

# Executive Summary

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The future of wildlife in this country is inseparably tied to activities taking place on private lands. Agriculture is by far the dominant user of these lands with about 50% of the United States or 900 million acres managed as cropland, pastureland, or rangeland. Decisions made by America's farmers and ranchers, therefore, directly affect the land's plant life, soil, water, and wildlife. Government agricultural programs and policy have had a large influence on the choices available to farmers and ranchers in the management of their lands.

Changes in the occurrences of native plants and animals are a reflection of our stewardship of the land. Loss of biodiversity and declines in wildlife populations during the past century suggest that the country has fallen short on its stewardship responsibilities. Landcover changes associated with shifts in federal agricultural policy and programs, and farmers' land-use practices have had important consequences for wildlife in landscapes dominated by agriculture. In the Great Plains, for example, dramatic declines in grassland-dependent wildlife since the 1950s have been attributed to federal agricultural policy and programs that favored conversion of native habitats to agricultural purposes.

A myriad of agricultural, environmental, social, political, and economic considerations led to the passage of the 1985 Food Security Act (hereafter, Farm Bill). Inclusion of the conservation title in the 1985 Farm Bill marked a turning point in private land conservation. Amendments to the 1985 Farm Bill in 1990 and 1996 sought to further enhance wildlife benefits of conservation programs. Improvements in legislation that were sought by wildlife conservation interests included the (1) creation of state technical committees, (2) establishment of an application review procedure that ranked applications based on their environmental benefits (e.g., proximity to wildlife habitat, diversity of seed mixture, use of native plants), and (3) recognition of coequal status of wildlife with soil and water conservation. Additionally, new programs, such as the Wetlands Reserve Program (WRP), Wildlife Habitat Incentives Program (WHIP), and Environmental Quality Incentives Program (EQIP) were created that offered great hope for improving wildlife habitat on private land. To further improve these landmark programs so that they might realize their full potential, a better understanding of wildlife responses to Farm Bill conservation programs was urgently needed.

The purpose of this document was to tell us what these programs have done for wildlife conservation. This review began as an attempt to identify and annotate all published literature on Farm Bill conservation programs (Appendix I and II). Hundreds of scientific articles were assembled, and it soon

became apparent that in addition to identifying and annotating the literature, there was need to synthesize information to focus attention on the most important results. To assist with this task, leading scientists from universities and research or management organizations outside the agency were invited to contribute chapters summarizing major research findings in their area of expertise. Participants in this effort are recognized by the conservation community not only for their outstanding research contributions, but also for their demonstrated commitment to communicating their important results to land managers and nontechnical audiences.

Our understanding of Farm Bill contributions to wildlife conservation, though still largely incomplete, is best for the Conservation Reserve Program (CRP), the oldest and largest (size and cost) of the Farm Bill conservation programs. Because birds are considered important indicators of ecosystem function and because the wildlife community has given highest priority to conservation of grassland birds, our understanding is primarily based on assessments of bird responses to CRP in the Midwest and Plains states. Additionally, bird population objectives for some species (e.g., waterfowl) generally are clearly defined and habitat associations are well understood compared to other wildlife groups, so it is possible to measure program contributions to conservation goals.

Information on wildlife responses to other Farm Bill programs is greatly limited. Consequently, to provide a better understanding of WRP's contributions to wildlife conservation, we summarized all of the published literature pertaining to biological changes in restored wetlands. Treatments of WHIP and EQIP, however, were limited to descriptions of the programs and identification of information needs. The following highlights were taken from program sections.

### **Conservation Reserve Program (CRP)**

The ways in which CRP is implemented, and, therefore, its potential effects on wildlife, vary geographically. For example, in contrast to the Midwest and Great Plains regions where CRP fields have been planted almost exclusively in grasses, 62% of the 2.7 million acres of CRP in the Southeast were enrolled in tree planting practices, primarily loblolly pine. The replacement of agricultural lands with tree plantings in a forest-dominated landscape (48% of landbase) favors forest wildlife but may result in a long-term net loss of habitat for nonforest wildlife. During the first one to three years following planting, pine plantations are characterized by low-growing grasses and other nonwoody plants, and they provide habitat for grassland and regionally declining, early successional bird species. As the stand matures, nonwoody plants are replaced by shrubs and developing pines. Bird diversity increases with stand age as shrubland birds colonize the stand. The number of bird

species declines as pines mature and canopy shading eliminates herbaceous ground cover. In these older pine stands, thinning and prescribed burning may enhance habitat quality for bird species preferring grassland and shrublands. Because of the extended growing season and high growth rates in the Southeast, grasslands in the region need to be disturbed every three to five years to prevent encroachment by trees and shrubs and maintain their attractiveness for nonforest wildlife. (Note that less frequent disturbance is recommended in the northern Great Plains.) Overall, the potential wildlife benefits of CRP in the Southeast are substantial, but they may be limited by the selection of specific practices (e.g., pine plantations) and vegetative covers (e.g., fescue).

