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American Woodcock: Habitat Best Management Practices for the Northeast

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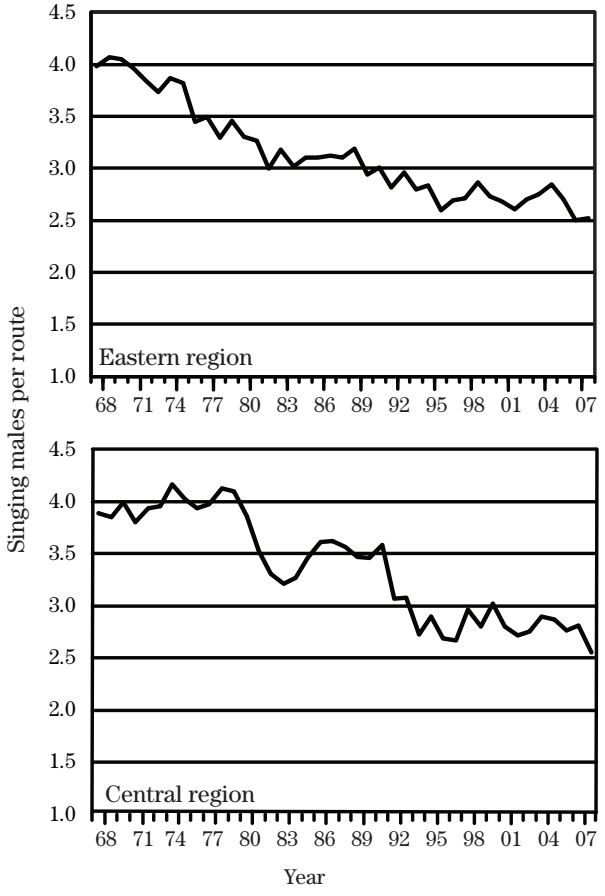
American Woodcock: Habitat Best Management Practices for the Northeast

Introduction

The American woodcock (*Scolopax minor)* is a migratory shorebird that has adapted to forested habitats. Its distinctive features include a stocky body, cryptic feather coloration and a long prehensile bill used to probe moist soils for earthworms, the primary food.

American woodcock populations have steadily decreased over the last quarter century at a rate of 1 to 2 percent per year (fig. 1). The decline is attributed to forest succession, the loss of young forest and shrubland habitat in the eastern and central United States due to forest succession, human development, absence of wildfires, and changing forest management practices.

Figure 1 Long-term trends of the number of woodcock heard on the Singing Ground Survey, 1968 to 2008 (Cooper, Parker, and Rau 2008)



The Northern Forest Woodcock Initiative was created to document best management practices for the Northern Forest region, develop a regional system of demonstration areas, and monitor the response of woodcock to habitat treatments.

Fifty-nine other species have been identified by New England States that require young forest and shrubland habitats of both deciduous and coniferous forest types for survival. All State Wildlife Action Plans can be accessed at http://www.wildlifeactionplans.org.

Cutting trees to create young forest and shrubland habitats is necessary for the recovery of woodcock. However, woodcock habitat management is not suitable in some situations and in some forests. It is critical to know where and where not to help woodcock by creating young forest. Another resource value that may supersede woodcock habitat creation includes threatened and endangered (T & E) species and associated habitats that must be protected so the listed species or its habitat is not harmed. The best source for understanding if there are T & E species in the area is the State wildlife agency, or Natural Heritage Program.

This Wildlife Insight summarizes work to date in Maine, New Hampshire, Vermont, New York, and Massachusetts. Information contained within applies to these States but may be applicable elsewhere.

Woodcock habitat needs

Woodcock need diverse habitats to survive, including small clearings for courtship, dense shrubland or young forest thickets for diurnal (i.e., daytime) foraging for earthworms, early successional forests for nesting and brood rearing, and clearings for summer roosting (fig. 2).

