

# WELCOME



Marsh Wren

The Arcata Marsh and Wildlife Sanctuary is home to the City of Arcata's innovative wastewater treatment facility. The sanctuary is 307 acres, including freshwater marshes, salt marsh, tidal sloughs, grassy uplands, mudflats, brackish marsh, approximately 5 miles of walking and biking paths and an Interpretive Center. By integrating conventional wastewater treatment with the natural processes of constructed wetlands, Arcata has succeeded in turning wastewater into a resource.

Located at the north end of Humboldt Bay, the sanctuary is situated along the Pacific Flyway, a major migratory route for thousands of birds that breed in the far north and winter in California, Mexico and Central and South America. These wetlands provide homes and migratory resting places for over 270 species of birds. With seventy-three species here year-round, there's always something to see.

Numerous species of plants, mammals, insects and amphibians inhabit the sanctuary, including River Otters, Gray Foxes, Raccoons, Pacific Tree Frogs, Red-legged Frogs, Rough-skinned Newts, Garter Snakes, Solitary Bees, Dragonflies and Damselflies, Ctenucha Moth and Swallowtail Butterflies.

The Arcata Marsh and Wildlife Sanctuary has received international recognition and numerous awards as a municipal planning design, a cost-effective public utility operation, a natural resource project, and for urban redevelopment.



Free guided walk – Melissa Neuffer

River Otter – Art Barab

# FREE GUIDED WALKS

Local volunteer docents lead tours of the wildlife sanctuary. No reservations are necessary for the following walks, which take place rain or shine:

## Friends of the Arcata Marsh (FOAM)

Every Saturday 2 pm – Meet at the Interpretive Center for guided walks on various topics. The last Saturday of the month includes a tour of the wastewater facility.

[www.arcatamarshfriends.org](http://www.arcatamarshfriends.org)

## Redwood Region Audubon Society

Every Saturday 8:30 am – Meet in the parking lot at the foot of South I Street for a guided birding walk.

[www.rras.org](http://www.rras.org)

## Reserved Walks

Free docent led walks on various topics are available for groups and schools if requested two weeks in advance.



Western Tiger Swallowtail



# INTERPRETIVE CENTER

The Arcata Marsh Interpretive Center has interactive interpretive exhibits, free maps and literature, a bookstore, bird lists and a log of recent bird sightings. The center is open Tuesday-Sunday from 9 am-5 pm, and Monday 1-5 pm.

## Arcata Marsh Interpretive Center

569 South G Street • Call 707-826-2359



City of Arcata  
Environmental Services Dept.  
[www.cityofarcata.org](http://www.cityofarcata.org)

This brochure was made possible by a grant from the Gerald O. & Susan Hansen Family Fund of the Humboldt Area Foundation

# MAP & GUIDE

# ARCATA MARSH & WILDLIFE SANCTUARY



Innovative, Award-winning,  
Inspiring

## SEASONS

The Arcata Marsh and Wildlife Sanctuary is a year-round destination for nature observation. Great Blue Herons, Great Egrets and Snowy Egrets are easy to spot all year. Numerous species of birds, plants, mammals, insects and amphibians inhabit the marsh. Each season reveals its own delights. The highlights listed below are but a few of the many possibilities.



*Pacific Tree Frog*

### WINTER

Mallards, Northern Shovelers, Northern Pintails, Ring-necked Ducks and American Widgeon often remain over winter. Virginia Rails and Soras may be forced out into easy viewing by the high tides of winter. Surf Scoters and Buffleheads swim in Klopp Lake. Wintering shorebirds cover the islands in Klopp Lake at high tide. Tiny Ruby-crowned Kinglets flit in the trees along the paths. Black-crowned Night Herons in their winter roost are easily visible in the leafless willow trees around the log pond.

### SPRING

Tree, Violet-green, Northern Rough-winged, Cliff and Barn Swallows, Purple Martins and Vaux Swifts return in the spring, swooping over the marshes. Rufous and Allen's Hummingbirds compete with the year-round resident Anna's Hummingbirds at Red-flowering Currant bushes. Tree Frogs can be seen and heard around the marsh. Yellow-rumped Warblers are easily seen in the trees.

### SUMMER

A family of River Otters may be seen in any body of water, though they are most frequently seen in Klopp Lake. Marsh Wrens, Red-winged Blackbirds and Song Sparrows sing from the cattails. Keep an eye out for broods of Mallard, Cinnamon Teal and Wood Ducklings. Dragonflies and Swallowtail Butterflies fill the air. Watch Brown Pelicans diving into Klopp Lake for a meal. Watch for Garter Snakes sunning on the paths.

