

AMERICAN WOODCOCK CONSERVATION PLAN



A Summary of and Recommendations for Woodcock
Conservation in North America

Woodcock Task Force
Migratory Shore and Upland Game Bird Working Group
Association of Fish and Wildlife Agencies

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American Woodcock Conservation Plan

*A Summary of and Recommendations
for Woodcock Conservation
in North America*

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Executive Summary

The American woodcock (*Scolopax minor*) is a popular game bird throughout eastern North America and is managed on the basis of two populations: eastern and central. Both populations have experienced significant declines since surveys were first implemented in the mid-1960s. Loss and degradation of early succession forest habitat is believed to be the primary factor responsible for these declines. Changes in land use and societal attitudes towards even-aged forest-management practices (i.e. clearcutting) that create early succession habitat will likely contribute to continued declines in woodcock populations. The *American Woodcock Conservation Plan* documents changes in woodcock densities and habitat that occurred from the early 1970s to present. Population density deficits were calculated and specific habitat acreage goals for erasing such deficits were developed.

There has been a loss of over 839,000 singing male woodcock since the early 1970s. This corresponds to a population-density deficit of just over 778,000 males. Approximately 21.3 million acres (8.6 million ha) of new woodcock habitat needs to be created in order to eliminate this deficit and return woodcock densities to those observed during the early 1970s.

Introduction

The American woodcock (*Scolopax minor*) is a popular game bird throughout eastern North America. Approximately 520,000 hunter days were expended to harvest nearly 300,000 woodcock in the United States during the 2004 to 2005 hunting season (Kelley and Rau 2006). Woodcock are managed on the basis of two regions or populations, Eastern and Central, as recommended by Owen et al. (1977, Figure 1). Population trends are monitored by singing-ground surveys (SGSs) within each state and province in the central and northern portions of woodcock breeding range (Figure 1). SGSs were developed to exploit the conspicuous courtship display of the male woodcock. Early studies demonstrated that counts of singing males provide indices to woodcock populations and could be used to monitor annual changes (Mendall and Aldous 1943, Goudy 1960, Duke 1966, and Whitcomb 1974). There have been long-term (1968 to 2006) woodcock declines of 1.9 percent per year in the Eastern Region and 1.8 percent per year in the Central Region (Kelley and Rau 2006, Figure 2).

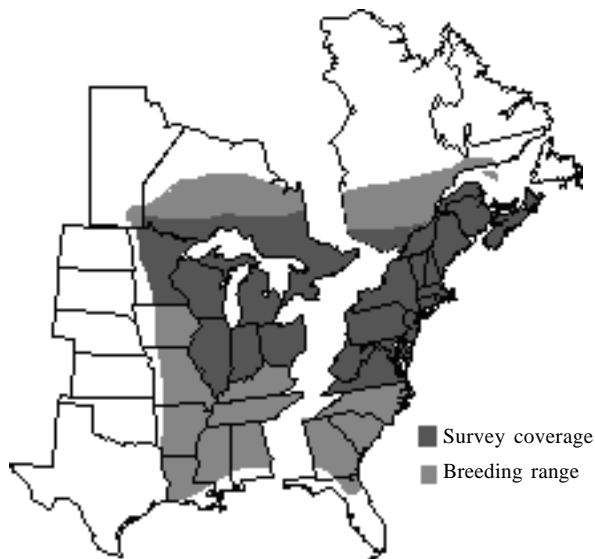


Figure I-01. Woodcock management regions, primary breeding range, and SGS coverage.

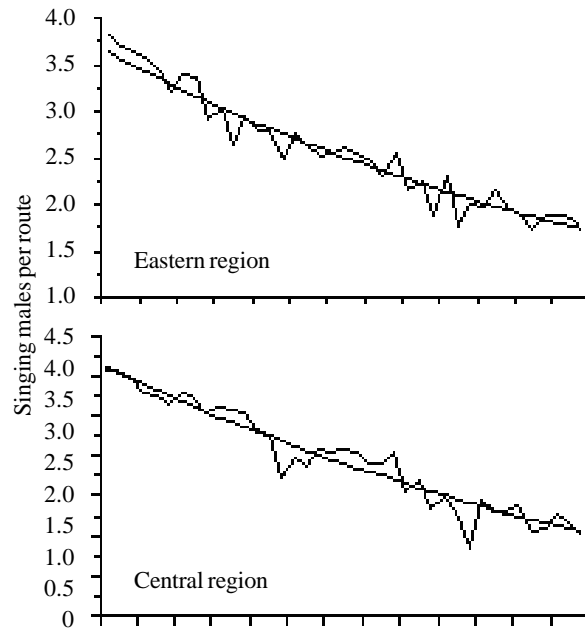


Figure I—02. Long-term trends (smooth line) and annual indices of the number of woodcock heard on the SGS, 1968 to 2006 (Kelley and Rau 2006).

