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Implementing the American Woodcock Conservation Plan

Progress to Date



Executive Summary

To achieve the goals set forth in the American Woodcock Conservation Plan, published in 2008, the Wildlife Management Institute and its partnering agencies and organizations have launched four regional habitat initiatives in the primary breeding range of the American woodcock, which spans eastern North America from Atlantic Canada to the Great Lakes.

Since the 1960s the woodcock population has fallen by about 1.2 percent each year, largely because the birds' preferred habitat – young, brushy forest – has dwindled. Many states now classify the woodcock as a “species of greatest conservation need.” Conservation biologists consider the woodcock to be an “umbrella species,” which means that creating habitat for woodcock simultaneously helps more than 50 other kinds of wildlife – including many species whose populations also have fallen – that need young forest during part or all of their life cycles.

In carrying out the regional initiatives, teams of experienced biologists provide public and private landowners with technical advice on how best to create young forest. They work to build and strengthen partnerships between and among federal and state natural resource agencies, wildlife and land-use organizations, foresters and forest-products companies, and owners of woodlands both large and small. Using the latest scientific techniques, they monitor woodcock, including the response of local populations to improvements and increases in habitat.

More than 50 new Demonstration Areas (described in Part II of this publication) showcase habitat-management techniques while providing thousands of acres of young forest where woodcock can feed, breed, and rear their young.

Clearly, the many partners in the American Woodcock Conservation Plan are making progress toward reversing the woodcock's population decline. The challenges are great: To restore the species' population to 1970s levels, we must add more than 20 million acres of young forest to the current landscape. In the near future, partners plan to start additional regional habitat initiatives in the United States and Canada within the woodcock's breeding range, migration corridors, and wintering ranges.

As we work to reverse the woodcock's population decline, we help wild animals, both uncommon and abundant, that share the habitat: reptiles and amphibians, birds, and mammals. Some of the many species that benefit from creating and restoring young forest are snowshoe hare, New England cottontail, bobcat, white-tailed deer, ruffed grouse, whip-poor-will, golden-winged warbler, willow flycatcher, indigo bunting, box turtle, bog turtle – as well as a host of insects and plants.

Meeting the habitat goals set forth in the American Woodcock Conservation Plan requires nothing less than re-educating North Americans to understand that creating and perpetually renewing young forest is necessary for safeguarding our continent's fascinating and valuable biodiversity.

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Tim Flanigan

Population and Habitat



American Woodcock/Tim Flanigan

The American woodcock (*Scolopax minor*), sometimes called the timberdoodle, lives in young forest near rivers and streams. Woodcock eat worms and insects, which they catch by probing in damp soil using their long bills.

In the last century, woodcock were abundant because many thousands of acres of young forest existed across their range (photo below). But many of those acres have grown to become mature forest, where woodcock rarely venture. Urban and suburban development and clean farming practices have destroyed other acres once used by woodcock. Today we suppress fire, a natural force that in times past periodically created vast areas of regrowing young trees. Also, many people today react negatively to heavy timber cutting; in some states, and in preserves such as Adirondack Park, regulations and public opinion have curtailed this form of logging, which once yielded a continual supply of young-forest acres.

In most states where woodcock breed, their current numbers are significantly lower than in the past (Figure 1).



Prime woodcock young forest and alder habitat./Toby Alexander, NRCS

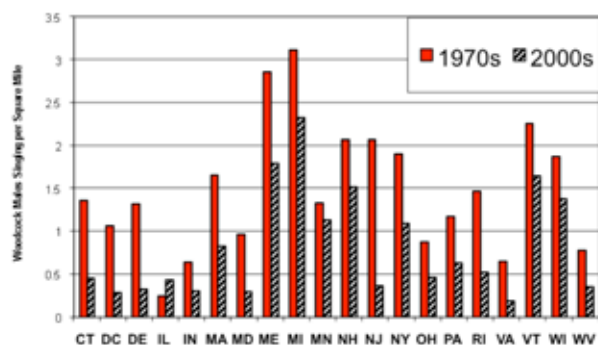
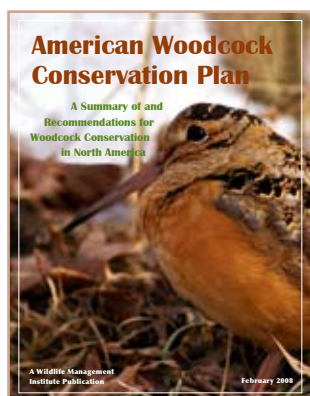


Figure 1. Changes in American Woodcock abundance over time as measured by the USFWS Singing Ground Survey.

Federal and state wildlife agencies, along with organizations including the Wildlife Management Institute, the Association of Fish and Wildlife Agencies, the National Fish and Wildlife Foundation, and the Ruffed Grouse Society jointly developed the American Woodcock Conservation Plan, which the Wildlife Management Institute published in 2008.



Woodcock Conservation Plan – www.timberdoodle.org

The plan lists the total acres of young forest now existing in the 19 states and six Canadian provinces that constitute the woodcock's primary breeding range. The plan presents the number of acres of young forest that, wildlife scientists have calculated, must be created or restored annually to halt the decline of the American woodcock population by 2012, and to return the population to 1970s densities by 2022 (Table 1).

BCR	State/Province	Stop Decline	Partial Recovery	Full Recovery
12	MI	146,408	168,878	191,348
	MN	215,976	240,193	264,409
	WI	101,007	109,751	118,496
	Sub-total US	463,391	518,821	574,252
13	NY	65,055	105,047	145,040
	OH	17,945	26,038	34,131
	PA	6,425	8,431	10,437
	VT	2,270	2,939	3,608
	Sub-total US	91,695	142,455	193,216
14	CT	716	2,104	3,492
	ME	248,686	296,499	344,312
	MA	962	2,832	4,703
	NH	20,408	27,132	33,857
	NY	23,104	35,141	47,178
	VT	19,354	29,207	39,060
	Sub-total US	313,230	392,916	472,602
23	IL	0	130	260
	IN	1,529	3,412	5,295
	MI	30,762	47,609	64,455
	MN	19,847	23,374	26,901
	WI	62,196	77,596	92,997
	BCR Total	114,333	152,121	189,909
28	MD	3,255	4,013	4,770
	NJ	921	3,938	6,954
	NY	32,726	47,808	62,891
	OH	27,771	36,275	44,780
	PA	82,270	108,121	133,973
	VA	29,090	36,999	44,909
	WV	43,982	57,816	71,650
	BCR Total	220,014	294,971	369,927
30	CT	4,400	11,477	18,555
	DE	2,350	6,809	11,267
	ME	2,595	4,953	7,311
	MD	8,435	17,470	26,505
	MA	5,290	7,050	8,810
	NH	2,095	3,011	3,927
	NJ	6,955	27,685	48,415
	NY	1,295	5,360	9,424
	RI	1,065	3,395	5,724
	VA	3,140	6,163	9,186
	BCR Total	37,620	93,372	149,124

Table 1: Acres of young forest needed per year over the next 20 years to stop American Woodcock decline and for partial to full recovery of 1970s population levels of American Woodcock.

Implementing the Plan

The American Woodcock Conservation Plan specifies regional habitat Initiatives based on Bird Conservation Regions (BCRs), fundamental biological units recognized by the U.S. North American Bird Conservation Initiative, a coalition of government agencies, private organizations, and initiatives aimed at helping different bird species. (See Figure 2).

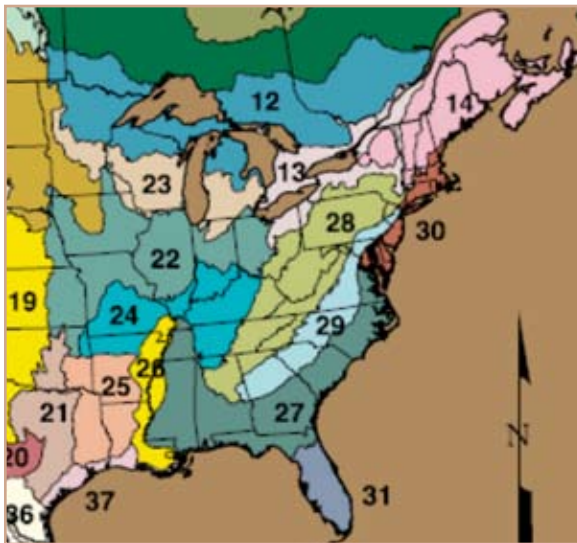


Figure 2. Boundaries of woodcock habitat initiatives are based on the international Bird Conservation Regions.

Within the different regions, partners focus management efforts on creating young forest through logging, mechanical brush-cutting, the use of herbicides, and controlled burning (photo at upper right). In some cases, partners also strive to suppress non-native invasive shrubs in favor of native shrubs that provide greater benefits to a broad range of wildlife. Rigorous scientific studies document the effectiveness of different techniques. Ultimately, the partners involved in the Woodcock Conservation Plan hope to have habitat-creation and -stabilization programs in all 16 Bird Conservation Regions where American woodcock breed, through which the birds migrate, and where they winter.



Chainsaw cutting of over mature alder.

A core strategy in each regional initiative is to develop a “Best Management Practices” manual explaining optimum ways of creating and renewing habitat in that particular region. A second important strategy involves setting up Demonstration Areas where interested persons and agency representatives can go to view up-to-date habitat-management practices.



Best Management Practices document (www.timberdoodle.org)

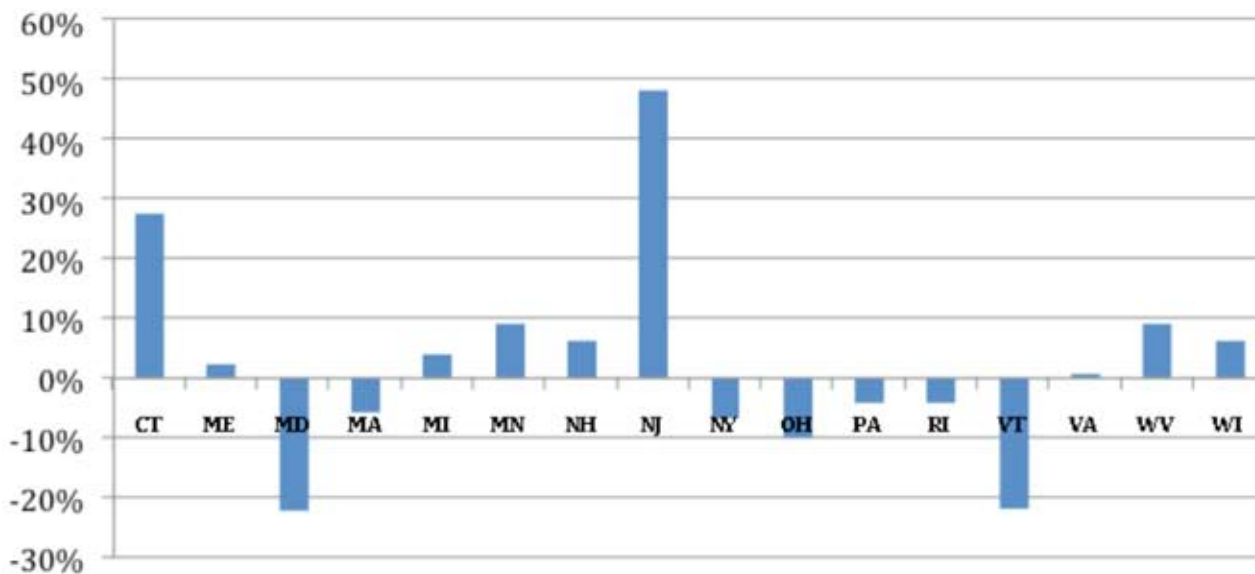


Figure 3. Percent change in small diameter forest area between 2004 and 2008. The start of the period represents the publication of the Woodcock Conservation Plan and the start of regional woodcock habitat initiatives. Data generated by USFS Forest Inventory and Analysis.