### FALL

Peregrine Falcons, Northern Harriers, Red-tailed Hawks, Red-shouldered Hawks and White-tailed Kites are readily seen. With luck you can spot an Osprey or even a Bald Eagle. Flocks of Cedar Waxwings visit. Fall color shows up in the salt marsh as the Pickleweed turns red. Purple California Asters bloom along with white Queen Anne's Lace. Watch for migrating warblers, shorebirds and ducks.

## HISTORY

**1949** – First wastewater treatment plant discharges primary-treated effluent into Arcata Bay.

**1957** – Oxidation ponds constructed.

**1966** – Chlorination added to treatment system.

**1969** – Wastewater aquaculture project was started by Humboldt State University Professor, Dr. George Allen. Pacific Salmon and Cutthroat Trout were raised in a mixture of partially treated wastewater and seawater.

**1970** – Main parking lot and boat ramp constructed on South I Street.

**1974** – New State policy prohibited discharge of wastewater into bays and estuaries unless "enhancement" was proven.

**1975** – Humboldt Bay Wastewater Authority proposes a regional wastewater treatment plant at an initial estimated cost of \$25 million.

**1978** – Arcata citizens rally for an integrated wastewater treatment plant that utilizes the natural treatment processes of marshes.

**1979** – State authorizes Arcata to demonstrate "enhancement" with a two-year pilot project of a 10-cell marsh, which treated 10% of Arcata's wastewater.

**1979** – Arcata Marsh and Wildlife Sanctuary Task Force formed to oversee public usage of Arcata's wetland areas and plan new projects.

**1981** – Original Arcata Marsh and Wildlife Sanctuary covering 75 acres along South I Street completed.

**1983** – State Water Resources Control Board permits Arcata to upgrade its wastewater treatment plant, including wetland treatment enhancement units.



*Wood Duck*



*Lesser Goldfinch*

*Allen's Hummingbird*



**1986** – Butcher's Slough Wetlands Restoration Project completed.

**1986** – With completion of Butcher's Slough Wetlands Restoration Project, funded by California Coastal Conservancy, Arcata Marsh and Wildlife Sanctuary boundaries are expanded to 154 acres.

**1987** – Out of more than 1,100 entries, Arcata receives the Innovations in Government Award from Ford Foundation/Harvard University Kennedy School of Government and \$1,000,000 to build the Arcata Marsh Interpretive Center.

**1989** – Friends of the Arcata Marsh (FOAM) Arcata Marsh Interpretive Center Fund Drive raises \$56,000 locally.

**1993** – Arcata Marsh Interpretive Center opened.

**1998** – The City of Arcata obtains funds to purchase 75 acres of diked agricultural lands lying to the west of the sanctuary.

**2003** – Butcher's Slough Enhancement Project constructed on City-acquired lands north of the Log Pond.

**2004** – South I Street Pond constructed.

**2007** – McDaniel's Slough Project to cooperatively restore and enhance up to 250 acres of former tide lands.



*Brown Pelican*

# HOW DOES IT WORK?

**The Arcata Marsh** is a component of the City's wastewater treatment facility. Serving a population of 16,000, a series of ingeniously constructed ponds treat the water naturally with less reliance on chemicals. This unique system has been the model for similar facilities worldwide. The wastewater system's components are:

## Headworks

The headworks is the first phase in the treatment of the City's sewage to advanced secondary standards. Two Archimedes screw pumps lift the sewage 15 feet. It flows through a bar screen to remove sticks, debris, sand, gravel and other gritty materials that are taken to the landfill. From the headworks the sewage flows to the clarifiers.

## Clarifiers

Two large tanks called clarifiers are used to separate organic solids and skim off materials from the wastewater. The primary-treated wastewater that results from settling, or clarifying, flows to the oxidation ponds. The solids (sludge) that settle out in the bottom of the clarifiers are pumped to the digesters.

## Digesters

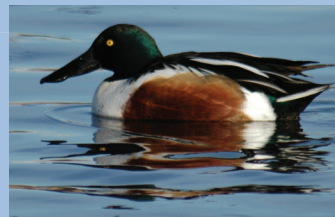
In the digesters, sludge from the clarifiers is heated, stirred and decomposed by bacteria. The digesters are anaerobic because the bacteria decompose or digest the sludge without using oxygen. Bacteria in the digesters convert some of the ingredients in the sludge into methane gas, which is used to heat the digesters.