Midwestern and Plains states have been the primary beneficiaries of CRP. Changes in land use associated with strong landowner interest in CRP have had an important influence on grassland-dependent wildlife in these regions. Responses to CRP vary not only by species but also by region, year, field characteristics (e.g., age, size, configuration, vegetation, disturbances), and features of surrounding habitats. Strong evidence was presented that bird abundance in CRP habitats in the Midwest was substantially higher than in rowcrop fields typically replaced by CRP plantings. Additionally, reported nest abundance in midwestern CRP habitat was 10-times greater than that in rowcrop fields. Nest success for birds breeding in CRP was approximately equal to or higher than that measured in alternative agricultural or grassland habitats. Limited evidence indicates that reproductive success and survival of birds in CRP habitats in the Midwest were sufficiently high to yield positive population growth for a few species (including several of high conservation concern). To date, however, a significant positive relationship between the establishment of CRP habitat and population growth has been documented for only two grassland bird species in the Midwest. Overall, the evidence accumulated to date indicates that CRP habitat in the Midwest and Great Plains likely contributes to the population stability or growth of many, but not all, grassland bird species.

The effects of CRP on waterfowl have been thoroughly documented in the northern Great Plains. The region is the principal breeding area for upland nesting ducks, including mallard, gadwall, blue-winged teal, northern shoveler, and northern pintail. Extensive conversion of grasslands to cropland reduced the amount of perennial upland cover that ducks needed for successful nesting; consequently, waterfowl production in the region was declining before CRP. A review of published and unpublished studies clearly indicated that CRP cover was highly attractive to nesting hens and that nest success in CRP cover was higher than other common cover types. Overall, nest success in CRP fields exceeded that level considered necessary for population maintenance of the above five duck species. Waterfowl nest success in other upland

nesting habitats also improved after implementation of CRP, suggesting that wildlife benefits extended beyond program areas to the entire prairie-wetland landscape. Between 1992 and 1997, it was estimated that CRP in the Prairie Pothole Region contributed to a 30% improvement in duck production or 10.5 million additional ducks. Assuming no further conversion of grasslands to cropland, maintenance of at least five million acres of CRP will be required to sustain a positive population growth rate for waterfowl in the Prairie Pothole Region. Minor adjustments in targeting would provide additional benefits to wetland-associated wildlife.

### **Continuous Enrollment Conservation Reserve Program**

Wildlife responses to conservation buffers, such as those being implemented through the Continuous Enrollment Conservation Reserve Program, were assessed based on a review of studies of bird communities in various strip-cover habitats such as grassed waterways, roadsides, fencerows, contour buffers, and terraces. Bird abundances and nest densities are higher in strip-cover than in block-cover habitats; however, nest success in strip-cover habitats is often very low. Use of habitats by birds depends upon their vegetation structure (height and density) and species composition (herbaceous vs. woody, grass vs. forb, native vs. introduced). Some bird species are limited by the width of strip-cover habitats; thus, there is a positive relationship between bird species richness and strip-cover width. Contributing to this may be the aversion that some bird species have for habitat edges. Vegetation management practices (e.g., mowing and grazing) influence bird communities both directly and indirectly. The amount of grassland surrounding herbaceous strips influences the occurrence and nesting success of birds in the strip cover. Rates of nest predation and brood parasitism by brown-headed cowbirds increase near wooded edges. Because some strip-cover habitats may function as ecological traps, there is an urgent need to identify and evaluate bird source and sink subpopulations in agricultural landscapes. Land-use decisions may vary depending upon wildlife management objectives, thus planning and evaluation of buffers will require a clear statement of conservation goals.

