

Small Wetlands Conservation: Web and Published Resources

The following list is a selection of the many resources available on wetland conservation, with an emphasis on small wetland science and protection, and tools for local governments.

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NYSDEC Hudson River Estuary Program/Cornell University

General Wetland Websites

National Wetland Inventory (NWI)

<http://www.fws.gov/nwi/index.html>

The US Fish and Wildlife Service's NWI website includes information on digital wetland data, wetland mapping efforts, and wetland science, including function, climate change, and status and trends. Technical publications are available for free download, including a lengthy report on geographically isolated wetlands and a user's guide on NWI maps.

U.S. Environmental Protection Agency (USEPA) Wetlands

<http://www.epa.gov/owow/wetlands/>

The EPA's wetland site includes laws and regulations, including interpretation of the Clean Water Act protections; information on why wetlands are important and how to protect them; and a series of wetland fact sheets.

U.S. Army Corps of Engineers (ACOE)

<http://www.usace.army.mil/cw/cecwo/reg/>

At their website, ACOE provides regulatory information and updates, including Clean Water Act guidance and details on Nationwide Permits, as well as technical and biological information, publications, FAQ, and more.

NYS Department of Environmental Conservation (NYSDEC)

<http://www.dec.ny.gov/lands/305.html>

The NYSDEC website provides information on both tidal and freshwater wetlands in New York. The freshwater wetlands webpages includes a description of the Freshwater Wetlands Act, and information on definitions, maps, classification, regulation, real property assessment, wetland nature centers, and results of a status and trends study for New York. New information is being added to the site on "Conserving Small Wetlands in the Hudson Valley" (<http://www.dec.ny.gov/lands/47486.html>) and will include information on the October 28, 2008 conference on small wetlands.

Association of State Wetland Managers (ASWM)

<http://www.aswm.org/>

The ASWM website offers many resources, including downloadable publications such as "Resource Protection Options for NY Communities -Planning and Zoning Techniques," "How to Hire the Right Wetlands Consultant," and "Protecting and Restoring Wetlands: Strengthening the Role of Land Trusts;" an annotated bibliography of technical publications; pages on wetlands science including "Wetlands and Global Climate Change;" weblinks of interest; and wetland-related news.

Center for Watershed Protection (CWP)

http://www.cwp.org/Resource_Library/Special_Resource_Management/wetlands.htm
CWP offers a series of in-depth articles on watersheds and wetlands (see a sample of titles below under "Local Government Tools"), in addition to slideshows, an annotated bibliography of urban wetland research, and an exhaustive list of weblinks.

Importance of Small Wetlands

Biodiversity Values of Geographically Isolated Wetlands in the United States

This 2005 NatureServe study sought to assess potential impacts of the 2001 SWANCC Supreme Court decision on the nation's biological diversity. Key findings indicated that wetlands that can be considered "geographically isolated" represent a considerable amount of the United States' ecological diversity and provide habitat for a considerable portion of the nation's flora and fauna. Significant loss of isolated wetland habitats could seriously affect opportunities for the survival and recovery of the many rare or endangered species that depend on them. <http://www.natureserve.org/publications/isolatedwetlands.jsp>

Where Rivers are Born: The Scientific Imperative for Defending Small Streams and Wetlands

Due to the changes in federal protection of small streams and wetlands, the Sierra Club and American Rivers asked eleven scientists to summarize the services wetlands and small streams provide society, including water quality and water supply, and the consequences of degrading these waters. The scientists used more than 235 scientific publications in preparing the "Where Rivers Are Born" report, which is also summarized in a shorter fact sheet. http://www.americanrivers.org/site/PageServer?pagename=AMR_whereriversareborn

Wetlands at Risk: Imperiled Treasures

How a Supreme Court Decision Jeopardizes Millions of Acres of Waters and Wetlands

America's wetlands, which provide critical wildlife habitat as well as pollution and flood control, are drained, filled and polluted at an alarming rate. This July 2002 report from Natural Resources Defense Council and the National Wildlife Federation looks at the potentially damaging consequences of a January 2001 Supreme Court decision regarding "isolated wetlands," and illustrates the vital role these areas play in ecosystems across the United States. <http://www.nrdc.org/water/conservation/atrisk/contents.asp>

Local Government Tools

A Local Ordinance to Protect Wetland Functions

Article 4 of the Wetlands & Watersheds Article Series, offered by the Center for Watershed Protection, outlines the key elements of an effective ordinance to protect wetlands from the indirect impacts of land development, and provides adaptable model ordinance language. http://www.cwp.org/Resource_Library/Special_Resource_Management/wetlands.htm