Two metrics were chosen to track the on-the-ground accomplishments of the regional initiatives: the change in the area of small diameter forest as measured by the US Forest Service; and the change in woodcock density as measured by the Singing Ground Survey. Since the start of the initiatives in 2004, 8 states have shown an increasing trend in young forest area while 7 states have shown a decreasing trend (Figure 3). The change in woodcock density has not yet been calculated but is expected to reflect the changes in habitat availability.



Woodcock habitat workshop with NRCS personnel in Vermont./Toby Alexander

Ultimately, the partners involved in the Woodcock Conservation Plan hope to have habitat-creation and -stabilization programs in all 16 Bird Conservation Regions where American woodcock breed, through which the birds migrate, and where they winter.

Benefit to Other Species

State agencies use State Wildlife Action Plans to focus management efforts on species of greatest conservation need. In the East, states have identified 54 birds, 12 mammals and 8 reptiles that depend upon early successional habitat, including young forest, for all or part of their habitat needs.



Golden Winged Warbler

The Golden Winged Warbler, for example, is a Neotropical migratory song bird that breeds in eastern North America, principally in the Appalachian Mountains Bird Conservation Region (BCR28) from northern Georgia to New York, in the Great Lakes region (MI, WI and MN), and in adjacent areas in Canada. Golden Winged Warblers spend the winter in Central and northern South America. Over the last 40 years, Golden Wing Warbler populations have declined rangewide by 3.1% per year with declines of up to 16% per year in some states (USGS Breeding Bird Survey). As such, the Golden Winged Warbler is one of the most critically threatened, non-federally listed species in eastern North America.

Because of the overlap in habitat needs with woodcock, Golden Winged Warbler habitat management is frequently featured on woodcock demonstration areas. The Appalachian Mountains Woodcock Initiative is helping fund research to determine where it makes most sense to integrate Golden Winged Warbler habitat needs into woodcock habitat management.

Restoration of New England Cottontail populations is a primary goal of the Atlantic Coast Woodcock Initiative. New England Cottontails have declined substantially due to loss of young forest and shrubland habitats and are a candidate for listing on the Federal Endangered Species list. In their range from southeastern Maine to Long Island, New York, woodcock initiative partners are focusing habitat improvement on those areas most likely to also benefit New England Cottontail. After management, habitats are used by both species.



New England Cottontail/Jeff Banke

Research and Monitoring

Research and monitoring activities allow scientists to adapt habitat management strategies to the preferences of woodcock and monitor the population response to habitat improvement. Monitoring takes place on several different scales – the largest being the USFWS Woodcock Singing Ground Survey. On woodcock demonstration areas, scientists monitor the response of woodcock and other species to implementation of best management practices. Some intensive monitoring involves radio telemetry.

For two years, project biologists have tracked woodcock response to habitat improvement in the Adirondacks of New York in a project funded by the New York Department of Environmental Conservation. With the support of the Northern Forest Woodcock Initiative, technical assistance was given to the managers of Lyme Adirondack Forest Company to create young forest that would benefit the American Woodcock. Habitat management was designed to provide three main components of habitat needs for woodcock: young forest habitat for feeding and nesting; large openings for nocturnal roost sites; and small openings for spring courtship activity. Demonstration areas were created between February 2008 and February 2010 by the harvest of merchantable forest products from the prescribed management areas. In the spring of 2008 and 2009 singing ground surveys of male woodcock courtship displays were conducted on demonstration areas. In 2009, woodcock were captured and fitted with a radio-telemetry unit for identification of summer habitat use. Radio-telemetry monitoring was conducted from April to October of 2009 when all signals were lost.



Attaching radio telemetry unit.

Of the eleven American Woodcock in this study there were 22 different habitats used for diurnal and crepuscular activities. The most abundantly used habitat was alders and the second most used habitats were stands with trees 10-30 feet tall with varying crown closures and forest types. These stands are all stands that were heavily cut in the past and typically have thick pole size timber ½ -6 inches in diameter. Some mature forest stands were used for diurnal activity. When birds were found in these stands, they were typically located near riparian areas with moist, rich soil. When compared to the representation of forest stand types, woodcock diurnal use showed a clear preference by using several habitats in proportions greater than available, especially alder stands. Also, a clear preference for young stands

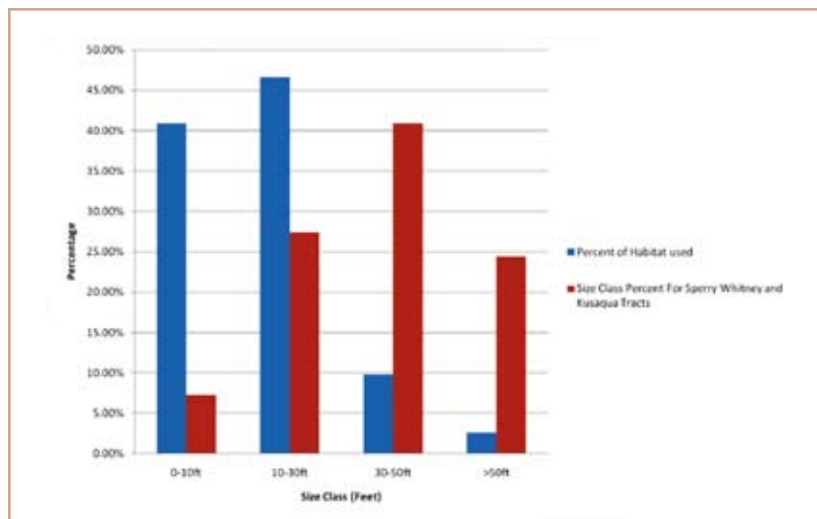
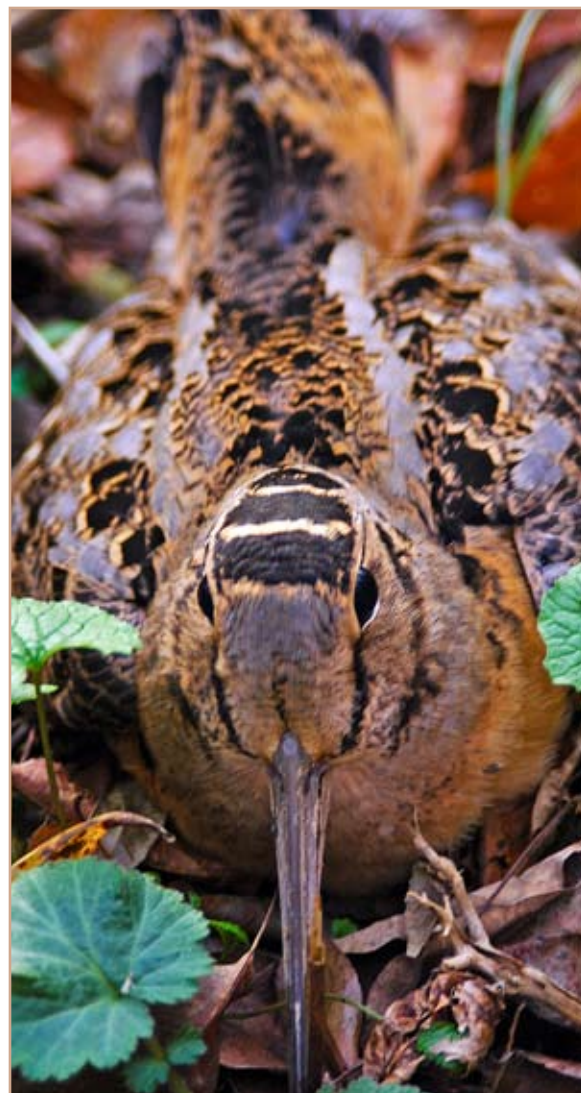


Figure 4: Percentage of size class used by woodcock vs. size class availability on woodcock habitat demonstration areas in the Adirondack Mountains of New York.

is demonstrated when comparing use by woodcock of different size classes vs. availability (Figure 4).

Nine of the eleven American Woodcock used in this study were tracked at night. There were 14 different stand types used by the nine birds tracked at night. The most abundantly used stand type at night was alders and the second most abundantly used stand type was log landings. When roosting woodcock were found in forest stands, most locations were on skid trails or within small openings.



American Woodcock/Tim Flanigan



Mark Banker, RGS

Communications

Funded by a grant from the U.S. Fish and Wildlife Service's Webless Migratory Game Bird Research Program, the consulting firm D.J. Case and Associates recently conducted focus-group interviews, surveys, and message testing and analysis to study the public's perception of woodcock, young forest, and wildlife. The results of this research are helping shape an overall communications strategy that will further the goals of the American Woodcock Conservation Plan.

The research revealed that many private landowners value natural beauty and scenery; conserving wildlife and nature for future generations; and high plant and animal diversity within ecosystems. Results indicated that, in some regions, certain species of young-forest wildlife may be deemed more attractive or more interesting or may be better-known than the American woodcock. The research demonstrated that jargon such as "early successional habitat" or "scrub/shrub habitat" and unfamiliar acronyms often alienate landowners and lead them to conclude that they are not the intended target audience for communications outreach.



Technical assistance to private landowners on ways to improve habitat for woodcock

A key finding was that landowners and the general public respond favorably to the concept of "young forests" and the message that "a diversity of wildlife requires a diversity of habitats." These conclusions will help guide ongoing and future communications efforts.



Got Woodcock? Cows Land and Lumber



Wildlife Needs Young Forest

Realizing the increasing importance of the worldwide web, WMI and its partners, including the National Fish and Wildlife Foundation, have set up and currently maintain a user-friendly website, www.timberdoodle.org, which has become highly ranked by search engines such as Google, Bing, and ask.com. The website explains the woodcock's biology, population dynamics, and habitat needs. It also describes and directs people to Demonstration Areas where they can see young forest and view the results of management efforts.

Communications specialists have developed a brochure, *Wildlife Needs Young Forest*, that field biologists are distributing to key contacts throughout the regional habitat initiatives. A portable tabletop display, featuring the brochure's contents and message, can be set up at conferences and seminars to promote the concept of young forest and explain its importance to woodcock and other wildlife. Communicators have written and designed signs that increase the public's awareness and understanding of habitat management practices favoring young forest (see image below). They are also preparing new outreach materials that emphasize the importance of young forest in ecosystem biodiversity.



