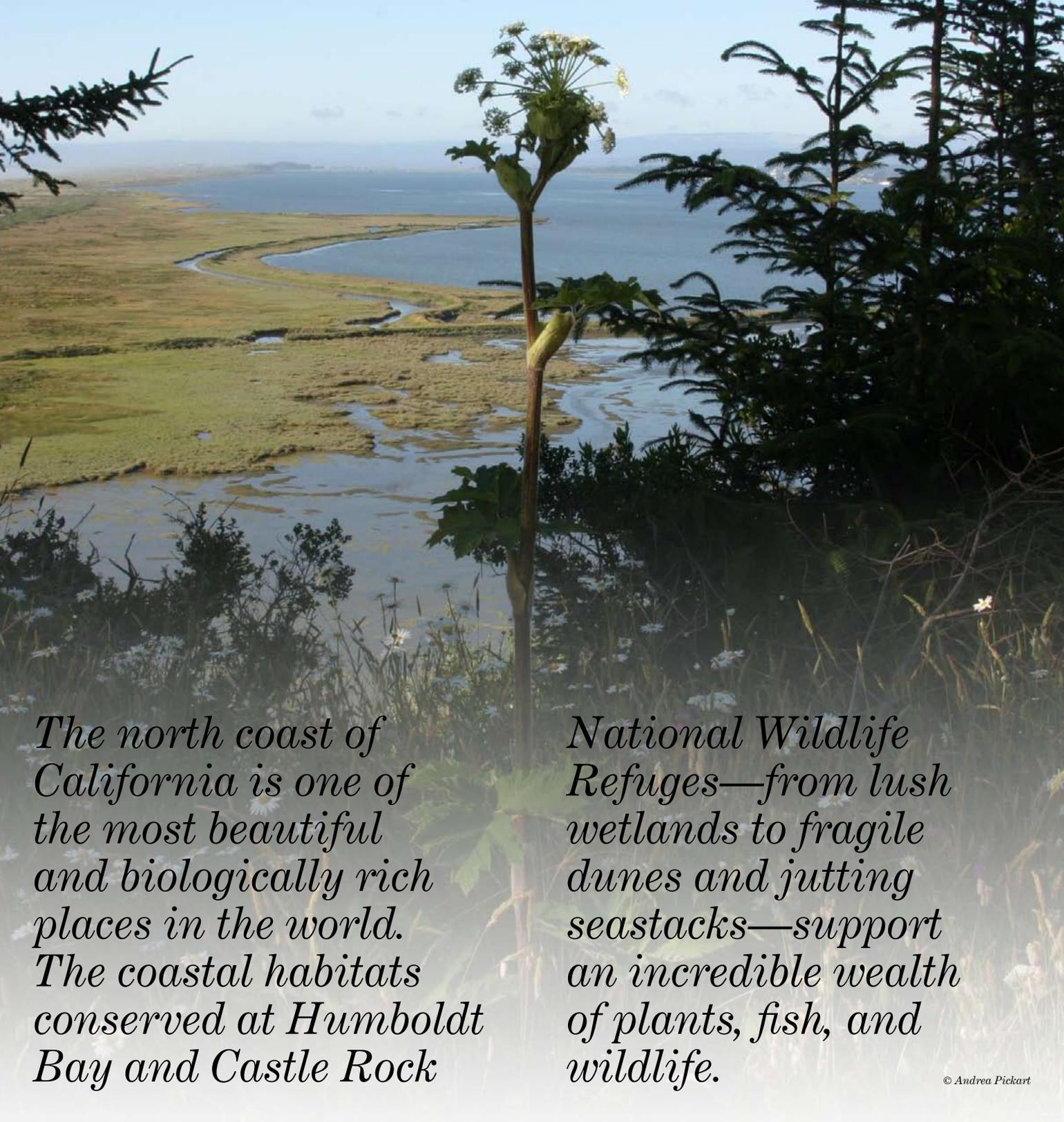


U.S. Fish & Wildlife Service

Humboldt Bay

*National Wildlife
Refuge Complex*





The north coast of California is one of the most beautiful and biologically rich places in the world. The coastal habitats conserved at Humboldt Bay and Castle Rock

National Wildlife Refuges—from lush wetlands to fragile dunes and jutting seastacks—support an incredible wealth of plants, fish, and wildlife.