The Importance of Protecting Vulnerable Streams and Wetlands at the Local Level

Article 6 of the Wetlands & Watersheds Article Series, offered by the Center for Watershed Protection, makes the case for expanded local protection of vulnerable streams and wetlands that may not be fully protected by state or federal law due to their perceived isolation from perennial or navigable waters. Also summarizes state and local approaches to closing this gap. http://www.cwp.org/Resource_Library/Special_Resource_Management/wetlands.htm

Wetland and Watershed Protection Toolkit: Guidance Materials for Local Governments in New York State

Completed in 2002, this toolkit offered by the Association of State Wetland Managers (ASWM) includes a collection of materials designed to encourage, aid, and improve the incorporation of wetland and watershed management into local government comprehensive planning. <http://www.aswm.org/lwp/nys/index.htm>

Planner's Guide to Wetland Buffers for Local Governments

The Planner's Guide from the Environmental Law Institute (ELI) identifies both the state-of-the-art and the range of current practice in protection of wetland buffers by local governments. The Guide is based on ELI's detailed examination of more than 50 enacted wetland buffer ordinances around the nation and nine model ordinances, as well as several hundred scientific studies and analyses of buffer performance.

http://www.elistore.org/reports_detail.asp?ID=11272

Gaining Ground Information Database

Pace University's Land Use Law Center maintains a free, searchable database of land use resources and ordinances from across the United States. The database includes laws and practices related to proper land development and human settlement, the conservation of natural resources, and the prevention of environmental pollution, with emphasis on local laws and practices. <http://landuse.law.pace.edu>.

Wetland Habitat, Wildlife, and Conservation Information

New York Natural Heritage Program Conservation Guides

The NY Natural Heritage Program maintains online animal, plant, and community guides that include description, habitat, distribution, places to see, conservation issues, and other information on the species and communities they track in their database. Future updates will include additional recommendations for planning and management.

<http://guides.nynhp.org>

Ecological Communities of New York State

From communities as large as Lake Ontario to a room-sized vernal pool, this document from the NY Natural Heritage Program classifies all communities of the state, both natural and cultural in origin. The 2002 draft by Edinger et al. is a revised and expanded edition of Carol Reschke's classic 1990 publication, and is available for download at the NYSDEC website.

<http://www.dec.ny.gov/animals/29392.html>

Biodiversity Assessment Manual for the Hudson River Estuary Corridor

By Erik Kiviat and Gretchen Stevens, 2001, Hudsonia (published by NYSDEC), 508 pages. The Manual profiles 38 ecologically significant habitat types of the Hudson Valley, discusses the associated plants and animals of conservation concern, and provides recommendations for protecting their biodiversity values. http://hudsonia.org/?page_id=35

Hudsonia's Habitat Fact Sheets

Hudsonia's fact sheets include descriptions of a selection of habitats of ecological significance in the Hudson Valley, associated plants and animals, common threats, and conservation recommendations for each habitat type. http://hudsonia.org/?page_id=62

U.S. Environmental Protection Agency (USEPA) - Wetland Types

The EPA website includes brief descriptions of different wetland types in the United States. Types are broken into four major categories: marshes, swamps, bogs, and fens. Common species, function, and other habitat information is included. <http://www.epa.gov/owow/wetlands/types/>

In Search of Swampland

by Ralph Tiner, 2005 (2nd ed.), Rutgers University Press, 336 pages.

"In Search of Swampland" provides an overview of wetland ecology, status, and trends, with emphasis on factors important to wetland identification and recognition. Designed for readers with little or no training in wetland science, this heavily illustrated field guide serves as a valuable resource for the scientist or amateur naturalist. It covers wetland characteristics, formation, functions, and values, causes of wetland loss and degradation, and wetland protection and can serve as a field guide to wetland plants, soils, animals, and wetland identification and delineation. It includes descriptions and illustrations of more than 300 wetland plants and 200 wetland animals (with clear identification keys), information on how to distinguish typical hydric or "wet" soils from dryland soils, and general procedures for identifying wetlands in the field. It also includes a list of Northeastern wetlands to visit and suggestions on how we can all help save these vital, threatened areas.