Signage developed to inform on the role of young forest in biodiversity management.

Sustainable Forestry

The concept known as Sustainable Forestry promotes forestry and timber-harvesting practices that enhance and protect biodiversity, at-risk species, wildlife habitat, and the prompt and healthy regrowing of trees. Partners in the American Woodcock Conservation Plan recognize that Sustainable Forestry techniques are key to reaching habitat goals that will help restore woodcock populations. For this reason, sustainable forestry practices underlie many of the habitat-creation efforts now going on.

The acreage goals recommended in the Conservation Plan are large – too large to be met if habitat-improvement measures do not generate income from forest products. Field biologists in the four regional habitat initiatives are working closely with the Sustainable Forestry Initiative (SFI) to make sure that the “Best Management Practices” developed for each region incorporate up-to-date sustainable-forestry techniques. A grant from the National Fish and Wildlife Foundation (a key partner in the American Woodcock Conservation Plan) helps managers and foresters apply those techniques in voluntary forest-management operations.



Sustainable forestry practices can produce important wildlife habitats./Mark Banker, RCS

Partners in the American Woodcock Conservation Plan recognize that Sustainable Forestry techniques are key to reaching habitat goals that will help restore woodcock populations. For this reason, sustainable forestry practices underlie many of the habitat-creation efforts now going on.

Accomplishments & Demonstration Areas

Northern Forest Woodcock Initiative: BCR 14

The Northern Forest Woodcock Initiative (NFWI), established in 2004, is the longest running woodcock habitat initiative. In recognition of the level of partner interest and action, the NFWI was awarded the 2008 Cooperative Conservation Award by the Secretary of the Interior.

Partners in the NFWI include the U.S. Fish and Wildlife Service; U. S. Forest Service; Doris Duke Charitable Foundation; Natural Resources Conservation Service; National Fish and Wildlife Foundation; U.S. Geological Survey; Northeast Association of Fish and Wildlife Agencies; fish, wildlife, and conservation agencies of Maine, New Hampshire, Vermont, Connecticut, Rhode Island, Massachusetts, Pennsylvania, Maryland, Delaware, Virginia, and West Virginia; the Ruffed Grouse Society; Woodcock Limited of Pennsylvania; Audubon NH; Audubon VT; New England Forestry Foundation; Berkshire Natural Resource

Council; National Wild Turkey Federation; Down East Land Trust; Cows Land and Lumber; Lyme Timber Company; Plum Creek Timber Company; Upland Forestry; International Paper Company; Vermont Electric Company; TransCanada; Consol Energy; and the Wildlife Management Institute (WMI).

Funding for the project was provided by the Doris Duke Charitable Foundation, National Fish and Wildlife Foundation, Wildlife Conservation Society, the Northeast Association of Fish and Wildlife Agencies, the U. S. Fish and Wildlife Service, the Natural Resources Conservation Service – Agricultural Wildlife Center, the U. S. Forest Service, the U. S. Geological Survey, and the Wildlife Management Institute.

One of the first accomplishments of the NFWI team was to develop a set of Best Management Practices and to publish those as a technical reference and resource. The Natural Resources Conservation Service

Activity	State								Total
	MA	ME	NH	NY	VT	CT	RI	NB	
NFWI Presentations & Implementation Meetings	8	24	25	3	5		1	4	75
Properties Assessed for ESH Demonstration Areas	11	59	82	14	14	1	5	6	192
Total Acreage of Existing or Planned AMWO Habitat	247	23,893	16,742	10,039	8,785		70	1,665	61,441
Properties w/ ESH Management Process Underway ²	5	25	38	14	9	1	1	5	91
Number of NFWI Management MOAs, (non-commercial contract acres)	3(64)	5(161)	17(2,429)	1(10,039)	1(335)		1		28 (13,028)



Mark Banker, RGS

– Agricultural Wildlife Center provided funding and leadership to develop the BMPs. Contributors to the publication included Gary Donovan, WMI; Dan McAuley, USGS; Pat Corr, USGS; John Lanier, WMI; and Scot Williamson, WMI. The publication: American Woodcock Habitat Best Management Practices for the Northern Forest Region is available for free download from www.timberdoodle.org.

Demonstration areas showcase Best Management Practices, provide an outdoor classroom for training sessions and workshops, and serve as science areas for monitoring and research. Demonstration areas in the NFWI developed to date include:

Silvio O. Conte National Fish and Wildlife Refuge, Nulhegan Basin Division, Essex County, Vermont

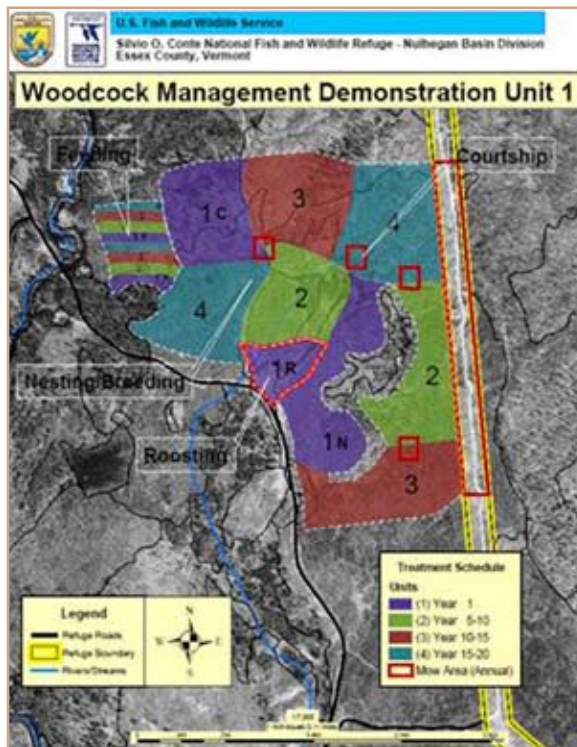
On this federal refuge in northeastern Vermont, a Woodcock Habitat Management Demonstration Project consists of three units totaling 286 acres. The units lie next to roads and are easily reached for ongoing

management practices, scientific study, and public inspection.

The first phase of timber harvesting began in 2007. At that time most of the land was covered with pole-stage and somewhat larger trees, including birch, aspen, and red maple, having last been logged in the 1980s. After commercial logging, a tracked excavator with a “brontosaurus” attachment shredded logging debris and other vegetation, creating openings and clearing land that is now growing back as dense young forest.

More cutting will take place in 2012, 2017, and 2022, setting in motion a 20-year rotation that will supply key woodcock habitat types: courtship, nesting and brood rearing, feeding, and roosting. Each year workers mow areas in the units to keep them functioning as springtime singing grounds. All of these habitats benefit a wide range of wildlife, including species as diverse as interior-forest-nesting songbirds, snowshoe hares, moose, and reptiles and amphibians.

Partners: U.S. Fish and Wildlife Service, Vermont Electric Power Company, Wildlife Management Institute.



Thomas LaPointe, USFWS

Second College Grant, Dartmouth College, Coos County, New Hampshire

In the 1990s Dartmouth foresters began a specific effort to create young forest in this large wooded area in northern New Hampshire. About half of the habitat improvement work has taken place in the Swift Diamond watershed and half in the Dead Diamond watershed.

Managers cut more than 12 acres of alder along streams and rivers, yielding a dense regrowth that provides woodcock with feeding and brood-rearing habitat; more alder regeneration is planned for the future. Workers periodically mow 78 acres of road edges, log landings, and old fields to keep them functioning as springtime singing and displaying habitat. Through commercial logging and the use of brontosaurus-type equipment, foresters increased the acreage

of woodcock roosting habitat to 44. An additional effort focuses on expanding existing aspen stands. Since 1998 wildlife researchers have been fitting woodcock with transmitters and following them through radiotelemetry to determine how they use the various habitats on the Second College Grant. Singing ground surveys have documented a strong increase in the woodcock population following habitat management efforts.

Partners: Dartmouth College, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, Wildlife Management Institute.

Lyme Adirondack Forest Company, Adirondack Park, New York

The Lyme Timber Company of Hanover, N.H., owns and manages The Lyme Adirondack Forest Company, whose 22 tracts total 276,000 acres in Adirondack Park in upstate New York. Lyme Adirondack is the largest private landholder in the Park. The company harvests forest products on a sustainable basis while conserving soil, water, and wildlife resources.

When Lyme bought the tracts in 2006, only 76 of the 276,000 acres were in forest size class 1 (trees less than 10 feet tall). Lyme plans to put 5 percent of the acreage in each tract back into young forest within 10 years. To date, commercial logging operations have included patch cuts up to 8 acres; uniform clearcuts as large as 25 acres; and shelterwood removal cuts of 5 to 90 acres. By late 2008, more than 280 acres of new young-forest habitat had been created on four tracts. Lyme is moving ahead to create wildlife-friendly young forest on its other tracts as well.

Strategically sited cuts in and near softwood stands along streams will also benefit spruce grouse, an endangered species in New York.

Partners: The Lyme Timber Company, New York State Department of Environmental Conservation, Wildlife Management Institute.

Cobscook Bay Wildlife Management Area, Washington County, Maine

Habitat managers have created demonstration areas on two units of this large WMA in eastern Maine.

On the 128-acre Dennison Point Unit, overgrown old fields were cleared to rejuvenate them as woodcock singing and breeding habitat. In alder stands, managers cut parallel strips 80 feet wide: 6.3 acres were treated in 2008 (about half of the total area to be restored through tree and shrub removal). In 2012 another 25 percent of the area will be cut, and in 2017 the remaining alder strips will be set back, ensuring a perpetual mix of different age classes of the regrowing shrubs.

On the 528-acre Morong Cove Unit, 5 acres of aspen and birch were logged to create patches of young forest. Another 4 acres will be cut in 2017. These woodcock nesting and brood-rearing areas augment existing feeding and courtship habitats elsewhere on Cobscook Bay WMA and on adjacent private lands.

Partners: Maine Department of Inland Fisheries and Wildlife, Wildlife Management Institute.



Scot Williamson, WMI

Moosehorn National Wildlife Refuge, Washington County, Maine

This refuge in eastern Maine hosts the largest and longest-lived research program exploring the biology, population dynamics, and habitat needs of American woodcock.

Refuge personnel manage 2,000 acres of woodlands to benefit woodcock and other young-forest wildlife. Technicians periodically mow or burn 60 acres of lowbush blueberry and old-field habitats to keep them functioning as roosting fields and singing grounds. Feeding habitats, including alder-

dominated shrub lands, amount to around 500 acres. The refuge has many stands of aspen, a key tree species for woodcock and other young-forest wildlife.

Through commercial logging and the use of brontosaurus and other machinery, workers cut down trees on numerous 5-acre patches. A 40- to 50-year rotation maintains different ages of forest. In alder stands, 60- to 100-foot-wide strips are cut on a 20-year rotation, with new strips made every four to five years.

