

Woodcock

IN THE SOUTHEAST:

Natural History & Management for Landowners



The University of Georgia College of Agricultural and Environmental Sciences
Cooperative Extension Service

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Natural History and Management for Landowners



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Understanding Woodcock

This bulletin describes woodcock habits, habitat needs, and habitat improvements that can help landowners increase woodcock numbers. This bulletin is aimed primarily at the Carolinas, Georgia, and northern Florida.

The quail-sized woodcock seems a peculiar bird. Unlike its sandpiper relatives, the woodcock is a forest bird. It spends its days hidden on the forest floor perfectly blended with dead leaves by its camouflaged pattern of broken blacks and browns. Its eyes sit so far back on its head that a woodcock can see all around, including behind itself. Its long, pencil-thin beak has nerves out to the tip to help its owner locate prey below the soil. A woodcock can open its beak just at the tip while it is probing deep in soft soil. These specializations of the bill enable the woodcock to grasp earthworms, its favorite prey, and pull them from the soil.

The woodcock stands on short legs positioned so far back on its body that it ambles about with an odd front-back bobbing gait. Perhaps because of the woodcock's curious habits and mysteriousness, it has many names that describe its appearance and habits: bog borer, bog sucker, big eyes, swamp bat, mud bat, *hokumpake*, Labrador twister, whistler, marsh plover, big-eyed John, swamp quail, snipe, blind snipe, brush snipe, cane snipe, dropping snipe, forest snipe, owl snipe, wood snipe, hill partridge, night partridge, *bec noir*, *becassé*, night *becassé*, and the most common nickname, timberdoodle.

Why Do People Want Woodcock on Their Land?

To the naturalist and woods-wise landowner, the woodcock indicates environmental quality. Woodcock are

not common on impoverished lands. They like the rich soils and thickets of wide (usually more than 50 yards), moist bottoms, and springs associated with permanent creeks. You may know from their sign and their song that woodcock are there; you just can't see them as they sit on the forest floor because they are such secretive birds, so perfectly camouflaged. They add an air of mystery to special places on the land.



A woodcock may announce its presence by bursting into flight at your feet when you least expect it. Being startled by a rising woodcock is a great thrill. However, most of the time, the landowner appreciates this silent friend just through knowing that woodcock are there.

Figure 1
The male woodcock performs the sky dance.



Photo: Jeff Jackson

Figure 2
"Splash" is evidence of woodcock.

To the birdwatcher, the woodcock is a fascinating bird to find because of its famous sky dance (Figure 1). Male woodcock carry on their courtship activities in open fields throughout most of the year, although it is concentrated from late winter through early summer.

The courtship behavior is complex. First the male woodcock enters a "singing ground," which is often a fallow field or a recent clearcut. After landing in a relatively open spot in the field at dusk, the male utters two calls, one right after the other. The first call is the "tuko" call, which is faint and can only be heard if you are quite close. The call that follows is the nasal "peent," which can be heard for some distance. As the male calls, he paces around in circles, so the peent call seems to rise and fall in volume.

After calling for a few minutes, the male lifts off of the ground and spirals upward into his towering sky dance. As he gains altitude, listen for a faint twittering sound made by the wind whistling past his three narrow outer primary feathers. Once he reaches the peak of flight, about as high as you can barely see in the darkening sky, he begins an undulating flight in a large circle. Then you will hear his chirping call. After he flies in circles for a while, the male will plummet back down to his little strutting ground.

Figure 3
A mixture of young pines, broomsedge clumps and bare patches makes this field popular with woodcock at night.

Photo: David Krementz



Once on the ground, he starts the whole display over again. While he is on the ground, females will visit the singing male. Many males would advertise their wares, but these display grounds are a place for competition. The competition is a cackle flight; competitors chase each other while calling back and forth. This system results in what behaviorists call a lek. The lek is a place and process that determines who breeds. There still remains some question about how the lek operates in the case of woodcock, but regardless, it is a fascinating ritual to watch.

To the hunter, the woodcock is a sporty game bird. Hunters like woodcock because they are challenging to shoot, they hold well for pointing dogs, and they are fine table fare. Before the Migratory Bird Treaty Act of 1918, woodcock were often hunted at night. Hunters used torches to approach woodcocks roosting on the ground in fields. A lone hunter could kill phenomenal numbers of woodcock in a night. Today hunters seek woodcock during the day in brushy fields and thick woods. The woodcock's habit of frequenting thick cover, its sudden flush and its darting flight make it a challenging quarry.

You May Have Woodcock on Your Land

Often landowners hope to attract woodcock and then find—to their surprise—woodcock are already there. A topographic map can help you locate wide (at least 50 yards) moist bottoms. Also check for springs and seepages flowing into creeks. If there are thickets in your bottomland fields and openings, examine the ground for the woodcock's characteristic dropping or "splash." If woodcock are using the thickets, you will see these telltale signs. Woodcock splash is about the size of a 50-cent piece. It is chalky-white with a dark

center (Figure 2). You may also find the little holes made by woodcock where they have been probing for worms.

Another way for finding woodcock is to go to potential roosting/singing grounds. These are 1- to 5-year-old clearcuts or other open brushy places near the wide bottoms. Visit the singing ground just before dark and position yourself where you can see the incoming woodcock against the darkening sky. You may also be fortunate to hear woodcock singing or peenting (Figure 3). It will be too late in the day for legal shooting, but once you have located a roosting/singing ground, you can be sure those woodcock using the singing ground are hiding in nearby thickets during the day (Figure 4).

