

small mammal burrows in mixed or deciduous woodlands. Spotted salamanders are easy to identify from their size (up to 7 ¾ inches) and dark color with multiple round yellow or orange spots. Spotted salamander egg masses can be quickly distinguished from wood frog eggs (see photo below right). The easiest clue is to see if individual eggs can be distinguished within the mass. Spotted salamander eggs can be counted within the mass, while eggs within wood frog masses will look like a continuous ball with no clear separation between eggs. Unlike wood frogs, spotted salamander populations cannot be monitored through egg mass counts. Female spotted salamanders may lay 1-10 egg masses each and individual salamanders may not breed every year.



The Fairy Shrimp is one tiny but environmentally important creature that can only live in a vernal pool. The eggs of this 'obligate' species must go through a dry cycle before they can hatch and therefore, could not survive in a permanent waterbody.

Why Are Vernal Pools Important?

Some species breed exclusively in vernal pools and individuals may return to the same place as they were born to reproduce. If particular pools are eliminated or become inaccessible due to barriers created by development or other disturbances, individuals as well as entire populations may be at risk. This could eventually lead to species extinction. Protecting pools becomes especially important for many rare species that have already been affected by habitat destruction and fragmentation, environmental factors, or over harvesting. The unique habitat created by vernal pools is not only important for the species that breed there, but also because they provide a food source for many animals living in the surrounding area. Frogs, salamanders, and newts may be eaten by mammals, birds, reptiles, and other amphibians. Insects and other invertebrates hatched in the pool also become a food source. The web of life begun in the pool continues even after the pool has dried as the energy produced becomes utilized by terrestrial species.

How Can You Tell if it Really is a Vernal Pool?

There are many ways to determine if the body of water you are observing is a vernal pool. One way to tell is to wait for a rainy night in late winter or early spring. Listen for the sound of "quacking" ducks. These are not ducks at all but the wood frog's breeding chorus. Look for insects in the water, and get to know the species found there.

Check for egg masses attached to submerged vegetation or dead branches. However, use care to not disturb or detach the egg masses because this is believed to increase predation by other species. This is especially true if the egg masses fall to the bottom. These masses are relatively large and easy to see and are often found grouped together. Very often they will appear to be green. This is due to algal growth and does not mean that there is something wrong with the eggs. Try to figure out what species these egg belong to. Most (but not all) egg masses are from spotted salamanders and wood frogs. Both of these are very common in our area and breed early in the season. With a little practice, it becomes easy to distinguish between salamander and frog egg masses.

Egg masses shown here are those of the Wood frog at left and the spotted salamander at right. Note the caddisfly at center, eating some of the salamander eggs.



What Can You Do to Protect a Vernal Pool?

The best way to protect a vernal pool is through certification. Pools are certified by the Natural Heritage and Endangered Species Program (a division of MassWildlife). There are three methods available: 1.) the obligate species method, 2.) the facultative species method, and 3.) the dry pool method. To certify the pool using the obligate species method, a photograph clearly showing water in the pool and evidence (pictures work best) of breeding activity of obligate vernal

pool species must be presented. Species include wood frogs, spotted salamanders, fairy shrimp, Jefferson salamanders, marbled salamanders, and spadefoot toads. To follow the facultative species method, photos of the pool both full AND dry must be submitted along with evidence of breeding activity of toads, frogs, newts, insects, clams, or snails. The dry pool method can be used if there is evidence that some of the facultative species, such as fingernail clam shells, snail shells, caddisfly cases or the exoskeletons of dragonflies and damselflies, are present. Along with this evidence, a picture of a dry pool must be submitted. These methods are explained in more detail at the Natural Heritage Programs Website: www.state.ma.us/dfwele/dfw/nhosp/vpcert.pdf.

Some of the Laws Protecting Vernal Pools...

The Wetland Protection Act, Surface Water Quality Standards, Forest Cutting Practices Act Regulations, Title 5 of the Massachusetts Environmental Code, and local bylaws protect vernal pools. If you suspect that a vernal pool habitat is being degraded due to building, excavation, dumping, or other activities, contact your local Conservation Commission. They will take the necessary steps to help preserve the valuable habitat and tell you what you should do to help.

Certification of vernal pools helps to ensure their survival. There are many resources available; many good sources of information on the certification process, species typically found in vernal pools, and ecology and conservation publications. If you are interested in protecting a vernal pool, talk to your local Conservation Commission. They will assist you and may be able to tell you where other pools are located.💧

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While not a reptile that is exclusive to vernal pools, the spotted turtle is an excellent example of a 'facultative' species that will thrive in a vernal pool while it is active.

Further Reading

If you'd like to know more about vernal pools...

Beebee, T.J. 1996. Ecology and Conservation of Amphibians. Chapman and Hall Publishing Co., London.

Behler, J.L. and F.W. King. 1979. National Audubon Society Field Guide to North American Reptiles and Amphibians. Chanticleer Press, Inc., New York.

Bishop, S.C. 1974. Handbook of Salamanders. Cornell University Press, Ithaca.

Bragg, A.N., 1965. Gnomes of the Night (The Spadefoot Toads). Oxford University Press, Great Britain.