Courtship areas

Male woodcock return to breeding ranges in early spring and immediately occupy courtship territories, usually referred to as singing grounds. Male woodcock perform courtship activities in a variety of openings such as clearcuts, natural openings, roads, pastures, cultivated fields, and reverting agricultural fields. The quality of singing grounds is influenced by the proximity of nesting and brood-rearing habitat. Singing grounds are usually close to diurnal foraging cover. Things to look for:

- Forest openings with sparse ground cover (snowpacks may knock down and flatten tall herbaceous vegetation allowing woodcock to display) (fig. 3).
- Log landings and forest roadsides.
- Pastures.
- Hayfields, especially close to wet areas.
- Reverting farmland.

Characteristics:

- Open herbaceous ground cover.
- Openings with scattered small shrubs and trees.
- Openings with ground cover flattened by winter snowpacks.
- Generally, singing grounds are a half acre in size or larger.

Figure 2 Diverse woodcock habitat

Figure 3 Forest openings used as woodcock singing grounds

Feeding areas and diurnal habitat

A wide variety of plant species may comprise suitable diurnal habitat, but important indicators of good habitat are a preponderance of shade intolerant hardwoods (e.g., alder and aspen) or have growth forms that provide adequate protection for birds. The abundance of earthworms is a critical determinant of woodcock use of a site. Moist, rich soils high in organic matter produced by decomposition of leaf litter support highest densities of earthworms (fig. 4). Birds may sometimes use more mature forests if there is a dense understory. Use of coniferous stands is minimal in northern breeding areas, but can be critical for survival during droughts and dry conditions. Things to look for:

- Abandoned farmland: especially abandoned apple orchards overtopped by young forests, when located within one-half mile of forested or scrub/shrub wetlands.
- Riparian habitats: rich moist habitats located adjacent to streams and waterbodies. Riparian stream habitats should be along second order and higher streams (at least one upstream branch). To be considered as high potential for woodcock habitat, stream courses should be low

Figure 4 Woodcock feeding

gradient, slow flowing, with flat topography (fig. 5).

- Lower benches: young forest or shrubland habitats located adjacent to riparian habitats and extending up to two benches or terraces uphill from the wetland edge. Also, in general, any young forest habitat within a half mile of a stream, wetland, pond, or waterbody. See the preferred forest types mentioned below for a more specific picture of woodcock preferred feeding areas.
  - Within the National Wetlands Inventory (NWI) (www.fws.gov/wetlands/), important woodcock habitats may be included in the following NWI wetland types: palustrine scrub-shrub and palustrine forested. To view the locations of these wetlands, use the wetland mapper tool on the NWI Web site (http://www.fws.gov/wetlands/data/WebMapServices.html).

Characteristics of feeding areas:

- Moist, rich soils with abundant earthworms.
- Preferred forest types for woodcock feeding include those generally labeled as shade intolerant hardwoods, including aspen, alder/willow, gray or paper birch, and pin cherry. Secondary forest types include young forest (with associated shrub layers) in the following forest types: northern hardwood, red spruce/balsam fir/hardwood mixtures, eastern red cedar/red maple mixtures, and elm/ash/red maple.
- In young forest and shrubland habitats, feeding areas should have greater than 10,000 stems per acre of young trees or shrubs. Typically, these habitats are regenerating hardwood clearcuts between 3 and 15 years of age.
- In general, most preferred forest types are prone to root suckering or stump sprouting.

Nesting cover

Most woodcock nests are in young second-growth (forest that was recently cut) hardwood stands that are near feeding areas and/or singing grounds (fig. 6). Nesting cover may also serve as diurnal feeding cover. The woody stem density of nesting areas should be at least 6,000 stems per acre. Preferred brood habitat is characterized by protective dense hardwood cover on fertile soils that support an abundance of earthworms. Things to look for:

- Forest sites somewhat drier than feeding areas with sapling to small pole sized trees (>4.5 ft tall, with a diameter at breast height (DBH) of 6 in or less). These areas may include young forest or shrubland habitats on uplands adjacent to riparian areas or 10- to 15-foot-tall alder on drier sites.
- Young, open, second-growth hardwood—seedling/sapling size class (DBH <4 inches) from 2 to 15 years following clearcutting if there is no dense ground cover. Bare ground is necessary for brood rearing.
- Nesting habitats may include large sapling/small pole-sized hardwoods (15 to 25 years post-cut) with a dense shrub layer (aspen with a hazelnut, dogwood, and/or viburnum understory, alder, tamarack, and aspen with fir).