Welcome to Humboldt Bay National Wildlife Refuge Complex

Humboldt Bay NWR is located on an estuary, a place where fresh water from rivers and streams meets ocean waters in a bay or slough. This dynamic situation creates some of the most productive ecosystems on earth.

Castle Rock NWR is an amazing coastal island in Del Norte County that hosts over 100,000 nesting seabirds and hundreds of seals and sea lions.

These unique coastal refuges are two of over 540 sites in the National Wildlife Refuge System. This federal system, symbolized by the blue goose insignia, is the largest network of lands in the world conserved specifically for fish and wildlife. As part of the Department of Interior, the U.S. Fish and Wildlife Service manages the refuge system to sustain and preserve a dynamic living heritage, conserving wildlife and habitat for people today and for generations to come.

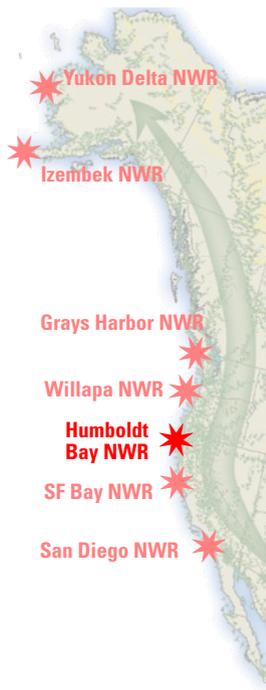


“Whenever you meet this sign, respect it. It means that the land behind the sign has been dedicated by the American people to preserving, for themselves and their children,

as much of our native wildlife as can be retained along with modern civilization.”

—Rachel Carson

An International Flyway



The Pacific Flyway is an “aerial highway” used by birds that nest in the far north and migrate to wintering areas in North and South America. Humboldt Bay and many other refuges are some of the key “stepping stones” in the Pacific Flyway.

The majority of birds use this refuge as a stop-over where they rest and replenish energy reserves. Others spend the winter here, and some use the refuge for nesting.

The wetlands around Humboldt Bay are critical to tens of thousands of shorebirds. This is the northernmost area on the Pacific coast where species such as American avocets, long-billed curlews, marbled godwits, and willets spend the winter in large numbers. They can be seen feeding on the mudflats or acrobatically skimming over the bay from late July through April.

Humboldt Bay is also a key area for Pacific brant. These small geese require eelgrass-filled bays during their travels between Arctic wetlands where they nest and coastal lagoons of Baja California and mainland Mexico where they overwinter. In November, most Pacific brant fly non-stop from Izembek Lagoon in Alaska to Mexico in 48-60 hours! On their return trip from January through April, as many as 10,000-20,000 brant may be using Humboldt Bay at one time.

Did You Know?

More than 50% of all the brant in the Pacific Flyway stop to refuel on eelgrass in Humboldt Bay between November and May!



© Gary Kramer

A Changing Landscape

Did You Know?
Humboldt Bay historically sustained over 9,000 acres of saltmarsh. Now only about 900 acres remain.

European-American pioneers arrived in the late 1800s and rapidly began to alter the landscape. Over the last 120 years, the bay has been significantly changed by diking, filling, dredging, sedimentation from upstream logging, oyster culture, and development. Vast expanses of wetlands were diked and drained to create lands for dairies, livestock, and farms.

Once considered “useless swamps,” wetlands are now recognized as extremely valuable and productive habitats. Wetlands help control flooding and erosion, filter pollution, conserve biodiversity, and provide open space and resources for fish, wildlife, and people.

Humboldt Bay NWR

A Unique Diversity of Habitats



Red-legged Frog
© Jamie Bettaso



Humboldt Bay Owl's Clover
© Andrea Pickart

In 1971, the refuge was established to conserve precious habitat for the great diversity of birds, mammals, fish, amphibians, invertebrates, and plants that occur in the Humboldt Bay area. The refuge has several different units totalling almost 4,000 acres. These units consist of a mosaic of mudflats, estuarine eelgrass meadows, saltmarsh, brackish marsh, seasonally flooded freshwater wetlands, riparian wetlands, streams, coastal dunes, and forest. These habitats support over 316 species of birds and 40 species of mammals. The refuge also provides habitat for approximately 100 species of fish and marine invertebrates, many of which contribute to sport or commercial fisheries, including steelhead, coho and chinook salmon, and Dungeness crab.