Colburn, E.A., 1997. A Citizen's Step-by-Step Guide to Protecting Vernal Pools. Mass. Audubon Society, Lincoln, MA.

Kenney, L.P. and M.R. Burne. 2000. A Field Guide to the Animals of Vernal Pools. Natural Heritage & Endangered Species Program, Westborough, MA.

Klemens, M.W., 2000. Turtle Conservation. Smithsonian Institution Press. Washington and London.

Massachusetts Division of Fisheries & Wildlife's Natural Heritage & Endangered Species Program, Route 135, Westborough, MA 01581. 508-792-7270 ext.200.
www.state.ma.us/dfwele/dfw/nhosp/vpcert.pdf

And Another Thing...
 by J. Taylor

"I don't know what happened to those salamander larvae. They couldn't have just grown legs and walked away!"

Downstream is produced twice yearly by the Metropolitan District Commission/Division of Watershed Management of The Commonwealth of Massachusetts, and includes articles of interest to residents of the watershed system communities. Our goal is to inform the public about Watershed Protection issues and activities, provide a conduit for public input, and promote environmentally responsible land management practices.

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Who Lives in a Vernal Pool?...

This collage shows some of the residents who enjoy life in the vernal pool environment (although not all at the same scale). Clockwise from the top left they include; The adult marbled salamander, the ribbon snake, the wood frog, wood frog tadpoles, a spotted salamander larva holding a fingernail clam, a spotted salamander egg mass, and wood frogs laying eggs. Within this issue of Downstream, we describe the basics of exactly what vernal pools are all about....



We value the contribution your well cared for land provides and welcome the opportunity to work with you. Please send us questions or comments which we will address in subsequent newsletters, or contact us if you wish to learn more about programs and assistance available to help landowners. Our address is shown below.

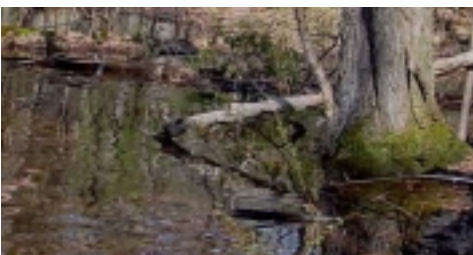
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Vernal Pools

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TO:



DOWNSTREAM
 Metropolitan District Commission/
 Division of Watershed Management
 180 Beaman Street
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Audubon Backyard publications:

“*The Audubon Garden Makeover*,” by Janet Marinelli, July-Aug. 2000
“*Gardening for Butterflies*,” by Kris Wetherbee, May-June 1999
“*Going Native*,” by Janet Marinelli, July–Aug. 1999
“*Homegrown Wetlands*,” by John Manuel, July-Aug. 1999
“*Private Property, Public Good*,” by David Dobbs, July-Aug. 1998
<http://magazine.audubon.org/backyard/gardening.html>;

Brooklyn Botanic Garden publications:

“*Welcoming Wild Birds to Your Garden*,” by Stephen W. Kress, 1998
“*The Natural Water Garden*,” by Colston C. Burrell, 1997
“*Going Native: Biodiversity in Our Own Backyards*,” by Janet Marinelli, 1994

National Wildlife Federation Backyard Habitat Program publications:

“*National Wildlife Federation Guide to Gardening for Wildlife*” by Craig Tufts and Peter Loewer, 1995
“*The Natural Habitat Garden*,” by Ken Druse, 1994

Suggested Reading

“*The Wild Lawn Handbook*,” by Stevie Daniels, 1995
“*To Mow or Grow*,” by Bret Rappaport, published in *Wildflower*, Spring 1996 issue
“*The Chemical-Free Lawn*,” by Warren Schultz, 1989
“*Easy Care Native Plants*,” by Patricia Taylor, 1996
“*Landscaping with Wildflowers and Native Plants*,” William H. Wilson, 1985

Internet Resources

Native Plant Conservation Initiative
(www.nps.gov/plants): Plant conservation, invasive exotics

The New England Wild Flower Society
(www.newfs.org): Plant conservation, naturalistic gardening

Wild Ones, Ltd. (www.for-wild.org):
Grassroots projects, Naturalistic landscaping, plant salvages

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“Landscaping with Wildflowers and Native Plants,” William H. Wilson, 1985

Internet Resources

National Wildlife Federation

Environmental Impacts of Lawn

Smaller American Lawns Today (SALT)
www.conncoll.edu/ccrec/arbo/salt

Turf Wars

www.Chicagotribune.com/leisure/homegarden/article/0,2669,sav9911140375.ff.html

Is Your Yard Green?, Chris Beimborn

www.buyrecycled.org/html/acrobat/16_isyouryardgreen.pdf

Honey, I Shrunk the Lawn

www.co.mo.md.us/services/dep/landscape/shrunk.htm

Books on Plant Selection

Manual of Woody Landscape Plants, Michael Dirr
Stipes Publishing, 1985

Illustrated Encyclopedia of Perennials, Ellen Phillips & C. Colston Burrell
Rodale Press, 1993