Characteristics of nesting cover:

- Areas as small as one acre can be used, although 5-acre units are better from a management perspective.
- Preferences for forest types for nesting are the same as preferences for feeding areas.

Figure 5 Riparian areas provide a consistent source of earthworms

Figure 6 Typical woodcock nesting cover

Roosting areas

Woodcock often leave diurnal areas at dusk and fly to openings such as clearcuts, abandoned agricultural fields, and pastures to spend the night. Use of roosting fields generally begins in July and continues up to time of migration. In northern areas, woodcock generally do not feed on roosting habitats, seeking out instead protection from predators at night. In general, the structure of roosting habitats should be open enough for woodcock to detect ground predators while affording scattered overhead protection from avian predators. On smaller openings it is advantageous to have a tapered (feathered) edge of small trees and shrubs rather than an abrupt edge. Things to look for:

- Naturally regenerating recent clearcuts and log landings.
- Revegetated gravel pits.
- Lowbush blueberry barrens or fields.
- Recently abandoned farmland.
- Newly established or herbicide-released tree plantations
- Pastures with light to moderate grazing.

Characteristics of roosting areas:

- Barren, light herbaceous ground cover.
- Some bare ground.
- Occasional weed or shrub cover for overhead protection.
- Clump grasses are preferred over sod grasses.
- Scattered small shrubs and trees less than 4 feet in height.
- Grazed pastures with some areas of short (4 to 6-in) grass.

Table 1 Scientific and common names of trees referenced in this document

Common Name	Scientific Name
alder	*Alnus* spp.
alder, speckled	*Alnus incana* spp. *rugora*
ash	*Fraxinus* spp.
aspen	*Populus* spp.
aspen, bigtooth	*Populus grandidentata*
aspen, quaking	*Populus tremuloides*
birch, gray	*Betula populifolia*
birch, paper	*Betula papyrifera*
blueberry, lowbush	*Vaccinium angustifolium*
cedar, eastern white	*Thuja occidentalis*
cherry, pin	*Prunus pensylvanica*
dogwood	*Cornus* spp.
elm	*Ulmus* spp.
fir, balsam	*Abies balsamea*
hawthorn	*Crataegus* spp.
hazelnut	*Corylus* spp.
tamarack	*Larix laricina*
maple, red	*Acer rubrum*
spruce, red	*Picea rubens*
viburnum	*Viburnum* spp.
willow	*Salix* spp.

Woodcock habitat mosaics

Quality woodcock habitat mosaics are a combination of dense hardwood cover on fertile soils, with an abundance of earthworms, interspersed with both large and small openings. Farmland/hardwood forest mix is an ideal location to consider managing for woodcock. Birch, bigtooth aspen, quaking aspen, speckled alder (hereafter alder), hawthorn, and dogwood provide the cover densities preferred by this species (table 1).

Woodcock populations thrive when all habitat components are located close to each other. To create a mosaic of quality habitat capable of supporting 500 woodcock (adults and chicks just after hatching) is an ultimate goal of woodcock experts. By looking at some examples of areas intensively managed for woodcock, it is clear that an intensively managed unit of 500 to 1,000 acres should support approximately 500 woodcock. Densities from the Moosehorn National Wildlife Refuge, Ethan Allen Firing Range (EAFR), and American Woodcock Singing Ground Survey are contrasted (figs. 7 and 8).

As a hedge against adverse impacts to populations caused by climatic events, disease, predation, etc., it is advantageous to position several habitat mosaics within 1 to 2 miles of each other. This way, if one population declines, there are suitable source populations nearby to allow for recolonization of the area. Undoubtedly, the preceding landscape-scaled goals