The Woodcock's World of Worms

Despite his docile look, the woodcock is a voracious predator. For most of his days, a woodcock eats worms—worms for breakfast, worms for lunch, worms for dinner. A woodcock without worms is in big trouble. Worms can be astoundingly abundant in good soil—hundreds or even thousands of pounds or more to the acre. Of this total earthworm tonnage, some species live too deep for woodcock to catch. *Understanding what makes good earthworm habitat is basic to helping woodcock.*

A woodcock must find worms within an inch or two of the surface nearly every day of its life. Woodcock also eat certain insects and their larvae, but worms are the main staple. And wormy habitat is where almost all their food is found.

Forest Type and Worms

Forest trees and soil type influence the quality of worm habitat and, therefore, the quality of woodcock habitat. Detritus-feeding worms, of the kinds that woodcock feed on, prefer a medium-loamy soil. Earthworms eat fallen

leaves and convert them to litter in their burrows. So efficient are worms that just a few individuals per square foot can consume up to half a ton of leaves per acre per season (Wilde 1958).

Alder produces the best leaves to feed the woodcock's favorite worms. These leaves are high in nitrogen and other elements that worms need. Pines produce the poorest litter of all. Presumably, the conversion of native forests, especially bottomland hardwoods, to southern pines degrades woodcock and worm habitat. Pines tend to acidify the soil. As soils become more acid, worms decline. Worms become very scarce when soil pH is less than 4.5.

We cannot evaluate woodcock habitat by simply measuring the abundance of worms. Although about 300 kinds of worms live in North America, any environment usually has only two or three species. Exceptional habitats may support as many as 15 species. Of these, woodcock will feed on only a few.

Some of the woodcock's favorite worms in northern states are *Aporrectodea tuberculata*, *Lumbricus rubellus* and *Dendrobaena octaedra* (Reynolds 1977). Surprisingly, none of these three favorite worms is native to America. All are introduced European species. Apparently the woodcock's original worm foods have been replaced by a number of species introduced from Europe and elsewhere.

A stunningly abundant worm in some places is the large nightcrawler *Lumbricus terrestris*. This worm, introduced from Europe, has spread over vast areas, but its spread has not been good news for the woodcock; they rarely eat this kind of worm. The woodcock's world of worms has been changed. No one knows what has happened to the woodcock's former favorite worms.



Photo: David Krementz

Figure 4

A woodcock hides in a thicket.

Figure 5

Probe holes are evidence of woodcock.

Photo: David Krementz





Photo: Jeff Jackson

HUNTING WOODCOCK

Dogs

Dogs are a must on the winter grounds because, in most cases, southern woodcock densities are low. Wandering around the woods without a dog will likely prove fruitless. Most woodcock hunters use pointing dogs such as English, Gordon, Irish or Llewellyn setters; English or French brittanies; drathhairs; German shorthairs; and weimaraners. Some hunters use flushing dogs such as springer, cocker or American spaniels; or Labrador or golden retrievers. The primary difference between these two basic dog groups for hunting woodcock is that with pointers, the hunter stays out of the heavy cover until a point is made. With flushing breeds, the hunter follows the dog closely and “busts brush” with the dog. The hunter reads the body language of the dog for clues that a flush is imminent. Hunting woodcock with a flushing dog requires a high level of alertness because woodcock take to the air with little warning.

Equipment

To follow a dog in woodcock cover requires briar proof pants, heavy field coat and heavy waterproof boots. Wear light leather gloves, protective eyeglasses and hearing protection. Wear enough orange so your hunting companions can see you.

Once in the air, the woodcock is a slow flier, compared with ruffed grouse or bobwhite quail. If you can keep calm, you have a good chance for a shot. Because woodcock are taken at close range, use open bores and smaller gauge shotguns, 20 or 16 suit the close quarters shooting that woodcock provide. Smaller shot sizes (7½, 8, 9) and low brass field loads are recommended. Make sure your shotgun is plugged to hold no more than three shells.

Don't Shoot Too Many

Having hunted a covert and bagging some woodcock, we suggest that you not overhunt your new discovery. Most woodcock hunters try to avoid shooting a covert more than two or three times per year. Woodcock are probably faithful to a particular location year after year.

Woodcock coverts are precious places; once you have a “trapline” of coverts to work during the season, be careful whom you tell!

Unfortunately we know little about which species of worms woodcock eat when they are in the Southeast.

Weather and Worms

Weather affects worms. If surface soil is too cold or too hot, worms go deep. A soil temperature of 50° to 68°F is about right for most of the woodcock's favorite worms (Edwards and Bohlen 1996). During the southern summer, the surface temperature is too hot for the woodcock's favorite worms. We wonder if that is one reason why they migrate north to find better feeding.

When surface soil dries out, worms also go deep. Woodcock cannot get worms from hard, dry soil. Nor can woodcock feed in soil that is too wet. Surface soil moisture of about 20 percent to 50 percent is best for woodcock and worms (Edwards and Bohlen 1996).