Great Blue Heron
© Gary Kramer

The Freshwater-Saltwater Continuum

When Humboldt Bay was diked in the early 20th century, the area of estuary was reduced by almost 40 percent. Although there is no longer an uninterrupted gradient from rivers and creeks to the ocean water at the bay's mouth, a complex mosaic of fresh, brackish, and saltwater wetlands occurs in response to tidal influence, freshwater inputs, and the residual salinity of old saltmarsh soils. As a result, there is a rich diversity of habitat types surrounding the bay.



Riparian forest

Riparian forest occurs along stream edges in freshwater areas. The canopy layer is dominated by red alder, willows, and Sitka spruce, with an understory of salmonberry, twinberry, California blackberry, and wax myrtle. Lady fern, wood fern, and sword fern create an attractive groundlayer in drier areas, with stands of small-fruited bulrush joined by skunk cabbage in wetter areas. The rich structural diversity of these areas, combined with the many fruit-bearing shrubs, attract a rich bird fauna, especially migrating and nesting songbirds.



Freshwater marsh

Freshwater marsh was probably limited historically within the Humboldt Bay watershed. It has become quite abundant in areas, such as the refuge, that were converted in the past from saltmarsh to agricultural land but are now managed as shallow seasonal wetlands. Our present day freshwater wetlands range from seasonally to permanently flooded marshes supporting a diversity of plants (cattails, rushes, and pondweeds) and invertebrates that sustain wildlife. Rails, otters, and frogs secret themselves among the dense marsh vegetation. Common waterfowl that use this seasonal habitat include green-winged teal, shoveler, wigeon, pintail, gadwall, and mallard.



Agricultural wetlands

Agricultural wetlands are diked former saltmarshes that support pasture grasses such as ryegrass, velvet grass, and tall fescue, as well as the native wetland species short-awned foxtail and Pacific silverweed. These areas are hayed or grazed to maintain the shortgrass pastures attractive to Aleutian cackling geese. They are also used by shorebirds, herons, egrets, and black-tailed deer.



Brackish marsh

Brackish marsh occurs where salt and fresh water mix or where salts in the soil remain high. These wetlands support native saltgrass, tufted hairgrass, and two species of arrowgrass. The edges of former tidal channels, where water levels are more constant, are lined with seacoast bulrush. These sloughs are used by salmonids and tidewater gobies, all listed species.



Saltmarsh

Saltmarsh was the most widespread wetland type around Humboldt Bay, but due to diking and draining in the early 1900s only 10 percent of our saltmarshes remain. Of the remaining 900 acres, most have been invaded by the aggressive dense-flowered cordgrass, introduced in the 19th century in the ballast of ships. Cordgrass is currently being removed to restore a diverse community of plants including pickleweed, jaumea, saltgrass, and several rare species.

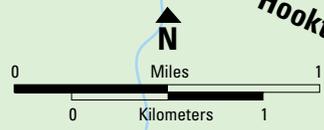
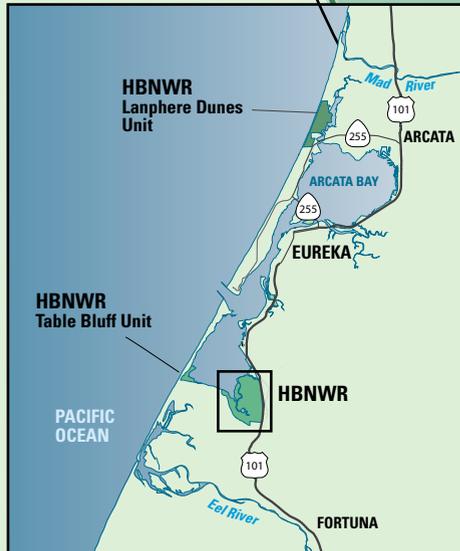


Mudflats

Intertidal mudflat and eelgrass beds occupy vast areas of the bay. Seemingly barren mudflats teem with life just beneath the surface. Plankton and algae anchor food webs of invertebrates, mollusks, crustaceans, fish, birds, and mammals, including humans. The intertidal flats of South Bay support approximately 2,000 acres of eelgrass, which are critically important to Pacific brant, other waterbirds, and the bay ecosystem.

