



Forest Stewardship

Information Exchange

Spring/Summer 1999
Volume 2 Issue 1

Stewardship News

Brook Trout Habitat Enhancement

Some landowners in the Northeast are fortunate to have brook trout streams flowing through their properties and may be interested in enhancing stream habitat to improve fishing or to enhance aquatic biodiversity. Prior to the elimination of Stewardship Incentive Program (SIP) funds in FY99, cost-share monies for fisheries habitat enhancement were available under SIP Practice No. 7 depending on state funding priorities. A recent article in the *New York Times* indicates that stream enhancement efforts can have positive benefits for brook trout in the East. According to the *Times* article, Canadian biologists in southern Quebec set about to improve marginal spawning beds in a 1-mile stretch of stream by exaggerating stream features that would enhance spawning. Biologists trucked in 115 tons of washed, nut-size gravel and strategically added boulders to turn the flow and create small pools to further enhance spawning sites. To protect newly hatched larvae and fry from fish-eating birds (e.g., belted kingfisher), large tree trunks were brought in and temporarily laid across the stream. According to the biologists, the results were almost immediate. The density of fry after the work was 120 per square yard, which was well above average.

The Wisconsin Department of Natural Resources has a rich history in trout stream habitat work. The publication *Trout Stream Therapy* by Robert L. Hunt (1993. Madison, WI: University of Wisconsin Press; 74 p.), is an excellent resource on trout stream enhancement techniques used in that state and applicable to other states of the region. Similar work has been conducted for salmon and resident cutthroat trout in the Pacific Northwest for many years. The use of natural materials such as large tree trunks, boulders, and washed gravels, and the construction of off-channel, lower flow waterways have increased stream habitat for these species. One study took place in the Salem District of the Bureau of Land Management in northwestern Oregon. The publication *Evaluation of Stream Rehabilitation Projects - Salem District (1981-1988)* by Robert House, Val Crispin, and Roger Monthey (1989. BLM Technical Note OR-6. Portland: Oregon State Office of BLM.). This is no longer in print, but photocopies are available from Roger Monthey, USDA Forest Service, Durham, NH, phone 603/868-7699.

Issue Highlights

Stewardship News	1-2
Biodiversity:	
Management in Action	3
Biodiversity Resources	4
Naturalist's Corner	7

Produced by:



USDA Forest Service



Northeastern Area
State and Private Forestry

Editors:

Roger Monthey:
*Forest Stewardship and
Stewardship Incentives Program*

Toni McLellan:
Wildlife Biologist

Stewardship News

New Resource Book

A recent book, *Legal Aspects of Owning and Managing Woodlands* by Thom J. McEvoy of the University of Vermont, is an excellent source of information for landowners wanting to learning more about the legal intricacies of managing land in today's complex world. Dr. McEvoy is very successful in making this complex subject as simple as possible for landowners and resource professionals to understand. The title of each chapter tells a lot about the material offered in this book:

- (1) Forestry: Past, Present, and Future,
- (2) Private Property,
- (3) Acquiring and Owning Forest Lands,
- (4) Surveys and Boundaries,
- (5) Managing and Using Forest Land,
- (6) Forest-Management Contracts,
- (7) Ethics in Forestry Practice,
- (8) Forest Taxation,
- (9) Planning for Woodlands in Your Estate, and
- (10) Settling Disputes and Shopping for an Attorney.

We highly recommend this book. For a copy, contact The Island Press, 1718 Connecticut Avenue N.W., Suite 300, Washington, D.C. 20009, phone: 202/232-7933, fax: 202/234-1328.

A previous book by Thom McEvoy is also noteworthy. The book is *Using Fertilizers in the Culture of Christmas Trees*, published by Paragon Books, Inc., P.O. Box 471, Richmond, VT 05477, phone: 802/434-3656.

