Terrestrial Habitats
Cropland

1. **Agricultural buffers and wildlife conservation: A summary about linear practices.**
Clark, William R. and Reeder, Kathleen F.
In: Fish and Wildlife Response to Farm Bill Conservation Practices; Bethesda, MD: The Wildlife Society, 2007.
ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/fwfb4.pdf
Descriptors: agricultural buffers/ conservation practices/ terrestrial habitat/ wildlife species/ wildlife management
Abstract: Conservation practices such as filter strips, grassed waterways, buffers, contour strips, riparian buffers, windbreaks and shelterbelts are eligible under a variety of USDA programs. Most were originally designed to provide benefits regarding reduced soil erosion and improved water quality. Most often grasses, or mixtures of grasses and forbs, are used in these practices, although establishment of trees and shrubs is encouraged in some practices. The small area and high edge-area ratios limit the usefulness of these practices for wildlife. Scientific evidence suggests that enrolling land in linear practices has accumulated in recent years, although most studies still focus heavily on benefits to birds and do not address the larger questions of the animal communities. With careful planning and management, applying linear practices widely within an agricultural landscape could be expected to have positive wildlife benefits compared with continued intensive row cropping.

2. **Agricultural producers' perceptions of sandhill cranes in the San Luis Valley of Colorado.**
Laubhan, Murray K. and Gammonley, James H.
Wildlife Society Bulletin 29(2): 639-645. (2001)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: Grus canadensis tabida [greater sandhill crane] (Gruiformes)/ human (Hominidae)/ animals/ birds/ chordates/ humans/ mammals/ nonhuman vertebrates/ Primates/ vertebrates/ agricultural production/ croplands/ economic attitudes/ human wildlife conflicts/ natural resources/ perceptions/ private land use/ social attitudes
Abstract: Management for migratory birds at an ecosystem scale requires forming cooperative partnerships with the private sector. To be effective, however, wildlife managers must understand the economic and social attitudes of private landowners to ensure that strategies involving stakeholders are viable and can be implemented. We documented attitudes of farmers in the San Luis Valley (SLV) of Colorado toward Rocky Mountain Population greater sandhill cranes (Grus canadensis tabida) using a self-administered, mail-back survey. Overall response rate was 46.7%. Viewing sandhill cranes in the SLV was considered somewhat important or important by 78.6% of respondents. In contrast, only 62.1% of respondents indicated that viewing sandhill cranes was somewhat important or important on their own land. Farmers' attitudes toward viewing sandhill cranes on their own property were related (P=0.02) to perceived conflicts with crop production. The extent of crane use (P=0.04) was the only variable we tested that predicted whether conflicts were reported. Our results suggest that partnerships between farmers and natural resource agencies concerned with management of sandhill cranes may be viable. However, the role of farmers in any proposed management strategy must be examined carefully because there may be an upper limit of crane use on private land that farmers will tolerate.

3. **An annotated bibliography for wildlife responses to the Conservation Reserve Program.**
Allen, A. W.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P.; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA/NRCS/WHMI.
Madison, MS: USDA, NRCS, Wildlife Habitat Management Institute, 2000; pp. 151-206.
NAL Call #: aS604.6 C66 2000
Descriptors: Conservation Reserve Program/ wildlife habitats/ wildlife management

4. **Annual set-aside programs: A long-term perspective of habitat quality in Illinois and the Midwest.**
Warner, Richard E.; Etter, Stanley L.; David, Larry M.; and Mankin, Philip C.
Wildlife Society Bulletin 28(2): 347-354. (2000)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: policies and programs/ farms/ food crops/ production/ grassland/ cultivated farmland/ habitat management for wildlife/ conservation programs/ land use/ cover/ vegetation/ agriculture/ habitat change/ grains/ prairie/ extensive agriculture/ Illinois/ Iowa
Abstract: Farm programs that divert cropland from production have been important for establishing grassy habitat in the Midwest since the 1930s. This study documents 1) the expansion of row crop production and general decline of grasses on farm landscapes of the Midwest in recent decades, and 2) the trend toward short-term set-aside programs that establish grassy habitat of marginal value, depicted in Illinois. During the 1980s and early 1990s, row crop production in the Midwest moderated and millions of hectares of grassland were established on cropland diverted from production. Nonetheless, from 1964 to 1992, row crop plantings increased by 39%, with an 84% increase in soybeans being the most striking land-use change. Row crops supplanted numerous cover types that have grassy structure, including oats (-83%), wheat (-10%), other minor crops (-51%), permanent pasture (-54%), diverted cropland (-51%), and other farmland (-41%). On a study area in east-central Illinois, we evaluated and compared selected habitat characteristics of grassy cover for 1962-63 and 1991-94 on 100 randomly selected 4.05-ha plots, including tract width, heterogeneity of vegetation, disturbance during the growing season, persistence of vegetation from one growing season to the next, and extent to which grassy fields were connected by permanent (grass) edges to surrounding landscape elements. There was a diminution (P<0.05) in these habitat attributes in the 1990s compared to the 1960s. The conservation community has emphasized the potential benefits of the Conservation Reserve Program (CRP) for wildlife, while

most of the grassland in the Corn Belt has been established by annual set-aside programs. Although the most recent set-aside era ended in the late 1990s, programs of this nature may reemerge. Our study underscores the need and opportunity for improving habitat conditions as part of future farm programs that would divert land from production under short-term contract.

5. **Architectural features of agricultural habitats and their impact on the spider inhabitants.**
Rypstra, A. L.; Carter, P. E.; Balfour, R. A.; and Marshall, S. D.
Journal of Arachnology 27(1): 371-377. (1999)
NAL Call #: QL451.J6; ISSN: 0161-8202.
Notes: Literature review.
Descriptors: habitats/ conservation tillage/ herbivores/ humidity/ intercropping/ mulching/ predator-prey relationships/ productivity/ tillage/ agricultural entomology/ Araneae/ arthropods/ Arachnida/ invertebrates/ animals
Abstract: The density and diversity of the spider community has been closely tied to the structural complexity of the local environment. For instance, soil dwelling spiders increase dramatically when the litter layer is enhanced because there are more retreats and hiding places and because temperature and humidity extremes are moderated. Web-building spiders are directly linked to the configuration of the vegetation because of specific web attachment requirements. Both correlative and experimental data support a tight relationship between spider density and habitat structure. Most of the available data show that agricultural practices which enhance the structural complexity of the environment (such as intercropping, mulching, and conservation tillage practices) enhance the density and diversity of the spider community. The key question regarding spiders in agroecosystems is, of course, whether they are in any way suppressing the activity of herbivores. Some studies uncovered a strong link between habitat complexity, spider abundance and plant productivity; but others have not, and the mechanisms by which spiders could exert a top-down effect are not clear. More investigation into the specifics of how habitat structure influences the predator-prey interactions in agroecosystems is needed in order to truly understand and manage agricultural production in a responsible manner.

6. **The Arkansas response to federal farm program opportunities.**
Long, J. D.; Akers, D.; and Wilson, S. N.
Journal of Soil and Water Conservation 46(4): 272-275. (July 1991-Aug. 1991)
NAL Call #: 56.8 J822; ISSN: 0022-4561 [JSWCA3]
Descriptors: farmland/ wildlife conservation/ habitats/ environmental protection/ federal programs/ Conservation Reserve Program
This citation is from AGRICOLA.

7. **Arsenic and mercury concentrations in major landscape components of an intensively cultivated watershed.**
Cooper, C. M. and Gillespie, W. B.
Environmental Pollution 111(1): 67-74. (2000)
NAL Call #: QH545.A1E52; ISSN: 0269-7491
Descriptors: wetlands/ arsenic/ mercury/ watersheds/ bioaccumulation/ stormwater runoff/ water pollution/ sediment pollution/ agricultural runoff/ flood plains/ aquatic organisms/ soil contamination/ sediment contamination/ fish/ runoff/ mercury-197/ pollution (soil)/ pollution (water)/ contaminated sediments/ fish/ catchment areas/ Pisces/ freshwater fish/ Mississippi R.
Abstract: To provide an understanding of arsenic (As) and mercury (Hg) concentrations in soil, sediment, water, and fish tissues, samples were collected from a Mississippi River alluvial floodplain located in northwest Mississippi. As concentrations increased approximately an order of magnitude from water (5.12 µg/l) to fish tissues (36.99 µg/kg) and an additional two orders of magnitude in soils, lake sediments, and wetland sediments (5728, 5614, and 6746 µg/kg), respectively. Average Hg concentrations in water, soils, lake sediments, and fish were 2.16 µg/l, 55.1, 14.5 and 125 µg/kg, respectively. As and Hg concentrations were within published ranges for uncontaminated soil, water, and sediments. As concentrations represented a low risk. Hg concentrations were also low but showed a greater tendency to concentrate in fish tissue. The dominant mode of entry of these materials into aquatic systems is through storm-generated runoff. Since both metals accompany sediments, agricultural conservation practices such as reduced tillage, buffer riparian strips, and bordering sediment ponds or drainage wetlands will minimize watershed input to aquatic systems.

8. **Artificial nest predation in hedgerows and scrub forest in a human-dominated landscape of central Mexico.**
Zuria, I.; Gates, J. E.; and Castellanos, I.
Acta Oecologica 31(2): 158-167. (2007); ISSN: 1146609X.
Notes: doi: 10.1016/j.actao.2006.07.005.
Descriptors: agriculture/ artificial nest/ birds/ ecological trap/ El Bajio/ hedgerow/ Mexico/ plasticine egg/ predation
Abstract: Hedgerows as well as other narrow corridors could be valuable habitats for birds in regions of intensive agriculture, however, it is still not clear how successful breeding birds are in different types of hedgerows as compared to birds nesting in their natural habitats. We used artificial nests to examine whether hedgerows were sinks (ecological traps) for birds by comparing rates of predation in two types of hedgerows with different vegetation structure (simple and complex), and in a tract of scrub forest in an agricultural landscape of central Mexico. We determined also the types of predators responsible for egg predation. Ground and elevated nests were baited with one Japanese quail Coturnix japonica egg and one plasticine egg and placed alternately along transects. Significantly, greater predation rates were found in scrub forest and complex hedgerows than in simple hedgerows. Higher predation rates in complex habitats seemed to reflect the higher number of predator types found there. The most important predator types were carnivores followed by rodents, birds, and humans. Carnivores and rodents mainly predated ground nests, whereas birds and humans predated elevated nests. Simple hedgerows in this landscape appeared to offer relatively safe nest sites in terms of predation pressure when compared to more complex habitats (complex hedgerows and scrub forest).

9. **Assessment of farmer attitudes and behavioral intentions toward bird conservation on organic and conventional Florida farms.**
Jacobson, Susan K.; Sieving, Kathryn E.; Jones, Gregory A.; and Van Doorn, Annamamria
Conservation Biology 17(2): 595-606. (2003)
NAL Call #: QH75.A1C5 ; ISSN: 0888-8892
Descriptors: bird (Aves)/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ bird conservation: behavioral intentions, farmer attitudes
Abstract: To enhance efforts to conserve birds, especially insectivorous species, we examined the social dimensions of conventional and organic farming in northern Florida (U.S.A.). Using a framework for the adoption of agricultural innovations, we developed a 44-item survey instrument to measure farmers' socio-demographic background, farm characteristics, participation in social organizations, communication and information networks, and perceived barriers and incentives to adopting bird-friendly practices. Seventy-six surveys were completed, with a response rate of 84% for organic farmers and 60% for conventional farmers. The population of conventional farmer was composed of more males who were older, less educated, and earned a greater income than organic farmers. Conventional farms were on average 20 times larger than organic farms and grew less than half the varieties of crops. These two factors correlated with higher agreement with statements that a considerable amount of money is spent on pest management and that leaf-eating insects cause considerable damage. Fewer conventional than organic farmers scouted for pests daily, an important component of integrated pest management. Almost all farmers (95%) reported recognizing most of the bird species on their farms. More organic farmers (31%) than conventional farmers (12%) reported more than 30 bird species on their farms. Farmers' overall willingness to attract birds to their farms was not correlated with economic or noneconomic incentives and barriers to adopting bird-friendly practices, such as current costs of pest management, experience with bird damage to crops, and farmers' knowledge of insectivorous birds and birds on their farms. Innovations in current farming practices that could enhance bird populations should be disseminated through existing social networks and media channels identified in this paper.

10. **Association of ring-necked pheasant, gray partridge, and meadowlark abundance to Conservation Reserve Program grasslands.**
Haroldson, K. J.; Kimmel, R. O.; Riggs, M. R.; and Berner, A. H.
Journal of Wildlife Management 70(5): 1276-1284. (2006)
NAL Call #: 410 J827; ISSN: 0022541X.
Notes: doi: 10.2193/0022-541X(2006)70[1276:AORPGP]2.0.CO;2.
Descriptors: abundance/ Conservation Reserve Program/ grasslands/ gray partridge/ habitat/ meadowlark/ Minnesota/ Perdix perdix/ Phasianus colchicus/ ring-necked pheasant/ Sturnella/ weather
Abstract: Wildlife managers and farm program administrators need information on how much habitat grassland birds need to support or expand their populations. We quantified the relationships between the amount of Conservation Reserve Program (CRP) habitat in 15 agricultural landscapes and relative abundance of ring-necked pheasants (Phasianus colchicus), gray partridge (Perdix perdix), and meadowlarks (Sturnella spp.) in south-central Minnesota, USA, over a 10-year CRP enrollment cycle. For each 10% increase of grass in the landscape, pheasant survey counts increased by an average of 12.4 birds per route in spring and by 32.9 birds per route in summer. Pheasant indices also varied by year, and the magnitude of year effects were equivalent to a change in grass abundance of 26-36%. Regardless of the amount of grass habitat available, partridge indices in our study declined dramatically from a peak in 1990 to a low in 1994-1995. Meadowlark indices increased by an average of 11.7 birds per route in summer for each 10% increase of grass in the landscape, while indices simultaneously declined from 1990 to 1998. Our results indicate that conversion of cropland to CRP grassland in intensively cultivated landscapes is associated with higher population indices of pheasants and meadowlarks, but not partridge. Managers should assess the success of habitat programs over periods of ≥ 5 years because population indices may fluctuate dramatically over time with little apparent change in habitat abundance.

11. **Association of the Conservation Reserve Program with ring-necked pheasant survey counts in Iowa.**
Riley, Terry Z.
Wildlife Society Bulletin 23(3): 386-390. (1995)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: Phasianus colchicus (Galliformes)/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ agriculture/ snowfall/ weather/ wildlife management
Abstract: More than 880,000 ha of Iowa farmland were enrolled in the Conservation Reserve Program (CRP) from 1986-1991. I evaluated the relationship between CRP enrollment and ring-necked pheasants (Phasianus colchicus) in Iowa and how cropland and weather affected that relationship. Six percent of the land area in Iowa was enrolled in the CRP between 1986 and 1991. Pheasant numbers in Iowa increased 30% during the first 5 years of the CRP compared to a similar period before the program began ($P = 0.026$). Numbers increased 34% ($P < 0.018$) in counties with > 70% cropland and 26% ($P = 0.12$) in counties with 50-70% cropland. I did not detect increases in pheasant numbers in counties with < 50% cropland ($P > 0.71$). Pheasant numbers were positively related to the CRP, but this function was also influenced by percent cropland and cumulative snowfall.

12. **Avian abundance, composition, and reproductive success on Conservation Reserve Program fields in northern Missouri.**
McCoy, T. D.
Columbia, MO: University of Missouri, 1996.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ Missouri
Abstract: Studied various avian species abundance, composition, and reproductive success in different grassland types (CP1 vs. CP2) in northern Missouri.

13. **Avian abundance in CRP and crop fields during winter in the Midwest.**
Best, Louis B.; Campa, Henry; Kemp, Kenneth E.; Robel, Robert J.; Ryan, Mark R.; Savidge, Julie A.; Weeks, Harmon P.; and Winterstein, Scott R.
American Midland Naturalist 139(2): 311-324. (1998)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: dark eyed junco (Passeriformes)/ horned lark (Passeriformes)/ lapland longspur (Passeriformes)/ meadowlark (Passeriformes)/ mourning dove (Columbiformes)/ northern bobwhite (Galliformes)/ ring necked pheasant (Galliformes)/ American goldfinch (Passeriformes)/ American tree sparrow (Passeriformes)/ Canada goose (Anseriformes)/ European starling (Passeriformes)/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ crop fields/ species abundance/ species composition/ winter/
Conservation Reserve Program
Abstract: We compared the abundance and species composition of birds in Conservation Reserve Program (CRP) fields with the same aspects in row-crop fields during the winter (January and February) over several years (1992-1995) for six Midwestern states (Indiana, Iowa, Kansas, Michigan, Missouri and Nebraska). Field techniques were standardized in all states. CRP fields consisted of either permanent introduced grasses and legumes (CP1) or permanent native grasses (CP2), and the plant species seeded in CRP fields differed within and among states. Vegetation characteristics of CRP fields varied considerably from state to state, but vertical density and total canopy cover (primarily grasses) were particularly high in Nebraska. Mean annual total bird abundance ranged from 0.1 to 5.1 birds per km of transect in CRP fields and from 0.1 to 24.2 in row-crop fields. The total number of bird species recorded in CRP fields in the six states ranged from 6 to 32; the range for row-crop fields was 8 to 18. The most abundant species in CRP fields differed among states but included the ring-necked pheasant, American tree sparrow, northern bobwhite, dark-eyed junco and American goldfinch. The most abundant species in row-crop fields included the horned lark, American tree sparrow, European starling, mourning dove, lapland longspur, meadowlarks and Canada goose. Some of the most abundant bird species wintering on CRP fields have been undergoing long-term population declines, thus this program has the potential to mitigate population losses.

14. **Avian community structure, reproductive success, vegetative structure, and food availability in burned CRP Fields and grazed pastures in northeastern Kansas.**
Klute, D. S.
Manhattan, KS: Kansas State University, 1994.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ Kansas
Abstract: Compared avian community structure and reproductive success, food availability, and vegetative structure in CRP grasslands in northern Kansas that were grazed and burned.

15. **Avian diversity and functional insectivory on north-central Florida farmlands.**
Jones, G. A.; Sieving, K. E.; and Jacobson, S. K.
Conservation Biology 19(4): 1234-1245. (2005)
NAL Call #: QH75.A1C5; ISSN: 08888892.
Notes: doi: 10.1111/j.1523-1739.2005.00211.x.
Descriptors: agroecosystems/ avian biodiversity/ avian conservation/ birds and farmlands/ functional insectivores/ avifauna/ biological control/ habitat related behavior/ insectivory/ pest control/ species diversity/ Florida/ Aves/ Hexapoda/ Insecta
Abstract: We studied the potential for native birds to control insect pests on farms. We assessed habitat factors correlated with diversity, distribution, and insect-foraging activity of native birds on farms in north-central Florida and then characterized common bird species that consumed insect biomass in crops as "functional insectivores" (birds most likely to contribute to pest control). Analyses of point-count survey data and foraging observations collected over 2 years on paired organic and conventional farm sites indicated that (1) farms supported most (82-96%) land birds known to breed in the region; (2) bird species richness and abundance varied significantly with matrix habitat and field border type (but not with year or farm management type); (3) the highest bird abundances were associated with mixed crop plantings, field borders, and adjacent matrix composed of forest and hedge; and (4) abundances of 10 species identified as functional insectivores were primarily influenced by crop type (mixed crops attracted significantly more insect foragers into fields than monocrops). We documented birds eating pest insects in crops and did not observe substantive crop damage by birds during growing-season observations. We advocate use of the term functional insectivore to emphasize the potential positive role of avian insectivory on farms during the growing season. ©2005 Society for Conservation Biology.

16. **Avian nesting density and success in alfalfa, cool season CRP, and warm season CRP plantings in eastern South Dakota.**
Rock, Marcus E. South Dakota State University, 2006.
Notes: Thesis (M.S.); Includes bibliographical references (leaves 46-52).
http://wfs.sdstate.edu/wfsdept/Publications/Theses/Rock,%20Marcus%20E.%20MS-2006.pdf
Descriptors: Conservation Reserve Program (U.S.)/ Birds---nests---South Dakota/ Birds---Habitat---Conservation---South Dakota/ Alfalfa
This citation is from AGRICOLA.

17. **Avian use and vegetation characteristics of Conservation Reserve Program fields.**
Delisle, Jennifer M. and Savidge, Julie A.
Journal of Wildlife Management 61(2): 318-325. (1997)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: bobolinks (Passeriformes)/ common yellowthroat (Passeriformes)/ dickcissels (Passeriformes)/ grasshopper sparrow (Passeriformes)/ ring necked pheasant (Galliformes)/ American tree sparrow (Passeriformes)/ Ammodramus savannarum (Passeriformes)/ Dolichonyx oryzivorus (Passeriformes)/ Geothlypis trichas (Passeriformes)/ Phasianus colchicus (Galliformes)/ Spiza americana (Passeriformes)/ Spizella arborea (Passeriformes)/ Sturnella spp. (Passeriformes)/

animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ Conservation Reserve Program/ fields/ meadowlarks/ seasonality/ species abundance/ vegetation structure/ wildlife management
Abstract: We compared avian use of Conservation Reserve Program (CRP) fields enrolled in the CP1 (cool-season grasses and legumes) and CP2 (warm-season native grasses) options in southeastern Nebraska from 1991 to 1995. In winter and in the breeding season CP2 fields had taller, denser vegetation than CP1 fields. However, total bird abundance did not differ between CP1 and CP2 fields (P = 0.47). Dickcissels (Spiza americana) and grasshopper sparrows (Ammodramus savannarum) were the most abundant species during the breeding season although population numbers varied among years (P < 0.001). Dickcissels and grasshopper sparrows showed no differences in abundance between CPs, but dickcissels were associated with tall, dense vegetation and grasshopper sparrows with sparser vegetation and a shallow litter layer. Bobolinks (Dolichonyx oryzivorus) were more abundant on CP1 fields (P = 0.001), and common yellowthroats (Geothlypis trichas) and sedge wrens (Cistothorus platensis) were more abundant on CP2 fields (P = 0.001 and P = 0.05). Average winter abundances did not change over years (P = 0.90). American tree sparrows (Spizella arborea) and ring-necked pheasants (Phasianus colchicus) were the most abundant species during winter and were more abundant on CP2 fields (P < 0.05). Meadowlarks (Sturnella spp.) were more abundant on CP1 fields in winter (P < 0.05).

18. **Avian use of fields enrolled in the Conservation Reserve Program in southeast Nebraska.**
Delisle, Jennifer M.
Lincoln, Nebraska: University of Nebraska, 1995.
Notes: Thesis (M.S.); Includes bibliographical references.
NAL Call #: NBU LD3656 1995 D455
Descriptors: Conservation Reserve Program---United States/ Birds---Habitat---Nebraska
This citation is from AGRICOLA.

19. **Aviation population trends within the evolving agricultural landscape of eastern and central United States.**
Murphy, Michael T.
Auk 120(1): 20-34. (2003)
NAL Call #: 413.8 AU4; ISSN: 0004-8038
Descriptors: agriculture/ conservation/ population studies/ terrestrial ecology/ Breeding Bird Survey/ Conservation Reserve Program/ U.S. Department of Agriculture/ agricultural land use/ agricultural landscape/ avian population trends/ farmland/ ecosystems/ eastern United States/ central United States/ farming and agriculture/ grasslands/ population ecology/ wildlife-human relationships/ commercial enterprises/ disturbances/ habitat use/ land zones/ artificial structures
Abstract: State-level Breeding Bird Survey (1980-1998) and U.S. Department of Agriculture statistics were used to test the hypothesis that changes in agricultural land use within the eastern and central U.S. have driven population trends of grassland and shrub habitat birds over the past two decades. The degree to which population trends differed between grassland and shrub habitats was evaluated with respect to migratory and nesting behavior. Grassland birds declined significantly between 1980 and 1999, but, on average, shrub habitat species did not. Grassland-breeding, long-distance migrants exhibited the strongest negative trends. Most species (78%; n=63) exhibited at least one significant association between population trends and changes in agricultural land use, and in most, land use "explained" 25-30% of the variation in population trends among states. Changes in the farmland landscape accounted for more of the interstate variability of population trends of short-distance migrants than of both long-distance migrants and residents, and that variability was greater in grassland than shrub species. Declines in the area of rangeland and cover crops were followed by population declines and increases, respectively, by many species. Increases of land in the Conservation Reserve Program had negative associations with population trends of some shrub species. The results indicate that grassland birds have declined strongly over the past two decades, and that regardless of migratory behavior or nesting habits, avian population trends are linked strongly to changes in agricultural land use within North America.

20. **Biotechnology: Environmental impacts of introducing crops and biocontrol agents in North American agriculture.**
Pimentel, D.
In: Biological control: Benefits and risks/ Hokkanen, H. M. and Lynch, J. M.; Series: Plant and microbial biotechnology research series No. 4, 1995; pp. 13-29.
Notes: Literature review; ISBN: 052154405X.
NAL Call #: TP248.27.P55P54
Descriptors: plant introduction/ introduced species/ crops/ livestock/ game birds/ game animals/ environmental impact/ weeds/ pests/ biological control agents/ weed control/ insect pests/ genetic engineering/ recombinant DNA/ transgenic plants/ risk/ North America/ animal pests/ pest potential/ weed eating insects
This citation is from AGRICOLA.

21. **Bird abundance and nesting in CRP fields and cropland in the Midwest: A regional approach.**
Best, Louis B.; Campa, Henry; Kemp, Kenneth E.; Robel, Robert J.; Ryan, Mark R.; Savidge, Julie A.; Weeks, Harmon P.; and Winterstein, Scott R.
Wildlife Society Bulletin 25(4): 864-877. (1997)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: nest predation/ nesting success/ rowcrop field/ species abundance/ vegetational structure/ Conservation Reserve Program/ Agelaius phoeniceus [red winged blackbird] (Passeriformes)/ Ammodramus savannarum [grasshopper sparrow] (Passeriformes)/ Spiza americana [dickcissel] (Passeriformes)
Abstract: We compared the abundance and nesting success of avian species in Conservation Reserve Program (CRP) fields during the summer with that in rowcrop fields over 5 years (1991-1995) for 6 Midwestern states (Ind., La., Kans., Mich., Mo., and Nebr.). Field techniques were standardized in all states. CRP fields consisted of either perennial introduced grasses and legumes (CP1) or perennial native grasses (CP2), and the plant species seeded in CRP fields differed within and among the states. Disturbances to CRP fields included mowing (partial or complete), application of herbicides, and burning. The height, vertical density, and canopy coverage of vegetation

in CRP fields were measured in each state; values for these measurements were particularly low in Kansas. Mean annual total bird abundance in CRP fields ranged from 4.9 to 29.3 birds/km of transect. The most abundant species on CRP fields differed among states but included red-winged blackbirds (Agelaius phoeniceus), grasshopper sparrows (Ammodramus savannarum), and dickcissels (Spiza americana). Although the total number of bird species was similar in CRP and rowcrop fields across the region, bird abundance was 1.4-10.5 times greater in the former. Nests of 33 bird species were found in CRP fields compared with only 10 species in rowcrop fields, and the number of nests found was 13.5 times greater in CRP fields. Nest success in CRP fields was 40% overall; predation was the greatest cause of nest failure. Long-term farm set-aside programs that establish perennial grass cover, such as the CRP, seem to provide many benefits for grassland birds, including several species for which conservation is a great concern.

22. **Bird abundance and nesting success in Iowa CRP fields: The importance of vegetation structure and composition.**
Patterson, Matthew P. and Best, L. B.
American Midland Naturalist 135(1): 153-167. (1996)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: passerine/ Passeriformes/ Aves/ Plantae/ animals/ birds/ chordates/ nonhuman vertebrates/ plants/ vertebrates/ Conservation Reserve Program/ land management practice
Abstract: Bird use of Conservation Reserve Program (CRP) and row-crop fields was studied in central Iowa from May through July 1991-1993. Thirty-three bird species were recorded in CRP fields and 34 in row-crop fields. The most abundant species in both habitats was the red-winged blackbird (Agelaius phoeniceus), accounting for 35% of all birds in CRP and 24% in row-crop fields. The dickcissel (Spiza americana), grasshopper sparrow (Ammodramus savannarum), bobolink (Dolichonyx oryzivorus), common yellowthroat (Geothypis trichas), brown-headed cowbird (Molothrus ater), savannah sparrow (Passerculus sandwichensis) and ring-necked pheasant (Phasianus colchicus) were the next most abundant species in CRP plots. The horned lark (Eremophila alpestris), vesper sparrow (Pooecetes gramineus) and brownheaded cowbird were the next most abundant species in row-crop fields. Nests of 16 bird species were found in CRP fields, with red-winged blackbirds accounting for 48% of all nests found. The vesper sparrow and horned lark were the only species nesting in row-crop fields. The major cause of nest loss for all species was predation, accounting for 52% of all nest loss in CRP fields and 65% in row-crop fields. Mammals accounted for 89, 88 and 85% of the predation on grasshopper sparrow, red-winged blackbird and dickcissel nests, respectively. The Conservation Reserve Program has likely contributed to an increase in the abundance of many bird species in central Iowa, inasmuch as the row-crop habitat that it replaced has lower bird abundance and supports fewer nesting species. The vegetation structure and composition of CRP fields in central Iowa are diverse, resulting in differences in the bird species communities using these fields. The effects of several land-management practices are discussed relative to bird species composition and nesting success.

23. **Bird abundance and success in CRP.**
Mccoy, T.
In: 62nd Midwest Fish and Wildlife Conference. Minneapolis. MN (USA). 2001.
Notes: Paper No. 307; Conference Sponsor: NCD-AFS; World Meeting Number 000 5249.
Descriptors: aquatic science/ biology/ environmental science

24. **Bird species richness in vegetation fences and in strips of residual rain forest vegetation at Los Tuxtlas, Mexico.**
Estrada, A.; Cammarano, P.; and Coates-Estrada, R.
Biodiversity and Conservation 9(10): 1399-1416. (2000)
NAL Call #: QH75.A1B562; ISSN: 09603115.
Notes: doi: 10.1023/A:1008935016046.
Descriptors: bird diversity/ conservation/ corridors/ forest fragmentation/ Los Tuxtlas/ Mexico/ tropical rain forests/ avifauna/ habitat corridor/ habitat fragmentation/ rainforest/ species richness/ Mexico
Abstract: Fragmentation of the lowland tropical rain forest has resulted in loss of animal and plant species and isolation of remaining populations that puts them at risk. At Los Tuxtlas, Mexico, lowland rain forests are particularly diverse in the avian fauna they contain and while most of the forests have been fragmented by human activity, many of the fragments still harbor diverse assemblages of bird species. In these landscapes, linear strips of residual rain forest vegetation along streams as well as linear strips of vegetation fences (live fences) crossing the pastures might provide some connectivity to bird populations existed in forest fragments. We investigated bird species richness and relative abundance in one 6-km long section of live fences (LF) bordering a dirt road and in two 6-km long sections of residual forest vegetation along a river (MR) and one permanent stream (BS). We used point count procedures which resulted in the count of 2984 birds representing 133 species. At the LF site we detected 74% of the species, 72% at the BS site and 57% at the MR site. Only 38% of the species were common among sites. Neotropical migratory birds accounted for 34-41% of the species counted at all sites. While edge and open habitat birds accounted for 6-10% of the species and for 50% of the records at the three vegetation strips, about 90% of the species were forest birds. Distance to forest fragments and degree of disturbance of the vegetation seemed to negatively influence bird species presence at the BS and MR strips. Rarefaction analysis indicated that the LF strip was richer in species than the other two sites, but the occurrence of the three vegetation strips in the landscape seem to favor the presence of many more species. We discuss the value of these vegetation strips to birds as stepping stones in the fragmented landscape.

25. **Bird use and nesting in conventional, minimum-tillage, and organic cropland.**
Lokemoen, John T. and Beiser, Julia A.
Journal of Wildlife Management 61(3): 644-655. (1997)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: commercial activities/ reproduction/ reproductive productivity/ ecology/ population dynamics/ animal constructions/ man-made habitat/ land and freshwater zones/ Aves: farming and agriculture/ fledgeing success/ farming system effect/ hatching success/ community structure/ seasonal changes/ mortality/ nest losses/ predators/ nest loss significance/ minimum tillage and organic farms/ nests/ density/ conventional/ minimum tillage and organic farmland/ cultivated land habitat/ farming system/ effect on community structure and reproduction/ North Dakota/ Prairie Pothole Region/ community structure and reproduction/ effect of farming system/ Aves/ birds/ chordates/ vertebrates

26. **Bird use of terraces in Iowa rowcrop fields.**
Hultquist, J. M. and Best, L. B.
American Midland Naturalist 145(2): 275-287. (2001)
NAL Call #: 410 M58; ISSN: 00030031
Descriptors: abundance estimation/ agricultural land/ avifauna/ habitat use/ terrace/ United States/ Agelaius phoeniceus/ Spiza americana
Abstract: Bird use of terraces in rowcrop fields was evaluated during 1996-1997 in southwestern Iowa by line transect counts of birds, nest searches and nest monitoring. Twenty-six bird species were observed in terraces. Red-winged blackbirds (Agelaius phoeniceus) and dickcissels (Spiza americana) were most abundant, accounting for 58% of the total bird abundance. Bird abundance in terraces ($\bar{x}$ = 463.0 birds/100 ha, SE = 33.0) was less than that in other strip-cover habitats such as grassed waterways and roadsides, but greater than that in rowcrops. Five species nested in terraces. We found 64.8 nests/10 ha of which 76% were red-winged blackbird nests. Predation resulted in failure of 73% of all nests. The relative contribution of terraces to grassland bird conservation is minor, and changes in current terrace management practices would not likely improve conditions for birds nor be economical.

27. **Bird use of three types of field margins in relation to intensive agriculture in Quebec, Canada.**
Jobin, B.; Choiniere, L.; and Belanger, L.
Agriculture, Ecosystems and Environment 84(2): 131-143. (2001)
NAL Call #: S601.A34; ISSN: 01678809.
Notes: doi: 10.1016/S0167-8809(00)00206-1.
Descriptors: Canada/ Crop pests/ Farmland birds/ field margin/ hedgerow/ Quebec/ windbreak/ habitat use/ birds/ field margin/ habitat use/ intensive agriculture/ Canada/ Aves/ Coniferales/ Galliformes
Abstract: Habitat structure and bird use of field margins were studied in intensive farmlands of southern Quebec, Canada. The main objectives were: (1) to assess the value of field margins for conserving avian diversity in agricultural landscapes, (2) to document their potential as breeding habitats for bird species particularly those considered as nuisance for crops, and (3) to describe habitat variables that best explained bird use of field margins. Three types of field margins were distinguished: (a) natural hedgerows (n = 27) with well developed tree and shrub strata, (b) planted windbreaks (n = 17) mostly composed of coniferous trees and generally devoid of a well structured shrub stratum, and (c) herbaceous field margins (n = 17) with isolated shrubs. A total of 42 bird species were recorded. Bird use of hedgerows and windbreaks was similar, herbaceous field margins having fewer bird species and individuals than the other two types of field margin. Field margins did not contribute significantly as breeding habitats of bird species that may damage crops, but offered shelter to a broad range of species potentially useful for biological pest control. Bird use of field margins was mostly related to hedges' structural complexity and dimension. Conserving natural hedgerows, minimising mechanical and chemical control of the vegetation in field margins, and planting a mix of deciduous and coniferous species in windbreaks represent efficient conservation strategies both from a wildlife and an agronomic point of view.

28. **Birds and the Conservation Reserve Program: A retrospective study.**
Lauber, T. B.
Orono, Me.: University of Maine, 1991.
Notes: Thesis (M.S.) in Wildlife Management. Bibliography: leaves 243-248. Includes vita.
NAL Call #: MeU Univ. 1991 L38
Descriptors: Conservation Reserve Program---U.S/ Bird populations, Effect of agricultural conservation on
This citation is from AGRICOLA.

29. **Black-tailed prairie dogs and the structure of avian communities on the shortgrass plains.**
Smith, G. A. and Lomolino, M. V.
Oecologia 138(4): 592-602. (2004); ISSN: 00298549
Descriptors: biological diversity/ fragmentation/ grassland birds/ keystone species/ avifauna/ community structure/ conservation management/ prairie/ rodent/ ecosystem/ Sciuridae/ ecosystem/ Sciuridae/ Oklahoma/ Artemisia filifolia/ Athene cunicularia/ Buteo regalis/ Charadrius vociferous/ Cynomys ludovicianus/ Eremophila alpestris/ Sturnella
Abstract: We tested the hypothesis that black-tailed prairie dogs (Cynomys ludovicianus) influence avian community structure on the shortgrass prairie. We surveyed 36 prairie dog towns and 36 paired sites without prairie dogs during summer and fall of 1997, 1998, and 1999 in the Oklahoma Panhandle. Our surveys totaled 9,040 individual observations for 73 avian species. Significantly distinct avian communities were present on prairie dog towns when compared to sites within four different macrohabitats of the surrounding landscape: open rangeland, scrub/sandsage (Artemisia filifolia) habitats, Conservation Reserve Program (CRP) plots, and fallow crop fields. Relative densities of all bird species combined was higher on prairie dog towns versus paired sites in summer and fall. Mean species richness of birds was significantly higher on prairie dog towns than paired sites during summer, but there were no significant differences in fall. Open rangeland had the highest mean species richness in fall. Assemblages of avian communities differed significantly between prairie dog towns and the four macrohabitat types during summer. Burrowing owls (Athene cunicularia), killdeer (Charadrius vociferous), horned larks (Eremophila alpestris), and

meadowlarks (Sturnella spp.) were positively and significantly associated with prairie dog towns during summer, while horned larks and ferruginous hawks (Buteo regalis) were significantly associated with prairie dog towns during fall. Even in their current remnant state, black-tailed prairie dogs continue to play a significant rolein the assembly of ecological communities across the Great Plains. Conservation of prairie dogs goes well beyond a single species, and is an important strategy for the preservation of the prairie ecosystem as a whole.

30. **Breeding bird abundance and diversity in agricultural field borders in the black belt prairie of Mississippi.**
Smith, Mark D.; Barbour, Philip J.; Burger, L. Wes.; and Dinsmore, Stephen J.
Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 59: 43-56. (2005)
NAL Call #: SK1.S6; ISSN: 0276-7929
Descriptors: conservation measures/ ecology/ community structure/ population dynamics/ terrestrial habitat/ man-made habitat/ land zones/ Aves: habitat management/ breeding species abundance/ species diversity/ agricultural field border strips/ relative abundance/ population density/ distribution within habitat/ grasslands/ cultivated land habitat/ Mississippi/ Clay and Lowndes Counties/ birds/ chordates/ vertebrates
Abstract: Conservation buffer practices implemented under U.S. Department of Agriculture (USDA) Farm Bill programs offer opportunities for enhancing breeding season habitat for farmland birds. Recently, CP33 (Habitat Buffers for Upland Birds) was added as a new continuous Conservation Reserve Program (CRP) practice designed to address habitat goals for northern bobwhite (Colinus virginianus) under the Northern Bobwhite Conservation Initiative. However, it is presumed that this practice will also benefit other birds. To evaluate potential benefits of CP33 field borders for farmland birds, we established a total of 89.0 km of experimental field borders (6.1-m wide) along agriculture field edges on three 405-ha farms in Clay and Lowndes counties, Mississippi. We used 200-m x 20-m strip transects to measure abundance and diversity of birds inhabiting bordered and non-bordered field edges. Indigo bunting (Passerina cyanea) and dickcissel (Spiza americana) abundances were nearly twofold greater along bordered field edges. However, mourning dove (Zenaida macroura), northern cardinal (Cardinalis cardinalis), and common grackle (Quiscalus quiscula) abundances did not differ between bordered and non-bordered field edges. Field borders adjacent to strip habitats (i.e., fencerows, drainage ditches) had greater total bird and red-winged blackbird (Agelaius phoeniceus) abundance than non-bordered edges adjacent to strip habitats. Species richness was greater along bordered than non-bordered edges. Within intensive agricultural landscapes where large-scale grassland restoration is impractical, USDA conservation buffer practices such as field borders (CP33) may be useful for enhancing local breedingbird richness and abundance.

31. **Breeding bird composition and species relative abundance patterns on Conservation Reserve Program (CRP) land in western Minnesota.**
Hanowski, JoAnn M.
Loon 67(1): 12-16. (1995)
Descriptors: communities/ Conservation Reserve Program/ conservation programs/ birds/ Minnesota/ Minnesota, western

32. **Butterflies and continuous Conservation Reserve Program filter strips: Landscape considerations.**
Davros, N. M.; Debinski, D. M.; Reeder, K. F.; and Hohman, W. L.
Wildlife Society Bulletin 34(4): 936-943. (2006)
NAL Call #: SK357.A1W5; ISSN: 00917648.
Notes: doi: 10.2193/0091-7648(2006)34[936:BACCRP]2.0.CO;2.
Descriptors: buffers/ butterfly abundance/ diversity/ farm conservation/ filter strip/ landscape context/ Minnesota/ species richness
Abstract: Filter strips or buffers are areas of grass or other perennial herbaceous vegetation established along waterways to remove contaminants and sediments from agricultural field runoff. In the heavily cultivated regions of the Midwestern United States, these buffer zones established under the Farm Bill provide important habitat for wildlife such as butterflies. The question of how the landscape context of these plantings influences their use has not been adequately researched. We used multiple regression and Akaike's Information Criteria to determine how habitat width and several landscape-level factors (i.e., landscape composition [total herbaceous cover, amount of developed area, and amount of wooded cover] and configuration [herbaceous edge density]) influenced the abundance and diversity of the butterfly community using filter strips in southwestern Minnesota, USA. Habitat-sensitive butterfly abundance and all richness and diversity measures were positively correlated with filter-strip width. Butterfly abundance was negatively associated with the amount of developed areas (cities, towns, and roads) within the area of a 1-km radius (3.14 km^2) surrounding the sites. Percentage of wooded cover in the landscape was an important variable explaining individual species abundance, although the direction of the relationship varied. Our finding that landscape context influences butterfly use of filter strips highlights the importance of landscape-level approaches to wildlife conservation in agroecosystems.

33. **Changes in breeding bird populations with habitat restoration in northern Iowa.**
Fletcher, R. J. and Koford, R. R.
American Midland Naturalist 150(1): 83-94. (July 2003)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: Conservation Reserve Program/ grassland birds/ avian communities/ area sensitivity/ prairie wetlands/ natural wetlands/ abundance/ Dakota/ fields
Abstract: Native tallgrass prairie and wetland habitat in the Prairie Pothole Region of the United States have declined over the past two centuries. Bird communities using these habitats have also experienced widespread declines that are often attributed to severe habitat loss and fragmentation. We estimated the change, or turnover, in bird populations in the Eagle Lake Wetland Complex, Iowa,

with ongoing grassland and wetland restoration by linking geographic information system data and bird surveys in different land cover types (hayland, pasture, restored grassland, restored wetland and rowcrop agriculture) during the 1999-2001 breeding seasons. Habitat restoration efforts primarily converted rowcrop agriculture and pastures into grassland and wetland habitat. Based on land conversion, abundances of most species have likely increased in the area, including many species of management concern. Yet a few species, such as killdeer (Charadrius vociferus), have probably decreased in abundance. This estimation approach and these estimates provided a critical first step for evaluating restoration efforts; however, information on demographic parameters, such as nesting success, in restored areas is needed for understanding how restoration ultimately affects bird populations.

34. **Comanagement of wildlife corridors: The case for citizen participation in the Algonquin to Adirondack proposal.**
Brown, R. and Harris, G.
Journal of Environmental Management 74(2): 97-106. (Jan. 2005)
NAL Call #: HC75.E5J6
Descriptors: citizen participation/ conservation programs/ wildlife habitats/ case studies/ animal communities/ landowners/ household surveys/ environmental management/ land use/ Eastern United States/ forest management/ natural resources, environment, general ecology, and wildlife conservation/ forestry related
Abstract: The debate between top-down and bottom-up planning has recently re-emerged in environmental management. Many commentators agree on the merits of comanagement, in which affected citizens and professional managers share responsibility for planning. Nevertheless, the manifold advantages of comanagement have not always been fully appreciated in environmental planning. For example, a group representing NGOs and academic institutions recently proposed an ecological corridor linking Algonquin Provincial Park in southern Ontario to the Adirondack Park in northern New York. This corridor, known as A2A, was designed to encourage the migration of wolves and other wildlife between the parks. Much of the land in A2A is private property. A survey of households, randomly scattered throughout the United States portion of the corridor, revealed that affected landowners had little knowledge of the proposal and no contact with its advocates. Many respondents were farmers who utilized land for livelihood. Other landowners enjoyed property for a variety of recreational purposes. Regardless of use, survey participants placed high value on the importance of conserving biological diversity. They also expressed great distrust toward restrictions that might be placed on their activities. In general, respondents felt very unsure about A2A, and they were uncertain about personal involvement in the planning process. Certain landowners indicated a willingness to have their land be included in an ecological corridor, despite not knowing about it before the survey was administered. These results suggest that A2A proponents have little to lose and much to gain by disseminating information locally and by embracing comanagement for further formulation of this plan. © 2004 Elsevier Ltd. All rights reserved. [publisher]
This citation is from AGRICOLA.

35. **Combining data from state and national monitoring surveys to assess large-scale impacts of agricultural policy.**
Nusser, S. M.; Clark, W. R.; Wang, J.; and Bogenschutz, T. R.
Journal of Agricultural, Biological, and Environmental Statistics 9(3): 381-397. (2004)
NAL Call #: S566.55.J68; ISSN: 10857117.
Notes: doi: 10.1198/108571104X4441.
Descriptors: Conservation Reserve Program/ National Resources Inventory/ Phasianus colchicus/ population modeling/ ring-necked pheasant
Abstract: An increasing number of state and national databases are available to assess agricultural and environmental trends in natural resource populations. We use a case study approach to consider methodologies for combining state and national data to assess the impact of agricultural policy on state wildlife populations. The scientific question is to assess the impact of the Conservation Reserve Program on pheasant populations in Iowa, using land cover/use data from the National Resources Inventory and count data from an annual state pheasant population survey. Our approach involves identifying a common spatial polygon for linking summaries from each of two datasets, and then estimating parameters that describe temporal trends in land cover and in pheasant populations over a common time period within each polygon. Estimated pheasant population parameters are regressed on land cover summaries to investigate the impact of the Conservation Reserve Program on pheasant populations in regions of the state. Results reveal that the population response to the Conservation Reserve Program varies by region in relation to the physiography and agricultural use of the region, in ways that were not anticipated by policy developers. Statistical considerations for developing appropriate models for combining data are discussed. © 2004 American Statistical Association and the International Biometric Society.

