



Wood frog



Blue-spotted salamander



Blanding's turtle

conserving maine's significant wildlife habitat

VERNAL POOLS

Temporary Habitats That Need Permanent Protection

Vernal pools are usually small—often less than one acre—but their ecological impact for wildlife is much bigger. Even though vernal pools may only fill with water for a short time in spring and fall, they provide important breeding habitat for amphibians and invertebrates (small, soft-bodied animals). What draws these specialized species to breed in such temporary pools? It's actually something the pools *don't* have: fish. Isolated from streams and subject to periodic drying, vernal pools provide a nearly predator-free haven for the development of eggs into young animals. The amazing amount of life emerging from these pools each year then provides an important food source for larger animals from far into the surrounding forest, including raccoons, coyotes, snakes, hawks, turkeys, and numerous other predators.

The same temporary nature that makes vernal pools unique breeding habitat also puts them at high risk from develop-

ment. Without water for much of the year, vernal pools can be easy to miss. They can also fall through gaps in existing state and federal wetland regulations that are better designed to protect larger, more permanent wetlands. Significant Wildlife Habitat rules are an important tool to increase protection of Maine's most important vernal pools, and to balance that protection with well-planned development.

What is Significant Wildlife Habitat?

Significant Wildlife Habitat is an area protected under Maine's Natural Resources Protection Act. The Maine Department of Environmental Protection (DEP) has established criteria to identify *significant* vernal pools, those with the highest value to wildlife. While forest management is exempt, other development activity within 250 feet of significant vernal pools may require a permit from DEP. The permit review process helps assure that any activities in and around significant vernal pools are done in ways that avoid harm to both wildlife and habitat.



Vernal pool with ice

Unique Species in Special Pools

Wood frogs are the first frogs to emerge in spring, and can be heard calling from vernal pools that are sometimes still partially covered with ice. The males call in loud choruses that sound like quacking ducks for about two weeks in the spring, while the females each lay just one egg mass that can contain more than 1,500 individual embryos. After the brief breeding season, adult wood frogs will move as much as 1,500 feet away from the vernal pool to their summer habitat in nearby forest, often a forested wetland. The eggs hatch into tadpoles in about three weeks. About two months later, anywhere from early June to mid-August, they transform into miniature frogs about the size of a thumbnail. Both adults and young frogs will spend the winter hibernating on the drier, upland forest floor under leaves or in rotting logs and stumps.

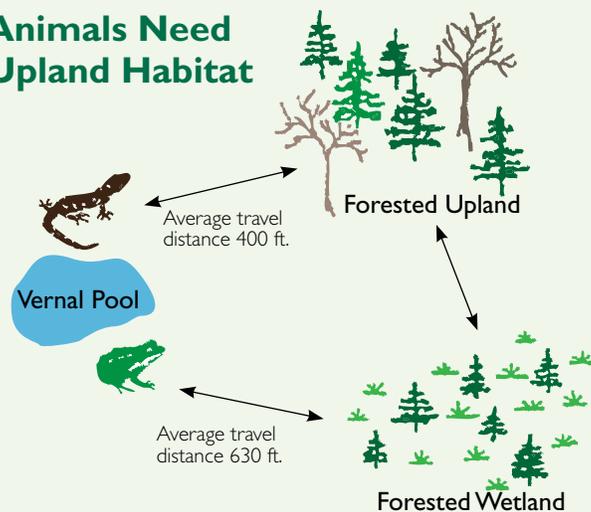
Blue-spotted and spotted salamanders are two types of mole salamanders that spend most of the year hidden in underground tunnels made by small mammals, eating insects, earthworms and other invertebrates. They prefer damp, moderately shaded forests, and amazingly, they can live to be 15 to 20 years old! Each spring they travel at least 400 feet from forest habitat to vernal pools to breed. Spending up to six weeks in and around the pool, females lay their eggs in loose masses. The eggs develop into larvae within a couple months, and by fall the larvae transform into miniature adult salamanders. Both salamander species hibernate on the forest floor in burrows and root channels, or under large logs.

Fairy shrimp are aquatic crustaceans, up to one and a half inches long, that tend to congregate in sunny patches in vernal pools where they swim upside down and feed on tiny soft-bodied animals called zooplankton. Adult fairy shrimp cannot tolerate warm water (above about 70° F) and are typically not found in Maine's vernal pools beyond May or June. Their eggs, however, tolerate warm temperatures and will also survive long after the vernal pool has dried out. In fact, fairy shrimp eggs may remain viable for several years before hatching, perhaps explaining why adults may not appear every year in a given pool. The seemingly magical and unpredictable appearance of adult fairy shrimp is what gives them their name.



PIOTR NASRZECKI

Vernal Pool Animals Need Upland Habitat



Beyond the Pool: The Importance of Protecting Upland Habitat

The forested uplands surrounding vernal pools are critically important for the survival of vernal pool amphibians. Pool-breeding species travel from the pools to forested and other wetland habitat where they can find abundant food, safety from predators, and places to hibernate. A vernal pool in isolation from these other important habitats will not sustain its amphibian population. To maintain healthy populations of vernal pool wildlife, it is important to maintain relatively undisturbed forest adjacent to pools. It is also important to maintain corridors of habitat among clusters of vernal pools, since amphibians and turtles may use multiple pools as stepping stones on their way to and from other habitats.



