

Interim Technical Report
Fish and Wildlife Technology Findings
from projects of the
NRCS Agricultural Wildlife Conservation Center
January 2009



**Agricultural Wildlife Conservation Center
Madison, Mississippi**

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About the Agricultural Wildlife Conservation Center

The U.S. Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) Agricultural Wildlife Conservation Center (AWCC) is a fish and wildlife conservation technology development center.

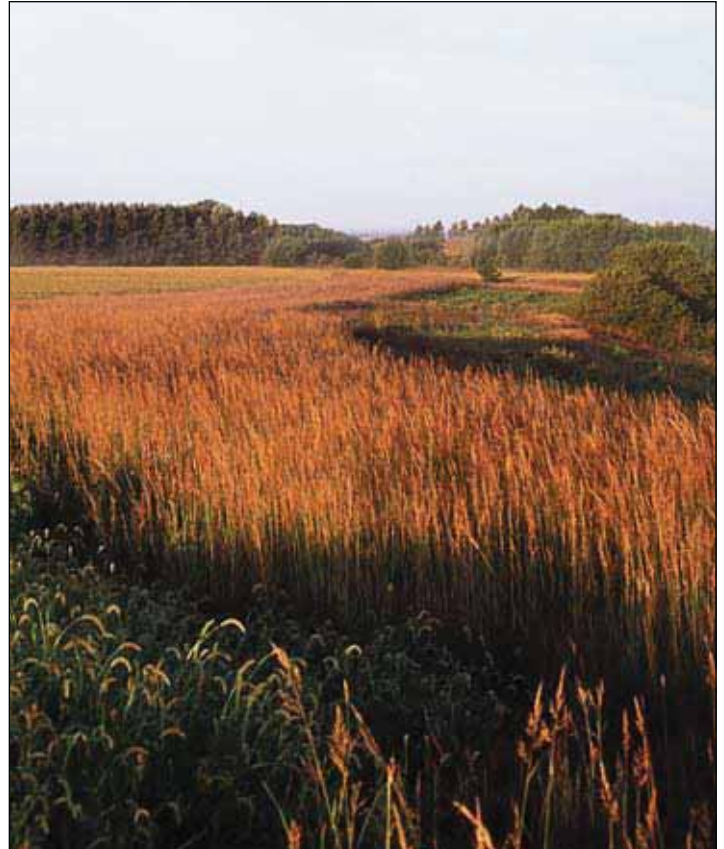
Located in Madison, Mississippi, the AWCC offers annual grants to universities, research agencies, and conservation organizations to develop the best science available for fish and wildlife habitat on agricultural lands.

This report was developed with assistance from current and former members of the AWCC and former Wildlife Habitat

Management Institute (WHMI), as well as national NRCS biologists and the NRCS Wildlife Team. Photographs in this report were provided by the NRCS, as well as its partners and cooperators.

It was compiled by Iowa State University for the AWCC as part of a CESU cooperative agreement with Extension Wildlife Programs.

To contact the AWCC, call (601) 607-3131.



About the Agricultural Wildlife Conservation Center Projects

The NRCS Agricultural Wildlife Conservation Center— *More than a Decade of Fish and Wildlife Conservation Technology Development*

The AWCC and its technology development for fish and wildlife conservation began in 1996, when the NRCS established the WHMI.

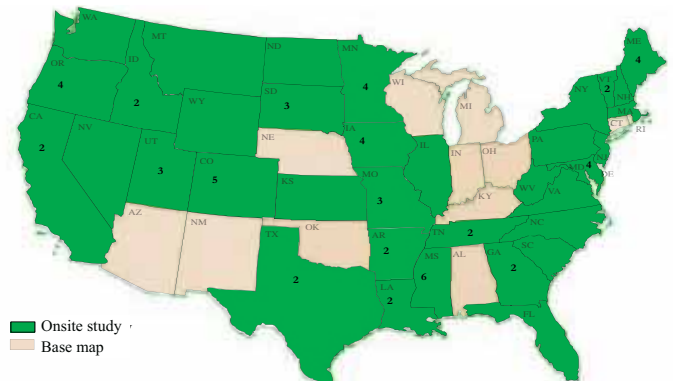
Technology development projects were undertaken with one objective in mind: using highly respected fish and wildlife scientists to develop the best information possible on fish and wildlife habitat needs on private lands and transfer that information to NRCS field offices and others in a form that they can easily use as they work with private landowners in comprehensive conservation planning.

An NRCS reorganization in 2003 resulted in a delay of some projects and cancellation of others, as well as WHMI staff dispersal to serve other NRCS needs.

The AWCC officially opened in June of 2006. This report reflects all project work since the WHMI was established. It includes:

- Summarized results of 82 completed projects, including new technology and information materials
- Guidelines and recommendations of AWCC staff for conservation program options based on the fish and wildlife technology developed
- Technical information on multiple projects aimed at restoring northern bobwhite and sage-grouse
- A listing of 19 projects currently underway/continuing
- A listing of resources, publications, tools, and other AWCC materials resulting from work over the past 10 to 12 years
- An addendum with one-page summaries of results from more than 60 completed projects

Sites of AWCC Fish and Wildlife Technology Development Projects



States in green currently have onsite work within that State or have completed projects. States with multiple studies have numbers indicating total projects in that State.

AWCC Mission

Develop new fish and wildlife habitat technology and transfer it through:

- Local NRCS offices
- Conservation districts
- Fish and wildlife agencies
- Farm and wildlife groups

AWCC Grants Program

Annual competitive grants for conservation partners, including research institutions and others, to improve fish and wildlife conservation technology:

- Develop it
- Test it
- Transfer it
- Help it work on farms, ranches, and urban areas



Guidelines Based on Interim Findings

Technology development projects of the AWCC are meant to develop specific technical guidelines for NRCS field personnel to use with landowners in planning, establishing, and maintaining conservation practices.

Completed projects and those underway are often reinforcing or fine-tuning existing information in the NRCS technical guides by helping conservationists recommend best management practices for specific locations.

While detailed findings of individual projects of the AWCC relate to the site and specific species studied in those projects, some general conclusions can be drawn from the aggregated work.

Some of those science-based conclusions are listed below in the form of guiding principles.

Guiding principle for wetlands in the Northwest

- The value of winter-flooded farmland fields to wetland wildlife species has been known, but if those flooded wetlands can maintain connections to nearby rivers, they are valuable winter habitat for salmon and other native fish.

Guiding principle for grazing riparian areas in the West

- The same high intensity, short duration, rotational grazing systems of riparian areas that work for cattle can also provide more streamside cover, with higher input of terrestrial insect and other invertebrate prey for trout than continuous grazing.

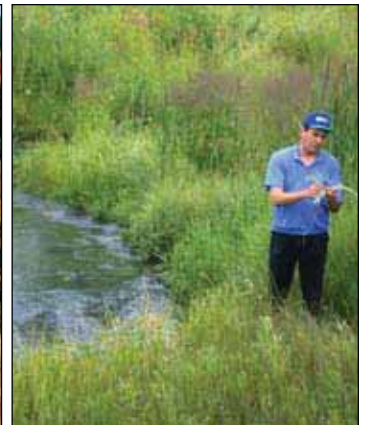
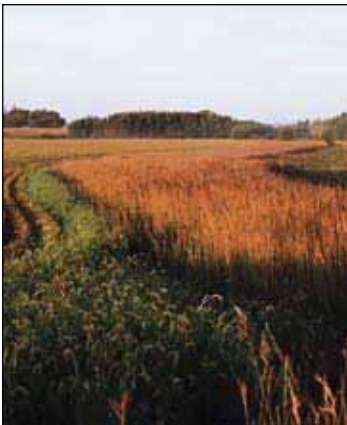
Guiding principle for USDA grasslands establishment

- Despite the need for improved management on grass stands established by CRP and other USDA programs, these grasses are providing valuable habitat to birds and other wildlife species.