## Sludge Drying Beds

Digested sludge, which has the consistency of pudding, is drained from the digester to covered drying beds and dried in the open air. Once dry, the sludge is mixed with chipped wood waste and marsh plants that are harvested from the enhancement marshes. This mixture is then aerobically (with oxygen) composted and used in Arcata's natural areas and parks.

## Oxidation Ponds

Wastewater from the clarifiers flows by gravity to the oxidation ponds. Bacteria and other microorganisms in the ponds break down, or digest, the wastes in the sewage. Algae in the ponds provide oxygen for the bacteria. Additional oxygen is supplied mechanically by machines called aerators. Since algae and bacteria become pollutants when they die, it is important to remove them from the wastewater before it is sent to the bay.



Northern Shoveler

### Treatment Marshes

Bullrush and cattails in the four treatment marshes shade the water so algae cannot grow. These plants slow the flow of wastewater, allowing suspended pollutants to sink to the bottom. These plants also provide habitat for bacteria, fungi and other microorganisms that feed on and further break down pollutants in the wastewater.

### Chlorine Contact Basin

Wastewater is treated with chlorine to kill pathogens, harmful bacteria and viruses, before it flows to the enhancement marshes, and again before it is discharged into Humboldt Bay. Sulfur dioxide is used to remove the chlorine before the water is discharged into the bay.

### Enhancement Marshes






Three freshwater enhancement marshes (Allen, Gearheart and Hauser) were constructed to further remove suspended materials and pollutants from the wastewater, while providing habitat for wildlife.

### Humboldt Bay

After the wastewater flows through these marshes, it is pumped back to the chlorine contact basin, where it is chlorinated and de-chlorinated before it is discharged into Humboldt Bay.

*Great Egret, Osprey, Red-flowering Currant*



-  Arcata Marsh & Wildlife Sanctuary
-  Road
-  Railroad
-  Trail
-  Bird Blinds



## POINTS OF INTEREST

**Allen Enhancement Marsh** – Allen Marsh, which can be seen from the Interpretive Center, was built on an abandoned log deck. This marsh was named for Dr. George Allen, who operated an aquaculture project, raising salmon and trout in a mixture of wastewater and bay water. This concept of wastewater as a resource was instrumental in the development of the Arcata Marsh and Wildlife Sanctuary.

**Gearheart Enhancement Marsh** – Named for Dr. Robert Gearheart, this marsh was previously pasture land. Dr. Gearheart's marsh pilot project demonstrated to the State that wetlands were a viable way to treat wastewater.

**Hauser Enhancement Marsh** – This marsh once was a leachate basin. It is named for a former City Council member, Mayor and City Manager, Dan Hauser, who worked tirelessly persuading the State to let Arcata proceed with the integrated wetland wastewater treatment plant.

**Mount Trashmore** – In 1964 this grassy hill was the site of the County sanitary landfill which was sealed in 1973.

**Klopp Lake** – Originally a leachate basin for the landfill, this lake is now popular for birdwatching and picnicking. It is named for the former City Public Works Director Franklin Klopp, who was instrumental in the creation of the marsh.

**Old Arcata Wharf** – These pilings are remnants of California's first railroad, the Union Plank Walk and Rail Track Company. Built in 1855 to insure Arcata's commerce through a shipping channel, the wharf and horse-drawn railroad ran two miles into the bay.

*Red-winged Blackbird*



**Butcher's Slough** – This tidally influenced portion of Jolly Giant Creek was restored in 1986. The numerous pilings once supported a plywood mill.

**Log Pond** – This pond was once a place where logs were stored before being milled. It has been transformed into a productive freshwater pond.

**No-Name Pond** – This developed naturally in a low-lying area. At the prompting of his students, Dr. Stanley Harris named it "No-Name Pond." The City officially adopted the name in 2001 to honor Dr. Harris' work in local ornithology and wetland ecology.

**Pilot Project** – These ten 20' x 200' marshes were used to demonstrate to the State the effectiveness of wetlands for treating wastewater.

**Restored Salt Marsh** – 90% of the original salt marsh areas around Humboldt Bay have been either diked or filled. The City of Arcata and the California Department of Fish and Game are restoring 250 acres of the McDaniel's Slough Estuary.

**Arcata Marsh Interpretive Center** – Constructed with a grant from the Ford Foundation and fundraising efforts of Friends of the Arcata Marsh, the center opened in 1993. Interactive exhibits provide information on the history and operation of the Arcata Marsh and Wildlife Sanctuary, as well as the wildlife that lives here.

**Stormwater Treatment Marsh** – Stormwater runoff slows as it enters this marsh. Here, solids settle and microorganisms remove pollutants before the water enters Butcher's Slough and Humboldt Bay.