NED-1 Software Program Update

Work is continuing on the new NED-1 software at the Northeastern Research Station in Burlington, Vermont. Although not yet fully tested, the software is available at the following website: <http://www.fs.fed.us/ne/burlington/ned/>. NED-1 is a Windows program which emphasizes the analysis of forest inventory data from the perspective of different forest resources. The resources addressed are aesthetics, ecology, forest health, timber, water, and wildlife. NED-1 will evaluate to what degree individual stands, or the management unit as a whole, provide the conditions required to accomplish specific goals. An extensive hypertext system provides the user with information about the resource goals, the desired conditions which support achieving those goals, and the related data used to analyze the actual condition of the forest. Information may be obtained from the Northeastern Research Station, 705 Spear Street, P.O. Box 968, Burlington, VT 05402-0968, phone: 802/951-6771. Documentation for the program is still being developed and will be available in the next few months.

NEWILD

NEWILD is a computer program intended to assist in the access and evaluation of the information presented in the species/habitat matrices developed by DeGraaf and others (DeGraaf, R.M.; Yamasaki, M.; Leak, W.B.; Lanier, J.W. 1992. *New England wildlife: management of forested habitats*. Gen. Tech. Rep. NE-144. Radnor, PA: U.S. Department of Agriculture, Forest Service, State and Private Forestry, Northeastern Area; 271 p.). It is one tool in a set of tools known collectively as NED, which is intended to support good forest stewardship. The new NED-1 software (an update of NED) includes an updated NEWILD to reflect some recent work in species/habitat relationships in Pennsylvania. In addition, work is underway to modify NEWILD to better fit the species and habitat conditions in the Mid-Atlantic States. Contact Toni McLellan, USDA Forest Service, Durham, NH, phone: 603/868-7690.



Web Source

The Forest Stewardship Information Exchange is now on the World Wide Web at:

http://willow.ncfes.umn.edu/pubs/stewardship/foreststew98_1_1/foreststew98_1_1.htm

Biodiversity: Management in Action

Partners for Fish and Wildlife

With the loss of funding for the USDA Forest Service's Stewardship Incentive Program in FY99, landowners should be aware of another cost-share program which is offered by the U.S. Fish and Wildlife Service (FWS). The Partners for Fish and Wildlife (PFW) Program provides funds for habitat restoration work concentrating on restoring drained, altered, or degraded freshwater and saltwater wetlands; restoring riparian (stream-side) habitats; the habitats of endangered and threatened species; uplands; and fish habitat. Habitat restoration generally requires little or no financial commitment from the landowner. The landowner may participate as a partner and contribute funds and/or services to the restoration. All landowners are required to sign an agreement with the FWS which commits them to maintaining the restored habitat for a minimum of 10 years. This time period may be increased based on the cost and size of the restoration. The FWS can help the landowner plan and design a habitat restoration project. PFW funds can be used to restore wetlands, establish vegetation, and provide advice and information on a variety of issues, including nest structures or nesting islands, food and shelter for fish and wildlife, haying schedule to provide habitat for wildlife during nesting, and water level management.

One recent project involved the Arthur and Christie Johnson Memorial Forest, owned and managed by Dr. William Jahoda and family. Located in Pittsburg, New Hampshire, this 400-acre Forest Legacy conservation easement area had some abandoned gravel pits next

to a stream and alder wetland. With financial assistance from the PFW Program, Dr. Jahoda, a retired professor of wildlife management at Ohio State University, designed a woodcock habitat improvement project utilizing brush hogging, leveling, and seeding to improve woodcock courting and nesting habitat. Water quality in the adjacent brook and wetland was also enhanced by this restoration work. More information about the Partners for Fish and Wildlife Program can be obtained by calling or writing Robert Scheirer, U.S. Fish and Wildlife Service, 22 Bridge St., Concord, NH 03301, phone: 603/225-1411.