### **Wetlands Reserve Program (WRP)**

The Wetlands Reserve Program (WRP) provides incentives for landowners to restore function and value to degraded wetlands in agricultural landscapes on a long-term or permanent basis. Since authorization of the program in the 1990 Farm Bill, landowner interest has resulted in substantial enrollment. As of June 2000, over 912,000 acres were enrolled in WRP: 696,461 acres of permanent easements (76%); 161,201 acres of 30-year easements (18%); and 54,818 acres of 10-year cost-share agreements (6%). An additional 500,000 acres of unfunded projects have been offered for enrollment into the program. Approximately 55% of the lands currently enrolled consist of former bottom-land hardwood wetlands and riparian floodplain habitats. Approximately 15%

of the area consists of emergent wetland and open water complexes, and 30% is nonwetland buffer areas. Although current WRP enrollments have resulted in establishment of diverse wetland habitats, few quantitative data have been published depicting actual wildlife benefits of wetlands restored under the program. Therefore, studies on a variety of nonWRP wetland restoration projects were used to make inferences on the wildlife benefits derived from wetlands restored under WRP. The published literature on wildlife response to wetland restoration supports the premise that WRP is making a substantial contribution to the habitat needs of wetland wildlife throughout the country, particularly in areas where significant enrollments are occurring (e.g., Lower Mississippi Alluvial Valley and California's Central Valley).

### **Wildlife Habitat Incentives Program (WHIP)**

The Wildlife Habitat Incentives Program (WHIP) is one of a suite of conservation provisions added to the amended 1985 Food Security Act in 1996. WHIP was developed to assist landowners with habitat restoration and management activities specifically targeting fish and wildlife, including threatened and endangered species. Within the framework of state, regional, and national habitat priorities, WHIP funds were allocated to states based on plans developed by state conservationists in consultation with their state technical committees. Special consideration was given to locally led initiatives with substantial outside funding and partnership participation. Of the \$50 million available for WHIP in 1998 or 1999, \$30 million was distributed to states for financial and technical assistance in 1998 and \$20 million in 1999. This distribution resulted in 4,600 projects affecting 672,000 acres in 1998 and 3,855 projects on 721,249 acres in 1999. WHIP projects averaged 146 (1998) or 187 (1999) acres in size and \$4,600 in cost-share. WHIP targeted a wide range of fish and wildlife species, from economically and culturally important species such as northern bobwhite and Atlantic salmon (*Salmo salar*) to threatened and endangered species such as Karner blue butterfly (*Lycaeides melissa samuelis*) and Indiana bat (*Myotis sodalis*). WHIP also provided cost-share for restoration of critical aquatic habitat such as cold water streams and rare terrestrial habitats in oak savanna, longleaf pine, prairie, and riparian ecosystems. WHIP was extremely popular with landowners and conservation partners because it targeted wildlife and addressed important management needs identified at the local level that were not eligible for cost-share under other USDA conservation programs.

### **Environmental Quality Incentives Program (EQIP)**

Most EQIP practices have the potential to provide some benefits to fish and wildlife resources if they are planned with these resources in mind. The stated program purposes are to provide technical and financial assistance to farmers and ranchers that face the most serious threats to soil, water, and related natural resources, including grazing land, wetlands, and wildlife habitat. Practices with the primary purpose of addressing threats to soil and water and



grazing lands can be planned to also address habitat needs of important fish and wildlife resources identified by local work groups. In this manner, EQIP can be used as a powerful fish and wildlife habitat enhancement tool while addressing a broad range of natural resource concerns in agricultural landscapes.

### **Highly Erodible Land and Swampbuster**

U.S. Department of Agriculture (USDA) programs since 1985 have included conservation provisions that require an environmental standard to be achieved on certain categories of land in order to remain eligible for other USDA farm program benefits. The highly erodible lands and wetlands conservation provisions collectively work to reduce the rate of soil erosion from highly erodible croplands and to reduce the rate of conversion of other highly erodible lands and wetlands to crop production. These provisions do not create wildlife habitat directly, but collectively support the conservation gains made by CRP and WRP. While the greatest effect of these provisions is the reduction of soil erosion and the associated delivery of sediments and other pollutants to aquatic systems, substantial habitat gains made by other programs would not occur without the linkage of these compliance provisions with USDA financial assistance. For example, it was estimated that without wetland protection, the average breeding duck population in the Prairie Pothole Region eventually could decline by over 30% or 2.8 million breeding ducks/year. Consequences of noncompliance with highly erodible lands and wetlands conservation provisions for other wildlife groups and regions are unknown.

### **Conclusion**

Farm Bill conservation programs were created to serve many purposes. Foremost among these purposes was to enable America's farmers and ranchers to be better stewards of their lands. In general, wildlife have responded positively to these improvements, particularly when their needs were considered in conservation planning and implementation. Whereas our understanding of wildlife responses to Farm Bill conservation programs is still incomplete, there is no question that these programs are making significant contributions toward conservation of the nation's fish and wildlife resources.