Best Development Practices (BDPs): Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States

WCS/MCA Technical Paper No. 5. By Aram J. K. Calhoun and Michael W. Klemens, 2002. This publication contains techniques to guide local and state planners, officials, and other land use decision-makers as they attempt to conserve vernal pool habitats and wildlife. <http://www.metropolitanconservationalliance.org/mcapublications>

Habitat Management Guidelines for Vernal Pool Wildlife

WCS/MCA Technical Paper No. 6. By Aram J. K. Calhoun and Philip deMaynadier, 2004. This document provides habitat management guidelines for maintaining vernal pool biodiversity in forested landscapes, especially in the commercially-harvested forests of northern New York and New England. <http://www.metropolitanconservationalliance.org/mcapublications>

Science and Conservation of Vernal Pools in Northeastern North America

by Aram Calhoun and Phillip deMaynadier, 2008, CRC Press, 392 pages.

The book introduces vernal pools as a keystone ecosystem in northeastern forests of North America. Section I reviews the physical parameters that demonstrate how vernal pools function differently from other wetland systems and where they are found in the landscape. Section II provides an overview of the diversity and natural history of their unique biota, focusing on plants, invertebrates, amphibians, and other pool-associated vertebrates. Finally, Section III synthesizes the best-available science from peer-reviewed and unpublished sources relevant to conserving vernal pools in human-dominated landscapes. The book also highlights the significant role that educators and citizens have in effecting local conservation, and in ensuring a permanent place on the landscape for seasonal wetlands.

Vernal Pools: Natural History and Conservation

by Elizabeth Colburn, 2004, McDonald and Woodward Publishing Company, 426 pages.

“Vernal Pools” is a comprehensive and substantive book on the natural history, ecology, and conservation of vernal pools, with emphasis on the pools of the formerly glaciated region of eastern North America. Colburn writes in a style that is accessible, appealing, and informative to both general and advanced readers.

The Vernal Pool Association

The Massachusetts-based organization offers general information, slide shows, many photos, and other resources on vernal pool conservation. http://www.vernalpool.org/vpinfo_1.htm

A Field Guide to the Animals of Vernal Pools

By Leo Kenney and Matthew Burne, Massachusetts Div of Fisheries & Wildlife and Vernal Pool Association, 2001.

An introductory reference to the specialized animals that depend upon vernal pools, this field guide includes photographs of adult salamanders, frogs, toads, turtles, and snakes; amphibian egg masses and larvae; and invertebrates. <http://www.vernalpool.org>

Select Citations from Scientific Journals

Gamble, R.L., K. McGarigal, C.L. Jenkins, and B.C. Timm. 2006. **Limitations of regulated “buffer zones” for the conservation of marbled salamanders.** *Wetlands* 26(2)298-306.

Most amphibians that breed in seasonal wetlands are predominantly terrestrial animals that require “upland” habitats for the majority of their life cycles. However, wetland regulations aimed partially at protecting wildlife values are often limited to the wetland basins and small terrestrial “buffer zones” that typically extend 30m (100ft) or less from the wetland edge. In a study of marbled salamanders in western Massachusetts, findings highlighted the dramatic limitations of existing wetland regulations with regard to upland habitat use by mole salamanders (family Ambystomatidae) and the need to approach conservation of these animals both at broader scales and with more comprehensive and innovative strategies.

Gibbs, J. P. 2000. **Wetland loss and biodiversity conservation.** Conservation Biology 14(1):314-317.

Most species of wetland-dependent organisms live in multiple local populations sustained through occasional migration. Retention of minimum wetland densities in human-dominated landscapes is fundamental to conserving these organisms. An analysis of wetland mosaics was performed for two regions of the northeastern United States to assess the degree to which historical wetland loss alters the metrics of wetland mosaics and to assess potential future effects mediated by differently structured wetland regulations. These analyses indicated that profound reductions in wetland density and proximity are associated with increased human populations and that protections for all wetlands >1 acre (0.4 ha) are likely required to retain wetland densities minimally sufficient to sustain the wetland biota.

Semlitsch, R.D. and J.R. Bodie. 1998. **Are small, isolated wetlands expendable?** Conservation Biology 12(5):1129-1133.

The authors argue that small wetlands are extremely valuable for maintaining biodiversity, that the loss of small wetlands will cause a direct reduction in the connectance among remaining species populations, and that both existing and recently proposed legislation are inadequate for maintaining the biodiversity of wetland flora and fauna. Small wetlands are not expendable if our goal is to maintain present levels of species biodiversity. At the very least, based on these data, regulations should protect wetlands as small as 0.5 acre (0.2 ha) until additional data are available to compare diversity directly across a range of wetland sizes. The authors also strongly advocate that wetland legislation focus not only on size but also on local and regional wetland distribution in order to protect ecological connectance and the source-sink dynamics of species populations.

For more information:

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<http://www.dec.ny.gov/lands/4920.html>