36. **A comparison of Conservation Reserve Program habitat plantings with respect to arthropod prey for grassland birds.**
McIntyre, N. E. and Thompson, T. R.
American Midland Naturalist 150(2): 291-301. (2003)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: environment-ecology/ Texas High Plains/ North American grassland/ population trends/ CRP fields/ community structure/ avian abundance/ nestling diet/ vegetation/ Coleoptera/ landscape
Abstract: The Conservation Reserve Program (CRP) was designed to reduce soil erosion and curb agricultural overproduction by converting highly erodible agricultural land to various forms of perennial habitat. It has had an incidental benefit of providing habitat for wildlife and has been beneficial in reversing population declines of several grassland bird species. However, the mechanisms behind these reversals remain unknown. One such mechanism may be differences in food availability on CRP vs. non-CRP land or between different types of CRP. The influence of CRP habitat type on the abundance of arthropod prey used by grassland birds has not been previously explored. We compared the abundance and diversity of arthropods among four CRP habitat types in Texas [replicated plots of exotic lovegrass (Eragrostis curvula), Old World bluestem

(Bothriochloa ischaemum), mixed native grasses with buffalograss (Buchlo dactyloides) and mixed native grasses without buffalograss] and native shortgrass prairie. Attention was focused on adult and juvenile spiders (Order Araneae), beetles (Coleoptera), orthopterans (Orthroptera: grasshoppers and crickets) and lepidopterans (Lepidoptera: butterflies and moths), as these taxa are the primary prey items of grassland birds during the breeding season. Arthropod diversity and abundance were higher on indigenous prairie compared to CRP, reflecting differences in vegetative diversity and structure, but there were no differences in arthropod richness or abundance among CRP types. These results indicate that, although CRP is not equivalent to native prairie in terms of vegetation or arthropod diversity, CRP lands do support arthropod prey for grassland birds. More direct assays of the survivorship and fitness of birds on CRP compared to native shortgrass prairie are clearly warranted.

37. **A comparison of landscapes occupied by increasing and decreasing populations of grassland birds.**
Veech, J. A.
Conservation Biology 20(5): 1422-1432. (2006)
NAL Call #: QH75.A1C5; ISSN: 08888892.
Notes: doi: 10.1111/j.1523-1739.2006.00487.x.
Descriptors: bird population trends/ Conservation Reserve Program/ randomization test/ urbanization
Abstract: For several decades, many grassland bird species have been declining in abundance throughout the Midwest and Great Plains regions of the United States, possibly due to loss of natural grassland habitat and increasing urbanization. I used 20 years of data from the North American Breeding Bird Survey to identify increasing, decreasing, and stable populations of 36 grassland-nesting bird species. I characterized the immediate landscape (circle with radius = 30 km) surrounding each population based on data from the National Resources Inventory. For each landscape, I calculated the proportion of eight different land-cover types: restored grassland, rangeland, cultivated cropland, pasture, noncultivated cropland, forest, urban land, and water. Using a null model, I compared landscape composition of increasing, decreasing, and stable populations. As predicted on the basis of the habitat preferences of grassland birds, increasing populations inhabited landscapes that contained significantly more restored grassland and rangeland but significantly less forest land and urban land than landscapes inhabited by decreasing populations. There was no significant difference in the proportion of cropland within the landscapes of increasing and decreasing populations, although cropland composed a large proportion (>30%) of many landscapes. In contrast, restored grassland typically composed a very small proportion (<3.5%) of total land cover, yet it was significantly more common in the landscapes of increasing than decreasing populations. These results suggest that grassland birds may benefit from government initiatives, such as the Conservation Reserve Program, that promote the restoration of grassland at a landscape scale. ©2006 Society for Conservation Biology.

38. **A comparison of public lands and farmlands for grassland bird conservation.**
Cunningham, M. A.
Professional Geographer 57(1): 51-65. (2005);
ISSN: 00330124
Descriptors: biodiversity/ Conservation Reserve Program/ grassland birds/ habitat fragmentation/ biodiversity/ environmental management/ grasslands/ habitat fragmentation/ passerines/ species conservation/ Minnesota/ Aves/ Passeri
Abstract: Midwestern states have invested extensively in grasslands for wildlife conservation, yet these public lands make up a minority of grassland habitat. How effective are public grasslands, relative to private lands, for conserving native songbird populations? I compare private and public lands in southern Minnesota using bird survey data from Conservation Reserve Program (CRP) fields and public lands and assessing fragmentation in a GIS. Bird abundance and diversity were greater on CRP lands. Vegetation composition, field isolation, and field size appear to explain differences in bird counts. Land cover data show that grassland habitat on public lands is scarce and widely scattered. The CRP provides more, and here better, habitat for grassland birds. Funding partly explains this disparity. Trends in farm set-aside program rules and distribution, which can be vary greatly over time, will strongly influence the success or failure of biodiversity conservation in this region. © 2005 by Association of American Geographers.

39. **A conceptual model and indicators for assessing the ecological condition of agricultural lands.**
Hess, G. R.; Campbell, C. L.; Fiscus, D. A.; Hellkamp, A. S.; McQuaid, B. F.; Munster, M. J.; Peck, S. L.; and Shafer, S. R.
Journal of Environmental Quality 29(3): 728-737. (2000)
NAL Call #: QH540.J6; ISSN: 00472425
Descriptors: agricultural products/ ecosystems/ environmental protection/ farms/ mathematical models/ productivity/ societies and institutions/ agricultural land/ agroecosystems/ sustainability/ agriculture/ agriculture/ conference paper/ ecosystem/ environmental management/ environmental monitoring/ environmental planning
Abstract: As part of an environmental monitoring and assessment effort, we developed a conceptual model for measuring and assessing the condition and sustainability of agroecosystems. An agroecosystem is a field, pasture, or orchard and the associated border areas. We focused on ecological sustainability and defined the goals for agroecosystems in terms of the values people place on them. The purpose of an agroecosystem is to produce food and fiber. Other desired outcomes can be considered as goals for the larger landscape and the rest of the world, and they sometimes function as constraints on production. Condition is defined by agroecosystem productivity and the degree to which farmers use management and stewardship practices that conserve and protect valued natural resources in the landscape and the rest of the world. An agroecosystem in good condition is productive and is managed to conserve valued resources. Sustainability is the maintenance of good condition over time. We developed indicators that link system condition and sustainability to societal values and goals. These indicators measure productivity, management practices that promote

sustainability at the agroecosystem scale, and management practices that promote sustainability at landscape and global scales. Our initial efforts focused on annually harvested herbaceous crops; however, the concepts we used can be adapted to other plant and livestock systems. Our conceptual approach may be used to evaluate the effectiveness of several major programs now being implemented, including the USDA's Environmental Quality Incentive and Conservation Reserve Programs.

40. **Conducting a financial analysis of quail hunting within the Conservation Reserve Program.**
Williams, C. F. and Mjelde, J. W.
Wildlife Society Bulletin 22(2): 233-241. (Summer 1994)
NAL Call #: SK357.A1W5; ISSN: 0091-7648 [WLSBA6]
Descriptors: colinus virginianus/ hunting/ economic analysis/ federal programs/ Texas
This citation is from AGRICOLA.

41. **Conservation assessment: Henslow's sparrow Ammodramus henslowii.**
Burhans, Dirk E.
St. Paul, MN: North Central Forest Experiment Station, Forest Service, U.S. Department of Agriculture; General Technical Report-NC 226, 2002. 46 p.
Notes: 0363-616X (ISSN); Literature review.
Descriptors: conservation/ reproduction/ ecology/ land zones/ Ammodramus henslowii: conservation measures/ conservation assessment/ United States/ distribution/ biology and conservation assessment/ Aves, Passeriformes, Emberizidae/ birds/ chordates/ vertebrates
Abstract: Apparent population declines of migrant songbirds have resulted in special interest in grassland songbirds, which show some of the most consistent declines among songbirds generally. Among these species, Henslow's Sparrows have the most restrictive habitat requirements and show some of the most serious declines. The Henslow's Sparrow is often overlooked due to its shy, secretive nature and nondescript song. In the Midwest, Henslow's Sparrows historically bred in native tallgrass prairie habitat; in the East, grasslands maintained by natural disturbances or fires set by Native Americans provided habitat for birds like Henslow's Sparrow. Henslow's Sparrows were probably numerous in the Midwest before European settlement and the transition to large-scale grassland development. Declines in the Midwest are largely due to loss of tallgrass habitat; estimates of the tallgrass prairie lost range as high as 99.9 percent. Declines in the East may be due to reforestation and loss of pastures. In addition to loss of prairies and native grasslands throughout the Henslow's Sparrow's range, intensive human use of "secondary grasslands"--hayfields and pastures that contribute to the grassland landscape--has also contributed to habitat decline. Henslow's Sparrows use grassland habitats. Grasslands that provide breeding habitat for Henslow's Sparrow need to be large (generally >30 ha), have a well-developed layer of litter, and contain standing dead vegetation. Some woody shrubs will be used as song perches, but too many shrubs, such as in an old field, will result in unsuitable habitat. Wintering habitats used by Henslow's Sparrow may be much smaller (sometimes <1.0 ha) and may not require litter and standing dead vegetation. With the possible exception of reclaimed strip mines, both wintering and breeding habitats require frequent disturbance, such as fire, grazing, or mowing, to maintain suitability for Henslow's Sparrows. Henslow's Sparrows will not occupy these habitats immediately following severe disturbance, so that in some cases maintaining a desirable tract requires a "mosaic" of recently and not so recently (2-4 years) disturbed habitat parcels. Other recent studies suggest that light to moderate levels of grazing will maintain proper habitat structure throughout an entire tract. Where patches of grassland habitat adjoin one another, removal of fencerows and treelines between patches may facilitate occupancy of smaller breeding habitats. Publicly owned grasslands on both the breeding and wintering grounds, particularly at some U.S.Army installations and National and State Wildlife Refuges, comprise significant habitats having large Henslow's Sparrow populations; yet many significant breeding populations are also found on privately owned lands, including reclaimed strip mines, pastures, hayfields, and ConservationReserve Program (CRP) lands. The future of sparrow populations on private lands is not assured, particularly with declines in dairy farming, increases in intensive grazing, and row cropping of former hayfields. Studies on use of CRP land indicate that this land may provide appropriateHenslow's Sparrow habitat, but continuance of the program and management of grassland succession under CRP are not assured. Present population surveys using Breeding Bird Survey (BBS) routes do not appear well suited for monitoring the species because of the ephemeralnature of Henslow's Sparrow habitat and because the surveys miss some significant populations. Future research needs to more adequately surveyand monitor populations so that potential declines or increases can be accurately assessed. Although much new information on breeding and wintering populations of Henslow's Sparrow has been acquired since Pruitt's 1996 report, more information is needed to determine the extent and viability of populations. Additional data are required on locations of breeding populations and nesting success across a range of fragment sizes; wintering site fidelity, habitat use, and site locations; and management approaches for both wintering and breeding habitat. The above data, when combined with reliable population survey data, will provide a more accurate assessment of how stable the Henslow's Sparrow population is and where or when management should intervene.

42. **Conservation practices in western Oregon perennial grass seed systems: III. Impacts on gray-tailed vole activity.**
Steiner, J. J.; Gavin, W. E.; Mueller-Warrant, G. W.; Griffith, S. M.; Whittaker, G. W.; and Banowetz, G. M.
Agronomy Journal 99(2): 537-542. (2007);
ISSN: 00021962.
Notes: doi: 10.2134/agronj2006.0165.
Descriptors: conservation tillage/ seeds/ gray-tailed voles/ Microtus canicaudus/ wildlife habitat/ prescribed burns
Abstract: Decreased use of field burning to dispose of straw after harvest of temperate grass seed crops and the implementation of alternative conservation practices including direct seeding (DS) and maximal residue (HR) management have raised questions whether certain pests such as the gray-tailed vole (Microtus canicaudus) are worse than before these changes. The number of vole

burrow holes was determined 15 Jan. 1999 at two research locations in western Oregon. Comparisons were made for the effects of DS and conventional tillage (CT) establishment, maximal and minimal residue (LR) management, present perennial seed crops, and immediate-prior crop in the rotation sequence and two-crops-prior in the rotation sequence. The treatments that most greatly influenced vole activity were crop establishment method and the previous crop in the rotation sequence. Vole activity was greatest in DS tillage establishment and when perennial grass seed was the prior crop in the rotation sequence. A possible production strategy to reduce vole activity could be to include meadowfoam (Limnanthes alba Benth.) or cereals in the rotation sequences when DS perennial grass seed crops are grown. This research demonstrates how vole activity can be reduced in perennial grass seed crops, without the need for tillage before establishment of new stands.

43. **The Conservation Reserve Program: A wildlife conservation legacy.**
Rude, Kathleen and Wildlife Management Institute.
Washington, D.C.: Wildlife Management Institute, 1994.
15 p.: ll., map.
Notes: Original title: "The Conservation Reserve Program: A wildlife conservation legacy --- America needs the Conservation Reserve Program"; "October, 1994."
NAL Call #: S624.A1C67 1994
Descriptors: Conservation Reserve Program---United States/ Soil conservation---Government policy---United States/ Wildlife conservation---United States
This citation is from AGRICOLA.

44. **Conservation Reserve Program: Alternatives are available for managing environmentally sensitive cropland.**
General Accounting Office
Washington, DC: GAO, 1995.
Notes: GAO/RCED-95-42.
http://www.gao.gov/archive/1995/rc95042.pdf
Descriptors: cultivated lands/ land management/ agriculture/ land use/ water quality/ watershed protection
Abstract: If not properly managed, agricultural production on the nation's 382 million cropland acres can adversely affect the quality of water and air, the productivity of soil, and the availability of wildlife habitat. In an effort to reduce these effects by temporarily removing highly erodible cropland from production, the Congress enacted the Conservation Reserve Program (CRP) in 1985. The CRP was also designed to reduce surplus crop production and support farm income. Under the CRP, the U.S. Department of Agriculture (USDA) contracted with farmers to take 36.4 million acres out of production for 10 years in return for rental and cost-share payments of almost $20 billion through the year 2002. These contracts will begin to expire in 1995, with the contracts for the majority of acres-22 million-expiring in 1996 and 1997.

45. **The Conservation Reserve Program and duck and pheasant production in St. Croix County, Wisconsin.**
Evrard, J. O.
Madison, Wisconsin: Wisconsin Dept. of Natural Resources; Report 183, 2000. 8 p.
http://digital.library.wisc.edu/
Descriptors: Phasianus colchicus/ Anas discors/ Anas platyrhynchos/ common pheasant/ blue-winged teal/ mallard/ habitat management/ prairie/ cover/ nest

46. **The Conservation Reserve Program and grassland birds.**
Johnson, D. H. and Schwartz, M. D.
Conservation Biology 7(4): 934-937. (1993)
NAL Call #: QH75.A1C5; ISSN: 0888-8892
Descriptors: Aves/ grasslands/ environmental restoration/ habitat utilization/ government policy/ United States/ birds
Abstract: Several bird species that breed in the temperate grasslands of North America, many of which winter in the Neotropics, declined in abundance during the past quarter century. The Lark Bunting (see Table 1 for scientific names) and Grasshopper Sparrow, as examples, declined by about half during that period, as indexed by the U.S. Fish and Wildlife Service's Breeding Bird Survey. Populations of other grassland species have also diminished steadily, if not as spectacularly. Why so many species declined is not known, but continued conversion of perennial grassland to annually tilled cropland is a suspected cause. A test of this possibility is offered by the Conservation Reserve Program, a program of the United States Department of Agriculture that caused the reversion of millions of hectares of marginal cropland to perennial grassland. We evaluated the use by breeding birds of selected Program fields in eastern Montana, North Dakota, South Dakota, and western Minnesota. These four states have about four million hectares of land enrolled in the Program.

47. **The Conservation Reserve Program and northern bobwhite population trends in Illinois.**
Roseberry, J. L. and David, L. M.
Transactions of the Illinois State Academy of Science 87 (1-2): 61-70. (1994)
NAL Call #: 500 IL6; ISSN: 0019-2252
Descriptors: Colinus virginianus/ population status/ land use/ agricultural ecosystems/ Illinois/ management/ birds/ United States
Abstract: We examined 3 indexes of Northern Bobwhite abundance in Illinois at various geographic scales to determine possible relationships with the Conservation Reserve Program. Over 256,000 ha were enrolled in the CRP during the first 9 signup periods (1986-1990). About 87% of this land was in CP-1 vegetation (introduced cool-season grasses and legumes). Male bobwhite call counts in some parts of the state may have been positively related to amounts of CRP land. However, there was no strong evidence that autumn population densities increased as a result of the program. Positive CRP effects on local bobwhite habitat in some areas were probably offset by neutral or negative effects in others. We discuss possible reasons why potential benefits of the CRP for Northern Bobwhite have not been fully realized.

48. **The Conservation Reserve Program and wildlife habitat in the southeastern United States.**
Carmichael, D. Breck
Wildlife Society Bulletin 25(4): 773-775. (1997)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: conservation programs/ Conservation Reserve Program/ habitat management/ management/ wildlife/ United States, southeastern region
Abstract: The author provides a history of the Conservation Reserve Program in the southeastern United States. A recent cooperative study by the International Association of Fish and Wildlife Agencies and the U.S. Fish and Wildlife Service conducted between 1988 and 1992 showed no significant, long-term enhancement of habitat attributable to the CRP in the Southeast. The author discusses reasons for this lack of success in this region.

49. **Conservation Reserve Program: Benefit for grassland birds in the northern plains.**
Reynolds, R. E.; Shaffer, T. L.; Sauer, J. R.; and Peterjohn, B. G.
Transactions of the North American Wildlife and Natural Resource Conference 59: 328-336. (1994)
NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: birds/ conservation programs/ ducks/ grassland/ nests and nesting/ waterfowl/ abundance/ cover, nesting/ policies and programs/ statistics/ North Dakota/ South Dakota/ Conservation Reserve Program/ upland nesting/ nest success/ waterfowl production Areas/ Breeding Bird surveys/ population Trends/ grasslands/ North Dakota/ South Dakota/ northern plains
Abstract: The importance of the Conservation Reserve Program (CRP) to upland-nesting ducks and certain other grassland-nesting birds was investigated. For ducks, nest success in CRP cover was compared with nest success in planted cover on waterfowl production areas in the same period (1992-93) and with that of an earlier period (1980-84). For nonwaterfowl, North American Breeding Bird Survey data were used to compare trends in populations of certain species found in CRP, for the Periods 1966-86 (pre-CRP establishment) and 1987-92 (post-CRP cover establishment) in North Dakota.

50. **Conservation Reserve Program benefits on Henslow's sparrows within the United States.**
Herkert, J. R.
Journal of Wildlife Management 71(8): 2749-2751. (Nov. 2007)
NAL Call #: 410 J827
Descriptors: Conservation Reserve Program/ Henslow's sparrow/ Ammodramus henslowii
Abstract: Henslow's sparrow (Ammodramus henslowii) is one of North America's fastest declining songbirds. Population declines combined with a small global population have led to heightened conservation concern. I used data from the North American Breeding Bird Survey to assess the impact that the Conservation Reserve Program (CRP) has had on Henslow's sparrows throughout their United States breeding range. My analysis suggests local Henslow's sparrow population trends are correlated with CRP enrollment, with populations increasing more in areas with relatively high local CRP enrollment, and that CRP appears to be playing a significant role in reversing long-term population declines.
This citation is from AGRICOLA.

51. **Conservation Reserve Program bibliography.**
Allen, Arthur W.
Fort Collins, CO: Northern Prairie Wildlife Research Center, 1996.
Notes: Version 30SEP2002; Query-searchable bibliography.
http://www.npwrc.usgs.gov/resource/literatr/crpbib/index.htm
Descriptors: Conservation Reserve Program (CRP)/ wildlife habitat/ wildlife management/ cropland/ grassland
Abstract: This bibliography contains citations pertaining to the effects of the Conservation Reserve Program (CRP) on wildlife habitat. Selected additional references relevant to integration of agricultural policy, wildlife management, or other environmental objectives associated with management of agricultural ecosystems also are included.

52. **Conservation Reserve Program (CRP) contributions to avian habitat.**
Allen, A. W.
In: U.S. Fish and Wildlife Service Federal Aid Report, National Biological Survey; Fort Collins, CO: National Ecology Research Center, 1994.
Descriptors: Conservation Reserve Program/ United States/ avian conservation/ landscape management/ habitat management
Abstract: Discusses characteristics of CRP contracts with greatest potential benefits, landscape planning, and management recommendations.

53. **The Conservation Reserve Program: Good for birds of many feathers.**
Kantrud, H. A.; Koford, R. R.; Johnson, D. H.; and Schwartz, M. D.
North Dakota Outdoors 56(2): 14-17. (1993)
Descriptors: state conservation programs/ North Dakota/ Conservation Reserve Program/ population trends/ birds
Abstract: Examined avian species' use and population trends on CRP land in North Dakota.

54. **The Conservation Reserve Program - Planting for the Future: Proceedings of a National Conference.**
Allen, Arthur W. and Vandever, Mark W.
Reston, VA: U.S. Geological Survey; Scientific Investigations Report 2005-5145, 2005. 268 pp.
Notes: Conference held: June 6-9, 2004 at Fort Collins, Colorado.
http://www.fort.usgs.gov/Products/Publications/21490/21490.pdf
Descriptors: Conservation Reserve Program (CRP)/ conservation assessment/ cropland/ prairies/ shrublands/ wildlife
Abstract: In June 2004 the U.S. Department of Agriculture's Farm Service Agency (FSA), with support from the U.S. Geological Survey (USGS), held a three-day symposium on the Conservation Reserve Program (CRP) in Fort Collins, Colorado. These proceedings contain

papers by most of those who made presentations at the symposium, but some were unable to provide written papers. This shortcoming has been addressed in part by addition of papers presenting information on prairie grouse response to the CRP, long-term trends in Southern Plains CRP grassland vegetation, and discussion of FSA support of an investigation to regionally refine management of CRP grasslands to address ecological conditions in the short-grass prairie region.

55. **Conservation Reserve Program: Source or sink habitat for grassland birds in Missouri?**
McCoy, Timothy D.; Ryan, Mark R.; Kurzejeski, Eric W.; and Burger, Loren W.
Journal of Wildlife Management 63(2): 530-538. (1999)
NAL Call #: 410 J827; ISSN: 0022-541X.
Notes: Project Number: MO W-013-R.
Descriptors: Fringillidae/ Passeriformes/ Agelaius phoeniceus/ Ammodramus savannarum/ Carduelis tristis/ Geothlypis trichas/ Spiza americana/ Spizella pusilla/ Sturnella magna/ behavior/ birds/ communities/ Conservation Reserve Program/ ecosystems/ fecundity/ grasslands/ habitat management/ management/ nests-nesting/ species diversity/ wildlife/ wildlife-habitat relationships/ wild birds/ wildlife conservation/ federal programs/ natural resources/ land development, land reform, and utilization (macroeconomics)/ conservation programs/ grassland/ habitat/ reproduction/ statistics/ wildlife-habitat relationships/ population dynamics/ grasshopper sparrow/ field sparrow/ eastern meadowlark/ American goldfinch/ common yellowthroat/ dickcissel/ red winged blackbird/ Missouri/ Knox County/ Macon County/ Linn County
Abstract: The Conservation Reserve Program (CRP) has been credited with contributing substantially to the conservation of grassland birds. Although many species have nested on grasslands established under the CRP, little evidence of positive effect on populations has been reported. We measured reproductive rates and estimated fecundity of 7 grassland bird species in CRP fields in northern Missouri and compared those rates to estimates of fecundity needed to maintain stable populations (λ = 1). Under conservative assumptions of survival CRP fields seemingly were source habitats (fecundity exceeded levels necessary for λ = 1 for grasshopper sparrows (Ammodramus savannarum) and field sparrows (Spizella pusilla) in at least 2 of 3 years, 1995 P = 0.02, 1995 P < 0.001) and pooled over 3 years (Ps < 0.001). Although evidence was less compelling CRP fields were likely source habitat for eastern meadowlarks (Sturnella magna) and American goldfinches (Carduelis tristis). For American goldfinches, fecundity was greater than that necessary of λ = 1 in 1995 (P < 0.001), and pooled over 3 years (< 0.001). Our pooled estimate of fecundity was greater than necessary for λ = 1 for eastern meadowlarks (Ps < 0.001), but only under a liberal assumption of survival in 2 of 3 years (1993: P = 0.001; 1995: P = 0.088). Fecundity of common yellowthroats (Geothlypis trichas) varied substantially; therefore, source-sink status alternated among years, although the pooled estimate of fecundity was less than required for λ = 1 (P < 0.001). Dickcissel (Spiza americana) fecundity was consistently less than necessary for λ = 1 (conservative survival assumption; all Ps < 0.001; liberal survival assumption: 1994 P = 0.009, pooled P = 0.014). For red-winged blackbirds (Agelaius phoeniceus), CRP fields were consistently a sink habitat (all Ps < 0.001). Based on our evidence, the CRP likely has contributed to the conservation of grasshopper sparrows, field sparrows, and eastern meadowlarks. Although large numbers of dickcissels and red-winged blackbirds nested in CRP fields, there is little evidence that the CRP has contributed to populations of those species.

56. **Conservation Reserve Program: Tree thinning.**
United States, Farm Service Agency
Washington, D.C.: USDA, Farm Service Agency. (1999).
Notes: Fact sheet (United States. Farm Service Agency)
NAL Call #: aS930.C659 1999
Descriptors: Conservation Reserve Program---United States/ Forest thinning---United States/ Conservation of natural resources---United States/ Wildlife habitat improvement---United States
This citation is from AGRICOLA.

57. **Conservation Reserve: Yesterday, Today and Tomorrow, Symposium Proceedings.**
Joyce, L. A.; Mitchell, J. E.; and Skold, M. D.
Fort Collins, CO: Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; General Technical Report-RM 203, 1991. 71 p.
Notes: Meeting held January 14, 1991 at Washington, DC.
Descriptors: agriculture/ future planning projected/ land use/ environmental effects/ decision making/ implementation/ economic impacts/ reserves/ farm management/ contracts/ land ownership/ history/ wildlife/ recreation/ ecology/ crop yields/ land conservation/ resource conservation/ Agricultural Resources Conservation Program/ Food Security Act of 1985/ Farm Bill of 1990/ Conservation Reserve Program/ Great Plains Region United States/ natural resources and earth sciences/ natural resource management/ agriculture and food agricultural equipment/ facilities and operations/ urban and regional technology and development/ regional administration and planning
Abstract: Contents: The Conservation Reserve Program--How Did We Get Where We Are and Where Do We Go From Here; An Overview of the Agricultural Resources Conservation Program; Economics of Livestock and Crop Production on Post-CRP Lands; Landowner Options When CRP Ends; The Conservation Reserve Program: Effects on Soil, Water and Environmental Quality; Conservation Reserve Program Effects on Wildlife and Recreation; Future Costs and Benefits of Conservation Reserve Lands; Impacts of the Conservation Reserve Program in the Central Great Plains; Research Questions Related to the Conservation Reserve Program; Some Sociological and Ecological Effects of the Conservation Reserve Program in the Northern Great Plains; The CRP in Oregon's Columbia Basin: A Local Perspective.

58. **Conserving biological diversity and the Conservation Reserve Program.**
Szentandrasi, S.; Polasky, S.; Berrens, R.; and Leonard, J.
Growth Change 26(3): 383-404. (1995)
NAL Call #: HT390.G74; ISSN: 0017-4815 [GRCHDH].
Notes: Published: Lexington, Ky., College of Business and Economics, University of Kentucky; In the special issue: Wilderness areas. Paper presented at the conference,

"Wilderness areas, regional planning, and the quality of life" held October 8, 1994.
Descriptors: Conservation Reserve Program/ CRP/ habitat conservation/ biological diversity
This citation is from AGRICOLA.

59. **Le Conte's sparrows breeding in Conservation Reserve Program fields: Precipitation and patterns of population change.**
Igl, L. D. and Johnson, D. H.
In: Ecology and conservation of grassland birds of the western hemisphere/ Vickery, P. D. and Herkert, J. R.; Series: Studies in Avian Biology 19, 1999; pp. 178-186.
Descriptors: Conservation Reserve Program/ regional conservation programs/ Great Plains
Abstract: Discussed pattern of population change in Le Conte's Sparrows associated with changes in precipitation and moisture condition.

60. **Contributions of the Conservation Reserve Program to populations of breeding birds in North Dakota.**
Johnson, Douglas H. and Igl, Lawrence D.
Wilson Bulletin 107(4): 709-718. (1995)
NAL Call #: 413.8 W692; ISSN: 0043-5643
Descriptors: Aves/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ habitat/ North American Breeding Bird Survey
Abstract: Previous studies have shown that habitat provided by the Conservation Reserve Program (CRP), a feature of the 1985 Farm Bill. is used by many birds. The present study quantitatively assesses the importance of the CRP by estimating changes in breeding-bird populations of North Dakota projected if CRP land would revert to cultivation. Of 18 species that were common in CRP or crop fields or both, 12 were more abundant in CRP habitats. Six of these species had suffered significant population declines during 1967-1990. according to the North American Breeding Bird Survey. In contrast, none of the six species that were more common in cropland than in CRP fields had declined significantly. Termination of the Conservation Reserve Program and a return of enrolled land to cultivation is projected to cause populationdeclines in North Dakota exceeding 17% for Sedge Wren (Cistothorus platensis), Grasshopper Sparrow (Ammodramus savannarum), Savannah Sparrow (Passerculus sandwichensis), Dickcissel (Spiza americana), and Lark Bunting (Calamospiza melanocorys).

61. **Cover quality of Conservation Reserve Program grasslands in Minnesota, USA.**
Haroldson, K.; Kimmel, R.; and Riggs, M.
Gibier Faune Sauvage 15(4): 501-516. (1998);
ISSN: 0761-9243.
Notes: Numero Special Tome 1.
Descriptors: Phasianus colchicus (Phasianidae)/ Sturnella (Icteridae)/ farming and agriculture/ conservation measures/ grasslands/ cover quality/ Minnesota/ Conservation Reserve Program/ birds/ chordates/ vertebrates

62. **Creating quality quail habitat.**
Fiedler, David
Missouri Conservationist 63(5): 22-27. (2002);
ISSN: 0026-6515.
Full Text Available at: http://mdc.mo.gov/conmag/2002/05/40.htm
Descriptors: Galliformes/ Odontophoridae/ Colinus virginianus/ birds/ conservation/ conservation programs/ corridors/ ecosystem management/ ecosystems/ farmland/ fires and burns/ habitat management/ land, private/ landowners/ management/ riparian habitat/ wildlife/ quail
Abstract: The author explains the dedicated efforts of Ed Keifner to create a suitable habitat for quails at his Bollinger County, Missouri farm. Keifner was concerned about the low population of quails on his land. A private lands' conservationist attributed this to the thick growth of fescue and broomsedge in his fields, which was hampering the movement of quails. This could be altered by the use of controlled burning of the grassy areas and careful application of herbicides. Moreover, a dense brush cover like thick briar and brush tangles was required in the nearby woody area, which would serve as a nesting and brooding area for the quails. Apart from this, he was advised to establish a strip of vegetation along the stream bank to reduce soil erosion and improve water quality in the Little Whitewater River. This growth would also provide the quails with more cover. Nearly 32 acres of his property was dedicated to making this strip and 10,000 black walnut and burr oak seedlings were planted. He then controlled the growth of weeds around these seedlings. In addition, Kiefner's land was enrolled in the Conservation Reserve Program (CRP), which provided him financial aid from the US Department of Agriculture. His efforts have yielded positive results. In 2000, the Conservation Department set up the Private Land Services Division for providing assistance to over 300,000 private landowners. Their publication "Private Land Services" gives details on all their services and programs.

63. **Creating wildlife habitat through federal farm programs: An objective-driven approach.**
Burger, L. W.
Wildlife Society Bulletin 34(4): 994-999. (2006)
NAL Call #: SK357.A1W5; ISSN: 00917648.
Notes: doi: 10.2193/0091-7648(2006)34[994:CWHTFF]2.0.CO;2.
Descriptors: conservation planning/ Conservation Reserve Program/ Farm Bill/ objective-driven/ private land/ wildlife habitat
Abstract: Conservation programs administrated by the United States Department of Agriculture under the Farm Bill have tremendous potential to impact wildlife habitat and populations on private land. Recent comprehensive reviews demonstrate that private landowners who participate in these programs have established habitats that may contribute to sustaining some regional wildlife populations. However, I argue that if Farm Bill conservation program lands are to consistently provide habitat that supports viable wildlife populations, conservation planners must have a better understanding of species-specific habitat requirements and ecological processes. Concomitantly, wildlife biologists also must have a working knowledge of the conservation programs, practices, and landowner needs and eligibility requirements. This understanding is

then translated to changes on the landscape through comprehensive planning and implementation at the farm scale. I argue that, all too often, landowner's selection of conservation practices is program-driven. Program-driven implementation is less likely to result in quality wildlife habitat. I contend that the consistent application of an objective-driven approach to farm-scale conservation planning is more likely to produce habitats that sustain viable wildlife populations. Under this approach, landowner conservation objectives drive management practices and management practices lead to program selection, instead of program requirements driving management practices.

64. **The CRP and wildlife habitat.**
Bucklin, R.
Agricultural Outlook (AO)(162): 30-31. (Apr. 1990)
NAL Call #: aHD1751.A422; ISSN: 0099-1066
Descriptors: wildlife/ habitats/ land management/ farm surveys/ farm income/ United States/ Conservation Reserve Program/ farm costs and returns surveys
This citation is from AGRICOLA.

65. **CRP land and game bird production in the Texas High Plains.**
Berthelsen, P. S.; Smith, L. M.; and Coffman, C. L.
Journal of Soil and Water Conservation 44(5): 504-507. (1989)
NAL Call #: 56.8 J822 ; ISSN: 0022-4561
Descriptors: agricultural practices/ game management/ Aves/ Texas/ government policy/ habitat conservation/ birds/ wildlife management
Abstract: Soil Conservation Service personnel were surveyed about the land enrolled in the Conservation Reserve Program (CRP) in the Southern High Plains of Texas (71 counties, 903,215 ha). Information included type of cover established, land enrolled, establishment success, and cost of establishment for five conservation practices (CP1, 2, 4, 10, 12). Land in permanent introduced grasses (CP1) and permanent native grasses (CP2) accounted for 98% of the total CRP land. Establishment costs for the most common cover types averaged $142.90/ha ($57.85/acre). Establishment success was 87%. Ring-necked pheasant and waterfowl production in a four-county area was estimated on selected CRP grass combinations (blue grama/side-oats grama mixtures, blue grama/Kleingrass mixtures, and blue grama/old world bluestem mixtures) using 1988 nesting information and land enrollment figures. Estimated pheasant production was 174,204 chicks/year. Water-fowl production was estimated at 1,426 ducklings/year.

66. **CRP, succession, and Brewer's sparrows: Advantages of a long-term, federal land retirement program.**
Igl, Lawrence D. and Murphy, Lisa A.
South Dakota Bird Notes 48(3): 69-70. (1996); ISSN: 0038-3252
Descriptors: Fringillidae/ Passeriformes/ Spizella breweri/ behavior/ birds/ breeding/ conservation programs/ Conservation Reserve Program/ distribution/ ecosystems/ grasslands/ habitat use/ home range-territory/ range extension/ succession/ vocalization/ Brewer's sparrow/ Artemisia spp/ South Dakota: Butte County
Abstract: Brewer's sparrows have extended their breeding range to the grasslands created by the Conservation Reserve Program in Butte County, South Dakota. These grasslands provide habitat for sagebrush nesting and other shrubland bird species.

67. **Decline of the red-winged blackbird population in Ohio correlated to changes in agriculture (1965-1996).**
Blackwell, B. F. and Dolbeer, R. A.
Journal of Wildlife Management 65(4): 661-667. (2001)
NAL Call #: 410 J827; ISSN: 0022541X
Descriptors: Agelaius phoeniceus/ habitat/ hay/ Ohio/ population decline/ red-winged blackbird/ agricultural land/ habitat selection/ land use change/ passerines/ United States/ Agelaius phoeniceus/ Glycine max/ Medicago sativa/ Zea mays
Abstract: Based on North American Breeding Bird Survey (BBS) data since 1966, Ohio has traditionally hosted 1 of the highest breeding season densities of red-winged blackbirds (Agelaius phoeniceus) of any U.S. state or Canadian province. However, from 1966 through 1996, breeding populations of red-winged blackbirds in Ohio showed a marked decline ($\bar{x}$% change/yr in birds per route = -3.9), with breeding population indices decreasing by over 53%. Because the red-winged blackbird successfully adapted to habitats created by agricultural expansion over the last century and became a recognized pest of crops such as corn (Zea mays), understanding the decline of this species in Ohio is important from both ecological and damage control perspectives. We examined 35 crop and climatic factors relative to their relationship with the observed breeding population trend for the red-winged blackbird in Ohio 1966 to 1996. Each year, we found that the area of non-alfalfa (Medicago sativa) hay harvested, the combined area of corn and soybeans (Glycine max) harvested, the area of non-alfalfa hay cut by 30 May of the index year (1966-1996), and the area of hay (all types) cut by 30 May of the year prior to the index best explained the variance in the breeding population trend of the red-winged blackbird in Ohio. Given our findings, we suggest that a long-term population trend for this abundant bird in Ohio is negatively associated with the efficiency and expansion of modern agriculture.

68. **Demographic characteristics of a grasshopper sparrow population in a highly fragmented landscape of western New York State.**
Balent, Karla L. and Norment, Christopher J.
Journal of Field Ornithology 74(4): 341-348. (2003)
NAL Call #: 413.8 B534; ISSN: 0273-8570
Descriptors: Ammodramus savannarum/ Passeriformes/ Emberizidae/ population studies/ reproduction/ terrestrial ecology/ adult return rates/ breeding biology/ colonization/ demographic characteristics/ dispersal/ extirpation/ fragmented landscape/ grassland habitat/ habitat loss/ nest success/ population ecology/ site fidelity/ territorial defense/ home range/ territory/ continuous grassland habitat maintenance/ distribution/ grasslands/ ecosystems/ habitat management/ Monroe County, NY/ Mendon Ponds County Park/ New York/ status/ survival/ behavior/ conservation/ wildlife management/ habitat use/ land zones
Abstract: We studied the breeding biology, site fidelity, and dispersal of Grasshopper Sparrows (Ammodramus

savannarum) from 1996 to 2000 in a fragmented landscape in western New York State. Ten fields (1.8-13.2 ha) contained territorial male Grasshopper Sparrows during the study; total territorial males in the study area varied between 31 and 19 birds. In 1996, eight fields were occupied; five extinctions and two colonizations occurred between 1997-2000. Fields that suffered extinctions were smaller than fields in which subpopulations persisted or colonizations occurred. Adult return rates (0.33 vs. 0.16), nest success (0.59 vs. 0.25) and average number of fledglings/female/year (2.3 vs. 1.3) tended to be higher in fields ≥ 8 ha. Estimates of λ, the finite rate of increase, were 0.23 for small fields and 0.46 for large fields. Although sample sizes were small, our data suggest that return rates and productivity were greater in large than in small habitat patches. However, even the larger habitat patches in our study area appeared to function as population sinks, suggesting that the Grasshopper Sparrow population is unlikely to persist without immigration. Survival prospects for our study population are poor, given its demographic characteristics and the fragmented nature and continuing loss of grassland habitat. Our results suggest that conservation efforts in the Northeast should focus on protecting large patches of continuous grassland habitat.

69. **Demographics of northern bobwhite on agricultural and intensively-managed bobwhite plantation landscapes.**
Hughes, Daymond W.; Terhune, Theron M.; Sisson, D. Clay; and Stribling, H. Lee
Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 59: 30-42. (2005)
NAL Call #: SK1.S6; ISSN: 0276-7929
Descriptors: conservation measures/ reproduction/ behavior/ ecology/ habitat utilization/ terrestrial habitat/ man-made habitat/ land zones/ Colinus virginianus: habitat management/ reproductive productivity/ home range/ population dynamics/ demographic studies/ agricultural vs intensively managed plantation landscapes/ distribution within habitat/ habitat preference/ forest and woodland/ cultivated land habitat/ Georgia/ Baker County/ Aves, Galliformes, Phasianidae/ birds/ chordates/ vertebrates
Abstract: The declining bobwhite populations evident throughout the Southeast are cause for concern. Whereas habitat loss and/or intensified agriculture have been implicated as two potential causal mechanisms for these declines, few studies have directly compared bobwhite demographics between agricultural and managed bobwhite plantation landscapes. Therefore, we monitored northern bobwhite (Colinus virginianus; hereafter, bobwhite) via radiotransmitters (N = 472) on a center-pivot irrigated agricultural landscape (N = 154) and an adjacent, intensively-managed bobwhite plantation (N = 318) to evaluate differences in home range, habitat use, survival, and nest survival between these two landscapes. Winter covey home ranges were larger during fall-winter 1998-99 on the agriculture site (P < 0.001). Coveys on the agricultural landscape used young planted pines (Pinus spp.) greater than expected (P < 0.05) during both years. Annual survival did not differ between sites during 1997-98 (P = 0.199) but was lower on the agriculture site (0.081, SE = 0.04) than the plantation (0.297, SE = 0.05) during 1998-99 (P < 0.001). Daily nest survival was lower on the agriculture site (0.939, SE = 0.02) than the plantation (0.979, SE = 0.01) during the 1998 nesting season (P = 0.030) but not during 1997 (P = 0.782). We surmised that large home ranges, low over-winter survival, and low nest survival observed on the agriculture site was related to poor habitat conditions and subsequent limited food resources. Thus, when agricultural landowner objectives are to benefit bobwhite, management endeavors should focus on augmenting habitat in agricultural fields, particularly during fall and winter, and, improving existing habitats (e.g., dry corners, young planted pines).

70. **Density and fledgling success of grassland birds in Conservation Reserve Program fields in North Dakota and west-central Minnesota.**
Koford, R. R.
Studies in Avian Biology 19: 187-195. (1999)
NAL Call #: QL671.S8
Descriptors: Conservation Reserve Program/ State conservation programs/ Minnesota/ North Dakota
Abstract: Studied how CRP field habitat influences grassland bird density and fledgling success.

71. **Diets of swift foxes (Vulpes velox) in continuous and fragmented prairie in northwestern Texas.**
Kamler, J. F.; Ballard, Warren B.; Wallace, Mark C.; and Gipson, Philip S.
Southwestern Naturalist 52(4): 504-510. (Dec. 2007)
NAL Call #: 409.6 So8
Descriptors: swift foxes/ Vulpes velox/ diets/ habitat fragementation/ prairies/ wildlife habitat/ Texas
Abstract: Distribution of the swift fox (Vulpes velox) has declined dramatically since the 1800s, and suggested causes of this decline are habitat fragmentation and transformation due to agricultural expansion. However, impacts of fragmentation and human-altered habitats on swift foxes still are not well understood. To better understand what effects these factors have on diets of swift foxes, scats were collected in northwestern Texas at two study sites, one of continuous native prairie and one representing fragmented native prairie interspersed with agricultural and fields in the Conservation Reserve Program. Leporids, a potential food source, were surveyed seasonally on both sites. Diets of swift foxes differed between sites; insects were consumed more on continuous prairie, whereas mammals, birds, and crops were consumed more on fragmented prairie. Size of populations of leporids were 2–3 times higher on fragmented prairie, and swift foxes responded by consuming more leporids on fragmented (11.1% frequency occurrence) than continuous (3.8%) prairie. Dietary diversity was greater on fragmented prairie during both years of the study. Differences in diets between sites suggested that the swift fox is an adaptable and opportunistic feeder, able to exploit a variety of food resources, probably in relation to availability of food. We suggest that compared to continuous native prairie, fragmented prairie can offer swift foxes a more diverse prey base, at least within the mosaic of native prairie, agricultural, and fields that are in the Conservation Reserve Program.

72. **Diversity of arthropod prey of grassland birds on different Conservation Reserve Program habitat types.**
Mcintyre, Nancy E.
In: 87th Annual Meeting of the Ecological Society of America and the 14th Annual International Conference of the Society for Ecological Restoration, Tucson, Arizona, USA; August 04-09, 2002.; Vol. 87.; pp. 391; 2002.
Descriptors: biodiversity/ terrestrial ecology: ecology, environmental sciences/ Conservation Reserve Program/ arthropod community/ avian prey abundance/ avian prey diversity/ habitat type/ prey diversity/ vegetation structure/ vegetative diversity/ vegetative physiognomy

73. **Do artificial nests reveal meaningful patterns of predation in Kansas grasslands?**
Robel, R. J.; Hughes, J. P.; Keane, T. D.; and Kemp, K. E.
Southwestern Naturalist 48(3): 460-464. (2003)
NAL Call #: 409.6 So8 ; ISSN: 0038-4909
Descriptors: environment-ecology/ duck nests/ success/ prairie/ fragmentation/ dickcissels/ habitats/ cropland/ density/ birds/ Iowa
Abstract: We determined the fates of artificial and natural bird nests in Conservation Reserve Program (CRP) fields in northeastern Kansas from mid May through early August 1994. The CRP fields had been planted to native grasses in 1988 or 1989. Artificial nests contained Japanese quail (Coturnix japonica) or house sparrow (Passer domesticus) eggs in nest baskets in bunchgrass clumps to simulate nests of dickcissels (Spiza americana), the most common avian species nesting in the CRP fields. Natural dickcissel nests were found by rope dragging and intensive searches of the CRP fields. Losses among 562 artificial nests did not differ by egg type; however, the 9.8% loss of artificial nests was significantly lower than the 70.1% loss-level among 97 natural dickcissel nests in those CRP fields. The daily survival rate for artificial nests was 0.99, significantly more than the 0.92 for natural dickcissel nests. An assessment of nest depredation based on data from artificial nests might not be representative of depredation on natural nests in grasslands.