Many of the studies looked at habitat for declining grassland bird species because there is widespread concern by conservationists across the country.

Guiding principles for grasslands to support grassland-dependent birds:

- Establishing some grass in intensively farmed agricultural landscapes is better than having no grass at all.
- Wider strips are better than narrow strips for nesting success and to avoid predation.
- Block habitat is generally better than strip habitat.
- Grassland strips are most valuable as habitat if they are used as corridors to connect larger blocks of habitat.
- The structure of grasses—height variation, density, and mixture of plant types—may be more important than whether grasses used are warm- or cool-season grasses.
- While management techniques are extremely important, the success of grassland birds may be tied just as closely to the surrounding landscape as the management in any one field.
- For early successional birds, management is critical to maintain early successional habitat. Grasses that are allowed to become thick and rank lose their value as habitat.
- Fire and disking are far superior to mowing as disturbance techniques to maintain early successional habitat for quail and songbirds.



Implications/Recommendations for NRCS Program Managers

If development of wildlife habitat is a goal for program managers, the following recommendations should be considered. They are made by the AWCC staff after reviewing the scientific evidence and observations of numerous AWCC projects.

- **Offer higher incentives for landowners willing to make wider buffers.**
While it is important to birds, butterflies, and other grassland-dependent species to have grasslands of any size and shape, research shows larger tracts are most helpful in slowing the decline of grassland species.
- **Offer higher incentives for buffers that connect large habitat blocks.**
Field borders, contour buffers, or riparian buffers that connect larger tracts of grasslands to one another have been shown to be more valuable to wildlife than those with no connection.
- **Offer more incentives for landowners willing to actively manage grasslands for wildlife.**
Research shows wildlife values decline in grasslands as they mature, especially for birds that must travel along the ground through heavy grasses. Also, many birds of concern rely on the insects that are supported by new growth of plants from the seedbank in the soil. Benefits to wildlife from rotational disturbance, including fire and disking, are proven for early successional species, but landowners are not sufficiently rewarded for this management in most existing conservation programs.
- **Offer higher incentives for new habitat that enhances existing surrounding habitat.**
In light of research showing surrounding landscapes may be more important to wildlife than management practices on any particular field, perhaps more emphasis should be placed on selection of land areas that enhance and multiply wildlife benefits on the landscape.
- **Place more emphasis on using existing seedbanks rather than seeding new grasses.**
While this will vary by location, soil, water, and wildlife goals, research is showing that quite often it is not necessary to make new plantings to establish early successional habitat. Techniques that allow the land to go fallow and encourage seedbank plants to emerge can save on establishment costs.
- **Offer more incentives and training to encourage enhanced wetlands to offer fish habitat.**
In the Pacific Northwest, where salmon and other native fish are threatened, winter floodwaters provide protection. This protection disappears when floodwaters recede, however, and fish are left stranded in wetlands that dry up in spring. Enhanced wetlands can keep waters higher longer in spring and techniques are available to make sure these fish can get back to the rivers that were flooded.



Completed Technology Projects



Much wider buffers needed for grassland-dependent birds

A study by the U.S. Geological Survey Wildlife Research Center and the Agricultural Research Service found that buffers do indeed need to be much wider for grassland-dependent birds. Researchers found that birds will use narrower buffers (less than 100 feet), but they do not nest in them. Nesting pairs were found in buffers 130 feet to 200 feet wide.

Conclusion: 150 feet is the minimum buffer width for grasshopper sparrow and eastern meadowlark—two birds of concern.

67-7482-0-585



More songbird diversity in wide filter strips

Iowa State University (ISU) researchers looked at 39 filter strips that ranged from 20 to 450 feet wide and found that songbird use of grassed filter strips increases as buffers become wider. The ISU research found that wide filter strips had more birds and greater diversity of species. Another conclusion was that filter strips planted with native and nonnative mixes produced similar structural characteristics.

Conclusion: Wide filter strips produce more birds and more species diversity.

68-7482-2-51



More butterfly species are found in wide buffer strips

Iowa State University butterfly specialists looked at 49 filter strips with widths varying from 60 feet to 550 feet. Researchers found that habitat-sensitive butterflies, like the great spangled fritillary, liked wider buffer strips and preferred native grasses with forbs.

Conclusion: Butterfly use of buffers is consistent with bird use—even narrow buffers are used by common butterflies—but wider buffers with native grasses and forbs bring more diversity.

68-7482-1-777



No bird preference for cool- or warm-season grasses in the Midwest

An Iowa State University study that compared bird use of 33 grass filter strips found no significant differences in grassland bird response to warm- versus cool-season grasses. Warm-season plantings had more vertical density, more forbs, and more plant species richness, but that did not translate to more grassland birds or nests in warm-season strips.

Conclusion: Bird use of buffers in the Midwest is more dependent on structure and plant diversity than type.

#68-7482-2-27



Naturally vegetated buffers work for wildlife, water

A study by North Carolina State University found that naturally vegetated buffers are an option for cleaning the water and establishing habitat for wildlife. The study found that increasing buffer width removed most nitrate from swine waste effluent in shallow ground water.

Conclusion: Widening buffers by allowing natural revegetation reduces nitrate moving into streams. Natural regeneration of plants from the soil seed bank is adequate to make riparian habitat suitable for wildlife.

68-7482-2-35

Completed Technology Projects



Birds use field borders in the South in winter and breeding season

A study by Mississippi State University in the intensively farmed Mississippi Alluvial Valley found four times as many birds in the winter in fields with wide borders as in those with no borders. In the breeding season, more species were found in fields with established field borders than in fields without established field borders. Nearly all nests were found in wide borders.

Conclusion: Field borders—even narrow ones—are important habitat for grassland birds in intensively farmed landscapes.

68-7482-2-42



Grassed waterways are habitat for birds and snakes

An Iowa State University study in southeastern Iowa of 33 grassed waterways varying in widths from 20 to 80 feet found waterways to be habitat for both birds and snakes. The study found that a third of the 27 bird species found nested. Researchers also found that snakes were present in 80 percent of the waterways and more prevalent in wider waterways.

Conclusion: Grassed waterways, even narrow ones, are habitat for both birds and snakes.

68-7482-2-27



Significantly more birds found in buffered fields than nonbuffered fields

The University of Maryland found 7 times as many birds in the summer in CRP and CREP buffers as in fields without buffers and 13 times more bird density in unmowed buffers. However, most lacked the diversity offered in large grass fields. There was no preference for warm- versus cool-season grasses.

Conclusion: Many generalist birds use buffers in Maryland, but most buffers are too narrow to support a diverse community of grassland-dependent birds.

68-3A75-4-104



Grassland birds will quickly colonize CRP fields as grass begins to grow

A 7-year study at Chino Farms in Maryland by the University of Maryland found that grassland birds began colonizing U.S. Department of Agriculture Conservation Reserve Program (CRP) grass fields as soon as the grasses began growing and that migrating birds returned to breed at unprecedented high rates. Highest densities were found the year after prescribed burns.

Conclusion: Grassland birds will quickly colonize CRP to breed and nest and return to well-managed native coastal grasslands each year.

67-7482-2-22



Surrounding landscape more important to birds than field management

While emphasis has been placed on management techniques and planting mixtures, a study by the U.S. Fish and Wildlife Service on 13 refuges in the Northeast found that nearly all variation in bird density could be explained by where the field was in context with the rest of the landscape.

Conclusion: Habitat features in surrounding landscapes are a more important factor to breeding grassland birds than management treatment in any one field.