Figure 7 Densities of woodcock on intensively managed demonstration areas

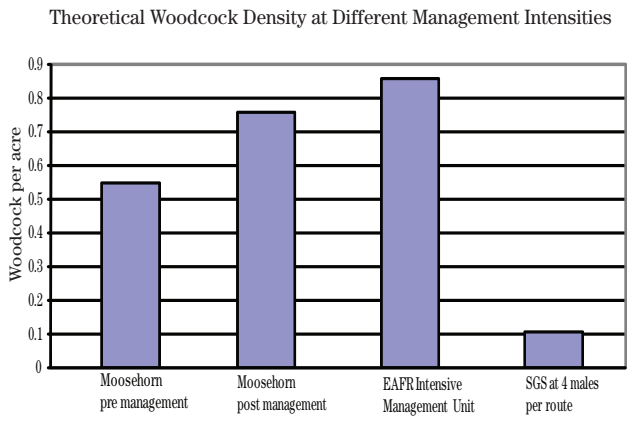
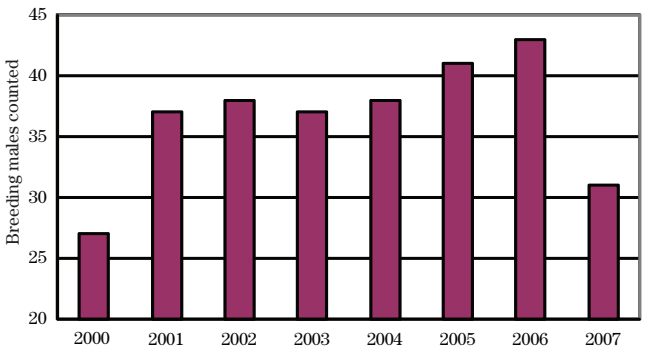


Figure 8 Breeding male population on EAFR



for woodcock populations and habitat mosaics can be daunting for those working primarily with owners of smaller forested parcels common to the Northeast. However, it is recognized that a shifting mosaic of suitable woodcock habitat can be maintained on small parcels across the landscape. Cumulatively smaller-scale efforts will benefit the species and will contribute toward landscape-level goals.

Landowners and land managers can use this guide to help provide some or all of the four habitat components required by woodcock on small parcels and at smaller scales. It should be noted that adjacent lands and or landowners may need to be involved to meet all the habitat needs of woodcock where smaller ownerships are involved. For instance, a landowner with a 50-acre forested parcel may have good site conditions to provide nesting and feeding habitat but may have to rely on nearby agricultural lands for long-term courtship and roosting areas for local woodcock. A Landowner's Guide to Woodcock Management in the Northeast (Sepik, Owen, and Coulter 1981) contains examples of smaller-scale woodcock habitat projects.

Composition of habitat mosaics

In the ideal woodcock management unit, the following habitat configuration should result in the highest densities of woodcock (fig. 9):

- Locate the unit so that its center or core is an alder swale or other forested wetland (on the National Wetlands Inventory (http://www.fws.gov/wetlands/), look for palustrine scrub-shrub and palustrine forested wetlands).
- More than 80 percent of the management unit should be dedicated to providing diurnal foraging areas. An important component of this diurnal habitat area is the core scrub-shrub or forested wetland that is used to define the center of the management unit. Here, the structure of the scrub-shrub or forested wetland should be managed so that it provides dense sapling growth. Because these areas are most likely to feature moist soils high in organic matter (important for earthworms) regardless of drought conditions, the core feeding area will be the most reliable habitat to support woodcock populations through time.
- Diurnal habitat surrounding or adjacent to the core alder swale or other forested wetland will be created by even–aged forest cuttings of greater than 5 acres in size located on adjacent uplands. These cuts will stimulate sprouting of shade-intolerant species such as aspen to create ideal woodcock feeding habitat.
- Alder diurnal habitat areas will grow out of usefulness when the canopy opens and allows grasses and forbs to thrive in the understory or the process of stem exclusion in the developing stand has evolved to less than 10,000 stems per acre. Plan to regenerate 25 percent of the core alder feeding habitat every 5 years so that the entire area is rotated through a cutting cycle within 20 years. This way, woodcock will always have a choice of different aged feeding areas.
- In preferred forest types (defined in the feeding areas section), this important mosaic of feeding areas can be structured so that 25 percent of the unit is in one of four age classes: 0 to 10, 11 to 20, 21 to 30, and 31 to 40 years since cutting. One efficient method is to create new young forest habi-

Figure 9 Woodcock habitat mosaic implemented on the ground at the Silvio O. Conte National Fish and Wildlife Refuge, Nulhegan Basin Division, Essex County, VT