74. **Do riparian buffer strips mitigate the impacts of clearcutting on small mammals?**
Cockle, K. L. and Richardson, J. S.
Biological Conservation 113(1): 133-140. (Sept. 2003)
NAL Call #: S900.B5
Descriptors: forestry/ Insectivores/ populations/ riparian zones/ rodents/ clearcutting/ mammal/ riparian zone
Abstract: We assessed the impact of clearcutting on small mammals in riparian areas and evaluated riparian buffer strips as a tool for conserving small mammals in managed forests. Over two summers, we trapped small mammals of seven species in riparian areas in southwestern British Columbia, Canada. Communities of small mammals were compared across three different habitat types: (1) clearcut to the stream bank, (2) clearcut with a 30 m riparian buffer strip, and (3)control (no logging). Species richness was significantly lower in clearcuts than in controls and buffers. On clearcut sites, creeping voles were more abundant, but red-backed voles and dusky shrews were less abundant than at the control sites. At sites with riparian buffer strips, both voles were present in numbers similar to those found in controls, but dusky shrews were less common. Significantly more deer mice and creeping voles were infested with bot flies at clearcut sites than at buffer sites, and no animals were infested at any of the control sites. Riparian reserves appear to be useful in reducing the short-term impacts of clearcutting on small mammal communities, though they do not eliminate these impacts altogether.

75. **Does habitat fragmentation influence nest predation in the shortgrass prairie?**
Howard, Melissa N.; Skagen, Susan K.; and Kennedy, Patricia L.
Condor 103(3): 530-536. (2001)
NAL Call #: QL671.C6; ISSN: 0010-5414
Descriptors: birds/ behavior/ nest predation/ nests-nesting/ ecosystems/ prairies/ grasslands/ agricultural practices/ habitat islands/ habitat alterations/ Conservation Reserve Program/ Colorado, Northeastern
Abstract: The authors examined the effects of habitat fragmentation and vegetation structure of shortgrass prairie and Conservation Reserve Program (CRP) lands on predation rates of artificial and natural nests in northeastern Colorado. The CRP provides federal payments to landowners to take highly erodible cropland out of agricultural production. In this study area, CRP lands have been reseeded primarily with non-native grasses, and this vegetation is taller than native shortgrass prairie. The authors measured three indices of habitat fragmentation (patch size, degree of matrix fragmentation, and distance from edge), none of which influenced mortality rates of artificial or natural nests. Vegetation structure did influence predation rates of artificial nests; daily mortality decreased significantly with increasing vegetation height. Vegetation structure did not influence predation rates of natural nests. CRP lands and shortgrass sites did not differ with respect to mortality rates of artificial nests. The study area is only moderately fragmented; 62% of the study area is occupied by native grassland. The authors conclude that the extent of habitat fragmentation in their study area does not result in increased predation in remaining patches of shortgrass prairie habitat.

76. **Duck nest success on Conservation Reserve Program land in the Prairie Pothole region.**
Kantrud, H. A.
Journal of Soil and Water Conservation 48(3): 238-242. (May 1993-June 1993)
NAL Call #: 56.8 J822 .
http://www.npwrc.usgs.gov/resource/birds/crpdns/index.htm
Descriptors: waterfowl/ ducks/ nesting/ Conservation Reserve Program/ Prairie Pothole region
Abstract: Implementing Agricultural Conservation Practices: Barriers and Incentives is one in a multi-volume set developed by the Water Quality Information Center at the National Agricultural Library in support of the U.S. Department of Agriculture's Conservation Effects Assessment Project (CEAP). The bibliography is a guide to recent literature examining agricultural producers' views of conservation programs and practices. It provides people working in the area of agriculture and the environment with

a guide to information resources that focus on the psychological and socioeconomic factors that influence agricultural producers' behavior with regard to environmental issues.
This citation is from AGRICOLA.

77. **The dynamics of nongame bird breeding ecology in Iowa alfalfa fields.**
Frawley, B. J.
Ames, IA: Iowa State University, 1989.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ Iowa
Abstract: Nesting, abundance, and density of nongame birds in Iowa alfalfa fields were addressed and linked to CRP.

78. **Earthworm, infiltration, and tillage relationships in a dryland pea-wheat rotation.**
Wuest, Stewart B.
Applied Soil Ecology 18(2): 187-192. (2001)
NAL Call #: QH541.5.S6 A67; ISSN: 0929-1393
Descriptors: commercial activities/ ecology/ population dynamics/ terrestrial habitat/ man-made habitat/ land and freshwater zones/ Aporrectodea trapezoides (Oligochaeta): farming and agriculture/ farming practices/ population density/ soil habitat/ cultivated land habitat/ Oregon/ Pendleton/ cultivated soil habitat/ farming practices effects/ Oligochaeta/ Annelida/ Annelids/ invertebrates
Abstract: Dryland farming in the Mediterranean climate of the Pacific Northwest, USA supports extremely low earthworm populations under conventional tillage. Increases in earthworm populations are being observed in fields under no-till cropping systems. A 30+ year experiment with four tillage levels in a pea (Pisum sativum L.)-winter wheat (Triticum aestivum L.) rotation was evaluated for earthworm populations and ponded infiltration rates. Where tillage has been limited to 2.5 cm depth, Apporectodea trapezoides (Duges) mean population was 25 m-2. Plots subject to tillage by plow (25 cm depth) or chisel (35 cm depth) averaged less than 4 earthworms m-2. The shallow tillage treatment also had the highest average infiltration rate of 70 mm h-1 compared to 36 for chisel, 27 for spring plow, and 19 mm h-1 for fall plow treatments. The highly variable nature of earthworm counts and infiltration measurements prevented conclusive correlation between the two, but increases in both can be attributed to minimum tillage.

79. **Earthworm (Lumbricidae) survey of North Dakota fields placed in the U.S. Conservation Reserve Program.**
Deibert, E. J. and Utter, R. A.
Journal of Soil and Water Conservation 58(1): 39-45. (2003)
NAL Call #: 56.8 J822; ISSN: 0022-4561
Descriptors: electrical conductivity/ environmental impact/ habitat selection/ habitats/ nitrate nitrogen/ particle size/ phosphorus/ population distribution/ potassium/ precipitation/ sand fraction/ soil chemical properties/ soil organic matter/ soil pH/ soil physical properties/ spatial distribution/ surveys/ survival/ Aporrectodea caliginosa/ earthworms/ Lumbricus rubellus/ North Dakota/ United States/ Dendrobaena octaedra/ Aporrectodea/ Lumbricidae/ Oligochaeta/ Annelida/ invertebrates/ animals/ Dendrobaena/ Lumbricus
Abstract: Twenty-three field sites in North Dakota, where highly erodible soil is placed under permanent vegetation in the U.S. Conservation Reserve Program (CRP) from five to eight years, were surveyed for the presence or absence of earthworms. Soils were sampled to determine chemical and physical properties, and soil cores were collected to estimate earthworm populations. Earthworm species identified at 12 CRP sites were Aporrectodea tuberculata (Eisen), Aporrectodea trapezoids (Duges), Aporrectodea caliginosa (Savigny), Dendrobaena octaedra (Savigny), and Lumbricus rubellus (Hoffmeister). Sites with earthworms were associated with organic matter levels of greater than 2.5%. Sand content of the 11 sites without earthworms averaged 67% (± 13), and the soil usually contained what appeared to be sharp shiny crystals or grains that might not be ideal for earthworm survival. Dendrobaena octaedra and Lumbricus rubellus were found at sites with the highest soil organic matter and nitrate-N levels plus low sand percent. Soil P, K, pH and EC levels were not related to the presence or absence of earthworms in these CRP sites. Total earthworm population estimates from five CRP sites averaged 6.3 million ha-1 (± 4.7), with adults, juveniles, and cocoons at 0.6 (± 0.4), 4.5 (± 3.1), and 1.2 (± 2.0) million ha-1, respectively. Earthworm populations along a 90-meter transect from the edge of the CRP field were similar when averaged over the five sites. An estimate of population at the other seven earthworm sites was not possible because environmental stress as earthworms tended to migrate only to areas in the field where taproot plant species were located. The presence of wetlands or tree habitat in these CRP fields could not be used as criteria for determining the presence of earthworms.

80. **Eastern meadowlarks nesting in rangelands and Conservation Reserve Program fields in Kansas.**
Granfors, D. A.; Church, K. E.; and Smith, L. M.
Journal of Field Ornithology 67(2): 222-235. (1996)
NAL Call #: 413.8 B534; ISSN: 0273-8570
Descriptors: Sturnella magna/ nests/ site selection/ rangelands/ old fields/ ecosystem management/ Kansas/ birds/ United States
Abstract: Eastern Meadowlark (Sturnella magna) nesting habitat was studied to make management recommendations for fields enrolled in a federal land retirement program. We compared available microhabitat, nest-site selection, and nest success on rangelands and Conservation Reserve Program (CRP) fields in eastern Kansas. Daily nest survival rates and numbers fledged per female did not differ significantly between land-use types, but the power of these tests was low. Predation was the primary source of nest failure throughout incubation, hatching, and nestling stages; abandonment, trampling, inviability, and unknown causes also were important during incubation. Mowing CRP fields was a source of nest failure and also induced adults to abandon some fields. CRP fields had a significantly higher percent, depth, and density of litter cover; a taller herbaceous canopy; less herbaceous cover; and more standing dead cover than rangelands. Differences in habitat structure indicate that CRP has increased the diversity of available nesting habitats. Eastern Meadowlarks selected nest sites with significantly greater litter cover, higher proportion of grass, more

uncompacted litter, and more structural homogeneity than available on random plots. Delay of mowing and prescribed burning are recommended to enhance and maintain habitat suitability for nesting Eastern Meadowlarks in CRP fields.

81. **Ecology of Columbian sharp-tailed grouse associated with Conservation Reserve Program and reclaimed surface mine lands in northwestern Colorado.**
Boisvert, J. H.
Moscow, USA: University of Idaho, 2002.
Notes: Thesis
Descriptors: sharp-tailed grouse/ Conservation Reserve Program/ reclaimed surface mine lands/ Colorado

82. **Effect of field borders and nest-predator reduction on abundance of northern bobwhites.**
Palmer, William E.; Wellendorf, Shane D.; Gillis, James R.; and Bromley, Peter T.
Wildlife Society Bulletin 33(4): 1398-1405. (2005)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: conservation measures/ nutrition/ diet/ prey/ ecology/ community structure/ predators/ man-made habitat/ land zones/ Colinus virginianus: habitat management/ fallow field borders/ relative abundance/ fallow field borders and mammalian nest predation reduction effects/ farm habitat/ mammalian predators/ cultivated land habitat/ North Carolina/ Hyde/ Tyrell and Wilson County/ Aves, Galliformes, Phasianidae/ birds/ carnivores/ chordates/ mammals/ marsupials/ vertebrates
Abstract: Fallow-field borders along edges of crop fields have been promoted for increasing northern bobwhites (Colinus virginianus) on farms and are a component of recovery plans for this species. However, research on bobwhite population response to field-border practices is sparse. Previous research on 2 farms documented increased use of farm fields and greater reproduction by bobwhites on farms with field borders, but nesting success was low during May and June. Bobwhite population response to field-border practices may increase when they are combined with nest-predator reduction on farms. Effect of nest-predator reduction on bobwhite populations on farmed landscapes has not been investigated in the Southeast. Therefore, we tested the effects of field borders and mesomammal nest-predator reduction on bobwhite abundance on 12 farms in eastern North Carolina, 1997-1999. We applied treatments to farms as factorial combinations. Reduction of mesomammal nest predators, including raccoons (Procyon lotor), Virginia opossums (Didelphis virginiana), and foxes (Urocyon cinereoargenteus and Vulpes vulpes), Occurred from February-May of each year. To assess bobwhite response to treatments, we measured summer abundance of males using variable-radius point counts and covey abundance on farms in September and October using morning covey-call surveys. Bobwhites were more abundant on farms with field borders during summer (P=0.08). On field-border farms we heard 1.8x the number of coveys heard on farms without field borders (P=0.004). Summer abundance of bobwhites did not differ as a result of predator reductions (P=0.37), and we heard slightly fewer coveys on predator-reduction farms (P =0.084) during autumn. However, we heard more coveys on farms with both field borders and predator reduction compared to all other farms (P=0.022). Field-border systems were a practical management technique to increase autumn abundance of bobwhites on individual farms in eastern North Carolina.

83. **Effects of agricultural diversification on the abundance, distribution, and pest control potential of spiders: A review.**
Sunderland, K. and Samu, F.
Entomologia Experimentalis et Applicata 1: 1-13. (2000); ISSN: 0013-8703
Descriptors: population density/ population dynamics/ agricultural practices/ pest control/ Araneae/ agriculture/ applied entomology
Abstract: A review of the literature showed that spider abundance was increased by diversification in 63% of studies. A comparison of diversification modes showed that spider abundance in the crop was increased in 33% of studies by `aggregated diversification' (e.g. intercropping and non-crop strips) and in 80% of studies by `interspersed diversification' (e.g., undersowing, partial weediness, mulching and reduced tillage). It is suggested that spiders tend to remain in diversified patches and that extending the diversification throughout the whole crop (as in interspersed diversification) offers the best prospects for improving pest control. There is little evidence that spiders walk in significant numbers into fields from uncultivated field edges, but diversification at the landscape level serves to foster large multi-species regional populations of spiders which are valuable as a source of aerial immigrants into newly planted crops. There are very few manipulative field studies where the impact of spiders on pests has been measured in diversified crops compared with undiversified controls. It is encouraging, however, that in those few studies an increased spider density resulted in improved pest control. Future work needs are identified.

84. **Effects of alternative cotton agriculture on avian and arthropod populations.**
Cederbaum, S. B.; Carroll, J. P.; and Cooper, R. J.
Conservation Biology 18(5): 1272-1282. (2004)
NAL Call #: QH75.A1C5; ISSN: 08888892.
Notes: doi: 10.1111/j.1523-1739.2004.00385.x.
Descriptors: agroecosystems/ alternative agriculture/ clover/ conservation tillage/ cover crop/ integrated pest management/ r elay stripcover/ songbirds/ agricultural ecosystem/ arthropod/ conservation/ cotton/ songbirds/ Georgia/ Arthropoda/ Aves/ Galliformes/ Gossypium/ Gossypium hirsutum/ Passeri/ Trifolium
Abstract: Among the major agricultural crops in the southeastern United States, cotton (Gossypium hirsutum L.) generally provides the least suitable habitat for most early successional songbirds. Newer cropping approaches, such as use of conservation tillage and stripcover cropping, offer hope for improving the ecological value of cotton fields. We examined the effects of clover stripcover cropping with conservation tillage versus conventionally grown cotton with either conventional or conservation tillage on avian and arthropod species composition and field use in east-central Georgia. Stripcover fields had higher bird densities and biomass and higher relative abundance of arthropods than both conservation tillage and conventional

fields. During migration and breeding periods, total bird densities on stripcover fields were 2-6 times and 7-20 times greater than on conservation and conventional fields, respectively. Abundance and biomass for epigeal arthropods were also greatest on stripcover fields during much of the breeding season. Although the clover treatment attracted the highest avian and arthropod densities, conservation fields still provided more wildlife and agronomic benefits than conventional management. Our findings suggest that both conservation tillage and stripcropping systems will improve conditions for birds in cotton, with stripcropped fields providing superior habitat. The reduction of inputs possible with the clover system could allow farmers to lower costs associated with conventional cotton production by $282-317/ha. This reduction of input, coupled with similar or possibly increased yield over conventional systems makes stripcover cropping not only a good choice for reducing negative impacts on wildlife and surrounding ecosystems, but also an economically desirable one.

85. **Effects of burning and discing Conservation Reserve Program fields to improve habitat quality for northern bobwhite (Colinus virginianus).**
Greenfield, K. C.; Chamberlain, M. J.; Burger, L. W.; and Kurzejeski, E. W.
American Midland Naturalist 149(2): 344-353. (Apr. 2003)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: vegetation/ wildlife/ Conservation Reserve Program/ northern bobwhite/ Colinus virginianus
Abstract: Since 1985 considerable expanses of highly erodible cropland have been enrolled in the Conservation Reserve Program (CRP). Areas enrolled in CRP provide wildlife habitat; however, habitat quality and specific resources on these sites vary in relation to seasonal biological processes of target wildlife species, planted cover and vegetation succession. Throughout the southeastern United States habitat quality for early successional species, such as northern bobwhite (Colinus virginianus), may decline as CRP grasslands age. Although disturbance may-enhance and maintain habitat quality for bobwhite, concerns regarding perceived conflicts between wildlife habitat and soil erosion objectives of the CRP persist. During 1995 and 1996 we evaluated effects of strip- discing or prescribed burning on vegetation structure and composition and soil erosion in fescue (Festuca arundiacea) dominated CRP fields in Mississippi. Fall discing generally increased percentage bare ground and plant diversity and decreased percentage litter cover and litter depth. Fall discing enhanced bobwhite habitat quality, but responses diminished by the second growing season post treatment. Burning increased plant diversity and improved quality of habitat for bobwhite. Soil loss for all treatments was within United States Department of Agriculture tolerable limits. Discing or burning intensity on CRP fields could be increased without compromising soil erosion provisions of CRP.

86. **Effects of conservation practice, mowing, and temporal changes on vegetation structure on CRP fields in northern Missouri.**
McCoy, Timothy D.; Kurzejeski, Eric W.; Burger, Loren W.; and Ryan, Mark R.
Wildlife Society Bulletin 29(3): 979-987. (2001)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: conservation measures/ terrestrial habitat/ man-made habitat/ land and freshwater zones/ Aves: habitat management/ grassland/ cultivated land habitat/ Conservation Reserve Program fields/ vegetation structure/ habitat conservation value/ Missouri/ North/ fields management/ birds/ chordates/ vertebrates

87. **Effects of Conservation Reserve Program field age on avian relative abundance, diversity, and productivity.**
Millenbah, K. F.; Winterstein, S. R.; Campa, H.; Furrow, L. T.; and Minnis, R. B.
Wilson Bulletin 108(4): 760-770. (1996)
NAL Call #: 413.8 W692; ISSN: 0043-5643
Descriptors: Aves/ species richness/ abundance/ productivity/ fields/ age/ Michigan/ birds/ United States
Abstract: Introduced grass dominated Conservation Reserve Program (CRP) fields were monitored in summer 1992 in Gratiot County, Michigan, to determine the relationship between field age and avian relative abundance, diversity, and productivity. Younger CRP fields (1-2 years old), best described as a combination of forbs and bare ground, had the greatest diversity and relative abundance of avian species. Older CRP fields (3-5/6 years old) were a combination of grasses and deep litter cover and had the greatest avian productivity. We recommend that after 3-5 growing seasons CRP fields be manipulated to provide a variety of successional stages to maintain simultaneously high avian relative abundance, diversity, and productivity.

88. **Effects of Conservation Reserve Program seeding regime on harvester ants (Pogonomyrmex), with implications for the threatened Texas horned lizard (Phrynosoma cornutum).**
McIntyre, N. E.
Southwestern Naturalist 48(2): 274-277. (2003)
NAL Call #: 409.6 So8 ; ISSN: 0038-4909
Descriptors: environment-ecology/ fire ants/ hymenoptera/ formicidae/ grassland/ birds
Abstract: I compared the presence and abundance of nest-sites made by harvester ants (Pogonomyrmex), the primary prey for the endangered Texas horned lizard (Phrynosoma cornutum), among restored grassland plots planted in different grass species and indigenous prairie. The restored plots had been seeded as part of the Conservation Reserve Program (CRP) as exotic monocultures of either Old World bluestem (Bothriochloa ischaemum) or weeping lovegrass (Eragrostis curvula), or as mixtures of native grasses (both with and without buffalograss, Buchloe dactyloides). On average, the fewest ant mounds were found on Old World bluestem plots, whereas the indigenous grassland had the highest density of harvester ant mounds. However, there were no significant differences between native and exotic CRP plantings. Results obtained from a simultaneous

visual survey for Texas horned lizards corroborate these findings. Thus, there is no evidence that CRP plots planted in exotic grasses are significantly poorer habitat for Texas horned lizards in terms of ant abundance than native grass plantings.

89. **Effects of CRP field age and cover type on ring-necked pheasants in eastern South Dakota.**
Eggebo, S. L.; Higgins, K. F.; Naugle, D. E.; and Quamen, F. R.
Wildlife Society Bulletin 31(3): 779-785. (2003)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: environment-ecology/ Conservation Reserve Program/ cool season/ cover/ CRP/ habitat/ Phasianus colchicus/ ring necked pheasant/ South Dakota/ warm season/ Conservation Reserve Program/ grassland bird conservation/ vegetation/ populations/ abundance/ models
Abstract: Loss of native grasslands to tillage has increased the importance of Conservation Reserve Program (CRP) grasslands to maintain ring-necked pheasant (Phasianus colchicus) populations. Despite the importance of CRP to pheasants, little is known about the effects of CRP field age and cover type on pheasant abundance and productivity in the northern Great Plains. Therefore, we assessed effects of these characteristics on pheasant use of CRP fields. We stratified CRP grasslands (n=42) by CRP stand age (old [10-13 yrs] vs. new [1-3 yrs] grasslands) and cover type (CP1 [cool-season grasslands] vs. CP2 [warm-season grasslands]) in eastern South Dakota and used crowing counts and roadside brood counts to index ring-necked pheasant abundance and productivity. Field-age and cover-type effects on pheasant abundance and productivity were largely the result of differences in vegetation structure among fields. More crowing pheasants were recorded in old cool-season CRP fields than any other age or cover type, and more broods were recorded in cool- than warm-season CRP fields. Extending existing CRP contracts another 5-10 years would provide the time necessary for new fields to acquire the vegetative structure used most by pheasants without a gap in habitat availability. Cool-season grass-legume mixtures (CP1) that support higher pheasant productivity should be given equal or higher ratings than warm-season (CP2) grass stands. We also recommend that United States Department of Agriculture administrators and field staff provide broader and more flexible guidelines on what seed mixtures can be used in CRP grassland plantings in the northern Great Plains. This would allow landowners and natural resource professionals who manage pheasant habitat to plant a mosaic of cool- and warm-season CRP grassland habitats.

90. **Effects of different age classes of fields enrolled in the Conservation Reserve Program in Michigan on avian diversity, density, and productivity.**
Millenbah, Kelly Francine
East Lansing, MI: Michigan State University, 1994.
Notes: Degree: MS; Advisor: Winterstein, Scott R.
Descriptors: wildlife/ ecology/ bird communities/ wildlife density/ agricultural conservation/ landowners/ Conservation Reserve Program
Abstract: Agricultural landowners have enrolled lands in the Conservation Reserve Program (CRP) for wildlife and economic benefits. Avian communities and vegetative characteristics were examined on 6 age classes (1-6 growing seasons) of CRP fields in Gratiot County, Michigan in 1991 and 1992 to determine the relationships between field age and characteristics of avian communities. Younger CRP fields (1-3 growing seasons), characterized by forbs and bare ground, supported greater avian densities and diversities than older fields (4-6 growing seasons). Older CRP fields, characterized by grasses and high litter cover, supported greater avian productivity. Results indicate that grassland birds in Michigan may require a diversity of age classes of CRP fields in agricultural landscapes to meet their habitat requirements. Continued enrollment of lands into the program and periodic manipulation of these lands, will create a mosaic of grassland successional stages important to a diversity of avian species.

91. **Effects of emergency haying on duck nesting in Conservation Reserve Program fields, South Dakota.**
Luttschwager, K. A.; Higgins, K. F.; and Jenks, J. A.
Wildlife Society Bulletin 22(3): 403-408. (Fall 1994)
NAL Call #: SK357.A1W5; ISSN: 0091-7648 [WLSBA6]
Descriptors: anas/ nesting/ reproduction/ population density/ habitats/ grasslands/ federal programs/ private ownership/ South Dakota/ nesting success/ private land
This citation is from AGRICOLA.

92. **Effects of emergency haying on vegetative characteristics within selected Conservation Reserve Program fields in the northern Great Plains.**
Allen, A. W.; Cade, B. S.; and Vandever, M. W.
Journal of Soil and Water Conservation 56(2): 120-125. (2001)
NAL Call #: 56.8 J822; ISSN: 00224561
Descriptors: alfalfa/ Conservation Reserve Program/ emergency use/ grasslands/ haying/ intermediate wheatgrass/ management/ wildlife habitat/ grassland/ hay/ soil conservation/ North America/ Cirsium arvense/ Medicago sativa
Abstract: Successional changes in vegetation composition within seeded grasslands may affect attainment of long term conservation objectives. Comparisons between vegetation composition within Conservation Reserve Program (CRP) fields planted to cool season, introduced grasses hayed for emergency use, and non hayed fields of the same age and species composition were completed to determine potential effects of periodic haying. Emergency haying had little long term effect on vegetation height/density, percent cover of live grass, or forb cover when compared to characteristics within non hayed fields. The presence of legumes [primarily alfalfa (medicago sativa L)] increased in response to haying, whereas, abundance of noxious weeds [chiefly Canada thistle (Cirsium arvense (L) Scop.)] diminished. Implications for long term management CRP grasslands to achieve wildlife habitat objectives are discussed.

93. **Effects of field size and landscape composition on grassland birds in south-central Iowa.**
Horn, David Joseph; Koford, Rolf R.; and Braland, Malinda L.
Iowa Academy of Science, Journal 109(1-2): 1-7. (2002); ISSN: 0896-8381
Descriptors: Agelaius phoeniceus/ Ammodramus henslowii/ Ammodramus savannarum/ Carduelis tristis/ Cistothorus platensis/ Dolichonyx oryzivorus/ Geothlypis trichas/ Melospiza melodia/ Molothrus ater/ Spiza americana/ Spizella pusilla/ Sturnella magna/ Sturnella neglecta/ Passeriformes/ biogeography/ field size/ landscape composition/ communities/ grasslands/ ecosystems/ Iowa/ habitat use/ land zones/ red-winged blackbird/ Henslow's sparrow/ grasshopper sparrow/ American goldfinch/ sedge wren/ bobolink/ common yellowthroat/ song sparrow/ brown-headed cowbird/ dickcissel/ field sparrow/ eastern meadowlark/ western meadowlark
Abstract: Many species of grassland birds have been shown to avoid smaller fields. The avoidance of smaller fields, however, has not been consistently reported; avoidance may occur in one study, but not in another. To examine one possible reason for these inconsistencies, we examined how landscape composition influenced the relations between occurrence or abundance and field size. The study took place during the 1998 breeding season on 44 Conservation Reserve Program (CRP) fields located in Adair, Ringgold, and Union counties. The relations between occurrence, abundance, and field size were not influenced by landscape composition for any species. Grasshopper Sparrow, Ammodramus savannarum, Bobolink, Dolichonyx oryzivorus, and Eastern Meadowlark, Sturnella magna, were more likely to occur or were more abundant in larger fields. Field Sparrow, Spizella pusilla, Western Meadowlark, Sturnella neglecta, Brown-headed Cowbird, Molothrus ater, and American Goldfinch, Carduelis tristis, were less likely to occur or were less abundant in larger fields. Field size is an important factor influencing the occurrence and/or abundance of grassland songbirds in fields. Future studies that investigate the effects of landscape composition on area sensitivity should use landscapes that have similar habitat compositions other than the habitat being varied, and use similar sized fields in each landscape.
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94. **Effects of grazing and haying on arthropod diversity in North Dakota Conservation Reserve Program grasslands.**
Hoernemann, C. K.; Johnson, P. J.; and Higgins, K. F.
Proceedings of the South Dakota Academy of Science 80: 283-308. (2001)
NAL Call #: 500 So82; ISSN: 0096-378X
Descriptors: species diversity/ Conservation Reserve Program/ grazing/ arthropods/ conservation practices

95. **Effects of grazing Conservation Reserve Program lands in North Dakota on birds, insects, and vegetation.**
Kennedy, Carmen L.; Jenks, Jonathan A.; and Higgins, Kenneth F.
Proceedings of the South Dakota Academy of Science 80: 213-226. (2001)
NAL Call #: 500 So82; ISSN: 0096-378X
Descriptors: Aves/ grazing/ Conservation Reserve Program/ North Dakota/ deferred rotation grazing/ passerines/ lark bunting/ Calamospiza melanocorys/ grasshopper sparrow/ Ammodramus savannarum/ red-winged blackbird/ Agelaius phoeniceus/ brown-headed cowbird/ Molothrus ater/ species density/ insect biomass/ vegetation height
Abstract: Effects of two grazing systems on nongame birds, insect biomass, and vegetation structure in Conservation Reserve Program (CRP) grasslands were evaluated in North Dakota. Treatments included idle (controls), 3-pasture twice-over deferred rotation grazing, and season-long grazing systems. Twelve species of nongame passerine birds in 1992 and ten species in 1993 used CRP fields. The lark bunting (Calamospiza melanocorys), grasshopper sparrow (Ammodramus savannarum), red-winged blackbird (Agelaius phoeniceus) and brown-headed cowbird (Molothrus ater) dominated species composition in 1992 and 1993. CRP pastures under rotational or season-long grazing treatments maintained equal or higher mean male bird densities compared to idle CRP control fields. Mean density of male birds, terrestrial insect biomass and, for the most part, vegetation height, were lower in 1993 than 1992. Results indicated that high insect biomass in pastures with dense cover does not necessarily equate to higher nongame bird use. At moderate stocking rates (~2.1 AUM/ha), our results indicated that grazing of CRP lands could be included in contract terms or in negotiations in any extensions or modifications of future CRP contracts without any significant losses to nongame birds.
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96. **Effects of habitat manipulations on Texas horned lizards and their prey.**
Fair, W. Scott and Henke, Scott E.
Journal of Wildlife Management 61(4): 1366-1370. (1997)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: Phrynosoma cornutum/ amphibians and reptiles/ ants/ Conservation Reserve Program/ fires-burns/ foods-feeding/ habitat alterations/ habitat use/ livestock/ Texas horned lizard/ Texas/ Duval County
Abstract: The effects of habitat manipulations on Texas horned lizards (Phrynosoma cornutum) and their main prey, harvester ants (Pogonomyrmex spp.) were studied in South Texas. The relative abundance of lizards, their scat, and active harvester ant mounds was assessed on 1-ha plots that were manipulated with either prescribed burning, disking, burning and disking combination, grazing, or land in the Conservation Reserve Program (CRP). We determined differential habitat use or avoidance using Chi-square analysis and Bonferroni Z-statistics to control the experiment-wise error probability at 10%. Lizards used burned plots disproportionately more, were neutral in their use of the disked and grazed plots, and under-utilized the burned and disked combination and CRP plots. Analysis of scat led to similar conclusions in relation to burned, grazed, and CRP plots, but scats were distributed on combination plots pro rata to availability and were underrepresented on the disked plots. No difference was detected in the relative abundance of active ant mounds among the 5 land management practices. Even though Texas horned lizards preferentially used areas that were recently burned, the process of burning may harm them due to the shallow depths in which they hibernate.
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97. **Effects of habitat on dickcissel abundance and nest success in Conservation Reserve Program fields in Kansas.**
Hughes, John P.; Robel, Robert J.; Kemp, Kenneth E.; and Zimmerman, John L.
Journal of Wildlife Management 63(2): 523-529. (1999)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: Fringillidae/ Passeriformes/ Spiza americana/ behavior/ birds/ Conservation Reserve Program/ ecosystems/ edge habitat/ farmland/ habitat management/ habitat use/ management/ nesting sites/ nests-nesting/ productivity/ wildlife/ wildlife-habitat relationships/ wild birds/ reproduction/ federal programs/ wildlife conservation/ Kansas/ species abundance/ land development, land reform, and utilization (macroeconomics)/ dickcissel/ Kansas/ Riley County
Abstract: Declining avian populations in the Midwest have increased interest in various aspects of grassland habitats and their effects on grassland birds. We studied the effects of vegetation characteristics, woody field edges and surrounding land use on abundance and daily nest survival of the dickcissel (Spiza americana) in Conservation Reserve Program (CRP) fields in the northeastern Kansas. We observed 873 dickcissels during surveys on 11 CRP fields during the summers of 1994 and 1995. In those fields, we located 186 dickcissel nests of which 13.2% were successful in 1994 and 14.9% were successful in 1995. The vertical density of vegetation in CRP fields, wooded area surrounding the fields, and amount of woody edge bordering fields were associated with dickcissel abundance (P = 0.001). Live and dead canopy cover and litter cover were associated with daily nest survival (P = 0.005). Therefore, the habitat quality of CRP fields for dickcissels might be enhanced by modifying vegetation characteristics. The outcome of any modifications of CRP habitat for dickcissels should be judged on changes in the number and success of their nests rather than on the abundance of birds.
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98. **Effects of landscape composition and multi-scale habitat characteristics on the grassland bird community.**
McCoy, T. D.
Columbia, MO: Univ. of Missouri-Columbia, 2000.
Notes: Ph.D. Dissert.; Project Number: MO W0-013-R-54/Job 1/Study 43
Descriptors: habitat/ modeling/ grassland/ birds/ communities/ wildlife-habitat relationships/ species diversity/ conservation programs/ nests and nesting/ abundance/ sparrows/ reproduction/ statistics/ meadowlarks, blackbirds and orioles/ population density/ vegetation/ Missouri/ Adair County/ Know County/ Linn County/ Macon County/ Shelby County
Abstract: Measures of grassland bird demography on Conservation Reserve Program (CRP) fields were compared and modeled at several spatial scales to identify habitat factors associated with increased conservation value for grassland birds. Grassland bird populations and species richness were compared between fields located in landscapes with different amounts of CRP habitat and total grassland. Multi-scale habitat models were developed from and validated on two independent data sets to identify the primary habitat features that could predict the potential value of CRP and other idle grasslands for grassland bird conservation.
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99. **Effects of livestock grazing on neotropical migratory landbirds in western North America.**
Bock, C. E.; Sabb, V. A.; Rich, T. D.; and Dobkin, D. S.
In: Status and management of neotropical migratory birds. Estes Park, Colorado. Finch, D. M. and Stangel, P. W. (eds.)
Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, U.S. Dept. of Agriculture; pp. 263-309; 1993.
NAL Call #: aSD11.A42
Descriptors: Conservation Reserve Program/ regional conservation programs
Abstract: Examined the idea that moderate haying/grazing of CRP coupled with livestock enclosures on public land could enhance the value of public rangelands for wildlife.

100. **Effects of mammalian predator removal on waterfowl and non-game birds in North Dakota.**
Garrettson, P. R.; Rohwer, F. C.; Zimmer, J. M.; Mense, B. J.; and Dion, N.
Transactions of the North American Wildlife and Natural Resource Conference 61: 94-101. (1996)
NAL Call #: 412.9 N814; ISSN: 0078-1355.
Notes: Conference: 61st North American Wildlife and Natural Resources Conference: Facing Realities in Resource Management, Tulsa, OK , 22-27 Mar 1996.
Descriptors: aquatic birds/ predator control/ environmental impact/ nesting/ bird eggs/ nature conservation/ habitat improvement (physical)/ breeding sites/ environment management/ Aves/ North America/ species interactions: general/ conservation, wildlife management and recreation/ freshwater/ brackish water/ marine environment
Abstract: Waterfowl managers have long been concerned about low nest success on the North American prairies. A review of duck nesting success shows that, despite great variation between studies, there is a dramatic pattern of decline in nest success in the past 50 years (Beauchamp et al. 1996). The linear regression of success versus year shows that hatching rates dropped from 33 percent in 1935 to only 10-percent nest success in 1992. Low nest success, which reflects high nest predation, is viewed as the most significant limitation on waterfowl productivity in the prairies. Most of the management effort under the North American Waterfowl Management Plan (NAWMP) in the prairie region of the United States and Canada is an attempt to elevate nest success for upland-nesting ducks. Compounding habitat degradation is a major shift in numbers types of nest predator on the prairies. Extirpation of wolves (Canis lupus) and reduction of coyotes (Canis latrans) has allowed medium-sized predators, such as red fox (Vulpes vulpes), skunk (Mephitis mephitis) and raccoon (Procyon lotor); to flourish. Raccoons are a recent arrival to much of the prairies, though they now are abundant and the dominant nest predator for many prairie ducks. Abundance of medium-sized mammals and scarcity of nesting cover has been a very detrimental combination for breeding ducks. Most attempts to increase duck nesting success have focused on ways to make nests less accessible to predators. Dense nesting cover has been the dominant

management on United States Waterfowl Production Areas (WPA) and on NAWMP areas in Canada, yet this strategy typically has improved nest success by only a few percentage points, with highly variable results. Improved nest success associated with the Conservation Reserve Program (CRP) suggests that landscape-level additions of nesting cover improve recruitment, but habitat improvement on this scale is not economically feasible for wildlife groups. Intensive management efforts to make nests inaccessible, such as construction of islands and predator barrier fences, can increase nest success, but costs are high.

101. **Effects of riffle-step restoration on hyporheic zone chemistry in n-rich lowland streams.**
Kasahara, Tamao and Hill, Alan R.
Canadian Journal of Fisheries and Aquatic Science 63(1): 120-133. (2006)
NAL Call #: 442.9 C16J; ISSN: 0706-652X
Descriptors: freshwater ecology: ecology, environmental sciences/ methods and techniques/ wildlife management: conservation/ piezometer/ field equipment/ riffle step restoration/ applied and field techniques/ hyporheic zone chemistry
Abstract: Stream restoration projects that aim to rehabilitate ecosystem health have not considered surface-subsurface linkages, although stream water and groundwater interaction has an important role in sustaining stream ecosystem functions. The present study examined the effect of constructed riffles and a step on hyporheic exchange flow and chemistry in restored reaches of several N-rich agricultural and urban streams in southern Ontario. Hydrometric data collected from a network of piezometers and conservative tracer releases indicated that the constructed riffles and steps were effective in inducing hyporheic exchange. However, despite the use of cobbles and boulders in the riffle construction, high stream dissolved oxygen (DO) concentrations were depleted rapidly with depth into the hyporheic zones. Differences between observed and predicted nitrate concentrations based on conservative ion concentration patterns indicated that these hyporheic zones were also nitrate sinks. Zones of low hydraulic conductivity and the occurrence of interstitial fines in the restored cobble-boulder layers suggest that siltation and clogging of the streambed may reduce the downwelling of oxygen- and nitrate-rich stream water. Increases in streambed DO levels and enhancement of habitat for hyporheic fauna that result from riffle-step construction projects may only be temporary in streams that receive increased sediment and nutrient inputs from urban areas and croplands.

102. **Effects of the Conservation Reserve Program on selected wildlife populations in southeast Nebraska.**
King, Justin W.
Lincoln, NE: University of Nebraska, 1991.
Notes: Thesis (M.S.)--University of Nebraska, Lincoln--Forestry, Fisheries, and Wildlife, 1991. Includes bibliographical references.
NAL Call #: NBU LD3656 1991 K564
Descriptors: Wildlife conservation---Nebraska/ Wildlife management---Nebraska/ Conservation of natural resources---Nebraska
This citation is from AGRICOLA.

103. **Effects of the Conservation Reserve Program on soil duality and overall economic viability of Maryland's native grassland restoration projects.**
Koenig, Kristin A. and Sherman, Leslie A.
In: 229th National Meeting of the American Chemical Society. San Diego, CA ; Vol. 229 (Part 1).; pp. U505-U506; 2005.
Notes: 0065-7727 (ISSN).
Descriptors: soil science/ wildlife management: conservation/ cropland burning/ applied and field techniques/ cation exchange capacity/ grassland restoration/ cropland conversion/ loss on ignition

104. **Effects of the Conservation Reserve Program on wildlife habitat in the Great Plains.**
Baker, Bryan Douglas. University of Minnesota, 1992.
Notes: Degree: PhD; Advisor: Gersmehl, Philip J.
Descriptors: geography/ wildlife/ birds/ climate/ behavior conservation/ predators/ erosion/ wildlife/ conservation practices/ agricultural practices/ South Dakota/ Nebraska/ Kansas/ Texas
Abstract: The Conservation Reserve Program (CRP), a ten-year federal agricultural land retirement program, returned several million acres of the Great Plains to grass by 1989. Improvement of wildlife habitat was a secondary but important rationale for the program. Enrollments are concentrated in the southern High Plains and the northern glaciated Plains. CRP fields increase in size from east to west, with many counties exceeding 320 acres for mean contract size. A study of Plains land use, soils, geology, and climate helped construct a list of expected effects of the CRP on the mammals and breeding birds. The list was revised based on comments from Plains biologists. Most of the species on the Plains depend on woodlands, wetlands, or other cover the CRP does not provide. Some species that use grassland or agricultural land will gain habitat, mainly for nesting. Nine-section study areas in six Plains counties detailed land cover changes associated with the CRP. Most areas have seen a net increase in cropland since the late 1960s despite the CRP retirements. In some counties, especially far western ones, CRP land is in larger blocks, isolated from woodland and shrubs. These areas favor small to medium sized grassland birds and mammals. CRP parcels in other counties, especially to the east, are well-interspersed with other cover. Mosaic species using grassland, cropland and woodland should benefit there. These include bobwhite quail, white-tailed deer, and some predators. A dynamic programming model was developed to help investigate the effects of landscape pattern on animal behavior and survival. A preliminary version calculated winter survival of bobwhite quail. Small demonstration areas selected from the study areas suggested that the configuration of CRP fields could be improved to maximize wildlife benefits. Many of the wildlife benefits of the CRP could vanish after the program expires if farmers return CRP fields to cropland. Other long-term alternatives could prove less costly. Limited federal buy-outs of erosion-prone land may be feasible, especially in expansion of National Grassland. Easements, purchase of cultivation rights, and subsidies for alternative agricultural practices are other tools for encouraging long-term conservation on the Great Plains.

105. **Effects of the Conservation Reserve Program on wildlife in southeast Nebraska.**
King, J. W. and Savidge, J. A.
Wildlife Society Bulletin 23(3): 377-385. (Fall 1995)
NAL Call #: SK357.A1W5; ISSN: 0091-7648 [WLSBA6]
Descriptors: wild birds/ species diversity/ population density/ seasonal variation/ agricultural land/ federal programs/ wildlife conservation
This citation is from AGRICOLA.

106. **The effects of the Conservation Reserve Program on wildlife in southeastern Wyoming.**
Wachob, Douglas Glenn. University of Wyoming, 1997.
Notes: Degree: PhD; Advisor: Anderson, Stanley H.
Descriptors: alfalfa/ Aves/ birds/ habitat use/ small mammals/ sharp-tailed grouse/ Typanuchus phasianellus/ raptors/ carnivores/ big game/ grazing/ Conservation Reserve Program
Abstract: The primary objective of this study was to identify the vegetation and spatial characteristics of CRP that influence habitat use by non-game birds, small rodents, sharp-tailed grouse (Tympanuchus phasianellus), raptors, carnivores, and big game in a CRP/agricultural landscape. The study was conducted in Laramie, Platte, and Goshen counties in southeastern Wyoming, during 1993-5. The study area was dominated by intensively grazed native range land and winter wheat (Triticum sp.); CRP comprised 15% of the study area. Non-game bird use was higher in CRP with an alfalfa component, compared to CRP without alfalfa in 1994, but not in 1993. Fine scale selection by birds for specific vegetation structure was detected in 1994 but not in 1993. Bird use of CRP was independent of the spatial characteristics of CRP patches. Small mammal use of CRP and range lands was higher than winter wheat lands. Vegetation species richness, vegetation height, standard deviation of vegetation cover, and patch area were significant predictors of small mammal use of CRP patches. This small mammal community selected habitat at the landscape and patch scale but not at the intrapatch scale. I investigated use of CRP lands by sharp-tailed grouse during nesting and brood-rearing seasons. All nests were located in CRP. Hens selected nest sites in larger CRP patches. Hens with broods used CRP and irrigated alfalfa patches more often and wheat and rangeland patches less often than they were available. Hens with broods used CRP patches with high coverage of broad leafed weeds and annual grasses more often and patches without alfalfa less often than these patch types were available. I found that CRP was the vital reproduction habitat for sharp-tailed grouse in southeastern Wyoming. Sharp-tailed grouse dancing grounds (leks) were located closer to CRP and had greater coverage of CRP within 1 km, compared with the entire study area. I also found that CRP patch size, percent cover of CRP, and CRP patch number predicted the number of leks and the number of males at leks, at a scale of 100 km$/sp2$. I investigated the spatial relationship of CRP fields to bird and mammal species richness using computer simulations. I used observations of 28 common species as model input data. Computer simulations of a hypothetical landscape showed that species richness increased rapidly as CRP coverage increased from 0-15%, and less rapidly as CRP coverage increased from 15-50%.

107. **Effects of the CRP on wildlife habitat: Emergency haying in the Midwest and pine plantings in the Southeast.**
Hays, R. L. and Farmer, A. H.
Transactions of the North American Wildlife and Natural Resource Conference (55th): 30-39. maps. (1990)
NAL Call #: 412.9 N814; ISSN: 0078-1355 [NAWTA]
Descriptors: afforestation/ farmland/ forest plantations/ haymaking/ nature reserves/ pinus/ planting/ remuneration/ Colinus virginianus/ United States, southeastern region/ Conservation Reserve Program (CRP)
This citation is from AGRICOLA.

