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MDIF&W Photo by Phillip deMaynadier

**Floodplain vernal pool habitat along the Sebasticook River in Waldo County.**

# VERNAL POOLS

MILESTONES AND MISCONCEPTIONS

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Vernal pools come in myriad shapes, sizes and settings but nearly all are small, forested wetlands whose depressions fill with water from spring snowmelt and rain and dry partly or completely by late summer. What makes these habitats so valuable for wildlife is a rich food base fed by

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## **IF&W Fact**

Funding for vernal pool identification and conservation by the Maine Department of Inland Fisheries and Wildlife is supported by contributions to the state's Nongame and Endangered Wildlife Fund, proceeds from the Conservation "Loon" license plate and Chickadee Check-off, and a grant from the U.S. Fish and Wildlife Service.

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**High value vernal pool habitat hosts rare species in York County.****Continued from Page 1**

surrounding forest organic matter and a lack of fish.

Isolated from streams and subject to periodic drying, vernal pools provide a nearly predator-free haven for a diversity of specialized amphibians (salamanders, frogs, and toads) and aquatic invertebrates (over 500 species in New England pools alone) that lack the physical and chemical defenses to reproduce in more fishy environs. Some of Maine's better known pool-breeding specialists -- Spotted Salamanders, Blue-spotted Salamanders, Wood Frogs, Fairy Shrimp, and Fingernail Clams -- have become iconic for their colorful, conspicuous, and nearly exclusive use of vernal pools.

Just as the state's more traditionally recognized wildlife habitats, such as deer wintering areas and waterfowl and wading bird wetlands, host more than deer and ducks, so do vernal pools provide habitat for more than a few specialized frogs and salamanders. In fact, over half of the state's amphibians, turtles, and snakes frequent vernal pool habitats during their life cycle, as do myriad more familiar species such as black and wood ducks, great blue herons, broad-winged hawks, deer, moose, fox, mink, bats and other small mammals.

Some forest herbivores are drawn to vernal pools be-

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cause they serve as spring oases where the season's first herbaceous forage is available. Forest predators are attracted to vernal pools because of the abundance of pool-breeding amphibian prey occupying the surrounding forest floor.

The collective weight (or "biomass") of these unseen spring amphibian sentinels has been estimated to exceed that of all birds and mammals combined in some forests with productive pools! Indeed, their sheer abundance and palatability has many biologists and sportsmen convinced that the terrestrial wanderings of pool-breeding frogs and salamanders play a powerful role in the local ecology of Maine's forests.

Finally, among Maine's dozens of wetland community types, few host as many rare and endangered species as do vernal pools, providing sustenance and shelter to animals as varied as Blanding's Turtles (Endangered), Ribbon Snakes (Special Concern), and Ringed Boghaunter dragonflies (Threatened), and plants as elusive as Featherfoil (Threatened), and Sweet Pepperbush (Special Concern), to name a few of the most vulnerable vernal pool denizens. Some of these species could face extinction in Maine without the presence of high value vernal pools distributed throughout their range.

Interestingly, as little as 10 years ago the mention of "vernal pools" in a public forum, or even among some natural resource professionals, elicited blank stares as participants struggled to conjure an image of the habitat. Today, much has changed. There are few members of Maine's greater landowner, land trust, municipal planning, academic, or professional communities that are not at least partially familiar with the defining characteristics and values of vernal pools. This is due partly to volumes of recent scientific research, much of it from New England, documenting the significance of this previously poorly understood ecosystem. Maine's biologists have been in the forefront of translating this science, often buried among academic journals, into publicly accessible outreach materials designed to inform land managers of the values of woodland pools to wildlife diversity and forest ecosystem functions. Another factor has also moved vernal pools into the common vernacular of Maine natural resource discussions: special rules promulgated in 2006 for protection of Significant Vernal Pools

### SPOTTED SALAMANDER (INDICATOR SPECIES)



MDIF&W Photo by Jonathan Mays

### BLUE-SPOTTED SALAMANDER (INDICATOR SPECIES)



MDIF&W Photo by Jonathan Mays

under the state's Natural Resources Protection Act (NRPA).

Because much has already been penned on the science and importance of vernal pools for wildlife (see references below) the balance of the focus here is on policy; specifi-

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cally revisiting the history of vernal pool regulation in Maine and clarifying common questions and misconceptions about its implementation.

The mandate for vernal pool protection is not new. Surprising to some is the fact that the Maine Legislature added vernal pools as far back as 1995 as one of seven Significant Wildlife Habitats eligible for regulatory protection under NRPA – along with Deer Wintering Areas, Seabird Nesting Islands, Atlantic Salmon Spawning Areas, Waterfowl and Wading Bird Wetlands, Shorebird Nesting-Feeding-Staging Areas, and Endangered and Threatened Wildlife Habitat. The inclusion of vernal pools was in response to growing public and scientific recognition of their exceptional wildlife value and vulnerability to certain intensive land use practices.