The ratio of immature birds per adult female in the harvest provides an index to recruitment of young into the population and is measured by the national Wing-collection Survey. Age- and sex-related plumage characteristics (Martin 1964, Sepik 1994) are examined on approximately 10,000 wings submitted by hunters each year to derive the recruitment index. There have been long-term declines in woodcock recruitment in both regions (Figure 3). Wing receipts also provide information on the geographic distribution of the harvest (Appendix 1).

It is widely believed that loss of early succession forest habitat is responsible for declines in woodcock recruitment and in overall population status. The Woodcock Task Force of the Association of Fish and Wildlife Agencies was formed to document loss of woodcock habitat that has occurred during the past three

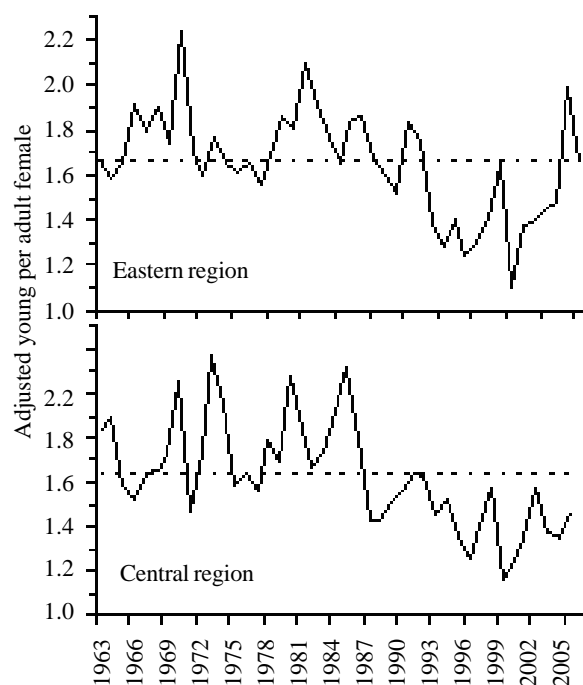


Figure I-03. Weighted and annual indices of recruitment (United States), from 1963 to 2005. The dashed line is the 1963 to 2005 average (Kelley and Rau 2006)

decades and to develop habitat-management recommendations that are needed to halt, and ultimately to reverse, population declines. The Woodcock Task Force recognizes that significant acreage of former woodcock habitat has reverted to land uses that makes it forever unavailable to new management efforts. Therefore, we did not develop objectives that strove for a return to absolute population sizes observed during the early 1970s. Instead, we adopted a framework for returning woodcock densities to former levels.

Goal. The goal of the Woodcock Management Plan is to halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource

Objectives. Objectives of the plan are:

1. to halt woodcock population declines by 2012 as measured by SGSs
2. to achieve positive population growth by 2022 as measured by SGSs

3. to halt decline of early succession habitat by 2012 as measured by the Forest Inventory Analysis system (FIA)
4. to increase early succession habitat by 2022 as measured by the FIA.

Woodcock Ecology and Management

Breeding

Habitat important to breeding woodcock can be divided into several categories (Figure 4).

Singing ground. 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 ground is influenced by the proximity of nesting and brood-rearing habitat. Singing grounds are often less than 109.4 yards (100 m) from diurnal cover (Straw et al. 1994).

Nesting and brood-rearing habitat. Most woodcock nests are in young, second-growth hardwood stands that are near feeding areas as well as near singing grounds. Woody stem density of nesting areas varies between 14,600 to 49,000 stems per hectare. Preferred brood habitat is characterized by a protective, dense, hardwood cover on good soil that supports an abundance of earthworms (Straw et al. 1994).

Diurnal habitat. A wide variety of plant species may comprise suitable diurnal habitat. Good habitat is indicated by early succession growth or by growth forms that provide adequate protection for birds. The abundance of earthworms is a critical determinant of woodcock use of a site. Woodcock may sometimes use more mature forest if there is a dense understory. Use of coniferous stands is minimal in northern breeding areas (Straw et al. 1994).

