

Rhythms of the Refuge

Open Your Eyes to Wildlife



An Educator's Guide to Tualatin River National Wildlife Refuge

Introduction

Welcome, Educator!

Thank you for choosing to bring your students to Tualatin River National Wildlife Refuge! We are happy that you are using the Refuge's resources to enhance the learning experience for your students. With the help of this guide, we hope that field trips to the Refuge delight the senses and nurture an ongoing process of discovery. The guide includes information about the Refuge's habitats and wildlife, as well as about the environmental education program: field trip planning and pre-field trip, on-site, and post-field trip activities. Together as educators, we have a chance of increasing environmental awareness throughout our communities.

Visit us at: www.fws.gov/tualatinriver/

An Approach to Learning

We seek comprehensive, integrated, hands-on educational methods. Our field trip activities are designed to mesh well with teachers' objectives, and to meet state requirements for environmental education. We believe that our role as educators is to awaken in students the following:

- Awe and delight in nature with respect for all life forms
- A foundation of practical ecological knowledge
- A sense of belonging to a special human niche within the natural world
- A feeling of accountability for human impacts upon the environment
- Sensitivity toward diverse interests and cultural perspectives
- The skills to identify and resolve environmental problems

U.S. Fish & Wildlife Service

The U.S. Fish and Wildlife Service (FWS), which operates within the U.S. Department of the Interior, is the principal agency through which the United States government carries out its responsibilities to care for the country's wildlife and their habitats. Migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish are all wildlife resources managed by the FWS. Some of the natural resource programs within the agency include:



Endangered Species

The FWS leads the federal effort to protect and restore animals and plants that are in danger of extinction both in the United States and worldwide. Using the best scientific evidence available, FWS biologists identify species that appear to be endangered or threatened. After review, species may be placed on the Interior Department's official "List of Endangered and Threatened Wildlife and Plants." FWS biologists, along with other partners, then develop recovery plans for these species that include research, habitat preservation and management, and other recovery activities.

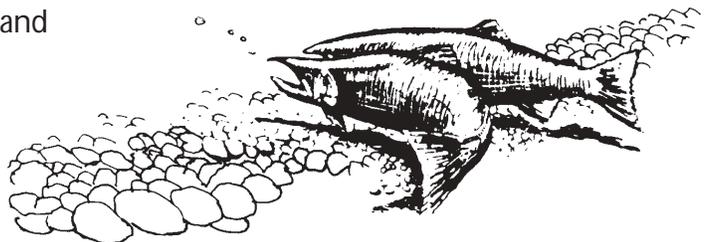


Migratory Birds

Because many bird species fly thousands of miles on their annual migrations, conservation by any single state or nation alone is inadequate; cooperative efforts by each entity are required. The United States government is responsible for coordinating migratory bird conservation under several laws and international treaties with Canada, Mexico, Japan, and Russia. The FWS is responsible for the conservation of more than 800 species of migratory birds: it regulates hunting, studies bird populations, and acquires and manages many national wildlife refuges to provide secure habitat for migratory birds.

Fisheries

Restoration of nationally significant fisheries that have been depleted by overfishing, pollution, or habitat damage is a major effort of the FWS. Research laboratories study fish health, genetics, ecology, nutrition, and other topics to provide the information needed to raise fish in hatcheries and restore wild fish populations. As part of this program, nearly 80 national fish hatcheries produce some 50 species of fish. The FWS stocks more than 160 million fish annually.



Federal Aid

Through a system of excise taxes on fishing and hunting equipment, more than \$50 million per year is distributed to states for fish and wildlife management. Grants to states fund the purchase and development of critical habitat and research on endangered species.

Law Enforcement

The FWS enforces federal laws that protect endangered species, migratory birds, marine mammals, and fisheries. The FWS carries out U.S. enforcement obligations under international agreements. Special agents work to prevent exploitation of game and nongame species, such as the interstate transportation of illegally taken wildlife. Wildlife inspector stations at major ports of entry check the legality of documents and permits and inspect shipments of live animals and wildlife products, to ensure that protected species are not imported or exported illegally.

National Wildlife Refuge System

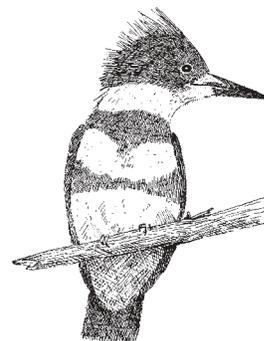
Since President Theodore Roosevelt designated Florida's Pelican Island as the first national wildlife refuge in 1903, the National Wildlife Refuge System has grown to contain 545 refuges and more than 3,000 waterfowl production areas located throughout all 50 states and several U.S. territories. At over 95 million acres, it is the world's largest system of lands and waters whose primary purpose is the conservation of wildlife and their habitats. The System is still growing, making it possible for refuges to protect more of our natural heritage than ever.

True to their name, wildlife refuges give wildlife top priority. "Wildlife First" is the motto of the National Wildlife Refuge System. Our national refuges provide homes for 700 bird species, 220 mammal species, 250 reptile and amphibian species, and more than 200 kinds of fish - and this list includes more than 250 threatened or endangered plants and animals such as the bald eagle, Kincaid's lupine, and Fender's blue butterfly. Through the intense management of habitats, National Wildlife Refuges provide food, water, shelter, and space to millions of migrating and resident wildlife.