Humboldt Bay National Wildlife Refuge

- NWR Lands
- Designated Hunting Area
- Refuge Boundary
- Hiking Trail
- Non-motorized Boat Trail
- Non-motorized Boat Launch
- Visitor Center & Office
- Parking
- Hunt Check Station
- Interpretive Kiosk



The Wiyot People

The **Wiyot Tribe** has lived on the shores of Humboldt Bay (known to them as Wigi) and surrounding areas for thousands of years. Their population is estimated to have been between 1,000 and 3,000 at the time of European-American settlement. The center of the Wiyot universe was Indian Island, the place of their creation, which continues to be the center of their culture. Wiyots subsisted on a variety of plant and animal resources including mollusks, sea lions, stranded whales, deer and elk, and the rich berry harvest of the coastal forests. The anadromous fish runs of the Mad and Eel Rivers were an important source of salmon that were smoked and stored to last through winter. Village sites were primarily located on the bay, sloughs, and rivers, but the tribe used the dunes extensively for implement-making sites, gathering, and surf-fishing.

European-American contact at the time of the California Gold Rush changed the character of northwestern California forever, leading to the decimation and displacement of the Wiyot in only 15 years. From 1850 to 1865, Wiyot territory became the center for the largest concentration of people in California north of San Francisco. Diseases and violence, culminating in the 1860 Indian Island massacre, decimated the Wiyots, with the few survivors driven to distant reservations or marginal lands in the Humboldt Bay region.

Today, there are over 450 members of the Wiyot Tribe, approximately 25 percent of whom live at the **Table Bluff Reservation** overlooking Humboldt Bay. They continue to work towards the perpetuation of their culture, and in 2004 had 40 acres of Indian Island restored to them by the City of Eureka.



Traditional
Wiyot basket
© Wiyot Tribe

© Andrea Pickart

Lanphere and Ma-le'l Dunes

*Because of the fragile nature of the dune habitats, the **Lanphere Dunes Unit** is only open by guided tour or special use permit. Call (707)444-1397 for information on programs and tours.*

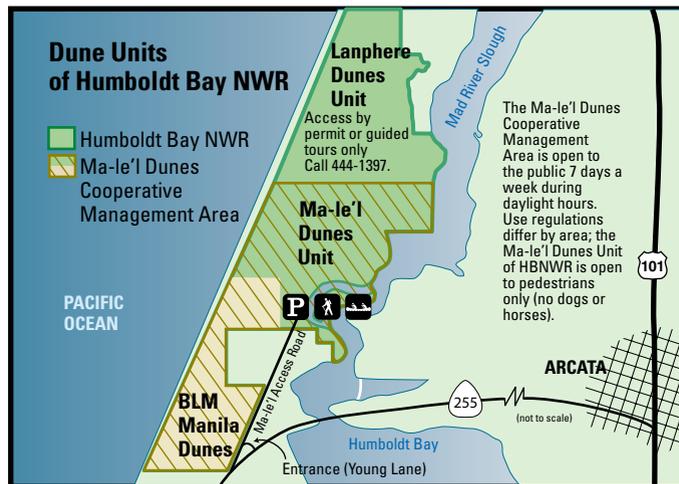
The **Lanphere Dunes Unit** is located at the upper end of the North Spit of Humboldt Bay, west of Mad River Slough. The most pristine remaining dune system in the Pacific Northwest, the Lanphere Dunes were protected by two biology professors from Humboldt State University, William and Hortense Lanphere. They donated their land to The Nature Conservancy, which added adjacent parcels and, in 1998, transferred 450 acres to Humboldt Bay National Wildlife Refuge. In 2005, with funding from the State Coastal Conservancy and as the result of strong community support, 160 acres to the south were added to the refuge and the **Ma-le'l**



© Don Tuttle

Dunes Unit was created, using a place name of the ancestral Wiyot tribe. The Lanphere Dunes is the site of one of the most successful dune restoration projects on the west coast, accomplished through the ongoing

removal of invasive, non-native vegetation. The new Ma-le'l Dunes is being similarly restored.



From Beach to Forest



Native foredune grassland



Dune mat



Reindeer lichen and bearberry on the forest floor:

All photos on this page
© Andrea Pickart

Native foredune grassland is a community restricted to the foredune (the first rise above the beach), and characterized by the native grass *Leymus mollis*, which is able to tolerate the intense salt spray and sand deposition that occurs in this habitat. The refuge supports one of the few remaining stands of this community, which is **globally endangered**. It has been displaced by introduced European beachgrass, which outcompetes native plants, along the entire Pacific Coast.