Managing for Biodiversity in an Agricultural and Woodland Farm Setting

Prescott Farm Audubon Center in Laconia, New Hampshire, has developed plans for a series of stewardship demonstration areas at this 160-acre historic farm property. A primary goal of the center is to manage the land to promote biodiversity within an agricultural and woodland farm setting and to develop educational programs that explore relationships between natural and managed environments. As conceived by the Audubon staff, a citizen's advisory committee, and the owners of the property (Prescott Conservancy, Inc.), management projects on the site will demonstrate such practices as:

- managing hayfields for grassland bird habitat,
- management of field edges for structural diversity,
- forestry practices to enhance biodiversity,
- management of invasive species,
- using different inventory methods to monitor biodiversity,
- using native plants in landscaping, and
- enhancing backyards for biodiversity.

Prescott Farm Audubon Center is interested in sponsoring on-site educational workshops in cooperation with other organizations working on land stewardship for biodiversity (there may be additional grant funding available). If your organization would be interested in developing a cooperative stewardship/educational program, please contact Malin Ely, Center Director, at 603/366-5695 or send e-mail to: prescottfarm@cyberportal.net.

Corrections

I accept responsibility for any errors that may appear in this Information Exchange. In the Fall/Winter issue of 1998, I provided the incorrect phone number for Kathy Nitschke, who is Forest Stewardship Coordinator for the State of Maine. Sorry, Kathy. Here is the correct information.

Phone: 207/287-1073

*E-Mail address:
kathy.nitschke@state.me.us.*

I also stated in the last issue that Congress has eliminated all SIP cost-share funds for FY98. It should have read FY99.

Biodiversity: *Biodiversity Resources*

Crop Tree Management

An inciteful and easy-to-understand publication, *Crop Tree Management in Eastern Hardwoods* by Arlyn W. Perkey, Brenda L. Wilkins, and H. Clay Smith (1993. NA-TP-19-93. Morgantown, WV: U.S. Department of Agriculture, Forest Service, State and Private Forestry, Northeastern Area; 58 p. + app.), is a great reference for those interested in enhancing biodiversity (e.g., wildlife structural habitat, food production, lichen productivity and diversity, and others) in their forest stands. This publication describes how to manage individual crop trees for fish and wildlife habitat improvement, aesthetic enhancement, water quality maintenance, and timber production. The system focuses on selecting and releasing trees that will yield multiple landowner benefits. It requires a clear understanding of landowner's property goals, whether they be biodiversity (e.g., wildlife and plants), aesthetics, or timber production. Based on the landowner's property goals, objectives for each stand can be established and criteria developed to guide the selection of individual crop trees. A crown-touching release is then applied to free the crop trees

from competing trees. Once released, the crop trees respond with accelerated growth.

How can crop tree management enhance biodiversity? By selecting crop trees, releasing them, and allowing them to grow to a larger size more quickly, several positive benefits may result. For example, bigger trees tend to do the following:

- (1) provide a larger surface area to support a richer and more abundant array of lichens and thus a richer invertebrate fauna that use lichens as living substrates,
- (2) provide larger cavities for wildlife species such as raccoons and pileated woodpeckers,
- (3) produce greater amounts of mast if the trees are oaks or beeches,
- (4) provide a larger size class that is often unavailable in more intensively managed forested stands (i.e., enhance the diversity of size classes that are available), and

(5) increase the amount and variety of regeneration.

In essence, large trees enhance the diversity of niches and food sources for animal and some plant species; therefore, active management of forest stands to produce larger trees can enhance biodiversity of those stands if conducted in the proper manner.

The Northeastern Area is currently working with Marsh-Billings-Rockefeller National Historical Park in Woodstock, Vermont, to establish a crop tree demonstration area. Plans are being made for a crop tree demonstration workshop, actual implementation of crop tree management at the park, and educational and interpretive activities to explain the “why’s and how to’s” of crop tree management.



