



Photo: Martin Neptune

Pəskehtək^wok

Joining of the Branches

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Penobscot Indian Nation
 Department of Natural Resources
www.penobscotnation.org/DNR/DNR1.htm

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VERNAL POOL TIME

Text for this article was taken directly from the Inland Fisheries & Wildlife (IFW) poster on vernal pools, their fact sheets on particular species, and Maine Audubon documents and web pages.

Vernal pools get their name from the Latin word for spring, **vernalis**.



Vernal pools are small isolated wetlands, usually not connected to streams or larger wetlands, that are filled by spring rains and melting snow but often dry out by late summer. In the spring, these ephemeral spring wetlands explode with the sounds and sights of ducks, frogs, salamanders, turtles, dragonflies, water beetles, and other creatures. With the onset of summer, pools become surprisingly dormant, providing few clues about the excitement that occurred just weeks earlier.

May flowers are not all that April's showers bring in the northeast. Spring rains and warm temperatures also herald spectacular, though often unseen, wildlife migrations. On the first warm rainy evenings of spring, legions of wood frogs and salamanders emerge from their deep, leafy forest retreats to hop and crawl toward small woodland pools. This marks one of the first signs that spring has finally arrived.

What makes these temporary wetlands unique is that absence of fish. Some animals - such as wood frogs, spotted salamanders, spadefoot toads, and fairy shrimp - are defenseless against fish predators and breed most successfully in fishless environments. Though safe from fish, animals that breed in vernal pools



must contend with the drying clock of summer. During drought years, pool-breeding species may suffer catastrophic losses if their habitat dries up too soon.

In addition to the species dependent upon these pools for successful reproduction, vernal pools are also used for feeding and resting by many other animals, such as spring peepers and grey tree frogs, even though they can successfully reproduce in permanent waters or other aquatic habitats.



SPOTTED SALAMANDERS

- These salamanders are also called mole salamanders because of the burrowing habits of adults who live most of their lives underground in root cavities and the burrows of small mammals. They may live as deep as three feet below ground.
- Adult salamanders emerge on the first relatively warm rainy nights of early spring.
- It is estimated that most animals return to the pools from which they emerged.
- Male salamanders migrate to

the breeding pool first and wait for the females to arrive.

- Adult salamanders will migrate up to one-half mile to reach breeding pools.
- The eggs are generally laid in gelatinous masses attached to vegetation in the water.
- The eggs hatch in three to eight weeks. The larvae are entirely aquatic and breathe with external gills. They gradually develop legs and jaws during their time in the pool.
- Larvae are carnivorous, eating insect larvae, small crustaceans, and aquatic worms. Under crowded conditions, larvae may become cannibalistic.
- After two or three months (usually between July and September), they transform into young adults. When they have lost the last traces of their gills, they leave the pool to begin the next phase of their lives.
- Salamanders may live up to 15-20 years.

SPOTTED TURTLES

- These turtles emerge in April.
- They eat amphibian eggs and larvae (tadpoles). This abundant food supply is critical to their survival because they likely consume much of their yearly food needs in May and June.



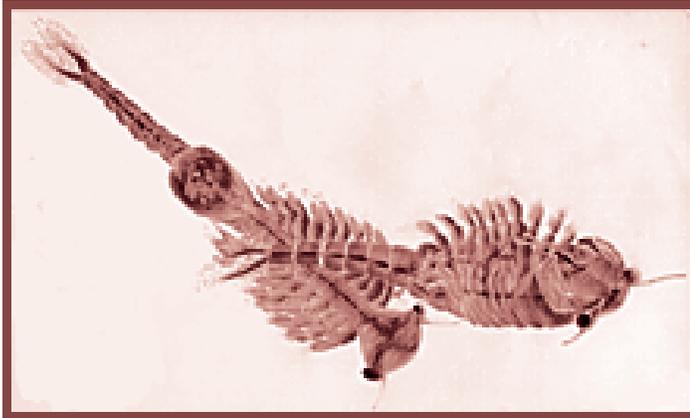
- They travel an average of 3/4 mile per year and use up to 3 different wetlands.
- They attain sexual maturity at 7-10 years of age.
- Mating occurs from March to May.
- Nests are often concentrated in human-created habitats where nest loss may be high from predators or road grading.
- Incubation time depends on soil temperature, but typically lasts 88-125 days and hatching occurs in September and October. Eggs may not hatch in cold, wet summers.
- Hatchlings probably overwinter in nearby wetlands but little is known of their habitat use and movements until they become adults.
- As vernal pools dry and food supplies diminish, adults may wait-it-out in upland areas in late summer. During this time they burrow into forest leaf litter within 260 feet of the nearest wetland.
- When fall rains come they move to wetlands for hibernation - sometimes communally.