67-7482-1-663

Completed Technology Projects



Delay late hay cuttings to allow birds to re-nest and fledge young

A University of Vermont study comparing nesting success of grassland birds for various management techniques on working haylands found that early cut haying caused almost all Savannah sparrow and bobolink nests to fail. But the birds re-nest, and late-hayed fields were found to be high-quality reserves for late-nesting birds.

Conclusion: Waiting 65 days after a May cutting before the next cut allows young to fledge from the nest ahead of the next haying.

68-3A75-2-89



Light disking enhances early successional habitat with negligible erosion

Disking has been widely accepted as an important tool in creating early successional habitat for northern bobwhite, but conservationists had concerns about soil erosion. A study in Missouri by Mississippi State University concluded erosion was negligible with proper techniques, including timing and rotation.

Conclusion: Rotational strip disking enhances habitat for northern bobwhite and can be done with minimal erosive effect.

68-7482-8-375



Control of pasture plants critical in restoring longleaf pines in CRP

A study by the University of Georgia of vegetation and bird use of 41 restored CRP fields found that controlling competing pasture plants was critical to successful reestablishment of longleaf pine on agricultural fields. In addition, researchers recommended larger fields for early successional songbird use.

Conclusion: Control of agricultural pasture plants like bahiagrass and bermudagrass to allow native vegetation to compete is critical in longleaf pine restoration.

68-7482-1-775



Reforest bottomland hardwoods adjacent to existing large forest tracts

In a U.S. Geological Survey and University of Georgia study, isolated reforested tracts attracted grassland birds, but also their predators. Shrub-scrub birds had better nest success than grassland birds in the reforested habitat.

Conclusion: A better plan for reforestation is to select sites adjacent to large forest tracts, and plant a high percentage of fast-growing trees to enhance the habitat for shrub-scrub birds.

68-7482-1-775



Revisiting Zumwalt Prairie to assess wildlife values of grazing practices

More than 25 years ago, Marcy Houle attributed one of the densest concentrations of ferruginous, red-tailed, and Swainson's hawks coexisting in a bunchgrass remnant of the Zumwalt Prairie in Oregon to good range management practices. Oregon State University has documented a stable territory occupancy from 1979 to 2006 for two of these birds of national concern, despite landscape changes and a shift in nesting substrates.

Conclusion: Privately owned grazing lands can provide suitable raptor habitat.

68-7482-3-155

Completed Technology Projects



CRP has significant positive effects on birds

The University of Northern Colorado conducted a study that linked the land use and cover data from the National Resources Inventory to the Breeding Bird Survey conducted by U.S. Geological Survey. When researchers overlaid the data, they found that CRP land had a significant positive effect on grassland bird diversity in 6 of 16 bird regions of the country.

Conclusion: The match up of bird diversity and CRP land cover indicates CRP is being used in areas that benefit birds.

68-3A75-4-106 Mod. 2



CRP/rangeland combination preferred by lesser prairie chickens

The lesser prairie chicken has seen a population decline of about 97 percent over much of its range, but not in western Kansas, where CRP grasslands may be helping it expand its range. Colorado State University scientists found that the females prefer taller, denser CRP vegetation as nesting cover, but broods were found more often in rangeland.

Conclusion: A combination of rangeland and CRP may be needed for lesser prairie chicken nesting and brood rearing.

68-7482-3-116



Restored agricultural wetlands are important in winter for shorebirds

A study by the U.S. Geological Survey of agricultural wetlands in the Willamette River Valley found that shorebird habitat is abundant and evenly distributed in years with average rainfall, but not in dry years. Restored wetlands provide habitat in dry years; shorebirds rely on multiple wetlands in the winter and are attracted to areas where agricultural wetlands are clustered.

Conclusion: Enhanced wetlands, especially those in clusters, benefit shorebirds.

67-7482-3-160



Enhanced wetlands in the Northwest also serve as fish habitat

An Oregon State University Study of the Chehalis River flood plain in Washington State found enhanced wetlands had more Coho salmon. Juvenile Coho salmon prefer enhanced wetlands to feed, but must be able to get back to the river when wetland waters recede.

Conclusion: Salmon and other native fish benefit from water control structures that keep water levels up longer and use outlets that allow fish to leave wetlands for rivers.

68-7482-4-192



Native fishes grow and reproduce in agricultural drainages in the Northwest

Oregon State University researchers found that farm drainages of grass seed production lands in the Upper Willamette River Basin are providing winter refuge for native fish, including Chinook salmon and Oregon chub. They found it is critical to maintain connections from these farm streams to river channels.

Conclusion: Drainage channels and seasonal streams in grass seed fields offer food and habitat some native fish need to grow and reproduce.

68-7482-2-26

Completed Technology Projects



High-intensity, short-duration grazing beats continuous grazing for trout

Colorado State University researchers found that trout densities on high-density, short-duration grazed riparian sites in Wyoming were similar to continuous grazing, but the fish were longer and heavier, producing twice the trout biomass.

Conclusion: Planned, rotational, intensive grazing systems can produce more cover, more food for insects and more insects for trout, resulting in bigger, healthier trout than in continuous grazing systems.

68-7482-3-131



Ranchettes spell trouble for native species

In a first-of-its-kind study of subdivided ranches in the Front Range, Colorado State University researchers comparing plants and wildlife on ranches, nature reserves, and ranchettes found human-adapted wildlife species' populations were up to 15 times higher on ranchettes than ranches.

Conclusion: Ranchettes result in fewer birds of concern, more generalist species, more introduced plant species, and fewer native predators.

68-7482-8-325



Clustered and dispersed housing development similar in wildlife value

It has been assumed that grouping houses close together and leaving the remaining area as open space benefits wildlife. Colorado State University compared songbird and nest density and plant species in large lot developments, clustered developments, and undeveloped land in Boulder County.

Conclusion: Closer proximity to humans and lack of native plants made clustered developments more similar to dispersed developments than undeveloped land.

68-7482-3-158



How to design and build dugouts for the Topeka shiner and prairie fish

A South Dakota University study found that dugouts in the flood plain of smaller streams of the Missouri River Basin can function as off-channel habitat for the endangered Topeka shiner and other fishes. To enhance habitat, constructed dugouts should include connection to the ground water, be placed in a frequently flooded zone, and be disconnected from, but located close, to the stream channel.

Conclusion: Properly located dugouts can provide habitat for Topeka shiner.

67-7482-3-101



Multipage leaflets from AWCC offer online food and cover needs

The AWCC worked with the Wildlife Habitat Council to compile and summarize the food, water, and cover needs of 34 fish and wildlife species or groups, as well as habitat value for 12 specific habitats such as wetlands. Concise summaries of the most important information about each species is posted online.

Conclusion: Critical habitat needs of 34 fish and wildlife species from turtles to trout to birds and butterflies is posted on the AWCC Web site.

68-7482-7-260 and # 68-7482-4-165

Completed Technology Projects



Fish and frog response to microtopography development in Wetland Reserve Program (WRP) wetlands in the White River Watershed, Arkansas

Louisiana State University's Cooperative Fish and Wildlife Research Unit sampled frog and fish use of wetlands restored through the WRP and found that while micro- and macrotopography sites may support fewer waterfowl per area, as they mature, they will provide habitats for many species of amphibians and other fish and wildlife species.

Conclusion: Micro- and macrotopography can be rapidly utilized by flood plain fish and amphibians.

68-7482-2-17



Monitoring wildlife use of Farmable Wetlands Program (FWP) wetlands in Iowa and South Dakota

Iowa State University researchers found FWP restorations received high use by wetland and grassland birds, including several species of conservation interest. Numbers of invertebrates were relatively low, and species typically found in temporary wetlands were conspicuously absent.