National Wildlife Refuges are far more than havens for wild plants and animals. In fact, over 40 million people visit refuges each year, where they are encouraged to participate in wildlife-dependent recreational activities designated, by law, as the primary activities of the National Wildlife Refuge System. These include environmental education, resource interpretation, hunting, fishing, wildlife observation, and wildlife photography.

Learn more by visiting www.fws.gov/refuges

The mission of the U.S. Fish & Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.



Tualatin River National Wildlife Refuge

Land and Wildlife

Tualatin River National Wildlife Refuge is located within the floodplain of the Tualatin River basin near Sherwood, Oregon. Its topography is predominantly flat bottomland bordered by uplands, and is characterized by rivers and streams, wetlands, riparian woodlands, grasslands, and forested uplands. Refuge habitats include floodplain, seasonal emergent, forested, and scrub-shrub wetlands, Oregon ash riparian hardwood and conifer forests, and oak-pine communities. These areas are among the best representative examples of these severely depleted habitats remaining in the Willamette Valley.



When flooded in fall and winter, the Tualatin River floodplain wetlands support thousands of ducks, arctic-nesting Canada geese, tundra swans, and a variety of other waterbirds. Dominant ducks consist of northern pintail, green-winged teal, mallard, and American wigeon. Canada geese include dusky and cackling subspecies. Tualatin River NWR supports significant breeding populations of wood duck and hooded merganser and, to a lesser extent, cinnamon teal, blue-winged teal, and mallard.

The Refuge is also an important breeding area for neotropical migratory birds as well. Mammals that use the Refuge include deer, coyote, beaver, river otter, and numerous small rodents. Several species of amphibians and reptiles also use the Refuge. Threatened and sensitive species which frequent the area include peregrine falcon, bald eagle, western pond turtle, dusky Canada goose, northern red-legged frog, and winter steelhead.

History of Establishment

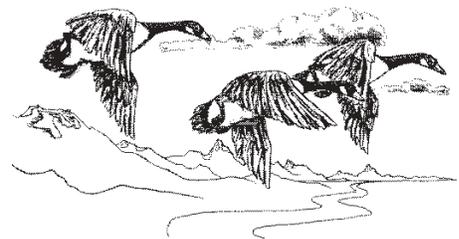
In the early 1990s, the U.S. Fish and Wildlife Service began studying the idea to create a National Wildlife Refuge along the bottomlands of the Tualatin River. Many local residents and leaders recognized that the river and its floodplain had been highly modified by both agriculture and urbanization. This recognition fueled a desire to preserve open greenspace and create an area where future generations could enjoy outdoor recreation and interpretation, and to leave an educational legacy for children. The Service identified a need to protect and enhance floodplains, wetlands, riparian habitats, and upland buffers for a variety of wildlife and for the enjoyment of people. This idea culminated in a decision, in February of 1992, to create the Tualatin River National Wildlife Refuge.

Acquisition Status

The approved acquisition boundary is currently 3,060 acres. An initial 12-acre private donation started the Refuge in 1993. From 1994 through 2004, 1,346 more acres have been protected for a current total of 1,358 acres. A total of 1,702 acres remain to be protected within the approved boundary.