Spotted and blue-spotted salamanders

KEVIN J. RYAN



ARAM CALHOUN

Wood frog egg masses in a vernal pool



MEGAN GAHL

Wood frog

The designation of Significant Vernal Pools protects a unique and discrete wildlife habitat that is critical to a wide range of species, but allows for well-planned and placed development. Balancing conservation with development is key to maintaining functional habitat and healthy populations of all species of wildlife and for maintaining Maine's special quality of place.

Why Protect Vernal Pools?

For some species, vernal pools are irreplaceable. Some species are adapted to the temporary nature of vernal pools in early spring, so they breed more successfully in this habitat than in permanent water bodies. These species breed quickly when conditions are suddenly favorable, and their eggs and larvae have adapted to grow quickly. They can't simply move to a pond or swamp and expect to have the same success.

Amphibian species depend on the same pool from year to year. Vernal pool amphibians will return to breed in the place where they hatched. If a pool is filled or somehow altered by human activity, the amphibians that have used it in the past will return to breed even if the habitat is severely degraded.

Vernal pools are important habitat for rare species.

A number of rare species depend on vernal pools for feeding, breeding, resting, and hibernating including Blanding's turtle (state endangered), spotted turtle (state threatened), ringed boghaunter dragonfly (state threatened), featherfoil (state endangered plant), wood turtle (state special concern) and eastern ribbon snake (state special concern).

Many wildlife species use vernal pools as part of their habitat. Vernal pools are veritable fast-food stops for birds, reptiles, and other amphibians moving through our forests. Bear, moose, deer, raccoon, mink, skunk, and other small mammals stop at pools regularly to drink and to feed on amphibians, their eggs and larvae, and newly emerging spring vegetation.

Vernal pools support ecosystems far beyond their borders. As the summer progresses, hatching insects and juvenile amphibians emerge from vernal pools, providing an important food source that disperses far into the surrounding forest and feeds a wide variety of wildlife.



Ribbon snake



Which areas Qualify as Significant Wildlife Habitat?

About a third of the vernal pools surveyed so far have been designated as Significant Vernal Pools. The determination of “significance” is based on specific abundance criteria for wood frogs, fairy shrimp, spotted and blue-spotted salamanders or the presence of a rare, threatened, or endangered species whose life history is closely associated with vernal pools. Unlike some other Significant Wildlife Habitats, most Significant Vernal Pools have not been mapped.

A permit from DEP may be required for development

within 250 feet of Significant Vernal Pools. With a permit, landowners can alter a portion of that area, as long as they maintain 75 percent of the adjacent habitat as unfragmented forest and do not disturb the pool depression. While the 250-foot radius is a required minimum, many amphibians migrate up to four times this distance from vernal pools. Towns and individuals are encouraged to protect larger areas that will allow for annual movement among pools, summer habitat, and upland wintering sites.

What You Can Do:

- If you think you have a significant vernal pool on your property, contact the nearest regional DEP office to talk with a staff person and request a site visit.
- If you are planning to build or conduct other regulated activities near a Significant Vernal Pool, contact your local DEP office for more information about the permit process so you can efficiently plan activities to avoid impacts.
- If you are working on local land conservation efforts in your town or region, learn more about Significant Wildlife Habitats in your community by looking at SWH maps from the Maine DEP website (www.umaine.gov/dep) or by consulting your town’s High Value Plant and Animal Habitat map from Beginning With Habitat (www.beginningwithhabitat.org).
- Do not walk through vernal pools or disturb amphibian eggs, especially in early spring. View pools from the edge, using binoculars to get a closer look.
- Do not remove eggs, or move them from a pool if it is drying up. Losing some eggs each year is part of a long-term breeding strategy for vernal pool breeders.
- Keep a healthy forest canopy near vernal pools, and leave dead branches and logs on the forest floor. Dead leaves that fall into vernal pools are a primary source of food for tadpoles and salamander larvae. Downed logs provide safe cover for juveniles and adults in the forest.
- Use organic fertilizers for your lawns and gardens. Amphibians readily absorb pesticides through their skin, which can cause deformities and reproductive problems in some species.

For More Information:

Department of Environmental Protection

www.maine.gov/dep, search for “vernal pool”

Bureau of Land and Water Quality (*Augusta*)

(207)287-3901 or 1-800-452-1942

Southern Maine Regional Office (*Portland*)

(207)822-6300 or 1-888-769-1036

Eastern Maine Regional Office (*Bangor*)

(207)941-4570 or 1-888-769-1137

Northern Maine Regional Office (*Presque Isle*)

(207)764-0477 or 1-888-769-1053

Department of Inland Fisheries and Wildlife

www.mefishwildlife.com

For questions about SWH regulations, please contact the Environmental Coordinator (207) 287-5258

For questions about wildlife and habitats, please contact staff at Beginning with Habitat (207) 287-5254 or visit www.beginningwithhabitat.org

Maine Audubon

(207)781-2330, www.maineaudubon.org/swh

Maine Vernal Pools Project

Maine Audubon and the University of Maine (*Orono*)
www.umaine.edu/vernalpools

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