Occasionally, widespread, extremely cold winter temperatures in the South have caused soil to freeze and woodcock to move. In most years, however, it is flooding on the winter grounds that

causes relocations of wintering woodcock. Their movements are generally local; at most, a few miles. During these times, woodcock suffer much predation because the better covers are often inundated with water and woodcock are forced into poor-quality cover. As floods recede, the woodcock fly back to their old haunts. The worms survive the flooding.

Worms, Woodcock and Land-Use Practices

Fire, grazing and tillage all reduce the volume of dead plant matter on the soil surfaces. These practices may reduce worm food and, hence, reduce worm populations. However, fire, grazing and tillage may benefit woodcock in the short term by clearing away thick plant material so that woodcock can easily probe for worms. Johnson and Causey (1982) noticed that woodcock favored burned pinelands for feeding after dark. Woodcock use such open habitats only at night because the shortage of cover makes the birds vulnerable to predation. In general, fire, grazing

and tillage followed by moist, rainy conditions means that good worm hunting increases in the short term.

Removing vegetation by fire, grazing and tillage also has long-term effects. Without the litter layer, the soil dries out more quickly, making worms less available until the next rain. And in the long-term, less vegetation can mean less fertility and less worms.

Can Woodcock Overharvest Their Worms?

We suspect that woodcock can reduce their food supply if they feed repeatedly in the same small area. Woodcock eat 3 to 5 ounces of worms per day—nearly their own body weight. Such removals, in large night-feeding habitats, may not reduce worm-hunting success. But it is likely that in small special places, like seepage areas, woodcock could reduce their food supply to the point where they would have to seek worms elsewhere. Presumably that is one reason woodcock leave favorite covers after dark to forage more widely: to find places where worms are less exploited and more abundant.

The Woodcock's Life Through the Year

Spring Migration

In late January and early March, most woodcock migrate from the southern winter grounds to the breeding grounds in the northern two tiers of states and southern Canada.

The timing of spring migration depends on increasing day length, but the exact time of the major flights is dependent on moon phase and the passage of weather fronts.

When you see a full moon in February, you know that most woodcock will leave the winter grounds within two weeks.

The trigger will be a wind blowing from south to north. When the woodcock sense this wind, they depart shortly after

sunset. They leave singly or in loose, small flocks. They are thought to migrate at low altitudes, traveling about 30 to 40 miles per hour. We think that mountain ranges, rivers and the seashore are their guides.

Their arrival on breeding grounds is remarkably constant from year to year. The woodcock's journey north takes them from a mild southern climate into the end of the northern winter. When woodcock arrive on the breeding grounds, the weather is often harsh with snow and ice storms, and temperatures below freezing. If woodcock experience harsh weather during the spring, survival rates and nesting success suffer.

A few woodcock remain to breed in the South, but they become progressively scarcer from Tennessee to the Gulf Coast. These remaining birds seem to disappear come June or so. By July, and continuing through the summer, it is almost impossible to find a woodcock in the Deep South. Whether these birds migrate north with their young remains a mystery.

Nesting

Birds nesting in the South will begin as early as late January. Most nesting on the northern breeding grounds begins late April to early May.

The woodcock hen lays four eggs in a shallow depression on the ground, often under bushes, amongst dead leaves and twigs. The eggs are a beautifully camouflaged brown-spotted buff color. A nest is so hard to see that you can accidentally step on it. The hen incubates the eggs about 21 days. Birds may renest if the nest is destroyed or if the young are lost early during brood rearing.

The young can travel with the female within a day of hatching, but they are not as independent as young turkeys and quail, which can feed themselves immediately after hatching. The hen gathers most of their food and feeds the young directly. The young will huddle under her for warmth during the first 10 days. After this stage, the hen no longer broods the young. Before they are truly

independent, the young are vulnerable to death from cold, wet weather. The hen's assistance tapers off after three weeks, and the young are on their own after about 35 days. Once independent, the young disperse from the brooding area but remain in the general vicinity until the fall migration south.

Fall Migration

The return south is a drawn-out affair. In the far North, woodcock begin migrating as early as late September, but most birds begin migration in October. Timing of migration may be dependent on weather, but, as with the spring migration, the driving force is day length.

By Thanksgiving, most woodcock have left the summer breeding grounds. Migration routes of birds headed for Georgia and the Carolinas are mainly east of the Appalachians. More adults migrate inland than young, which migrate along the Atlantic coast. Some woodcock migrate through the Southeast and winter in Louisiana.

Early migrants arrive on the winter grounds in late November. By mid-December, most birds have arrived at their winter destination. The northern limit of the wintering grounds is south of freezing soil. Frozen ground makes worms unavailable. Most woodcock winter in the southern Piedmont and Coastal Plain, although some go as far south as Miami.

Winter in the South

Once on the southern wintering grounds, the woodcock follow a daily

cycle of roosting, feeding and courtship. Woodcock become active about an hour before daybreak when they feed heavily and sometimes conduct courtship activities. The birds usually fly from their roosting site to a location in dense thickets where they will spend the day. These flights are under half a mile, and take less than a minute.

Although woodcock may use a variety of daytime habitat types, they usually choose wet thickets where they find a high density of plant stems, but the ground itself will be open and clear. Such cover allows easy access to worms and insects in the leaf litter, while the roof of plant stems and leaves protects them from predatory mammals or birds. Typical covers include cane, privet, wax myrtle and briars. After arriving in daytime cover, woodcock will move and feed for an hour or so, then settle down to hide for the rest of the day.