Conclusion: For greatest benefits, maximize the size of FWP restorations, restore original hydrology, and use seedings that offer diverse structure.

68-7482-2-50



Landscape approach to grassland bird conservation in the Prairie Pot-hole region, developing habitat models for bird species

The University of Montana study identified local and landscape attributes that influence density of grassland songbirds in western Minnesota and northwest Iowa and developed a conservation planning tool to cross-validate the predictive capability of grassland bird models to quantify how well they perform.

Conclusion: Workshop agendas developed from the model illustrate how grassland songbirds avoid woody edges.

68-7482-3-156



Grass buffers: comparing crop yields, pests, insects, and habitat value in fields with Farm Bill programs, Mississippi

Break-even analyses showed that a number of factors influenced whether or not CRP CP33—Upland Wildlife Habitat Buffers were more profitable than cropping field edges. The most important factors included the type of plant community adjacent to the crop, expected yield reduction, county soil rental rates, expected crop yield, and expected commodity prices.

Conclusion: Economics of CP33 are highly variable.

68-7482-1-770



Response of early succession birds to warm-season grasses in the Southern Piedmont, University of Georgia

Twice as many overwintering birds, and more species, were found in fields replanted to native grasses as in exotic pastures in a University of Georgia study.

Conclusion: In the forest-dominated landscape of the Southeast, where early successional habitat is in short supply, patches of native warm-season grasses should be encouraged.

68-7482-1-775

Completed Technology Projects



Develop ecological interpretations of the National Resources Inventory, University of Northern Colorado

A project of the University of Northern Colorado extends the use of the National Resources Inventory (NRI), the most extensive multi-resource inventory of natural resources in the world. This project extends NRI usefulness to help analyze ecological patterns of land use data for correlation with wildlife diversity and abundance.

Conclusion: NRI land use data can be correlated with wildlife data from other sources.

68-7482-2-46



Effects of tile drainage on aquatic habitat, Minnesota

A literature review has been undertaken to extend the known water quality and hydrologic effects of agricultural tile drainage on freshwater aquatic ecosystems.

Conclusion: The results of the literature review are pending.

68-3A75-2-89



Wildlife response to mechanically treated pinyon-juniper

A Colorado State University study is evaluating wildlife and plant response to using the Hydroax to reduce pinyon-juniper that has invaded grasslands. This mechanical treatment has been used on the study area for 6 years.

Conclusion: Results are pending.

68-7482-3-159



Minorities in Natural Resources Conservation (MINRC)

Since 1998, the former WHMI and the AWCC have worked with MINRC, a joint committee of the Southeastern Association of Fish and Wildlife Agencies (SEAFWA), Southeast Section of the Wildlife Society, and Southern Division of the American Fisheries Society to recruit minority students into the natural resources arena.

Conclusion: Young people are interacting with fisheries and wildlife professionals.

68-7482-4-214



East Arkansas Enterprise Community (EAEC) assistance to limited resource farmers

A community development initiative was undertaken by the nonprofit EAEC and AWCC to increase the quality and quantity of wildlife habitat that fit the conservation and economic development needs of small scale and limited resource farmers in the Mississippi River Delta. Strategies include developing farm enterprise systems such as waterfowl fee hunting, deer leases, fishing for a fee, etc.

Conclusion: Limited resource farmers are receiving assistance.

68-7484-6-291

Completed Technology Projects



Support for working with fish and wildlife agencies to develop the Conservation Effects Assessment Project wildlife approach and work plan

The AWCC provided funding to engage State fish and wildlife agencies, the Farm Service Agency, and others in developing regional approaches to document Farm Bill program benefits to wildlife.

Conclusion: The AWCC has directly supported the NRCS Conservation Effects Assessment Project, as well as developed technology that gave indirect support.

67-7482-0-585



Using Natural Heritage data, assess conservation practice benefits to rare and at-risk fish and wildlife species in Missouri

If the Missouri pilot practice-to-species relationship data were to apply nationwide, 89 percent of conservation practices would have a positive, neutral, or mixed effect on most upland wildlife species, and 79 percent of practices would have positive or neutral effects on most aquatic species.

Conclusion: The pilot study holds promise that existing data sets can be used to assess effects of conservation practices on at-risk species.

68-3A75-5-146



Use of NRI and Breeding Bird Survey data to assess grassland bird response to CRP

This project links NRCS National Resources Inventory data on land use and cover with U.S. Geological Survey breeding surveys, to estimate bird response to Conservation Reserve Program grasslands and other USDA programs. This project directly supported the NRCS Conservation Effects Assessment Project (CEAP).

Conclusion: NRI land use and cover data are being linked to wildlife data from other sources to enhance CEAP findings.

68-3A75-4-106



Audubon at Home

Through a partnership with the AWCC, Audubon launched and maintains a Web site through an initiative called Audubon at Home. Online information explains a healthy yard is a habitat, a sanctuary for wildlife that provides a natural haven beneficial to birds, other creatures, and people. Helpful hints are included on managing a backyard for wildlife. The Web site is http://www.audubon.org/bird/at_home/

Conclusion: Cooperative efforts between Audubon and NRCS are producing educational materials.

68-7482-2-29



Use of Doppler weather radar to determine bird use of restored wetlands in California, USGS National Wetlands Research Center

Using archived digital Doppler radar data and land cover data, the U.S. Geological Survey National Wetlands Research Center and NRCS are developing tools to assess use of Wetlands Reserve Program wetlands by migratory birds in the Central Valley of California. This project directly supported the NRCS Conservation Effects Assessment Project.

Conclusion: Results are pending.

67-7482-6-275

Completed Technology Projects



Effects of Conservation Reserve Program seeding mixtures on breeding birds in the Northern Plains, USGS

A study by the U.S. Geological Survey examined the benefits of native grasses in the Conservation Reserve Program to grassland birds in the Northern Plains, partly to see if higher costs of expensive native grasses are justified.

Conclusion: Results are pending.

68-7482-2-28



Grassland birds and CRP: How big is big enough?

A U.S. Geological Survey project attempted to determine minimum buffer size needed for grassland birds near wetland habitats in the Prairie Pothole Region. Of 16 grassland birds observed, seven preferred larger grasslands and four showed no clear preference. Two preferred smaller areas and three varied in sensitivity by region.

Conclusion: The CRP has been extremely important in offsetting some negative effects of grassland habitat loss in the Midwest and the Great Plains in the Prairie Pothole Region.

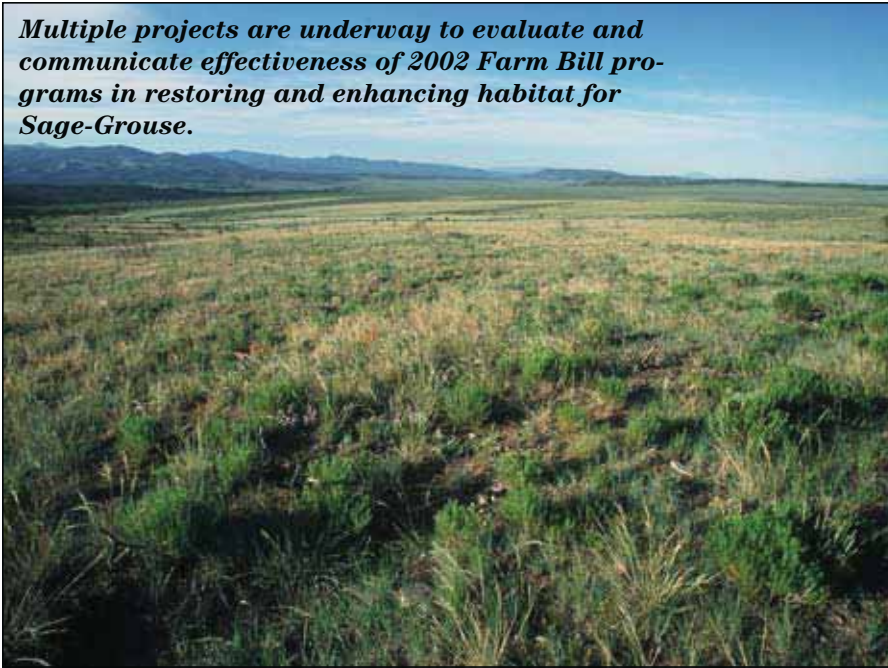
68-7482-4-197

Major Technology Project—Sage-Grouse Restoration

Sage-Grouse Research and Demonstration Projects

68-9327-2-03

Multiple projects are underway to evaluate and communicate effectiveness of 2002 Farm Bill programs in restoring and enhancing habitat for Sage-Grouse.