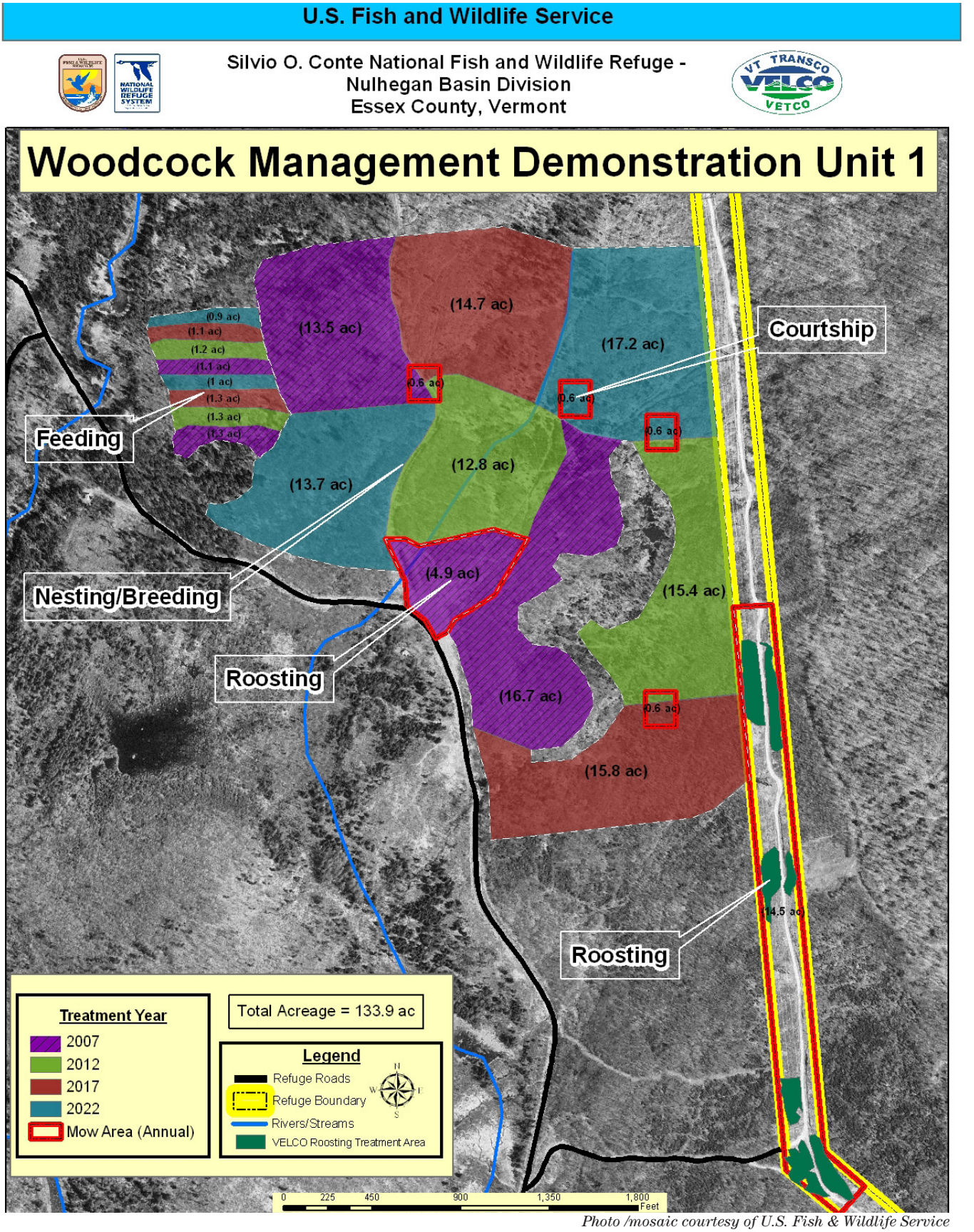


Photo /mosaic courtesy of U.S. Fish & Wildlife Service

tats in 5-acre or larger blocks on a 40-year rotation on a 10-year entry period. This management approach would also provide nesting and brood rearing habitat over time. In secondary forest types, lengthen rotation and/or age class distribution to achieve commercial forest products.