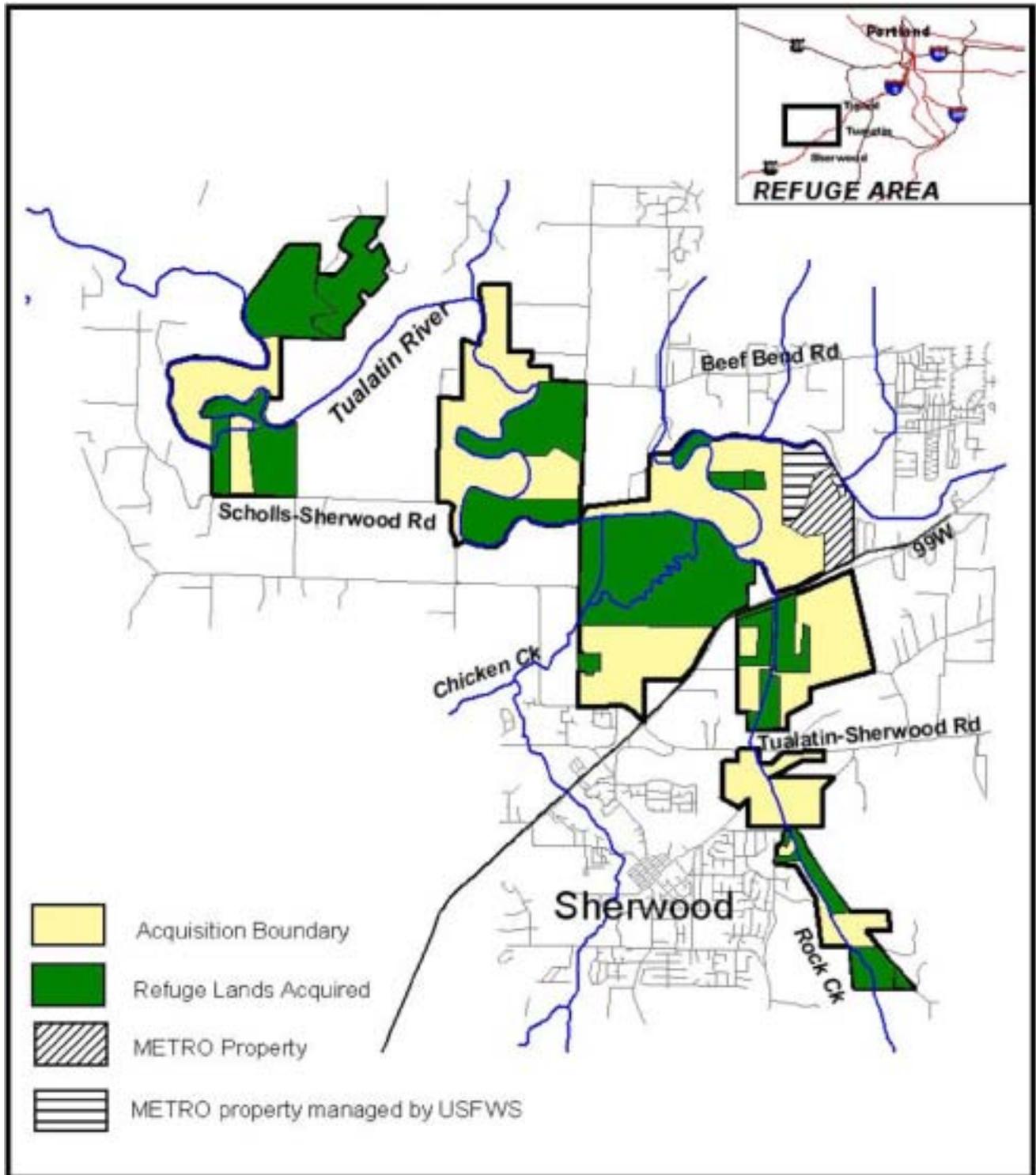
Public Use

The protection of fish and wildlife and their habitats on the Refuge will provide the public with wildlife-oriented recreation, education, and interpretation opportunities. This will help foster environmental awareness to develop an informed and involved citizenry that will support fish and wildlife conservation. People of all ages will experience the beauty of the Tualatin River Valley, view abundant wildlife, and discover what historic landscapes looked like prior to settlement. It will be an ideal setting for the public to enjoy a variety of hands-on educational programs and to learn about wildlife management at Tualatin River National Wildlife Refuge. **Visit us at: www.fws.gov/tualatinriver/**



Tualatin River National Wildlife Refuge

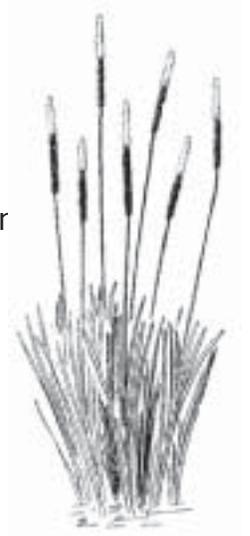
Land Acquisition Status 2006



Managing the Refuge

Refuge Goals

- Protect and restore a diversity of native habitats and associated populations of indigenous fish, wildlife, invertebrates, and plant species of the Tualatin River basin
- Provide high-quality opportunities for wildland- and wildlife-dependent recreation and environmental education to enhance public appreciation, understanding, and enjoyment of refuge fish, wildlife, habitats, and cultural resources, with an emphasis toward urban residents.
- Protect, restore, and develop a diversity of habitats for migratory birds such as neotropical songbirds, wading birds, and shorebirds, with special emphasis on wintering waterfowl.
- Protect and restore floodplain type benefits associated with the Tualatin River including water quality, flood storage, and water recharge.
- Protect, restore, and develop habitats for, and otherwise support recovery of, federally listed endangered and threatened species and help prevent the listing of candidate species and species of management concern.



Why is it necessary to manage the resources?

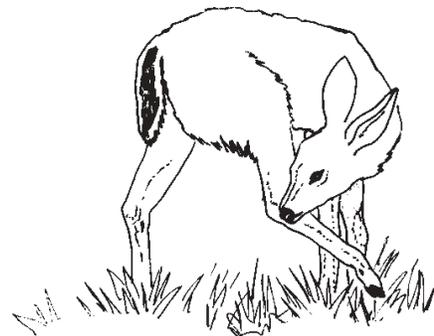
- Loss of habitat due to development
- Pollution from urban runoff, industrial and agricultural activities
- Introduction of non-native plants and animals

How does the Refuge staff manage these resources?

- Designs, develops and implements restoration plans to improve wildlife habitat
- Monitors the populations of wildlife species
- Conducts programs to educate people about the value of the resources
- Acquires additional land to protect and restore
- Controls non-native plants and animals
- Restores native habitats
- Actively manages habitats to be as productive as possible for the benefit of wildlife

How can students help the Refuge?