The purpose of the Sage-Grouse Restoration Project is the evaluation and documentation of effects of 2002 Farm Bill conservation technologies and strategies on sage-grouse and other sagebrush-steppe wildlife. Information gained will be used to assist private landowners and the NRCS, soil conservation districts, and State wildlife agency field staff in the planning and implementation of habitat projects and practices on private lands to benefit sage-grouse and other sagebrush-steppe obligate species.

The information gained from the multi-State experiments will also assist local sage-grouse working groups in complying with the conservation plan reporting requirements set forth in the U.S. Fish and Wildlife Service (USFWS) Policy for Evaluation of Conservation Efforts (PECE) When Making Listing Decisions. More than 60 local working groups have been organized throughout the current sage-grouse range. The efforts of these groups were cited by the USFWS in their 2005 decision denying the petition to list greater sage-grouse as an endangered species.

Three projects are underway through a cooperative agreement with Utah State University Extension to address critical information needs regarding the management of both greater and Gunnison sage-grouse species.

- **Grazing Sagebrush with Sheep to Enhance Greater Sage-Grouse Brood-rearing Habitat** is being conducted by Utah State University on Parker Mountain in Garfield, Sevier, Piute, and Wayne Counties of Utah to determine if sheep grazing can be used to enhance sagebrush habitat for greater sage-grouse and other sagebrush obligate species while maintaining animal performance.
- **Development of a Sagebrush Habitat Improvement Guide for the Gunnison Sage-grouse by Evaluating Recently and Historically Treated Areas within the Gunnison Basin** is being conducted by Colorado State University at numerous locations within the Gunnison Basin of western Colorado. This work will evaluate the habitat conditions within recently and historically treated sagebrush areas in the Gunnison Basin and relate those findings to the habitat requirements of sage-grouse as outlined in the Gunnison Sage-Grouse Rangewide Conservation Plan.
- **Greater Sage-Grouse Use of Restored Sagebrush Areas in Rich County Utah** is being conducted by the Utah Division of Wildlife Resources (UDRW) in Rich County in northeastern Utah. The UDWR will evaluate methods to assess habitat use by greater sage-grouse in areas where sagebrush cover has been to benefit the species. More information about SGRP and these projects can be found on the Web site: <http://www.sgrp.usu.edu>.

Major Technology Project—Northern Bobwhite Quail Restoration

Northern Bobwhite Quail Research and Demonstration Projects

68-7482-3-121

Multiple projects—11 projects in 9 States—evaluated the effectiveness of conservation practices and NRCS technical assistance to meet population and habitat goals of the Northern Bobwhite Conservation Initiative



The AWCC led the Bobwhite Restoration Project, a cooperative effort among multiple agencies designed to develop and evaluate the technology needed to establish or manage the habitat needed to restore northern bobwhite quail populations to 1980 levels.

The technology will assist NRCS field staff in future planning by evaluating the efficacy of NRCS conservation practices in restoration of northern bobwhite habitat and populations.



Dr. Wes Burger of MSU is overseeing the studies.



The research and new technology will assist in meeting a goal of the Northern Bobwhite Conservation Initiative that seeks the addition of 2,770,922 coveys to the current population.

Partners include Mississippi State University, Forest and Wildlife Research Center, Department of Wildlife and Fisheries (MSU), Quail Unlimited, Inc. (QU), and the Southeastern Association of Fish and Wildlife Agencies (SEAFWA).



The Department of Wildlife and Fisheries at MSU is the umbrella institution that coordinated 11 research projects among 9 universities. States with research projects include Arkansas, Florida, Illinois, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, and Texas.

Major Technology Project—Northern Bobwhite Quail Restoration

Findings from a sampling of Bobwhite Quail Research Projects



Better quail and grassland songbird habitat with fire and roller chopping

A study of rangelands in south Florida by the Tall Timbers Research Station, University of Georgia, and University of Florida found that quail populations could be doubled in as little as 2 years with improved management. Specifically, it found the use of summer fire rather than winter fire and roller drum chopping in summer offered both improved forage for cattle and improved quail habitat.

Conclusion: Use of summer fire on a 2-year frequency along with roller drum chopping, if needed, increases forage production and quail habitat on Florida rangeland.



Quail numbers double with only 3 percent of the farm in fallow buffers

A North Carolina State University study of linear and block field borders on 24 farms found that quail populations almost doubled on farms where 2 to 3 percent of the cropland edge was allowed to go fallow. It also found that blocks of fallow habitat (1/4 acre to 6 acres in size) produced twice the number of quail as narrow (10-foot) linear field borders.

Conclusion: Quail populations may be increased in agricultural landscapes with relatively little amounts of land dedicated to early successional habitat.



Disk, use fire and herbicides for early successional vegetation

A University of Tennessee study compared the success of numerous treatments in promoting forbs and other early successional habitat within older, rank stands of native warm-season grasses, as well as methods to control tall fescue and woody species. Timing of treatments was critical, as was intensity of disking.

Conclusion: Active management is required to maintain early successional habitat to provide wildlife needs and prevent woody species encroachment. Fire and heavy disking are most successful methods, while mowing is ineffective.



Buffers provide valuable connections to large habitat blocks

Research in Mississippi by Iowa State University shows a cumulative effect from applying buffers that connect larger blocks of grassland habitat. A farm with this combination produced three to four times as many quail as surrounding farms with minimal habitat. Also, buffers with diverse plants attracted twice the diversity of songbirds, and block habitats produced the most songbird diversity and nesting success.

Conclusion: Landscape systems of block habitat with connecting grassland and riparian buffers multiply benefits to grassland birds.



Bobwhite response to EQIP grazing and brush management practices differs in the High Plains and Rolling Plains ecoregions of Texas

Studies by Texas Tech and Texas A&M Universities show quail benefit from some, but not too much, woody cover. In the High Plains, where there was little brush, more quail were found in areas with more woody cover. In heavy mesquite cover in the Rolling Plains, brush management was helpful. Deferred grazing practices were helpful in both areas.

Conclusion: Some woody cover and deferred grazing are helpful to quail.

Technology Development—Projects Underway



Evaluate pollinator restoration functions of conservation practices in California's Central Valley

The Xerces Society for Invertebrate Conservation will evaluate pollinator restoration techniques for NRCS conservation practices such as buffers in the Central Valley of California. The project will also evaluate the cost of using proper vegetation and the willingness of landowners to pay and will provide demonstration conservation plans to show the restoration techniques and practices that minimize negative impact to bees.

69-7482-6-277



American woodcock habitat best management practice and technical standard development

A project by the Wildlife Management Institute will develop best management practices and technical standards for American woodcock habitat management. It will also develop demonstration areas for training NRCS staff and landowners. The work will lead to habitat evaluation procedures.