- When diurnal habitat areas have been identified or delineated, the remainder of the management unit should be dedicated to roosting field and singing ground habitats. Generally, these two components require open habitats. Strive to create:
  - One roosting field per 100 acres: Roosting fields should be at least 5 acres in size (fig. 10).
  - Eight singing grounds per 100 acres: singing grounds should be at least one-half acre in size.

Woodcock conservation plan and habitat goals

How much is enough? Is one 500- to 1,000-acre habitat mosaic per county enough? The Woodcock Conservation Plan (http://www.timberdoodle.org) has quantified habitat and population goals by region and state to increase woodcock populations to 1970 levels. The Woodcock Conservation Plan emerged from the efforts of the United States Fish and Wildlife Service (USFWS), State wildlife management agencies and nongovernmental organizations to galvanize action to reverse the decline of woodcock.

The Woodcock Task Force recognized that bird interest groups dedicated generally to conservation of waterfowl, shorebirds, neotropical migrant songbirds and waterbirds had developed strategic plans to set population objectives, rank the level of risk, define amounts or types of critical habitat, and outline funding deficiencies. Goals from those plans would drive agency funding and priorities. Woodcock, however, had not received similar attention. To allow woodcock needs to compete with other bird needs, a conservation plan was needed.

The Woodcock Conservation Plan assessed current levels of woodcock habitat and woodcock populations and calculated the amount of new habitat needed to return woodcock to 1970s population levels. Goals for each region of woodcock range can be found by downloading the plan from http://www.timberdoodle.org. Within each specific initiative's (e.g. Northern Forest Initiative) page on the web site, there are links to step down plans that provide planning goals for states and counties within each region.

Woodcock habitat management practices

Aspen management

- Aspen responds to cutting by sending up thousands of spouts from underground roots. This develops into dense sapling growth that makes aspen a preferred species to manage for woodcock (fig. 11).
- Even if aspen is scarce in a forest stand, it can regain dominance if correctly managed. As little as 30 square feet of basal area per acre of aspen makes a stand suitable for management as an aspen stand.

Figure 10 Roosting field

Figure 11 Aspen is preferred forest type for woodcock

- In old or decadent stands, a greater percentage of the area may need to be cut in the first two cutting cycles to prevent the death of aspen clones from the lack of viable root sprouting.
- In stands with aspen, position 5-acre patch cuts so that they include existing aspen trees. Roots from the cut trees will sprout and revegetate in the opening around the stump.
- To maximize sprout growth, time the cutting to occur after leaf-fall. Whenever possible, operate on frozen ground.
- Cutting aspen on a 40- to 60-year rotation should result in commercial timber revenue. Landowners may get the habitat work paid for and perhaps even make money while improving woodcock habitat.

Alder management

- Alder is an important habitat type for woodcock when young alder stands exhibit high stem density with little understory so that woodcock can feed freely without the threat of predation. Like aspen, alder sprouts vigorously when cut, although most alder sprouting is directly from the stump, not from roots. Alder will also grow naturally from seed.
- When alder stands become old, stem density decreases substantially and understories are overtaken by grasses and other ground covers. Woodcock cannot feed freely in old alder stands.
- To determine the suitability of the age of a stand of alder, observe the growth form of alder stems. When old, alder frequently grows horizontally instead of vertically. Alder stands with horizontal growth are good candidates for regeneration (fig. 12).
- A widely practiced way to manage alder is to cut strips that are 50- to 100-feet wide through the alder stand. Strips are positioned so that every 5 years, an adjacent strip can be cut. By doing so, all alder strips will be revisited once every 20 years. As with aspen, the percentage of the area cut can be accelerated in decadent stands with substantial horizontal growth.
- Not all alder is suitable for woodcock. Stands with standing water, saturated soils or heavy sedge growth are likely too wet to support earthworms.
- Depending on site conditions, alder management can be accomplished using a brush hog, a hydroaxe, an excavator equipped with a mowing head (brontosaurus), or by shearing off stems with a skidder or bulldozer blade in winter at or near ground level after the ground has frozen.
- Generally, there is no commercial use for alder, but local habitat management programs (e.g., Farm Bill) may provide financial assistance to private landowners.