108. **Effects of thinning CRP pine stands on nesting songbirds in Georgia.**
Schaefbauer, M. K. and Schweitzer, S. H.
In: 7th Annual Conference of the Wildlife Society. Nashville. TN (USA).); 2000.
Notes: Conference Sponsor: The Wildlife Society; World Meeting Number 003 0833.
Descriptors: biology/ Conservation Reserve Program/ CRP/ songbirds/ pine stands/ Pinus/ Georgia/ forest thinning

109. **The effects of timber harvest in a South Carolina blackwater bottomland.**
Perison, Donna; Phelps, Joseph; Pavel, Christina; and Kellison, Robert
Forest Ecology and Management 90(2-3): 171-185. (1997)
NAL Call #: SD1.F73; ISSN: 0378-1127
Descriptors: commercial activities/ ecology/ terrestrial habitat/ land and freshwater zones/ Amphibia/ Reptilia: forestry/ harvest methods/ community structure/ timber harvest effects/ forest and woodland/ timber harvest/ South Carolina/ South Fork Edisto River/ blackwater forested wetlands/ amphibians/ chordates/ reptiles/ vertebrates

110. **Effects of transgenic herbicide-resistant soybean varieties and systems on surface-active springtails (Entognatha: Collembola).**
Bitzer, Royce J.; Buckelew, Lamar D.; and Pedigo, Larry P.
Environmental Entomology 31(3): 449-461. (2002)
NAL Call #: QL461.E532; ISSN: 0046-225X
Descriptors: commercial activities/ ecology/ terrestrial habitat/ man-made habitat/ Collembola: farming and agriculture/ transgenic soybean farming/ community structure/ surface active community/ effects of transgenic herbicide resistant soybean varieties and systems/ soil habitat/ cultivated land habitat/ transgenic soybean fields/ Insecta/ arthropods/ insects/ invertebrates
Abstract: The degree of abundance and diversity of springtails (order Collembola) often indicates the extent of disturbance by various agricultural practices. We examined how transgenic herbicide-tolerant soybean varieties and their associated weed management systems affect the abundance of 21 surface-active springtail species during three successive soybean growing seasons. With six soybean varieties (three transgenic, three nontransgenic), we tested three weed management systems: (1) targeted application of specific herbicides to the corresponding tolerant transgenic varieties; (2) conventional pre- and postemergence herbicide applications; and (3) mechanical cultivation. Each method posed its own potential costs and

benefits to springtails. In targeted plots, springtail numbers were similar to or higher than those in conventional plots, suggesting that the later and repeated targeted applications to transgenic soybeans do not adversely affect springtail numbers in the short term. We attributed the observed treatment effect differences on springtail numbers to resultant differences in weed cover and degree of soil disturbance (indirect effects), rather than to any direct toxic effects of the herbicides. The treatments affected some species but not others; most of the affected species responded similarly to differences in weed treatment. Our results overall suggested no deleterious short-term effects of transgenic soybean targeted weed-management systems on abundance of the springtail species examined.

111. **Effects of two haying provisions on duck nesting in Conservation Reserve Program (CRP) fields in South Dakota.**
Luttschwager, K. A.
Brookings, SD: South Dakota State University, 1991.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ South Dakota
Abstract: Evaluated the effects of emergency haying on duck nesting success in CRP fields.

112. **Effects of wheat-stubble height and weed control on winter pheasant abundance.**
Rodgers, R. D.
Wildlife Society Bulletin 30(4): 1099-1112. (2002)
NAL Call #: SK357.A1W5; ISSN: 00917648
Descriptors: Great Plains/ habitat/ herbicide/ High Plains/ Kansas/ Phasianus colchicus/ ring-necked pheasant/ stubble height/ tillage/ Triticum aestivum/ wheat/ wheat stubble/ abundance/ agricultural practices/ gamebird/ herbicide/ stubble/ weed control/ wildlife management/ United States/ Phasianus colchicus/ Triticum aestivum
Abstract: Recent changes in agriculture on the semi-arid central High Plains have serious implications for pheasants (Phasianus colchicus) and other farmland wildlife. Of greatest concern are increased herbicide use accompanying intensification of crop rotations and the shorter wheat (Triticum aestivum)-stubble heights produced by a shift to semi-dwarf wheat varieties and increasingly powerful combines. From 1990-1995, I investigated the effect of stubble height and post-harvest weed control on subsequent winter abundance of pheasants in wheat stubble. Increasing wheat cutting height from a mean of 22 cm to 46 cm produced a nearly 9-fold average increase in indices of winter pheasant abundance in wheat-stubble test blocks where no post-harvest weed control was performed. Post-harvest weed growth was positively affected by wheat-stubble height, probably due to taller stubble's ability to better conserve limited moisture by reducing ground-level air movement. Herbicide application to stubble reduced indices of winter pheasant abundance by >80%, and tillage reduced those indices by >90%, compared to untreated fields. Herbicide application to wheat stubble and reduced stubble height are considered major causes of the long-term decline of pheasants on the central High Plains. This research and a companion agronomic study have shown that increased stubble height and post-harvest weed growth in wheat stubble are integral components of a modified wheat-fallow rotation that provides superior habitat quality, soil conservation benefits, and greater profitability than other wheat-fallow systems currently in use. The benefits of greater wheat-stubble height can also be applied in more intensive wheat-row-crop-fallow rotations.

113. **Enhancement of farmland biodiversity within set-aside land.**
Van Buskirk, J. and Willi, Y.
Conservation Biology 18(4): 987-994. (2004)
NAL Call #: QH75.A1C5; ISSN: 08888892
Descriptors: agriculture/ biodiversity/ conservation/ set-aside land
Abstract: The efficacy of agricultural set-aside policies for protecting farmland biodiversity is widely debated. Based on a meta-analysis of 127 published studies, we found that land withdrawn from conventional production unequivocally enhances biodiversity in North America and Europe. The number of species of birds, insects, spiders, and plants is 1-1.5 standard deviation units higher on set-aside land, and population densities increase by 0.5-1 standard deviation units. Set-aside land may be especially beneficial for desirable taxa because North American bird species that have exhibited population declines react most positively to set-aside agricultural land. Larger and older plots protect more species and higher densities, and set-aside land is more effective in countries with less-intensive agricultural practices and higher fractions of land removed from production. Although policies specifically designed to protect biodiversity might work even better, current incentives clearly improve the standing of plants and animals in farmland.

114. **Environmental benefits of conservation buffers in the United States: Evidence, promise, and open questions.**
Lovell, S. T. and Sullivan, W. C.
Agriculture, Ecosystems and Environment 112(4): 249-260. (2006)
NAL Call #: S601.A34; ISSN: 01678809.
Notes: doi: 10.1016/j.agee.2005.08.002.
Descriptors: agricultural buffers/ agroecology/ Conservation Reserve Program/ riparian corridors/ sustainable agriculture/ agricultural ecosystem/ buffer zone/ United States
Abstract: Conservation buffers can have a tremendously positive impact on the ecological health of rural landscapes by reducing erosion, improving water quality, increasing biodiversity, and expanding wildlife habitats. Yet, in spite of our knowledge of their value, conservation buffers have not been fully embraced by landowners, or even by policy makers in the United States (US). In this critical review, we examine why conservation buffers remain underutilized in US agroecosystems. We examine the literature on the environmental benefits of buffers, the economic issues related to buffer adoption, and the importance of the aesthetic quality and design of buffers. We propose that many questions related to buffer design and management remain unanswered, and suggest a variety of areas in which future research is necessary to improve buffer functionality and adoption. The implications of this synthesis for designers, planners, scientists, policy makers, and citizens are discussed. Recommendations include: modifying policies to better reflect the preferences of

landowners and society, studying buffer systems at the watershed scale using multidisciplinary approaches, and designing buffers that consider aesthetic preferences and regional variation.

115. **Environmental conservation and locust control: Possible conflicts and solutions.**
Peveling, R.
Journal of Orthoptera Research 10(2): 171-187. (2001); ISSN: 1082-6467.
Notes: Publisher: Orthopterists' Society.
Descriptors: pest control/ Insecticides/ habitat preferences/ Acrididae/ Orthoptera/ grasshoppers/ agriculture/ applied entomology
Abstract: In contrast to pests developing in close association with a particular host crop, locusts and grasshoppers are often controlled in natural or semi-natural landscapes, exposing structurally and functionally diverse communities to agrochemicals, chemicals to which they are not adapted. This suggests that insecticide-induced perturbations may be severe. On the other hand, with acridids being highly mobile, exposure of non-target biota at any one location tends to be rare, and insecticides might be seen as yet another component in a canon of stochastic and deterministic, natural or human-induced environmental catastrophes and selective forces, shaping communities and ecosystems. Moreover, habitat loss is by far the most important single threat to biodiversity, so why should doubt be cast on the potential and resilience of populations to recover from occasional insecticide stress? This paper reviews the environmental impact, as well as ecological and conceptual characteristics of acridid pest control. It concludes that ecologically significant risks may arise, in particular in ecosystems exposed to multiple stressors. Four priorities in ecological risk assessment and acridid pest management are proposed: 1) delimitation and characterization of sensitive areas within locust and grasshopper habitats, 2) ecosystem-specific, long-term field studies and operational monitoring, 3) real-time stewardship of control campaigns, with adequate participation of stakeholders, and 4) incorporation of the precautionary principle into decision-making and risk management.

116. **Environmental Quality Incentives Program: Program summary and potential for wildlife benefits.**
Esser, A.; Molleur, R.; Buck, P.; and Rewa, C.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA/NRCS/WHMI.
Madison, MS: U.S. Department of Agriculture, 2000; pp. 125-134.
NAL Call #: aS604.6 C66 2000
Descriptors: Environmental Quality Incentives Program/ conservation/ conservation buffers/ farming systems/ nutrient management/ erosion control/ wildlife management

117. **Estimating response of ring-necked pheasant to the Conservation Reserve Program .**
Nielson, R. N.; McDonald, L. L.; Howlin, S.; Sullivan, J. P.; Burgess, C.; and Johnson, D. S.
Cheyenne, WY: Western EcoSystems Technology, 2006. 55 p.
Notes: Technical report prepared for US Department of Agriculture Farm Service Agency, Contract Number 53-3151-5-8059.
http://www.fsa.usda.gov/Internet/FSA_File/pheasant_study.pdf
Descriptors: ring-necked pheasant/ Conservation Reserve Program/ Breeding Bird Survey/ statistical analysis/ modeling
Abstract: We evaluated benefits of the Conservation Reserve Program (CRP) to ring-necked pheasant (Phasianus colchicus) populations by modeling Breeding Bird Survey (BBS) counts of ring-necked pheasants along 388 BBS routes in the US during 1987-2005.

118. **Estimating wildlife response to the Conservation Reserve Program: Bobwhite and grassland birds.**
Burger, L. W. and Riffell, S. K.
Solicitation Number: FSA-R-28-04DC, 2006.
ftp://ftp fc.sc.egov.usda.gov-/NHQ/nri/ceap/quailandsongbirds.pdf
Descriptors: Conservation Reserve Program/ CRP databases/ Farm Service Agency/ forest habitats/ grasslands/ bird populations/ land managment/ monitoring program/ northern bobwhite/ quail populations/ shrubland/ wildlife species
Abstract: We provided retrospective analysis of correlative relationships among land use/land cover types, Conservation Reserve Program habitats and indices of grassland bird populations in response to FSA's request for "national and regional estimates of per acre CRP effects on wildlife populations for CRP conservation practices (RFP for FSA-R-28-04DC)." Although robust per acre estimates of the real effect of CRP on wildlife species can only be derived from an ongoing monitoring program based on probabilistic sampling design, correlative analyses are the only possibility with retrospective data.

119. **Evaluating potential effects of CRP on bobwhite quail in Piedmont Virginia.**
Stauffer, Dean F.; Cline, Gerald A.; and Tonkovich, Michael J.
Transactions of the North American Wildlife and Natural Resource Conference 55: 57-67. (1990)
NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: Galliformes/ Odontophoridae/ Colinus virginianus/ Conservation reserve programs/ habitat classification/ habitat management/ management/ modeling/ wildlife/ bobwhite/ habitat/ dispersion/ Virginia

120. **An evaluation of Canada's Permanent Cover Program: Habitat for grassland birds?**
McMaster, D. Glen and Davis, Stephen K.
Journal of Field Ornithology 72(2): 195-210. (2001)
NAL Call #: 413.8 B534; ISSN: 0273-8570
Descriptors: birds/ census-survey methods/ ecosystems/ grasslands/ habitat management/ management/

productivity/ species diversity/ study methods/ techniques/ wildlife/ wildlife-habitat relationships/ Populus ssp./ Canada/ Nova Scotia/ Alberta/ Manitoba
Abstract: In the early 1990s Agriculture Canada's Permanent Cover Program (PCP) converted over 445,000 ha of cropland to perennial vegetative cover. The wildlife benefits of the PCP have not been the subject of previous research. We conducted grassland bird surveys on 629 PCP sites and 564 cropland sites across Alberta, Saskatchewan, and Manitoba between 25 May and 3 July 1998. PCP sites showed higher avian species richness than cropland, and nine of ten commonly detected grassland bird species occurred at higher frequencies in PCP than cropland. PCP sites were characterized by taller, denser vegetation and less bare ground than cropland sites. Hayed and grazed PCP sites differed significantly in their vegetative structure and avian community composition, but did not differ in species richness or evenness. Mean bird species richness at both cropland and PCP sites was significantly lower in the aspen parkland ecoregion than in the mixed and moist-mixed grassland ecoregions. Logistic regression identified 18 geographic and vegetative variables that significantly influenced the occurrence of individual species, but models for only two species predicted both presence and absence with greater than 50% accuracy. Avian productivity on PCP lands must be determined to appraise definitively the quality of this habitat for grassland birds.

121. **Evaluation of select CRP lands as bobwhite quail habitat.**
Burger, L. W.; Kurzejeski, E. W.; Dailey, T. V.; and Ryan, M. R.
Proceedings, American Forage and Grassland Conference: 27-30. (1991)
NAL Call #: SB193.F59; ISSN: 0886-6899.
Notes: Meeting held April 1-4, 1991, Columbia, Missouri. Includes references.
Descriptors: quails/ colinus virginianus/ habitats/ conservation areas/ Missouri/ Conservation Reserve Program
This citation is from AGRICOLA.

122. **Evaluation of the effect of CRP on duck recruitment in the prairie pothole joint venture area of Fish and Wildlife Service Region 6.**
Reynolds, R.
Bismark, ND: U.S. Fish and Wildlife Service, 1992.
U.S. Fish & Wildlife Service Progress Report.
Descriptors: Conservation Reserve Program/ regional conservation programs/ state conservation programs/ Prairie Pothole Region/ Montana/ South Dakota/ North Dakota
Abstract: Reported the 1992 results of a pilot effort to evaluate waterfowl production in CRP grasslands compared to Waterfowl Production Areas.

123. **Evaluation of the landscape surrounding northern bobwhite nest sites: A multiscale analysis.**
White, C. G.; Schweitzer, S. H.; Moore, C. T.; Parnell, I. B.; and Lewis-Weis, L. A.
Journal of Wildlife Management 69(4): 1528-1537. (2005)
NAL Call #: 410 J827; ISSN: 0022541X
Descriptors: Colinus virginianus/ Conservation Reserve Program/ Georgia/ habitat/ land-cover/ landscape/ multiscale analysis/ nest/ northern bobwhite
Abstract: Implementation of the Conservation Reserve Program (CRP) altered the interspersion and abundance of patches of different land-cover types in landscapes of the southeastern United States. Because northern bobwhites (Colinus virginianus) are experiencing significant population declines throughout most of their range, including the Southeast, it is critical to understand the impacts of landscape-scale changes in habitat on their reproductive rates. Our objective was to identify components of landscape structure important in predicting nest site selection by bobwhites at different spatial scales in the Upper Coastal Plain of Georgia. We used a Geographic Information System (GIS) and spatial analysis software to calculate metrics of landscape structure near bobwhite nest sites. Logistic regression was used to model the relationship of nest sites to structure within the surrounding landscape at 4 spatial scales. We found that patch density and open-canopy planted pine were consistently important predictor variables at multiple scales, and other variables were important at various scales. The density of different patch types could be increased by thinning rows of pines in large monotypic stands of closed-canopy planted pine stands. Thinning and creating openings in CRP pine plantations should provide increased nesting opportunities for bobwhites. We interpret the support for other variables in our analysis as an indication that various patch configuration lead to different combinations of landscape structure that provide an acceptable range of habitat conditions for bobwhites.

124. **Evidence for a recent Henslow's sparrow population increase in Illinois.**
Herkert, James R.
Journal of Wildlife Management 71(4): 1229-1233. (2007)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: conservation measures/ ecology/ land zones/ Ammodramus henslowii: habitat management/ undisturbed grassland establishment/ effect on population trends/ population dynamics/ population trends/ undisturbed grassland effects/ Illinois/ Aves, Passeriformes, Emberizidae/ birds/ chordates/ vertebrates
Abstract: The Henslow's sparrow (Ammodramus henslowii) is a species of high conservation concern due to long-term population declines and a small global population. Habitat loss is considered to be the most likely cause of Henslows sparrow declines and the recent establishment of large acreages of undisturbed grasslands through the Conservation Reserve Program is considered to have the potential to benefit populations. I used data from Illinois' Spring Bird Count to estimate recent population trends and examine the association that changes in land-use, especially the establishment of Conservation Reserve Program lands, have had on local Henslow's sparrow population trends. My analysis shows that Henslow's sparrow populations have increased substantially within Illinois, USA over the last 10 years and that this population increase strongly coincides with the establishment of >400,000 ha of grasslands within the state by the Conservation Reserve Program. New rules allowing for managed haying and grazing on Conservation Reserve Program grasslands have the potential to reduce the

suitability of program fields for this species and, thus, Henslow's sparrow use of program fields should be monitored as the new rules are implemented.

125. **Factors influencing mourning dove nest success in CRP fields.**
Hughes, John P.; Robel, Robert J.; and Kemp, Kenneth E.
Journal of Wildlife Management 64(4): 1004-1008. (2000)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: Zenaida macroura/ dove, mourning/ zenaida macroura/ nests and nesting/ conservation programs/ grassland/ land use/ mating grounds/ survival/ cultivated farmland/ cover/ vegetation/ reproduction/ habitat management for wildlife/ mourning dove/ nest/ habitat/ agriculture/ ecological requirements/ Riley County/ Kansas/ United States
Abstract: Mourning doves (Zenaida macroura) nest primarily in trees. However, ground nesting is prevalent in the Great Plains region where mourning dove numbers have increased since the mid 1980s when the Conservation Reserve Program (CRP) was initiated. We monitored mourning dove nest success in CRP fields in Kansas during 1994 and 1995 to determine if that habitat could be a source for the increased numbers. Mourning dove nest success averaged 56% (n = 90) in our CRP fields. Daily nest survival rates in CRP fields were associated positively with height of live vegetation (P = 0.011) and negatively with percent grass cover (P = 0.001) and percent live vegetation cover (P = 0.005). Management practices that produce sparse overall cover but tall vegetation height may increase mourning dove nest success in CRP fields.

126. **Farm Bill environmental program may threaten native prairie habitat.**
Baker, B.
Bioscience 50(5): 400. (May 2000)
NAL Call #: 500 Am322A; ISSN: 0006-3568 [BISNAS]
Descriptors: federal programs/ land management/ prairies/ environmental policy/ United States/ Conservation Reserve Program
This citation is from AGRICOLA.

127. **Farming practices influence wild pollinator populations on squash and pumpkin.**
Shuler, Rachel E.; Roulston, T'ai H.; and Farris, Grace E.
Journal of Economic Entomology 98(3): 790-795. (2005); ISSN: 0022-0493
Descriptors: commercial activities/ nutrition/ diet/ associations/ mutualism/ ecology/ man-made habitat/ land zones/ Apidae: farming and agriculture/ food plants/ Curcubita/ pollination/ farming practices/ wild pollinator populations/ pumpkin/ squash/ Virginia/ West Virginia/ population dynamics/ cultivated land habitat/ Maryland/ Insecta, Hymenoptera, Apocrita, Aculeata, Apoidea, Apidae/ arthropods/ hymenopterans/ insects/ invertebrates
Abstract: Recent declines in managed honey bee, Apis mellifera L., colonies have increased interest in the current and potential contribution of wild bee populations to the pollination of agricultural crops. Because wild bees often live in agricultural fields, their population density and contribution to crop pollination may be influenced by farming practices, especially those used to reduce the populations of other insects. We took a census of pollinators of squash and pumpkin at 25 farms in Virginia, West Virginia, and Maryland to see whether pollinator abundance was related to farming practices. The main pollinators were Peponapis pruinosa Say; honey bees, and bumble bees (Bombus spp.). The squash bee was the most abundant pollinator on squash and pumpkin, occurring at 23 of 25 farms in population densities that were commonly several times higher than tat of other pollinators. Squash bee density was related to tillage practices: no-tillage farms hosted three times as great a density of squash bees as tilled farms. Pollinator density was not related to pesticide use. Honey bee density on squash and pumpkin was not related to the presence of managed honey bee colonies on farms. Farms with colonies did not have more honey bees per flower than farms that did not keep honey bees, probably reflecting the lack of affinity of honey bees for these crops. Future research should examine the economic impacts of managing farms in ways that promote pollinators, particularly pollinators of crops that are not well served by managed honey bee colonies.

128. **Farmlands for farming and nature.**
Freemark, Kathryn
In: Issues and Perspectives in Landscape Ecology
Wiens, J. A. and Moss, M. R.
New York: Cambridge University Press, 2005; pp. 193-200.
Notes: 0521830532 (ISBN).
Descriptors: commercial activities/ man-made habitat/ comprehensive zoology: farming and agriculture/ landscape scale farming practices/ Conservation significance/ cultivated land/ landscape scale farming practices significance/ cultivated land habitat

129. **Field evaluation of the northern bobwhite habitat suitability index model with implications for the Conservation Reserve Program.**
Tonkovich, Michael Joseph
Blacksburg, Va.: Virginia Polytechnic Institute and State University, 1995.
Notes: Thesis (Ph. D.); Bibliography: leaves 182-203.
NAL Call #: ViBIbV LD5655.V856 1995.T665
Descriptors: Colinus virginianus/ bobwhite quail/ wildlife habitats/ Conservation Reserve Program/ CRP
This citation is from AGRICOLA.

130. **Fine tuning the Conservation Reserve Program for biological diversity and native wildlife.**
Bidwell, Terrence G. and Engle, David M.
In: The Conservation Reserve Program Planting for the future: Proceedings of a National Conference.Fort Collins, Colorado.) Allen, Arthur W. and Vandever, Mark W. (eds.)
Reston, VA: U.S. Geological Survey; 6 pp.; 2005.
Notes: Scientific Investigations Report 2005-5145. http://www.fort.usgs.gov/Products/Publications/21490/21490.pdf
Descriptors: cropland/ Conservation Reserve Program (CRP)/ lesser prairie chicken/ Tympanuchus pallidicinctus/ prairies/ shrublands/ Great Plains/ bobwhite quail/ Colinus virginianus/ mountain plover/ Eupoda montana/ wildlife conservation/ wildlife habitat/ Okalahoma/ Texas/ ring-necked pheasant

Abstract: This paper provides as assessment of conservation programs in the Great Plains by the Conservation Reserve Program (CRP). The authors present major issues related to CRP lands created islands of habitat across the landscape that benefited native wildlife species but caused other native species to decline while favoring introduced wildlife species, such as the ring-necked pheasant. Guidelines to improve conservation programs are described. CRP decisions should be based on research formulated in the context of landscape composition and needs of habitat specialists (also known as indicator species). Indicator wildlife and plant species are those where abundance and distribution reflect a healthy landscape and ecosystem. In this setting, single species management (i.e., of indicator wildlife species) is appropriate within the context of restoring whole landscapes rather than of establishing vegetation cover on individual fields without considering the spatial influence of individual management decisions. Another key to restoration success is to reestablish ecological drivers of herbivory and fire with appropriate prescriptions to produce desired habitat elements and appropriate spatial extent of habitat to maintain population viability of the indicator wildlife species.

131. **The first distributional record of the least weasel, Mustela nivalis, in northeastern Missouri.**
Mock, O. B.; Sells, G. D.; Ellis, L. S.; and Easterla, D. A.
Transactions of the Missouri Academy of Science 35: 7-11. (2001)
NAL Call #: 500 K13T
Descriptors: geographical distribution/ Missouri/ mustela nivalis/ weasels/ Conservation Reserve Program
Abstract: This paper reports a significant range extension for the least weasel (Mustela nivalis). Failure to capture least weasels during the previous 50-year period in which the Adair County area has been intensely trapped for small mammals suggests that this species is a recent immigrant into northeastern Missouri, USA. The location of the capture sites near the break between the Missouri and Mississippi drainage systems does not support a riparian mode of dispersal. We speculate that changes in agricultural policies and practices that have reduced row-crop farming and increased meadows and USDA Conservation Reserve Program land are factors in the recent movement of M. nivalis into northeastern Missouri.
© CABI

132. **GIS analysis of the effects of habitat configuration and the Conservation Reserve Program (CRP) on the abundance of ringnecked pheasants, gray partridge, and meadowlarks.**
Lockman, Drake J. and Kimmel, R. O.
In: MN DNR Farmland Wildlife Population and Research Unit Report, 1994; pp. 33-39.
Descriptors: Phasianus colchicus/ Aves/ Perdix perdix/ common pheasant/ birds/ partridge/ dispersion/ prairie/ GIS/ United States/ geographic information systems
© NISC

133. **GIS-based evaluation of the Conservation Reserve Program in Texas County, Oklahoma.**
Awawdeh, Muheeb Mohammad
Stillwater, OK: Oklahoma State University, 2004.
Descriptors: correlation analysis/ potential resources/ soil erosion/ stream flow/ water quality/ watersheds/ Oklahoma
Abstract: The main goal of this research was to evaluate the long-term environmental benefits of the Conservation Reserve Program (CRP). The GIS-integrated hydrologic model, AVSWAT (ArcView-Soil and Water Assessment Tool), was used to evaluate the potential environmental benefits of the CRP in the Beaver River watershed, Texas County, Oklahoma. In this study SWAT model was used to simulate erosion rates and related stream water quality. The GIS interface of AVSWAT is ideally suited for input data management and output visualization purposes. The Beaver River Watershed was subdivided into 53 sub-basins using the digital elevation model as the base data source. Calibration results using monthly predicted values generally matched well with the observed values of two USGS gage stations in the watershed. The R2 values of 0.65, 0.61 and Nash-Sutcliffe efficiency 0.63, 0.55 of stream flow for the two stations were similar to values found in the literature. Although the simulated sediment yields was low, it correlated well with the CRP areas. The higher the CRP area the lower the sediment yield with an overall 30% reduction in annual sediment yield for Texas County. Sediment yield was highest from wheat, general agriculture and corn fields with an average of 9.25, 2.40, and 0.25 tons/ha/year respectively. Mapping sediment yield based on data from hydrologic response units determined priority areas for future CRP enrollment. The areal association between sediment yield and CRP area was calculated to be 53%. Correlation analysis also revealed a good inverse relationship between sediment yield and area under CRP. Wheat fields accounted for about 71% of total phosphorus and 77% of total nitrogen lost in Texas County. Results from Patch Analyst showed 7% increase in grassland area, 24% decrease in number of patches, and an increase in average patch size from 24 ha to 36 ha. Analysis of changes in landscape structure indicated that CRP can potentially improve the quality and quantity of wildlife habitat.
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134. **Good news for grouse.**
Hoffman, Rick
Colorado Outdoors 49(2): 10-13. (2000); ISSN: 0010-1699
Descriptors: Galliformes/ Phasianidae/ Tympanuchus phasianellus columbianus/ behavior/ birds/ conservation/ Conservation Reserve Program/ distribution/ habitat management/ management/ mining/ population ecology/ protection/ reclamation/ status/ wildlife/ Columbian sharp-tailed grouse/ Colorado
Abstract: Information is presented on the status and distribution of Columbian sharp-tailed grouse on Conservation Reserve Program lands in western Colorado. Methods are being developed to manage and conserve the population of grouse in a way that is compatible with existing land uses in the region.
© NISC

135. **Grassland bird abundance associated with Conservation Reserve Program grasslands.**
Haroldson, Kurt J.; Kimmel, Richard O.; and Riggs, Michael R.
Minnesota Department of Natural Resources Summaries of Wildlife Research Findings 2001: 69-79. (2002)
Descriptors: conservation measures/ ecology/ population dynamics/ terrestrial habitat/ land zones/ Perdix perdix/ Phasianus colchicus/ Sturnella: habitat management/ national parks and reserves/ population density/ distribution within habitat/ habitat utilization/ grassland/ grassland species abundance/ Conservation Reserve Program/ Minnesota/ Aves, Galliformes, Phasianidae/ birds/ chordates/ vertebrates

136. **Grassland bird conservation: CP1 vs. CP2 plantings in Conservation Reserve Program fields in Missouri.**
McCoy, Timothy D.; Ryan, Mark R.; and Burger, Loren W.
American Midland Naturalist 145(1): 1-17. (Jan. 2001)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: conservation measures/ reproduction/ reproductive productivity/ ecology/ population dynamics/ terrestrial habitat/ land and freshwater zones/ Aves/ habitat management/ reproductive productivity/ nesting success/ Fecundity/ community structure/ population density/ nests/ grassland/ Cool season and warm season grass fields/ nesting success and fecundity/ conservation implications/ Missouri/ Knox County/ Macon County/ Linn County/ conservation biology/ birds/ chordates/ vertebrates
Abstract: To determine the relative value of different Conservation Reserve Program (CRP) plantings for breeding grassland and winter birds we measured vegetation structure, avian abundance and reproductive success, and estimated fecundity during 1993-1995 on CP1 (cool-season grass) and CP2 (warm-season grass) plantings in 16 fields in northern Missouri. CP1 fields had been planted to cool-season grasses or cool-season grass-legume mixtures and CP2 fields had been seeded with switchgrass (Panicum virgatum). Species richness, abundance and nesting success of grassland birds during the breeding season and total bird use in the winter did not differ between CPs. During the breeding season CP1 fields had higher abundances of grasshopper sparrow (Ammodramus savannarum), eastern meadowlark (Sturnella magna), Henslow's sparrow (Ammodramus henslowii) and American goldfinches (Carduelis tristis), whereas common yellowthroats (Geothlypis trichas) were more abundant in CP2 fields. Fecundity of dickcissels (Spiza americana) and nesting success and fecundity of red-winged blackbirds (Agelaius phoeniceus) were higher on CP2 than on CP1 habitat, but both CPs were likely sinks ($\lambda < 1$) for these species. Both CPs were likely source ($\lambda > 1$) habitat for grasshopper sparrows, whereas only CP1 habitat was likely a source for eastern meadowlarks and American goldfinches. In winter American goldfinches were more abundant in CP1 fields than CP2 fields. The shorter, more diverse, cool-season grass fields were equal or better habitat than taller, more vertically dense, switchgrass-dominated fields for grassland birds, including several species of high conservation concern. Single-species plantings of warm- or cool-season grasses should be avoided to increase the potential wildlife benefits of CRP and other grassland habitats.

137. **Grassland bird use of Conservation Reserve Program fields in the Great Plains.**
Johnson, Douglas H.
In: Fish and wildlife benefits of Farm Bill conservation programs: 2000-2005 update, Technical Review 05-2/ Haufler, Jonathan B., editor; Bethesda, MD: The Wildlife Society, 2005. pp. 17-32.
http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html
Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Conservation Reserve Program
Abstract: An enormous area in the Great Plains is currently enrolled in the Conservation Reserve Program (CRP): 19.5 million acres (nearly 8 million ha) in Montana, North Dakota, South Dakota, Wyoming, Nebraska, Colorado, Kansas, Oklahoma, and Texas. Th is change in land use from cropland to grassland since 1985 has markedly infl uenced grassland bird populations. Many, but certainly not all, grassland species do well in CRP fields. Th e responses by birds to the program diff er not only by species but also by region, year, the vegetation composition in a fi eld, and whether or not a field has been hayed or grazed. The large scale and extent of the program has allowed researchers to address important conservation questions, such as the eff ect of the size of habitat patch and the infl uence of landscape features on bird use. However, most studies on nongame bird use of CRP in or near the Great Plains have been short-lived; 83% lasted only 1-3 years. Further, attention to the topic seems to have waned in recent years; the number of active studies peaked in the early 1990s and dramatically declined after 1995. Because breeding-bird use of CRP fields varies dramatically in response both to vegetational succession and to climatic variation, long-term studies are important. What was learned about CRP in its early stages may no longer be applicable. Finally, although the CRP provisions of the Farm Bill have been benefi cial to many grassland birds, it is critical that gains in grassland habitat produced by the program not be off set by losses of native prairie.

138. **Grassland bird use of Conservation Reserve Program fields in the Great Plains.**
Johnson, D. H.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA/NRCS/WHMI.
Madison, MS: USDA, NRCS, Wildlife Habitat Management Institute, 2000; pp. 19-33.
NAL Call #: aS604.6 C66 2000
Descriptors: Conservation Reserve Program/ wildlife habitats/ wildlife management/ birds

139. **Grassland bird use of riparian filter strips in southeast Iowa.**
Henningsen, J. C. and Best, L. B.
Journal of Wildlife Management 69(1): 198-210. (2005)
NAL Call #: 410 J827; ISSN: 0022541X.
Notes: doi: 10.2193/0022-541X(2005)069<0198:GBUORF>2.0.CO;2.
Descriptors: agriculture/ bird abundance/ buffer/ Conservation Reserve Program/ CRP/ filter strip/ Iowa/ nest success/ riparian grassland/ strip cover/ conservation management/ habitat management/ habitat use/ nest site/ nesting success/ passerines/ riparian zone/ Iowa/ Agelaius phoeniceus/ Aves/ Geothlypis trichas/ Melospiza melodia/ Poaceae/ Riparia/ Spiza/ Spiza americana/ Turdus merula
Abstract: The U.S. Department of Agriculture (USDA) under its Continuous Enrollment Conservation Reserve Program (CRP) has actively promoted establishment of conservation buffers. Although these programs are intended to benefit wildlife in addition to protecting soil and water resources, benefits to grassland birds may be compromised by narrow widths, presence of woody vegetation, and high predation pressure. During 2001 and 2002, we surveyed breeding grassland birds and searched for nests in 33 CRP filter strips that varied in planting mixture (cool-season vs. warm-season grasses) and adjacent edge type (non-wooded vs. wooded). The most abundant species in filter strips were red-winged blackbird (Agelaius phoeniceus), dickcissel (Spiza americana), song sparrow (Melospiza melodia), and common yellowthroat (Geothlypis trichas). Relative abundances of birds and nests were similar between cool-season and warm-season planting mixtures. Dickcissels and red-winged blackbirds and their nests were relatively less abundant at wooded than non-wooded sites. Our nest success estimates generally were low in all treatments, and nest success varied little with the variables we studied. Predation was the major cause of nest failure; 62% of all nests were depredated. Although the most common birds using filter strips are generalists, filter strips also have potential to provide breeding habitat for some species of management concern.

140. **Grassland birds: Development and testing of models to predict species richness, abundance, and reproductive success at local and landscape levels.**
Schultz, J.
Columbia, MO: Missouri Dept. of Conservation, Wildlife and Research Div.; PB2001104751XSP, 2000. 180 p.
Notes: Study No. 43; Final Report to Research and Survey Projects as Required by Federal Aid in Wildlife Restoration Act, Missouri, Federal Aid Project no. W-13-R-54(2000). Contains Dissertation of Timothy McCoy on Effects of Landscape Composition and Multi-Scale Habitat Characteristics on the Grassland Bird Community; Prepared in cooperation with Missouri Univ.-Columbia. Graduate School.; Sponsored by Fish and Wildlife Restoration Program, Washington, DC.
Descriptors: endangered species/ models/ abundance/ reproduction biology/ conservation/ habitats/ landscapes/ birds/ wildlife management/ Conservation Reserve Program/ grassland birds/ natural resources and earth sciences natural resource management/ medicine/ biology/ ecology
Abstract: Measures of grassland bird demography on Conservation Reserve Program (CRP) fields were compared and modeled at several spatial scales to identify habitat factors associated with increased conservation value for grassland birds. Grassland bird populations and species richness were compared between fields located in landscapes with different amounts of CRP habitat and total grassland. Multi-scale habitat models were developed from and validated on two independent data sets to identify the primary habitat features that could predict the potential value of CRP and other idle grasslands for grassland bird conservation.

141. **The Great Plains: America's best chance for ecosystem restoration, Part 1.**
Licht, Daniel S.
Wild Earth 4(2): 47-53. (1994); ISSN: 1055-1166
Descriptors: Canis latrans/ Mephitis/ Microtus pennsylvanicus/ Procyon lotor/ Vulpes vulpes/ Ciconiiformes/ Fringillidae/ Passeriformes/ Scolopacidae/ Ammodramus bairdii/ Bartramia longicauda/ Catoptrophorus semipalmatus/ Gallinago gallinago/ Limosa fedoa/ Molothrus ater/ Phalaropus tricolor/ agricultural practices/ birds/ Conservation Reserve Program/ ecosystem management/ ecosystems/ farmland/ grasslands/ habitat alterations/ land, private/ mammals/ management/ restoration/ coyote/ red fox/ raccoon/ skunk/ meadow vole/ Baird's sparrow/ brown headed cowbird/ marbled godwit/ upland sandpiper/ common snipe/ Wilson's phalarope/ willet/ North America/ Great Plains
Abstract: The author discusses the Conservation Reserve Program (CRP) in the United States and its effect on Great Plains wildlife and ecosystems. Although a large number of acres are temporarily taken out of agricultural use under the CRP program, the individual tracts are small. Very often, farmers plant exotic grasses on the CRP tracts instead of native ones that would support native wildlife species.

142. **Ground beetle (Coleoptera: Carabidae) assemblages in organic, no-till, and chisel-till cropping systems in Maryland.**
Clark, S.; Szlavecz, K.; Cavigelli, M. A.; and Purrington, F.
Environmental Entomology 35(5): 1304-1312. (2006)
NAL Call #: QL461.E532; ISSN: 0046225X
Descriptors: Carabidae/ chisel-till/ cropping systems/ no-till/ organic
Abstract: Ground beetle assemblages were compared in organic, no-till, and chisel-till cropping systems of the USDA Farming Systems Project in Maryland. The cropping systems consisted of 3-yr rotations of corn (Zea mays L.), soybean (Glycine max L. Merr.), and wheat (Triticum aestivum L.) that were planted to corn and soybean during the 2 yr of field sampling (2001-2002). Each year, ground beetles were sampled using pitfall traps during three 9- to 14-d periods corresponding to spring, summer, and fall. A total of 2,313 specimens, representing 31 species, were collected over the 2 yr of sampling. The eight most common species represented 87% of the total specimens collected and included Scarites quadriceps Chaudoir, Elaphrapus anceps (LeConte), Bembidion rapidum (LeConte), Harpalus pensylvanicus (DeGeer), Poecilus chalcites (Say), Clivina impressefrons LeConte, Agonum punctiforme (Say), and Amara aenea (DeGeer). Canonical variates analysis based on the 10 most abundant species showed that the carabid

assemblages in the three cropping systems were distinguishable from each other. The organic system was found to be more different from the no-till and chisel-till systems than these two systems were from each other. In 2002, ground beetle relative abundance, measured species richness, and species diversity were greater in the organic than in the chisel-till system. Similar trends were found in 2001, but no significant differences were found in these measurements. Relatively few differences were found between the no-till and chisel-till systems. The estimated species richness of ground beetles based on several common estimators did not show differences among the three cropping systems. The potential use of ground beetles as ecological indicators is discussed. © 2006 Entomological Society of America.

143. **Gunnison sage-grouse use of Conservation Reserve Program fields in Utah and response to emergency grazing: A preliminary evaluation.**
Lupis, S. G.; Messmer, T. A.; and Black, T.
Wildlife Society Bulletin 34(4): 957-962. (2006)
NAL Call #: SK357.A1W5; ISSN: 00917648.
Notes: doi: 10.2193/0091-7648(2006)34[957:GSUOCR]2.0.CO;2.
Descriptors: Centrocercus minimus/ Conservation Reserve Program/ Emergency grazing/ Gunnison sage-grouse/ habitat use/ Utah
Abstract: Little information is available on the use of areas enrolled in the Conservation Reserve Program (CRP) by Gunnison sage-grouse (Centrocercus minimus) or the impacts of grazing on their habitat selection and movement patterns. Using radiotelemetry, we monitored 13 Gunnison sage-grouse in San Juan County, Utah, USA during 2001-2002 to determine their use of CRP. Additionally, in 2002 some of the CRP land used by the birds in 2001 was grazed under a drought emergency declaration. This afforded us an opportunity to monitor their response to livestock grazing. Although Gunnison sage-grouse used CRP for nesting, brood-rearing, and summer habitat, it was not selected in greater proportion than its availability ($P \leq 0.10$) on the landscape. Bird-use sites in the CRP did not entirely meet habitat guidelines recommended by the Gunnison sage-grouse Rangewide Steering Committee (2005). Most of the sage-grouse we monitored avoided CRP fields when livestock were present. The one exception to this was a hen with a brood. We believe long-term maintenance of CRP in San Juan County will result in achieving habitat conditions that are more desirable for Gunnison sage-grouse. Future livestock management practices in areas used by Gunnison sage-grouse should incorporate short-term, high-intensity deferred-grazing rotations.

144. **Habitat associations of grasshopper species (Orthoptera : Acrididae) in winter wheat (Triticum aestivum L.) and adjacent rangeland.**
Gillespie, R. L. and Kemp, W. P.
Journal of the Kansas Entomological Society 68(4): 415-424. (1995)
NAL Call #: 420 K13; ISSN: 0022-8567
Descriptors: Acrididae/ Triticum aestivum/ rangelands/ species composition/ population density/ United States/ Orthoptera/ population ecology/ insects
Abstract: Thirty-one species of grasshoppers were collected in either winter wheat or adjacent rangeland/CRP, at ten study sites for three years. Eighteen species were collected in winter wheat fields while 29 species were collected in adjacent reseeded native rangeland or newly seeded Conservation Reserve Program (CRP) land, seeded to crested wheatgrass (Agropyron cristatum (L.) Gaertn. and alfalfa Medicago sativa L.). In native rangeland these two species were reseeded into Stipa comata Trin. and Rupr., Bouteloua gracilis (H.B.K). habitat. Melanoplus sanguinipes, M. bivittatus, and M. packardii, pest species of crops and rangeland in the Northern Great Plains, were the predominant species in winter wheat and together with Aulocara elliotti were the predominant species in adjacent rangeland or CRP. The number of M. sanguinipes collected per unit of effort in CRP was the same as the number collected in "established" reseeded rangeland. Fewer A. elliotti were collected per unit effort in CRP when compared to "established" reseeded rangeland. The results suggest that CRP supports a lower population of A. elliotti than "established" reseeded rangeland or there has been an insufficient span of time for A. elliotti to disperse into these areas.

145. **Habitat management to conserve natural enemies of arthropod pests in agriculture.**
Landis, Douglas A.; Wratten, Stephen D.; and Gurr, Geoff M.
Annual Review of Entomology 45: 175-201. (2000)
NAL Call #: 421 An72; ISSN: 0066-4170.
http://arjournals.annualreviews.org/doi/pdf/10.1146/annurev.ento.45.1.175?
Descriptors: control/ conservation measures/ man-made habitat/ Insecta: biological control/ habitat management/ farm management/ cultivated land habitat/ arthropods/ insects/ invertebrates
Abstract: Many agroecosystems are unfavorable environments for natural enemies due to high levels of disturbance. Habitat management, a form of conservation biological control, is an ecologically based approach aimed at favoring natural enemies and enhancing biological control in agricultural systems. The goal of habitat management is to create a suitable ecological infrastructure within the agricultural landscape to provide resources such as food for adult natural enemies, alternative prey or hosts, and shelter from adverse conditions. These resources must be integrated into the landscape in a way that is spatially and temporally favorable to natural enemies and practical for producers to implement. The rapidly expanding literature on habitat management is reviewed with attention to practices for favoring predators and parasitoids, implementation of habitat management, and the contributions of modeling and ecological theory to this developing area of conservation biological control. The potential to integrate the goals of habitat management for natural enemies and nature conservation is discussed. [article abstract]

146. **Habitat preferences of migrant and wintering northern harriers in northwestern Texas.**
Littlefield, C. D. and Johnson, D. H.
Southwestern Naturalist 50(4): 448-452. (2005)
NAL Call #: 409.6 So8; ISSN: 00384909.
Notes: doi: 10.1894/0038-4909(2005)050 [0448:HPOMAW]2.0.CO;2.
Descriptors: Circus cyaneus/ Triticum aestivum/ Texas/ harriers/ Conservation Reserve Program/ prairies/ grasslands
Abstract: We studied habitat preferences of northern harriers (Circus cyaneus) in 4 counties of the Southern High Plains of northwestern Texas from October 1989 to May 1995. Harriers generally arrived in late July and departed in April. They hunted over a variety of habitats in the study area but mainly in Conservation Reserve Program (CRP) grasslands and vegetated playa basins. CRP grasslands, playa basins, and shortgrass prairie were used disproportionately to their availability, whereas winter wheat was used less than its availability. Brown harriers (adult females or subadults of either sex) foraged in CRP about as often as adult males but more frequently in playas and prairies, whereas adult males foraged more in winter wheat. As underground water sources for irrigation continue to be depleted, agricultural practices are likely to change. Depending on how the land is used after irrigation ceases, harriers might benefit if CRP grasslands, vegetated playas, and shortgrass prairies persist. If dominant land use reverts to livestock grazing, however, the harrier population will be negatively affected.

147. **Habitat restoration and agricultural production under land retirement.**
Purkey, D. R. and Wallender, W. W.
Journal of Irrigation and Drainage Engineering 127(4): 240-245. (2001)
NAL Call #: 290.9 Am3ps (IR); ISSN: 0733-9437
Descriptors: agricultural production/ endangered species/ groundwater/ groundwater flow/ habitats/ irrigation water/ land diversion/ nature conservation/ simulation/ simulation models/ wildlife conservation/ Dipodomys/ Sciuridae/ Vulpes
Abstract: Current land retirement programmes seek to address drainage management challenges in the western San Joaquin Valley of California, USA, using a willing seller strategy. In choosing between available parcels, the programme managers focus primarily on the drainage mitigation potential of retiring each parcel of land. The results of 50-year groundwater simulations suggest that retirement of parcels already underlain by shallow groundwater produces the largest drain flow reduction. However, the managers also want this land to provide useful habitat for threatened terrestrial organisms (Kit Fox, Giant Kangaroo-rat, blunt-nosed leopard lizard and Nelson's antelope ground squirrel). Using the depth of unsaturated material above a shallow water table as a proxy for habitat suitability, the model results reveal that only retirement of land that is currently well aerated and free from shallow groundwater will provide useful habitat in the long term. A secondary objective of land retirement is to minimize the negative local economic impact of removing a parcel from production. According to a productivity proxy drawn from model results, the retirement of land already overlying shallow groundwater could minimize the short-term productivity decline.

