

**Great Meadows National Wildlife Refuge**

**Mailing address:  
73 Weir Hill Road  
Sudbury, MA 01776**

**Physical address:**

**Monsen Road  
Concord, MA 01742  
978/443 4661  
978/443 2898 Fax  
[http://www.fws.gov/refuge/great\\_meadows/](http://www.fws.gov/refuge/great_meadows/)**

**Federal Relay Service  
for the deaf and hard-of-hearing  
1 800/877 8339**

**U.S. Fish & Wildlife Service  
1 800/344 WILD  
<http://www.fws.gov/>**

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**U.S. Fish & Wildlife Service**

# Great Meadows

*National Wildlife  
Refuge*

## *Concord Unit Trails*



*printed on recycled paper with vegetable based inks*

## Welcome



*This goose, designed by J.N. Ding Darling, has become the symbol of the National Wildlife Refuge System.*

Great Meadows National Wildlife Refuge is one of more than 560 refuges in the National Wildlife Refuge System which is administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife resource management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys, and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.



Welcome to the Great Meadows National Wildlife Refuge – Concord Unit, which is considered one of the best inland birding sites in Massachusetts by noted ornithologists. This is a "Leave No Trace" area. The 2.7 miles of trails within the unit, including the Dike, Timber, Edge, and Black Duck Creek trails go through a variety of habitats that harbor various species including a variety of migratory waterfowl.

Please note: there is an entrance fee for this site. Information and self-pay station are located at parking lot.

The Dike Trail is part of the original 250 acres donated by Samuel Hoar in 1928 establishing the Great Meadows National Wildlife Refuge.

A good place to start your walk is from the observation tower beside the parking lot. From here you can best see the full extent of the upper pool to the left and the lower pool to the right, separated by the dike trail down the middle. We commonly refer to these pools as 'impoundments', indicating that these pools are man-made rather than natural ponds.

*Red-winged blackbird*



The dike itself is also man-made. It runs between the upper and lower pools and turns to the east along one side of the lower pool separating the "meadow" from the river. Visitors can get an even closer look on our observation platform located midway on the dike.

## Common Sights and Sounds

While walking along the Dike Trail, you can expect to see or hear several wildlife species, particularly birds.

By far the most common and noisiest residents of this wetland are red-winged blackbirds. These birds are easy to identify by their glossy black plumage and unmistakable vibrant orange and yellow shoulder-patches. Red-winged blackbirds nest early in the spring and summer, but are seen perched at the tops of the maple saplings and button bush along the fringes of the pools throughout the summer.

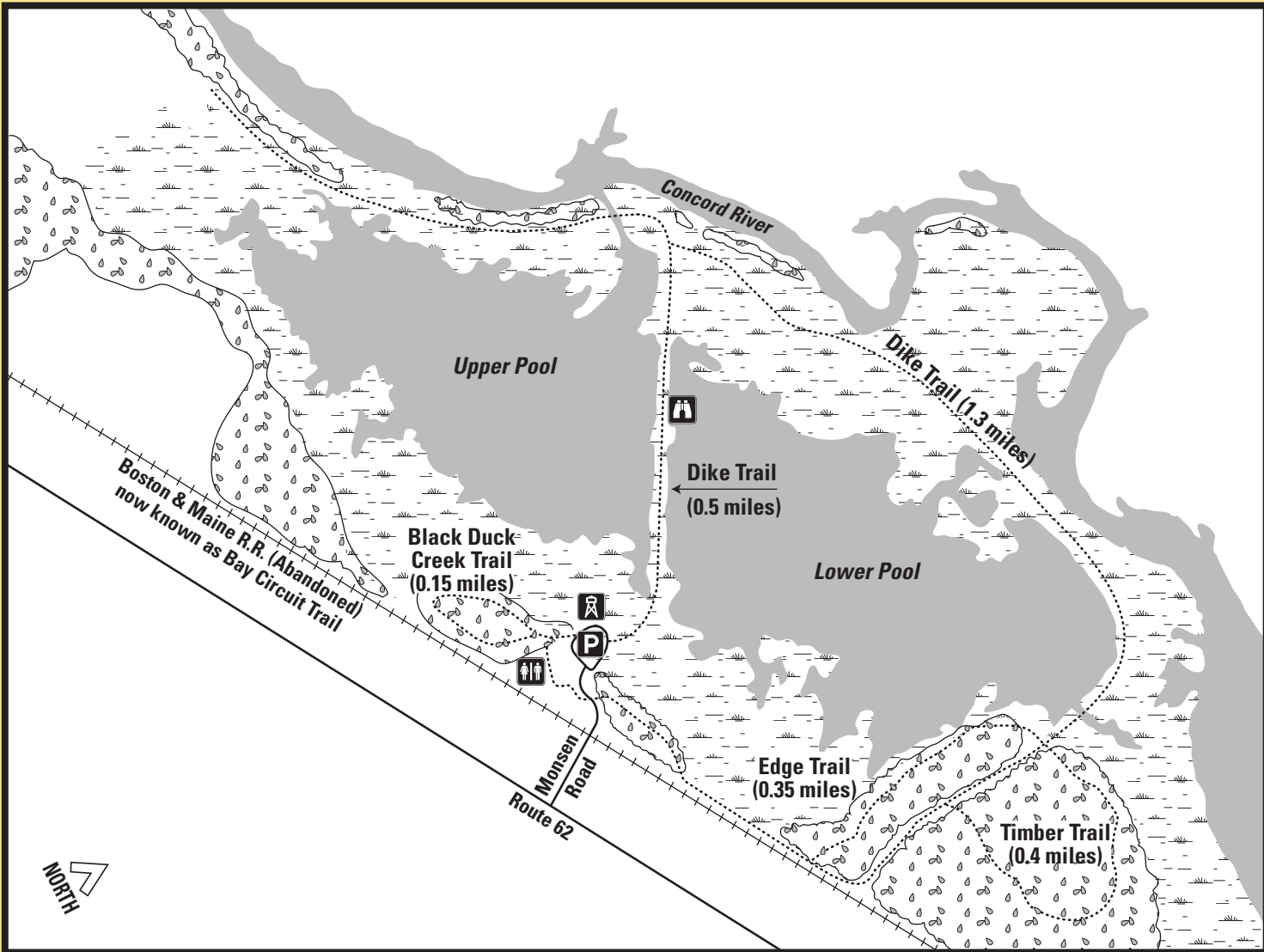
Great blue herons are another frequent summer visitor to the pools. These tall blue-grey birds are often seen standing in the shallows where they hunt fish and frogs, or flying slowly and gracefully over the water.