Woodcock avoid predators by remaining perfectly motionless. Movement is risky. About an hour before dark, woodcock begin again to forage in their thickets. Around dusk, they may move to a brushy field or to another spot in the woods and continue to forage for a couple of hours after dark. Those birds that move to fields often conduct courtship activities including peenting and the sky dance. Foraging activities subside, but after midnight they may forage again for an hour or so. After this, woodcock settle down again for the rest of the night.



FACTS ABOUT AMERICAN WOODCOCK

- Woodcock are migratory shorebirds that primarily winter in the Southeast. They begin to arrive around late November and leave by early March.
- Long bill with large eyes set far back on head and mottled brown plumage make the woodcock an odd-looking bird.
- Nicknames include *bec noir*, *becassé*, night *becassé*, bog borer, bog sucker, big eyes, swamp bat, mud bat, *hokumpake*, Labrador twister, whistler, marsh plover, big-eyed John, swamp quail, snipe, blind snipe, brush snipe, cane snipe, dropping snipe, forest snipe, owl snipe, wood snipe, hill partridge, night partridge, and the most common nickname, timberdoodle.
- Females are slightly larger than males (6 ounces vs. 5 ounces).
- Most live less than one year.
- Moist thickets are the best habitat, but woodcock can sometimes be found in a variety of habitat types from bottomland hardwoods to old-growth pines.
- Earthworms are their main food. They also eat insects.
- We believe the woodcock is an indicator species; its presence speaks of land health.

Woodcock Management

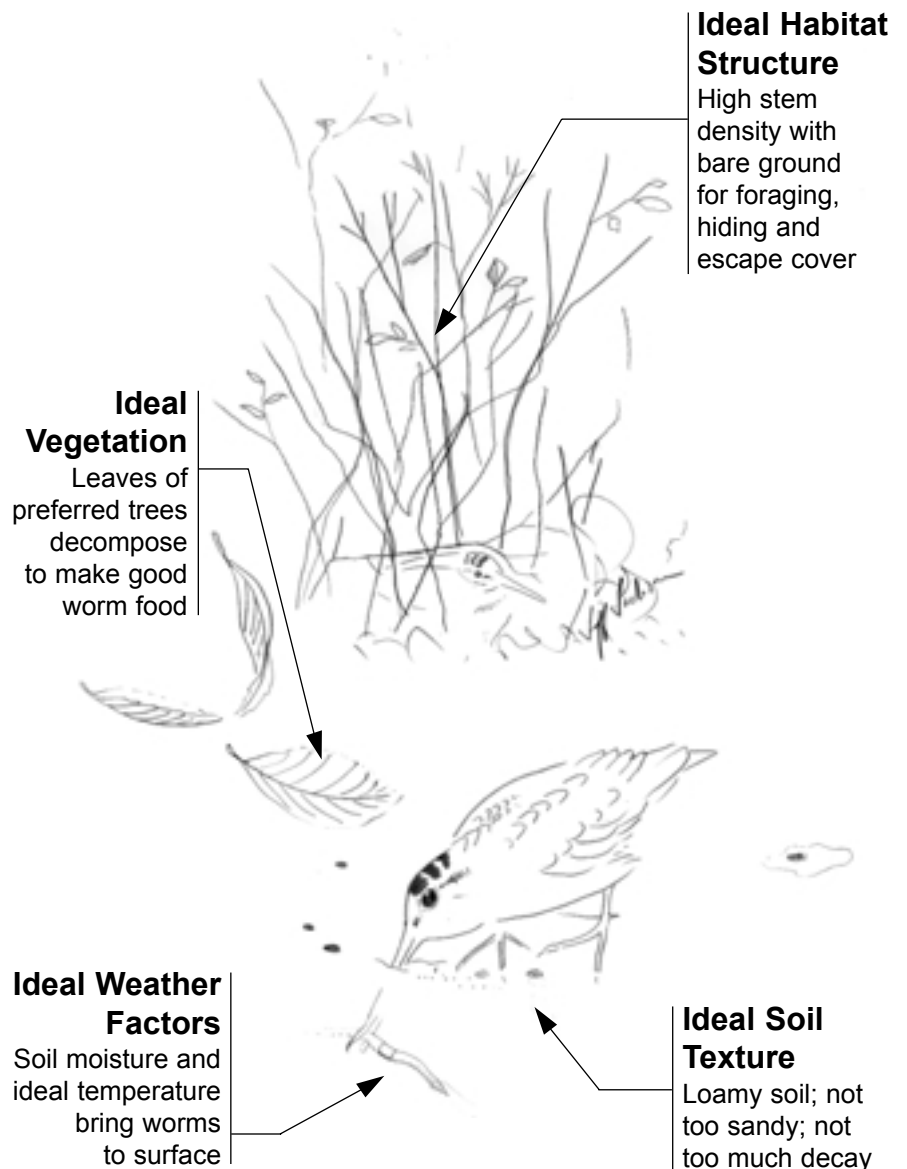
Perhaps more than any other southern game animal, the woodcock is the truest indicator of total wildland quality. This is due to the array of habitats it needs: forest, thickets and fields on good soil.

By contrast, some game animals can be brought to greater abundance by quick-fix management plans: A grain field planted for doves can produce a dove shoot in 90 days; an agricultural field converted to thickets of blackberries can create good rabbit hunting in two years; a clearcut of hardwoods in the mountains can make grouse habitat in five to 10 years. Some animals like deer can be abundant in degraded forests or almost any habitat. Why can't we make instant woodcock habitat?