Researchers use radio telemetry and other techniques to study how woodcock interact with their habitat, food resources, and predators. The biologists monitor songbirds that breed on the managed areas and have documented stable or increasing populations of species that depend on young forest habitat. Birds that breed in more-mature woods also use the managed areas, switching to these sites in late summer to feed on fruits of small trees and shrubs whose growth and productivity improve when logging sets back taller shade-producing vegetation.

The Moosehorn offers a Woodcock Trail (a short walking circuit with signs identifying vegetation and habitat types and explaining management practices) and two auto tours that showcase habitat-improvement efforts.

The Moosehorn offers a Woodcock Trail (a short walking circuit with signs identifying vegetation and habitat types and explaining management practices) and two auto tours that showcase habitat-improvement efforts. Visitors can arrange guided tours

and, depending on the season, may be able to accompany wildlife biologists doing field work.

Partners: U.S. Fish and Wildlife Service, U.S. Geological Survey, University of Maine, Maine Department of Inland Fisheries and Wildlife, Ruffed Grouse Society, Wildlife Management Institute.

Poland Brook Wildlife Management Area, Franklin County, Massachusetts

On 664-acre Poland Brook WMA in western Massachusetts, managers targeted 25 acres in four areas of former farm fields where woodlands were becoming too mature for woodcock and other young-forest wildlife.

In 2007 workers used chainsaws, log skidders, and heavy-duty mowers to cut down pine seedlings and hardwood trees. They left trees and shrubs that produce food for wildlife, including black cherry, junberry, blueberry, hawthorn, and apple. In some areas they removed taller trees to promote the dense regrowth of shrubs, including alders. A combination of herbicide use, livestock grazing, and machinery helped suppress exotic invasive plants including glossy buckthorn, multiflora rose, Japanese barberry, and bush honeysuckle.

As well as benefitting woodcock, many of the newly opened areas provide good brood-rearing habitat for wild turkeys.

Partners: Massachusetts Division of Fisheries and Wildlife, National Wild Turkey Foundation, and Wildlife Management Institute.

Cowls Sawmill & Land Company, Norris Lot, Hampshire County, Massachusetts

The Norris Lot, in central Massachusetts, belongs to Cowls Sawmill and Land Company, a conservation-minded firm based in North Amherst. The site includes pastures and small woodlots that were abandoned from one to four decades ago.

Wildlife managers identified seven stands totaling 14.5 acres. In winter 2008, an initial round of tree-cutting took place on three of the seven stands. Logging removed marketable timber, including trees that were shading out food-producing shrubs and apple trees. Patches and strips were cut into the habitat in key areas. Altogether, about 7 acres were treated in this first cutting.

Over the next 15 years, continued cutting and mowing will keep the different habitat areas in grassy or young-forest stages. A staggered 15-year rotation of all stands will provide a wide array of regrowing vegetation.

Partners: Cowls Sawmill & Land Company, Massachusetts Division of Fisheries and Wildlife, Wildlife Management Institute.

Green Mountain Audubon Center, Chittenden County, Vermont

This 255-acre former farm in the Champlain Valley of northwestern Vermont is mostly grown up into mature woodland. It adjoins the 140-acre Birds of Vermont Museum; the two properties combined have been designated an Important Bird Area.



Scot Williamson, WMI

Near the visitors' center, 4 acres are kept in different stages of young-forest regrowth through brush-hogging and manual clearing. Another 3.7 acres of maturing woodland are divided into three units. Managers will clear the units sequentially, with cutting during 2009, 2012, and 2015. Another old field is being allowed to grow back in aspen. Nearby hayfields are mowed every other year to keep them functioning as woodcock singing grounds.

Although this demonstration area is not large in term of acreage, it provides important habitat niches in a landscape where many wooded tracts have become too mature to support woodcock and other young-forest wildlife. It also educates the many visitors to the Center on the importance of young forest to overall wildlife diversity.

Partners: Audubon Vermont, Birds of Vermont Museum, Natural Resources Conservation Service, Wildlife Management Institute.



Charles Fergus

Crowley Island, Washington County, Maine

On this 700-acre coastal island in eastern Maine, the Pleasant River Wildlife Foundation bought two large parcels of land, safeguarding three miles of shoreline, 283 acres of upland, and more than 150 acres of intertidal wetlands.

Alders, aspen, birch, and other native shrubs and hardwood trees cloak many upland acres, providing brood-rearing and feeding habitats. Recent management efforts have concentrated on creating openings from which male woodcock can sing and conduct springtime display flights, and fields where woodcock can roost at night during late summer and early fall.

In 2009 an excavator with a brontosaurus cutting head knocked down shrubby growth in old fields and blueberry barrens to improve an 8-acre roosting field; cleared 2 acres of singing grounds and courtship areas spread over three sites; and cut a 1.5-acre strip in an alder

stand. A series of strip cuts will ultimately provide different ages of alder shrubs, keeping a percentage of the stand in the dense young growth that benefits woodcock and other birds and mammals.

Partners: *Pleasant River Wildlife Federation, U.S. Fish and Wildlife Service (Partners for Fish and Wildlife Program), Wildlife Management Institute.*

Groton State Forest, Caledonia and Washington Counties, Vermont

Since the 1980s managers have been creating young forest for woodcock by logging on two demonstration areas on this state forest in northern Vermont.

In one area (in Caledonia County), 267 acres of strip and patch cuts made in 1984 have grown back in northern hardwoods where woodcock nest and feed. At a 4-acre gravel pit, managers will fill and grade edge areas to improve the site as roosting habitat. Strips cut in mature woods during the next ten years will create additional young-forest habitat.

On the second demonstration area (in Washington County), 97 acres of upland forest have been harvested in a series of logging operations. Four more cuttings are scheduled over the next 60 years, so that a large percentage of the area will continually remain in a young-forest stage.

Partners: *Vermont Agency of Natural Resources (Department of Forests, Parks & Recreation), Wildlife Management Institute.*

Johns River Watershed, Coos County, New Hampshire

Wildlife biologists are assembling a constellation of landscape-scale projects in northern New Hampshire.

At the center is the 5,600-acre Pondicherry Division of the Silvio O. Conte National Fish and Wildlife Refuge. Much of the refuge was logged in the late 1990s and early 2000s before the U.S. Fish and Wildlife Service acquired the land. Today, several thousand acres of young forest checkerboard the refuge. The following projects, now underway, encircle this core habitat:

Wagner Forest Management

This private company controls 1,700 acres on the lower slopes of Cherry Mountain and on valley bottomland near the headwaters of the Johns River. Wagner has mapped out this tract in a grid of 5-acre blocks. The company will cut all of the blocks over the next four decades to spur the regrowth of aspen, creating five different size and age classes of this sylvan species, a favorite of woodcock and many other wild creatures. The first entry was in 2008-09.

Pine Knob Farm

This 950-acre tract is owned by Dave and Tanya Tellman, participants in the Coverts Project sponsored by the University of New Hampshire Cooperative Extension Service. In 2008-09 the Tellmans made five 2-acre clearcut openings to increase forest diversity and provide brushy young-forest habitat for wildlife. In five to ten years, the Tellmans will make five more patch cuts. Since 1992 the Tellmans have cut 15 to 20 acres specifically to create young forest, and harvested timber on another 150 acres by making strip and patch cuts to benefit wildlife.

Goodson Property

On this small private tract, the landowner created a 1.5-acre opening in a stand of mature gray birch and aspen by commercially harvesting trees, then having a brontosaurus cutting device chew down limbs and stumps. Another 2 to 3 acres will be cut in the near future. Mowed and pastured portions of this and nearby properties already provide woodcock with singing grounds and roosting areas.

Partners: U.S. Fish and Wildlife Service, Wagner Forest Management Ltd., Marjorie Goodson, Dave and Tanya Tellman, New Hampshire Fish and Game (Small Grants Program), Wildlife Management Institute.

Missisquoi National Wildlife Refuge, Franklin County, Vermont

This 6,729-acre federal refuge hugs the shore of Lake Champlain in northwestern Vermont. Along with providing habitat for waterfowl, creating young forest for woodcock and other wildlife is a clear priority for refuge staff.

On a 50-acre upland fringing the Stephen J. Young Marsh, 20 acres of hardwood forest were cut in 100-foot-wide strips. Cutting will continue at 8- to 10-year intervals, creating

This 6,729-acre federal refuge hugs the shore of Lake Champlain in northwestern Vermont. Along with providing habitat for waterfowl, creating young forest for woodcock and other wildlife is a clear priority for refuge staff.



Scot Williamson, WMI

alternating bands of different-aged forest. Managers also promote growth of apple trees, mow grassy corridors, and let adjoining fields grow up in native shrubs that furnish roosting and feeding cover for woodcock and energy-rich fruits for migrating songbirds.

Strip and patch cuts on 60 acres of red maple-green ash swamp near the Maquam Creek and Black Creek Nature Trails created habitat for woodcock, brown thrasher, gray catbird, Canada warbler, Eastern towhee, ruffed grouse, and wild turkey. Cutting will continue on a 10-year rotational cycle. Around Maquam Bog, 500 old-field acres are being maintained as shrub-scrub habitat with alders, willows, dogwoods, and birches. On the eastern side of the refuge, 132 grassy acres in seven separate fields are being allowed to grow up as shrub-rich habitat.

Partners: U.S. Fish and Wildlife Service, Wildlife Management Institute.

Maquam Wildlife Management Area, Franklin County, Vermont

A significant part of Maquam WMA is being managed to create young-forest habitat in a part of northwestern Vermont where active farmland and mature woodland predominate.

Habitat managers annually mow grassy openings on this formerly farmed tract to keep them functioning as woodcock singing grounds. Workers used a hydro-ax device to cut trees at the edges of the openings, expanding them and creating dense brood-rearing and feeding cover.

On both sides of an old road that bisects the WMA, managers laid out a series of 1- to 6-acre patch cuts to create a mosaic of open areas and young forest. Twelve patch cuts totaling 25 acres were made in winter 2005; 11 more cuts on another 18 acres were scheduled for winter 2010. Additional cuts are planned for 2013 and 2018, intended to expand the size of aspen stands, creating prime woodcock feeding and brood-rearing cover.

Ruffed Grouse Society volunteers used chainsaws to cut down trees that were casting shade on apple trees; now the apple trees are growing vigorously in full sunlight, providing fruit for wildlife from bears to ruffed grouse, with woodcock probing for earthworms in the rich soil beneath the trees.

Partners: Vermont Agency of Natural Resources (Fish and Wildlife Department), Ruffed Grouse Society, Wildlife Management Institute.

Hanover Water Works, Grafton County, New Hampshire

This 1,400-acre tract in the Connecticut River Valley in central New Hampshire includes the water supply for Hanover and Dartmouth College. In the early 1900s the site was mainly farmland; today it is largely forested with northern hardwoods and planted conifers.

Since 1978 O'Brien Forestry Services of Orford, N.H., has supervised commercial logging on different forest stands throughout the property. In addition to the ongoing logging that creates young-forest habitat, two projects have improved the tract for woodcock.