Northern water snakes, leopard and bull frogs, marsh wrens, swallows, swifts, muskrats, and various colorful species of dragonflies are also common sightings along the dike.

## Dike Trail (1.7 miles)



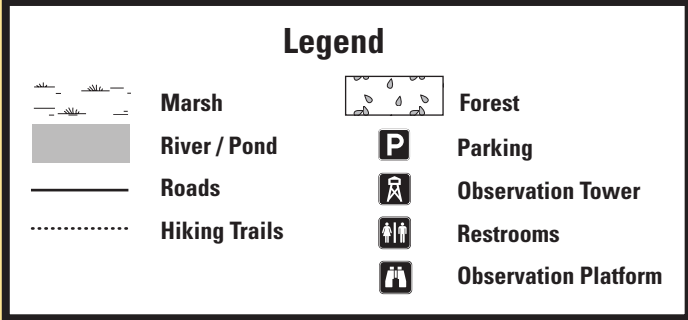
*Great blue heron*  
©Julien Beaugard



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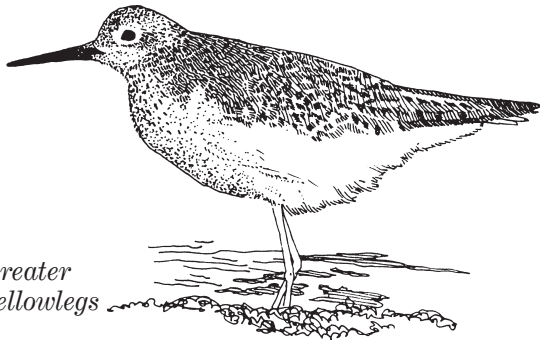
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*Concord Unit Trails*



## Migratory Waterfowl and Water-level Management

Every summer the two impoundments are systematically drained into the Concord River, and then refill with river water later in the season. The resulting mud flats provide ideal feeding grounds for many species of shore birds and waterfowl that migrate in mid to late summer. On any given day in late July or August, visitors may see a wide range of birds including various species of sandpipers, killdeer, lesser and greater yellowlegs, and great egrets. Large numbers of great blue herons, ducks and Canada geese are also attracted to these muddy and nutrient-rich feeding grounds.



Greater yellowlegs

## Native Plants and their roles



Cattails

Native plant species such as cattail, pickerelweed, wild iris, arrowhead, and American lotus are all emergent plants. Their stems are ridged so that they can extend beyond the surface of the water.

Water lilies and duckweed are two of the many floating plants common in the upper and lower pools. Their leaves rest on the surface of the water to obtain the maximum amount of sunlight. These plants are either connected to the soil by long weak stems or float free on the surface. Many animals such as ducks and muskrats depend on these plants for food, and fish depend on them for shade and cover.

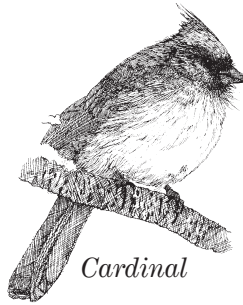
## Invasive Plants



Purple loosestrife

One of the biggest threats to the delicate ecosystem at Great Meadows is the spread of invasive exotic plants, primarily water-chestnut (*Trapa natans L.*) and purple loosestrife (*Lythrum salicaria*). These 'invaders' are very aggressive and out-compete native plants while providing little or no value to wildlife.

There are numerous methods used to control or eliminate invasive species, including mechanical and manual harvesting, herbicides, biological controls and water-level manipulation. For example, biologists at Great Meadows have used the galerucella beetle (*Galerucella pusilla*), to control the growth of purple loosestrife. Native to the plant's European habitat, the beetle feeds exclusively on the plant's leaves, flowers, stems and roots. This natural method of controlling purple loosestrife has no adverse affects on the surrounding environment.



Cardinal

Draining pools where water chestnut grows is another example of naturally controlling invasive species. The drained pools leave the water chestnut seeds (called caltrops) dry and infertile, allowing more beneficial, native plants to grow.

## Timber Trail (0.4 miles), Edge Trail (0.35 miles), and Black Duck Creek Trail (0.15 miles)

Each of these trails winds through woodland dominated in places by pines and oaks, and in other places by maples. Gray catbirds, eastern wood-pewees, cardinals, phoebes, and flycatchers are some of the various song birds which make these habitats their homes.

We hope you have enjoyed the trails here at Great Meadows. Trails are open sunrise to sunset. Please come again soon!