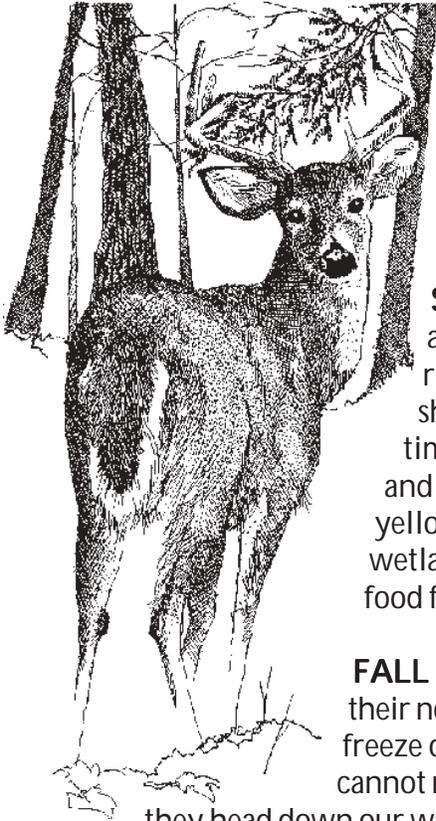
- Learn about habitats, wildlife, and plants
- Protect wildlife from pets by following regulations
- Teach others, including parents, about the Refuge
- Reduce, Reuse, and Recycle
- Get involved in your community
- Preserve natural areas in your own neighborhood
- Never dump anything down storm drains, and label storm drains with warnings



Seasons of the Refuge

Tualatin River National Wildlife Refuge means different things to different creatures. For some it's a place where they raise their young, or a stopover during migration. For others it's a place to spend the winter or a year-round home. Visit the Refuge during many times of the year to discover an ever-changing panorama of wildlife and habitats.

Located on the Pacific Flyway, a major migratory route for many bird species, the Refuge is an important stopover where migrating waterfowl, songbirds, and shorebirds can rest and refuel.



YEAR ROUND - Year round, you can spot bald eagles, native cutthroat trout, American crows, red-winged blackbirds, and several mammals such as coyotes, deer, bobcats, beavers, river otters and small mammals. Long-legged egrets and herons hunt for frogs, fish, and snakes that live in and around the seasonal wetlands. And for raptors, at the top of the food chain, wetlands and meadows offer fish, birds, voles, and other desirable prey.

SPRING and SUMMER - As the water levels in the wetlands are drawn down in the spring, mudflats are created that provide a rich source of invertebrates, a favorite food for migrating shorebirds such as long-billed dowitchers and dunlin. At the same time, migratory songbirds arrive, taking advantage of the insects and seeds that fuel the birds for breeding season. Look for foraging yellow-rumped warblers and song sparrows. As summer progresses, wetland plants grow in the basins. These wetland plants then become food for migrating waterfowl in the winter.

FALL and WINTER - When their northern breeding grounds freeze over, migrating waterfowl cannot reach the food they need. So they head down our way, just as the wetlands are filling with water. Look for northern pintails, green-winged teal, mallards, American wigeons, and cackling Canada geese feeding on the nutritious wetland plants. You may even be lucky enough to spot a bald eagle! Groups will need to be prepared for cold, wet weather during the winter, but the reward is worth it. At times, thousands of waterfowl can be seen at once.



Walking Trails

The Tualatin River National Wildlife Refuge year-round trail traverses several types of habitats over its 1 mile length. At the end of this trail, the wetland observation deck provides expansive views of the wetland basins and the watershed beyond. Walkers must return back on the same one mile trail. There are several environmental education study sites along the way, specifically designed for students to investigate the habitats and wildlife of the Refuge.

Trail Details--things you should know:

- The year-round trail and study sites have a compact surface with grades of 5% or less, making them accessible for visitors using wheelchairs.
- There are seasonal trails that are open largely during the summer months - from May 1 - September 30. These trails have uneven gravel surfaces. Please check with the Refuge on availability of seasonal trails.
- Please stay on the trails—no off-trail use.
- Trails are for walking only. Please no jogging, running, or bicycles.
- Pets are not allowed.
- Please leave plants and animals where they are—no collecting.



Note: Some education activities from this curriculum ask students to collect and investigate resources such as seeds and invertebrates. This type of collecting is approved when activity guidelines are closely followed.

Environmental Education Study Sites

*Distances and approximate hiking times are from the parking lot. The times indicated are for steady walking. Please **ADD TIME** to account for wildlife and habitat observation.*

Wetland Ponds (0.1 mile – 5 minutes)

A wetland is a transitional area between water and land systems where the water table is at or near the surface of the land. This area is usually covered by shallow water.

Oak Savanna (0.2 mile – 10 minutes)

This habitat consists of very old oak trees with grassland beneath them. Compare the newly planted oaks with the mature oaks that are up to 350 years old.

Habitat Edges (0.25 mile – 12 minutes)

This habitat shows how the environment transitions from the oak savanna to the forest. Look for the changes in plants and animals.

Rock Creek – Water Access (0.3 mile – 15 minutes)

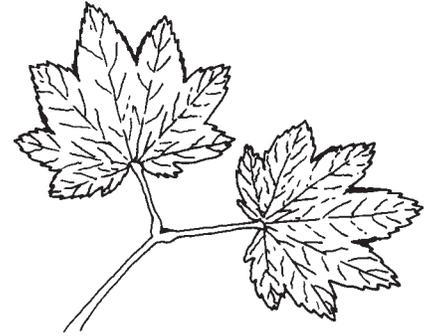
Here you will gain access to a small forest stream, and can observe the plant and animal life associated with streams.

Riparian Forest (0.7 mile – 20 minutes)

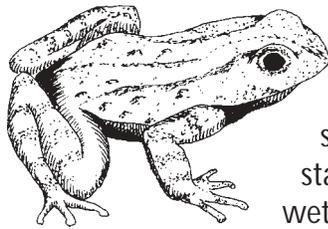
A riparian forest is a habitat that is near a stream and contains specialized plants and animals. The forest floor is thick with ferns and the tree canopy is dense.