However, the Maine Legislature also made it clear that the intent was not to expand general wetland protections to include all vernal pools, but instead charged the departments of Environmental Protection and Inland Fisheries and Wildlife to identify a high value subset of the state's vernal pool resource. This seemingly simple charge took over 10 years to accomplish by a state vernal pool technical working group led by the Maine State Planning Office and comprised of agency biologists, environmental consultants, academics, forest management interests, and other stakeholders.

Despite pressure to develop a definition based on remote (aerial photography) or physical characteristics (size, depth), the working group abided by the spirit of the Significant Wildlife Habitat provisions of NRPA in recognizing exceptional wildlife use as the sole criteria by which potentially high value pools could be eligible for protection. Specifically, breeding egg mass thresholds for a small suite of specialized pool breeding indicator species were considered the primary means by which Significant Vernal Pools can be identified. Also potentially eligible for Significance are those pools used by a short list of state rare and endangered species that require vernal pools to complete their life cycle. Finally, regardless of wildlife use, only pools of natural origin can be regulated.

This science-based definition of vernal pool Significance received unanimous bipartisan support from the Natural

### BLANDING'S TURTLE (ENDANGERED SPECIES)



MDIF&W Photo by Jonathan Mays

### SPOTTED TURTLE (THREATENED SPECIES)



MDIF&W Photo by Phillip deMaynadier

Resources Committee and approval by the 120th Maine Legislature in 2006. Significant Vernal Pools are currently protected in the same manner as the state's other Significant Wildlife Habitats, under Chapter 335 of the NRPA, with regulatory authority administered by the Department of En-

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vironmental Protection and technical review and mapping support provided by the Department of Inland Fisheries and Wildlife.

While Significant Vernal Pools have been part of Maine's regulated landscape for nearly four years, there is still occasional confusion about their identification and breadth of regulatory jurisdiction. As a relatively newly protected resource this is understandable, and was similarly the case for other protected natural resources whose value and vulnerability are now taken for granted, including streams, great ponds, and larger freshwater wetlands. Interestingly, most vernal pool confusion is biased toward an assumption that the state's rules are more inclusive and further reaching than is in fact true. To this end, it is worth clarifying a few of the most common questions and misconceptions:

- **Are all (or most) vernal pools now regulated?**

NO. Only Significant Vernal Pools are eligible for regulatory protection using science-based criteria of exceptional indicator species abundance or use by rare or endangered species. As such only a subset of the state's highest value pools are identified as Significant Wildlife Habitat under Maine's Natural Resource Protection Act. Of the nearly 1,200 vernal pools reviewed to date statewide by MDIF&W only 230 (~19%) have been identified as Significant.

- **Can a Significant Vernal Pool be documented on my property without my knowledge?** NO. MDEP and MDIFW have a strict policy of requiring landowner permission before any pool is assessed or mapped. Once a survey is conducted on a willing landowner's property a determination of the pool's status is made by state wildlife biologists and a written notification of the determination is provided to the landowner from MDEP.

- **Is forestry regulated in or near Significant Vernal Pools?** NO. Forest management activities (including associated road construction) are exempt from regulation in or near Significant Vernal Pools, and other Significant Wildlife Habitats. In fact, there is scientific support that careful forest harvesting practices that conserve partial forest canopy, forest litter, and coarse woody debris in proximity to vernal pools is highly compatible with the protection of pool-breeding wildlife. Voluntary management guide-

## SPATTERDOCK DARNER DRAGONFLY (SPECIAL CONCERN SPECIES)



Photo by Blair Nikula

lines for forest management near high value vernal pools are available from the Maine Forest Service at <http://www.maine.gov/doc/mfs/fpm/facts.htm>.

- **Is all development activity prohibited near Significant Vernal Pools?** NO. The 250-foot area around Significant Vernal Pools is a consultation zone where permits may be required from MDEP for certain intensive development activity. Generally, development activities that maintain 75% of the forest cover (only on that portion of the habitat controlled by the landowner) do not require a full permit review and are eligible for Permit by Rule, a streamlined notification process. More intensive development activity may also be acceptable under circumstances where

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avoidance and minimization is not possible due to specific parcel constraints. Of the 465 full NRPA permits issued in 2010 by MDEP for all natural resource issues, from wetlands to shorelands to sand dunes, only 4 (0.8%) involved Significant Vernal Pools. Furthermore, since the implementation of pool regulations in 2007, MDEP has not issued a single permit denial for a proposal involving Significant Vernal Pools.