148. **Herbicide and prescribed fire as habitat management tools for northern bobwhite in Conservation Reserve Program fields.**
Greenfield, Kirk C.; Burger, L. Wes; and Chamberlain, Michael J.
Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 55: 445-455. (2001)
NAL Call #: SK1.S6; ISSN: 0276-7929
Descriptors: commercial activities/ conservation measures/ terrestrial habitat/ abiotic factors/ Chemical factors/ physical factors/ land zones/ Colinus virginianus: farming and agriculture/ habitat management/ Grassland habitat quality improvement/ herbicide and prescribed fire management tools assessment/ grassland/ fertilizers and pesticides/ pesticides/ fire/ Mississippi/ Lowndes County/ Aves, Galliformes, Phasianidae/ birds/ chordates/ vertebrates
Abstract: Kentucky-31 tall fescue (Festuca arundicacea) was a common planting established on Conservation Reserve Program (CRP) fields throughout the southeastern United States during the late 1980s and 1990s. Fescue-dominated grassland communities on CRP fields offer poor quality nesting, brood-rearing, and foraging habitat for northern bobwhite (Colinus virginianus) because of dense vegetation, high litter cover, low bare ground, and low plant diversity. Herbicide applications have been shown to reduce fescue and release early successional plant communities, and therefore may enhance bobwhite habitat quality. However, the relative efficacy of herbicide used in conjunction with fire has not been investigated. We tested singular and joint effects of herbicide (glyphosate) application and burning on vegetation in fescue CRP fields in east Mississippi. We tested the following 4 treatments: spring glyphosate application, spring burn, spring burn and glyphosate application, and control. All manipulations modified plant communities and enhanced bobwhite brood-rearing habitat to varying degrees. Spring burn increased bare ground and decreased litter cover (P≤0.05). Spring herbicide application increased forbs, legumes, and annual weeds, but decreased grass and fescue canopy (P<=0.05). Spring burn/herbicide application increased forbs, legumes, annual weeds, and bare ground but decreased grass canopy, fescue canopy, and litter cover (P≤0.05). Canopy coverage of bobwhite food plants was greatest in spring burn/herbicide (P≤0.05). Herbicide applied alone and in conjunction with burning enhanced bobwhite brood-rearing habitat in fescue CRP fields in east Mississippi by promoting early successional plant communities. This information has implications for implementation of wildlife management in federal agricultural multiple-year land retirement programs and other cool season grasslands not enrolled in federal programs.

149. **History and economics of Farm Bill legislation and the impacts on wildlife management and policies.**
Harmon, K. W.
In: Impacts of the Conservation Reserve Program in the Great Plains, General Technical Report-RM 158; Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, 1988. pp. 105-108.
Notes: 0277-5786 (ISSN); Proceedings of a Symposium on "Impacts of the Conservation Reserve Program in the Great Plains," held Sept 16-18, 1987, Denver, Colorado. Includes references.
NAL Call #: aSD11.A42
Descriptors: land diversion/ wildlife/ legislation/ revegetation/ habitats/ pheasants/ resource conservation/ soil conservation/ erosion control/ Conservation Reserve Program/ Food Security Act of 1985
This citation is from AGRICOLA.

150. **Home range and habitat use of coyotes in an area of native prairie, farmland and CRP fields.**
Kamler, J. F.; Ballard, W. B.; Lemons, P. R.; Gilliland, R. L.; and Mote, K.
American Midland Naturalist 153(2): 396-404. (2005)
NAL Call #: 410 M58; ISSN: 00030031
Descriptors: canid/ habitat use/ home range/ prairie/ Texas/ United States/ Canidae/ Canis latrans
Abstract: From 1999 to 2001 we monitored 12 coyotes (Canis latrans) in northwestern Texas to determine their home ranges and habitat use in a landscape interspersed with native prairie, farmland and Conservation Reserve Program (CRP) fields. Annual home range size was 10.1 km^2 for residents and 84.5 km^2 for transients. We determined habitat use at two spatial scales: within home ranges and within study area. Habitat use patterns were similar at both scales, as residents selected for native prairie and transients selected for CRP fields. Habitat use between residents and transients differed in both seasons, with residents selecting more native prairie, less farmland and less CRP (summer only) than transients. Habitat at natal den sites also differed from expected for residents, as most dens (8 of 10) were located in CRP fields. The CRP fields contained the only tall permanent vegetation on our study sites and appeared to provide important foraging habitat for transient coyotes, and denning habitat for resident coyotes.

151. **Home range and seasonal movements of Columbian sharp-tailed grouse associated with Conservation Reserve Program and mine reclamation.**
Boisvert, J. H.; Hoffman, R. W.; and Reese, K. P.
Western North American Naturalist 65(1): 36-44. (2005)
NAL Call #: QH1.G7; ISSN: 15270904
Descriptors: Colorado/ Columbian sharp-tailed Grouse/ Conservation Reserve Program/ home range/ mine reclamation/ seasonal movements/ Tympanuchus phasianellus columbianus/ Pedioecetes phasianellus columbianus/ Phasianidae/ Tympanuchus phasianellus
Abstract: During 1999 and 2000 we trapped and radio-marked 156 Columbian Sharp-tailed Grouse (Tympanuchus phasianellus columbianus) on leks in Conservation Reserve Program (CRP, n = 73) and mine reclamation (MR, n = 83) lands in northwestern Colorado. Median spring-fall home range sizes using the 95% fixed kernal and minimum convex polygon estimators for 54 grouse were 86 ha and 61 ha, respectively. Median fixed kernal home range size did not differ between males (79 ha) and females (87 ha). Home ranges of grouse associated with CRP (112 ha) were larger than those of grouse in MR (75 ha). Directional orientation of movements from leks of capture to wintering areas was nonrandom, and there was a positive elevation gain (median = 102 m) associated with these movements. Movements did not differ between grouse captured in CRP and MR for any season but did differ between genders for the spring-fall period. Males exhibited stronger fidelity and less variation in their movements than females; 96% of males compared with only 77% of females remained within 2.0 km of their lek of capture from spring through fall. Ninety percent of females nested within 2.5 km of their lek of capture. During winter all grouse were found farther (median = 21.5 km) from lek sites than in any other season. Males remained on the breeding range longer in the fall and returned earlier in the spring than females even though they wintered similar distances away (median males = 21.5 km, median females = 21.4 km). Our findings support the 2.0-km radius used in the Habitat Suitability Index model for Columbian Sharp-tailed Grouse to assess nest and brood-rearing cover around leks, but not the 6.5-km radius used to evaluate winter cover.

152. **Home ranges of ring-necked pheasants in northwestern Kansas.**
Applegate, Roger D.; Flock, Brian E.; Gipson, Philip S.; Mccoy, Matthew W.; and Kemp, Kenneth E.
Prairie Naturalist 34(1-2): 21-29. (2002)
NAL Call #: QH540.P7; ISSN: 0091-0376
Descriptors: Conservation Reserve Program [CRP]/ adaptive kernels/ brooding behavior/ habitat density/ home range size/ minimum convex polygons/ nesting behavior/ travel distance/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ Phasianus colchicus [ring-necked pheasant] (Galliformes): female, male
Abstract: We studied the home ranges of 29 female and 9 male ring-necked pheasants (Phasianus colchicus) in northwestern Kansas during 1994 to 1995. Home ranges for hens varied from an average of 127 ha in high-density (25%) Conservation Reserve Program (CRP) to 155 ha on low-density (8 to 11%) CRP sites. Home ranges for cocks averaged 179 ha on the high-density CRP site and 105 ha on the low-density CRP site. The amount of CRP in areas where home ranges were located had no detectable effect on size of home ranges. Our estimates of hen home ranges during nesting and brooding periods were larger than reported from other regions. This might reflect the need for hens to travel greater distances in northwestern Kansas in order to obtain adequate food and cover for themselves and their broods.

153. **A home to roam.**
Breining, Greg
Minnesota Conservation Volunteer 64(379) (2001).
URL: http://www.dnr.state.mn.us/volunteer/novdec01/prairie_chickens.html
Descriptors: Accipitridae/ Ciconiiformes/ Galliformes/ Phasianidae/ Strigidae/ Strigiformes/ Bubo virginianus/ Buteo jamaicensis/ Phasianus colchicus/ Tympanuchus cupido/ agricultural practices/ habits-behavior/ birds/

conservation/ ecosystems/ endangered-threatened species/ funding/ grasslands/ habitat alterations/ habitat management/ habitat use/ history/ management/ monitoring/ nest parasitism/ prairies/ predation/ predators/ protection/ restoration/ status/ stocking-transplanting/ survival/ techniques/ telemetry/ wildlife/ prairie chicken/ ring-necked pheasant/ red-tailed hawk/ great horned owl
Abstract: Prairie chickens once lived throughout the prairies of western and southern Minnesota, conspicuous on their spring booming grounds and popular with the state's hunters. The population of the bird started to grow for sometime but over-hunting over a period of time, loss of habitats of native grasses and small farm fields, as they were converted to larger acreages of row crops, led to their population decline. Prairie protection programs and federal grassland projects such as Conservation Reserve Program, which includes projects, like reintroduction and relocation of the species, restoration and protection of habitats has helped in rebuilding and stabilizing their population. Although the programs faced problems like "dump nest" by pheasants, (leaving of relocated areas to move into another area where the birds were reintroduced), and predators, many birds have managed to survive, which has led to an increase in population.

154. **Human-imprinted northern bobwhite chicks and indexing arthropod foods in habitat patches.**
Palmer, W. E.; Lane, M. W.; and Bromley, P. T.
Journal of Wildlife Management 65(4): 861-870. (2001)
NAL Call #: 410 J827; ISSN: 0022541X
Descriptors: agriculture/ arthropods/ Colinus virginianus/ corn/ feeding/ habitat/ northern bobwhite/ soybean/ arthropod/ diet/ foraging behavior/ gamebird/ patch use/ wildlife management/ Colinus virginianus
Abstract: Arthropods are an important diet resource for northern bobwhite (Colinus virginianus) chicks. Estimates of arthropod abundance using standard entomological sampling techniques may lack biological relevance for assessing potential foraging value of habitat patches because they do not incorporate a realistic availability measure of arthropods to bobwhite chicks. Assuming that human-imprinted (hereafter, imprinted) bobwhite chicks foraged similarly to wild bobwhite chicks, we estimated foraging rates (arthropods [g] consumed/30 min/chick) and mass (g) changes of imprinted chicks foraging in different habitat patches, and used these measures to index arthropod abundance. Ranks of arthropod abundance in soybean fields (n = 8) based on foraging rates of imprinted chicks were different from ranks based on arthropod counts from sweepnet sampling. Ranks of arthropod abundance in soybean fields (n = 10) based on mass changes of imprinted chicks were different from ranks based on dry mass (g) of arthropods collected by sweepnetting and pitfall trapping. However, ranks of habitat patches based on foraging rates and mass changes of imprinted chicks were similar. Estimated sample sizes for comparing chick foraging rates of 2 agricultural habitats, with power (1 - β) = 0.8 and α = 0.05, were reasonable (n ≤ 11) at observed levels of sampling error. Foraging rates of imprinted chicks in randomly selected, conventionally tilled soybean and corn fields were low (range 0.09-0.12 g/30 min/chick), but foraging rates were 2.1 and 3.8 times greater along field edges and in no-tilled fields, respectively. Our results suggest that using estimates of arthropod abundance to rank the foraging value of habitats may be unreliable without information on availability of arthropods to chicks. Indices of the foraging value of habitat patches based on imprinted bobwhite chicks were more biologically relevant than arthropod abundance information.

155. **Illinois Wildlife Enhancement Bonus Program: Analysis of the Illinois Department of Natural Resources and Illinois Quail Unlimited Conservation Program.**
Hasstedt, S. C.
Edwardsville, IL: Southern Illinois University at Edwardsville, 2002.
Notes: Report numbers: CI01316, ADA398508XSP; Thesis
Descriptors: natural resources/ population/ preservation/ birds/ agriculture/ farms/ land areas/ Illinois/ silviculture/ conservation/ habitats/ wildlife/ bobwhite quails/ IWEBP/ wildlife enhancement bonus programs/ natural resource management/ medicine/ biology/ botany/ zoology/ ecology
Abstract: In 1998 the Illinois Department of Natural Resources (IDNR), Division of Wildlife Resources, Habitat Stamp Fund in conjunction with Illinois Quail Unlimited (QU) initiated the Illinois Wildlife Enhancement Bonus Program (IWEBP) . Financial incentives are available to property owners for implementation of wildlife friendly practices on land enrolled in the United States Department of Agriculture's (USDA) Conservation Reserve Program (CRP) and non-CRP acres are eligible under a fescue (Festuca arundinaceae) conversion initiative. Mail surveys following the Total Design Method (Salant and Dillman 1994) were used to gauge both land owner I operator and Natural Resources Conservation Service (NRCS) professional's perceptions regarding IWEBP efficacy in improving wildlife habitat, administrative costs of IWEBP, and characteristics of enrolled participants. Proportional response histograms and higher order analyses revealed IWEBP participants place a high intrinsic value on both habitat and the presence of wildlife on their land, and the financial incentive is most important to offset the high cost of re-establishing native grasses and forbs. NRCS personnel generally believe, compared to other state conservation programs, IWEBP provides similar or better habitat benefits for wildlife in general and is particularly beneficial to bobwhite quail (Colinus virginianus). Land owners and NRCS personnel alike appreciate the relative simplicity of IWEBP enrollment procedures, but further education efforts regarding the singular importance of habitat (Brennan 1991, Jenkins 2000) in improving upland wildlife populations could further the success of this program.

156. **Impact of agricultural management on carabid communities and weed seed predation.**
Menalled, Fabian D.; Smith, Richard G.; Dauer, Joseph T.; and Fox, Tyler B.
Agriculture, Ecosystems and Environment 118(1-4): 49-54. (2007)
NAL Call #: S601.A34; ISSN: 0167-8809
Descriptors: commercial activities/ nutrition/ diet/ ecology/ population dynamics/ man-made habitat/ land zones/ Carabidae: farming and agriculture/ agricultural management systems/ Effect on communities/ community structure/ population size/ cultivated land habitat/ Michigan/ Hickory Corners/ Insecta, Coleoptera, Adephaga,

Caraboidea/ arthropods/ beetles/ insects/ invertebrates
Abstract: This study evaluated the relationship between diversity and activity-density of carabid beetles and invertebrate weed seed predation in conventional, no-till, and organic management systems in the Midwest USA. Carabid beetles were sampled with pitfall traps and invertebrate seed predation rates of fall panicum and common lambsquarters were assayed with exclosure cages. Total carabid activity-density was over two times higher in the conventional systems compared to the no-till and organic management systems. In contrast, activity-densities of seed-predating carabid species were over three times higher in the no-till compared to the conventional and organic systems. Carabid diversity was higher in the no-till and organic systems compared to the conventional system, and a multivariate analysis showed that carabid community structure was distinct among the three systems. Predation of fall panicum and common lambsquarters seeds was often over two times higher in the no-till compared to the conventional and organic systems, and there was a strong correlation (r > 0.94) between seed removal rates and the total number of carabid seed predators captured in each system.

157. **The impact of CRP on avian wildlife: A review.**
Ryan, M. R.; Burger, L. W.; and Kurzejeski, E. W.
Journal of Production Agriculture 11(1): 61-66. (Jan. 1998-Mar. 1998)
NAL Call #: S539.5.J68; ISSN: 0890-8524 [JPRAEN].
Notes: Literature review.
Descriptors: wildlife/ wild birds/ habitats/ government policy/ populations/ grasslands/ species diversity/ nests/ population growth/ land banks/ wildlife conservation/ Conservation Reserve Program
Abstract: We reviewed the literature to assess the impact of the Conservation Reserve Program (CRP) on bird populations in the central USA. The CRP replaced production agriculture fields with grassland habitat used by more than 90 species of birds. At least 42 bird species nested in CRP habitats. Bird species richness in CRP fields was similar to that in rowcrop fields, but relative abundance was 1.4 to 10.5 times higher in CRP plantings. Nest abundance was 13.5 times higher in CRP than crop fields, although nesting success of songbirds was only slightly higher in CRP fields (40% vs. 36% in crops). Limited evidence suggests that the CRP has positively affected the population growth rates of several nongame grassland bird species. Waterfowl nest densities and nesting success in CRP fields were similar to these occurring in grassland habitats managed specifically for waterfowl. The presence of CRP grassland has been postulated to have improved the quality of existing duck nest habitat by dispersing nests over a larger area. Ring-necked pheasant (Phasianus colchicus L.) populations seemingly increased substantially with CRP acres. Little evidence of positive population response by northern bobwhites (Colinus virginianus L.) to the CRP is available. Overall, grassland birds known to be declining throughout North America were seemingly the most benefitted by the CRP.
This citation is from AGRICOLA.

158. **Impact of different agricultural practices on the genetic structure of Lumbricus terrestris, Arion lusitanicus and Microtus arvalis.**
Kautenburger, R.
Animal Biodiversity and Conservation 29(1): 19-32. (2006)
NAL Call #: QL1.M87; ISSN: 1578665X
Descriptors: Arion lusitanicus/ DNA fingerprinting/ genetic structure/ land use/ Lumbricus terrestris/ Microtus arvalis
Abstract: Little attention has been given to date to the potential influence of agricultural land use methods or farming practice on the genetic variability of native species. In the present study, we measured the genetic structure of three model species - Microtus arvalis, Arion lusitanicus and Lumbricus terrestris - in an agricultural landscape with a diversity of land use types and farming practices. The aim of the study was to investigate whether different management strategies such as the method of land use or type of farming practice (conventional and ecological farming) have an impact on the species' genetic structure. We used RAPD markers and multilocus DNA fingerprints as genetic tools. Genetic similarity was based on the presence or absence of bands, which revealed a wide range of variability within and between the analysed populations for each model species. Cluster analysis and Mantel tests (isolation by distance) showed different genetic structures in the populations of M. arvalis from sampling sites with different land use. However, the main factors influencing the genetic variability of these vole populations were geographic distances and isolation barriers. The genetic variability observed in A. lusitanicus populations correlated with geographic distance and the type of land use method, but no correlation was found with different farming practices. Our preliminary results suggest that the genetic structure of L. terrestris populations is influenced by the agricultural land use method used at the different sampling sites but not by the geographic distance. © 2006 Museu de Ciencies Naturals.

159. **The impact of haying Conservation Reserve Program lands on productivity of ducks nesting in the Prairie Pothole Region of North and South Dakota.**
Renner, R. W.; Reynolds, R. E.; and Batt, B. D.
Transactions of the North American Wildlife and Natural Resource Conference 60: 221-229. (1995)
NAL Call #: 412.9 N814; ISSN: 0078-1355 [NAWTA6].
Notes: Conference held 24-29 Mar 1995, Minneapolis. MN; Conference Sponsors: Ducks Unlimited and Wildlife Management Institute; World Meeting Number 951-0315.
Descriptors: Anatidae/ prairies/ conservation areas/ haymaking/ reproductive performance/ nature reserves/ land banks/ North Dakota/ South Dakota
Abstract: Compared nest success and duck production in hayed and non-hayed CRP fields.
This citation is from AGRICOLA.

160. **Impact of haying CRP lands on duck nesting in the Prairie Pothole Region.**
Renner, R. W. and Reynolds, R. E.
In: 60th North American Wildlife and Natural Resources Conference. Minneapolis. MN (USA).
Bismarck, ND: Ducks Unlimited; 1995.
Notes: Conference Sponsor: Wildlife Management Institute (Washington, DC); World Meeting Number 951-0315.
Descriptors: hay/ haying/ waterfowl/ ducks/ nesting/ Conservation Reserve Program/ Prairie Pothole region

161. **Impact of leafy spurge on post-Conservation Reserve Program land.**
Hirsch, S. A. and Leitch, J. A.
Journal of Range Management 51(6): 614-620. (Nov. 1998)
NAL Call #: 60.18 J82 ; ISSN: 0022-409X [JRMGAQ]
Descriptors: euphorbia esula/ conservation areas/ weed control/ species diversity/ economic impact/ grazing/ carrying capacity/ wildlife/ North Dakota
Abstract: Leafy spurge (Euphorbia esula L.), a noxious weed infests some of the 1.2 million hectares of Conservation Reserve Program (CRP) land in North Dakota. Once established a leafy spurge monoculture will reduce expected CRP benefits and impact returns to some post-CRP land uses. The study estimated statewide direct economic impacts of about $351,000 on post-CRP land maintained in vegetative cover, $1.118 million on post-CRP grazing land, and negligible (assumed $0) on post-CRP cropland, for a total of $1.469 million. Total annual direct and secondary economic impacts to North Dakota's economy were estimated to be $4.665 million, which would support about 57 jobs.
This citation is from AGRICOLA.

162. **Impact of the Conservation Reserve Program on duck recruitment in the U.S. Prairie Pothole Region.**
Reynolds, R. E.; Shaffer, T. L.; Renner, R. W.; Newton, W. E.; and Batt, B. D.
Journal of Wildlife Management 65(4): 765-780. (2001)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: breeding success/ recruitment/ land use/ wildlife management/ Conservation Reserve Program/ habitat improvement/ breeding sites/ food availability/ hunting/ aquaculture/ Anas/ Montana/ South Dakota/ North Dakota/ Prairie Pothole Region/ Prairie Pothole Region/ Conservation Reserve Program/ Dabbling ducks/ management/ Culture of other aquatic animals/ United States
Abstract: The U.S. Department of Agriculture (USDA)'s Conservation Reserve Program (CRP) resulted in the conversion of about 1.9 million ha of cropland to perennial grass cover in the Prairie Pothole Region of North Dakota, South Dakota, and northeastern Montana by 1992. Many wildlife managers believed this cover would provide benefits to wildlife, including upland nesting ducks. During 1992-1995, we evaluated success of 5 duck species nesting in CRP fields and nearby Waterfowl Production Areas (WPA) throughout the region. We examined relationships between daily survival rates (DSR) of duck nests in CRP cover and landscape-level habitat and population parameters. We computed DSR of duck nests in other major cover types in our study area from data collected during 1980-1984 (pre-CRP) and 1990-1994 (CRP) periods. We then applied recruitment models to estimate duck production in our study area during peak CRP years (1992-1997) and compared these results with those that simulated the scenario in which cropland was in place of CRP cover (i.e., the CRP had not occurred). DSR were higher in all habitats combined during the CRP period compared to the pre-CRP period. Regressions of DSR in CRP cover on the percent of each study plot in perennial cover and geographic location were significant (P< 0.01) for 4 of 5 duck (Anas spp.) species. Estimated nest success and recruitment rates for the 5 species combined during 1992-1997 were 46% and 30% higher, respectively, with CRP cover on the landscape compared to a scenario where we simulated cropland in place of CRP. Our model estimated an additional 12.4 million recruits from our study area to the fall flight as a consequence of the CRP during 1992-1997. Our results document benefits to 5 duck species in the northern plains associated with a farm program that provided financial incentives to landowners for planting undisturbed grass cover as an alternative to annual crops.

163. **Impact of the Conservation Reserve Program on wildlife conservation in the Midwest.**
Farrand, D. Todd and Ryan, Mark R.
In: Fish and wildlife benefits of Farm Bill conservation programs: 2000-2005 update, Technical Review 05-2/ Haufler, Jonathan B., editor; Bethesda, MD: The Wildlife Society, 2005. pp. 41-60.
http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html
Descriptors: conservation programs/ wildlife conservation/ wildlife response/ United States, Midwest/ Conservation Reserve Program/ grasslands/ population stability
Abstract: Evidence that the Conservation Reserve Program (CRP) created habitat used by grassland birds in the Midwest is unquestionable. Evidence also is accumulating that suggests CRP is used by a variety of other terrestrial wildlife species. Reproductive and population-level benefits have been demonstrated for some, but not all, avian species; evidence for other terrestrial wildlife is lacking. Wildlife response to CRP is a multiscale phenomenon dependent upon vegetation structure and composition within the planting, practice-level factors such as size and shape, and its landscape context, as well as temporal factors. Thus, the benefits of CRP and the impacts of recent programmatic changes are location- and species-specific. Overall, CRP habitat in the Midwest likely contributes to the population stability and growth of many, but not all, grassland wildlife species.

164. **Impact of the Conservation Reserve Program on wildlife conservation in the Midwest.**
Ryan, M. R.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA/NRCS/WHMI.
Madison, MS: USDA, NRCS, Wildlife Habitat Management Institute, 2000; pp. 45-54.
NAL Call #: aS604.6 C66 2000
Descriptors: Conservation Reserve Program/ wildlife habitats/ wildlife management/ Midwest

165. **Impacts of farm programs on bobwhites: ACR and CRP seedings as bobwhite nesting and brood-rearing habitat.**
Roseberry, J. L. Illinois Department of Conservation, 1992. 29 pp.
Notes: Cooperative Upland Wildlife Research; Final Report; Project Number: IL W-106-R/Job 4.1A/Study 4.
Descriptors: Colinus virginianus/ bobwhite/ seeding/ habitat management for wildlife/ farms/ habitat/ nests and nesting/ broods and brooding/ utilization/ cultivated farmland/ policies and programs/ transect survey/ vegetation/ cover, nesting/ population density/ Illinois/ Jasper County

166. **Impacts of small mammals and birds on low-tillage, dryland crops.**
Sterner, R. T.; Petersen, B. E.; Gaddis, S. E.; Tope, K. L.; and Poss, D. J.
Crop Protection 22(4): 595-602. (2003); ISSN: 02612194.
Notes: doi: 10.1016/S0261-2194(02)00236-3.
Descriptors: bird/ corn/ Crop damage/ deer mouse/ dryland/ Great Plains/ low-tillage/ plant debris/ small mammal/ soybean/ avifauna/ crop pest/ dryland farming/ pest damage/ small mammal/ United States/ Calamospiza melanocorys/ Charadrius montanus/ Charadrius vociferus/ Eremophila alpestris/ Lepus californicus/ Lepus townsendii/ Odocoileus hemionus/ Odocoileus virginianus/ Onychomys leucogaster/ Peromyscus maniculatus/ Reithrodontomys megalotis/ Spermophilus tridecemlineatus/ Sturnella neglecta/ Zenaida macroura
Abstract: During 2000-2001, small mammals, birds, and potential corn/soybean damage were studied at a low-tillage, non-irrigated agricultural research site in the Colorado Piedmont. A small mammal survey involved four trapping sessions and 18, 12-live-trap grids each. Within years, two grids each were placed at random, fixed locations in experimental corn, fallow, millet, pea, soybean, sunflower, and wheat plots at the site; two off-plot grids each were set at random, fixed locations < 100 m from the north and south edge of these plots. In 2001, periodic bird observations were conducted, and damage to corn and soybean plants was assessed. Capture rates were low during all trap sessions (range 0.1%-3.3%, $\bar{x}$ = 2.2%). Sixty-three small mammals were captured and 39 were recaptured. Captures included deer mouse (Peromyscus maniculatus), northern grasshopper mouse (Onychomys leucogaster), thirteen-lined ground squirrel (Spermophilus tridecemlineatus), and western harvest mouse (Reithrodontomys megalotis). Deer mice accounted for 56 of the initial captures (88.9%). In-crop captures (n = 15) and recaptures (n = 16) were most frequent in wheat plots. Bird counts were low and included horned lark (Eremophila alpestris), killdeer plover (Charadrius vociferus), lark bunting (Calamospiza melanocorys), mountain plover (Charadrius montanus), mourning dove (Zenaida macroura), and western meadowlark (Sturnella neglecta). No direct seed removal, sprout removal, or plant clipping by small mammals or birds was observed, but some clipping of soybean plants was attributed to deer (Odocoileus virginianus and O. hemionus) and jack rabbits (Lepus townsendii or L. californicus). Plant debris accumulation is viewed as a key factor determining small mammal abundance and potential damage in low-till agriculture.

167. **Impacts of tillage, cover crop, and nitrogen on populations of earthworms, microarthropods, and soil fungi in a cultivated fragile soil.**
Reeleder, R. D.; Miller, J. J.; Coelho, B. R. Ball; and Roy, R. C.
Applied Soil Ecology 33(3): 243-257. (2006)
NAL Call #: QH541.5.S6 A67; ISSN: 0929-1393
Descriptors: commercial activities/ ecology/ community structure/ terrestrial habitat/ man-made habitat/ abiotic factors/ land zones/ North America/ Canada/ Acari/ Aporrectodea turgida/ Collembola/ Microarthropoda: farming and agriculture/ soil population responses to tillage regime/ cover crop and nitrogen levels/ biomass/ relative abundance/ population dynamics/ soil habitat/ cultivated land habitat/ abiotic factors/ Ontario/ The Delhi/ Annelida, Oligochaeta/ Annelids/ Arachnids/ arthropods/ Chelicerates/ insects/ invertebrates
Abstract: The impacts of tillage regime, cover crop, and nitrogen on various soil organisms inhabiting a fragile sandy soil (Brunosolic Gray Brown Luvisol) were determined. Soil samples were collected between 2000 and 2003 from a long-term tillage experiment, established in 1988 to determine the effect of tillage systems on yield of corn (Zea mays), soil quality, and weed populations. Populations of several of the soil organisms studied were significantly affected by one or more agronomic treatments. A single earthworm species, Aporrectodea turgida, was found in the experimental area. Worm populations were generally low and dominated by juveniles. Spring-sampled populations were significantly higher in no-till plots than in conventionally tilled plots. Fall-sampled populations were not affected as greatly by tillage, but were generally higher in no-till plots not receiving additional nitrogen or in plots overseeded with a rye (Secale cereale) cover crop. Soil microbial biomass, as represented by extractable soil DNA, was higher in the spring than in the fall. Populations of the soilborne stramenopile Pythium were generally higher in conventionally tilled plots, and were increased by a rye cover crop. Higher rates of nitrogen increased populations of total soil fungi but nitrogen had little effect on prostigmatid or cryptostigmatid mites; prostigmatid populations were generally higher in no-till plots. Spring populations of mesostigmatid mites were higher in plots with a rye cover crop than in plots without an overwintering plant cover. Conventional tillage stimulated populations of astigmatid mites during periods of high rainfall. Collembola populations were dominated by the families Onychiuridae and Isotomidae, but neither was greatly affected by any tillage treatment. Principal component analysis showed that populations of A. turgida and soil aggregation tended to be positively associated with one another, but that variations in populations of Onychiuridae springtails, prostigmatid mites, and Pythium tended not to be associated with changes in other variables. Overall, effects of tillage treatments on soil organisms were found to differ from previous reports in several respects, suggesting that soil type may impose conditions that over-ride the impacts of agronomic cultivation systems on populations of soil organisms. [Crown Copyright 2005.]

168. **The Imperial Valley of California is critical to wintering mountain plovers.**
Wunder, M. B. and Knopf, F. L.
Journal of Field Ornithology 74(1): 74-80. (2003)
NAL Call #: 413.8 B534; ISSN: 02738570
Descriptors: California/ Charadrius montanus/ Imperial Valley/ mountain plover/ shorebird/ Charadrius montanus
Abstract: We surveyed Mountain Plovers (Charadrius montanus) wintering in the Imperial Valley of California in January 2001, and also recorded the types of crop fields used by plovers in this agricultural landscape. We tallied 4037 plovers in 36 flocks ranging in size from 4 to 596 birds. Plovers were more common on alfalfa and Bermudagrass fields than other field types. Further, most birds were on alfalfa fields that were currently being (or had recently been) grazed, primarily by domestic sheep. Plovers used Bermudagrass fields only after harvest and subsequent burning. Examination of Christmas Bird Count data from 1950-2000 indicated that the Mountain Plover has abandoned its historical wintering areas on the coastal plains of California. Numbers in the Central Valley seem to have undergone recent declines also. We believe that the cultivated landscape of the Imperial Valley provides wintering habitats for about half of the global population of Mountain Plovers. We attribute the current importance of the Imperial Valley for Mountain Plovers to loss of native coastal and Central Valley habitats rather than to a behavioral switching of wintering areas through time. Future changes in specific cropping or management practices in the Imperial Valley will have a major impact on the conservation status of this species.

169. **The importance of Conservation Reserve Program fields to breeding grassland birds at Buffalo Ridge, Minnesota.**
Leddy, Krecia L.; Higgins, Kenneth F.; and Naugle, David E.
South Dakota Academy of Science: Proceedings 76: 105-111. (1997)
NAL Call #: 500 SO82; ISSN: 0096-378X.
Notes: Papers presented at The 82nd Annual Meeting of the South Dakota Academy of Science, April 25-26, 1997, Northern State University, Aberdeen, South Dakota. Editor: Higgins, Kenneth F.
Descriptors: Passeriformes/ agricultural crops/ habits-behavior/ birds/ breeding/ Conservation Reserve Program/ density/ ecosystems/ farmland/ grasslands/ habitat management/ habitat use/ management/ pastures/ species diversity/ wildlife/ Minnesota, southwestern
Abstract: Nongame birds were surveyed during summer 1995 at Buffalo Ridge in southwestern Minnesota, to evaluate the importance of Conservation Reserve Program (CRP) grasslands to local avifauna. Bird abundance and composition were compared among three habitat types (CRP grasslands, pasturelands, and croplands) using an index to breeding bird density (i.e., number of singing males/transect area), percent species composition, and total species richness. Vertical height and density of vegetation were measured early in the growing season (mid-May) and during the peak of the growing season (mid-June) to determine whether vegetative structure was related to bird use of vegetation. Conservation Reserve Program fields had higher vegetation measurements and supported higher bird densities and species richness than pasturelands and croplands. Mean bird density (birds/100 ha) in CRP grasslands was 312.5 compared to 166.7 in pasturelands and only 75.0 in croplands. Ten bird species were present in CRP grasslands compared to eight in pasturelands and nine in croplands. The presence of three native bird species (sedge wren, dickcissel, and clay-colored sparrow) in CRP grasslands that were not found in pasturelands or croplands indicated that CRP grasslands were an important habitat type for maintaining avian diversity at Buffalo Ridge.

170. **Improving Conservation Reserve Program pine plantations for songbirds.**
Drew Lanham, J.; Ellenberger, J. E.; and Schweitzer, S. H.
Forest Landowner 61(3): 16-19. (2002)
NAL Call #: SD144.A15F67; ISSN: 10879110
Descriptors: conservation/ deforestation/ ecosystems/ Global warming/ pesticides/ seed/ wildlife conservation/ forestry/ Biocides/ birds/ conservation/ ecosystems/ forestry/ seeds
Abstract: The improvements in the Conservation Reserve Program (CRP) for songbirds of pine plantations are discussed. These birds consume hordes of inspect pests, dispering seeds and pollinating plants and help in the sustainment of healthy forest ecosystems. The factors related to the declining numbers are natural population cycles, tropical deforestation, pesticide use, global warming and habitat alterations.

171. **The influence of field age on mammalian relative abundance, diversity, and distribution on Conservation Reserve Program lands in Michigan.**
Furrow, Ly Thi
East Lansing, MI: Michigan State University, 1995.
Notes: Masters Thesis
Descriptors: conservation/ wildlife distribution/ prairies/ meadows/ agricultural conservation programs
Abstract: Past research evaluating wildlife use of Conservation Reserve Program (CRP) lands have focused primarily on avian populations as indicators of wildlife habitat quality. In addition to avian species, mammals may also serve as indicators of wildlife habitat quality and have not been adequately evaluated on CRP lands. Relative small mammal abundance, species composition, diversity, and vegetative characteristics were examined on replicated CP1 fields of 6 age classes and on agricultural fields in Gratiot County, Michigan in 1992 and 1993. Additionally, predator scent stations were used to monitor medium sized mammals associated with CRP fields. Results suggest that the structure and composition of various age classes of CRP fields influenced mammal abundance, richness, and diversity. Reverting CRP lands to cropland may have significant impacts on a diversity of mammal species that depend on habitat conditions provided by these grasslands.

172. **Influence of intercropping canola or pea with barley on assemblages of ground beetles (Coleoptera: Carabidae).**
Butts, R. A.; Floate, K. D.; David, M.; Blackshaw, R. E.; and Burnett, P. A.
Environmental Entomology 32(3): 535-541. (2003)
NAL Call #: QL461.E532; ISSN: 0046225X
Descriptors: agroecosystems/ biological control/ Canada/ diversity/ intercropping/ polyculture/ agricultural practices/ agroecology/ beetle/ biological control/ community composition/ intercropping/ species diversity/ Amara/ Bembidion/ Brassica napus/ Carabidae/ Coleoptera/ Hordeum vulgare/ Pisum sativum
Abstract: Pitfall traps were used to compare assemblages of ground beetles (Coleoptera: Carabidae) among treatments of two intercrop trials replicated at each of two sites in each of three years. The first trial comprised canola (Brassica napus L.) and barley (Hordeum vulgare L.) in monoculture and three intercrop treatments of canola and barley. The second trial comprised pea (Pisum sativum L.) and barley in monoculture and three intercrop treatments of pea and barley. Treatment had little effect on species richness. For taxa combined, a significant effect of treatment was detected in 3 of 11 cases, reflecting greater captures of beetles in canola or pea than in barley. Captures of individual taxa were compared among canola or pea versus each of the three intercrops versus barley. For 14 of 15 cases showing significant differences between monocultures, more beetles were captured in canola or pea than in barley. For 12 of 14 cases showing significant differences between monocultures and intercrops, captures of beetles were highest in canola or pea. These cases primarily reflected different captures of Amara spp. and Bembidion spp. across treatments. Results show that under the experimental conditions of the current study in Alberta, Canada, intercropping barley into canola or pea did not increase the activity abundance of populations above that observed in the latter two crops.

173. **Influence of landscape composition on bird use of rowcrop fields.**
Best, Louis B.; Bergin, Timothy M.; and Freemark, Kathryn E.
Journal of Wildlife Management 65(3): 442-449. (2001)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: wildlife management: conservation/ terrestrial ecology: ecology, environmental sciences/ principal component analysis/ analytical method/ landscape composition: influence/ rowcrop fields: bird use
Abstract: We evaluated the influence of landscape composition on bird use of rowcrop (corn and soybean) fields in 6 watersheds in Iowa from mid-May to late July 1993 and 1994. We counted birds within 50-m-radius circular plots positioned randomly within rowcrop fields and determined coverages for 21 habitats within 800-m-radius circles centered on each bird census plot. We evaluated the relationships between bird abundances in rowcrop fields and the habitat coverages in the landscape by using 2 multivariate procedures. We derived 3 landscape scenarios from a cluster analysis of the original habitat variables; the abundances of 7 bird species differed significantly among the 3 scenarios. Species abundances in rowcrop fields were greater in landscapes with more grassland block-cover and/or more wooded block-cover and strip-cover. Principal component analysis illustrated the responses of bird species to landscape composition; species responses depended upon the relative use (ranging from resident to occasional) that the birds made of the rowcrop fields. Habitat selection and use in birds is a multiscale phenomenon, and the landscape context should be considered when evaluating bird use of rowcrops.

174. **Influence of the Conservation Reserve Program on landscape structure and potential upland wildlife habitat.**
Weber, Whitney L.; Roseberry, John L.; and Woolf, Alan
Wildlife Society Bulletin 30(3): 888-898. (Fall 2002)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: conservation measures/ land and freshwater zones/ comprehensive zoology/ habitat management/ Illinois: South and west central/ Conservation Reserve Program/ landscape structure/ upland wildlife habitat/ Phasianidae: Galliformes, Aves/ birds/ chordates/ vertebrates

175. **The influence of the CRP on grasshopper sparrow population trends in the mid-continental United States.**
Herkert, James R.
Wildlife Society Bulletin 26(2): 227-231. (1998)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: Fringillidae/ Passeriformes/ Ammodramus savannarum/ birds/ Conservation Reserve Program/ ecosystems/ habitat management/ land use/ land, private/ management/ population ecology/ techniques/ wildlife/ wildlife-habitat relationships/ conservation programs/ sparrows/ abundance/ evaluation/ habitat changes/ grasshopper sparrow
Abstract: Data suggest that a balance of both managed and undisturbed Conservation Reserve Program lands in the northcentral United States would be most beneficial to a wide variety of grassland birds, including the grasshopper sparrow.

176. **Intercropping sunflower in organic vegetables to augment bird predators of arthropods.**
Jones, G. A. and Sieving, K. E.
Agriculture, Ecosystems and Environment 117(2-3): 171-177. (2006)
NAL Call #: S601.A34; ISSN: 01678809.
Notes: doi: 10.1016/j.agee.2006.03.026.
Descriptors: avian insectivory/ farmland birds/ Helianthus annuus/ intercrops/ predator augmentation
Abstract: Field experiments were used to test whether intercropping sunflower (Helianthus annuus) in organic vegetables would (1) attract insect-eating birds and encourage them to (2) forage in greater numbers and (3) for more time in cropped fields. Cropped areas with sunflower treatments of one or two rows per 0.4 ha exhibited significantly greater mean abundance of insectivorous birds than did control plots, across a variety of crop types. Additionally, both mean numbers of individual birds foraging on insect prey and mean insect-foraging time per hour in crops were significantly greater in plots with sunflower rows than without. Birds actively pursuing prey in study plots consumed economically important pest species

and did not damage crops during the study. The addition of sunflower intercrops proved to be an effective habitat modification for augmenting avian insectivore numbers and insect-foraging time in organic vegetables.

177. **Land-use changes and hunter participation: The case of the Conservation Reserve Program.**
Langner, L. L.
Transactions of the North American Wildlife and Natural Resource Conference (54th): 382-390. (1989)
NAL Call #: 412.9 N814; ISSN: 0078-1355 [NAWTA]
Descriptors: erosion control/ land use/ soil conservation/ wildlife management/ United States
This citation is from AGRICOLA.

178. **Land-use policy change and the ramifications for stewardship and waterfowl conservation in Saskatchewan.**
Riemer, G.
Prairie Forum 30(1): 11-24. (2005); ISSN: 03176282
Descriptors: land use change/ land use planning/ nature conservation/ prairie/ waterfowl/ Canada/ North America/ Saskatchewan/ Anas/ Anatidae/ Anser
Abstract: Most agricultural producers in the northern Great Plains consider themselves to be good stewards of the land, whether they are ranchers or grain farmers. In European culture, the notion of stewardship is rooted in a biblical context in which the steward maintains the productivity of his master's money. Today, the conservation movement has expanded stewardship to mean the proper care of the natural system, and many farmers consider good stewardship to mean clean, healthy crops from fence line to fence line. In many ways, the biblical notion of stewardship works against the conservation of native habitats. Over much of the last century, when stewardship was coupled with pro-grain production policies, farmers reacted by bringing land into "production" and Saskatchewan's landscape changed dramatically to the detriment of waterfowl and wildlife habitat in general. However, since the 1980s, the landscape of Saskatchewan has changed significantly again as producers have adjusted how they farm the land. The amount of land in permanent cover is roughly the same now as it was in the 1960s and 1970s. While the land that has been reseeded to grass does not have the same ecosystem integrity as native prairie, it does provide more ecosystem functions than the cropland it replaced. That is great news for those concerned about waterfowl conservation, but it is not the whole picture. This paper examines economic and policy-based causes of landscape changes in Saskatchewan, the effects of these changes on waterfowl populations, and habitat evaluations undertaken as part of the North American Waterfowl Management Plan (NAWMP).

179. **Landscape use and movements of wolves in relation to livestock in a wildland-agriculture matrix.**
Chavez, Andreas S. and Gese, Eric M.
Journal of Wildlife Management 70(4): 1079-1086. (2006)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: damage caused by animals/ conservation/ nutrition/ diet/ prey/ behavior/ activity patterns/ ecology/ man-made habitat/ land zones/ Canis lupus: damage to livestock/ conservation measures/ livestock conflicts management/ mammalian prey/ Bos taurus and Ovis aries/ Circadian activity/ home range/ habitat utilization/ potential livestock conflicts and management implications/ cultivated land habitat/ agricultural wildland matrix/ Minnesota/ Red River Valley/ Mammalia, Carnivora, Canidae/ carnivores/ chordates/ mammals/ vertebrates

180. **Linking soil properties and nematode community composition: Effects of soil management on soil food webs.**
Sanchez Moreno, Sara; Minoshima, Hideomi; Ferris, Howard; and Jackson, Louise E.
Nematology 8(5): 703-715. (2006); ISSN: 1388-5545
Descriptors: commercial activities/ ecology/ trophic structure/ terrestrial habitat/ man-made habitat/ Nematoda: farming and agriculture/ tillage and continuous cropping/ Impact of soil management on food webs and community composition/ food webs/ soil fauna/ influence of soil management/ community structure/ soil habitat/ food webs and community composition/ impact of soil management/ cultivated land habitat/ soil food webs and community composition/ Nematoda/ invertebrates/ nematodes
Abstract: The purported benefits of conservation tillage and continuous cropping in agricultural systems include enhancement of soil ecosystem functions to improve nutrient availability to crops and soil C storage. Studies relating soil management to community structure allow the development of bioindicators and the assessment of the consequences of management practices on the soil food web. During one year (December 2003-December 2004), we studied the influence of continuous cropping (CC), intermittent fallow (F), standard tillage (ST) and no tillage (NT) on the nematode assemblage and the soil food web in a legume-vegetable rotation system in California. The most intensive systems included four crops during the study period. Tillage practices and cropping pattern strongly influenced nematode faunal composition, and the soil food web, at different soil depths. Management effects on nematode taxa depended on their position along the coloniser-persister (cp) scale and on their trophic roles. At the last sampling date (December 2004), Mesorhabditis and Acrobeloides were positively associated with NH4+, while Panagrolaimus and Plectus were negatively correlated with certain phospholipid fatty acids (PLFA). Microbial-feeders were in general associated with both bacterial and fungal PLFA, microbial biomass C (MBC) by chloroform fumigation-extraction, total C and N, NH4+ and NO3-, and were most abundant in the surface soil of the NTCC treatment. Fungal-feeders were more closely related to PLFA markers of fungi than to ergosterol, a purported fungal sterol. Discolaimus, Prionchulus, Mylonchulus and Aporcelaimidae, in contrast, were associated with intermittent fallow and deeper soil layers. The organisms in the higher levels of the soil food web did not respond to the continuous input of C in the soil and a long recovery period may be required for appropriate taxa to be reintroduced and to increase. At the end of the experiment, each treatment supported quite different nematode assemblages and soil food webs.