In 2009 a timber operation salvaged mature pines that had blown down in a storm. After a bulldozer dug out and buried the stumps, workers limed and fertilized the resulting 7-acre opening, then seeded it with grasses and clover to create breeding and roosting habitat for woodcock near existing nesting, brood-rearing, and feeding cover. Elsewhere on the property, managers cleared and planted an additional 3-acre opening to provide displaying and roosting habitat.

Partners: Hanover Water Works, Dartmouth College, O'Brien Forestry Services, Natural Resources Conservation Service, Wildlife Management Institute.

Cutter Property, Grafton County, New Hampshire

This privately owned central New Hampshire tract was heavily logged in the past and is now growing back in mixed northern hardwoods

and conifers. To keep the property in a young-forest state, in 2008 managers cut a series of six parallel strips off an existing logging road. The cuts were 66 feet wide and of differing lengths. Five more strips will be cut to the south of this area in the near future.

The parcel has the potential to provide 20 acres of woodcock feeding habitat, 20 acres of nesting and brood-rearing cover, and 10 acres of roosting and breeding habitat.

In 2012, 2017, 2022, and 2027 more cuts will be made between the parallel strips. Ultimately the area will have five different age and size classes of trees, providing nesting, brood-rearing, and feeding habitats for woodcock. Apple trees will be daylighted, and roosting fields (on old log landings) and singing grounds (on log landings and logging access roads) will be maintained. The parcel has the potential to provide 20 acres of woodcock feeding habitat, 20 acres of nesting and brood-rearing cover, and 10 acres of roosting and breeding habitat.

Partners: Donald Cutter, Natural Resources Conservation Service, New Hampshire Fish and Game Department, Wildlife Management Institute.

Brouha Property, Caledonia County, Vermont

This 430-acre hill farm in northeastern Vermont borders Calendar Brook Wildlife Management Area. The property includes old pasture that has reverted to forest. For 35 years landowners Paul and Carol Brouha have

created and maintained young-forest habitat through commercial timber sales, apple-tree release, brush-hogging, planting and renewing grass-and-clover food plots, and planting native trees and shrubs that provide food for wildlife.

Most of the Brouhas' wooded acres are on a 40-year cutting cycle, with commercial logging occurring on different parcels at 10-year intervals. In the 1980s, around 80 acres were harvested; in the 1990s, another 80 acres; and in the 2000s, about 60 acres. Another round of cutting is scheduled for 60 acres. The Brouhas have also cut back older aspen and birch stands to let those trees resprout densely, creating additional woodcock feeding and brood-rearing cover.

Partners: Paul and Carol Brouha, Natural Resources Conservation Service, Wildlife Management Institute.

Freedom Town Forest, Carroll County, New Hampshire

This 2,661-acre municipal forest is in the Ossipee Pine Barrens, a rare natural community where pitch pine, scrub oak, and other trees and shrubs grow in sandy, gravelly soil. The tract, in east-central New Hampshire, supports moose, bear, ruffed grouse, wild turkeys, nighthawks, whippoorwills, Eastern towhees, and other species that thrive on young forest growing on dry sites. Woodcock feed in areas of deeper soil near active beaver flowages.

The tract has three forest management compartments; the goal is to keep one of the compartments in at least 20 to 25 percent young forest. In 2009 five existing log

landings were turned into woodcock singing grounds: Workers used a tracked vehicle with a brontosaurus cutting head to expand the landings, which were limed, fertilized, seeded, and mulched to transform them into permanent openings that will be used by woodcock and other wildlife.

A series of commercial clearcuts in aspen areas created nine patch cuts of 3 to 5 acres each. Woodcock use the young forest regrowing on cuts at lower elevations, while grouse, turkeys, and other wildlife use the higher, drier sites.

Partners: Town of Freedom, Natural Resources Conservation Service, New Hampshire Fish and Game, Ruffed Grouse Society, Wildlife Management Institute.

Sullivan County Farm, Sullivan County, New Hampshire

This county-owned property is in the foothills of central New Hampshire near the Connecticut River. Over the next decade about 58 of the tract's 673 acres will become a habitat management unit benefitting woodcock and other young-forest wildlife.

Managers have used brush-hogging, mowing, apple-tree release, and herbicide spraying of invasive plants on three management units totaling 7.5 acres. Logging scheduled for 50 acres of adjoining woodland will add to the total young-forest area, with much of the logged land expected to come back in a thick growth of aspen.

Woodcock currently find roosting cover on the margins of hay and crop fields and in approximately 12 acres of old fields.

Partners: Sullivan County, Natural Resources Conservation Service, University of New Hampshire Cooperative Extension Service, Wildlife Management Institute.

Steepletop Property, Berkshire County, Massachusetts

This 879-acre tract, owned by the Berkshire Natural Resources Council, is in the Housatonic River watershed in western Massachusetts. It includes a mix of wetlands and mature forest. On numerous timber stands, 4- to 5-acre clearcuts will create woodcock feeding, nesting, brood-rearing, and roosting cover while improving overall habitat and increasing biodiversity.

Partners: Berkshire Natural Resources Council, Natural Resource Conservation Service, Massachusetts Division of Fisheries and Wildlife, Wildlife Management Institute.

Devlin Property, Hancock County, Maine

On this private tract in Midcoast Maine, block and strip cuts will regenerate aspen and alder stands, creating 6 acres of feeding cover and 9 to 11 acres of nesting and brood-rearing habitat. Over time, up to 32 acres of early successional habitat will be opened up.

Partners: Patrick Devlin, Wildlife Management Institute.

Mattawamkeag River Wildlife Management Area, Penobscot County, Maine

This 4,000-acre WMA includes extensive wetlands along the Mattawamkeag River near Kingman in eastern Maine. On the Page Farm tract, a network of strip and patch cuts totaling more than 86 acres will be made in stands of alder, aspen, and other hardwoods. Workers will mow old fields to create and maintain woodcock singing grounds and roosting areas.

Partners: Maine Department of Inland Fisheries and Wildlife, Natural Resources Conservation Service, National Wild Turkey Federation, Paul Fortunato, Wildlife Management Institute.

Apple Orchard Stewardship Project, Bennington County, Vermont

This cooperative project in southern Vermont, east of Manchester in the Green Mountain National Forest, will create 34 acres of young forest and grassy openings to benefit wild turkeys, grassland and shrub land songbirds, woodcock, grouse, snowshoe hares, and many other wild animals. Management efforts are aimed at spurring the regrowth of aspen, encouraging dense stands of young hardwood trees, releasing apple trees, and establishing and maintaining native-grass openings.

Partners: National Wild Turkey Federation, U.S. Forest Service, Wildlife Management Institute.

Appalachian Mountain Woodcock Initiative: BCR 28

The Appalachian Mountain Woodcock Initiative (AMWI) was begun in 2006. Woodcock habitat development in the AMWI is critical because many of the same habitats used by woodcock are also used by Golden Winged Warbler, a critically rare neotropical migrant songbird. Collaboration with the Golden Winged Warbler Working Group allows coordination of efforts to expand the benefits of habitat restoration of American Woodcock to provide ancillary benefits to Golden Winged Warblers. Project personnel provide technical and financial assistance to the working group.

Partners in the AMWI include the U.S. Fish and Wildlife Service; U. S. Forest Service; Doris Duke Charitable Foundation; Natural Resources Conservation Service; National Fish and Wildlife Foundation; U.S. Geological Survey; American Bird Conservancy; Northeast Association of Fish and Wildlife Agencies; fish, wildlife, and conservation agencies for New York, Pennsylvania, Ohio, Maryland, West Virginia, and Virginia; the Ruffed Grouse Society; Woodcock Limited of Pennsylvania; and the Wildlife Management Institute.

Funding for the project was provided by the Doris Duke Charitable Foundation, National Fish and Wildlife Foundation, Wildlife Conservation Society, the Northeast Association of Fish and Wildlife Agencies, the U. S. Fish and Wildlife Service, the Natural Resources Conservation Service – Agricultural Wildlife Center, the U. S. Forest Service, the U. S. Geological Survey, the state agencies of VA, WV, PA, MD and OH and the Wildlife Management Institute.

A team of experts experienced in habitat management in the northern Appalachians developed a set of BMPs for the region. Contributors to this publication included Steve Capel, WMI; Carl Graybill, WMI; Walt Lesser, WMI; Jim Rawson, WMI; Mark Banker, Ruffed Grouse Society; Tom Mathews, WMI; Dave Putnam, WMI; Pat Ruble, WMI; Gary Donovan, WMI; Dan McAuley, USGS; Pat Corr, USGS; John Lanier, WMI; and Scot Williamson, WMI. BMPs were printed and made available to Partners. The publication: American Woodcock Habitat Best Management Practices for the Central Appalachian Mountains Region is available for free download from www.timberdoodle.org.

Activity	State						Total
	MD	OH	PA	VA	WV	Other	
AMWI Presentations & Implementation Meetings	13	12	37	12	26		100
Properties Assessed for ESH Demonstration Areas	3	5	21	9	16		54
Total Acreage of Existing or Planned AMWO Habitat	910	86	19,000	6,020	10,344		36,360
Properties w/ History of Woodcock Surveys	1	5	4	2	12		24

Accomplishments of the Appalachian Mountain Woodcock Initiative from inception to March 2010.

Demonstration areas were developed in each state on public and private lands and include:

Bald Eagle State Park, Centre County, Pennsylvania

At this popular central Pennsylvania park, 5,900 acres surround a 1,730-acre flood-control lake in Bald Eagle Valley, an important corridor for migrating birds.

When the U.S. Army Corps of Engineers acquired the site in 1965, most of it was farmland. Since then, the area has grown up in brush, pole-stage forest, and mature forest. In the 1990s state and federal agencies launched a Native Plant and Early Successional Stage Habitat Restoration Project to combat invasive plants and to restore the mosaic of old fields and fencerows. Land managers are testing mechanical, chemical, and biological treatments to control exotic vegetation in developing a protocol for combating invasives that can be used elsewhere in the Mid-Atlantic and Northeast.

The park is divided into ten management units. Wildlife technicians use chainsaws, hydro-ax machines, brush hogs, mowers, and tree-shears to cut strips and blocks, many of which stretch from low, damp areas uphill through progressively drier soils, letting woodcock shift within feeding habitats during damp or droughty periods. In 2002, cutting and other operations began on four management units. Once invasive shrubs are under control, young-forest habitat will be kept on a 25-year rotation, with 20 percent of each unit cut back every five years.

In 2008, Dr. Jeffrey Larkin of Indiana University of Pennsylvania began an intensive study to determine the extent to which golden-



Mark Banker, RGS

winged warblers breed in the area; verify the size and density of individual territories; and characterize habitat types that most benefit this declining songbird species. Experimental and control plots have been set up, with cutting taking place in winter 2010. Larkin established a separate comparison site in Sproul State Forest 20 miles northwest of Bald Eagle State Park and 1,000 feet higher in elevation. The golden-winged warbler research team designed the 2010 work plan for the Native Plant and Early Successional Stage Habitat Restoration Project at Bald Eagle State Park.