Dune mat is a spectacular community of wildflowers that occurs on semi-stable dune ridges behind the foredune. Beginning in May with beach pea, successive waves of color paint the dunes as different wildflowers come into bloom, including beach buckwheat, seaside daisy, and dune goldenrod. This community is home to **two endangered plants**, **Humboldt Bay wallflower** and **beach layia**. Native solitary bees create burrows in the sand, and are essential pollinators that maintain this community. A variety of invertebrates, including many specially adapted for this environment, occur here. Mammals such as porcupines, gray fox, and striped skunk leave their calling cards in the form of footprints. Dune



Humboldt Bay wallflower

mat has become extremely rare in the Pacific Northwest, and in many parts of California, due to the spread of European beachgrass, iceplant, and other aggressive non-native species.



Dune swales



Moving dunes



Coniferous dune forest

Dune swales occur in the nearshore dunes in depressions between ridges. These seasonal freshwater wetlands form in winter when loose sand blows away and the water table rises, allowing plants to colonize. First algae, and then rushes and sedges occur with many associated herbs such as springbank clover, Pacific silverweed, bird's-foot trefoil, and willow-herb. Soon, Hooker's willow and beach pine follow, ultimately creating wooded swales that attract many birds and mammals. Swales provide the seasonal water needed for many amphibian species, including red-legged frogs and Pacific tree frogs.

Moving dunes are the most dramatic of the many landforms found here. Large dunes migrate inland, slowly covering the forest to the east. At the juncture of dune and forest, massive slipfaces slowly engulf trees that become bleached and skeletal as the dunes move forward. Few plants can gain a foothold here, but the constant traffic of mammals moving between forest and foraging areas on the dunes is recorded as an intricate maze of tracks.

Coniferous dune forest occurs east of the moving dunes on older stabilized dunes. The dune forest is an incredibly lush and productive environment, with over 300 species of mushrooms, lichen, and mosses. The forest canopy is dominated by Sitka spruce and beach pine, with lesser grand fir, Douglas-fir, and madrone. The understory varies from dense stands of huckleberry and salal, to more open woodlands with a groundcover of bearberry (ground manzanita), reindeer lichen, and the showy calypso orchid, rein orchid and hooded ladies' tresses. The largest mammals of the forest are gray fox, but there are many small mammals including the rare white-footed vole.

Recreational Opportunities

Visitor Center



© HBNWR

The **Richard J. Guadagno Headquarters and Visitor Center** is located at the **Salmon Creek Unit** and is **open daily from 8 a.m. to 5 p.m.** The Visitor Center has

stunning dioramas and a beautiful observation room equipped with telescopes. There are exciting things to see and do all year with peak wildlife viewing from November through March.

Hiking



Restrooms are available at the Salmon Creek, Hookton Slough, and Ma-le'l Dunes Units.

Hikes led by naturalists are offered throughout the year at the Salmon Creek and Lanphere Dunes Units. For information on these and other special events, please call (707) 733-5406.

Emergencies—call 911.

Please report any injuries or accidents to the refuge headquarters.

Environmental Education

The **Shorebird Loop Trail (1.7 miles roundtrip)** is open during Visitor Center hours. This level gravel trail begins at the Visitor Center and features an observation kiosk and interpretive panels. The trail passes along seasonal freshwater wetlands, eventually leading to a permanent brackish pond and the eastern edge of Hookton Slough. Look for swallows and sparrows, listen for the marsh wren or secretive sora rail, and keep an eye skyward for raptors like the peregrine falcon and bald eagle.

To the southwest of the Visitor Center is the **Hookton Slough Unit (see map)**. This unit is open daily from sunrise to sunset. The **Hookton Slough Trail (1.5 miles one way)** starts at the Hookton Slough Unit parking area and follows the west bank of Hookton Slough out and back. The trail is level, gravel-based, and has interpretive panels.

For a completely different experience, there are several trails that explore the dune forest ecosystem and beach at the Ma-le'l Dunes Cooperative Management Area west of Arcata (**see Dune Units map**). This area also has a short, fully accessible trail that follows the edge of Mad River Slough. **This area is open sunrise to sunset daily.**

The refuge offers opportunities and guidance for outdoor class activities. Call (707) 733-5406 for information.