Nocturnal habitat. Woodcock often leave diurnal areas at dusk and fly to openings, such

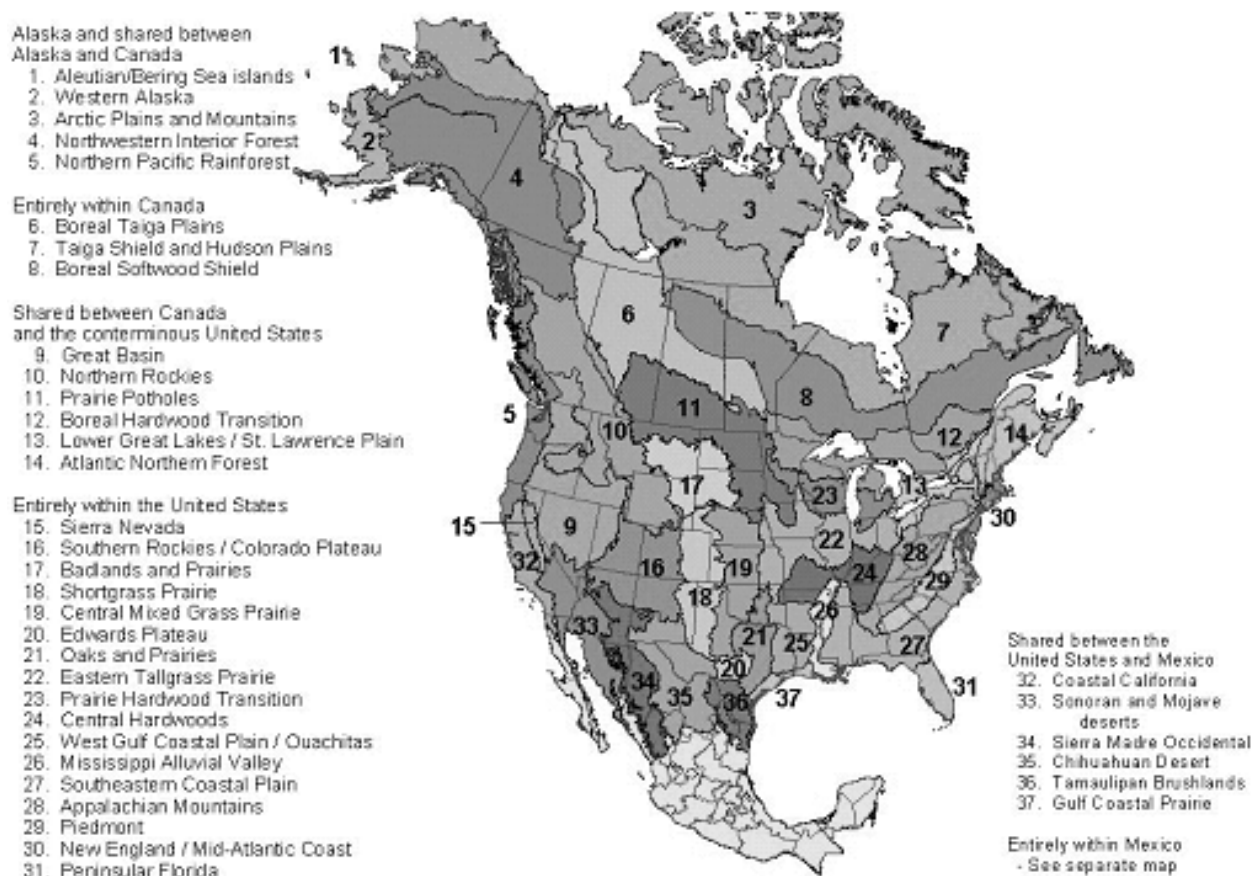


Figure I—04 Bird conservation regions in North America, excluding portions of Mexico. Map produced by the North American Bird Conservation Initiative.

as clearcuts, abandoned agricultural fields and pastures (Straw et al. 1994).

Migration and Wintering

Little is known about the habitat requirements of woodcock during migration. Sheldon (1971) outlined potential woodcock migration pathways based on band-recovery data. Recent telemetry studies in the Central Region provide further insights to the migration pathways used by woodcock (Myatt and Krementz unpublished data, 2002). Krementz and Jackson (1999) have developed a habitat management manual for wintering woodcock.