69-7482-6-281



Evaluate mid-contract management of CP33 practices for effects on vegetation, insects, and birds

Mississippi State University's Department of Wildlife and Fisheries will evaluate the effects of mid-contract management on lands in the Conservation Reserve Program. Specifically, management impacts on effects on vegetation, insects, and birds will be evaluated for the CP33 Habitat Buffers for Upland Birds practice. The results of the project will help improve NRCS standards and include development of technical notes to assist NRCS planners.

69-7482-6-286



Developing and evaluating landscape level practices for the greater prairie-chicken in the Midwest

The Missouri Department of Conservation will use radio telemetry and GIS to assess effectiveness of patch burn grazing, translocations of simulated leks, and landscape restoration for greater prairie-chicken populations in Missouri. The intent is to develop and evaluate landscape level practices to restore greater prairie-chicken on private lands in the Midwest. The project will also provide field days for landowners and NRCS staff for training.

69-7482-6-284



Develop local cultivars and demonstration sites to promote use of native warm-season grasses

A project of the Wildlife Management Institute will develop demonstration sites with NRCS Plant Materials Centers (PMC) to help convince landowners of the value of native warm-season grasses in their agricultural operation. The project will develop technical guidance and will work with PMCs to develop local cultivars. It will also provide field days and workshops for NRCS, State wildlife agencies, landowners, and private farm and wildlife organizations.

69-7482-6-280

Technology Development—Projects Underway



Develop standards to evaluate ecological restoration on Wetlands Reserve Program (WRP) sites

A University of Tennessee project will evaluate the ecological restoration of WRP sites by comparing them to existing wetlands. The project will develop an NRCS tool to assist with evaluating the state of restoration on WRP sites, as well as training sessions and a Web site.

69-7482-6-279



Assess brook trout populations/habitat in Maine, including creation of stream habitat index tool

A project by the Maine Department of Inland Fisheries and Wildlife will evaluate stream habitat on streams passing through private lands managed for agriculture and forestry. The project will create a stream habitat index tool for use by technical staff and provide field demonstrations for landowners to understand the importance of their conservation efforts.

69-7482-6-283



Evaluate vegetation, soil, and avian responses to wildfires in the Texas Panhandle

A study by the Department of Range, Wildlife and Fisheries Management at Texas Tech University will observe vegetation, soil, and avian responses to the East Amarillo Complex wildfires of the Texas Panhandle, and evaluate the impact of the wildfires on the soils and grasslands. The project will measure vegetation recovery and the response of birds and develop recommendations to assist with landscape conservation recovery efforts.

69-7482-6-285



Assess organizational capacity and tools needed to maximize sage-grouse working group success

Utah State University will evaluate the successful local working groups leading to the recovery of sage-grouse on private lands. The work will provide recommendations and techniques for NRCS to assist ranchers and others to improve local sage-grouse working groups to apply conservation on private lands.

69-7482-6-282



Identify treatment areas and evaluate conservation practices for sage-grouse habitat in Colorado

The Colorado Division of Wildlife Identify treatment areas where conservation practices will positively influence sage-grouse habitat as part of the Pinon Mesa Gunnison Sage-Grouse Cooperative Conservation Project. The project will identify treatment areas where conservation practices will positively influence sage-grouse habitat. The project will also evaluate the effectiveness to the conservation practices being applied.

69-7482-6-287

Technology Development—Projects Underway



Evaluate cutthroat trout restoration techniques and partnership involvement in Maggie Creek, Nevada

Trout Unlimited will evaluate Lahontan Cutthroat Trout movement to determine habitat restoration success. The evaluation will include the success of range and other restoration techniques that involve landowners, private companies, Federal and State agencies in the Maggie Creek Watershed of northeastern Nevada. The project will show the value of involving landowners and other partners to help NRCS plan and put conservation on the ground.

69-7482-6-288



Field evaluation of improved grazing systems to maintain stream riparian links that support trout populations

A study by Colorado State University will evaluate the impacts of four grazing systems (high-intensity/low-frequency, deferred-rotation, early-season and season-long) on invertebrate and trout populations. The project will develop guidelines for technical notes that assist NRCS staff and landowners improve pasture and range management.

69-7482-6-278



Monitoring waterfowl on actively managed Wetland Reserve Program (WRP) areas

This project through Mississippi State University will evaluate the benefits associated with active management of WRP areas to encourage the development of plant communities that are capable of supporting diverse and abundant waterfowl and wildlife communities.

68-7482-2-39



Wildlife habitat and native grasses education project for Louisiana, Arkansas, and Mississippi—phase II

This is an educational outreach activity with Southern University CESU and EAEC working with small and minority farmers in Arkansas and Mississippi.

68-7482-2-39 Mod. 41

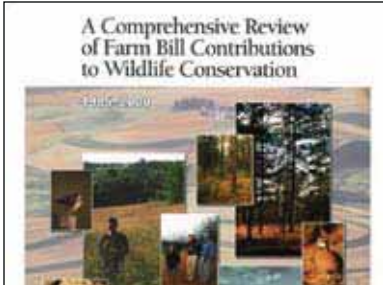


Gueydan Prairie restoration: effects of soil nutrients, fire, and mowing in Louisiana

NRCS in Louisiana is restoring 100 acres of coastal prairie near Gueydan. The restoration project will evaluate the effects of soil nutrients, fire, and mowing during the restoration. It will also evaluate coastal prairie planting techniques that involve planting seeds of 24 prairie species—18 forbs and 6 grasses—collected from local prairie remnants. Restoration began in 2003.

68-7482-3-87X

Resources, Publications, Tools, Input from AWCC



A comprehensive review of Farm Bill contributions to wildlife conservation

A comprehensive review was made of scientific literature to determine wildlife responses to conservation programs undertaken as part of the 1985 Food Security Act and amendments under the 1990 and 1996 Farm Bills. In general, wildlife responded favorably to the land stewardship programs of USDA, particularly when wildlife needs were addressed in conservation programs. Used in further development of USDA conservation program planning.

Unnumbered



Land of Life—an inspirational DVD featuring America's conservation farmers

This scenic tribute to the Nation's farmers and ranchers for their care of natural resources—in particular wildlife habitat—is ideal to open a meeting or for use in the classroom. A high quality, 9-minute show in DVD format, it was shot in high definition, with original music score and surround sound. Includes a series of extras—a photo gallery of spectacular scenes, landowner interviews, TV spots, a collection of habitat facts, and links to helpful organizations.

Unnumbered



Understanding the Landscape—a series of case studies and expert commentary showing ecosystem interdependencies

A course designed to help conservationists and land managers understand the connectivity of ecological processes to apply resource management principles on managed lands in a more holistic and sustainable manner. Through a series of 17 videotapes—12 lectures and 5 case studies—students are introduced to the components of land management at a landscape scale.

68-7482-1-789X



MARIS—the multistate aquatic resource information system

A multistate pilot project offers water quality data, populations of fish species, winter kill information, lake depths, and much more information on lakes and streams all over the country from a single point of contact on the Internet. MARIS is a six-State cooperative pilot project that uses a common, Internet-based application to make selected fish population survey data available from Illinois, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. These States have developed a statewide fisheries survey database.

Unnumbered



Birds of North America—A subscription for a comprehensive reference for NRCS State Offices

Profiles of characteristics and habitat needs of 700 birds in North America. A set of this “encyclopedia” of birds was purchased and placed into each NRCS State Office.