Wildlife Observation and Photography



The refuge is excellent for birdwatching, wildlife viewing, and photography. The Salmon Creek Unit has an observation kiosk and a photo blind. The refuge office has wildlife and plant lists and other information.

Hunting



Waterfowl hunting is permitted in designated areas of the refuge and governed by federal and state regulations. Waterfowl hunting on the Salmon Creek Unit takes place Tuesdays and Saturdays only, from mid-late October until late January. For current information, see the refuge hunting brochure or call (707) 733-5518. All firearms must be unloaded and cased.

Fishing



Fishing is permitted in Humboldt Bay and tidal sloughs year round. The Hookton Slough trail and boatdock are open to fishing; access to other areas is by boat.

Boating



Humboldt Bay and tidal sloughs are open to boating. **The refuge has two launch areas for non-motorized boats only.** One is in South Bay at the **Hookton Slough Unit**, where a popular trip is to paddle around the remnant dikes of Teal Island. The other is in North Bay at the **Ma-le'l Dunes Unit, adjacent to the Mad River Slough (see Dune Units map).**

For your personal safety, always wear proper flotation devices, carry required safety equipment, and be aware of tides and weather conditions.

Public boat launches for hunting, clamming, fishing, and exploring are available at Fields Landing, Woodley Island, the Arcata Marsh, and Samoa County Park.



© Shannon Smith

Wildlife Viewing Tips

Who was Richard J. Guadagno?



© USFWS

Rich was a career employee of the Fish and Wildlife Service and had worked at several refuges across the nation before coming to Humboldt Bay NWR. Rich was the Refuge Manager from March 2000 until September 11, 2001, when he was tragically killed on Flight 93 in Pennsylvania. The Visitor Center was named in his honor by Congress. There are three scholarships a year awarded in his name to local college students pursuing careers in the natural sciences.

Volunteers Welcome

Volunteers are very important to the refuge's success. Volunteers work alongside refuge staff and partners on virtually all refuge programs including interpretation and environmental education, office assistance, wildlife management activities and a variety of maintenance duties. Please contact us in the office or at **(707) 733-5406** if you would like to volunteer or get more information.



© Eric Nelson

Friends of Humboldt Bay NWR

The Friends of Humboldt Bay NWR and Friends of the Dunes both assist the refuge in innumerable ways, from recruiting volunteers to leading walks and providing environmental education. Please call the refuge for further information.

Partners

We also work with Audubon Society, Humboldt State University, The Nature Conservancy, CA Coastal Conservancy, CA Waterfowl Association, Ducks Unlimited, Pacific Coast Joint Venture, Aleutian Goose Working Group, local schools, communities, ranchers, and others.

When



© Michael Peters

Dawn and dusk are generally the best times to observe wildlife. However, tide levels also have great influence on wildlife behavior and movements around estuaries. The best times around the South Bay are generally within 1–2 hours either side of high tide. Peak season for most species of waterbirds and raptors is November through April. Aleutian cackling geese, Pacific brant and migratory shorebird populations peak from March to late April. Summer visitors can see many terns, cormorants, and pelicans, as well as resident egrets, herons, and migratory songbirds such as warblers, sparrows, and swallows. Some mammals, like black-tailed deer, river otters, and gray fox, may be spotted all year.

Where

Most waterfowl, shorebirds, and raptors can be found on the Hookton Slough and Salmon Creek Units. Each has a walking trail.

How

Quick movements and noise scare away most wildlife. You will see more if you are quiet and listen. Look for tracks, nests, and other signs that can tell you interesting stories, then leave this evidence undisturbed for others. Please stay on trails to reduce disturbance to wildlife.



© Gary Kramer

Do not approach or disturb nesting birds, and leave all young animals alone. Even though you may think they are abandoned, a parent is likely close by waiting for you to leave. Do NOT feed wildlife. It disrupts their digestive systems and compromises their natural instinct for survival.

What to Bring

Binoculars and scopes, field guides, insect repellent, water, and rain gear are recommended. **Discovery Packs, containing field guides and binoculars, are available for loan at the Visitor Center.**

Help 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.

The following are prohibited:

- dog walking
- driving, biking, and jogging (except on paved entrance road)
- fires and fireworks
- kite-flying (birds think they are aerial predators)
- overnight parking
- weapons (except firearms legal for refuge hunting)
- horseback riding

Please do not litter; *carry out what you bring in!*

To ensure a quality experience for our visitors and to minimize disturbance to wildlife, collecting natural objects such as plants, animals, feathers, antlers, and objects of antiquity (including Native American artifacts) is strictly prohibited.