One reason is that *woodcock feed in the detritus food chain*. Detritus is dead and decaying plant matter. Unlike the above creatures, which live in the *grazing food chain* and eat live vegetation. The woodcock's food supply depends on decomposition. The value and richness of the good wormy soil that woodcock need exists out of sight, under ground and largely beyond our control. We cannot make woodcock habitat directly, in the short term. But if we manage our land with woodcock in mind, in the long-term it will, on average, be better land for a great variety of wildlife.

Start With a Land-Use Inventory

The first step in wildlife habitat management is to inventory your land. Make a map. Within your property boundaries, draw the boundaries of the major habitat types; e.g., bottomland hardwoods, pine plantations, streamside corridors or whatever. Get aerial photos from your local natural resource conservation service office. Include habitat



information from your adjacent neighbors. It may be that your property has no nighttime cover, but your neighbor may have plenty. If so, you would be wise to concentrate on improving the daytime covers found on your property.

Figure 6
Ideal woodcock habitat includes these features.

Once you have a map, think about what areas you would be willing to manage. These decisions will be based on the acreage involved, the extent of management needed and whether management will really help. Whether management will help will depend on the availability of the different woodcock covers and foraging areas that woodcock need daily. The following sections

will help you make your map. You may also want to consult W. G. Sheldon's 1971 book, *The Book of the American Woodcock*, for additional information.

Protect or Create Daytime Cover

Find and Maintain Daytime Hiding Places

Ideal woodcock habitat is a combination of vegetation type, structure, weather factors and soil (Figure 6).

Woodcock distribution is most limited during the day. The first job in woodcock management should be to find and protect the special places where woodcock can spend the day. These treasures are the heart of

your woodcock habitat. Look for moist soil at the toe of slopes, or near springs or seepage areas. Rich, moist soil under cover of thickets, where they can find worms and be safe, is preferred habitat

for woodcock to spend the day. These special places are indicators of the general health of the land; thus, an abundance of woodcock is one indication that the land is healthy.

"We still have those rich patches where agriculture and forestry have been found uneconomical to pre-empt. They are treasures."

— C. H. D. Clarke

If your search for ideal woodcock daytime habitat reveals ideal moist soil habitat that lacks cover, you can create that cover. If cover is deficient due to grazing, fence off the habitat to allow thickets to grow. Establish suitable cover plants such as alders, cane, or possibly privet. Do not establish privet if it is not already common in the area, as privet is an invasive exotic plant with pest status. Consider half-cutting over-story trees and leaving the tops to create immediate cover. Half-cutting means partially severing the trunk to allow the tree to fall. Half-cut trees often remain alive and will last longer as cover than completely severed trunks. Once sunlight reaches desirable moist soil on the forest floor, a thicket will likely establish itself. If a special place is too dense, consider a thinning or prescribed burning to thin the cover. Thin just a little, not too much.



Photo: Jeff Jackson

Figure 7
Cane thickets can make excellent hiding thickets for woodcock.

Figure 8
A wet woods is often good woodcock habitat.

Photo: Jeff Jackson



Some creek bottoms and low lying lands show evidence of old ditches left over from the drainage days when ditching was a widespread practice. A possible management procedure might be to plug those ditches (Figure 9). The resulting rise in the water table will usually benefit worms and so help woodcock. Be wary of this practice where you have valuable timber because changing the water level might hurt the trees. The habitat management practices for daytime cover will also benefit woodcock visiting those covers at night.

Land Management Practices That May Incidentally Help Woodcock

Although the core of woodcock management is finding, protecting or creating special places, woodcock management can also be a by-product of land management done for other purposes. Burning, mowing, herbicide application, tillage and timber harvest may help or harm woodcock habitat as a by-product of their primary purposes. Read the following sections to see how they might contribute to your woodcock management plan. Generally speaking, these practices set back plant succession. They can be used to improve foraging habitat and singing grounds.

Timber Management and Woodcock

Managed timber rotations mimic plant succession in simplified fashion with some exceptions. Timber managers usually simplify the forest to focus growth on one or more profitable species of trees. They may reduce understory with herbicides or fire. Woodcock may find good habitat, at certain times and places, as an accidental by-product of timber rotation.



Photo: David Krementz

Clearcuts

You can make a temporary field by harvesting timber. Clearcuts can be excellent nighttime cover (Figure 3).

Shelterwoods and Seed Trees

Trees left after partial harvest are often intended to provide a seed source for the next crop of timber. A shelterwood or seed tree will suffice to create a patchy environment. These partial harvests may not be quite as good as clearcuts because birds of prey like to perch in trees.

Postcutting Treatments

Remember, you want a patchy appearance to the field: a mix of thickets and open. What better way to achieve this objective than by letting hardwoods and softwoods grow for the first year or two? A reasonable amount of slash left on the ground will further add to patchiness. Whatever you do with your cut, we do encourage you to leave alone wetter sites—seeps, springs, streams, creeks. These sites are suited for hardwoods naturally, and managing them for pines usually involves both mechanical and herbicidal treatments. The costs of these treatments might not be worth the future return. These wet spots are what woodcock thrive on; leave wet spots alone.

Figure 9

Plugging a ditch can be a step in improving woodcock habitat.