P.O. 40-7482-2-47

Resources, Publications, Tools, Input from AWCC



SVAP2: An aquatic assessment tool to check the health of small streams

An updated version of an original stream assessment, the Stream Visual Assessment Protocol (SVAP2) is a more accurate tool to help landowners check the health of streams on their property. Conservationists with basic training in aquatic biology or hydrology can use SVAP2 to evaluate the physical condition of and habitat quality of any stream shallow enough to sample without the use of a boat. The assessment is a good first look at up to 16 elements of physical, chemical, and biological conditions of wadeable streams, their riparian areas, and instream habitats.

68-3A75-4-101



The NRCS Corridors Handbook and the Henry's Fork case study

The NRCS Corridors Handbook was developed by Utah State University in partnership with the former Watershed Science and WHMI to assist in planning watershed scale wildlife corridor projects in agriculturally dominated landscapes. A case study of the lower Henry's Fork was also prepared to evaluate effectiveness of procedures outlined in the Corridors Handbook. All aspects of the case study are tiered to the methodology and principles detailed in the handbook.

40-7482-1-125



Ecology and management of large wood in world rivers

The proceedings of the conference on Ecology and Management of Large Wood in World Rivers was published by WHMI, the USDA Forest Service, American Fisheries Society, and Oregon State University. It includes chapters describing processes to retain wood in rivers for habitat complexity and river restoration, with application to NRCS field office recommendations for riparian, flood plain, and stream and river habitat.

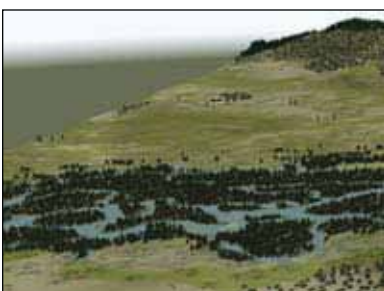
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NRCS Stream Design Guide, Chapter 1

Staff of the WHMI contributed to developing information and writing chapter 1 of the NRCS Stream Design Guide. The first chapter describes and guides the restoration of ecological processes and functions of streams. Information includes ecological responses of species to adjustment of channels, aquatic dynamics, aquatic habitats and their interaction with riparian habitats, and the importance of disturbance in sustaining aquatic communities.

68-7482-4-192



Restoring flood plain and riparian processes: Willamette River flyover

This project produced a computer-based, simulated flyover of the historic Willamette River in the northwestern United States. It can be used to help landowners visualize land use decisions in a watershed.

68-7482-1-786

Resources, Publications, Tools, Input from AWCC



Reptile and amphibian guidelines for the Northeast, Northwest, and Southeast

Working with the Partners for Amphibian and Reptile Conservation, the AWCC has helped complete regionally developed guidelines on reptile and amphibian management for three regions and has plans to complete the series for the entire country.

Unnumbered



Bats and mines

Bats and Mines is a guide to surveying and evaluating abandoned mines for use by bats, with alternatives to mine closure. A continuing partnership between the AWCC and Bat Conservation International has produced a number of publications and other information on bat habitat needs, as well as the value of bats in the ecosystem. The materials show why and how to include the needs of bats in conservation planning.

68-7482-2-18X



Water for wildlife: designing water devices helpful to bats and birds

When bats skim the water to get a drink from a livestock tank at night, they often get killed by wires or obstructions near the tank or get knocked into the water and drown. A cooperative project with Bat Conservation International produced guidelines and materials for safer tanks with escape ramps, without diminishing usefulness for livestock. Included was a user friendly guide *Water for Wildlife—A Handbook for Ranchers and Range Managers*.

68-7482-2-18X



Role of bats in integrated pest management

This publication was cooperatively researched, written, and published through a partnership of the AWCC and Bat Conservation International. *Role of Bats in Integrated Pest Management* demonstrates the value of bats in insect control and offers guidelines on bat habitat.

68-7482-2-18X



Forest management and bats

Bats eat millions of pounds of insects nightly and are just as important to forest health by night as birds are by day. Almost all bats rely on forests for survival. They need basic foraging habitat, water resources, and roosting trees and structures. *Forest Management and Bats*, a 14-page detailed booklet, offers private forest landowners and managers excellent guidelines on bat conservation in forests.

68-7482-2-18X

Resources, Publications, Tools, Input from AWCC



Rights-of-way for wildlife: guidelines for developing and maximizing wildlife habitat on utility rights-of-way corridors

Utility rights-of-way can be managed as effective wildlife habitat if a few guidelines are followed. The Wildlife Habitat Council cooperated with the AWCC to make recommendations on the use of specific best management practices to utility managers. All vegetative management plans for rights-of-way should include habitat management surveys, plan for control of invasive species, and recommend use of native plant species, according to the guidelines.

68-7482-2-30



Corporate campaign for migratory bird management: technical materials for managing western riparian areas

The Wildlife Habitat Council, in cooperation with the AWCC, produced *Riparian Areas of the Great Basin: A Management Guide for Landowners*. The booklet discusses how nearly all bird species, mostly migratory, found in the Great Basin depend on riparian areas. The Great Basin, centered in Nevada, includes parts of five western States. The booklet points out damaging practices and offers guidelines for improvement.

68-7482-2-45



Our living land: success stories of wildlife conservation on private lands

A colorful 16-page publication with information on the advances private landowners have made in recent years in providing habitat for fish and wildlife. The publication includes successes in establishment of new habitat through USDA conservation programs. Available by calling 1-888-LANDCARE or on the Web at <http://www.nrcs.usda.gov> and clicking on publications.

Unnumbered



2002 Farm Bill conservation practices and programs for your farm

This attractive, 8-page color foldout ties conservation practices to an overview of the 2002 Farm Bill conservation programs. A program matrix outlines eligibility requirements, type of financial assistance, and producer obligations for eight major USDA conservation programs. This overview was produced by the Wildlife Management Institute with technical help from the WHMI.

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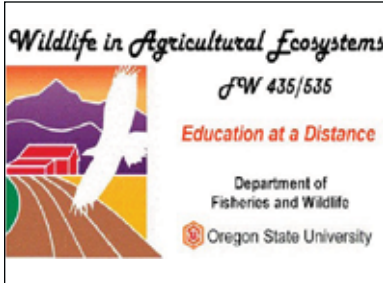


Wildlife habitat communications materials for field offices

A series of 52 easy-to-use articles in both hard copy and electronic format, with both high- and low-resolution photo and "tidbit" for each article. This was designed for newspaper, newsletter, and handout material for field offices as turn-key wildlife conservation material. Topics include habitat needs for many wildlife species found on agricultural lands. The CD contains wildlife artwork, as well as photographs.

Unnumbered

Resources, Publications, Tools, Input from AWCC



Wildlife in Agricultural Ecosystems

This long-distance learning course by Oregon State University was introduced in 2002. It features a 28-session videotape series that examines relationships between agricultural production and fish and wildlife. Videotaped lectures by professors from Oregon State University, Utah State University, specialists from the NRCS, Oregon Department of Fish and Wildlife, and nonprofit organizations discuss problems, as well as opportunities, for enhancing wildlife populations on farmlands.

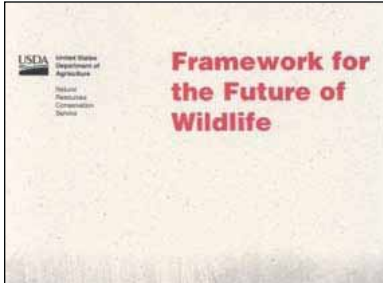
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Managing early successional habitats in the Northeast—a land manager's guide

This guide is meant to help landowners manage grasslands, shrublands, and young forest habitats to address the decline of early successional habitats and wildlife species in the northeastern United States. The New Hampshire Fish and Game Department coordinated development of the publication, with review and funding assistance from the WHMI.