# Foreword

Settlement of the continent by Europeans beginning in the eighteenth century produced many changes in North American land forms and vegetation (hereafter, landcover). Unquestionably, agriculture was the major contributor to landcover changes. Suitability of land for agriculture greatly influenced settlement patterns in North America (Maizel et al. 1998). As expansion rapidly proceeded westward during the 1800s and early 1900s, farms were created at the population frontier; areas too wet or too dry were leapfrogged to be farmed later when drainage or irrigation was possible. Other areas with poor climate, steep slopes, or soils unsuitable to support cropland, pastureland, or hayland uses were either farmed unsuccessfully or never farmed at all.

Nowhere is the influence of agriculture on landcover more evident than in the fertile midsection of the nation, the Great Plains. Once the continent's largest ecosystem, the vast grasslands, shrublands, and savannas that characterized the region, historically supported a tremendous abundance and diversity of plants and animals (Dinsmore 1994). However, conversion of grasslands to agricultural purposes has been extensive, exceeding 99 percent in some states (e.g., Iowa and Minnesota; Noss et al. 1995). Associated with landcover changes in the Great Plains has been a concomitant change in the communities of birds and other animals that rely on grassland habitats. For example, dramatic declines in grassland bird species since the 1950s are attributed to changes in the agricultural landscape of the region (Gerard 1995). Extensive loss and degradation of grasslands in the Great Plains resulted in its designation as one of the nation's most endangered ecosystems (Noss et al. 1995).

The large influence that agriculture has on wildlife and their habitats presents us with both a challenge and an opportunity. As stated in the current NRCS strategic plan (USDA 1997):

*“Agriculture has had a substantial impact on the distribution and abundance of fish and wildlife populations. But as agriculture has been a significant factor in many wildlife declines, it also can be a major factor in restoring wildlife populations. Soil and water conservation has been and will continue to be the foundation of NRCS assistance to landowners and communities. Achieving the targets for soil and water resources, grazing land, and wetlands will produce parallel improvements in fish and wildlife habitats as well.”*

Clearly, with nearly 70% of the conterminous United States held in private ownership and 50% managed as cropland, pastureland, or rangeland, successful partnerships between landowners and conservation interests are critically important to achievement of wildlife goals.



Greater prairie chicken (W. Hohman)

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A myriad of agricultural, environmental, social, political, and economic considerations led to the passage of the 1985 Food Security Act (hereafter, Farm Bill) that included for the first time a chapter devoted to conservation (Berg 1994). Amendments to the 1985 Farm Bill in 1990 and 1996 retained and expanded conservation provisions such that there are now about 20 agricultural conservation programs with a combined funding level of \$2.5 billion/year. Most of these programs have significant potential for affecting fish and wildlife and their habitats (McKenzie 1997).

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The Conservation Title of the 1985 Farm Bill as amended in 1996 elevated the importance of wildlife in the delivery of conservation programs to the nation's privately owned lands. Recognizing the opportunities and challenges related to conserving and enhancing fish and wildlife habitat, the Under Secretary of Agriculture for Natural Resources and Environment and the Chief of the NRCS convened a wildlife scoping team to consider the agency's problems and needs associated with delivering planning assistance to land-owners and communities. The wildlife scoping team was broad-based, involving NRCS staff and representatives from our partners with wildlife and agricultural interests.

The resulting reports, *Framework for the Future of Wildlife* and *Barriers to Providing Wildlife Assistance*, identified problems, established goals, and offered recommendations for achieving goals (USDA 1996a, b). One of the team's recommendations was the establishment of a technology institute as part of the NRCS National Science and Technology Consortium to interact with academic institutions, partner agencies, nongovernment organizations, and other institutes within the Consortium to develop new ideas and concepts related to aquatic and terrestrial habitat management. In response to this need, NRCS established the Wildlife Habitat Management Institute in 1997 to work with conservation partners to develop and disseminate scientifically based technical materials that will assist NRCS field staffs and others to promote conservation stewardship of fish and wildlife and deliver sound habitat management principles and practices to America's land users.

To better understand how Farm Bill conservation programs were affecting wildlife, I asked my staff in January 2000 to identify and review all published literature on wildlife responses to Farm Bill programs. Hundreds of scientific articles were assembled and it soon became apparent that in addition to identifying and annotating the literature, there was need to synthesize information to focus attention on the most important results. To assist us with this task, I invited leading scientists from universities and research or management organizations outside the agency to contribute chapters summarizing major research findings in their area of expertise. Participants in this effort are recognized by the conservation community not only for their outstanding

research contributions, but also for their demonstrated commitment to communicating their important results to land managers and nontechnical audiences. The resulting report is a current and comprehensive document that reflects the best judgment of the scientific community as to the effects of Farm Bill programs on wildlife.

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