Habitats of the Refuge

The Tualatin River National Wildlife Refuge comprises less than 1% of the total area of the Tualatin River watershed, but due to its diversity and richness of habitats, the Refuge supports some of the most abundant and varied wildlife in the entire 712-square-mile watershed. Some of the most common habitats are described below.



Floodplain



Most of the Tualatin River National Wildlife Refuge lies within a floodplain. Floodplains are naturally dynamic places, where rain and river water flow freely over the surface of the land and then recede, in a seasonal ebb and flow. As we restore the floodplain to mimic its original state, we are building the foundation of all Refuge habitats including wetlands, riparian forests, oak savanna and wet meadows. Many kinds of wildlife are responding to the slow changes we are making, and choosing these

habitats as either a home or a stopping point. The Refuge lies within the path known as the Pacific Flyway, a bird migration route along the Pacific Coast. Birds fly from both the north and south, depending on the season, and take advantage of the rich resources of the Refuge.

Emergent Wetlands

Before it was farmed, the lowlands near the Tualatin River were natural seasonal wetlands. Using dikes and controlling water levels, Refuge managers have restored hundreds of acres of wetland habitat. Here's how it works in nature. As the rains come and the river rises each winter, the water can overflow onto the land. Sediment from the river sinks, enriching the soil for native plants adapted to wet conditions. The plants slow the water and filter it, and also provide the perfect food source for wildlife. From the deeper water of winter to the shallow mudflats of summer, the wetlands provide the food and shelter that wildlife depends on. Throughout the year, wetlands attract waterfowl wading birds, shorebirds, songbirds, and raptors, along with a variety of invertebrates, amphibians, reptiles, and mammals. Plants and animals you may expect to see in the wetlands include cattails, bulrush, dragonflies, northern pintails, bald eagles, great blue herons and western sandpipers.

Oak Savanna

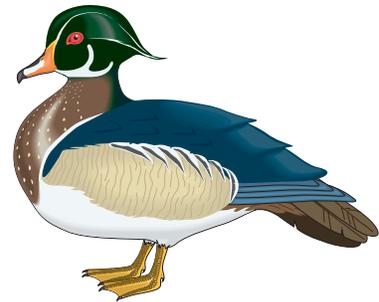
The oak savanna was once a dominant habitat in the Willamette Valley. This community is made up of Oregon white oak with a mostly herbaceous understory such as grasses. Almost all of this habitat type has been either invaded by Douglas fir trees or converted to agricultural uses, leaving only small patches of highly fragmented habitat. The Refuge is fortunate to have several Oregon white oak trees that are more than 300 years old. Also, the Refuge is actively restoring oak savanna communities by planting young oaks and native grasses. The year-round trail winds through a very successful example of one of these oak savanna restoration projects. Wildlife such as rough-skinned newts, garter snakes, western grey squirrels, and western bluebirds make their home in the oak savanna.



Habitats of the Refuge (continued)

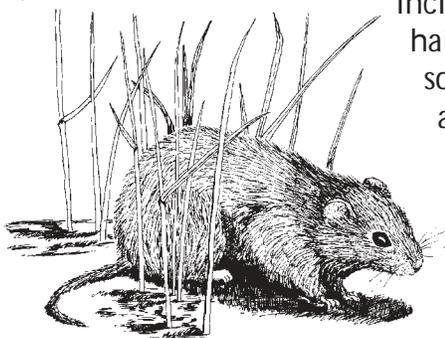
Riparian Forest

Bottomland riparian forests are among the most biologically rich and productive ecosystems in North America, and this habitat occurred historically throughout the floodplains of the Willamette and Tualatin River Valleys. However, less than 8% of this important habitat remains today. It is characterized by an overstory of trees greater than 18 feet tall, with Oregon ash as the dominant tree species. Other trees that are common include black cottonwood, western red cedar, big leaf maple, Douglas fir, and red alder. The native shrubs of this riparian forest generally form dense thickets of red-osier dogwood, Douglas spirea, Pacific ninebark, and vine maple. The plants of a healthy riparian forest help stabilize streambanks, filter sediments, provide shade for streams, and provide habitat for a wide range of wildlife species. Fish such as cutthroat trout and winter steelhead benefit from the fact that riparian forests help keep the river cleaner and cooler. Neotropical migratory songbirds such as common yellowthroats, resident birds like song sparrows, and raptors such as red-tailed hawks use this habitat for foraging and breeding. Cavity-nesting waterfowl such as wood ducks use large hollow trees as nesting sites. Also, look for other types of wildlife such as red-legged frogs and beavers.



Wet-Meadow Prairie

Wet meadows are treeless open areas with wet or clay soils, often located near a high water table. Water moves slowly through this habitat and the meadows may or may not have standing water. Some have expanses of hummock-forming plants called sedges that make them look lumpy. During settlement of the Willamette Valley, expansive wet-meadow prairies quickly disappeared as they were converted to productive farmland. Wet meadows have a great variety of plant species, including important grass or grass-like plants such as sedges, tufted hairgrass, and spikerush. Wet meadows support migratory songbirds, small mammals, reptiles, and amphibians. These animals are prey species that attract wading birds such as great egrets and great blue herons, as well as raptors like northern harriers and barn owls.



Birds of the Refuge

The following list, though not complete, describes some of the birds commonly seen at Tualatin River National Wildlife Refuge.

