing and hunting on the refuge. Boat ramps are available at the Vallejo public marina near Brinkmans Marine and at Port Sonoma near the Petaluma River. Boat launching is not available on the refuge.

## Volunteers



Volunteers are an important component of the refuge's success. They work alongside refuge staff contributing to interpretive programs and events, environmental education programs, office assistance, wildlife management activities and a variety of maintenance duties. Please contact us for more information or to volunteer.

## Facilities



Restrooms and drinking water are available at the refuge office on Mare Island during regular office hours. No restrooms, picnic areas, campgrounds, drinking water or other facilities are available at the Tolay Creek or Cullinan Ranch units. Please help keep our trails clean and take litter and trash home with you.

## Pets



Due to the sensitive nature of the wildlife living on the refuge, and for protection of endangered species, pets are not allowed.

## Wildlife Observation/Photography



Wildlife observation and photography are encouraged on refuge trails during daylight hours. Remember that the animals on the refuge are wild and will flush if one gets too close. Please stay on the trails at all times. Use binoculars for a better view.

## Hunting



Hunting and fishing are allowed on designated areas of the refuge during respective seasons subject to both State and Federal regulations. Firearms are permitted only while engaged in legal hunting activities during these established open seasons.

## Fishing



Fishing by boat is allowed in the open bay and intertidal waters of the refuge. Fishing from shore is not allowed. Please contact the refuge for additional information regarding fishing and hunting.

## Special Use Permits

Special Use Permits are required for commercial tour groups, research activities, special events, commercial photography and filming, or any activity not specifically permitted in this brochure. Permits may be obtained by contacting the refuge office during business hours.

*Please respect wildlife, their habitat and the nature experience of others. Take only pictures and memories and leave only footprints.*



USFWS

## Help Us Protect the Refuge

### Some Restrictions are Necessary



While you enjoy the refuge, please obey the following regulations which are designed to protect both wildlife and visitors.

We do not allow any of the following activities: off-trail driving or biking, personal watercraft, jet-skiing, camping, horseback riding, fires, fireworks, overnight parking or weapons (except firearms used for hunting in permitted areas during legal hunting season).

To ensure a quality refuge experience to our visitors and provide minimal disturbance to wildlife, collecting plants, natural features, wildlife or historic artifacts is prohibited.

While on the trails, please do not litter, jog, run, use cell phones (unless an emergency) or use sound equipment to attract wildlife.

### Refuge Office

The San Pablo Bay National Wildlife Refuge office is located at Building 505 on Mare Island in Vallejo. If you have any questions regarding authorized activities on the refuge or where you can go, it is best to check with the refuge manager.

### Be Safe, Be Prepared



*California brown pelican*

The climate varies in San Francisco Bay throughout the year. Fog, rain or unexpected temperature drops can occur. Check the local weather forecast before your visit. Refuge trails are not paved so wear sturdy footwear. Be prepared to encounter ticks and mosquitoes. We recommend bringing insect repellent, water and sunscreen. Do not hike in the marsh; you may sink, become stuck or create trails for predators. To protect endangered species, some areas are closed to public access.

## Other Area Activities

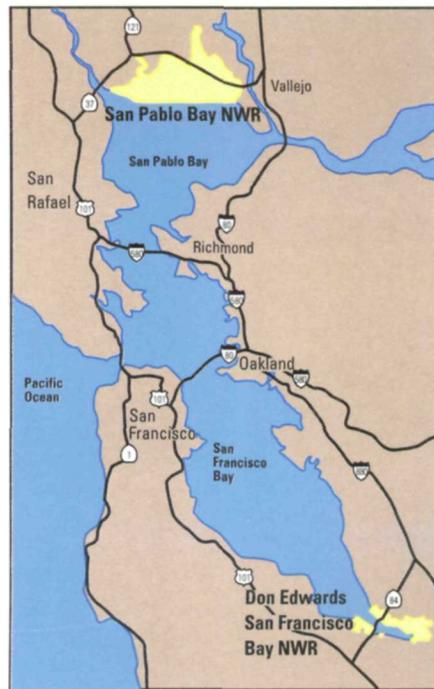


© Anthony Battiste

*Great egret*

The Vallejo Convention Center and Visitors Bureau has information on local restaurants, lodging, RV parks and other points of interest within commuting distance of the refuge. They can be reached at (707) 642-3653.

Information on camping at California State Parks can be obtained by calling (800)444-7275.



This emblem, designed by conservationist J. N. "Ding" Darling, has become a symbol of the National Wildlife Refuge System

San Pablo Bay National Wildlife Refuge is one of eight refuges managed as part of the Don Edwards San Francisco Bay National Wildlife Refuge Complex. The National Wildlife Refuge System includes more than 520 refuges across the country. This network of lands was established for the conservation and management of fish, wildlife, and plant resources for the benefit of present and future generations.

San Pablo Bay  
National Wildlife Refuge  
P.O. Box 2012  
Cedar and "I" Street, Bldg. 505  
Mare Island  
Vallejo, California 94592  
(707) 562-3000 / (707) 562-WILD

U.S. Fish & Wildlife Service  
<http://www.fws.gov>

Refuge bird checklist  
<http://www.npwrc.usgs.gov>

For Refuge information  
1 800/344 WILD

California Relay Service  
TTY 1 800/735 2929  
Voice 1 800/735 2922

September 2001



U.S. Fish & Wildlife Service

# San Pablo Bay

*National Wildlife Refuge*