Ecosystem Restoration

Dr. Alan Ammann of the USDA Natural Resources Conservation Service in Durham, New Hampshire, is working on a publication, *Restoring New Hampshire's Natural Ecosystems: A Guide for Towns*. Dr. Ammann may be reached at the following e-mail address: apa@nh.nrch.usda.gov. Information on restoring aquatic ecosystems, beaver-dominated wetlands, bogs (peatlands), early successional ecosystems, forests, pine barrens, riparian forests, salt marshes, and vernal pools will be included in the publication. This publication is still in the draft stage but we're sure that Alan would appreciate hearing from you concerning any of your thoughts on the topic of ecosystem restoration in the Northeast.

Web Source

<http://www.fs.fed.us>

Web site for the US
Forest Service

Lichen and Bryophyte Biodiversity

Did you know that the diversity of lichens and bryophytes (mosses and liverworts) in your woodland may be enhanced by proactive management techniques? Much of the work that has been conducted on this topic has been done in the Pacific Northwest where high rainfall produces abundant and diverse populations of lichens and bryophytes. A recent videotape by Dr. Patricia Muir at Oregon State University, "Enhancing Lichens and Bryophytes in Young Forests," highlights the possibilities for enhancing the biodiversity of these species in the Pacific Northwest. Dr. Muir discusses the importance of maintaining and/or protecting the following attributes of younger forests: (1) remnant green trees and downed large, woody debris from the previous stand, (2) wolf trees, (3) hardwood openings in a coniferous woodland, and (4) rocky outcrops. A major problem for lichens and bryophytes in intensively managed forests is that their dispersal is limited. Lichens rely primarily on physical translocation of the vegetative thallus (body of the lichen) in order to disperse. In other words, they must be broken apart physically by agents (animal, winds, freezing/thawing) and then be transported by agents such as gravity and wind to inoculate younger forest trees. Mosses rely on water to transport their propagules and are less dependent on the dispersal of the moss thallus in order to disperse. A copy of Dr. Muir's videotape may be obtained from:

Forestry Media Center,
Oregon State University,
248 Peavy Hall,
Corvallis, OR 97331-5702.

Can biodiversity of lichens be enhanced in the Northeast as is the case in the Pacific Northwest? We believe so, based on some work by

lichen researchers, such as Dr. Steve Selva at the University of Maine at Fort Kent. Dr. Selva, for example, showed in a study of older stands in northern New England and western New Brunswick that epiphytic lichen floras become richer over time, with older stands harboring more rare species (1994. Lichen Diversity and Stand Continuity in the Northern Hardwoods and Spruce-Fir Forests of Northern New England and Western New Brunswick. *The Bryologist* 97(4): 424-429.). Therefore, retention of existing older stands or remnants of previously existing stands in younger stands in the form of large, old trees or downed, woody debris should produce similar results as noted for the Pacific Northwest. Dr. Selva also noted that the lichen flora at spruce-fir sites is distinct from the flora associated with northern hardwood sites. Thus, maintenance of inclusions of spruce-fir in hardwoods stands or inclusions of hardwoods in spruce-fir stands should enhance the diversity of lichens in forest stands in New England. Observations of natural, rocky outcrops and man-made rock walls in New England indicate an abundance and great variety of lichens and bryophytes in these habitats as well, and suggest that the maintenance and protection of these habitats is important in enhancing the diversity of lichens and bryophytes. Lichens of rock walls were recently the subject of the paper, "Rock Wall Lichens," by Elizabeth Kneiper, published in *Massachusetts Wildlife* by the Massachusetts Division of Fisheries and Wildlife. A copy of this article can be obtained by contacting the New England Wildflower Society at 508/877-7630, ext. 3001, or the Massachusetts Division of Fisheries and Wildlife at 1 Rabbit Hill Road,

Westborough, MA 01581, phone: 508/792-7270, ext. 104.