Belted Kingfisher (*Ceryle alcyon*)

The kingfisher dives from the air, head first, into the water to catch fish with its long beak. They nest in tunnels dug into the banks of rivers and lakes. The kingfishers head and back are gray, and it has a gray band across its white breast. The female also has a rusty-colored band on its belly. Look for belted kingfishers at the footbridge along the year-round trail.



Cinnamon Teal (*Anas cyanoptera*)

The male cinnamon teal has a cinnamon-colored head, neck, and underparts. The female is brown. Males older than 8 weeks have red-orange eyes, yellowish legs, and bright blue on their wings. They breed on the Refuge during spring.

Common Yellowthroat (*Geothlypis trichas*)

The male common yellowthroat has a broad black mask and a bright yellow throat and breast. The female lacks the black mask and is more olive colored. The Yellowthroat can be found in grassy fields, in shrubs and near wetlands. It often holds its tail cocked like a wren. Its song is a loud, rolling *wichity wichity wichity wich*.



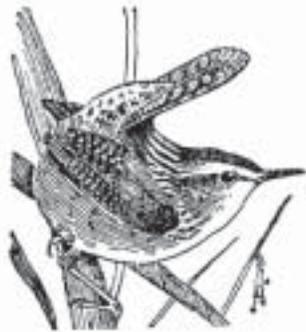
Great Blue Heron (*Ardea herodias*)

One of the larger wading birds, the great blue heron stands 4 feet tall. It is slate blue with a white head, and has a black stripe extending above the eyes and a white foreneck streaked with black. The great blue heron is graceful and majestic, as are all herons. It eats fish by spearing one with its long beak, flipping the fish upwards, and catching it in mid-air! The heron also eats frogs and mice, and is found in most habitats of the Refuge.

Birds of the Refuge (continued)

Mallard (*Anas platyrhynchos*)

The male mallard is identified by his metallic green head and neck, yellow bill, narrow white collar, and chestnut breast. Black tail feathers curl up. A mallard is a “puddle duck” that feeds with its tail in the air and head underwater. The mallard is one of the most abundant species found on the Refuge during the winter waterfowl migration.



Marsh Wren (*Cistothorus palustris*)

This little bird has a brown crown, bold white eye line, black triangle streaked with white on its upper back, and underparts that are mostly white. The marsh wren’s call sounds like a lawn sprinkler, *whish, whish*. It is found in reedy freshwater marshes.

Northern Shoveler (*Anas clypeata*)

The shoveler has a large, spatula-like bill that is longer than its head. The male has a green head, white breast, and brown sides. The female has a grayish bill tinged with orange. The shoveler is found in the seasonal wetlands of the Refuge.



Pied-billed Grebe (*Podilymbus podiceps*)

The pied-billed grebe is a small, stocky brown bird that has a black ring around its stout whitish bill, a black chin and throat, and a pale belly. It nests around marshy ponds and sloughs and tends to hide from intruders by sinking like a submarine until only its head shows. Like owls, grebes spit up pellets of indigestible materials such as bones.

Red-winged Blackbird (*Agelaius phoeniceus*)

In the spring, the red-winged blackbird is commonly found nesting near a freshwater pond. The male has a black body with a red patch on the wings, while the female typically has a browner, striped tone. Both have a relatively stocky body with rounded wings and a fairly short tail.



Birds of the Refuge (continued)

American Goldfinch (*Carduelis tristis*)

This is a bright-yellow bird with a black cap and black wings. It is common in flocks in weedy fields, bushes, roadsides, and seed-bearing trees. American goldfinches are regulars at backyard bird feeders.

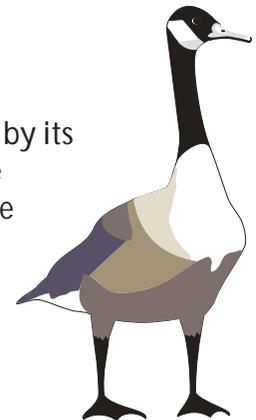


Barn Swallow (*Hirundo rustica*)

This swallow has an iridescent blue back, and a cinnamon-colored belly and throat. Most distinctive is its long, deeply forked tail. It makes open cup-shaped mud nests. If it can't find any mud, it makes its own by walking in water and then soil. It eats insects while flying.

Canada Goose (*Branta canadensis*)

The Canada goose is the most common and best-known goose. It is identified by its black head and neck and broad white cheek. Canada geese can be seen in large flocks, grazing in open fields within commuting distance of water. The Refuge has two primary subspecies, the western and the cackling Canada goose, which differ greatly in size and slightly in color. The characteristic honking of the larger western is well known.



Killdeer (*Charadrius vociferus*)

Killdeer have two black stripes on a white breast. They are common in fields and pastures as well as on shores and riverbanks. The killdeer eats insects, worms and grubs, and is a skilled actor, feigning injury to distract intruders away from its nest.

Northern Harrier (*Circus cyaneus*)

Both sexes of the harrier have a distinct white area between the lower back and tail called a white rump patch. The female is brown above and white below with dark streaks, while the male is gray above and white underneath. The harrier flies close to the ground searching for mice, rats, frogs, rabbits, small birds, and other small prey.