Pets



To avoid conflicts with wildlife and visitors, pets are not permitted on the refuge.



© Gary Kramer

Frequently Asked Questions

Why are hunting and fishing allowed on this National Wildlife Refuge, but not walking my dog, jogging, or biking?

The National Wildlife Refuge System was established in 1903 to “preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations.” This includes the following six priority public uses: wildlife observation, photography, interpretation, environmental education, hunting, and fishing. These pursuits are all wildlife dependent, while other activities such as jogging, biking and dog walking can be done at many other places.

Why is there haying and/or grazing on the refuge?

In the early 1900s most of the saltmarsh around the bay was diked off to create pasture. When kept short and nutritious, these grasslands are used each winter and spring by many species of shorebirds, tundra swans, wigeon, and especially thousands of Aleutian cackling geese. This once endangered population of geese has recovered from less than 800 in 1974 to more than 100,000 in 2006. These geese are now having an increasing economic impact on local ranchers as significant numbers of geese graze on private lands. To maintain optimal conditions for wildlife, management techniques include a combination of mowing, haying, and grazing.

Aleutian cackling geese

© Michael Peters



Castle Rock NWR



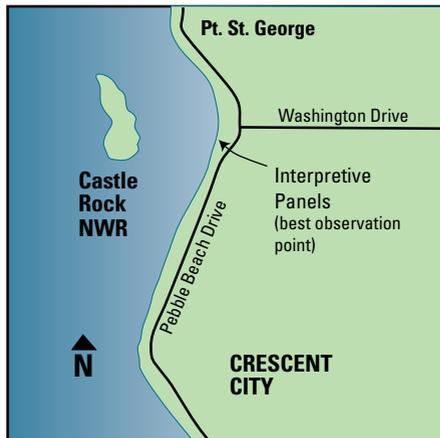
© Stan Harris

An Island Paradise for Wildlife

From February to mid-April, the dawn fly-off of Aleutian cackling geese from Castle Rock is often spectacular. The geese roost on Castle Rock each night and feed on mainland pastures by day.

Eighty miles north of Humboldt Bay, Castle Rock National Wildlife Refuge lies about a half mile offshore from Crescent City, California. Castle Rock was purchased in 1979 from The Nature Conservancy to preserve habitat for magnificent seabird colonies and marine mammals. Castle Rock NWR is only 14 acres in size, but is critical to the survival of several hundred thousand seabirds each year. It is also a key roost site for up to 20,000 Aleutian cackling geese each winter and spring.

Castle Rock rises 335 feet above sea level with a grassy slope, two large inlets, and cliffs that are important to nesting seabirds in the summer.



The birds of Castle Rock NWR can best be seen in the early morning hours with a spotting scope. The refuge is closed to the public to prevent disturbance to the seabirds, their habitat, and marine mammals.

Did You Know?

Castle Rock NWR and northcoast ranchers played a critical role in the recovery of Aleutian cackling geese, one of the signatory successes of the Endangered Species Act. Fully delisted in 2001, this population has grown from fewer than 800 birds in 1974 to more than 100,000 in 2006.

The cliffs provide nesting habitat for one of the largest breeding populations (100,000) of common murres on the Pacific coast. Ten other species of seabirds also nest here, including three species of cormorants, pigeon guillemots, Cassin's and rhinoceros auklets, Leach's and fork-tailed storm-petrels, and tufted puffins. Because many of these bird species nest in burrows and crevices and are primarily nocturnal, they avoid predation by western gulls that also nest on the island.

Castle Rock NWR also serves as an important haul out (resting site) for marine mammals, including harbor seals, northern elephant seals (both bear pups there), and California and Steller sea lions.

Harbor seals haul out on Castle Rock NWR.

© Tupper Ansel Blake



During April–May the clown-like tufted puffins may be seen.

© Jesse Irwin



**Humboldt Bay
National Wildlife Refuge Complex
Refuge Manager
Humboldt Bay NWR
Castle Rock NWR
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<http://www.fws.gov/humboldtбай>

**Visit the U.S. Fish & Wildlife Service
on the internet at
<http://www.fws.gov>**

**For Refuge information
1 800/344 WILD**

July 2006