Diurnal habitat. Diurnal habitat use by woodcock on the wintering grounds varies widely. Forest types used range from

bottomland hardwoods to upland pine and pine-hardwoods (Roberts 1993). Bottomland habitat used typically is found in the middle zones of the floodplain, above the oxbows dominated by bald cypress and swamp tupelo but at lower elevations than upland forests. Dense monocultures of southern pines tend to acidify soils and to degrade habitat for woodcock (Krementz and Jackson 1999). However, southern pine (longleaf, shortleaf, loblolly and slash) forests can provide good woodcock habitat if there is a suitable understory and a litter layer with good soils underneath (Krementz and Jackson 1999). Specific areas used by woodcock in pine forests are often depressions or drainages dominated by hardwoods (Roberts 1993). In a study of the use of prescribed fire in pine stands it was determined that recently burned stands

were preferred by woodcock due to the presence of bare soils, compared to stands burned 2 to 3 years earlier (Johnson and Causey 1982).

Nocturnal habitat. Nocturnal woodcock habitat during winter includes pastures, fallow fields, agricultural fields, and young clearcuts (Roberts 1993). Woodcock in Louisiana commonly use taller, unmowed sections of pastures and wet areas, but extremely dense vegetation may need to be mowed or grazed to create a more open condition (Glasgow 1958). In the southeastern United States, young clearcuts or old fields were preferred as nocturnal habitat compared to pastures or hayfields (Krementz 2000). Presence of shrubbery and bare ground that provides easy access to soil for foraging seem to be important site factors (Krementz 2000).

Singing grounds. A variety of openings are used by male woodcock for singing grounds in the south, but they seem to prefer brushy fields or young pine plantations (Roberts 1993).

Nesting and brood-rearing habitat. Habitat requirements of nesting woodcock in the south are not well known (Whiting and Boggus 1982). A description of 32 nest sites in Alabama indicated that 61 percent occurred in mixed pine-hardwood, 17 percent in hardwoods, 13 percent in pines and 9 percent in open sites (Roboski and Causey 1981). Tree basal area on nest sites ranged from 5 to 37 square miles per hectare, and stem densities ranged from 5,000 to 50,000 stems per hectare (Roboski and Causey 1981).

Factors Responsible for Population Declines

Most biologists believe that loss of early succession forest habitat throughout the range is responsible for the observed declines in woodcock recruitment and the overall population status. Early succession wildlife

habitat has declined throughout much of the eastern United States, mostly from forest maturation, from declines in farm abandonment, from drainage and from conversion of bottomland hardwoods to agriculture and pine plantations through fire suppression and urbanization.

Forestland is maturing because disturbance factors, such as fire, have been suppressed. In addition, there has been an increase in the number of small (fewer than 100 acres [fewer than 40.5 hectares]) forest tracts that have nonindustrial private owners, who are less likely to harvest timber. Further, negative societal attitudes towards active forest management have reduced suppression and, therefore, increased maturation. Public misconceptions about forest management have fostered the belief that wildlife species that inhabit mature forests are imperiled. In many cases, the exact opposite is true. For example, in the northeastern United States, most woodland breeding bird species have increasing population trends. Whereas, more than half of all successional or shrub species are declining (U.S. Geological Survey Breeding Bird Survey 2006).

What Needs To Be Done?

In the absence of natural forest disturbance factors, habitat managers must replicate those factors in order to conserve species that depend on early succession habitat. Without management programs to create patches of young forest, species that are associated with them will continue to decline and eventually will disappear. Interestingly, there is increasing evidence that species typically considered to be associated only with mature forest will seek out food and cover resources provided by early succession habitats, especially during the juvenile stage. Therefore, the challenge is to protect, create or restore an appropriate mix of young and old forest.

Proper habitat management for woodcock involves careful consideration of the juxtaposition of various covers that serve different purposes. For example, clearings (more than 0.5 acre [more than 0.2 hectare]) provide singing ground for males. But, it is critical that such clearings be placed near suitable nesting and brood-rearing cover consisting of young, second-growth hardwoods. Creating feeding covers of dense shrubs and stands of young hardwoods on moist, rich soil is also important. Finally, nocturnal roosting areas consisting of old fields or of recently harvested woodland of at least 3 to 5 acres (1.2 to 2.0 hectares) should be located within 0.5 mile (0.8 km) of suitable feeding cover. Active forest-management programs in hardwood and mixed-hardwood forests can provide all of these necessary components.