Birds of the Refuge (continued)

Peregrine Falcon (*Falco peregrinus*)

The peregrine falcon is large and stocky with pointed wings and a short tail. The peregrine has a dark head, uniformly patterned underwing, and gray or dark barring on its belly. The fastest-diving bird, the peregrine dives on smaller birds at speeds of up to 200 miles per hour! Peregrines can be seen hunting around the Refuge's seasonal wetlands.

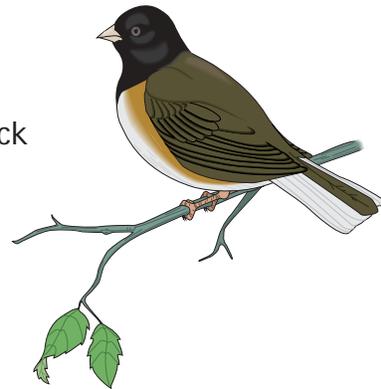


Common Flicker (*Colaptes auratus*)

The flicker is a jay-sized woodpecker with a brown back and a black breast crescent. In flight, note its white rump and the salmon color under its wings and tail. The flicker is often seen on the ground eating ants. It is common in open country near large trees. The call is a loud repeated *flick* or *flicker*.

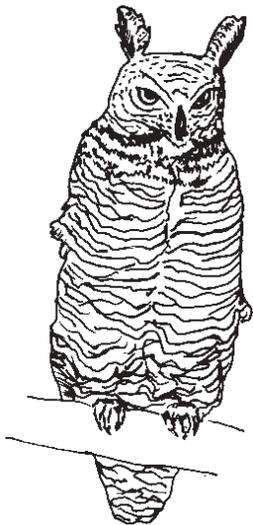
Dark-eyed Junco (*Junco hyemalis*)

The junco is a rather tame sparrow with light pink bill, gray or black hood and white outer tail feathers that are visible when it flies. Often seen in flocks, they hop on the ground and pick up small seeds. In winter, juncos are easily attracted to feeding stations.



Great Horned Owl (*Bubo virginianus*)

This large nocturnal owl is distinguished by its large "ear" tufts (they are actually feathers, not ears!). The great horned owl will take prey as large as skunks and often preys on baby barn owls. They can be found in the Refuge's riparian zone.



Birds of the Refuge (continued)

Pileated Woodpecker (*Dryocopus pileatus*)

This large woodpecker has a prominent red crest, and black and white head, and black back with white under wings. The pileated woodpecker eats insects from the trees in which it drills its nest. Once abandoned, its nest is then used by a squirrel, swallow or wood duck family.



Spotted Towhee (*Pipilo erythrophthalmus*)

This large, ground-feeding sparrow has rufous (reddish) sides, a white belly, and a long rounded tail with large white spots. Its back is spotted with white. Towhees are commonly seen in brush, heavy undergrowth and wooded margins. They hop with both feet together, and usually fly close to the ground.

Song Sparrow (*Melospiza melodia*)

The song sparrow has a long, rounded tail, that it pumps during flight. It has a distinctive broad, grayish eyebrow and broad, dark stripe bordering its whitish throat. Its upper parts are usually streaked and its breast is also heavily streaked, with lines converging at a central spot. Its legs and feet are pinkish. Song sparrows are common and are often found in dense brush.

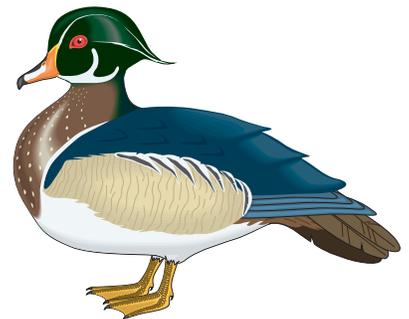


Red-breasted Nuthatch (*Sitta canadensis*)

This small acrobatic bird climbs up, around or down a tree trunk head first. Its white face, solid black cap and black eye stripe are distinctive. Both males and females have a pale orange underbelly. Its call is a weak, nasal *yenk*, and it is common in deciduous woodlands.

Wood Duck (*Aix sponsa*)

The wood ducks large head, short neck, and long square tail are good field marks. The male is distinctively colorful, and no other duck has the long slicked-back crest. It feeds on plant materials, from duckweed to acorns, and some insects. Nesting is in natural tree cavities or nest boxes. Wood ducks are fairly common in open woodlands near ponds or rivers.



Birds of the Refuge (continued)

American Wigeon (*Anas americana*)

The wigeon is a surface-feeding duck that eats mostly aquatic plants. In flight, wigeons appear mostly brown with a white wing patch. The male has green and white on the top of its head. The wigeon is commonly seen in the fall and winter.

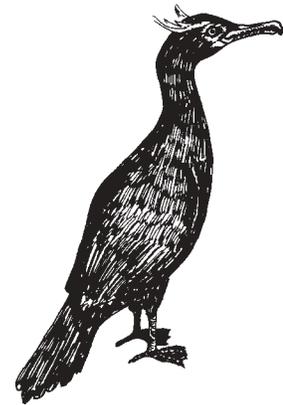


Bald Eagle (*Haliaeetus leucocephalus*)

An adult bald eagle is readily identified by a white head and tail and huge yellow bill. The immature bald eagle is mostly dark brown; it takes four or five years for a bald eagle to reach full adult plumage with the white head and tail feathers. It regularly feeds on waterfowl. The bald eagle was formerly an endangered species, but populations are increasing thanks to intense recovery programs.