Partners: Pennsylvania Department of Conservation and Natural Resources, U.S. Fish and Wildlife Service, Pennsylvania Game Commission, Ruffed Grouse Society, California University of Pennsylvania, Indiana University of Pennsylvania, Wildlife for Everyone Endowment Foundation, Woodcock Limited of Pennsylvania, U.S. Army Corps of Engineers, Wildlife Management Institute.



Scot Williamson, WMI

Lake Raystown, Huntingdon County, Pennsylvania

This Army Corps of Engineers project in southcentral Pennsylvania includes a 28-mile-long lake bordered by 22,000 acres. West of the lake the Pennsylvania Game Commission manages the 3,000-acre Raystown Lake Mitigation Area, where 600 acres have been designated a Woodcock Management Demonstration Area.

Here, 80 acres of low-lying fields are being allowed to grow up in alder, dogwoods, and hawthorn. Periodically workers fell trees and overmature alder to keep the habitat in a young-forest or shrub stage. Nearby, a logging operation included a 6-acre clearcut to increase golden-winged warbler habitat,

plus 24 acres where native shrubs were left to provide dense low growth. Managers planted 50 acres of old fields with aspen and native shrubs. In the future, the aspen will be harvested in a 20-year rotation to keep the site suitable for woodcock.

At the lake's south end, the Jim Bashline Habitat Management Area includes 600 acres of upland forest managed for ruffed grouse through periodic logging. Another 150 acres of bottomland hardwoods provide current and potential woodcock habitat: 30 acres have been logged since 2004, with 40 more acres scheduled for harvesting by 2011. Nearby, another 50 acres of old fields were planted with native shrubs.

Partners: U.S. Army Corps of Engineers, Ruffed Grouse Society, Pennsylvania Game Commission.

Polk Wetlands, State Game Lands 39, Venango County, Pennsylvania

In a floodplain on this largely forested 10,000-acre State Game Lands, managers are converting 83 formerly farmed acres to woodcock habitat. The core of the project is a low-lying 25-acre field where old drainage tiles have been disabled, earthen berms built, and tree and shrub seedlings planted. The site, in western Pennsylvania, is part of the Pennsylvania Woodcock Habitat Initiative on State Lands (WHISL) program, a joint venture of the Ruffed Grouse Society and Mackin Engineering.

In 2008, Ruffed Grouse Society volunteers joined personnel from the Pennsylvania Game Commission, Pennsylvania Department of Transportation, and Mackin Engineering

to plant 30,000 seedlings of dogwood, hawthorn, crabapple, alder, and aspen on 25 acres. In the same general area, 58 acres of old fields are being allowed to come up in native shrubs or are being planted with shrub seedlings to create and enhance woodcock habitat.

Partners: Pennsylvania Game Commission, Mackin Engineering, Ruffed Grouse Society, Pennsylvania Department of Transportation, National Fish and Wildlife Foundation, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, Pennsylvania Department of Environmental Protection, Pennsylvania Historical and Museum Commission.

Clermont Tract, McKean and Elk Counties, Pennsylvania

Forest Investment Advisors manages the Clermont Tract, more than 25,000 productive wooded acres in northcentral Pennsylvania. The area was heavily logged in the past by other landowners. Today a new round of more-responsible logging is underway, largely of high-value black cherry trees. Several thousand acres have been harvested recently; depending on timber markets, more than 10,000 additional acres may be cut by 2019. Areas where soils are deep and moist will regenerate as woodcock cover; other wildlife species, including golden-winged warbler, snowshoe hare, and bobcat will thrive on both moist sites and those where the soil is drier.

Scattered throughout the Clermont Tract are large areas along streams where no trees currently grow. Habitat managers are planting native trees and shrubs on these infertile fire-caused savannahs, creating hundreds of acres of new woodcock habitat to supplement the

young forest that will continually be renewed through commercial logging in surrounding hardwoods. The first four demonstration sites are Hagaman Farm (15 acres), Stump Patch (154 acres), Gum Boot Run (312 acres), and Wellendorf Branch (212 acres).

In 2009, Forest Investment Advisors made a 15-acre patch cut to regenerate an aspen stand on the Hagaman Farm site. Other aspen areas will be cut in the future to create more dense feeding and brood-rearing habitat.

Partners: Forest Investment Advisors, Pennsylvania Game Commission, Ruffed Grouse Society, Woodcock Limited of Pennsylvania, U.S. Fish and Wildlife Service, California University of Pennsylvania, Wildlife Management Institute.



Mark Banker, RGS

Steve Liscinsky Memorial Project, State Game Lands 278, Blair County, Pennsylvania

This central Pennsylvania demonstration area memorializes a leading Pennsylvania woodcock biologist. It includes a stream bottom grown up with alder and aspen. Rather than letting the shrubs and trees all get old



Mark Banker, RGS

at the same time, wildlife managers in 2006 began regenerating 7 acres. Workers used chainsaws to cut down older horizontal alder stems while leaving younger, more upright stems. The cut alder is resprouting vigorously.

Chainsaw work removed several clones of mature aspen on 3 acres. The aspens' root systems sent up dense saplings, and the stands are expanding in area. Thinning the mature aspen lets sunlight fall on hawthorns in the understory, spurring the growth of those shrubs, which provide overhead cover for feeding woodcock and fruit for other wildlife.

An active beaver colony will feed on regrowing aspen and alder, prolonging the stand's use as feeding and brood-rearing habitat. A nearby powerline right-of-way is managed to provide woodcock singing grounds and roosting habitat and an environment where grouse and turkey broods can find insects. Upslope from the powerline the Pennsylvania Game Commission has sold the timber on 175 acres. After this area is logged and begins to regrow, the dense sprouts and seedlings will provide feeding habitat for migrating woodcock.

Partners: Pennsylvania Game Commission, Ruffed Grouse Society, Lion Country Supply, U.S. Fish and Wildlife Service.

William H. Goudy Memorial Habitat Project, State Game Lands 82, Somerset County, Pennsylvania

Biologist Bill Goudy (1933-2007) worked for state and federal conservation agencies and conducted woodcock research in Michigan that the U.S. Fish and Wildlife Service applied when designing the annual woodcock singing-ground survey. This project, centered on the Wills Creek drainage in southcentral Pennsylvania, includes two areas of old farmland (27 and 56 acres) currently used by woodcock.

Workers used chainsaws and tree-shears to remove pole-size trees invading the old fields and to cut back overmature alder, promoting dense resprouting. The scattered alder patches are expanding into damp parts of nearby fields. Aspen seedlings have been planted and apple trees and hawthorns preserved and daylighted. Grassy food plots are mowed periodically to keep them functioning as singing grounds and roosting areas.

The Game Commission sold the timber on a forest stand between the two old farming areas. Starting in 2009, a contractor has three years to cut the trees on 60 acres, which will result in a long swath of young forest growing on moist bottomland soil, creating a corridor between the two old-field habitats. On nearby uplands another 120 acres will be cut, yielding feeding habitat for breeding and migrating woodcock.

Partners: Pennsylvania Game Commission, Ruffed Grouse Society, William H. Goudy Estate.

Kirk Orchard Unit, Green Ridge State Forest, Allegany County, Maryland

This 505-acre tract in western Maryland was a commercial orchard before being acquired as state forest in the late 1970s. In 2008, the Maryland Department of Natural Resources drew up plans to actively manage the Kirk Orchard as an Early Successional Wildlife Habitat Focus Area – the largest tract of public land in Maryland managed specifically for young forest.

The tract is divided into eight units. Managers used aerial herbicide spraying to kill pole-stage, commercially non-valuable trees so that an existing understory of shrubs can grow in thickly. Four 5-acre blocks of Virginia pine were clearcut to provide temporary woodcock roosting habitat and singing grounds. On two stands, 100 semi-open acres were brush-hogged to keep them functioning as singing grounds and roosting areas.

Management activities include pushing back 6 acres of field edges; making patch cuts in a 50-acre forest stand (the work is done by students participating in forestry summer camps sponsored by Allegany College of Maryland); daylighting mature apple trees; planting apple trees; brush-hogging roads and grass strips, which function as singing grounds; and burning grassy areas to prevent trees from invading them. (Woodcock will use the burned areas as singing and roosting habitats.)

Partners: Maryland Department of Natural Resources, Wildlife Management Institute.

T.M. Gathright Wildlife Management Area, Bath County, Virginia

The Virginia Department of Game and Inland Fisheries manages this area bordering Lake Moomaw, a U.S. Army Corps of Engineers project in western Virginia. Most of Gathright's 13,428 acres are mountainous and forested, with about 70 acres of low-lying old fields where managers are renewing and creating environments for woodcock, golden-winged warblers, and other wildlife in a region where young-forest habitat is scarce.



Walter Lessor

On 25 acres of old fields wildlife technicians are opening up a series of 16-foot strips by shear-doing off overmature shrubs. In two to three years, new strips will be cut next to the first ones, and in another several years, the final strips will be cut.

In another area, several small fields will have their shrubby edges expanded, making the field borders of alder and buttonbush more useful to wildlife. Managers will disk sodbound cool-season grasses; use herbicides as necessary; lay out commercial logging and firewood cuts; and plant native shrubs (indigobush, silky dogwood, and alder). On nearby Bolar Mountain, mowing and brush-hogging open areas, as well as expanding logging operations, will create more young-forest habitat to help upland wildlife.

In another area, several small fields will have their shrubby edges expanded, making the field borders of alder and buttonbush more useful to wildlife.

Partners: Virginia Department of Game and Inland Fisheries, U.S. Forest Service, Wildlife Management Institute.

Sarah Fletcher Tract, Tucker County, West Virginia

This habitat demonstration area in the Canaan Valley of northeastern West Virginia has historic significance: Here, in 1964 the West Virginia Department of Natural Resources began an ambitious program to learn more about woodcock in the Mountain State. Some of that research took place on the Fletcher

tract and on adjacent lands that in 1994 became the Canaan Valley National Wildlife Refuge.

On the Fletcher tract, habitat restoration focuses on four former pasture fields. Mature alder stands are being cut in 66-foot wide swaths; the swaths will grow back densely, producing prime feeding and resting areas. The first set of strips, totaling 14.5 acres, was cut during the winters of 2007-08 and 2008-09, using a skid-steerer with a mulching head. More strips will be cut in the third, fifth, seventh, and ninth years of the ten-year project, regenerating a total of 60 acres. Machine operators leave food-producing trees such as fire cherry and hawthorn, as well as standing snags and hollow den trees.

A second part of the project involves regenerating quaking aspen. Altogether, five separate stands will be clearcut, totaling 13 acres. The aspen will be harvested during the trees' winter dormancy so that energy stored in the root systems will spur abundant regrowth.

Partners: Sarah Fletcher; West Virginia Division of Natural Resources, Wildlife Resources Section; Ruffed Grouse Society; Ecological Services Division, U.S. Fish and Wildlife Service; Natural Resources Conservation Service.

Wallkill River National Wildlife Refuge, Sussex and Orange Counties, New Jersey

This federal refuge in northern New Jersey protects 9 miles of the Wallkill River and 5,100 acres of diverse habitats including wetlands and lowland and upland forests. Owing to heavy human development nearby,

the refuge is an important area for migratory and resident wildlife, including a population of bog turtles, an endangered species that needs openings and young forest.