A landscape-level approach to woodcock management involves using management units of

500 to 1,000 acres (202.3 to 404.7 hectares), which should support approximately 500 woodcock. Ideally, several units should be located within 1 to 2 miles (1.6 to 3.2 km) of each other to allow interchange of birds. Within management units, habitat treatments should be centered on broad-leaved deciduous or on deciduous shrub-scrub wetlands where moist soils are found. By locating (where allowable) treatments across wet areas or streams, suitable woodcock habitat will be created along a moisture gradient that will provide a consistent supply of earthworms throughout summer. Even-age forest management treatments of more than or equal to 5 acres (2.0 hectares) will stimulate sprouting of shade-intolerant species, such as aspen, to create ideal woodcock habitat. Short rotation cutting cycles of no more than 20 years ensures that forested habitat will not become too mature and will not experience a decline in woodcock use.

Woodcock Population and Habitat Goals

The Woodcock Management Plan is intended to be used primarily for planning purposes. Specifically, the intent is to determine the extent of population loss from the early 1970s, as well as the loss of early succession habitat since that time. Next, we determined the acreage of early succession habitat that must be created in each bird conservation region (BCR) and state to return woodcock densities to those observed in the early 1970s. It should be pointed out that the population and habitat goals developed in this process constitute objective estimates of what it will take without being constrained by factors that may prevent creation of new woodcock habitat. This will allow bird-conservation planners to determine where the greatest need for woodcock conservation overlaps with the needs of other bird species. We recognize that practical limitations may prevent total achievement of habitat goals to fully restore woodcock densities in many portions of woodcock range. Therefore, we also determined the amount of early succession habitat that must be created annually in each BCR to halt decline of such habitat (i.e. stabilize availability). Pursuing this objective in a given region should stabilize woodcock numbers in that region by providing a steady state of early succession habitat availability.

Analytical Approach

Woodcock Population Goals

We used a deficit approach to derive population and habitat goals. Average woodcock populations of singing males only were estimated from 1970 to 1975 and from 2000 to 2004 for each BCR (Figure 5), or portion of a BCR, covered by an SGS. This was accomplished by determining the average number of singing males on each SGS route for each time period. We then converted estimates from singing males per route to singing males per acre since we knew how many acres each survey route sampled.

Based on these data, density contours were developed for the entire SGS area. In the United States, individual counties were assigned a density category based on which density contour the majority of its land area fell within. The total number of singing males in each county was determined by multiplying the density estimate by the total land-base acreage (not simply acres of woodcock habitat) in the county. In Canada, population estimates were determined at the provincial level only. The population estimate for an entire BCR was determined by summing population estimates from individual counties or provinces found within the BCR. The effective density of singing males in each time period was determined by dividing the number of singing males by the number of manageable acres found in the BCR during that time period. We defined manageable acres as all timberland as determined by the FIA.

We derived a woodcock density deficit by subtracting the current effective density from the historical effective density. The population deficit is the number of singing males that need to be added to a given BCR to achieve the effective density observed during 1970 to 1975. The population deficit was calculated by multiplying the density deficit by the current number of manageable acres (Appendix II).

Woodcock Breeding Habitat Goals

Knowledge of population deficits was used to determine breeding habitat goals for each BCR. Habitat goals are the additional acres of woodcock habitat in a given breeding BCR that must be created to produce sufficient birds such that the effective density of singing males will equal those found during 1970 to 1975. We identified woodcock habitat as being small-diameter (seedling or sapling) and nonstocked forest inventory categories (Cushwa et al. 1977, Gutzwiller et al. 1982).