Unnumbered



Framework for the Future of Wildlife—and barriers to providing wildlife assistance

This series of reports has guided the former WHMI and the NRCS nationally on wildlife habitat programs and issues. It was distributed to all NRCS State Offices.

Unnumbered



A pocket guide to prairie birds

A shirt-pocket size guide with color photos, habitat, diet, and range information on the most common birds of the Great Plains Prairies, the guide is a convenient, user friendly resource. Developed in partnership with Great Plains State wildlife agencies, Rocky Mountain Bird Observatory, Playa Lakes Joint Venture, Texas Prairie Rivers Region Inc., and other private partners, the guide is a resource both for local landowners and residents to learn about prairie bird species.

Unnumbered



PLANTS database: develop plant diagnostic data for all U.S. legumes and grasses

The AWCC is supporting continued development of the widely used PLANTS database of NRCS in a cooperative effort with the Missouri Botanical Garden. The project will provide plant identification and resource management information on all legumes and grasses in the United States.

68-3H75-3-122

Resources, Publications, Tools, Input from AWCC



Conservation tillage systems and wildlife—a literature review

This early WHMI project found that conservation tillage systems do offer wildlife habitat. For instance, significantly more species of birds nest in no-till corn fields than in conventionally tilled fields because of food availability, amount and height of cover, and less disturbance. The literature search led to development of *Summary—Conservation Tillage Systems and Wildlife*, and *Conservation Tillage and Terrestrial Wildlife*, which are available online at

<http://www.whmi.nrcs.usda.gov/technical/literature.html>

Unnumbered



National Biology Handbook

The NRCS National Biology Handbook, distributed by NRCS to all field offices, provides comprehensive information on the management and conservation of fish and wildlife habitats on working lands.

68-7482-2-12



Favored food and cover

This handy foldout reference includes highlights of the favored food and cover for wild turkey, northern bobwhite quail, bats, butterflies, bluebirds, and 10 other popular fish and wildlife species in the Midwest. It was produced in 2004 by Midwest State Offices of the NRCS in cooperation with the AWCC.

Unnumbered



Buffers for wildlife publications by State NRCS offices

State Conservationists and directors of State wildlife agencies in Maryland, North Carolina, Illinois, Texas, South Dakota, and Utah brought staff together in facilitated workshops that led to job sheets on specific conservation buffer practices. Participants in this effort facilitated and coordinated by WHMI and the Watershed Science Institute received the Wildlife Management Institute's prestigious *Touchstone Award* for their cooperative efforts in developing useful materials on buffers.

Unnumbered



Gulf Coast CESU

The project established the Gulf Coast Cooperative Ecosystem Studies Unit (CESU). The Gulf Coast CESU is a network of cooperative units established in parts of seven Gulf Coast States to provide research, technical assistance, and education to resource and environmental managers. The AWCC coordinates much of its grants program through cooperative agreements with CESUs across the country.

Unnumbered

Resources, Publications, Tools, Input from AWCC



Best management practices for shortgrass prairie birds: a landowner's guide

This 33-page booklet by the Colorado Bird Observatory is designed to guide landowners and other conservationists in creating and maintaining habitat for 13 bird species of the shortgrass prairie, birds that are in need of conservation efforts. For each species, there is a brief description of the bird, its nest, eggs, and preferred habitat. There is also information about its breeding season and specific management activities that will contribute to healthy populations.

Unnumbered



North Dakota ecological site descriptions

This project assisted the North Dakota State Office of NRCS in developing ecological site descriptions that included information on fish and wildlife habitat.

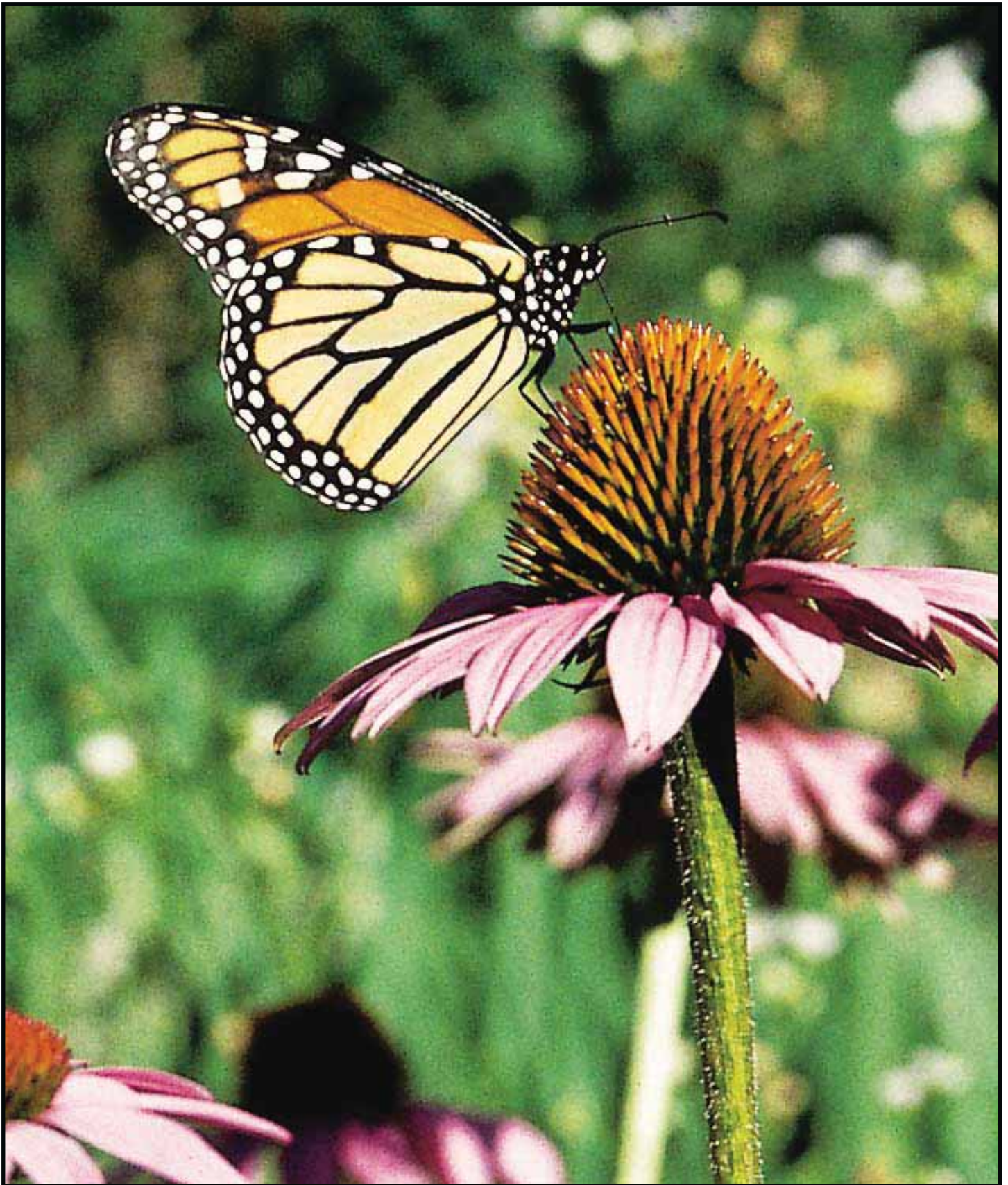
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Fish and wildlife database

This project will develop a cataloging system of the most pertinent fish and wildlife information, including technology development projects of NRCS/AWCC, for management on privately owned agricultural lands through a centralized clearinghouse. A business plan and prototype have been developed with the assistance of Iowa State University. The final Fish and Wildlife Database should provide information in much the same style as the PLANTS Database.

68-3H75-3-122



Agricultural Wildlife Conservation Center
Madison, Mississippi