Double-crested Cormorant (*Phalacrocorax auritus*)

This cormorant's large, rounded throat pouch is orange year round. The "double crests" are seldom visible. Its body is black throughout. Its kinked neck is distinctive in flight, and it flies with rapid wing beats. The cormorant is commonly found along the Tualatin River and can be seen perched on standing dead trees in the seasonal wetlands.



Northern Pintail (*Anas acuta*)

When feeding, this dabbling duck "tips over" for its meal (plant matter), showing off its long tail feathers. The male has a chocolate brown head and white neck with a dark stripe down the back. Black central tail feathers extend to form a "pintail." Thousands of northern pintails can be seen foraging on the Refuge during fall and winter.

Mammals & Amphibians of the Refuge

The following list, though not complete, describes some of the birds commonly seen at Tualatin River National Wildlife Refuge.

Beaver (*Castor canadensis*)

The beaver is a rodent with long incisors, webbed feet, and a long flat tail. It constructs a dam for its home in lakes and streams by chewing down trees with its large teeth. Usually very shy and most active at night, beavers can be difficult to see, but they leave distinctive “chew marks” on trees throughout the Refuge.

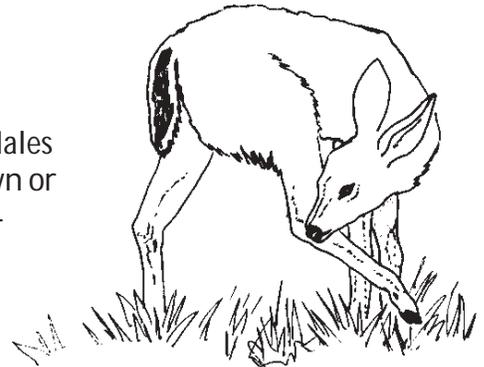


Coyote (*Canis latrans*)

The coyote has large pointed ears and a fluffy tail. About the size of a large domesticated dog, its tracks can be mistaken for those of a dog. Coyotes eat small rodents, hares, Canada geese, sometimes larger animals such as newborn fawns, and even berries.

Black-tailed Deer (*Odocoileus hemionus columbianus*)

Black-tailed deer are commonly seen foraging on the Refuge. Males grow branching antlers. Both males and females have dark brown or black flattened tails with white underneath. Like all deer, black-tailed deer browse exclusively on vegetation.



Northern Red-legged Frog (*Rana aurora aurora*)

The northern red-legged frog grows up to 10 cm in length. Its upper surface and sides are usually reddish brown, with a few dark spots or blotches, while the underside of the belly and inner legs are a pinkish red. It lives in or near marshes, streams and ponds, and is usually voiceless.

Pacific Treefrog (*Hyla regilla*)

The adult Pacific treefrog is about 4 cm long and can range in color from green to brown to gray. It typically has dark blotches on its legs and is characterized by a white-bordered dark streak running through each eye. Its call sounds something like *wreck-it*. Pacific treefrogs, like most treefrogs, have sticky finger pads that allow them to grip onto trees.



Mammals & Amphibians of the Refuge

(continued)

Mink (*Mustela vison*)

The mink is a mammal that can grow to the size of a small house cat. It has a long slender body, short legs, slender tail and dark brown fur. Mink can be found around freshwater marshes, streams and lakes. They eat muskrats, voles, fish, shorebirds, young ducks and amphibians. The main predators of mink are humans (for their fur), hawks and owls.

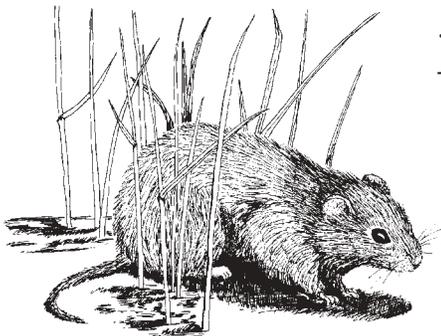
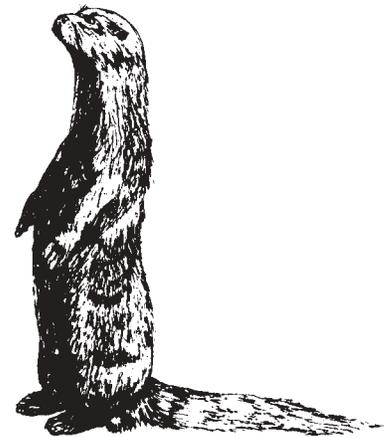


Deer Mouse (*Peromyscus maniculatus*)

The deer mouse is small with large membranous ears. They primarily eat seeds and fruit and can be found in grassland, shrub and woodland habitats. Deer mice are preyed upon by raptors and owls.

River Otter (*Lutra canadensis*)

The river otter is a fur-bearing mammal with large canine teeth, a long slender body, short legs, four webbed feet and a long tail covered with dense fur. River otters live in streams, large lakes, rivers and sea coasts. They eat a variety of fish, frogs, and occasionally small diving birds and small mammals. River otters tracks are commonly seen along the Refuge's muddy stream banks.



Townsend's Vole (*Microtus townsendi*)

This small mouse-like mammal has a rounded nose, short bi-colored tail, and long front teeth for gnawing. Voles are most commonly found in grassland and woodland areas and eat seeds, roots, berries and mushrooms. They are important to many plants because they help scatter seeds and spores, and they create tunnels that aid water absorption into the soil. Voles are abundant and a primary food source for many predators.