Bryophytes also can likely be enhanced in the Northeast by proactive management. Sarah Cooper-Ellis documented 24 species of bryophytes that occur exclusively in old-growth forests of western Massachusetts (1994. Ecology and Distribution of Bryophytes in Old-Growth Forests of Western Massachusetts. Northampton, MA: Smith College. Master's thesis.). Seven of these species occurred with enough frequency to make them useful as indicators of old-growth in western Massachusetts hemlock-hardwood forests. Most of these species are epiphytes, growing sparsely on the bark of tree trunks and more abundantly on their bases. Cooper-Ellis also found that trees in western Massachusetts old-growth hemlock-hardwood stands support a richer and more varied bryophyte flora than trees of the same species and comparable diameters in stands of second-growth, and total bryophyte cover on tree bases in old-growth hemlock-hardwood stands exceeds that on tree bases in second-growth stands. Although this study did not directly analyze the possibilities for enhancing the biodiversity of bryophytes in younger stands, it seems from the results that second-growth stands could be managed to protect inclusions of larger, older trees and to allow for these trees to be maintained in the long term to produce the characteristics apparently favorable to bryophytes in older stands. The maintenance of remnant large trees and large, downed woody debris from previous stands would also seem to be a logical approach for enhancing biodiversity of bryophytes in younger stands.

Deer Browsing and Forest Biodiversity: A Dilemma

Concerns over the increasing white-tailed deer population in the eastern United States and its effects on forest biodiversity have been the subject of many scientific articles (Warren 1997). Numerous studies have documented the impacts of deer on plant species composition, community structure, and regeneration for many forest types (Stromayer and Warren 1997). Two regions of the Northeast have been intensively studied - the Allegheny Plateau and the Great Lakes States. Studies in the former area indicate that deer browsing has profound effects on the establishment of regeneration, species composition, and density of hardwood seedlings (Horsely and Marquis 1983; Marquis 1974, 1981). In the latter area, studies on the effects of deer browsing have documented a replacement of conifers (e.g., hemlock, white cedar, and Canada yew) by hardwoods (Alverson and others 1988). Effects of deer browsing in other areas in the East include the decline of Atlantic white cedar in the New Jersey pine region (Little and Somes 1965) and suppression of balsam fir in West Virginia (Michael 1992).

DeCalesta and Stout (1997) developed a conceptual framework for managing deer for sustainability of ecosystems and the diversity of those ecosystems. They related relative deer density (i.e., current deer density as a proportion of deer density at ecological carrying capacity) to sustainability of ecosystems. Three levels of relative deer density were identified: the highest level associated with maximum sustained yield of deer numbers for harvest (highest

browsing pressure), the intermediate level or the level at which timber productivity can be sustained (i.e., where the forest can regenerate even with some intermediate level of deer browsing), and the lowest level or the level associated with sustaining biodiversity (i.e., lowest level of deer browsing). The interesting concept here is that managing deer herds to sustain biodiversity should result in the regeneration of the forest, but with lower hunting opportunities. So what is more important, sustaining biodiversity or maximizing hunting opportunities? With a shrinking hunting population due to cultural changes since the 1950's, sustaining biodiversity may often be a popular goal for an area. But this would likely result in the difficult decision to reduce current deer populations. Whether this is acceptable or not in your area, we'll leave that up to you.

The references cited above are listed below if you are interested in reading more about this topic.

Alverson, W.S.; Waller, D.W.; Solheim, S.L. 1988. Forests too deer: edge effects in northern Wisconsin. *Conservation Biology* 2: 348-358.

DeCalesta, D.S.; Stout, S.L. 1997. Relative deer density and sustainability: a conceptual framework for integrating deer management with ecosystem management. *Wildlife Society Bulletin* 25(2): 227-234.

Horsely, S.B.; Marquis, D.A. 1983. Interference by weeds and deer with Allegheny hardwood reproduction. *Canadian Journal of Forestry Research* 13: 61-69.

Little, S.; Somes, H.A. 1965. Atlantic white-cedar being eliminated by excessive animal damage in south Jersey. Research Note NE-33. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station; 3 p.

Marquis, D.A. 1974. The impact of deer browsing on Allegheny hardwood regeneration. Research Paper NE-308. Upper Darby [Radnor], PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station; 8 p.