WOODCOCK RECIPE

To the cook, the woodcock is a culinary experience. Many appreciate its rich, hearty flavor. Woodcock have low fat content, so either cook slowly with moist heat or cook quickly with high heat. These approaches help avoid the error of over-drying.

**Jane Gusmano's
woodcock with cream**
serves 1-2

2 woodcock
Several gratings fresh
nutmeg
3-4 Tbs. butter
4 Tbs. heavy cream
salt and pepper

Carefully pluck woodcock rather than skin them. Leaving skin on prevents loss of juices. Put the liver, heart and 1 tablespoon of butter inside the bird, then skewer it shut. Rub birds well with butter, salt, pepper and nutmeg.

Place in a low baking dish and pour 2 tablespoons heavy cream on each bird. Bake in a 375° oven for about 25 minutes until tanned and tender. Baste every 5 minutes. Spoon hot cream and juices over each serving.

If you abandon management, plant succession will change a logged area back into a forest. After a few years, most clearcuts become too thick for woodcock. At this point, a prescribed fire might help. A light fire will thin out the vegetation but leave enough patchiness to encourage continued woodcock use. If you don't maintain the field, the canopy will close in after five to 10 years. Almost all use of the field as a nighttime cover will cease as ground and midstory layers disappear.

Thinning the Forest

You can sometimes improve a dense woods for woodcock by harvesting some trees. The extra light on the ground will allow thicket cover plants to thrive. When choosing trees for removal, you must inevitably make tradeoffs among timber value, growth potential and value to woodcock and other wildlife. There is no one proper way to thin woodlands. A wildlife enthusiast often prefers a variety of trees to a pure stand or monoculture.

There is no set rule about the number of trees to remove when thinning. Heavier thinning will put more light on the ground and will stimulate undergrowth. This undergrowth may be excellent or poor for woodcock depending on the soil, plants present, and previous history of the site. Keep in mind that woodcock are often unable to use a forest habitat with too sparse an understory. Consider, too, that certain old natural forests have become increasingly rare. If you have a special woods, treasure it as it is.

Get an accurate measure of the volume and professional help before selling any trees. The Extension service and state forestry agencies have bulletins on timber harvest to help you.

Pine Monoculture and Woodcock

Many people ask, "Are pines good for wildlife?" Dense monocultures of southern pines tend to acidify the soil and degrade habitat for woodcock and many other species of wildlife. Pure pine monocultures are usually poor woodcock habitat (Figure 10). However, the southern pines (longleaf, shortleaf, loblolly or slash) can vary from good to poor as woodcock habitat. The variation is due to differences in the understory, litter layer and soil. A very sparse pine forest with a good thicket understory is better for woodcock than dense pines that shade the forest floor and often have little or no suitable thickets for woodcock. Hardwood sprouts, small trees, gallberries, blackberries, cane thickets, broomsedge, wiregrass or other vegetation may grow under pines.

Prescribed Burning in Pinelands

Burning is a common forest management practice, especially in pine habitat. Fire can remove pine needles and clear the forest floor to create opportunities for woodcock to find worms. Fire sets back plant succession, can favor fire-resistant pines and can stimulate regrowth. Fire can provide many of the same benefits as mechanical and herbicidal treatments but at less expense.

A prescribed fire is one set with a goal and a plan. Contain prescribed fires within a man-made or natural firebreak. Get help from experienced personnel when conducting fires. Bulletins on controlled fire are available from the county office of your land-grant university Extension service and forestry agencies.

There are many uses, benefits, and liabilities of fire that are too complex to explain here. Winter burns remove dense vegetation and plant litter so woodcock have easy

access to the soil for foraging. It is best if the larger stems remain to provide cover.

How often should you burn? The richer the soil, the faster plants grow and the more often burning is necessary. Vegetation on very poor soils may be slow to recover. A mosaic of 1- to 4-year-old burned areas often works well to ensure a mixture of cover. A greater variety of plants can result from a mosaic of burns than when large areas are given uniform treatment. Some environments need burning more often than others.

Avoid burning large areas. Large burned areas are less desirable for woodcock than those that leave scattered, unburned patches of habitat valuable for feeding and protection. Sometimes you can burn with spot fires under conditions that leave patches of cover. Or you can divide the woods into a mosaic of smaller sections with firebreaks. Burn a third of these sections each year or so at winter's end.

Rake around or otherwise protect isolated hardwood trees in pine stands. Likewise, avoid burning forest edges if they contain choice thickets or other desirable plants.

Choosing the right time to burn pinelands is critical. Early winter burns remove cover for a long period, whereas burns just before spring green-up allow cover to regrow shortly after a fire.

Often ideal conditions for a winter or early spring fire develop after a cold front brings a soaking rain of at least an inch. A few days of steady, reliable wind from the north or west will usually follow. The litter should be wet right down to the soil (check it). As the litter dries from the top there is an increasing layer of flammable material above the moist litter.

Flash fuels like dry grasses may burn readily after only a short drying period, especially if it is windy. When there is enough dry material to carry a fire, check the wind and humidity. Humidity should be between 30 percent and 60 percent. A wind speed of 5 to 15 miles per hour will help keep the heat cleared away from the pine tops and reduce the chance of scorching treetops. With no wind, scorching is likely. Fires may be set to back into the wind (backfire), burn at a right angle



Photo: David Kremetz

to the wind (flank fire), or run with the wind (headfire). Backfires are safest for beginners. Set fires with a drip torch in strips or as spots. Do not encircle areas with fire unless you intend to kill all trees and vegetation within. Read Georgia Extension Bulletin 838, *Prescribed Burning: A Management Tool* or other suitable instructions before using fire in the woods. Get help and advice and permits, if necessary, from your state forestry organization.