Managers will maintain about 1,000 acres of young forest to benefit woodcock, ruffed grouse, golden-winged warbler, prairie warbler, field sparrow, Eastern towhee, and gray catbird. Over the next 15 years, hundreds of acres of old farm fields will be allowed to grow back in shrubs. Refuge staff will use manual cutting, prescribed burns, mowing, livestock grazing, and herbicide treatments to keep the vegetation in a young stage.

Recently volunteers from a local Ruffed Grouse Society chapter used chainsaws to cut back 20 acres of mature aspen; the trees are growing back thickly. Volunteers have also planted gray dogwood, birch, aspen, alder, and sumac on about 100 old-field acres.

Partners: U.S. Fish and Wildlife Service, Ruffed Grouse Society.

Montour Preserve, Montour County, Pennsylvania

The Montour Environmental Preserve includes 5,000 acres surrounding a central-Pennsylvania power plant operated by Pennsylvania Power & Light. In 2008, volunteers with Woodcock Limited of Pennsylvania joined Pennsylvania Game Commission employees in planting 3,000 aspen and alder seedlings on 3 acres of old fields. Woodcock singing ground circles are mowed each year, and PP&L and its partners are moving ahead with a project to suppress invasive shrubs while creating many more acres of young-forest habitat.

Partners: Pennsylvania Power and Light, Woodcock Limited of Pennsylvania, Pennsylvania Game Commission, Wildlife Management Institute.

Barron Tract, Somerset County, Pennsylvania

In 2008 the Western Pennsylvania Conservancy conveyed timber rights on this 2,300-acre parcel in southwestern Pennsylvania to the Ruffed Grouse Society. RGS is working with Appalachian Forestry Consultants to develop a cutting plan that, over the next 15 years, will create hundreds of acres of young forest.

As timber is harvested and saplings begin to push up, relatively flat areas at higher elevations will see use as feeding habitat by migrating woodcock and a range of songbirds. Lower-elevation sites along Sandy Run and Laurel Hill Creek will provide woodcock nesting and brood-rearing habitat. Cutting began during winter 2008-2009. The tract is part of the Forbes State Forest.



Tom Mathews

Partners: Ruffed Grouse Society, Richard King Mellon Foundation, Western Pennsylvania Conservancy, Pennsylvania Department of Conservation and Natural Resources.

Nescopeck State Park, Luzerne County, Pennsylvania

This 3,550-acre park in northeastern Pennsylvania has fallow fields, wet meadows, mature forest, and high-quality wetlands along Nescopeck Creek. Parts of the park have traditionally been managed for woodcock and other young-forest wildlife. Volunteers and Pennsylvania Game Commission workers are suppressing invasive shrubs (mainly honeysuckle and autumn olive) on 73 acres of reverting fields, while sparing native shrubs such as hawthorns and crabapples to encourage their growth and expansion.

Partners: Pennsylvania Department of Conservation of Natural Resources, Bureau of State Parks; Pennsylvania Game Commission; Natural Resources Conservation Service; National Wild Turkey Federation; Wildlife Management Institute.



Tom Mathews

State Game Lands 252, Lycoming and Union Counties, Pennsylvania

This 3,018-acre parcel, in the Susquehanna River Valley in central Pennsylvania, is managed by the Pennsylvania Game Commission, which recently designated it a young-forest habitat demonstration area.

Using mechanical means and herbicides, land managers are removing invasive shrubs, particularly honeysuckle. When the non-native species are under control, managers plan to begin logging on forested tracts. They will seed open areas with aspen to create young-forest habitat beneficial to woodcock and other wildlife. Partners: Pennsylvania Game Commission, Natural Resources Conservation Service, Wildlife Management Institute.

Aelred Geis Memorial Woodcock Habitat Demonstration Area, Mt. Nebo Wildlife Management Area, Garrett County, Maryland

This 1,863-acre management area in western Maryland memorializes a prominent woodcock biologist. It includes a 130-acre wetlands complex with open glades and extensive alder stands surrounded by forest. There are also around 50 acres of old fields growing up with hawthorn, viburnums, and gray-stemmed and silky dogwood.

Managers in the Maryland Department of Natural Resources have planted numerous apple trees. They cut aspen to renew and

expand aspen stands, and will cut back mature alders to spur the healthy regrowth of those shrubs. Grassy openings are maintained for woodcock roosting and courtship activities. Approximately 400 acres on six management units will be managed to provide the shrubby young-forest habitat needed by woodcock, ruffed grouse, alder flycatchers, golden-winged warblers, and other wildlife.

Partners: *Maryland Department of Natural Resources, Ruffed Grouse Society, Aelred Geis Estate, and Wildlife Management Institute.*

Wallace Tract, Bath County, Virginia

The Wallace Tract is in the George Washington National Forest along the Cowpasture River in western Virginia. Four old fields contain about 170 acres of open land growing up in shrubs such as hawthorn, buttonbush, and wild crabapple. Much of the area is already prime young-forest habitat. To improve the tract, managers will plug old drain tiles currently draining parts of the fields; break up thick sod to open the soil for native shrubs; plant shrubs including alder, buttonbush, and silky dogwood; and conduct logging operations to create young forest.

Ruffed grouse, golden-winged warblers, and wild turkeys will benefit, along with amphibians that will breed in vernal pools that will form in the restored wetlands.

Partners: *Virginia Department of Game and Inland Fisheries, U.S. Forest Service, Ruffed Grouse Society, National Wild Turkey Federation, Wildlife Management Institute.*



Chris Gilbert, JDI

Crooked Creek Wildlife Management Area, Carroll County, Virginia

This 1,796-acre property, owned and managed by the Virginia Department of Game and Inland Fisheries, is in the gently rolling mountains of southwestern Virginia. The tract was formerly farmland; forested areas are mainly mixed hardwoods with scattered white pine stands and rhododendron thickets bordering streams.

Land managers will preserve and expand wetland areas; maintain grassy openings in abandoned pastures; and increase the density and diversity of shrubs to provide feeding and nesting habitat for woodcock and other wildlife. During the first phase, 42 to 45 acres of habitat will be created or renewed.

Partners: *Virginia Department of Game and Inland Fisheries, Wildlife Management Institute.*



Dave Putnam, USFWS

An immediate goal for 2010 is to rejuvenate 10 acres of abandoned farmland where trees and shrubs are becoming too mature. Here, 100-foot-wide serpentine strip cuts will extend from wet areas near the lake to drier ground up the slope.

Maurice K. Goddard State Park and State Game Lands 270, Mercer County, Pennsylvania

Goddard State Park has abundant wetlands and old fields bordering 1,860-acre Lake Wilhelm in western Pennsylvania. WMI biologists are setting up a rotation of cuts on approximately 103 acres. An immediate goal for 2010 is to rejuvenate 10 acres of abandoned farmland where trees and shrubs are becoming too mature. Here, 100-foot-wide serpentine strip cuts will extend from wet areas near the lake to drier ground up the slope. Skid-loader-mounted mulchers and tree shears will cut vegetation; herbicides will be used to suppress invasives; and managers will plant native trees and shrubs. Openings will be maintained as singing grounds for woodcock and foraging areas for bluebirds and purple martins.

State Game Lands 270 adjoins Goddard Park to the west. On SGL 270, managers planted 20 acres of former agricultural land with native shrubs in 2009, and another 15 acres are scheduled for planting in 2011.

Partners: Pennsylvania Department of Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service, California University, Wildlife Management Institute.

Upper Great Lakes Woodcock and Young Forest Initiative

The Upper Great Lakes Woodcock and Young Forest Initiative was started in 2008. Partners in the Initiative include the U.S. Fish and Wildlife Service; U. S. Forest Service; National Fish and Wildlife Foundation; U.S. Geological Survey; fish, wildlife, and conservation agencies for Michigan, Minnesota and Wisconsin; the Ruffed Grouse Society; National Wild Turkey Federation; Woodcock Minnesota; and the Wildlife Management Institute.

Funding for the project was provided by the National Fish and Wildlife Foundation, the U. S. Fish and Wildlife Service, the U. S. Forest Service, the U. S. Geological Survey, the state agencies of MI, MN and WI and the Wildlife Management Institute.

As with the Appalachian Mountain Woodcock Initiative, habitat management work in the Upper Great Lakes is focused on both woodcock and Golden Winged Warbler.

A team of experts experienced in habitat management in the Upper Great Lakes developed a set of BMPs for the region. Contributors to this publication include

Dr. David Andersen, USGS MN CFWRU; Pat Ruble, WMI; Tom Cooper, USFWS; Bill Bartush, USFS; Al Stewart, MI DNR; Dan Dessecker, RGS; Gary Zimmer, RGS; Scott Hull, WI DNR; John Huff, WI DNR; Andy Paulios, WI DNR; Kim Kreitingner; Noel Cutright, WE Energies; Bob Howe, UW-Green Bay; Ursula Petersen, WI DATCP; Cynthia Osmundson, MN DNR; Earl Johnson, MN DNR; Jodie Provost, MN DNR; Rick Horton, MN DNR; Amber Roth, WMI; Steve Wilds, WMI; Gary Donovan, WMI; Dan McAuley, USGS; and Scot Williamson, WMI. BMPs were printed and made available to Partners. The publication: ***Best Management Practices for Woodcock and Associated Bird Species in the Upper Great Lakes Region*** is available for free download from www.timberdoodle.org.

Demonstration areas were identified in each state on public and private lands to include:
Line Shack (private property), MI
Tamarac NWR, MN
Chippewa NF, MN
Rice Lake NWR, MN
American Legion State Forest, WI
Navarino WMA, WI
Chequamegon-Nicolet NF, WI

Activity	State				Total
	MI	MN	WI	Other	
UGLW&YFI Presentations & Implementation Meetings	10	38	14	5	67
Properties Assessed for ESH Demonstration Areas	1	6	16		23
Total Acreage of Existing or Planned ESH Habitat	540	4508	12,022		17,070
Properties w/ History of Woodcock Surveys	1	6	2		5



Figure 4. High Priority Management Zones (brown) in Michigan, Minnesota and Wisconsin.

To help focus management activities, the Upper Mississippi River/Great Lakes Region Joint Venture Science Team, in consultation with the USFWS, USFS, the DNRs of the three states, RGS, NWTf and WMI, conducted a modeling exercise based on soils, forest inventory information and historical woodcock relative abundance data to identify zones within the three states in which management efforts were most likely to yield the strongest population response. The product of the modeling exercise was then further refined and adjusted by state and federal biologists with extensive knowledge of the regional habitat base and potential. The intent is to focus future management efforts in these high priority zones to the highest population response per management dollar spent.



Steve Wilds

Atlantic Coast Woodcock Initiative

The Atlantic Coast Woodcock Initiative (BCR 30) was created in 2009. The Initiative is unusual in that woodcock are featured in the southern terminus of the region (especially NJ, eastern PA, eastern MD and eastern VA) while New England Cottontail is the focal species in the northern terminus from Long Island, New York to coastal Maine.