- **Is there scientific support for maintaining intact forest habitat in proximity to Significant Vernal Pools?** YES. Numerous scientific studies from Maine and throughout the Northeast have documented that pool-breeding amphibians travel hundreds, sometimes thousands, of feet into the terrestrial habitat surrounding vernal pools where outside of the breeding season they require cool, moist, mostly closed canopy forest conditions. The 250-foot zone around Significant Vernal Pools is critical to the viability of pool-breeding wildlife and yet only protects a portion of the total upland habitat needs of adults and juveniles as documented using radio telemetry and amphibian trapping techniques.

The Maine Legislature has declared it the policy of the state "to conserve, by according such protection as is necessary ... all species of fish and wildlife found in the State as well as the ecosystems upon which they depend". The Maine Department of Inland Fisheries and Wildlife takes this mandate seriously, but also acknowledges that this is a tall order when considering that wildlife is further defined by the state to include over 15,000 species of native birds, mammals, fish, reptiles, amphibians, and invertebrates. The Department uses a fine scale, hands-on approach to the conservation and management of a relatively small number of these species -- mainly those managed as harvestable fish and game, and those endangered or threatened by the risk of extinction. However, the state does not have the luxury of managing all of its fish and wildlife resources on an individual species by species basis. It is well recognized that a more efficient and lasting approach for sustaining the vast majority of Maine wildlife requires landscape scale, habitat-based strategies.

To this end, MDIF&W has used a combination of voluntary cooperative outreach and legislatively-approved

### BLACK DUCK (USFWS FOCAL SPECIES)



MDIF&W Photo by Steve Walker  
**Black duck nest in vernal pool in Cumberland County.**

regulatory tools to conserve public trust wildlife resources on private lands. One regulatory tool that has been used judiciously and conservatively is the protection of Significant Wildlife Habitat – those discrete patches of habitat that provide exceptional public benefit by serving a disproportionate role in maintaining viable populations of Maine's native wildlife. While natural resource policy often lags behind natural resource science, Maine made important progress in recognizing the large body of accumulated peer-reviewed science demonstrating that a subset of the state's vernal pools are highly valuable and vulnerable components of our forest ecosystem.

The information presented here is intended to clarify that current approaches at Significant Vernal Pool protection are designed to strike a balance between accommodating private development interests and the state's public trust wildlife responsibilities and legislative mandates.

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### SELECTED SCIENTIFIC VERNAL POOL REFERENCES

Baldwin, R.F. and P.G. deMaynadier. 2009. Assessing Threats to Pool-Breeding Amphibian Habitat in an Urbanizing Landscape. *Biological Conservation* 142: 1628-1638.

Beaudry, F., P.G. deMaynadier, and M.L. Hunter, Jr. 2009. Seasonally dynamic habitat use by Spotted (*Clemmys guttata*) and Blanding's Turtles (*Emydoidea blandingii*) in Maine. *Journal of Herpetology* 43(4): 636-645.

Calhoun, A. 2003. Maine Citizen's Guide to Locating and Documenting Vernal Pools. Maine Audubon Society.

Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY. MCA Technical Paper No. 5.

Calhoun, A. J. K. and P. G. deMaynadier. 2004. Forestry habitat management guidelines for vernal pool wildlife. Metropolitan Conservation Allicance, Wildlife Conservation Society, Bronx, NY. MCA Technical Paper No. 6.

Calhoun, A. J. K. and P. G. deMaynadier (editors) 2008. Science and conservation of vernal pools in northeastern North America. CRC Press, Boca Raton, FL.

Colburn, Ph. D., E. A. 2004. Vernal pools: natural history and conservation. McDonald and Woodward Publishing Company, Blackburg, VA.

deMaynadier, P. G. and M. L. Hunter, Jr. 1999. Forest canopy closure and juvenile emigration by pool-breeding amphibians in Maine. *Journal of Wildlife Management* 63(2):441-450.

#### WOOD FROG (INDICATOR SPECIES)



Photo by Megan Gahl

Kenney, L.P. 1995. Wicked big puddles: A guide to the study and certification of vernal pools. U.S. Government Printing Office, Washington, D.C.

Kenney, L.P., and M.R. Burne. 2000. A field guide to the animals of vernal pools. Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program and Vernal Pool Association. Westborough, MA.

Maine Forest Service. 2006. Forest Management and Vernal Pools. A Factsheet of the Department of Conservation, Augusta, ME.

Mitchell, J. C., A. R. Breisch, and K. A. Buhlmann. 2006. Habitat management guidelines for amphibians and reptiles of the northeastern United States. Partners in Amphibian and Reptile Conservation, Montgomery, AL. Technical Publication HMG-3.

Semlitsch, R. D. 1998. Biological delineation of terrestrial buffer zones for pond-breeding salamanders. *Conservation Biology* 12(5):1113-1119.

Semlitsch, R. D. 2000. Principles for management of aquatic-breeding amphibians. *Journal of Wildlife Management* 64(3):615-631.