Figure 10
This pine monoculture stand is poor woodcock habitat.

Managing Open Lands for Woodcock

Maintain Old Fields

Landowners often establish and maintain old fields for rabbits, quail, deer and other wildlife. Woodcock



Photo: Jim Berdeen

Figure 11

Dense grass cover prevents woodcock from probing for worms.

use such habitat at night. Uniform ground cover is undesirable from the woodcock's standpoint. Thus, you will need to break up monotonous cover to make the field attractive to woodcock. Alternatives include discing, mowing, herbicides, burning and encouraging native shrubs and trees. The goal of these measures should be to make a field that is patchy. A little mowing here, a little tilling there, is better than doing too much.

Pasture Management

Cattle, goats and sheep can maintain areas of short vegetation that can be very desirable when interspersed with cover. Overgrown windrows of branches and trunks left after logging, brushy ditchbanks and dense thickets of briars are good kinds of cover in a pasture. Grazing animals will not overuse if pickings are better in the open field. Brief periods of intensive grazing will set back plant succession but if grazing continues too long, it may be detrimental. Grazing that results in areas of very short grass or little bare places can affect worm foraging habitat. Tall dense grass may support high worm populations but is not good woodcock foraging habitat.

Figure 12

Burning in field or forest can make worms more accessible to woodcock.

Photo: Hans Stigter



Mowing

Mowing functions much like grazing, and it has the added advantage of being very selective. Mow at any time of year to suppress unwanted growth as needed. Mowing in patches in fall after growth has ceased can help create foraging areas for woodcock in winter.

Tilling Fallow Croplands

Fallow fields are fields set aside to rest but will have crops again in the future. Harrowing tends to set back some sod-forming grasses and hardwood sprouts. It can make way for annuals, bunch grasses, shrubs and sometimes hardwoods. The timing of harrowing is important. Try harrowing small plots at different times throughout the year and note what plants grow afterward. Note which plots woodcock use. Results will vary with the locality. A field or field edge should have harrowed portions in various stages of regrowth. Try a three-year rotation so each year there is a mixture of 1-, 2-, and 3-year-old cover. Harrowing, like herbicides, can help create and maintain singing grounds. Burning can remove dense grasses and weeds to allow woodcock access to the soil for easy foraging. See figures 11 and 12.

History and Future of Woodcock

The Past and Future of Woodcock Populations

Woodcock populations in the East probably peaked around the 1940s-'50s after large-scale farmland abandonment during the 1930s.

As abandoned farmlands grew back into brush and then into young forests, a lot of great woodcock breeding habitat became available. Scattered dense thickets on good soil characterized these habitats.

Since the 1950s, however, abandoned farmlands have, through plant succession, grown to become forests. And the woodcock is not a big woods bird on the breeding grounds.

Today the combination of forest succession, land loss to urbanization, large-scale conversion to monotonous habitats and unknown factors have contributed to the decline of woodcock.

Since the U.S. Fish and Wildlife Service (USFWS) began monitoring woodcock populations in 1968, woodcock in the Eastern Region (Figure 13) have experienced an average annual decline of 2.6 percent (Figure 14). This survey measures the numbers of males singing along survey routes in the spring.

The USFWS also monitors the number of young of the year shot per adult female taken (Figure 15). The number of birds less than a year old as a proportion of the population gives an estimate of

recruitment. Recruitment is the number of new breeding animals entering a population. The number of young shot per female has shown a long-term decline, which supports the singing-ground survey results.

What Causes Woodcock Population Declines?

Among the many recognized causes for the decline of woodcock (Straw et al. 1994), the most probable causes include the loss and alteration of habitat.

The outright loss of habitat has been primarily due to urbanization. This has been especially true along the Atlantic seaboard from Boston to Washington. Habitat change has almost always meant more suburbs, bigger towns, larger cities. This trend is especially severe along the East Coast, which once had far more woodcock habitat than it does today. There will never be as much habitat available for woodcock in the future as there was in the past.