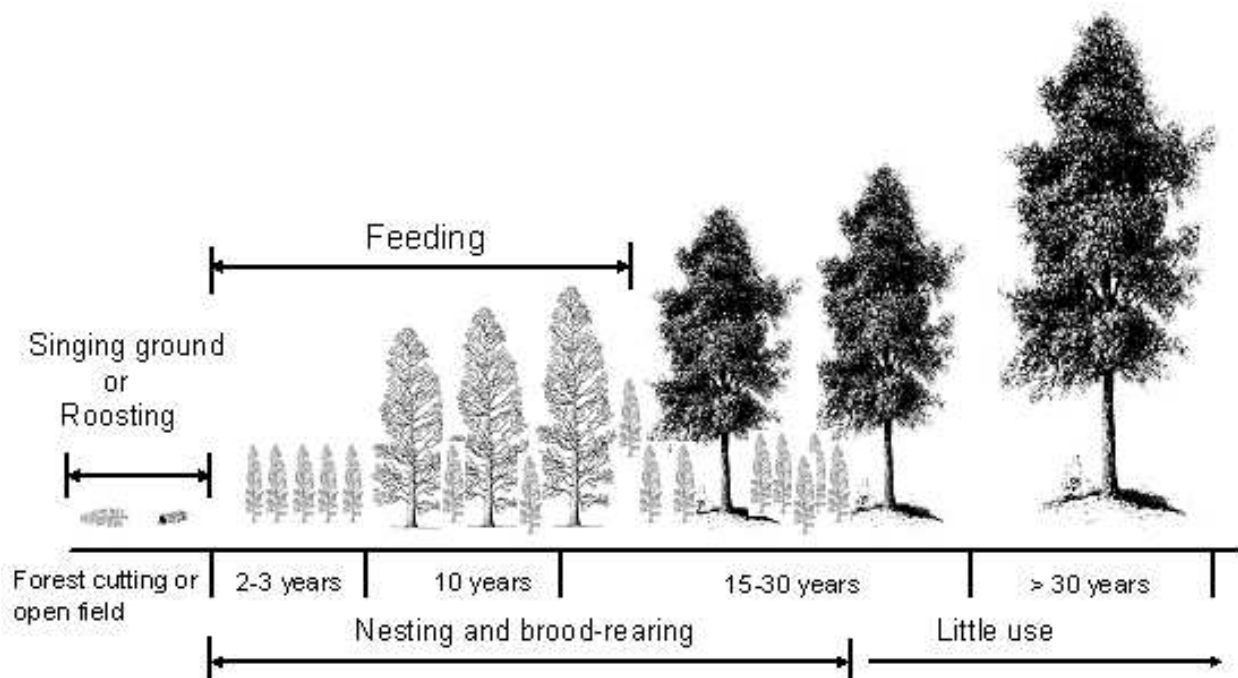


Figure I—05. Key habitat components required by woodcock in relation to forest succession.

First, we developed a habitat multiplier to determine how many acres of new habitat would be needed to add one singing male to the BCR. For each BCR, we calculated a habitat multiplier by dividing the acreage of early successional habitat (small-diameter and nonstocked forest) for the 1970 to 1975 period by the number of singing males found in the BCR during the same period. Acreage goals were calculated for each BCR by multiplying the population deficit by the habitat multiplier specific to that BCR.

There has been a loss of over 839,000 singing male woodcock since the early 1970s (Tables 1 and 2). This corresponds to a population density deficit of just over 778,000 males. Approximately 21.3 million acres (8.6 million hectares) of new woodcock habitat needs to be created in order to eliminate this deficit and to return woodcock densities to those observed during the early 1970s (Tables 1 and 2).

Stabilization of Early Succession Habitat

To estimate the amount of early succession

habitat that must be created annually to stabilize its availability, we first determined the current extent of small-diameter (seedling or sapling) forestland. We assumed a time horizon of 20 years for the lifetime viability of early succession habitat as being suitable for woodcock habitat. The current acreage of small-diameter forestland for each BCR was divided by 20 to determine the amount of new early succession habitat that needs to be created to halt the decline of such habitat.

In order to halt the decline of early succession habitat, approximately 4.7 million acres (1.9 million hectares) must be created annually (Tables 3 and 4). Habitat management should focus primarily on forest types that are potentially valuable woodcock habitat but that currently are too mature for woodcock use due to forest succession. This constitutes creation of new habitat because it concentrates on areas that once contained woodcock but no longer do. New habitat can also be created by converting nonforested habitat to habitat that would support woodcock. Examples of such

conversions would be withdrawing row crop fields from production and areas being actively reforested. Management of habitat that currently contains woodcock obviously will be part of the conservation effort. However, this could be better described as habitat enhancement rather than habitat creation. We have no information to guide us on how to quantitatively predict woodcock response to enhancement. Therefore, we did not include it in goal calculations. Recommended techniques for managing woodcock breeding habitat are provided by Sepik et al. (1981).

Woodcock Wintering Habitat Goals

A significant portion of woodcock migration and wintering range is not covered by SGSs.

Although woodcock nesting occurs in southern areas of the United States, the primary importance of this region is providing wintering habitat. Without density estimates for southern areas, development of population and habitat goals was not possible using the same deficit approach that was used for breeding areas. Instead, action plans for southern BCRs will focus on documentation of habitat loss, on description of current habitat composition and on identification of areas where current and potential woodcock habitat (manageable acres) exists. Recommended habitat management techniques in wintering areas are provided by Krementz and Jackson (1999).