Partners in the Atlantic Coast Woodcock Initiative include the U.S. Fish and Wildlife Service; U. S. Forest Service; National Fish and Wildlife Foundation; U.S. Geological Survey; fish, wildlife, and conservation agencies for Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Maryland, Delaware, New Jersey and Virginia; ; the Ruffed Grouse Society; National Wild Turkey Federation; New Jersey Audubon; and the Wildlife Management Institute.

Funding for the project was provided by the National Fish and Wildlife Foundation, the U. S. Fish and Wildlife Service, the U. S. Forest Service, the U. S. Geological Survey, the state agencies mentioned above and the Wildlife Management Institute.

The similarity in habitats between woodcock and New England Cottontail afford the opportunity to address both species. The New England Cottontail is a shrubland dependent rabbit that has suffered significant population decline due to habitat loss. The species is a candidate for inclusion on the Endangered Species list.

Best Management Practices are being assembled. Coordination of BMP development will be by Mark Banker of the Ruffed Grouse Society.

Demonstration areas developed to date include:

University of New Hampshire Woodlands and Natural Areas, Strafford County, New Hampshire

In southeastern New Hampshire, the University of New Hampshire manages 700 acres of woodlands and natural areas for timber production and wildlife habitat and to advance the institution's educational and research missions. Significant young-forest initiatives are underway on four units.

At the MacDonald Lot, three patch cuts removed low-quality white pine that had sprung up on former farmland. Managers will let the cuts regrow to young hardwood forest; regenerate alder stands through mechanical mowing and chainsaw labor; and create and maintain woodland openings as singing grounds. At East Foss Farm, managers have set in motion a plan to mow swaths through 5 to 10 acres of woodland following the moisture gradient near a long linear wetland.

At West Foss Farm, a 7-acre clearcut provides habitat for woodcock and New England cottontail; managers mow old fields to keep them functioning as singing grounds. At Thompson Farm, managers will renew a 3-acre old-field area; maintain four acres of grassy and shrubby openings; create 3 acres of small woodland openings as part of an "expanding gap" strategy; and make patch cuts in aspen stands.

Partners: University of New Hampshire, New Hampshire Fish and Game, New

Hampshire Wildlife Federation, Ruffed Grouse Society, U.S. Fish and Wildlife Service, Stonyfield Farm, Wildlife Management Institute.

Francis A. Crane Wildlife Management Area, Barnstable County, Massachusetts

This site includes more than 1,900 acres on lower Cape Cod in southeastern Massachusetts. It is one of the state's most popular public areas, used by thousands of citizens annually. Through its Upland Habitat Management Program, the Massachusetts Division of Fisheries and Wildlife manages the WMA as a mosaic of field and pitch pine/oak savannah habitats.

Between 2006 and 2010, pole-stage and mature trees were harvested from 285 wooded acres, creating vigorously regrowing young forest. Managers suppress invasive exotic shrubs and maintain old-field and grassland habitats by mowing them every several years. In the future, periodic small (approximately 25-acre) controlled burns will keep vegetation in a low, shrubby state.

Partners: Massachusetts Division of Fisheries and Wildlife.

Noquochoke Wildlife Management Area, Bristol County, Massachusetts

This 255-acre area is in southern Massachusetts and includes abandoned farm fields, wetlands, grassy areas, and woods. The WMA is essentially surrounded by slow-flowing streams and wetlands.

Habitat managers identified five units on the WMA totaling 67 acres. In 2009 they began using various techniques to create and restore old-field and young-forest habitats and to suppress invasive shrubs and trees. Timber harvesting, thinning shrubs to let light reach low-growing native shrubs, prescribed burning; mowing; and use of herbicide have all been employed to restore abandoned fields and create new openings. These habitats benefit a suite of wild species including woodcock, chestnut-sided warbler, Eastern meadowlark, Northern harrier, spotted turtle, Eastern box turtle, marbled salamander, and several uncommon butterflies and moths.

Partners: Massachusetts Division of Fisheries and Wildlife

Martin H. Burns Wildlife Management Area, Essex County, Massachusetts

In northeastern Massachusetts, this 1,555-acre area includes hilly, rocky terrain that was once farmed. In 2007 land managers began an ambitious effort to create young forest and to bring back shrubby areas that were being overtopped with mature trees or crowded out with invasive species.

In 2007-08 a brontosaurus machine mulched small trees and invasive shrubs on 130 acres of abandoned pastureland. On seven adjoining upland forest tracts, logging cleared 32 acres to create corridors of young-forest habitat linking the old-field tracts. Woodcock find singing and displaying cover in cleared areas; roosting habitat in barrens with scattered blackberry, dewberry, and blueberry; and feeding and brood-rearing habitat in the lower, damper logged areas. Fourteen Massachusetts "species of special conservation

need” have been helped by the creation and expansion of young forest on Martin Burns WMA.

Partners: Massachusetts Division of Fisheries and Wildlife.

Great Swamp Wildlife Management Area, Washington County, Rhode Island

This 3,475-acre area in southern Rhode Island includes 2,600 acres of forested wetlands in the floodplains of three rivers. Young-forest management efforts have centered on the Great Neck, a higher-elevation drumlin near the center of the WMA, which was farmed and pastured before being abandoned in the early to mid-1900s.

Land managers use brush mowers and commercial-grade brontosaurus mulchers to chew down vegetation on 42 acres, which woodcock use for springtime displaying and breeding. Around 44 acres of wildlife openings are managed using farming techniques to provide food and cover for wildlife and additional singing grounds for woodcock. Heavy cutting has created blocks of different-aged forest close to one another. Patch cuts were made in 1995 (15 acres) and 2007 (20 acres), with additional cuts in winter 2010. Other blocks are scheduled for harvesting in 2015, 2020, and beyond.

Since 2008 biologists have been capturing woodcock, fitting them with radio transmitters, and monitoring their movements. Researchers found that male woodcock would shift as far as 1 mile from singing grounds to feeding habitats in spring. (Most males fed in earthworm-rich floodplains of the Pawcatuck



Scot Williamson, WMI

and Usquepaug rivers.) The study expands in 2010 as the scientists will monitor a total of up to 40 woodcock, including 20 at nearby Arcadia WMA.

New England cottontail is another declining species that benefits from the creation of young-forest habitat in southern Rhode Island.

Partners: Rhode Island Division of Fish and Wildlife, University of Rhode Island, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Wildlife Management Institute.

Southern New Jersey Young Forest Network

A team of partners is putting together a network of projects in Salem, Cumberland, and Cape May counties, in southern New Jersey north of Delaware Bay. This region is extremely important to woodcock, which breed and winter in the area and also feed and



Chris Gilbert, JDI

rest there during migration. Habitat efforts that benefit woodcock help many other migratory birds that travel along the Atlantic Coast.

A core installation is Cape May National Wildlife Refuge on the Cape May Peninsula. The refuge includes about 11,500 acres and continues to grow. Ultimately it will protect more than 21,000 acres of habitat.

Mannington Mills

In 2009 and 2010, volunteers planted 3,000 native shrubs and trees on 12 acres of agricultural land, creating a forested buffer zone next to Fenwick Creek on land owned by Mannington Mills, a flooring manufacturer. During the first 20 years after its establishment, the site will benefit many bird species of conservation concern including woodcock, blue-winged warbler, prairie warbler, Eastern kingbird, field sparrow, and brown thrasher.

Salem River Wildlife Management Area

One unit of this WMA is a former commercial nursery, in a part of southern New Jersey given over to intensive farming. To benefit woodcock – along with bobwhite quail, wild turkey, numerous songbirds, and cottontail rabbit –

managers have begun a cycle of removing trees using a hydro-ax machine. Since 2007 more than 17 acres on this 320-acre parcel have been treated with the hydro-ax. Other fields are mowed to keep them in a shrubby state. Managers use herbicide applications and mowing to reduce the number of invasive shrubs in favor of native shrubs.

Gum Tree Corner Wildlife Management Area

On two fields totaling about 40 acres, a 15-year-old regrowing forest of mainly sweet gum and red maple is being set back through the use of a hydro-ax. Strip cuts will be made in three entries and at five year intervals.

Dix Wildlife Management Area

Numerous old fields on this 3,400-acre WMA provide excellent shrubby habitat. Currently 23 acres are scheduled to be hydro-axed to remove encroaching vegetation. This effort is part of an ongoing program to keep much of the WMA in woodcock-friendly young forest.

Higbee Beach Wildlife Management Area

Much of this 1,100-acre WMA is in old fields where woodcock feed and rest before flying across 20-mile-wide Delaware Bay. Managers are creating more feeding habitat by cutting back hedgerows and pushing back the edges of old fields through the use of a hydro-ax machine, then letting the areas regrow in dense trees and shrubs. Herbicide spraying reduces invasive plants in favor of native vegetation. Several recently acquired pasture fields will be allowed to grow up as young forest and then will be kept in that state.

Partners: New Jersey Division of Fish and Wildlife, U.S. Fish and Wildlife Service, New Jersey Audubon Society, U.S. Department of Agriculture

(Conservation Reserve Enhancement Program), Mannington Mills, Partnership for the Delaware Estuary, National Fish and Wildlife Foundation, Wildlife Management Institute.

Millington Wildlife Management Area, Kent County, Maryland

At Millington WMA, along the Chester River on the Eastern Shore of Maryland, around 500 acres are being managed on a long-term basis as young forest and shrub land habitat to benefit woodcock, bobwhite quail, songbirds, reptiles, and mammals.

Workers use mulching equipment, chainsaws, bulldozers, and aerial application of herbicides to remove or kill pole-stage trees. Sweet gum and red maple, aggressively seeding native trees, quickly take over stands that have been set back, including those treated with herbicides. The resulting stem growth resembles the quick response of a logged-off aspen stand. Over the past five years, managers have tried experimental herbicide treatments on about 80 acres, in 2- to 3-acre blocks. These blocks are being compared to parcels cleared by machines.

Partners: Maryland Department of Natural Resources, Wildlife Management Institute.

Roraback Wildlife Management Area, Litchfield County, Connecticut

On this 2,000-acre WMA in western Connecticut, managers recently completed the first state-lands cooperative habitat enhancement project designed to promote

awareness of and support for conserving woodcock and other young-forest wildlife.

A 13-acre regeneration cut was made in 2009. Managers left apple trees and stands of dogwood, spicebush, and viburnum while removing invasive shrubs. Signs are being developed for a self-guided hiking trail that will explain how young forest benefits wildlife. In the next phase of the project, scheduled for fall 2010, a 15-acre cut will add to the mosaic of young regrowing forest, old fields, and managed grass fields. Woodcock will find singing, nesting, and feeding and brood-rearing habitat on the 28-acre project area. A nearby 2.6-acre patch cut, now about 10 years old, strengthens the habitat diversity.

Partners: Connecticut Woodcock Council, Connecticut Department of Environmental Protection, Beardsley Zoo, Wildlife Management Institute.

For More Information

Details on Best Management Practices, Demonstration Areas, Communication Plans, Monitoring, Partners and Contacts for each regional initiative can be found at:

www.timberdoodle.org