181. **Male dickcissels feed nestlings in east-central Illinois.**
Maddox, J. D. and Bollinger, E. K.
Wilson Bulletin 112(1): 153-155. (Mar. 2000)
NAL Call #: 413.8 W692; ISSN: 0043-5643
Descriptors: feeding behavior/ paternal behavior/ nests/ food availability/ Illinois/ Spiza americana/ dickcissel/ birds/ United States
Abstract: We observed male Dickcissels (Spiza americana) commonly feeding nestlings in Conservation Reserve Program (CRP) fields in 1997 in east-central Illinois. Male Dickcissels fed nestlings at six of the eight nests we observed, accounting for 37% of the total nest visits. Overall, females made significantly more nest visits than males. However, at the six male-assisted nests, the number of male and female nest visits did not differ significantly. Male Dickcissel feeding behavior may have been prompted by low food abundance. Males were not observed feeding nestlings in 1998, when overall nest success was higher and nestling starvation was less than in 1997.

182. **Mammalian species composition, diversity, and succession in Conservation Reserve Program grasslands.**
Hall, D. L. and Willig, M. R.
Southwestern Naturalist 39: 11-10. (1994)
NAL Call #: 409.6 So8; ISSN: 0038-4909
Descriptors: Mammalia/ species composition/ species diversity/ succession/ nature reserves/ Texas/ conservation/ United States
Abstract: Species diversity and composition of small mammals were each compared between Conservation Reserve Program (CRP) grasslands and native shortgrass prairie on the Southern High Plains of Texas. Small mammals were livetrapped in all four seasons during a one-year interval at six CRP sites (1, 2, and 3 years of age) and two control sites. Two factors (vegetational heterogeneity and age of habitat) known to affect species diversity were analyzed by a variety of quantitative methods. No significant differences in mammalian diversity (Fisher's log series alpha) were found among sites, and diversity was not significantly correlated with vegetational heterogeneity or site age. Species composition (proportional density of species) was significantly different among all sites in each season. Regardless of season, a priori hierarchical comparisons revealed significant differences in the proportional abundances of species between all CRP sites as a group and in the control sites. The CRP grasslands simulate shortgrass prairies in species diversity, but not in species composition. Differences in species composition between CRP grasslands and shortgrass prairie may be a result of the lack of natural disturbances (i.e., grazing, fire) on the CRP grasslands.

183. **Management of field margins to maximize multiple ecological services.**
Olson, D. M. and Wackers, F. L.
Journal of Applied Ecology 44(1): 13-21. (2007)
NAL Call #: 410 J828; ISSN: 00218901.
Notes: doi: 10.1111/j.1365-2664.2006.01241.x.
Descriptors: ecological services/ Insect conservation/ northern bobwhite/ plant succession/ vegetative buffers
Abstract: 1. Vegetative buffers in agricultural landscapes can provide a range of important ecological services, including conservation of native flora and fauna, enhancement of biological pest control and reduction of agrochemical drift. Typically, studies addressing the impact of such vegetative elements focus on one particular benefit. We investigated whether the benefits of field margins that had been established for conservation of northern bobwhite quail Colinus virginianus populations extended to the enhancement of biological pest control in adjacent conservation tillage cotton fields. 2. Densities of a selection of insect species and the predation and parasitism rates of insect pest species were measured in first- and second-year field margins established for bobwhite quail as well as in an adjacent cotton crop. 3. Second-year field margins yielded higher densities of all species sampled, with the exception of staphylinids and cotton aphids. Despite this, thrips and their predator, Orius insidiosus, were the only species that were also more abundant in the adjacent cotton field. Tachinids and Trichogramma and Lygus species, appeared to prefer the field margin vegetation over the cotton. 4. Overall, the impact of second-year margins on the cotton crop did not significantly differ from first-year margins with regard to pest occurrence or biological control. 5. Analysis of the sugar content in Meteorus autographae, a generalist parasitoid of Lepidoptera larvae, suggested that this species is severely food-limited in the field margins established for bobwhite quail. 6. Synthesis and applications. This study shows that field margins designed to specifically benefit bobwhite quail may be unsuitable for providing other ecological services. By making small adjustments in the vegetative composition of these field margins, such as adding early season nectar-producing plants, it may be feasible to combine biodiversity and pest-control benefits and thereby optimize the overall ecological services to be gained. © 2006 British Ecological Society.

184. **Management of fields for nocturnal use by wintering American woodcock.**
Welch, James R.; Krementz, David G.; and Berdeen, James B.
Georgia Journal of Science 59(2): 101-107. (2001); ISSN: 0147-9369
Descriptors: commercial activities/ conservation measures/ ecology/ man-made habitat/ land and freshwater zones/ Scolopax minor (Scolopacidae): farming and agriculture/ habitat management/ habitat utilization/ cultivated land habitat/ Georgia/ Greene, Morgan and Oconee Counties/ old field management strategy/ nocturnal use/ wintering birds/ Scolopacidae/ Charadriiformes, Aves/ birds/ chordates/ vertebrates

185. **Managing farmlands for wildlife.**
Warner, Richard E.; Walk, Jeffery W.; and Hoffman, Catherine L.
In: Techniques for wildlife investigations and management/ Braun, C. E.; 6th ed.
Bethesda, MD: Wildlife Society, 2005.
Notes: 0933564155 (ISBN).
Descriptors: commercial activities/ conservation measures/ man-made habitat/ comprehensive zoology: farming and

agriculture/ farming impact on wildlife/ habitat management/ Farmland management for wildlife/ cultivated land habitat/ Farmlands/ habitat management for wildlife

186. **Managing your CRP for wildlife.**
United States Department of Agriculture, Natural Resources Conservation Service (NRCS), 2002
http://www.greatplains.org/resource/1999/mancrp/mancrp.htm
Descriptors: Conservation Reserve Program/ United States/ cropland/ habitat management/ wildlife habitat management/ wildlife
Abstract: Addressed the issue of wildlife habitat management and enhancement practices to better target CRP objectives.

187. **Managing your forest for bobwhite quail: Build and maintain a habitat that works.**
Chamberlain, Michael J.
Forest Landowner 59(3): 35-37. (2000)
NAL Call #: SD144.A15F67; ISSN: 1087-9110
Descriptors: Galliformes/ Odontophoridae/ Colinus virginianus/ birds/ Conservation Reserve Program/ ecosystems/ farmland/ habitat management/ management/ wildlife/ bobwhite quail
Abstract: High quail populations are traditionally associated with farmland and cultivated areas, but bobwhite numbers can be successfully managed on forested land as well. Frequent soil and vegetation disturbance is critical to maintaining good quail habitat. The author discusses the limitations of the Conservation Reserve Program and timber management on the production of bobwhite quail.

188. **Modeling the effects of Conservation Reserve Program lands on the diversity and abundance of wildlife and plant species in a temperate agro-ecosystem.**
Minnis, Richard B.
East Lansing, MI: Michigan State University, 1996.
Notes: Degree: MSc
Descriptors: Conservation Reserve Program/ abundance/ diversity/ models/ conservation/ land use
Abstract: The Conservation Reserve Program (CRP) provides the opportunity to model changes in wildlife and plant species composition in agricultural landscapes when land use practices are altered. Avian, mammalian, invertebrate, and vegetation characteristics were examined in 5 age classes (1-5 growing seasons) of CRP fields in Gratiot County, Michigan in 1992. Models developed from the data indicate that both field specific and landscape variables are important in predicting wildlife abundance and diversity. Field specific variables that describe the successional changes in vegetation composition and structure of CRP fields were important in predicting the relative abundance and diversity of invertebrate and avian species. Landscape variables such as the proportion and juxtaposition of different cover types within the landscape also significantly (P $< $ 0.10) affected wildlife diversity and abundance. Maintaining a diversity of CRP age classes within a landscape, through enrollment or periodic manipulation of fields, produces the highest and most stable overall wildlife diversity.

189. **A multivariate analysis of bird species composition and abundance between crop types and seasons in southern Ontario, Canada.**
Kirk, D. A.; Boutin, C.; and Freemark, K. E.
Ecoscience 8(2): 173-184. (2001)
NAL Call #: QH540.E366; ISSN: 11956860
Descriptors: Canada/ Farmland birds/ Ontario/ use of crops/ abundance/ agricultural land/ avifauna/ community composition/ crop plant/ habitat use/ multivariate analysis/ seasonality/ Canada/ Glycine max/ Malus/ Vitis/ Zea mays
Abstract: Many farmland bird species are declining in North America and Europe, yet there are few data documenting bird use of agricultural landscapes, especially in Canada. This information is needed in order to identify candidate factors contributing to declines. We examined the influence of crop type and adjacent habitat on birds in fields of four crop types in three southern Ontario counties during the 1988 breeding (May-July) and 1987 and 1988 migration (August-September) seasons, using canonical correspondence analysis (CCA). Crops included apple Malus spp. orchards in Norfolk, soybeans Glycine max in Essex, vineyards Vitae spp. in Niagara and corn Zea mays (maize) in all three countries. Bird assemblages differed between counties because corn in Norfolk had more adjacent wetlands and woodlands than those in Essex. During the breeding season (1988), significant habitat variables explaining variation in bird assemblages (in order of importance) were adjacent apple orchards, wetlands, and "other" wooded habitats and apple as the crop (as distinct from adjacent apple orchards). During migration, apple as the crop was most important, followed by crop type corn (distinct from adjacent corn). Adjacent wetlands and adjacent other crops in 1988. Apple as the crop was most important, followed by grape as the crop (distinct from adjacent vineyards) and wetlands in 1987. Based on median vector distances in ordination space as a measure of the difference between breeding and migration periods. Bird assemblages in soybean and corn in Essex changed most, while birds assemblages in apple orchards changed least, although differences were not significant among crops. Our results emphasize the importance of non-crop and crop habitats for birds during both breeding and migration seasons.

190. **National survey of Conservation Reserve Program (CRP) participants on environmental effects, wildlife issues, and vegetation management on program lands.**
Allen, A. W. and Vanderever, M. W.
Fort Collins, CO: U.S. Geological Survey, Fort Collins Science Center ; USGS BSR 2003-001, 2003. 56 p.
Notes: ADA418145XSP; Biological Sciences Report; Prepared in cooperation with Johnson Controls World Services, Inc., Fort Collins, CO 80526-8118.
http://www.fort.usgs.gov/products/publications/21075/21075.pdf
Descriptors: ground water/ Air quality/ soil erosion/ wildlife/ plants Botany/ fire hazards/ surveys/ long range Time/ environmental impact/ land use/ Conservation Reserve

Program/ natural resources and earth sciences/ agriculture and food agricultural equipment facilities and operations/ medicine/ biology/ ecology/ environmental pollution and control
Abstract: A national survey of Conservation Reserve Program (CRP) contractees was completed to obtain information about environmental and social effects of the program on participants, farms, and communities. Of interest were observations concerning wildlife, attitudes about long-term management of program lands, and effectiveness of U.S. Department of Agriculture (USDA) assistance in relation to these issues. Surveys were delivered to 2,189 CRP participants with a resultant response rate of 64.5%. Retired farmers represented the largest category of respondents (52%). Enhanced control of soil erosion was the leading benefit of the CRP reported. Over 73% of respondents observed increased numbers of wildlife associated with lands enrolled in the program. The majority of respondents reported CRP benefits, including increased quality of surface and ground waters, improved air quality, control of drifting snow, and elevated opportunities to hunt or simply observe wildlife as part of daily activities, income stability, improved scenic quality of farms and landscapes, and potential increases in property values and future incomes also were seen as program benefits. Negative aspects, reported by a smaller number of respondents, included seeing the CRP as a source of weeds, fire hazard, and attracting unwanted requests for trespass. Over 75% of respondents believed CRP benefits to wildlife were important. A majority of respondents (82%) believed the amount of assistance furnished by USDA related to planning and maintaining wildlife habitat-associated with CRP lands was appropriate. Nearly 51% of respondents would accept incorporation of periodic management of vegetation into long-term management of CRP lands to maintain quality of wildlife habitats. Provision of funds to address additional costs and changes in CRP regulations would be required to maximize long-term management of program lands.

191. **Natural resources and users benefit from the Conservation Reserve Program.**
Ribaudo, M. O.; Colacicco, D.; Langner, L. L.; Piper, S.; and Schaible, G. D.
Washington, DC: Economic Research Service, Resources and Technology Div.; USDAAER627; ERSAER627XSP, 1990 . 54 p.
Notes: Replaces PB90-167452; Also available from Supt. of Docs.
NAL Call #: A281.9 Ag8A no.627
Descriptors: protection/ erosion control/ planting/ grasses/ trees plants/ agriculture/ improvement/ ground water/ wildlife/ water quality/ air quality/ evaluation/ losses/ benefit cost analysis/ models/ tables data/ soil conservation/ natural resources/ land retirement programs/ habitats/ natural resources and earth sciences/ soil sciences
Abstract: The Conservation Reserve Program (CRP) may generate $6-14 billion (present value) in benefits to natural resources if 45 million acres of highly erodible or environmentally sensitive cropland are removed from agricultural production by 1990. Protecting the soil by retiring and planting permanent grasses and trees on such land for 10 years will improve soil productivity, water quality, air quality, wildlife habitat, and groundwater supply. But the magnitude and distribution of benefits can be altered by changing the emphasis of the program. The report estimates how retiring cropland benefits natural resources under three scenarios of CRP enrollment.

192. **Nest and brood survival of lesser prairie-chickens in west central Kansas.**
Fields, T. L.; White, G. C.; Gilgert, W. C.; and Rodgers, R. D.
Journal of Wildlife Management 70(4): 931-938. (2006)
NAL Call #: 410 J827; ISSN: 0022541X.
Notes: doi: 10.2193/0022-541X(2006)70[931:NABSOL]2.0.CO;2.
Descriptors: brood survival/ Conservation Reserve Program/ greater prairie-chicken/ Kansas/ lesser prairie-chicken/ nest survival/ radiotelemetry/ Tympanuchus cupido/ Tympanuchus pallidicinctus
Abstract: We evaluated the effect of habitat use and other sources of variation on survival of lesser prairie-chicken (Tympanuchus pallidicinctus) and greater prairie-chicken (Tympanuchus cupido) nests and broods. Daily nest and brood-survival probabilities were a function of a quadratic time trend, and both declined as the season progressed. Daily nest survival was negatively associated with nest age, and daily brood survival was positively associated with brood age. Lastly, broods tended by adult females had higher daily survival rates than broods reared by subadult females. The probability of a nest surviving from 10 May to 1 June was 0.72 (SE = 0.06). The probability of a brood surviving from 1 June to 30 July (hatch to 60 days posthatch) was 0.49 (SE = 0.19) and 0.05 (SE = 0.03) for broods reared by adults and subadults, respectively. Although nesting females and females with broods were using Conservation Reserve Program grasslands, there appeared to be no benefit to nest and brood survival during our study. Instead, age of the nest and brood, timing during the season, age of the brooding female, and precipitation during brooding were more important predictors of survival. Further experimentation is needed to determine the mechanisms responsible for decreased nest and brood survival throughout the season. Results from such research could be used to formulate management strategies to improve nest and brood survival.

193. **Nest success of mountain plovers relative to anthropogenic edges in eastern Colorado.**
Mettenbrink, C. W.; Dreitz, V. J.; and Knopf, F. L.
Southwestern Naturalist 51(2): 191-196. (2006)
NAL Call #: 409.6 So8; ISSN: 00384909.
Notes: doi: 10.1894/0038-4909(2006)51[191:NSOMPR]2.0.CO;2.
Descriptors: Charadrius montanus/ Colorado/ mountain plovers/ nest success
Abstract: We monitored nest success of mountain plovers (Charadrius montanus) relative to distance from the nearest anthropogenic edges, such as fence lines, roads, and perimeters of crop fields, in 2003 and 2004. We located and observed 163 mountain plover nests in eastern Colorado (USA). At least one egg hatched in 81 of 163 nests. Successful nests occurred at a mean distance of 93.94 m ± 8.87 SE, whereas unsuccessful nests were located 84.39 m ± 8.95 SE from the nearest edge. Based on our model selection criteria (AIC c), nests farther from edges were not necessarily more successful than those closer to edges.

The logistic regression coefficient for edge effects (0.13 ± 0.12 SE) suggests that nests farther from edges are more successful. However, the standard error for the edge coefficient was large and the 95% confidence interval (-0.08, 0.35) encompassed zero, suggesting nest success was independent of distance from an anthropomorphic edge. We conclude that phenomena determining nest success of mountain plovers cannot be attributed to the single factor of anthropogenic edges in this fragmented landscape.

194. **New Mexico's CRP and wildlife habitat improvement.**
Schmidt, Robert J.; Mullins, Charles J.; Woody, Monty; and Knight, Jim
Transactions of the North American Wildlife and Natural Resource Conference 55: 68-73. (1990)
NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: Conservation Reserve Programs/ habitat management/ management/ wildlife/ New Mexico

195. **Nongame bird nesting on CRP lands in the Texas Southern High Plains.**
Berthelsen, Peter S. and Smith, Loren M.
Journal of Soil and Water Conservation 50(6): 672-675. (1995)
NAL Call #: 56.8 J822 ; ISSN: 0022-4561.
Notes: Special issue on wetlands. Includes references.
Descriptors: Fringillidae/ Passeriformes/ Agelaius phoeniceus/ Aimophila cassinii/ Ammodramus savannarum/ Sturnella neglecta/ agricultural practices/ birds/ clutches/ communities/ conservation programs/ Conservation Reserve Program/ distribution/ ecosystems/ grasslands/ habitat management/ land use/ management/ nesting sites/ nests-nesting/ nongame wildlife/ productivity/ species diversity/ Texas, Southern/ wildlife/ agricultural land/ land diversion/ environmental impact/ permanent grasslands/ wild birds/ species/ diversity/ density/ habitats/ federal programs/ nest density/ agricultural economics/ land development, land reform, and utilization (macroeconomics)/ natural resources land resources/ western meadowlark/ red-winged blackbird/ grasshopper sparrow/ Cassin's sparrow

196. **Nonmarket economic benefits provided by increased recreational fishing from Conservation Reserve Program (CRP) related water quality improvement.**
Douglas, A. J. and Johnson, R. L.
Fort Collins, CO: U.S. Geological Survey, 2001. 38 p.
Notes: Mid-continent Ecological Science Center.
Descriptors: economic effects/ fishing, public/ conservation programs/ economic value/ water resources management/ socio-economic studies/ rivers/ cost analysis/ modeling/ statistics/ rehabilitation/ surveys/ California/ Klamath River Basin
Abstract: The estimates of CRP related nonmarket benefits presented in this study focus on angler responses to improvements in water quality. A targeted basin approach is used in which contingent use survey data for northern California's lower Klamath River Basin is used to estimate annual recreation benefits for the removal of adverse agricultural impacts on water quality for the nation. A series of calculations based on national data is used to extend the recreation benefits estimates for the Klamath River basin to all of the nation's rivers and streams, lakes and reservoirs, and coastal waters. Angling benefits are estimated as a major component of all water related recreation benefits.

197. **Observations of avian nesting activity in burned and non-burned weeping lovegrass CRP.**
Oberheu, D.; Mitchell, R.; Dabbert, B.; and Davis, S.
Texas Journal of Agriculture and Natural Resources 12: 14-17. (1999)
NAL Call #: S1.T49; ISSN: 0891-5466.
Notes: Publisher: Agriculture Consortium of Texas: Kingsville, TX.
Descriptors: eragrostis curvula/ wild birds/ habitats/ nesting/ nature conservation/ nests/ prescribed burning/ species/ drought/ ground cover/ endangered species/ Texas
This citation is from AGRICOLA.

198. **Occurrence and productivity of songbirds in prairie farmland under conventional versus minimum tillage regimes.**
Martin, Pamela A. and Forsyth, Douglas J
Agriculture, Ecosystems and Environment 96(1-3): 107-117. (2003)
NAL Call #: S601.A34; ISSN: 0167-8809
Descriptors: agriculture/ biodiversity/ wildlife management: conservation/ conventional tillage/ applied and field techniques/ minimum tillage regime/ applied and field techniques/ statistical analysis/ mathematical and computer techniques/ cover type/ endemism/ mate attraction/ prairie farmland/ species abundance/ species productivity/ summer fallow
Abstract: Abundance and productivity of common bird species in prairie cropland under either conventional or minimum tillage were examined in southern Alberta, Canada. Cover types included spring cereals, winter wheat and summerfallow. Productivity was assessed using observations of nesting and brood-rearing behavior. Five species were sufficiently abundant to allow for some statistical analyses: horned lark (Eremophila alpestris), savannah sparrow (Passerculus sandwichensis), Baird's sparrows (Ammodramus bairdii), chestnut-collared longspur (Calcarius ornatus) and McCown's longspur (Calcarius mccownii). Abundance varied between conventional and minimum tillage regimes for most species in at least one cover type. Savannah sparrows in spring cereal and winter wheat and chestnut-collared longspurs in summerfallow tended to prefer minimum tillage. McCown's longspurs and horned larks occurred more frequently on conventional than minimum till spring cereal plots in at least 1 of the 2 years. For savannah sparrows, minimum till spring cereal and winter wheat were more productive than conventional till habitat. Summerfallow of either tillage regime did not appear to be as productive as minimum till cereal fields for this species. Chestnut-collared longspurs occurred predominantly in minimum till summerfallow and spring cereal habitat and showed almost no productivity in conventionally managed plots. McCown's longspurs tended to have higher productivity in minimum till plots. Horned larks had high productivity in minimum till winter wheat in 1996. Male Baird's sparrows occupied territories in

minimum till winter and spring cereal fields in 1995, but did not attract mates; they were not detected in 1996. Minimum tillage appeared to confer benefits in productivity to species that nested in farmland.

199. **Opportunities for bird conservation through agricultural conservation programs.**
Gray, R. L.
Transactions of the North American Wildlife and Natural Resource Conference 70: 385-394. (2005)
NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: wild birds/ wildlife management/ Farm Bill/ Conservation Reserve Program/ natural resources, environment, general ecology, and wildlife conservation/ laws, legislation and regulations
This citation is from AGRICOLA.

200. **Opportunities for enhancing wildlife benefits through the Conservation Reserve Program.**
Isaacs, B. and Howell, D.
Transactions of the North American Wildlife and Natural Resource Conference (53rd): 222-231. (1988)
NAL Call #: 412.9 N814; ISSN: 0078-1355 [NAWTA]
Descriptors: wildlife conservation/ conservation areas/ farmland/ windbreaks/ woody plants/ United States
This citation is from AGRICOLA.

201. **An overview of some tillage impacts on earthworm population abundance and diversity: Implications for functioning in soils.**
Chan, K. Y.
Soil and Tillage Research 57(4): 179-191. (2001)
NAL Call #: S590.S48 ; ISSN: 0167-1987.
Notes: Literature review.
Descriptors: conservation tillage/ diversity/ ecology/ no-tillage/ populations/ tillage/ earthworms/ Oligochaeta/ Annelida/ invertebrates/ animals
Abstract: Conflicting reports in the literature on the effects of tillage on earthworms are reviewed in the light of their roles in agro-ecosystem functioning. Tillage can change the abundance (by 2-9 times) as well as the composition (diversity) of earthworm populations. The actual impact is dependent on soil factors, climatic conditions and the tillage operations but hitherto this information was seldom provided in research reports. The declines in earthworm population often reported in conventionally tilled soils are associated with undesirable changes in the soil environmental conditions resulting from excessive tillage. Different species of earthworm respond differently to tillage. While the abundance of the deep burrowing species (anecic) tends to decline under tillage, particularly under deep ploughing, endogeic species can actually increase in number especially when there is increased food supply. Under conservation tillage systems, earthworms can potentially play a more important role than under conventional tillage in the functioning of the farming systems because of their abilities to modify the soil physical environment and nutrient cycling. However, adoption of conservation tillage does not automatically result in an optimal earthworm population in terms of abundance and diversity. There are opportunities to introduce more beneficial species to improve the ecological performance of agro-ecosystems. More research is needed to fully understand the ecology of different earthworm species, their interactions and their potential roles in promoting more sustainable farming systems.

202. **Perceptions of wildlife damage by Conservation Reserve Program contract holders in Riley County, Kansas.**
Hughes, J. P. and Gipson, P. S.
Proceedings, Vertebrate Pest Conference: 154-157. (1996)
NAL Call #: SB950.A1V4; ISSN: 0507-6773 [PVPCBM]
Descriptors: vertebrate pests/ crop damage/ surveys/ Kansas/ Conservation Reserve Program
This citation is from AGRICOLA.

203. **Plains sharp-tailed grouse return to Colorado.**
Colorado Division of Wildlife
Colorado Department of Natural Resources, Division of Wildlife Newsletter (May): 1. (2004).
Full Text Available at:
http://dnr.state.co.us/news/press.asp?pressid=2748
Descriptors: Tympanuchus phasianellus/ birds/ birdwatching/ breeding grounds/ displays/ drought/ environmental factors/ habitat use/ habits-behavior/ land, private/ landowners/ lek behavior/ movements/ population ecology/ restoration/ tagging/ traps-trapping/ sharp-tailed grouse/ Colorado/ Colorado, Northeastern
Abstract: Colorado Division of Wildlife biologists are trapping sharp-tailed grouse in Wyoming and Nebraska and releasing them in Colorado. The aim is to restore the species to its historic Colorado range. The species has remained in isolated pockets of Douglas County and northern Weld County. These sharp-tailed grouse are being released on private land, in which the landowners convert highly erodable and environmentally sensitive croplands to vegetative cover and provide high-quality habitat for wildlife. The movements of the released sharp-tailed grouse are watched to determine the success of the species in establishing breeding grounds and nests. The health of the grassland will decide the success of the establishment of the species. During the beginning of the 20th century the species population declined due to prolonged drought conditions, unregulated hunting, and conversion of grassland to cropland. Landowners and district wildlife managers of Conservation Reserve Program have been working together to provide a variety of opportunities for maximizing the habitat and wildlife potential. The species could become a major attraction during the congregation of individuals on lekking grounds at sunrise and sunset between February and mid-May. In an attempt to establish dominance and attract females, the males display their plumage, stomp their feet, and produce a variety of hoots, cackles, and chortles through air sacs on their necks.

204. **Plant diversity in three types of hedgerows adjacent to cropfields.**
Boutin, C.; Jobin, B.; Belanger, L.; and Choiniere, L.
Biodiversity and Conservation 11(1): 1-25. (2002)
NAL Call #: QH75.A1B562; ISSN: 09603115.
Notes: doi: 10.1023/A:1014023326658.
Descriptors: Eastern Canada/ Farmland/ field margin/ natural woody hedgerow/ plant diversity/ plant species richness/ planted hedgerow/ windbreak/ conservation

management/ field margin/ hedgerow/ plant community/ species diversity/ Canada/ Aves/ Coniferophyta
Abstract: The farming landscape of eastern Canada is dotted with three main types of hedgerows: (1) natural woody, (2) planted woody and (3) herbaceous. The objective of this study was to compare the value of these habitats as a repository of plant biodiversity in agricultural areas of southern Quebec. The overall plant diversity was higher in natural hedgerows and they contained more plant species of conservation values than other hedgerow types. Plant species richness per quadrat was, however, higher in planted woody hedgerows, and together with the species composition, lead to the conclusion that planted hedgerows in their entirety consisted of an ecotone type of vegetation such as is found in field edges which usually support high plant diversity and productivity but where transient plant species predominate. Consequently, this study indicated that natural hedgerows fare better than planted hedgerows in terms of diversity of plants of conservation interest. In spite of that, planted woody hedgerows contained plant (and bird) species of some interest and should be favoured over more desolate herbaceous hedgerows. In areas where hedgerows were removed and are not re-establishing naturally, a mixture of deciduous trees and conifers should be encouraged in further windbreak planting programs so as to conciliate both the conservation and agronomic objectives. Furthermore, management practices should optimise the growth of establishing plants of conservation values.

205. **Plants and breeding bird response on a managed Conservation Reserve Program grassland in Maryland.**
Gill, D. E.; Blank, P.; Parks, J.; Guerard, J. B.; Lohr, B.; Schwartzman, E.; Gruber, J. G.; Dodge, G.; Rewa, C. A.; and Sears, H. F.
Wildlife Society Bulletin 34(4): 944-956. (2006)
NAL Call #: SK357.A1W5; ISSN: 00917648.
Notes: doi: 10.2193/0091-7648(2006)34[944:PABBRO]2.0.CO;2.
Descriptors: Ammodramus savannarum/ Conservation Reserve Program/ grasshopper sparrow/ grassland restoration/ habitat/ invasive species/ management/ prescribed burning/ species richness/ vegetation structure/ warm-season grasses
Abstract: Currently over 14.6 million ha of land at an annual cost of US$1.76 billion are enrolled in the Conservation Reserve Program (CRP). The habitat benefits of CRP frequently are lauded, but documentation that wildlife is responding as hoped is urgently needed. We evaluated plant and breeding bird responses to 92.4 ha of CRP grasslands at Chino Farms in northeastern Maryland, USA. In 1999 we seeded 12 contiguous CRP fields with 5 mixtures of warm-season grasses representing various growth-form heights in a replicated experimental design, and used mowing and topical herbicide applications to control noxious weeds and facilitate stand establishment. In 6 years cumulative plant species richness increased to 261, 105 of which were species exotic to the region. During the third growing season, we initiated a schedule of prescribed burning on a 3-year rotation to remove accumulated litter and to retard woody succession, and in 2003 we added additional management to control aggressive plant species. Several at-risk bird species colonized the restored grasslands in the first year and established sustainable breeding populations. We implemented a comprehensive observation and banding program, which included mapping male territories for selected bird species and recording nest locations. We marked 1,985 grasshopper sparrows (Ammodramus savannarum; GRSPs) in 7 years. Breeding GRSP populations ranged annually from 70 to 90 socially monogamous pairs with an additional 40 non-territorial males. Annual return rates in the last 5 years were 57% for adult males, 41% for adult females, and 12% for hatch-year individuals. Adults and young birds exhibited high site fidelity, but overgrown fields left unburned for 2-3 years were unpopulated by GRSPs but attracted several shrub-land bird species. Habitat preference for territories was influenced more by vegetation structure than by plant species composition. We recommend the management of grasslands restored for birds include spatial and temporal rotation of prescribed fire and herbicide applications to sustain vegetation physical structure rather than species composition.

206. **Plow: Lessons learned from CRP - Counterpoint, negative impacts of the Conservation Reserve Program on prairie wildlife.**
Bidwell, T. G.
In: 50th Annual Meeting of the Society for Range Management. Rapid City. SD (USA); 1997.
Notes: Conference Sponsor: South Dakota Section of the Society for Range Management; HQ: Society for Range Management (Denver, CO);
World Meeting Number 971 0113.
Descriptors: grazing/ livestock/ range management/ Conservation Reserve Program/ prairie wildlife

207. **Population dynamics of ambient and altered earthworm communities in row-crop agroecosystems in the Midwestern U. S.**
Shuster, William D.; Shipitalo, Martin J.; Bohlen, Patrick J.; Subler, Scott; and Edwards, Clive A.
Pedobiologia 47(5-6): 825-829. (2003)
NAL Call #: 56.8 P343; ISSN: 0031-4056
Descriptors: commercial activities/ ecology/ man-made habitat/ land zones/ Megadrili: farming and agriculture/ community structure/ population dynamics/ natural and altered communities/ cultivated land habitat/ row crop agroecosystems/ Ohio/ Piketon/ Annelida, Oligochaeta/ Annelids/ invertebrates
Abstract: Earthworms affect agroecosystem processes and few studies have addressed population dynamics when earthworms are intentionally introduced. Handsorting and formalin extraction were used semi-annually from fall 1994 to fall 1997 to measure populations in plots with and without added earthworms under chisel till in a corn-soybean rotation (CT) and a ridge-till system in a corn-soybean-wheat rotation (RT) in Ohio, USA. Earthworm communities were altered by adding ≃76 Lumbricus terrestris (L.) m-2 each spring and fall into plots with no, or very few of these anecic earthworms. Increases in L. terrestris were small (≃7 m-2) compared to the number added and their establishment was at the expense of the epigeic earthworm L. rubellus (Hoff.), which declined four and two-fold in CT and RT, respectively. Populations of the endogeic earthworm Octolasion tytaeum (Sav.) were unaffected by the addition of L. terrestris. Sampling 5 years after the additions indicated that L. terrestris persisted only in the RT

plots. The decline in L. rubellus populations in plots with added anecic worms was no longer evident. We understand that the increased number and amounts of residues and the minimal level of disturbance found in RT probably increased the extent and quality of earthworm habitat over CT plots, which had fewer crops, less cover, and periodic disturbance. Apparently, population dynamics and competitive relationships among different earthworm functional groups were regulated by agroecosystem type, and their correspondent disturbance regimes and resource distributions.

208. **Population trends of the Henslow's sparrow in relation to the Conservation Reserve Program in Illinois, 1975-1995.**
Herkert, J. R.
Journal of Field Ornithology 68(2): 235-244. (1997)
NAL Call #: 413.8 B534; ISSN: 0273-8570
Descriptors: Ammodramus henslowii/ population status/ agricultural practices/ government policy/ conservation/ Illinois/ birds/ United States
Abstract: Data from Illinois' Spring Bird Count was used to estimate long-term population trends of Henslow's Sparrows in Illinois and to examine if the Conservation Reserve Program has affected these trends. Spring Bird Count data suggest that Henslow's Sparrow populations in Illinois have declined significantly over the last 21 yr, with an estimated average rate of decline of 7.1% per year between 1975-1995. These data corroborate analyses of other long-term data sets and provide additional support for the general impression that populations of this species have declined in many parts of its range. Analyses of the potential benefits of the Conservation Reserve Program for Henslow's Sparrows revealed that recent population trends (1987-1995) in counties with high enrollment in this program were significantly greater than trends in counties with little Conservation Reserve Program enrollment. Although these data suggest that the Conservation Reserve Program may have benefitted Henslow's Sparrows in Illinois, this benefit has been insufficient to offset long-term declines due to other factors. Other conservation actions, beyond those associated with efforts aimed at reauthorizing and improving the Conservation Reserve Program, will likely be needed to achieve adequate protection for this species.

209. **Post-breeding season habitat use and movements of eastern meadowlarks in southwestern Wisconsin.**
Guzy, M. J. and Ribic, C. A.
Wilson Journal of Ornithology 119(2): 198-204. (2007)
NAL Call #: QL671.W55 ; ISSN: 15594491.
Notes: doi: 10.1676/06-081.1.
Descriptors: birds/ eastern meadowlarks/ Sturnella magna/ Conservation Reserve Program/ wildlife habitat/ Wisconsin
Abstract: We used radio telemetry to study post-breeding movements of adult female and juvenile Eastern Meadowlarks (Sturnella magna) in southwestern Wisconsin in 2002-2004. Twenty-one adult females were found 58% of the time in their nest field regardless of nest fate. Three adult females were not found outside of the field where their nests were located. Fifteen of 18 females that moved from the nest field at least once moved to Conservation Reserve Program fields or pasture. The average maximum distance females moved was 662 m. Once females left the nest field, 61% did not return. Twelve juveniles from different broods survived to the end of the post-breeding season. Two juveniles did not move from their nest fields during the monitoring period. Eight of 10 juveniles that moved at least once moved into Conservation Reserve Program fields, remnant prairie or pasture. The average maximum distance moved by juveniles was 526 m. Once juveniles started to leave the nest field, 67% did not return. Grassy habitats appear to be important in the post-breeding period for Eastern Meadowlarks. Management should be directed toward maintaining or enhancing the amount and quality of those habitats.

210. **Potential effects on grassland birds of converting marginal cropland to switchgrass biomass production.**
Murray, L. D.; Best, L. B.; Jacobsen, T. J.; and Braster, M. L.
Biomass and Bioenergy 25(2): 167-175. (2003); ISSN: 0961-9534
Descriptors: biotechnology/ applied microbiology/ biomass/ birds/ energy crops/ switchgrass (Panicum virgatum)/ watershed/ wildlife/ Conservation Reserve Program/ habitat selection/ CRP fields/ communities/ abundance/ Missouri
Abstract: Habitat loss is a major reason for the decline of grassland birds in North America. Five habitats (pastures, hayfields, rowcrop fields, small-grain fields, Conservation Reserve Program fields) compose most of the habitat used by grassland birds in the Midwest United States. Growing and harvesting switchgrass (Panicum virgatum) as a biomass fuel would create another habitat for grassland birds. Bird abundance information from studies conducted in Iowa and adjacent states and land-use data for the Rathbun Lake Watershed in southern Iowa were used in a Geographic Information System to model the potential effects on bird abundances of converting rowcrop fields to biomass production. Abundances of bird species that are management priorities increased in both biomass scenarios. Common yellowthroat (Geothlypis trichas) abundance in the watershed also increased greatly in both scenarios. Other species (e.g., horned lark (Eremophila alpestris), killdeer (Charadrius vociferous)) were more abundant in the existing land use than in the biomass scenarios, and conversion of fields from rowcrop to biomass production could be detrimental to these species. In general, biomass fields will provide habitat for grassland birds that are management priorities, but future monitoring of birds in such fields is needed as conversion of rowcrop fields to biomass production continues.

211. **Potential of winter cover crops to increase abundance of Solenopsis invicta (Hymenoptera: Formicidae) and other arthropods in sugarcane.**
Woolwine, A. E. and Reagan, T. E.
Environmental Entomology 30(6): 1017-1020. (2001)
NAL Call #: QL461.E532; ISSN: 0046-225X
Descriptors: commercial activities/ ecology/ population dynamics/ man-made habitat/ land and freshwater zones/ Arthropoda: farming and agriculture/ winter cover crops/ vegetation management/ population density/ cultivated land habitat/ sugarcane fields/ winter cover crops/ abundance/ Louisiana/ Gastropoda/ Mollusca/ arthropods/ hymenopterans/ insects/ invertebrates/ molluscs

Abstract: A 3-yr study was conducted in Louisiana sugarcane field plots to determine the potential of vegetation management and winter cover crops to enhance abundance of the fire ant, Solenopsis invicta Buren, other arthropods, gastropods, and spring sugarcane density. Treatments included pea, clover, and vetch cultivars, a weed-free herbicide treatment, a vetch with herbicide on the row tops; and a mixed weeds treatment arranged in a randomized complete block design. Compared with similar studies conducted during the summer months, spring collections of arthropods in pitfall traps were very low and few differences in arthropod densities occurred. Neither cover crop cultivar nor biomass substantially influenced arthropod density or cane stand density. Slugs (Limacidae) and earwigs (Dermaptera) were most abundant in mixed weed plots. The highest numbers of carabids in 1994 were found in vetch plots, which tended to have higher biomass than other treatments. Soybean oil-soaked bait cards attracted more ants in clover plots than in the plots with vetch plus herbicide. Compared with previous summer studies, we feel that harsher winter weather and other density independent mortality factors during this study period superseded effects of cover crops, vegetation management and quantity of biomass on arthropod densities during the winter. Although positive impacts of winter cover crops were not detected for the variables measured during the study period these data should not be used to suggest that cover crops do not provide agronomic benefit to farmers.

212. **Prairie grouse population response to Conservation Reserve Program grasslands: An overview.**
Rodgers, R. D. and Hoffman, R. W.
In: Conservation Reserve Program Planting for the Future: Proceedings of a National Conference.Fort Collins, CO. Allen, A. W. and Vandever, M. W. (eds.)
Reston, VA: USGS; pp. 120-128; 248 pp.; 2005.
Notes: U.S. Geological Survey, Biological Resources Discipline, Scientific Investigations Report 2005-5145. http://www.fort.usgs.gov/Products/Publications/21490/21490.pdf
Descriptors: prairie grouse/ grassland birds/ population responses/ Conservation Reserve Program/ CRP/ set-aside program lands
Abstract: Authors describe population responses of greater prairie chicken (*Tympanuchus cupido*), lesser prairie chicken (*T. pallidicinctus*), and sharp-tailed grouse (*T. phasianellus*) to establishment of CRP grasslands in Colorado, Illinois, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota. Generally the greatest benefits to prairie grouse occurred where CRP stands were established near pre-existing grasslands augmenting coverage and habitat diversity of the grassland complex. Common issues are associated with successes and failures of prairie grouse populations in their response to the CRP. CRP grasslands 12-30 inches in height appear most valuable to prairie grouse. Stands less than 12 inches generally furnish inadequate concealment and protection from the weather. Grass stands greater than 30 inches in height does provide thermal cover but such stands are often otherwise avoided. Multi-species plantings that are structurally diverse in height and growth forms are grasslands of the greatest value to these species. Presence of a high diversity of forbs, particularly legumes greatly enhance the quality of grasslands as habitat for prairie grouse. Native grasses furnish habitat of greater quality than do stands dominated by introduced species. Recommendations of management of individual grassland stands and landscape level management are presented.

213. **Predation rates on real and artificial nests of grassland birds.**
Davison, W. B. and Bollinger, E.
Auk 117(1): 147-153. (Jan. 2000)
NAL Call #: 413.8 AU4; ISSN: 0004-8038
Descriptors: nests/ predation/ site selection/ human impact/ grasslands/ Illinois/ Aves/ birds/ United States
Abstract: We estimated nesting success at real and artificial nests of grassland birds to test the influence of nest type, nest position, and egg size on predation rates. We distributed wicker nests and realistic woven-grass nests baited with a clay egg and either a Northern Bobwhite (Colinus virginianus) egg or a House Sparrow (Passer domesticus) egg in four grasslands that were part of the Conservation Reserve Program in east-central Illinois. Nesting success averaged 86.5% for 12 days of exposure for artificial nests. For real nests, nesting success was markedly lower, averaging 39% over the entire nesting cycle and 59% during approximately 12 days of incubation. Wicker nests were depredated more often than woven-grass artificial nests (18% vs. 8%), and nests baited with House Sparrow eggs were depredated more often than nests baited with Northern Bobwhite eggs (22% vs. 9%). Elevated and ground nests were depredated at the same rate. Patterns of nest predation on wicker nests were markedly different from depredation patterns on real nests over time and among fields. In contrast, patterns of nest predation on realistic woven-grass nests corresponded much more closely with predation rates of real nests over time and among fields. We suggest that future artificial nest studies use nests and eggs that mimic as closely as possible the real nests and eggs of target species. Use of unrealistic artificial nests and eggs, at least in grasslands, may result in patterns of predation that do not accurately reflect those of real nests. Artificial nests of any type appear to underestimate predation rates on nests of grassland birds, possibly because of a lack of snake predation on artificial nests.

214. **Predicting juniper encroachment and CRP effects on avian community dynamics in southern mixed-grass prairie, USA.**
Coppedge, B. R.; Engle, D. M.; Masters, R. E.; and Gregory, M. S.
Biological Conservation 115(3): 431-441. (2004)
NAL Call #: S900.B5; ISSN: 0006-3207
Descriptors: environment-ecology/ breeding bird survey/ Conservation Reserve Program/ grassland/ juniper/ logistic regression/ Oklahoma/ Conservation Reserve Program/ great plains grasslands/ woody plant invasion/ population trends/ breeding birds/ cover type/ fields/ vegetation
Abstract: The probability of occurrence of 30 bird species was modeled as a function of landscape covertype in northwestern Oklahoma, USA. This grassland region has been extensively fragmented by agricultural activity, and remnant grassland patches are undergoing severe degradation from encroaching juniper (Juniperus virginiana

L.). In addition, many marginal or highly erodable croplands have been placed into perennial pasture dominated by exotic grasses under the Conservation Reserve Program (CRP). Based on temporal patterns of landscape change observed between 1965 and 1995, we estimated the covertype composition of the landscapes in the year 2015 under various CRP administrative and juniper expansion/control scenarios. We then used logistic regression to predict bird responses to these landscape composition estimates. Our estimates suggest that at the current rate of expansion, juniper will overtake substantial areas of remnant grassland even with extensive control measures. As a result, some obligate and facultative grassland birds are projected to decline, while numerous species tolerant of or partially reliant on woody vegetation will increase. Landscape dynamics due to changes in the CRP might be significant and could be designed to benefit declining grassland birds, but these benefits thus far are relatively minor compared to the effects encroaching juniper woodlands will have on the landscape and the avian community.

215. **The quest for quantifying Conservation Reserve Program benefits.**
Yost, Michael
Transactions of the North American Wildlife and Natural Resource Conference 69: 20-29. (2004)
NAL Call #: 412.9 N814; ISSN: 0078-1355.
Notes: ISSN: 0078-1355; Meeting Information: 69th North American Wildlife and Natural Resources Conference, Spokane, WA, USA; March 16 -20, 2004; Sponsor: Wildlife Management Institute.
Descriptors: agronomy: agriculture/ conservation/ conservation/ soil erosion/ United States Department of Agriculture/ water runoff/
United States Farm Service Agency

216. **A regional assessment of windbreak habitat suitability.**
Hess, G. R. and Bay, J. M.
Environmental Monitoring and Assessment 61(2): 237-254. (2000)
NAL Call #: TD194.E5; ISSN: 01676369
Descriptors: agriculture/ data quality control/ EMAP/ habitat assessment/ habitat suitability index/ regional assessment/ shelterbelt/ wildlife/ windbreak/ agriculture/ conservation/ data acquisition/ ecology/ management information systems/ natural resources/ data quality control/ environmental monitoring and assessment program/ environmental protection/ environmental monitoring/ habitat use/ wind break/ environmental monitoring/ United States
Abstract: The Environmental Monitoring and Assessment Program was initiated in 1989 by the United States Environmental Protection Agency to collect, analyze, and report quantitative, statistically unbiased information about the state of the nation's environment on a regional basis. During a pilot program in Nebraska we measured a habitat suitability index for a probability sample of 40 windbreaks and expanded the results to estimate the potential value of windbreaks as wildlife habitat in Nebraska. The index estimates the suitability of a windbreak as habitat for wildlife including breeding birds, small mammals, and deer. Index values range from zero to one, where a value of one indicates maximal habitat value. We estimated that 50% (1/4 3% at 90% confidence) of windbreaks in Nebraska have a habitat suitability index of 0.25 or less and that no windbreaks have a suitability index greater than 0.6. Our results indicate that increasing the area of individual windbreaks is the most effective way to improve their value as wildlife habitat. Monitoring windbreak condition over time would alert wildlife managers to changes in the resource that might affect wildlife populations. Because our data were highly variable, the power to detect change in habitat condition between two measurement periods was low. A much larger sample would be required to detect small changes in habitat condition. Variability may be reduced, and power increased, by carefully and consistently constructing the sampling frame, keeping data collection as simple as possible, appropriately stratifying sample selection, and using a small number of well-trained data collection teams. However, we suggest adapting the index for use with aerial photography in future efforts to evaluate windbreaks as wildlife habitat in extensive areas.