Marquis, D.A. 1981. Effect of deer browsing on timber production in Allegheny hardwood forests of northwestern Pennsylvania. Research Paper NE-475. Bromall [Radnor], PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station; 10 p.

Michael, E.D. 1992. Impact of deer browsing on regeneration of balsam fir in Canaan Valley, West Virginia. *Northern Journal of Applied Forestry* 9: 89-90.

Stromayer, K.; Warren, R.J. 1997. Are overabundant deer herds in the eastern United States creating alternate stable states in forest plant communities? *Wildlife Society Bulletin* 25(2): 227-234.

Warren, R.J. (ed.). 1997. Special issue - deer overabundance. *Wildlife Society Bulletin* 25(2): 213-596.

Naturalist's Corner

We would like to feature some of the edible wild plants of the Northeast in each of our issues. This issue highlights wintergreen, which was recently named the state herb of Maine.

Usual (Common) Name: Wintergreen Latin (Specific) Name: *Gaultheria procumbens*

Other Names (Synonyms): Teaberry, checkerberry, ground holly, creeping wintergreen

Key Characteristics: A small evergreen perennial of the heath family, whose thin, trailing stems weave through and beneath moss, soil, and pine needles, sending up occasional “branches” which produce leaves and flowers. Leaves (usually in threes) are alternate, ovate, glossy green above, and whitened below. Flowers are waxy white and resemble tiny bells. The fruits are berrylike, red, aromatic, and somewhat dry.

Habitat and Range (Northeast): Found in woodlands, usually in or near coniferous trees, especially pines. Prefers acid sandy soils that have some shade and good moisture (e.g., cool north slopes). Newfoundland to Manitoba, south to Virginia, Kentucky, northern Indiana, Minnesota, and in the mountains to Georgia and Alabama.

Parts Used: The young reddish spring leaves are tender and aromatic, providing a tasty nibble in the field and an excellent tea. The older leaves are edible too, but are somewhat dry and tough. The berries are best in early spring; they can be used fresh or as a flavoring agent in salads and fruit dishes.

Collection: Gather berries and young leaves in the spring³/₄May or early June. Collect the mature green leaves in summer or fall.

Preparation: The aromatic leaves can be cut or chopped for tea and then used about 1 teaspoon per cup, steeping for 5 to 10 minutes in hot water. Fruits can be used as flavoring or in a variety of desserts and beverages.

(Monthey, L.G. Foraging for wild foods: a new recreational pastime. Madison, WI: University of Wisconsin-Extension, Environmental Resources Unit.)



Reprinted with permission from *The New Britton and Brown Illustrated Flora of The Northeastern United States and Adjacent Canada* (Volume 3), copyright 1952. The New York Botanical Garden

“The U.S. Department of Agriculture (USDA) prohibits discrimination on all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA’s TARGET Center at (202) 720-2600 (voice and TDD).”

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.”

Biodiversity Resources

Books

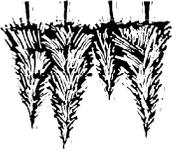
Biodiversity II: Understanding and Protecting Our Biological Resources. 1997. Marjorie L. Reaka-Kudla, Don E. Wilson, and Edward O. Wilson. This book updates readers on how much we already know and how much remains to be identified by science. It explores new strategies for quantifying, understanding, and protecting biodiversity. It reinforces the idea that the conservation of our biological resources is within reach.

Science and the Endangered Species Act. 1995. National Research Council. This book focuses on the sciences underlying the endangered species act and offers recommendations for making the act more effective. It provides an overview of what scientists know about extinction and means of biological conservation.

Biodiversity. 1988. E.O. Wilson. This book discusses the rapidly accelerating loss of plant and animal species to increasing human population pressure and the demands of economic development.

Research Articles

Geographical Information Systems in Long-term Forest Management and Planning with Special Reference to Preservation of Biological Diversity: A Review. Erik Naesset. Forest Ecology and Management Journal 93(1997): 121-136.



NA -S&PF
USDA Forest Service
271 Mast Road
PO Box 640
Durham, NH 03824