Roosting area management

- In forested areas, woodcock may have difficulty finding open areas in which to roost. In some cases, when open areas are not close by, woodcock may remain in diurnal habitats through the night. Scientists speculate that mammalian predation may be higher at night in these habitats. In other cases, when open areas are not abundant, woodcock may fly long distances to roosting fields. Research suggests that mortality increases when habitat components are scattered.
- In heavily forested areas with active forest management, newly created cuttings (especially softwood and mixed-wood sites) serve as roosting fields for at least several years after the time of cutting (fig. 13).
- In heavily forested areas without active annual management, or where management is not even-aged, roosting fields must be created and managed. Generally accepted guidelines for creating roosting fields are:
  - Cut and maintain openings of 5 acres or larger with sparse ground cover.
  - Do not plant or revegetate, especially with sod–forming grasses. The objective is to

Figure 12 Alder growing horizontally not suitable for woodcock habitat

allow the site to revegetate with patchy, naturally occurring weeds, forbs, and native clump grasses. Do not fertilize.

  - Sites should be maintained in this condition through mowing, prescribed burning, herbicides, or grazing.
  - Allow a 100-foot border of the opening to regenerate into dense sapling-sized deciduous shrubs and trees for woodcock nesting habitat.
  - Manage for one roosting field per 100 acres of habitat.

- In areas with pastures, hayfields or blueberry fields close by (within a half mile of feeding areas).
  - Pastures with light to moderate grazing pressure are maintained in cover suitable for use by roosting woodcock. These areas serve the needs for woodcock roosting and, therefore, eliminate the need for the landowner to manage other areas as roosting fields.
  - Because dense grass and weed growth prevent the use of roosting fields by woodcock, hayfields and blueberry openings must be managed to allow use by woodcock.
  - Mowing strips in hayfields is an effective management tool in some areas. To encourage woodcock use, strips from 6 to 8 feet wide should be mowed in hayfields during late summer. Up to 25 percent of a field can be strip mowed to maintain roosting habitat. In hayfields that provide suitable habitat for grassland nesting birds, the NRCS recommends mowing be conducted after the locally established breeding bird season dates.
  - Managed blueberry barrens provide good habitat structure for woodcock. Barrens should regularly be mowed or burned, usually on an annual or biannual treatment schedule depending on fuel load or rank growth.
- Other landscape components that serve as roosting fields include barrens, airstrips, military training grounds, topsoil mined areas, regenerating gravel pits, and newly established forest plantations.

Log landing management

Log landings can serve as both singing grounds and roosting fields and in a forested environment can serve as an efficient way to maintain some open habitat important for woodcock (fig. 14).

- Landings should be as large as possible, usually 1 to 3 acres in size is practical. The larger the landing area, the more likely the landing will be used as a roosting field. Large landings are also more likely to support multiple male courtship territories.
- Landings should be smoothed with dense slash removed or piled but little else in the way of site treatment is necessary.
- Landings should not be planted if woodcock use is desired. Landings with erosion problems may be planted to annual grasses.

Figure 13 Woodcock select areas with sparse vegetation to use as roosting fields including clearcuts

Figure 14 Log landings provide important habitat for woodcock

Commercial forest management

Commercial forestry can be an excellent way to improve woodcock habitat at no cost to the landowner. There are various forestry guides available, but forest managers should refer to the habitat composition goals listed in DeGraaf et al. (2005) as an excellent approach to integrating early successional habitat needs into forest management.

Summary

American woodcock respond favorably to habitat improvement, usually within one year or so. In fact, many private landowners witness the aerial acrobatics of displaying males the first spring after the creation of singing grounds. So the discussion and implementation of Best Management Practices for woodcock habitat provides quick rewards to both the landowner and the technical assistance provider.

Woodcock populations were highest when working farms and forestlands dotted the landscape. Brushy field edges, streambanks, orchards, fallow fields, pastures, reverting agricultural fields, and managed woodlots provided the mosaic of habitats that woodcock depended upon. Many of those habitats are gone today, replaced by either mature forests or human developments. Woodcock can recover to 1970 population levels if the right steps are taken to create and maintain better habitats. This relies in large part to the NRCS because working farm and forestlands provide the best opportunity to recreate the habitat mosaics of the past.

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