217. **Relation of grassland bird abundance to mowing of Conservation Reserve Program fields in North Dakota.**
Horn, D. J. and Koford, R. R.
Wildlife Society Bulletin 28(3): 653-659. (2000)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: Grasslands/ mowing/ conservation/ population decline/ North Dakota/ Cistothorus platensis/ Passerculus sandwichensis/ sedge wren/ Savannah sparrow/ conservation/ birds/ United States
Abstract: One factor that may be contributing to declines of several grassland bird species is mowing of grassland fields. We compared the relative abundance of birds in idled and mowed portions of grassland fields to investigate the influence of mowing in the previous summer on the grassland bird community. The study occurred in central North Dakota in 12 reseeded cropland fields enrolled in the Conservation Reserve Program. Sedge wrens (Cistothorus platensis) were more abundant in idled portions of grassland fields, whereas savannah sparrows (Passerculus sandwichensis) were more abundant in portions of fields that were mowed the previous year. Our findings are similar to other studies indicating that several grassland bird species in the central United States and Canada respond consistently to mowing.

218. **Relationship of habitat patch size to predator community and survival of duck nests.**
Sovada, Marsha A.; Zicus, Michael C.; Greenwood, Raymond J.; Rave, David P.; Newton, Wesley E.; Woodward, Robert O.; and Beiser, Julia A.
Journal of Wildlife Management 64(3): 820-831. (2000)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: Canis latrans/ Mephitis mephitis/ Spermophilus franklinii/ Taxidea taxus/ Vulpes vulpes/ Anatidae/ Anseriformes/ Anas platyrhynchos/ birds/ ecosystems/ habitat islands/ habitat use/ mammals/ nest predation/ nests-nesting/ prairies/ predator-prey relationships/ predators/ productivity/ survival/ upland habitat/ wetlands/ zoogeography/ red fox/ coyote/ American badger/ striped skunk/ Franklin's ground squirrel/ mallard/

Minnesota/ North Dakota/ South Dakota
Abstract: The authors studied duck nest success and predator community composition in relation to size of discrete patches of nesting cover in the Prairie Pothole Region (PPR) of the United States in 1993-95. They focused on nests in uplands that were seeded to perennial grasses and forbs and enrolled in the Conservation Reserve Program (CRP) in Minnesota, North Dakota, and South Dakota. They estimated daily survival rates (DSRs) of upland duck nests and indices of activity for red foxes (Vulpes vulpes), coyotes (Canis latrans), American badgers (Taxidea taxus), striped skunks (Mephitis mephitis), and Franklin's ground squirrels (Spermophilus franklinii), and related these variables to habitat patch size. The effect of patch size (small vs. large) on estimated annual mean DSR was dependent on date of nest initiation (early vs. late) and year. Examination of within-year comparisons for early and late nests suggested that DSR was generally greater in larger habitat patches. Activity indices for the five mammalian nest predators were influenced differently by year, location, and patch size. Activity indices of the red fox were greatest in small patches. Coyote indices were the most inconsistent, demonstrating a year X location X patch size interaction. Activity indices of the striped skunk and American badger varied only among years. Franklin's ground squirrel indices were affected by study area location, with higher indices in the southeast than the northwest. Red fox activity was weakly correlated with that of the striped skunk and coyote. Although a positive relationship between habitat patch size and nest success probably exists, the authors believe the experiment to fully test this hypothesis will continue to be elusive.
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219. **Relationship of soil management history and nutrient status to nematode community structure.**
Wang, K. H.; McSorley, R.; and Gallaher, R. N.
Nematropica 34(1): 83-95. (2004); ISSN: 0099-5444
Descriptors: commercial activities/ ecology/ man-made habitat/ abiotic factors/ land zones/ Nematoda: farming and agriculture/ soil management strategies/ trophic structure/ soil management/ community structure/ cultivated land habitat/ soil community/ chemical factors/ soil nutrient content/ Florida/ Alachua County/ invertebrates/ nematodes
Abstract: Historical effects of long-term yard-waste compost and tillage treatments on nematode community structure were compared separately between soils receiving high-yard-taste compost (HYWC) and no-yard-waste compost (NYWC) for 5 years; or between soils under no-tillage (NT) and conventional tillage (CT) for 25 years at the time of soil sampling. All the field sites had been left fallow for 1-5 years since the last soil cultivation. Tillage did not affect most nematode trophic groups, except for some fungivores. The yard-waste compost treatment increased the soil organic matter (OM) content greatly, and had a significant impact on many nematode genera. Most of the nematodes affected (P = 0.05) by yard-waste compost were bacterivores and predators. The lower fungivore to bacterivore ratio, and lower channel index, but higher enrichment index also suggested that the HYWC soil was N-enriched and was undergoing a bacteria-dominated decomposition channel. Population densities of several genera of bacterivorous and predatory nematodes were positively correlated kith most nutrient concentrations and OM, but were negatively correlated with concentration of Cu and Fe. Population densities of most genera of fungivorous nematodes correlated with concentrations of most nutrient elements except N, K and Mg and were always negatively correlated with OM. While effects of tillage practices on the soil nematode community were generally short-lived, the long-tern yard-taste compost applications that enhanced OM had a lasting impact on nematode community structure and nutrient cycling.
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220. **Relationships of habitat patch size to predator community and survival of duck nests.**
Sovada, M. A.; Zicus, M. C.; Greenwood, R. J.; Rave, D. P.; Newton, W. E.; Woodward, R. O.; and Beiser, J. A.
Journal of Wildlife Management 64(3): 820-831. (2000)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: patches/ habitat/ predators/ survival/ nests/ United States, Minnesota/ United States, North Dakota/ United States, South Dakota/ community composition/ aquatic birds/ breeding success/ area/ Anatidae/ Mammalia/ United States, Minnesota/ United States, North Dakota/ United States, South Dakota/ ducks/ mammals/ patch size/ Prairie Pothole Region/ mammals/ environmental effects
Abstract: We studied duck nest success and predator community composition in relation to size of discrete patches of nesting cover in the Prairie Pothole Region (PPR) of the United States in 1993-95. We focused on nests in uplands that were seeded to perennial grasses and forbs and enrolled in the Conservation Reserve Program (CRP) in Minnesota, North Dakota, and South Dakota. We estimated daily survival rates (DSRs) of upland duck nests and indices of activity for red foxes (Vulpes vulpes), coyotes (Canis latrans), American badgers (Taxidea taxus), striped skunks (Mephitis mephitis), and Franklin's ground squirrels (Spermophilus franklinii), and related these variables to habitat patch size. The effect of patch size (small vs. large) on estimated annual mean DSR was dependent on date of nest initiation (early vs. late) and year. Examination of within-year comparisons for early and late nests suggested that DSR was generally greater in larger habitat patches. Activity indices for the 5 mammalian nest predators were influenced differently by year, location, and patch size. Activity indices of the red fox were greatest in small patches. Coyote indices were the most inconsistent, demonstrating a year x location x patch size interaction. Activity indices of the striped skunk and American badger varied only among years. Franklin's ground squirrel indices were affected by study area location, with higher indices in the southeast than the northwest. Red fox activity was weakly correlated with that of the striped skunk and coyote. Although a positive relationship between habitat patch size and nest success probably exists, we believe the experiment to fully test this hypothesis will continue to be elusive.
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221. **Relationships of swift foxes and coyotes in northwest Texas.**
Kamler, Jan Frederick. Texas Tech University, 2002.
Notes: Advisor: Ballard, Warren B.; Thesis/ Dissertation
Descriptors: swift foxes/ Vulpes velox/ coyotes/ Canis latrans/ mating/ density/ depredation/ distribution/ wildlife/ plains/ mortality/ prairies, meadows/ survival/ habitat use

Abstract: Due to severe reductions in their distribution and numbers, the swift fox (Vulpes velox) was classified as warranted, but precluded as a threatened species by the U.S. Fish and Wildlife Service from 1995 to 2001. Several factors were likely responsible for the decline of the swift fox in the western Great Plains, including habitat loss and competition with coyotes (Canis latrans). From 1998 to 2001, we radio-collared and monitored 88 swift foxes and 29 coyotes at 2 study sites in northwestern Texas to investigate the ecology and relationships of both species. Initial results suggested that higher coyote numbers on site 1 resulted in lower survival, lower density, and lower recruitment of swift foxes compared to site 2. To test this hypothesis, we experimentally removed coyotes on site 1 during the final year of the study. Subsequently, swift foxes had increased survival, increased density, increased recruitment, and exhibited a source population due to lower predation by coyotes. We also found that high mortality from coyote predation affected the spatial distribution, mating system, and group structure of swift foxes. These results indicate that high coyote numbers can suppress swift fox populations due to heavy predation. To determine if habitat loss also negatively affected swift foxes, we examined habitat selection of swift foxes at 2 spatial scales on site 2, which was comprised of short-grass prairies grazed by cattle (46% of area), non-native (CRP) grasslands that were ungrazed (23%), and agricultural fields (31%). Habitat use was similar at both spatial scales, as swift foxes exhibited a strong preference for short-grass prairies and nearly complete avoidance of CRP grasslands and agricultural fields. These results indicate that swift foxes are habitat specialists, thus protection of native short-grass prairies might be necessary for their long-term existence. We documented that the social organization of swift foxes was based entirely on female territories, as adult males emigrated after adult female deaths, but not vice versa. A female-based social organization, previously unknown among canids, likely evolved in swift foxes from the reduced importance of food provisioning by males.

222. **Reproductive success of grasshopper sparrows in relation to edge.**
Delisle, Jennifer M and Savidge, Julie A.
Prairie Naturalist 28(3): 107-114. (1996)
NAL Call #: QH540.P7; ISSN: 0091-0376
Descriptors: Conservation Reserve Program/ ecology/ edge relation/ reproductive success/ Nebraska, southeastern/ wildlife management/ animals/ birds/ chordates/ nonhuman vertebrates/ grasshopper sparrow (Passeriformes)/ Ammodramus savannarum (Passeriformes)
Abstract: Using an index based on observations of breeding behaviors, we estimated reproductive success of 31 territorial grasshopper sparrows (Ammodramus savannarum) on Conservation Reserve Program fields in southeast Nebraska. Reproductive success was 52%, and no difference was detected between birds holding interior (>100 m from the edge) vs. edge territories. However, grasshopper sparrows appeared to avoid nesting within 50 m of edge habitats. Territories ranged from 0.36-1.24 ha, and territory size did not differ between successful and unsuccessful males.

223. **Response of timber growth and avian communities to quality vegetation management in mid-rotation CRP pine plantations.**
Sladek, Brandon G.; Munn, Ian A.; Burger, L. Wes; and Roberts, Scott D.
In: Proceedings of the 13th Biennial Southern Silvicultural Research Conference, General Technical Report-SRS 92/ Connor, Kristina F.; Asheville, NC: Southern Research Station, Forest Service, U.S. Department of Agriculture, 2006. pp. 30-33.
Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ land zones/ Aves: forestry/ forest and woodland/ loblolly pine plantations/ Mississippi/ upper and lower coastal plain/ vegetation management in pine plantations/ birds/ chordates/ vertebrates
Abstract: Provisions of the 2002 Farm Bill gave Conservation Reserve Program (CRP) participants greater flexibility to implement mid-contract management activities that encourage wildlife habitat improvement and timber production. Quality Vegetation Management (QVM) is one such technique that utilizes the selective herbicide Imazapyr and prescribed burning. Timber growth (d.b.h., total/merchantable heights, and cubic foot volume per acre) and summer avian community responses (relative abundance, species richness, and total conservation value) to the QVM treatment are being evaluated in mid-rotation CRP loblolly pine plantations in two physiographic regions of Mississippi. By 2-years post-treatment, significant increases in the relative abundance of six early successional bird species were detected on treated sites. Although not significant, mean pine growth increment increases were slightly greater on treated plots than on control plots.

224. **Reuse of annual set-aside lands: Implications for wildlife.**
Frawley, B. J. and Walters, S.
Wildlife Society Bulletin 24(4): 655-659. (Winter 1996)
NAL Call #: SK357.A1W5; ISSN: 0091-7648 [WLSBA6]
Descriptors: agricultural land/ land management/ wildlife/ conservation/ Indiana/ Conservation Reserve Program
This citation is from AGRICOLA.

225. **Reverting Conservation Reserve Program lands to wheat and livestock production: Effects on ground beetle (Coleoptera: Carabidae) assemblages.**
French, B. Wade; Elliott, Norman C.; and Berberet, Richard C.
Environmental Entomology 27(6): 1323-1335. (1998)
NAL Call #: QL461.E532; ISSN: 0046-225X
Descriptors: agricultural lands/ grazing lands/ Conservation Reserve Program/ ground beetles
Abstract: Highly erodible lands enrolled in the Conservation Reserve Program soon will revert to agricultural production. This study was designed to determine the effects of reversion of Conservation Reserve Program lands to wheat and livestock production on ground beetle assemblages. Reversion strategies included no reversion of Conservation Reserve Program grass (unmanaged bluestem), simulated grazing of Conservation Reserve Program grass (managed bluestem), minimum-tillage practices for wheat production, and no-tillage practices for wheat production. A randomized block experimental design was established with 4 replicates.

More ground beetles were captured in pitfall traps in 1995 than in 1996, and abundances within years differed among reversion strategies. Of the 73 ground beetle species collected, 9 species accounted for 61.7% of total abundance. Abundances of these 9 species differed with respect to reversion strategy. Species diversity and evenness differed among the reversion strategies in 1995, but only evenness differed in 1996. Canonical correspondence analysis showed that annual and monthly variation were the predominant factors in separating ground beetle assemblages. Lack of rainfall may have accounted for a large portion of differences in abundances between years. A partial canonical correspondence analysis showed that simulated grazing and no-tillage wheat were the predominant reversion strategies in separating ground beetle assemblages. These treatments represent disturbance levels intermediate to unmanaged bluestem and minimum-tillage wheat.

226. **A review and synthesis of habitat use by breeding birds in agricultural landscapes of Iowa.**
Best, L. B.; Freemark, K. E.; Dinsmore, J. J.; and Camp, M.
American Midland Naturalist 134(1): 1-29. (July 1995)
NAL Call #: 410-M58; ISSN: 0003-0031 [AMNAAF]
Descriptors: wild birds/ species diversity/ breeding places/ habitat selection/ vegetation types/ agricultural land/ checklists/ conservation/ Iowa/ species abundance
This citation is from AGRICOLA.

227. **Ring-necked pheasant nesting ecology and production on CRP lands in the Texas Southern High Plains.**
Berthelsen, Peter S.; Smith, Loren M.; and George, Ronnie R.
Transactions of the North American Wildlife and Natural Resource Conference 55: 46-56. (1990)
NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: Galliformes/ Phasianidae/ Phasianus colchicus/ birds/ behavior/ Conservation Reserve Programs/ management/ nests/ nesting/ productivity/ wildlife/ common pheasant/ fertility/ recruitment/ density/ northwestern Texas

228. **A roadmap to more quail.**
Gallagher, Elsa
Missouri Conservationist 65(7): 4-7. (2004); ISSN: 0026-6515.
http://mdc.mo.gov/conmag/2004/07/10.htm
Descriptors: Colinus virginianus/ agricultural practices/ birds/ conservation/ conservation programs/ ecosystems/ edge habitat/ fencerows/ habitat alterations/ habitat management/ habitat use/ hunting and anti-hunting/ landowners/ management/ population ecology/ restoration/ succession/ urbanization/ wildlife/ wildlife-habitat relationships/ northern bobwhite quail/ Missouri
Abstract: This article has notes about quails and their habitat in Missouri. Missourians naturally associate quail with open lands and brushy draws, fencerows, and crop field edges. These types of habitat are disappearing from the Missouri landscape. A diversified landscape is slowly being replaced by urban developments, larger crop fields, and pastures dominated by fescue and brome. These choke out the forbs, legumes, and bare ground necessary for quail survival. Fortunately, farmers and landowners are learning that they play an important role in restoring quail populations in Missouri. Landowners willing to devote 5 to 10 percent of their property to quail management will often see an immediate response of higher quail numbers. The South East Quail Study Group developed the Northern Bobwhite Conservation Initiative (NBCI) to meet the conservation and management needs of northern bobwhite. The NBCI is a landscape-scale habitat restoration plan, the first plan to address habitat needs of bobwhite. Improving habitat is the key to restoring quail and other grassland species. In most cases, bobwhite quail habitat can be created or enhanced with some combination of discing, burning, brush pile building, edge feathering, spraying, and shrub planting. The conservation department offers one-on-one consulting services and access to several programs to help landowners develop quality quail habitat. The Northern Bobwhite Conservation Initiative has helped the department include quail management into their planning and made it easier to integrate all bird conservation into these efforts.

229. **The role of farm policy in achieving large-scale conservation: Bobwhite and buffers.**
Burger, L. W.; Mckenzie, D.; Thackston, R.; and Demaso, S. J.
Wildlife Society Bulletin 34(4): 986-993. (2006)
NAL Call #: SK357.A1W5; ISSN: 00917648.
Notes: doi: 10.2193/0091-7648(2006)34[986:TROFPI]2.0.CO;2.
Descriptors: Colinus virginianus/ Conservation Reserve Program/ Farm Bill/ Farm policy/ habitat buffers for upland birds/ northern bobwhite/ Northern Bobwhite Conservation Initiative
Abstract: The Farm Bill provides a policy vehicle for implementing conservation programs with the potential to alter land use on a large spatial scale. The conservation payments under the Farm Bill dwarf the collective investment of the North American Wetlands Conservation Act, Endangered Species Act, Pittman-Robertson Act, and Conservation and Reinvestment Act. However, the ecological value of past policy has varied by program, practice, region, and wildlife species, resulting in a broad array of wildlife habitat and population effects ranging from positive to negative. We argue the conservation provisions of the Farm Bill can produce more consistent positive wildlife habitat benefits when policy (program statutes, rules, practices, and practice standards) is developed in the context of explicit goals identified as part of large-scale conservation initiatives. For example, initiatives like the North American Waterfowl Management Plan, Partners in Flight, and the Northern Bobwhite Conservation Initiative (NBCI) set science-based goals and objectives to facilitate wildlife species population recovery and sustainability at the landscape scale. We contend that the best ecological and societal cost/benefit ratio is achieved when Farm Bill conservation programs and practices are developed to address these specific habitat goals. We present a case study illustrating how a Conservation Reserve Program option (Conservation Practice 33-Habitat Buffers for Upland Birds) specifically addresses NBCI goals and objectives. We discuss the successes, failures, and lessons learned by NCBI in policy formulation, practice development, programmatic delivery, and evaluation.

230. **The role of the Conservation Reserve Program in relation to wildlife enhancement, wetlands and adjacent habitats in the northern Great Plains.**
Higgins, K. F.; Nomsen, D. E.; and Wentz, W. A.
In: Impacts of the Conservation Reserve Program in the Great Plains, General Technical Report-RM 158/ Mitchell, J. E.; Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, 1987. pp. 99-104.
Descriptors: Conservation Reserve Program/ regional conservation programs/ northern Great Plains
Abstract: Focused on the value of CRP grasslands directly related to wetlands and their associated wildlife (primary migratory birds).

231. **The role of trees and shrubs as economic enterprises and wildlife habitat development in the Great Plains.**
Hoefer, P. and Bratton, G. F.
In: Impacts of the Conservation Reserve Program in the Great Plains, General Technical Report-RM 158; Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, 1988. pp. 109-112.
Notes: 0277-5786 (ISSN); Proceedings of a Symposium on "Impacts of the Conservation Reserve Program in the Great Plains," held Sept 16-18, 1987, Denver, Colorado.
NAL Call #: aSD11.A42
Descriptors: soil conservation/ resource conservation/ revegetation/ erosion control/ shrubs/ trees/ wildlife/ habitats/ northern plains states of USA/ southern plains states of USA/ Conservation Reserve Program
This citation is from AGRICOLA.

232. **The role of wildlife as an economic input into farming or ranching operation.**
Bryant, F. C. and Smith, L. M.
In: Impacts of the Conservation Reserve Program in the Great Plains, General Technical Report RM 158; Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, 1988. pp. 95-98.
Notes: Report Series ISSN: 0277-5786; Proceedings of a Symposium on "Impacts of the Conservation Reserve Program in the Great Plains," held Sept 16-18, 1987, Denver, Colorado. Includes references.
NAL Call #: aSD11.A42
Descriptors: farming/ wildlife/ wildlife management/ economic impact/ Texas/ Conservation Reserve Program/ high plains/ rolling plains
This citation is from AGRICOLA.

233. **Rotational grazing demonstration with beef cattle on conservation reserve land in Adams County, Iowa, USA.**
Barnhart, S. K.; Peterson, B.; Nelson, C. O.; Bredahl, R. ; Klein, J.; and Sprague, R.
In: XX International Grassland Congress: Offered Papers. Wageningen, Netherlands: Wageningen Academic Publishers, 2005; pp. 787.
Notes: 20th International Grassland Congress, Dublin, Ireland; June 26 -July 01, 2005; 9076998817 (ISBN).
Descriptors: animal husbandry: agriculture/ wildlife habitat/ soil erosion/ United States Department of Agriculture/ rotational grazing/ Conservation Reserve Program

234. **Rural economic effects of the Conservation Reserve Program in North Dakota.**
Bangsund, D. A.; Leistritz, F. L.; and Hodur, N. M.
Fargo, N. D.: Department of Agribusiness and Applied Economics, North Dakota State University, 2002. viii; 117 p. Agribusiness and Applied Economics Report (AAER).
Descriptors: agricultural production/ agricultural situation/ economic impact/ expenditure/ hunting/ income/ land diversion/ land use/ losses/ opportunity costs/ outdoor recreation/ rural areas/ rural economy/ rural recreation/ wildlife conservation
Abstract: This study addressed the net economic effects of decreased agricultural activity and increased recreational activity associated with the Conservation Reserve Program or CRP (enacted in 1985) in six rural areas of North Dakota, USA, from 1996-2000. The negative effects of the CRP on agricultural revenues were based on the level of economic activity that would have occurred in the absence of the programme. The net change in revenues from CRP land returning to agricultural production in the six study areas was estimated at $76 million or about $56 per CRP-acre. However, returning CRP lands to agricultural production was estimated to lower commodity prices and reduce agricultural revenues on non-CRP lands by $25.9 million. The combined effect was estimated at $50.2 million annually or $37 per CRP-acre in the study areas. The CRP affects many types of outdoor recreation. However, hunting was identified as the most influenced type of recreation in North Dakota. Recreational impacts were determined by comparing pheasant, waterfowl, and deer hunter numbers before and after the CRP, assigning the relative role the CRP has played in the change in hunter numbers, allocating a percentage of the change in hunter numbers to each study area, and applying seasonal hunter expenditure patterns to the change in hunter numbers. Average annual CRP-related hunter expenditures in the six study areas were estimated at $12.8 million or $9.45 per CRP-acre. Overall, recreational revenues averaged 26% of the agricultural losses. The degree to which CRP-based hunting revenues in rural areas offset agricultural losses varied throughout the state. In several cases, hunting expenditures offset a substantial portion of the agricultural losses, while in other areas, the net economic loss from the programme remains high. The net economic effects of the programme in western and central North Dakota were the most favourable, whereas the effects were least favourable in eastern areas of the state. In North Dakota, the net economic effect of losses in agricultural revenues and gains in hunting-based recreational expenditures indicated that several areas of the state are not as economically burdened by the CRP as previous research has suggested.

235. **Scale-dependent dispersal and distribution patterns of spiders in agricultural systems: A review.**
Samu, F.; Sunderland, K. D.; and Szinetár, C.
Journal of Arachnology 27(1): 325-332. (1999)
NAL Call #: QL451.J6 ; ISSN: 0161-8202.
Notes: Literature review.
Descriptors: farming systems/ dispersal/ distribution/ effects/ habitats/ pest control/ predation/ prey/ survival/ tillage/ Araneae/ arthropods/ Arachnida/ invertebrates
Abstract: A conceptual framework is presented for the study of the factors affecting the distribution, dispersal and abundance of spiders in agricultural systems. It is useful to

consider how factors operate at three levels of a spatial hierarchy, namely micro-habitat, habitat and landscape. The size and distribution of spider populations are determined by factors influencing survival, reproduction and dispersal. Modes of dispersal vary in terms of the efficiency of sampling new habitats and the level of risk. A literature survey of proximal factors (micro-climate, habitat structure, disturbance, prey availability, predation, and territoriality) affecting micro-habitat usage by spiders showed that the relative importance of these factors varied according to spider species. Spider abundance and diversity were found, in general, to be positively correlated with environmental diversity at different spatial scales. Within-field habitat diversifications were found to be more effective in increasing spider populations when interspersed throughout the crop (e.g., polycultures and reduced tillage) than when spatially segregated (e.g., strip management). Two approaches (modeling and experimental) to studying the effects of landscape level phenomena on spider distribution and abundance are discussed. Manipulation of habitats at the edge of fields has not, in the main, resulted in increased spider density within fields. Opportunities were identified for increasing regional populations of spiders, and optimizing pest control, by management of the annual shift in the crop mosaic to maximize spider transfer rates from senescing crops to young crops.

236. **Sea of grass in New Mexico: A perspective on CRP.**
Garcia, H. B.
Rangelands 15(1): 18-21. (Feb. 1993)
NAL Call #: SF85.A1R32; ISSN: 0190-0528
Descriptors: sown grasslands/ range management/ prescribed burning/ introduced species/ wildlife management/ erosion control/ grazing systems/ New Mexico
This citation is from AGRICOLA.

237. **Seasonal use of Conservation Reserve Program fields by white-tailed deer in eastern South Dakota.**
Gould, J.
Brookings, SD: South Dakota State University, 1991.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ South Dakota
Abstract: CRP land cover and maintenance practices, where white-tailed deer populations nested in eastern South Dakota, were examined.

238. **Seasonal use of Conservation Reserve Program lands by white-tailed deer in east-central South Dakota.**
Gould, Jeffrey H. and Jenkins, Kurt J.
Wildlife Society Bulletin 21(3): 250-255. (1993)
NAL Call #: SK357.A1W5; ISSN: 0091-7648.
Notes: Project Number: SD W-075-R/Study 7541.
Descriptors: Odocoileus virginianus/ behavior/ Conservation Reserve Programs/ habitat use/ management/ mammals/ season/ wildlife/ odocoileus virginianus/ habitat selection/ seasonal variation/ diurnal variation/ conservation areas/ telemetry/ natural resources/ agriculture (general)/ deer, white tailed/ land, private/ cultivated farmland/ policies and programs/ habitat/ utilization/ seasons/ seasonal activities/ white tailed deer/ South Dakota/ East central region/ Brookings County/ Kingsbury County/ Lake County/ United States
Abstract: Objectives were to describe variation in deer use of Conservation Reserve Program (CRP) lands by season, diel period, and deer activity class as a means of assessing seasonal importance of CRP fields to white-tailed deer in the agricultural midwest. Use of CRP fields was determined by locating radiomarked female deer from 15 September 1989 to 31 December 1990.

239. **Seed availability in grazed pastures and Conservation Reserve Program fields during winter in Kansas.**
Klute, D. S.; Robel, R. J.; and Kemp, K. E.
Journal of Field Ornithology 68(2): 253-258. (1997)
NAL Call #: 413.8 B534; ISSN: 0273-8570
Descriptors: grasslands/ seeds/ abundance/ winter/ agricultural practices/ government policy/ Kansas/ management/ United States
Abstract: Studies have documented the importance of Conservation Reserve Program (CRP) fields to breeding birds, but few have examined them as food sources for wintering birds. We compared the biomass of seeds in CRP fields to that in grazed native grass pastures in northeastern Kansas during two winters. Log transformed total seed biomass was significantly lower in grazed pastures than in CRP fields during the first winter but not the second. Total seed biomass in CRP fields was highly variable, and decreased between November and February. Seeds that were typically abundant in CRP fields are important food items of wintering grassland birds. In conclusion, CRP fields are superior to grazed native grass pastures in northeastern Kansas as winter foraging habitat for birds.

240. **Selected effects of the Conservation Reserve Program on program participants: A report to survey respondents.**
Vandever, M. W.; Allen, A. W.; and Sexton, N. R.
Fort Collins, CO: U.S. Geological Survey, Fort Collins Science Center; USGSOFR02476, 2003. 30 p.
Notes: USGS Open file rept. 2476; Sponsored by Farm Service Agency, Lakewood, CO.
http://www.fort.usgs.gov/products/publications/10023/10023.pdf
Descriptors: surveys/ natural resources conservation/ conservation/ wildlife/ habitats/ social effect/ public opinion/ Conservation Reserve Program/ natural resources and earth sciences natural resource management/ agriculture and food agricultural economics
Abstract: In the summer of 2001, we drew a random sample of 2,212 persons holding active Conservation Reserve Program (CRP) contracts across all USDA Farm Production Regions because we wanted information from people intimately familiar with the program's effects on their land and communities, we did not send surveys to contracts held in the name of trusts, banks, or other non-personal ownership (49 contracts). To carry out the survey, we followed a dependable step-by-step process designed to maximize the quality and quantity of responses for mail surveys (Dillman 1978, 2000). As a result, the overall

response rate for the survey was 65%. Of the 35% who did not respond, only 1% (29 people) formally refused to participate. We were able to summarize the survey results nationally and by USDA Farm Production Region.

241. **Short-term bird response to harvesting switchgrass for biomass in Iowa.**
Murray, L. D. and Best, L. B.
Journal of Wildlife Management 67(3): 611-621. (July 2003)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: biomass/ birds/ energy crops/ grassland/ Iowa/ nest success/ Panicum Virgatum/ switchgrass/ Conservation Reserve Program/ grassland birds/ nest success/ North Dakota/ CRP fields/ abundance/ habitat/ vegetation/ Pheasants/ survival
Abstract: Conservation Reserve Program (CRP) provides habitat for grassland birds, but as contracts expire, some CRP fields might be returned to rowcrop production. One alternative to returning CRP fields to rowcrops is to produce switchgrass (Panicum virgatum) for use as a biomass fuel. Because the biomass is harvested during the fall and winter, breeding birds would not be directly affected by mowing the fields but might be influenced by changes in vegetation structure resulting from the harvest. We evaluated bird abundances and nest success in totally, harvested, partially harvested (alternating cut and uncut strips), and nonharvested CRP switchgrass fields in southern Iowa, USA, in 1999 and 2000. Species richness did not differ among harvest treatments. Abundances of most species (16 of 18) were not affected by the harvesting of switchgrass fields, and strip width did not affect bird numbers in strip- harvested fields. Grasshopper sparrows (Ammodramus savannarum) were more abundant in harvested portions of fields, and more sedge wrens (Cistothorus platensis) were recorded in nonharvested areas. The residual vegetation in nonharvested areas provided nest cover for species that begin nesting early in the season (e.g., northern harrier [Circus cyaneus] and ring-necked pheasant [Phasianus colchicus]). Nest success rates of grasshopper sparrows and common yellowthroats (Geothlypis trichas) were similar to those reported by other studies in switchgrass fields and might be sufficient to maintain stable populations. In general, switchgrass biomass fields create breeding habitat for some grassland birds, and a Mixture of harvested and nonharvested fields would be more beneficial to grassland birds than totally harvesting or partially harvesting all switchgrass fields.

242. **Short-term impacts of aboveground herbivory (grasshopper) on the abundance and 14C activity of soil nematodes in conventional tillage and no-till agroecosytems.**
Fu, Shenglei; Kisselle, Keith W.; Coleman, David C.; Hendrix, Paul F.; and Crossley, D. A.
Soil Biology and Biochemistry 33(9): 1253-1258. (2001)
NAL Call #: S592.7.A1S6; ISSN: 0038-0717
Descriptors: nutrition/ behavior/ ecology/ population dynamics/ terrestrial habitat/ man-made habitat/ land and freshwater zones/ Nematoda: activity patterns/ population density/ soil habitat/ cultivated land habitat/ tilled and untilled agroecosystems/ Georgia/ abundance and activity/ effect of insect herbivory levels/ arthropods/ helminths/ insects/ invertebrates/ nematodes
Abstract: This study was designed to monitor the responses of soil nematodes to different levels of aboveground herbivory and to test the hypothesis that the low level of aboveground herbivory facilitates soil nematode activities and high herbivory suppresses soil nematode activities. Three herbivory levels were established by introducing four pairs, two pairs and no grasshoppers to graze on corn plants (Zea mays) for 2 h. The experiment was conducted in conventional tillage (CT) and no-till (NT) agroecosystems at Georgia piedmont. In NT, bacterivorous and fungivorous nematode numbers were more abundant 24 h after herbivory treatment at high grazing level compared to controls, but this was not observed at low grazing level. In NT, the 14C activity of soil nematodes was significantly higher at both low and high grazing levels than the controls. In CT, however, we did not observe any effects caused by aboveground herbivory on the abundance and 14C activity of soil nematodes. The abundance of other trophic groups of soil nematodes (phytophages, predators and omnivores) was not affected by aboveground herbivory treatments under either NT or CT regimes. The curvilinear relationship between the nematode activity and the grazing intensity was not found in this study, we suggested that a grazing gradient of leaf area loss ranging from 0 to 100% might be more desirable for future research. We hypothesized that root associated materials might be more important to soil organisms in NT than in CT since the effect of aboveground herbivory on soil nematodes was only observed in NT.

243. **Small mammal populations occurring in a diversified winter wheat cropping system.**
Olson, R. A. and Brewer, M. J.
Agriculture, Ecosystems and Environment 95(1): 311-319. (2003)
NAL Call #: S601.A34
Descriptors: diversification/ ecology/ grasslands/ small mammals/ species diversity/ species richness/ vegetation/ wheat/ winter wheat
Abstract: Some Triticum aestivum (winter wheat) growers in the western region of the Northern Great Plains, USA, use a 3-year rotational, diversified dryland cropping system consisting of alternating strips of T. aestivum, fallow, and an additional spring sown crop such as Avena sativa (oats) or Zea mays (corn). Small mammal population characteristics (species richness, abundance, diversity) of the crops associated with this cropping system are unknown. Small mammal populations and vegetation characteristics (habitat) were evaluated at two sites in June 1998 and 1999 in three crops of the rotation and on undisturbed Conservation Reserve Program (CRP) grasslands. Small mammal abundance and diversity were highest in T. aestivum and grassland at both sites each year. Peromyscus maniculatus (deer mouse) was the most abundant species. Percent vegetation cover was significantly higher in T. aestivum and grassland, respectively, at both sites each year. Regression analyses using pooled data indicated a significant relationship between percent vegetation cover and small mammal species richness, abundance, and diversity. T. aestivum provided valuable habitat for small mammals in winter, spring, and early summer. Alternate grain crops in the

diversified cropping system, which is absent in traditional 2-year systems, probably offered additional valuable protective cover for small mammals following T. aestivum harvest.

244. **Small mammal response to farming as practiced on the Franklin Island Wildlife Area.**
Clawson, R. L. and Smith, J. W. Missouri Dept. of Conservation; MO W-013-R-39/Job 1/Study No. 69, 1985. 21 p.
Descriptors: wetlands/ cotton-rat/ food crops/ mammals/ mice, deer/ mice, harvest/ mice, white-footed/ mouse, house/ rodents/ species diversity/ state wildlife management areas/ tillage/ voles/ Triticum spp./ Missouri/ Howard County
Abstract: Objective was to determine small mammal populations in corn, soybean, and wheat fields on a Missouri Department of Conservation wetland area.

245. **Soil management to enhance bacterivore and fungivore nematode populations and their nitrogen mineralisation function.**
Ferris, H; Venette, R. C.; and Scow, K. M.
Applied Soil Ecology 25(1): 19-35. (2004)
NAL Call #: QH541.5.S6 A67; ISSN: 0929-1393
Descriptors: commercial activities/ ecology/ terrestrial habitat/ land zones/ Nematoda: farming and agriculture/ soil management/ bacterivore and fungivore populations/ nitrogen mineralization function/ relationships/ element cycles/ soil management effects/ population dynamics/ effect of soil management/ impact on habitat/ soil habitat/ California/ University of California/ agronomy/ farm/ nematoda/ invertebrates/ nematodes
Abstract: We tested the hypotheses that management of the soil food web in the fall would enhance grazing on bacteria and fungi by microbivorous nematodes in the spring, consequently increasing N availability in cover-crop driven organic and low-input farming systems. The food web was manipulated by irrigating the dry soil of late summer and/or providing carbon sources. By creating conditions conducive for biological activity, we increased the abundance of bacterivore and fungivore nematodes in the fall and the following spring. Greater biological activity in the soil enhanced concentrations of mineral N available to the subsequent summer tomato crop. Mineral N concentration in the spring was associated with abundance of bacterivore nematodes, and with the corresponding Enrichment Index (EI) provided by nematode community analysis. Because environmental conditions that favour increase of bacterivore nematodes probably also favour other microbial grazers, including protozoa, the abundance of bacterivore nematodes may be an indicator of overall grazing activity and N mineralisation rates from soil fauna. Decomposition pathways in the spring, inferred from nematode bioindicators, were dominated by bacteria in plots that had been irrigated the previous fall while fungi were more prevalent in those that had not. The responses of omnivore and predator nematodes to our treatments were not consistent and there was no evidence that regulation of opportunist species by predators would be enhanced by the management practices imposed.

246. **Soil organic carbon changes after 12 years of no-tillage and tillage of Grantsburg soils in southern Illinois.**
Olson, K. R.; Lang, J. M.; and Ebelhar, S. A.
Soil and Tillage Research 81(2): 217-225. (2005)
NAL Call #: S590.S48; ISSN: 0167-1987
Descriptors: biochemistry and molecular biophysics/ soil science/ economics/ agronomy: agriculture/ wildlife management: conservation/ tillage/ applied and field techniques/ moldboard plowing/ applied and field techniques/ no tillage/ applied and field techniques/ chisel plowing/ applied and field techniques/ yearly crop rotation system/ applied and field techniques/ Conservation Reserve Program/ applied and field techniques/ soil erosion/ crop production/ soil organic carbon changes/ grantsburg soil/ tall fescue hayland/ rooting zone/ subsurface layer/ surface layer
Abstract: Many factors including management history, soil type, climate, and soil landscape processes affect the dynamics of soil organic carbon (SOC). The primary objective of this research was to determine the effects of no-tillage and tillage systems on the SOC content after 12 years of controlled treatments. A tillage experiment with three treatments (no-till (NT), chisel plow (CP) and moldboard plow (MP)) was initiated in the spring of 1989 in southern Illinois. The plot area was previously in a tall fescue hayland for 15 years and had a 6% slope. Maize (Zea mays L.) and soybean (Glycine max L. Merr.) were grown in the plot area on a yearly rotation system starting with maize. Periodically, the SOC content of various soil layers, to a depth of either 30 or 75 cm, was measured and expressed on both a gravimetric and volumetric basis. After 12 years, the 0-15 cm surface soil layer of MP was significantly lower in SOC than the NT and CP plots. For all but 2 values, the significance of findings did not change with the form of expression (gravimetric versus volumetric). The surface layer (0-15 cm), subsoil (15-75 cm), and rooting zone (075 cm) of all treatments had reduction in SOC on a volumetric basis when compared to the pre-treatment values for sod. At the end of the 12-year study, the MP system had significantly less SOC in the surface layer, subsurface layer and rooting zone than the NT system at comparable depths. After 12 years of tillage under a maize-soybean rotation, the NT treatment sequestered or maintained more SOC stock (47.0 Mt ha^{-1}) than the CP (43.7 Mt ha^{-1}) and MP (37.7 Mt ha^{-1}) treatments. The annual rate of SOC stock build up in the root zone (0-75 cm), above the MP system base, was 0.71 Mt ha^{-1} $year^{-1}$ for the NT system and 0.46 Mt ha^{-1} $year^{-1}$ for the CP system. For land coming out of the Conservation Reserve Program and returning to row crop production, NT and CP systems would maintain more SOC stock than MP system and reduce CO2 emissions to the atmosphere.

247. **Spatial and temporal dynamics of hedgerows in three agricultural landscapes of southern Quebec, Canada.**
Schmucki, R.; De Blois, S.; Bouchard, A.; and Domon, G.
Environmental Management 30(5): 651-664. (2002)
NAL Call #: HC79.E5E5 ; ISSN: 0364152X.
Notes: doi: 10.1007/s00267-002-2704-9.
Descriptors: corridors/ field margin/ hedgerow network/ landscape dynamics/ noncrop habitat/ agriculture/ ecology/

principal component analysis/ hedgerows/ environmental impact/ agricultural land/ field margin/ habitat corridor/ spatial variation/ temporal variation/ agricultural management/ ecosystem/ environmental protection/ tree/ Canada/ agriculture/ conservation of natural resources/ ecosystem/ trees
Abstract: Noncrop areas such as hedgerows in agricultural landscapes can perform several ecological and agronomic functions (e.g., habitat, movement corridors, wind-break, etc.), but their dynamics and drivers of changes are often poorly known. We conducted a study in three agricultural landscapes of southern Quebec, Canada, to assess and compare the spatial and temporal (1958-1997) dynamics of three hedgerow networks in relation to geomorphic conditions (marine, glacial, and mixed deposit) and land-use changes. Hedgerow networks were mapped and described in terms of their structure (density, degree of connectivity, and presence of trees or shrubs) and their relationship to other components of the landscape (connection to woodland). Relationships were assessed in time and space using nonparametric correlation, Mantel test, and principal components analysis (PCA). Results show significant differences between hedgerow structure for the three landscapes and distinct temporal and spatial dynamics that can be related to changes in management practices and agricultural policies. On marine deposits, increases in hedgerow density did not always correspond to an increase in their degree of connectivity, suggesting a possible reduction in network quality. On glacial deposits, hedgerow density declined following abandonment of agricultural land, but rather than disappearing, these linear structures were integrated into adjacent brush or forested areas. Our analysis reveals the complex spatial and temporal dynamics of the hedgerow networks and highlights the need to take into account spatial attributes such as connectivity and connection to woodland to evaluate more accurately overall network quality.

248. **Spatial ecology and habitat selection of breeding male pheasants.**
Leif, A. P.
Wildlife Society Bulletin 33(1): 130-141. (2005)
NAL Call #: SK357.A1W5; ISSN: 00917648
Descriptors: dispersal/ habitat selection/ home range/ Phasianus colchicus/ ring-necked pheasant/ survival/ survival/ South Dakota/ Phasianidae
Abstract: In contrast to the management of European pheasants (Phasianus spp.), the spatial dynamics and habitat selection of breeding male ring-necked pheasants (P. colchicus) have received little attention in North America. To evaluate these parameters, I radiomarked 95 male pheasants over 5 years (1997-2001) on 2 study areas in eastern South Dakota. In spring 73% of radiomarked pheasants dispersed and moved an average of 3.2±0.3 km (SE) from wintering sites. Home range sizes of breeding male pheasants were bimodally distributed. One group of male pheasants exhibited localized movements and had relatively small (18.4±0.9 ha) home ranges, whereas a second group was intermittently sedentary and mobile and had relatively large (45.4±2.9 ha) home ranges. Males preferred to establish breeding home ranges in association with idled herbaceous and woody cover. The proportional abundance of woody cover decreased the size of male home ranges, whereas higher proportions of cropland resulted in larger pheasant home ranges. Within home ranges male pheasants preferred woody cover to other available habitats. While subjugated males assumed sedentary, submissive roles in Europe, in South Dakota males sought unoccupied spaces on landscapes to establish territories. Complexes of idled herbaceous and woody cover will maximize the capacity of landscapes to support male pheasant territories.

249. **Spring burning: Resulting avian abundance and nesting in Kansas CRP.**
Robel, R. J.; Hughes, J. P.; Hull, S. D.; Kemp, K. E.; and Klute, D. S.
Journal of Range Management 51(2): 132-138. (Mar. 1998)
NAL Call #: 60.18 J82 ; ISSN: 0022-409X [JRMGAQ]
Descriptors: fire ecology/ prescribed burning/ brush control/ wild birds/ nests/ Kansas
Abstract: Spring burning is used to control invasion by woody vegetation of rangelands in eastern Kansas and also of Conservation Reserve Program (CRP) fields planted to native grasses. We measured the effects of spring burning of CRP fields on vegetation structure and avian populations in northeastern Kansas during the summers of 1992 through 1995. Several vegetation characteristics differed between burned and unburned CRP fields in May, but few differed in July. Mean avian abundance on burned CRP fields was 5.6 birds km-1 of survey transect, significantly less ($P < 0.01$) than the 8.6 km-1 on unburned fields. The avian-assemblages on burned and unburned fields differed more in May/June [Morisita's Index to Similarity (MIS) = 0.86] than in June/July or July/August (MIS = 0.98 and 0.97, respectively). Avian species richness ranged from 12 to 21 on burned fields and from 10 to 19 on unburned fields. A total of 27 nests was found on burned fields, significantly less ($P < 0.01$) than the 372 found on unburned fields. The 22.2% nesting success on burned fields was not significantly different ($P = 0.205$) than the 34.1% success on unburned fields. Spring burning reduced bird-nest numbers in the summer of the same year, but did not reduce significantly ($P = 0.235$) the number of nests found in those fields the following summers nor the abundance of birds or nesting success. Avoidance of annual burning would reduce adverse impacts on bird populations relying on CRP fields for nesting habitat.
This citation is from AGRICOLA.

250. **Spring dispersal patterns of red-winged blackbirds, Agelaius phoeniceus, staging in eastern South Dakota.**
Homan, H. J.; Linz, G. M.; Engeman, R. M.; and Penry, L. B.
Canadian Field Naturalist 118(2): 201-209. (2004)
NAL Call #: 410.9 Ot8; ISSN: 00083550
Descriptors: Agelaius phoeniceus/ breeding range/ color-marking/ dispersal patterns/ northern Great Plains/ red-winged blackbird/ spring migration/ sunflower damage/ South Dakota/ Taxidea taxus/ Turdus merula
Abstract: Red-winged Blackbirds (Agelaius phoeniceus) are very abundant summer residents throughout the Prairie Pothole Region of central North America. In late summer they assemble in post-breeding flocks that cause significant amounts of agricultural damage, particularly in sunflower fields near natal sites. In April 2001, we aerially color-marked ~370 000 Red-winged Blackbirds near Badger,

South Dakota (44°48'N, 97°21'W), to determine if migrants staging here were summer residents in sunflower production areas ~ 350 km to the northwest. We measured patterns of migratory dispersal by collecting birds in 54 randomly selected blocks in the northcentral U.S. and the Prairie Provinces of Canada. The marked specimens (n = 33) were categorized into three polygons based on analyses of banding and re-sighting data and proximity to concentrated sunflower production. We estimated that 82% of the migrants that had staged in eastern South Dakota resided within or on the periphery of the sunflower growing area. These birds probably stay near their breeding territories until at least late August and cause early damage to sunflower, which comprises the majority of damage. Resident birds in Alberta and most of Saskatchewan (18%) might arrive too late in the damage season to impact the sunflower crop significantly.