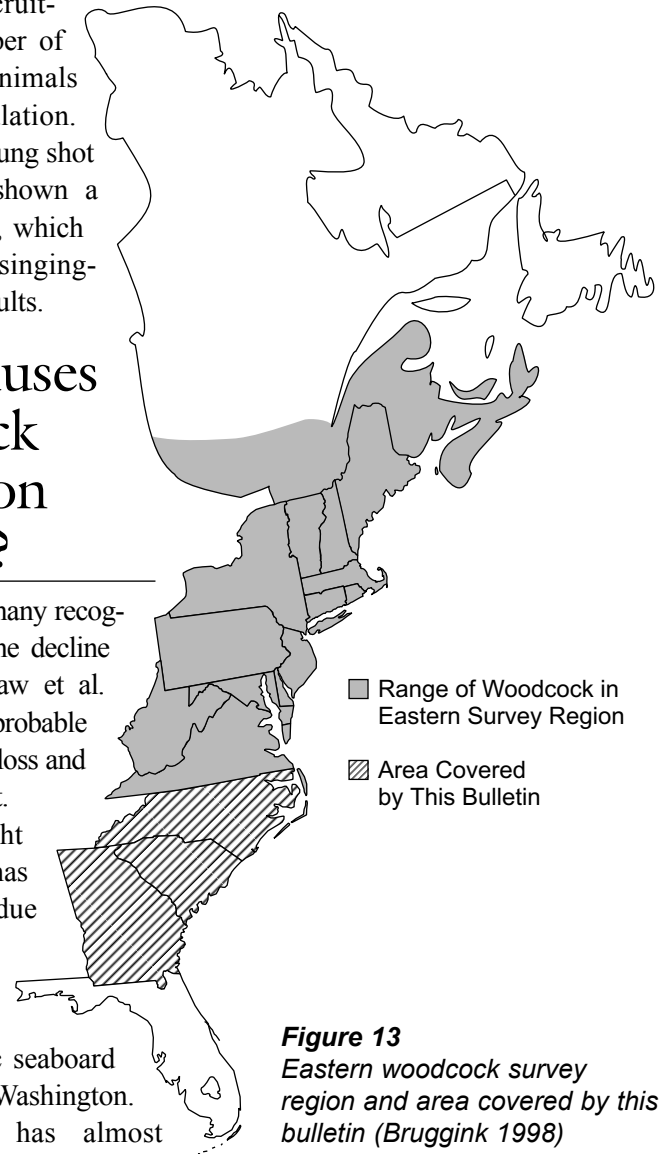


Figure 13
Eastern woodcock survey region and area covered by this bulletin (Bruggink 1998)

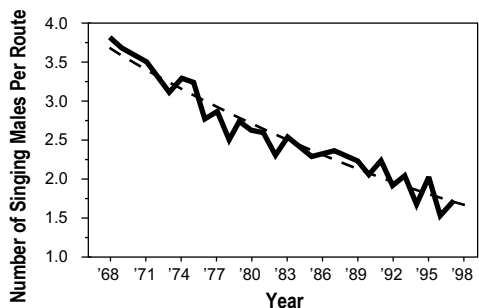


Figure 14 (far left)
Long-term trends and annual indices of the number of woodcock heard on the singing-ground surveys (Bruggink 1998)

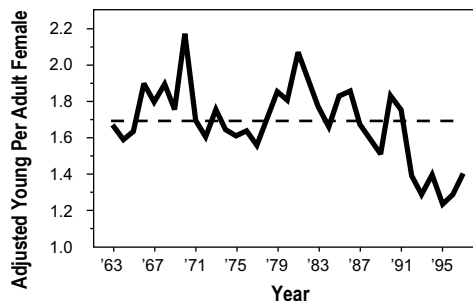


Figure 15
Indices of woodcock recruitment. Dashed line is the average. (Bruggink 1998)

More subtle than the loss of habitat has been the alteration of habitat. Examples include maturation of forests, water development, conversion of natural lands into agriculture or forest monocultures. But to woodcock, these alterations represent a loss of habitat complexity, a decrease in soil quality and often a change in the water table.

The U.S. Fish and Wildlife Service is mandated by law to manage woodcock populations in a manner that will not endanger the health of the woodcock population and, at the same time, provide opportunities for the public. The service has at its disposal two primary means of managing woodcock. First, and foremost, the service sets hunting season dates and bag limits. Since 1968, there have been four changes in dates and bag limits: 1982, 1983, 1991 and 1997. Season dates, bag limits or both were altered or reduced. The other alternative is to purchase or manage federal lands for woodcock or encourage private landowners to do so. To date, neither of these land management options has been attempted in more than a few isolated locations.

American Woodcock Management Plan

In 1990, the USFWS, USDA Forest Service and the Ruffed Grouse Society signed a memorandum of understanding designed to guide the conservation of woodcock in the United States.

This plan described ways federal, state and private agencies could work cooperatively in addressing problems, developing management programs, and assuring the future well being of woodcock.

The goal of the plan was to increase woodcock populations to levels consistent with the demands of people who use and enjoy them.

Inherent in this use was the harvest of woodcock, which was considered desirable and consistent with the conservation of woodcock.

A two-pronged approach was outlined. First, habitat management was thought to be the key to maintaining and increasing woodcock populations. Management of public lands on both the breeding and wintering grounds was outlined as well as outright protection of key concentration areas that are important during migration.

Second, population management should be conducted through existing regulatory processes with harvest commensurate with population status. Population status would be monitored through the singing-ground surveys and the wing-collection survey. The wing-collection survey has since been upgraded with the current Harvest Information Program, or HIP, which will greatly improve the means for obtaining data on harvest and hunter numbers.

The USFWS aims to help state, private agencies and private landowners to learn management practices that will help the woodcock. We hope our bulletin makes a contribution to that end.

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Suggested Web Sites

UGA Cooperative Extension Service:

<http://www.ces.uga.edu/pubs/pubsubj.html#forest>

UGA Forest Extension Service: <http://www.forestry.uga.edu/subjects/wildlife.html>

Office of Migratory Bird Management: <http://www.fws.gov/r9mbmo/homepg.html>

The Ruffed Grouse Society: <http://www.ruffedgrousesociety.org/>

The Ruffed Grouse Society of Canada: <http://www.rgs.ca/>

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Gale A. Buchanan, Dean and Director