WOOD FROGS

- Wood frogs rouse from hibernation sites and begin their annual migration to breeding ponds when melting snow and spring rains saturate the ground (some males move closer to breeding pools to hibernate in the fall).
- Although spring peepers are more familiar as harbingers of spring, wood frogs often appear first. Remarkably adapted to the cold, it is not unusual to find the earliest migrants swimming where ice remains in the water nearby.
- Wood frog calling, mating, and egg-laying occur mainly in the early night hours and gradually diminish toward dawn. Calling and breeding activity also occurs during the day in undisturbed locations.
- Wood frogs are described as explosive breeders because the entire sequence of appearance, mating, egg laying and return to the terrestrial habitat is accomplished in a very brief time. This may be as short as a week in some pools but, in rare instances, may extend up to 30 days.
- The emerging tadpoles transform into adults some 6 to 15 weeks later.
- Young tadpoles feed on algae and microorganisms scraped from aquatic vegetation. They may also feed on spotted and blue spotted salamander eggs. As they grow older, some other plant and animal matter is consumed.
- Adults summer in cool, moist woods and consume a wide variety of invertebrates including slugs, spiders, and worms.
- Wood frogs live from 3-5 years.
- Little is known about the ecological role of wood frogs in upland forests. However, they are present in large numbers in northeastern woodlands.



- Given their abundance and diet of forest invertebrates, it is likely that wood frogs influence decomposition rates and nutrient cycling in upland forests.



FAIRY SHRIMP

- Fairy shrimp are small crustaceans restricted to vernal pools.
- They are greatly restricted seasonally. Their temperature tolerance is limited to 40 to 60°F (4 to 20°C).
- They appear soon after spring thaw and disappear with the onset of warm, summer weather leaving behind resistant eggs that carry the species over to the next favorable period. The resting egg (actually a developing embryo) has a dark covering and is able to survive drying, extreme heat, freezing and ingestion by birds.
- Reflooding the following spring stimulates hatching.
- Adult fairy shrimp may persist into the summer season but are usually difficult to find after May.
- Fairy shrimp typically have one generation per wet episode.
- Fairy shrimp do not occur in all vernal pools. Even within one pool, shrimp may occur with regularity for many years, only to disappear in others, even under seemingly favorable conditions.
- The habitat requirements for fairy shrimp are not well documented. Studies in Maine were not able to explain why fairy shrimp commonly occur in some pools and are absent from others.
- Fairy shrimp are known to be intolerant of pollution, siltation, salinity, high alkalinities, and temperatures in excess of 20 degrees Celcius.

RINGED BOGHAUNTER

- The ringed boghaunter is one of the rarest dragonflies in North America.
- It is currently believed that they are at their northern extent of their range in southwestern Maine.
- They are the first dragonflies to emerge in early spring.
- The flight period begins in late April to Early May



and extends to mid-June.

- Adults are typically observed in forested areas up to 1/3 mile from breeding wetlands.
- They feed on small insects and mature for a week or two before returning to the wetlands to breed.
- They are docile and easily approached, sometimes landing on observers.
- Adults at breeding wetlands are not territorial.
- Eggs hatch in summer and the larvae crawl out of the water onto plants, split their larval skins, and fly away as immature adults.

IMPORTANCE OF VERNAL POOLS

In addition to being vital habitat for local plants and animals, vernal pools are important landscape features. If we think of them as wetland islands in a sea of upland forests, we see that groups of pools form stepping stones of hospitable habitat along which wetland-dependent wildlife may travel. Animals may skip over one pool to find more suitable habitat elsewhere. If the wetland mosaic of pools in an upland matrix is destroyed, wildlife populations may be isolated and more vulnerable to changes in their surroundings.

Less certain than the rain, however, is whether vernal pools themselves will survive to greet another spring migration. Residential development, urban sprawl, roads, and pollution are harming or destroying vernal pools. Luckily, people are becoming more aware of the beauty and diversity of vernal pools, and how to recognize and protect them.

Vernal pool amphibians and reptiles require several hundred feet of mostly undisturbed upland habitat surrounding the pool basin to ensure their continued existence.

In Spring, 1999, a vernal pool volunteer monitoring program was initiated by Maine Audubon Society and the University of Maine. The goal of this project is to collect long-term (a minimum of three years) biological data on pools, to make this data accessible to the public through development of a web page database and to begin mapping vernal pools on a GIS-mapping database.

For more information on vernal pools please check out the following resources:

Maine Inland Fisheries and Wildlife

www.state.me.us/ifw/index.html

Do a search for vernal pools

Maine Audubon Very Important Pools

www.maineaudubon.org/conserves/citsci/vip.shtml

www.maineaudubon.org/conserves/citsci/v_guide.pdf

Warning!

Guidelines for eating fish from Penobscot Territory Waters

To prevent possible harm from mercury, dioxins, and PCBs due to eating freshwater fish, we offer this advice:

All children under 8 and women who are nursing, pregnant or could become pregnant,

the most sensitive population from health effects of mercury,

should eat **NO FISH** from Penobscot Nation Territory waters

If you are eating fish: small trout and salmon are safer choices than large bass and pickerel.



EVERYONE ELSE who is taking fish from



on the Penobscot River below Mattaseunk Dam (Mattawamkeag)

OR

anywhere else, where you are taking...

... Brook trout, **OR** Any

You should eat **NO** more than **1 meal per month.**

This advisory is for protection from dioxins and PCBs.

You should eat **NO** more than **1 meal per week.**

You should eat **NO** more than **2 meals per month.**

These advisories are for protection from mercury.

For questions or more information: Penobscot DNR 207.827.7776, x. 7361