251. **Stable isotopes provide evidence for poor northern pintail production on the Canadian prairies.**
Hebert, C. E. and Wassenaar, L. I.
Journal of Wildlife Management 69(1): 101-109. (2005)
NAL Call #: 410 J827; ISSN: 0022541X.
Notes: doi: 10.2193/0022-541X(2005)069 <0101:SIPEFP>2.0.CO;2.
Descriptors: agriculture/ Anas acuta/ Anas platyrhynchos/ cropland/ geographic origin/ landscapes/ mallard/ northern pintail/ stable isotopes/ agricultural practices/ breeding population/ nesting success/ population decline/ population estimation/ stable isotope/ waterfowl/ Alberta/ Canada/ North America/ Saskatchewan/ Aves/ Platyrhynchos
Abstract: Concerns have been raised regarding declines in western North American northern pintail (Anas acuta L.) populations over the past 30 years. Elucidating the natal origins of pintails and identifying production areas of pintails are important steps in determining the cause of the observed declines. Here, we used stable isotope (sulphur, hydrogen, carbon, nitrogen) featherprints to determine the geographic origins of northern pintail ducks shot by hunters in southern Alberta and Saskatchewan, Canada. Based on the best data available for inferring the distribution of breeding pintails, the proportion of hatch-year pintails originating from Prairie regions was small-er than expected. Our results suggest that production of northern pintails on the Canadian Prairies may be significantly lower than predicted by the number of breeding birds and may be related to human-induced reductions in nest success as a result of agricultural practices.

252. **Stakeholder opinions regarding management of Conservation Reserve Program lands to address environmental and wildlife issues.**
Vandever, Mark W. and Hoag, Dana L.
Human Dimensions of Wildlife 11(2): 147-149. (2006); ISSN: 1087-1209
Descriptors: Conservation Reserve Program/ wildlife/ survey/ environmental benefits/ stakeholders
Abstract: The article presents an abstract for the study Stakeholder Opinions Regarding Management of Conservation Reserve Program Lands to Address Environmental and Wildlife Issues by Mark W. Vandever and Dana L. Hoag.

253. **Status and management of the greater prairie-chicken Tympanuchus cupido pinnatus in North America.**
Svedarsky, W. D.; Westemeier, R. L.; Robel, R. J.; Gough, S.; and Toepher, J. E.
Wildlife Biology 6(4): 277-284. (Dec. 2000)
NAL Call #: SK351.W663; ISSN: 0909-6396
Descriptors: management/ biogeography/ grasslands/ conservation/ North America/ Tympanuchus cupido pinnatus
Abstract: Greater prairie-chickens Tympanuchus cupido pinnatus are grouse of the tallgrass prairie of North America. Their range expanded greatly following the spread of early European agriculture into the grasslands and logging in forested areas. When the optimum mix of cropland and grass was exceeded, their range generally contracted to the regions where climatic and/or soil factors favoured the retention of grassland. Historically they probably occurred in 20 states of the United States and four Canadian provinces, but presently they only occur in 11 states and no longer in Canada. Their current status throughout the range varies considerably depending on habitat conditions, population levels, management capabilities and local land-use economic factors. A variety of conservation efforts, including translocation, are underway in the states where they occur, the intensity of which is generally inverse to numbers remaining. Noteworthy, is the Conservation Reserve Program (CRP) which has increased grassland cover on private land through incentive payments.

254. **Strategies for conserving mason bees.**
Stubbs, Constance S. and Drummond, Francis A.
In: Bees and Crop Pollination: Crisis, Crossroads, Conservation/ Stubbs, C. S. and Drummond, F. A. Lanham, MD: Entomological Society of America, 2001; pp. 95-112.
Notes: 0938522965 (ISBN).
Descriptors: commercial activities/ conservation measures/ associations/ mutualism/ man-made habitat/ land zones/ Osmia: farming and agriculture/ habitat management/ pollination/ Vaccinium angustifolium/ pollinator conservation and agricultural significance/ cultivated land habitat/ Maine/ Insecta, Hymenoptera, Apocrita, Aculeata, Apoidea, Megachilidae/ arthropods/ Hymenopterans/ Insects/ invertebrates

255. **Structural characteristics of vegetation in CRP fields in northern Missouri and their suitability as bobwhite habitat.**
Burger, Loren W.; Kurzejeski, E.; Dailey, Thomas V.; and Ryan, Mark R.
Transactions of the North American Wildlife and Natural Resource Conference 55: 74-83. (1990)
NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: Galliformes/ Odontophoridae/ Colinus virginianus/ Conservation Reserve Program/ habitat classification/ habitat surveys/ management/ wildlife/ bobwhite/ cultivated farmland/ habitat/ vegetation/ conservation programs/ cover/ habitat management for wildlife/ land, private/ agriculture/ Missouri

256. **Success of artificial nests in CRP fields, native vegetation, and field borders in southwestern Montana.**
Clawson, M. R. and Rotella, J. J.
Journal of Field Ornithology 69(2): 180-191. (1998)
NAL Call #: 413.8 B534; ISSN: 0273-8570
Descriptors: nests/ survival/ site selection/ environment management/ grasslands/ United States, Montana/ Aves/ birds/ management/ Birds
Abstract: In 1993-1994, we used artificial nests to study relationships between nest success and various spatial, temporal, and vegetation variables in three grassland types: Conservation Reserve Program (CRP) fields, field borders and watercourses, and native vegetation. Nest success was higher and vegetation was structurally more complex in CRP fields than in other grassland types. Nest success was 63% in CRP fields but only 24% in native vegetation. Results of univariate and multivariate analyses indicated that nests surrounded by taller, thicker cover were more likely to survive than nests with less concealing vegetation. Nests initiated later in the season, when vegetation volume was greater, survived at higher rates than nests initiated earlier. Spatial variables were not strongly related to nest success. Field size was directly related to nest success in CRP fields but not in other grassland types. However, field size not included in the most parsimonious, multivariate model of factors related to nest success in CRP fields. Similarly, proximity to field borders was not related to nest success in any grassland type. Our results suggest that CRP fields, which cover a large area in the Northern Great Plains and attract a greater diversity of grassland birds than the cropfields they replaced, provide secure nesting cover for ground-nesting species.

257. **Summer avian abundance, invertebrate biomass, and forbs in Kansas CRP.**
Hull, Scott D.; Robel, Robert J.; and Kemp, Kenneth E.
Prairie Naturalist 28(1): 1-12. (1996)
NAL Call #: QH540.P7; ISSN: 0091-0376
Descriptors: invertebrate biomass/ Kansas Conservation Reserve Program/ species abundance/ species richness/ terrestrial ecology/ bird/ Aves/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates
Abstract: Conservation Reserve Program (CRP) fields planted to native grasses have the potential to provide summer habitat for grassland bird populations in the Great Plains. Forbs in native grasslands are thought to increase the suitability of grasslands for birds. We measured invertebrate biomass (summer food for birds) and avian abundance in Kansas CRP fields planted to native grasses to determine if they were correlated with forb abundance in those fields. Sweep nets were used to collect invertebrate samples and avian abundance was estimated along line transects in six CRP fields from May through August 1992. Correlation analysis did not detect a statistically significant relationship between forb abundance and invertebrate biomass or avian abundance, or between avian abundance and invertebrate biomass. Avian species richness did not vary with forb abundance and the avian community assemblages on CRP fields with low and high forb abundance were similar.

258. **Summer Meleagris gallopavo silvestris use of a landscape dominated by agriculture and Pinus spp. plantations.**
Morgan, J. J.; Schweitzer, S. H.; and Carroll, J. P.
Southeastern Naturalist 5(4): 637-648. (2006)
NAL Call #: IPSP11706 ; ISSN: 15287092
Descriptors: eastern wild turkey/ turkeys/ Meleagris gallopavo silvestris/ habitat quality/ pine plantations
Abstract: Meleagris gallopavo silvestris (Eastern Wild Turkey) habitat was altered in the Southeast by the introduction of Pinus spp. plantations to agricultural areas through the Conservation Reserve Program. However, the preponderance of M. gallopavo silvestris research has focused on extensive Pinus spp. plantations that lack the cover-type diversity that typifies the Southeast. From May-July 1998 and 1999, we monitored 36 radio-tagged M. gallopavo silvestris in Burke County, GA to investigate habitat use in landscapes intensively managed for agriculture and silviculture. We used compositional analysis to identify habitats selected by male and female M. gallopavo silvestris during summers. Proportions of habitat types within the home range were different from habitats at radio-locations of males and females. Hardwood stands and fields were the most-selected habitat types by M. gallopavo silvestris in the summer. However, within home ranges, males and females also selected closed-canopy Pinus spp. habitats. Hens with broods did not preferentially select planted Pinus spp. habitats, but their use of Pinus spp. stands was greater than use of agricultural fields. The replacement of agricultural fields by closed-canopy Pinus spp. plantations may have improved habitat quality for M. gallopavo silvestris in some areas of the Southeast by diversifying the landscape. Our results suggest that closed-canopy planted Pinus spp. cover types are not detrimental to M. gallopavo silvestris when well distributed with fields and mature hardwood drains.

259. **A survey of CRP land in Minnesota: I. Legume and grass persistence.**
Jewett, J. G.; Sheaffer, C. C.; Moon, R. D.; Martin, N. P.; Barnes, D. K.; Breitbach, D. D.; and Jordan, N. R.
Journal of Production Agriculture 9(4): 528-534. (Oct. 1996-Dec. 1996)
NAL Call #: S539.5.J68
Descriptors: land policy/ governmental programs and projects/ permanent grasslands/ legumes/ grasses/ soil fertility/ phosphorus/ potassium/ soil pH/ Conservation Reserve Program/ Minnesota/ persistence/ regional surveys/ economics of land development, land reform and utilization/ plant ecology/ soil fertility, fertilizers, and manures
Abstract: This article provides an analysis of the federal Conservation Reserve Program (CRP), which had goals including reduced soil erosion and increased wildlife habitat, funded diversion of land from annual crops into permanent vegetation. The survival of grasses and legumes planted in CRP fields was not known. Our objectives were to assess the persistence and coverage of grasses and legumes in 6- to 8-yr-old CRP fields and to determine changes in soil pH, P, and K levels.

260. **Survival and nesting habitat use by Sichuan and ring-necked pheasants released in Ohio.**
Shipley, K. L. and Scott, D. P.
Ohio Journal of Science 106(3): 78-85. (2006)
NAL Call #: 410 Oh3; ISSN: 00300950
Descriptors: ring-necked pheasant/ Sichuan pheasants/ Conservation Reserve Program/ CRP/ nesting habitat
Abstract: Ring-necked pheasant (Phasianus colcbicus) populations in the Midwestern United States have declined drastically since World War II. Population numbers in Ohio have leveled off since the establishment of the Conservation Reserve Program (CRP); however, a return to historically abundant ring-necked pheasant populations is unlikely with current land-use practices. Studies by the Michigan Department of Natural Resources (DNR) of released Sichuan pheasants (P. c. strauchi), a subspecies of the ring-necked pheasant, suggested that Sichuans may nest in woody cover, a trait that could reduce agriculture-related nest losses common to ring-necked pheasants and potentially increase pheasant populations. We released over 2,000 Sichuan pheasants (962 females, 1,116 males) and 208 ring-necked pheasants (24 females, 84 males) in central Ohio, United States, in early April 1993-96. Survival and habitat use before, during, and after the nesting season were evaluated for a sample of hens from each subspecies through the use of radio-telemetry. Survival rates (range = 0.05-0.15) and apparent nest success (38% and 50% for Sichuan and ring-necked nests, respectively) were not different between the subspecies. The largest source of mortality for both subspecies was predation (71.84% and 65.88%, for Sichuan and ring-necked hens, respectively). Most nests, 85% of Sichuan and 81% of ring-necked, were located in upland herbaceous, upland shrub/ scrub, and hay macro-habitat types. Nests of both subspecies were within 16 m of an edge, surrounded by few woody stems (median = 0.25/m^2 and dense herbaceous cover (1,450 and 1,130 stems/m^2, Sichuan and ring-necked nests, respectively). Sichuan hens selected a higher proportion of forbs (37.5% and 15.0%, Sichuan and ring-necked, respectively) and ring-necked hens selected a higher proportion of grass (17.5% and 37.5%, Sichuan and ring-necked, respectively) within 1.0 m^2 of the nest (P ≤ 0.010). Population survey indices suggested that a self-sustaining Sichuan pheasant population was not established.

261. **Temporal patterns of bird abundance in cornfield edges during the breeding season.**
Best, L. B.
American Midland Naturalist 146(1): 94-104. (2001)
NAL Call #: 410 M58; ISSN: 00030031
Descriptors: abundance/ avifauna/ breeding season/ field margin/ temporal variation/ Iowa
Abstract: Bird abundance in cornfield edges in Iowa was documented from mid-April through early August 1992. During this period the barren, sparsely vegetated fields are transformed into fields with dense plant cover; the availability of food resources (corn and arthropods) also changes. Temporal patterns of bird abundance in cornfield edges differed greatly among species - Some were present in cornfield edges throughout most, if not all, of the study period (e.g., American robin and eastern kingbird), whereas others restricted their use to brief periods. Some were more abundant early in the season (e.g., killdeer and horned lark); others were more abundant later (e.g., black-capped chickadee and indigo bunting). Much of the seasonal change in bird abundance in cornfield edges was attributed to the habitat affinities of the various species and to seasonal shifts in available food resources. Birds that feed on the ground or in low herbaceous vegetation became less abundant later in the season, whereas species that characteristically feed in shrubs or the lower canopy of trees became more numerous. The availability of waste corn on the soil surface, the phenology of the developing crop and the life history stages of major corn insect pests all contribute to the temporal dynamics of bird abundance in cornfields. Also, seasonal patterns of bird abundance in cornfields influence avian risk of exposure to agricultural pesticides. Effective management and conservation of avian communities associated with cornfields require understanding temporal patterns of bird abundance and their implications.

262. **Tillage differentially affects the capture rate of pitfall traps for three species of carabid beetles.**
Hatten, Timothy D.; Bosque Perez, Nilsa A.; Johnson Maynard, Jodi; and Eigenbrode, Sanford D.
Entomologia Experimentalis et Applicata 124(2): 177-187. (2007); ISSN: 0013-8703
Descriptors: commercial activities/ techniques/ ecological techniques/ reproduction/ sex differences/ man-made habitat/ abiotic factors/ physical factors/ land zones/ Poecilus lucublandus/ Poecilus scitulus/ Pterostichus melanarius: farming and agriculture/ tillage effect on pitfall trap capture rate/ sampling/ pitfall trapping/ capture rate/ effect of tillage/ gender and microclimate/ behavioral sex differences/ pitfall trap capture rate/ cultivated land habitat/ pitfall trap capture rate/ climate and weather/ microclimate/ pitfall trap capture rate relationships/ Humidity/ ground level/ effect on pitfall trap cature rate/ temperature/ Idaho/ Palouse region/ Insecta, Coleoptera, Adephaga, Caraboidea, Carabidae/ arthropods/ beetles/ insects/ invertebrates
Abstract: The influence of tillage, gender, and microclimate on capture rates of pitfall traps for the beetles Poecilus scitulus LeConte, Poecilus lucublandus (Say), and Pterostichus melanarius Illiger (Coleoptera: Carabidae) were assessed in mark-release-recapture experiments in spring pea and spring wheat. Experiments were conducted during June, July, and August of 2003 in the Palouse region of northern Idaho, USA. Rates of capture in pitfall traps for the three carabid species were differentially affected by crop-tillage systems. Capture rates for P. scitulus and R. lucublandus were higher in no-till (NT) than in conventional tillage (CT) peas, whereas capture rates for R scitulus and Pt. melanarius were higher in CT than in NT wheat. Ground-level temperatures and relative humidity (r.h.) differed little among tillage systems. Nevertheless, capture rates were generally positively correlated with ground-level temperature and negatively correlated with r.h., with correlations more often significant in NT than in CT systems. The response of the thermophilic Poecilus spp. to temperature provides a possible mechanistic explanation for capture rate patterns in legumes during June, but not in other months for peas or any month in wheat during the experiments. Movement impedance due to residue could explain lower capture rates of R. scitulus and Pt. melanarius

in NT than in CT spring wheat. These results suggest that researchers using pitfall trapping for carabid populations should take into account potential capture biases their treatments can introduce.

263. **Use of Conservation Reserve Program fields by greater sage-grouse and other shrubsteppe associated wildlife in Washington.**
Schroeder, M. A. and Vander Haegen, W. M.
Olympia, WA: Washington Department of Fish and Wildlife, 2006. 39 p.
Notes: Published by the Wildlife Program, Science Division, Washington Department of Fish and Wildlife. http://wdfw.wa.gov/wlm/research/papers/shrub/use_of_crp_fields.pdf
Descriptors: Centrocercus urophasianus/ greater sage grouse/ Conservation Reserve Program/ CRP/ shrubsteppe/ wildlife/ Washington
Abstract: This report examines the use of CRP fields by wildlife in Washington, focusing on the shrubsteppe and grassland species most associated with the historical shrubsteppe habitat. Our focus also is on birds, because this group has received the most research attention in the recent past and includes numerous species of regional and national conservation concern. Our objective was to provide information that might be used to examine the potential of the CRP to aid in the conservation of these species.

264. **Use of no-till winter wheat by nesting ducks in North Dakota.**
Duebbert, H. F. and Kantrud, H. A.
Journal of Soil and Water Conservation 42(1): 50-53. (1987)
NAL Call #: 56.8 J822 ; ISSN: 0022-4561
Descriptors: no-tillage/ Aves/ North Dakota/ nesting/ birds/ habitats
Abstract: Nests of 5 duck species were found: blue-winged teal Anas discors, northern pintail A. acuta, mallard A. platyrhynchos, gadwall A. strepera, and northern shoveler A. clypeata. Average number of nest found was 8/100 ha in 1984 and 6/100 ha in 1985. Nest success for all species averaged 26% in 1984 and 29% in 1985. Predation by mammals was the principal cause of nest destruction. No egg or hen mortality could be attributed to pesticide use. Only 6 of 151 nests (4%) were abandoned during the 2 years. Nests of 7 other ground-nesting bird species were also found. The trend toward increased planting of no-till winter wheat in the prairie pothole region should benefit production of ducks and other ground-nesting birds. -from Authors

265. **Use of winter food plots by nongame wildlife species.**
Donalty, S.; Henke, S. E.; and Kerr, C. L.
Wildlife Society Bulletin 31(3): 774-778. (2003)
NAL Call #: SK357.A1W5; ISSN: 00917648
Descriptors: food plots/ Lagomorphs/ Lepus californicus/ Odocoileus virginianus/ rodents/ Sylvilagus floridanus/ Texas/ white-tailed deer/ exclusion experiment/ food consumption/ habitat management/ habitat use/ wildlife management/ winter/ United States/ Avena sativa/ Lepus californicus/ Odocoileus virginianus/ Sylvilagus floridanus
Abstract: Food plots typically are suggested as a management practice to benefit game species because use by nongame species is considered negligible. We tested this assumption and determined nongame species' use of winter food plots on 6 ranches in southern Texas. We equally divided a total of 144 1-m^3 sites among the ranches and located them randomly within newly planted winter oat (Avena sativa) food plots during December 1996. We built 24 1- m^3 exclosures per food plot to exclude white-tailed deer (Odocoileus virginianus; large-mesh fencing), deer and lagomorphs (medium-mesh fencing), all animals (small-mesh fencing), and no animals (i.e., no exclosures as control plots), respectively. We observed white-tailed deer in each food plot. We observed eastern cottontail rabbits (Sylvilagus floridanus) and black-tailed jackrabbits (Lepus californicus) within the large-mesh fencing exclosures and control plots. We observed 5 species of rodents within each exclosure type except the small-mesh fencing exclosures. We observed no animal or animal signs within the small-mesh fencing exclosures. After 4 months of growth, dry-matter biomass of winter oats differed between exclosure types. The small-mesh exclosures had the greatest biomass (356.9±5.7 g; $\bar{x}$ ±SE), followed by the medium- and large-mesh exclosures (219.8±13.2 g and 191.7±4.3 g, respectively), and no exclosures (62.3±6.2 g). Using the biomass of oats from the small-mesh exclosures as the potential plant growth, we determined that 46.7%, 9.6%, and 43.7% of the oats consumed were eaten by rodents, lagomorphs, and deer, respectively. Therefore, we attributed the majority of winter food plot consumption to nongame wildlife.

266. **Using Conservation Reserve Program maps derived from satellite imagery to characterize landscape structure.**
Egbert, S. L.; Park, S.; Price, K. P.; Lee, R. Y.; Wu, J. P.; and Nellis, A. D.
Computers and Electronics in Agriculture 37(1-3): 141-156. (Dec. 2002)
NAL Call #: S494.5.D3C652; ISSN: 0168-1699
Descriptors: remote sensing/ Conservation Reserve Program/ landscape metrics/ wildlife habitat/ Great Plains/ agriculture/ patch size/ Accuracy/ land/ GIS/ Geographic Information systems
Abstract: The Conservation Reserve Program (CRP) instituted one of the largest and most rapid land use/land cover conversions in US history. Approximately 14.8 million ha (36.5 million acres) of cropland were converted to grassland, woodland, and other conservation uses between 1986 and 1995. As policy makers continue to evaluate the future of the program and as scientists examine its effects, it is critical that the impact of CRP on landscape structure be considered because of its potential influence on wildlife populations. Utilizing multi- seasonal Landsat thematic mapper imagery in an unsupervised classification technique, we produced highly accurate maps of cropland and grassland for 1987 and 1992 for Finney County, Kansas. Post-classification differencing identified regions of cropland that had been converted to CRP. We then used the Finney County CRP map to examine changes in landscape structure caused by the introduction of CRP. Using the FRAGSTATS spatial pattern analysis program, we calculated the number of patches, mean patch size, patch density, edge density, mean shape index, nearest neighbor distance, and an interspersion/juxtaposition index.

In addition, we calculated total grassland area and percent of area in grassland for the pre- and post-CRP enrollment years. We found that the total grassland area and the percent area in grassland in Finney County increased due to CRP and that mean grassland patch size also increased. The total number of grassland patches decreased, however, due to coalescence of smaller grassland patches. Patch density, edge density, mean shape index, nearest neighbor distance, and the interspersion/juxtaposition index all showed relatively small changes. These small changes appear to reflect geographic differences in CRP effects within the county-large aggregating patches in the northeast were offset by a number of isolated patches of CRP in other areas. The implication of these findings for wildlife managers is that, for species that require large areas of grassland habitat, especially habitat that is contiguous, CRP in Finney County represents a substantial increase in potential habitat. This holds for species at all levels of management interest. ranging from economically valuable species to species that are rare. threatened, and endangered. These findings emphasize the importance of CRP for wildlife conservation and should further inform ongoing debate concerning the importance of the CRP.

267. **Using regional wildlife surveys to assess the CRP: Scale and data-quality issues.**
Giudice, J. H. and Haroldson, K. J.
Journal of Field Ornithology 78(2): 140-151. (2007)
NAL Call #: 413.8 B534; ISSN: 02738570.
Notes: doi: 10.1111/j.1557-9263.2007.00097.x.
Descriptors: Conservation Reserve Program/ land use/ Minnesota/ Phasianus colchicus/ ring-necked pheasant
Abstract: Evidence that the Conservation Reserve Program (CRP) has resulted in large-scale increases in populations of grassland birds is limited. Detecting large-scale CRP effects is difficult because agricultural landscapes are complex, dynamic systems where many concurrent changes are occurring across space and time, and CRP is only one of many factors influencing wildlife populations. Trying to isolate and quantify the contribution of CRP to large-scale population changes under these conditions is extremely difficult and tenuous. Data-quality issues affecting many large-scale monitoring programs exacerbate the problem. We use a case study of land-use and pheasant-monitoring data in Minnesota from 1974-1997 to illustrate these problems. In our example, roadside counts of Ring-necked Pheasants (Phasianus colchicus) were correlated positively with percent of CRP grasslands within 1.6 km of survey routes, but the predicted change in mean pheasant counts (pre-CRP vs. CRP) was negative in three of five regions despite the addition of up to 8% CRP grasslands. We also documented concurrent losses (1.8%-6.1% per year) of alternative reproductive habitats that apparently counteracted the positive association between pheasant counts and CRP abundance. These results illustrate the need for a more comprehensive evaluation of Farm Bill effects on wildlife, including commodity provisions that lead to conversion of pasture, hayland, and small grains to row crops. © 2007 Association of Field Ornithologists.

268. **Valuation of agriculture's multi-site environmental impacts: An application to pheasant hunting.**
Hansen, L.; Feather, P.; and Shank, D.
Agricultural and Resource Economics Review 28(2): 199-207. (1999)
NAL Call #: HD1773.A2N6; ISSN: 1068-2805
Descriptors: land diversion/ environmental impact/ hunting/ consumer surplus/ economic evaluation/ valuation/ pheasants/ United States/ Phasianidae/ Galliformes/ birds/ vertebrates/ Chordata/ animals
Abstract: Pheasant hunting benefits of the US Conservation Reserve Program (CRP) were estimated using a multi-site demand model, a national survey on recreation (1991), and environmental data processed through a geographic information system. Results indicate that pheasant hunting benefits of the CRP were approximately $80 million/year in 1991, in states where the CRP appears most critical to pheasant populations. It is argued that, not only is the resulting evaluation of the CRP's environmental impacts more accurately assessed than through the use of the generalized, supply-demand equilibrium models of previous work, but, more importantly, the environmental benefits of programme acreage can be compared across field locations allowing subtle changes in policy to be assessed and the design and operation of a programme to be optimized.

269. **The value of buffer habitats for birds in agricultural landscapes.**
Best, L. B.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA/NRCS/WHMI.
Madison, MS: USDA, NRCS, Wildlife Habitat Management Institute, 2000; pp. 75-94.
NAL Call #: aS604.6 C66 2000
Descriptors: wildlife habitats/ conservation buffers/ agricultural land

270. **Value of the Conservation Reserve Program to birds in the Texas southern high plains.**
Berthelsen, P. S.
Lubbock, TX: Texas Tech University, 1989.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ Texas
Abstract: Examined what habitat type would provide the greatest potential benefit of the CRP to avian wildlife species in the Texas southern high plains.

271. **Variation in spatial distribution and diurnal activity cycles of ground beetles (Coleoptera: Carabidae) encountered in experimental settings for study of sustainability issues.**
Ellsbury, M. M.; French, B. W.; Noble, C.; Head, G.; Fuller, B. W.; and Pikul, J. L.
American Entomologist 51(4): 219-223. (2005)
NAL Call #: QL461.A52; ISSN: 1046-2821.
http://www.entsoc.org/pubs/periodicals/ae/AE-2005/Winter/Ellsbury-et-al.pdf
Descriptors: commercial activities/ behavior/ activity patterns/ circadian activity/ ecology/ man-made habitat/

land zones/ Carabidae: farming and agriculture/ agricultural practices/ diurnal activity/ activity cycle variation/ crop residue/ community structure/ cultivated land habitat/ crop field habitat/ United States/ Insecta, Coleoptera, Adephaga, Caraboidea/ arthropods/ beetles/ insects/ invertebrates

272. **Vegetation characteristics in seasonal-disked fields and at bobwhite brood locations.**
Carver, A. Vince; Burger, Loren W.; Palmer, William E; and Brennan, Leonard A.
Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 55: 436-444. (2001)
NAL Call #: SK1.S6; ISSN: 0276-7929
Descriptors: commercial activities/ conservation measures/ man-made habitat/ land zones/ Colinus virginianus: farming and agriculture/ habitat management/ fallow field management for brood habitat improvement/ cultivated land habitat/ Fallow field/ Florida/ Leon County/ Tall timbers Research Station/ Aves, Galliformes, Phasianidae/ birds/ chordates/ vertebrates
Abstract: Disking fallow fields is a management practice commonly used to promote early successional habitats for northern bobwhite (Colinus virginianus) broods. However, effects on habitat value for bobwhite broods from different seasonal timing of disking is poorly understood. We compared vegetation composition and structure among fall-disked fields (N=24), spring-disked fields (N=26) and bobwhite brood locations determined by telemetry (N=22 broods). Both disking treatments produced more bare ground and visual obstruction than brood locations. In a joining cluster analysis based on vegetation structure, neither spring-disked nor fall-disked fields were grouped with broods. Ground coverage in disked fields tended to be dominated by a few species, but plant community composition differed between fall-and spring-disked fields. Spring disking promoted agronomic weed species such as Senna obtusifolia and Crotalaria spectibilis which have little food value to quail. Fall disking promoted important food plants for bobwhite, including Ambrosia artemisiifolia and Rubus spp. Fall-disked fields and broods were grouped serparately from most spring-disked fields in a joining cluster analysis based on vegetation composition. On our study site, use of annually disked fields by broods (N=22) was low (<5% of locations) relative to use of open canopy pine (Pinus spp.) forests (88% of locations). We recommend fall-disking over spring-disking to promote important food plants for bobwhite. However, neither of the disking treatment provided habitat used by broods on our study area.

273. **Vegetation management practices on Conservation Reserve Program fields to improve northern bobwhite habitat quality.**
Greenfield, K. C.; Burger, L. W.; Chamberlain, M. J.; and Kurzejeski, E. W.
Wildlife Society Bulletin 30(2): 527-538. (Summer 2002)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: agriculture/ CRP/ Colinus Virginianus/ Conservation Reserve Program/northern bobwhite/ RUSLE/ Revised Universal Soil Loss Equation/ Missouri/ wildlife
Abstract: Since 1985, an annual average of more than 14 million ha of very erodible cropland has been removed from production and enrolled in perennial grass practices under the Conservation Reserve Program (CRP). The rate of changes in plant communities on CRP fields can be modified (intentionally or accidentally) by disturbance-management regimes. Throughout the Midwest and Southeast, habitat quality for early successional and grassland species may decline as CRP grasslands age, but premeditated disturbance regimes may enhance and maintain habitat quality for these species. However, concerns regarding perceived conflicts between wildlife habitat and soil erosion objectives of the CRP persist among United States Department of Agriculture (USDA) and Natural Resources Conservation Service (NRCS) personnel. Therefore, we evaluated effects of strip- discing on vegetation structure and composition and soil erosion in tall fescue (Festuca arundiacea) and orchard grass (Dactylis glomerata) CRP fields in Missouri. We interpreted vegetation response in the context of habitat quality for a socially and economically important species, the northern bobwhite quail (Colinus virginianus). Fall discing generally increased percentage bare ground and plant diversity and decreased percentage litter cover and litter depth. However, plant community response and duration of effects differed between fescue and orchard grass fields. Gains in habitat quality in fescue fields were minimal and short-lived, whereas enhancements in orchard grass fields were substantial and longer-lived. Overall, fall discing enhanced bobwhite habitat quality, but responses diminished by the second growing season post-treatment, especially in CRP fields planted to fescue. Soil-loss potential, as estimated by the Revised Universal Soil Loss Equation (RUSLE), was well within USDA tolerable limits for all treatments. Our findings indicated that discing intensity on CRP fields could be increased by 2-3 times without compromising soil erosion provisions of CRP. Therefore, we suggest that strip-discing on a 2- to 3-year rotation should be a permissible and encouraged practice to maintain early succession plant communities on CRP fields in the Midwest and Southeast.

274. **Vegetation structure and avian species composition in diverted farmland: Evaluation of vegetation structure on CRP lands in northern Missouri/Avian species in diverted farmland.**
Kurzejeski, E. W.
In: Missouri Department of Conservation Annual Report, 1996. 62 p.
Notes: Final Report; Project Number: MO W-013-R-50/Jobs 1&2/Study 1; Unpublished Wildlife Report;
0085-3496 (ISSN).
Descriptors: cultivated farmland/ conservation programs/ vegetation/ birds/ abundance/ reproduction/ grassland/ sampling/ nests and nesting/ population density/ species diversity/ statistics/ Missouri/ Knox County/ Macon County/ Linn County

275. **Vegetative and invertebrate community characteristics of Conservation Reserve Program fields relative to gamebirds in western Kansas.**
Doxon, E. D. and Carroll, J. P.
American Midland Naturalist 158(2): 243-259. (2007)
NAL Call #: 410 M58; ISSN: 00030031.
Notes: doi: 10.1674/0003-0031(2007)158[243:VAICCO]2.0.CO;2.
Descriptors: invertebrates/ Conservation Reserve Program/ birds/ chicks/ Kansas
Abstract: We examined vegetation and invertebrate characteristics, including insect biomass, insect-prey, six Families and seven Orders in four varieties of Conservation Reserve Program (CP10, improved CP10 CP2 and CP25) and wheat fields in western Kansas during Jun. and Jul., 2004 and 2005 relative to gamebird chick ecology. CP10 fields had less bare ground and forbs compared to the other Conservation Practices and CP25 fields had lost much of their original forb component by the end of the study. Although there was little forb component, CP10 fields had high invertebrate biomass. However, CP10 fields demonstrated sizeable declines in the estimated effect size of examined invertebrate characteristics between sampling periods unlike the other mixes. Unharvested wheat (Triticum aestivum), CP10 and improved CP10 fields had the greatest number of insect-prey. Overall, most fields had adequate insect-prey availability suggesting that in terms of insect availability for gamebird chicks, these fields provide excellent brood feeding opportunities, therefore accessibility and other issues might be more important in determining habitat "quality" for gamebird chicks.

276. **Waterfowl density on agricultural fields managed to retain water in winter.**
Twedt, D. J. and Nelms, C. O.
Wildlife Society Bulletin 27(4): 924-930. (2000)
NAL Call #: SK357.A1W5; ISSN: 00917648
Descriptors: abundance/ agricultural fields/ mallard/ Mississippi Alluvial Valley/ moist-soil/ northern shoveler/ private lands/ rice/ soybean/ waterfowl/ winter-flooding/ agricultural land/ flood/ population density/ water management/ waterfowl/ United States/ Anas platyrhynchos/ Spatula clypeata
Abstract: Managed water on private and public land provides habitat for wintering waterfowl in the Mississippi Valley, where flood control projects have reduced the area of natural flooding. We compared waterfowl densities on rice, soybean, and moist-soil fields under cooperative agreements to retain water from 1 November through 28 February in Arkansas and Mississippi and assessed temporal changes in waterfowl density during winter in 1991-1992 and 1992-1993. Fields flooded earlier in Arkansas, but retained water later in Mississippi. Over winter, waterfowl densities decreased in Arkansas and increased in Mississippi. Densities of waterfowl, including mallard (Anas platyrhynchos), the most abundant species observed, were greatest on moist-soil fields. However, soybean fields had the greatest densities of northern shoveler (Spatula clypeata).

277. **Waterfowl responses to the Conservation Reserve Program in the Northern Great Plains.**
Reynolds, R. E.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P.; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA/NRCS/WHMI.
Madison, MS: USDA, NRCS, Wildlife Habitat Management Institute, 2000; pp. 35-43.
NAL Call #: aS604.6 C66 2000
Descriptors: Conservation Reserve Program/ wetlands/ waterfowl/ wildlife habitats/ wildlife management

278. **Waterfowl use of restored wetlands in CRP in southeastern Wisconsin.**
Halvorsen, Harvey H.
Passenger Pigeon 66(3): 211-221. (2004);
ISSN: 0031-2703
Descriptors: conservation measures/ ecology/ habitat/ land zones/ Aves: habitat management/ wetland restoration/ utilization by waterfowl relationship/ habitat utilization/ restored wetlands/ influences/ semiaquatic habitat/ restored wetlands/ habitat utilization by waterfowl/ Wisconsin/ restored wetland utilization by waterfowl/ Aves/ birds/ chordates/ vertebrates
Abstract: In 1992, we surveyed 147 restored wet-lands to determine waterfowl use in South-eastern Wisconsin. Of these, 106 (72%) were between 1 to 4 years old and provided brood-rearing water: Average size of all restorations was 1.6 acres. Emergent wet-land vegetation averaged 39% cover on all wetlands and 49.3% cover on wet-lands with broods. Wetlands were restored by either breaking sub-surface drain tiles, installing water control structures on tile lines, plugging surface drainage ditches, scraping topsoil sediment out of shallow basins, building small earthen dikes, or a combination of these techniques. In this survey, we observed 43 duck broods; brood size averaged 6.3 ducklings. The top 3 species, in decreasing order of abundance, were Mallard (Anas platyrhynchos), Wood Duck (Aix sponsa), and Blue-winged Teal (Anas discors). Duck brood use of the restored wetlands was likely influenced by the proximity of secure nest cover; by the ratio of emergent wet-land plant cover; open water; and the size, shape, and number of the restored wet-lands. CRP containing 80+ acres in grasscombined with four or more restored wet-lands was highly attractive to breeding waterfowl.The Conservation Reserve Program (CRP) provided the impetus for landowners to enroll their active croplands into quality wildlife habitat. The partnering of slate and federal agencies with private landowners contributed to successful development of grassland and wetland habitats for wildlife on former croplands.

279. **Why haven't pheasant populations in western Kansas increased with CRP?**
Rodgers, Randy D.
Wildlife Society Bulletin 27(3): 654-665. (1999)
NAL Call #: SK357.A1W5; ISSN: 0091-7648.
Notes: Project Number: KS FW-009-P; KS W-039-R.
Descriptors: Galliformes/ Phasianidae/ Phasianus colchicus/ birds/ conservation programs/ Conservation Reserve Program/ ecosystems/ grasslands/ habitat management/ management/ status/ wildlife/ wildlife-habitat

relationships/ phasianus colchicus/ population density/ land management/ federal programs/ Kansas/ natural Resources/ land development, land reform, and utilization (macroeconomics)/ population loss/ food crops/ habitat management for wildlife/ changes detrimental to wildlife/ cultivated farmland/ surveys/ summer/ burning/ pesticides/ habitat changes/ food supply/ private land/ winter/ common pheasant/ ecological requirements/ habitat change/ agriculture/ loss of habitat/ population dynamics/ reserve/ biocide/ vegetation
Abstract: Ring-necked pheasant (Phasianus colchicus) populations in western Kansas declined an average of 65% from 1966-75 to 1986-95, particularly in the 1980s. Although 686,000 ha of Conservation Reserve Program (CRP) grasslands have been added to the western Kansas landscape since 1985, pheasant populations have not recovered. Summer observations suggested that CRP was used proportionally more by pheasant broods than indicated by its relative availability. Overwinter pheasant use of CRP (a habitat gained) averaged just 37% of that in weedy wheat stubble (a habitat being lost). Widespread deterioration of abundant wheat stubble habitats, largely from increased herbicide use, represents an overwhelming habitat loss in western Kansas for which CRP could not compensate. In addition, anticipated pheasant benefits from CRP were not fully realized due to inadequate plant diversity, poor stand maintenance, and large field size. The habitat value of established CRP can be enhanced by strip-disking fireguards around the margins of fields to facilitate occasional controlled burns, stimulate growth of broad-leaved annuals, and increase edge. Interseeding perennial legumes and other forbs into recently burned grass stands also can be effective. Interspersion of grass-legume strips on intensively farmed croplands through the continuous signup of CRP offers great potential to improve pheasant habitat.

280. **Wildlife and federal cropland retirement programs.**
Berner, A. H.
In: When Conservation Reserve Program contracts expire: The policy options; Ankeny, IA: Soil and Water Conservation Society, 1994.
Descriptors: Conservation Reserve Program/ United States/ cropland/ conservation practices/ conservation programs
Abstract: Reviewed studies of wildlife responses to cropland retirement programs from 1956 to 1984 and discussed the future of cropland retirement programs.

281. **Wildlife and vegetative response to diverted agricultural land in Gratiot County, Michigan.**
Campa, H.; Winterstein, S. R.; Minnis, R. B.; and Pearks, A. J.
In: Michigan Department of Natural Resources: Annual Report, 1995. 50 p.
Notes: Project Number: MI W-127-R.
Descriptors: birds/ blackbirds and cowbirds/ changes detrimental to wildlife/ conservation programs/ cultivated farmland/ cutting/ grassland/ land use/ modeling/ pheasant, ring necked/ productivity/ vegetation/ abundance/ cover/ habitat management/ history/ statistics/ Michigan/ Gratiot County
Abstract: Project is composed of two separate studies. For the first study, vegetation characteristics of Conservation Reserve Program (CRP) fields and the differences in avian relative abundance, diversity, and productivity between CRP and agricultural fields were evaluated. For the second study, effects of various methods of mowing on vegetation characteristics and avian populations were examined, and information was gathered to evaluate habitat suitability index (HSI) models of selected avian species. Both studies provide management recommendations for a diversity of wildlife species on CRP fields.

282. **Wildlife benefits of the Conservation Reserve Program: A national perspective.**
Allen, A. W.
Land and Water 38: 23-25. (1994)
NAL Call #: HD101.L36
Descriptors: Conservation Reserve Program/ United States/ wildlife habitat/ environmental policy/ watersheds
Abstract: Provided a synopsis of the wildlife benefits of CRP and discussed how the pattern of CRP land distribution within a watershed would influence wildlife.

283. **Wildlife benefits of the Conservation Reserve Program in Ohio.**
Swanson, D. A.; Scott, D. P.; and Risley, D. L.
Journal of Soil and Water Conservation 54(1): 390-394. (1999)
NAL Call #: 56.8 J822 ; ISSN: 0022-4561
Descriptors: wildlife management/ agricultural land/ habitat utilization/ nests/ Ohio/ Aves/ Conservation Reserve Program/ birds/ conservation/ United States
Abstract: Federal agriculture programs significantly impact a variety of wildlife species. Grassland birds, in particular, should benefit from establishment of permanent vegetative cover through conservation initiatives like the Conservation Reserve Program (CRP). Evaluation of current conservation programs is needed to help shape future initiatives and ensure the long-term continuation of beneficial programs. The vegetative and physical characteristics of CRP fields in Ohio were quantified, the timing and extent of disturbances during the nesting season noted, avian use of these habitats measured, and indices of avian use related to field characteristics. It was found that more than half of the sampled fields were disturbed, primarily by mowing, during the nesting season (May to July). These same fields, however, were used by 43 avian species. Use of CRP fields by several grassland-dependent species was related to the amount of grassland habitat provided by the field and/or adjacent grasslands. Age of permanent cover and field size were not related, however, to total species richness. Eliminating disturbance of vegetative cover during the nesting season could significantly add to the wildlife value of these habitats. Policy options that include establishment of larger fields or grassland cover near existing grasslands should positively benefit the widest array of grassland birds.

284. **Wildlife habitat criteria in relation to future use of CRP lands.**
Allen, A. W.
Proceedings, Great Plains Agricultural Council: 41-88. (1993)
NAL Call #: 282.9 G7992; ISSN: 0434-5835.
Notes: Meeting held June 2-4, 1993, Rapid City, South Dakota. Includes references.
Descriptors: wildlife/ habitats/ land diversion/ selection criteria/ federal programs/ United States/ Conservation Reserve Program
This citation is from AGRICOLA.

285. **Wildlife management on Conservation Reserve Program land: The farmer's view.**
Miller, E. J. and Bromley, P. T.
Journal of Soil and Water Conservation 44(5): 438-440. ill. (Sept. 1989-Oct. 1989)
NAL Call #: 56.8 J822 ; ISSN: 0022-4561 [JSWCA3]
Descriptors: wildlife management/ soil conservation/ natural resources/ farmers' attitudes
This citation is from AGRICOLA.

286. **Wildlife management on Virginia Conservation Reserve Program land: The farmer's view.**
Miller, E. J.
Blacksburg, VA: Virginia Polytechnic Institute and State University, 1989.
Notes: M.S. Thesis
Descriptors: Conservation Reserve Program/ State conservation programs/ Virginia
Abstract: Surveyed land owners/farmers to ascertain their views on the CRP and its implementation.

287. **Wildlife on Conservation Reserve Program lands and native shrubsteppe in Washington.**
Vander Haegen, W. M.; Schroeder, M. A.; Germaine, S. S.; West, S. D.; and Gitzen, R. A.
Olympia, WA: Washington Department of Fish and Wildlife, 2004. 51 p.
Notes: 2004 Progress Report. http://wdfw.wa.gov/wlm/research/papers/shrub/conservation_reserve_program.pdf
Descriptors: Conservation Reserve Program/ CRP/ habitat restoration/ wildlife/ shrubsteppe/ grassland/ Columbia River Basin/ Washington
Abstract: The Conservation Reserve Program (CRP) is currently the only large-scale effort to restore habitat that may be used by grassland and shrubsteppe wildlife in the Columbia River Basin. Administered by the US Department of Agriculture, this voluntary program pays farmers to take agricultural lands out of production to achieve conservation objectives including reducing soil erosion and providing wildlife habitat. In Washington, over 1 million acres (405,000 ha) of converted farmland has been planted to non-native grasses and to native grasses, forbs and shrubs under the CRP. In 2003 we began a study to evaluate the potential role of CRP in the long-term conservation of obligate grassland and shrubsteppe wildlife in the Columbia River Basin. We established 48 study sites in CRP fields of varying age and landscape contexts and in extant shrubsteppe communities. In 2004, we repeated surveys of birds, herptiles, and small mammals and we examined reproductive parameters of selected bird species. In addition, we characterized the vegetation on all sites and we added two new components to the study: a survey of the mosses and lichens that make up the biological soil crusts and pellet surveys to document use by lagomorphs, deer, and prairie grouse. Plans for 2005 include continued bird and small mammal surveys, pellet sampling, and sampling of the remaining sites for biological soil crusts.

288. **Wildlife response to the Conservation Reserve Program in Minnesota.**
Mueller, JM.; Haroldson, KJ.; Berner, AH; and Kimmel, RO
Summaries of Wildlife Research Findings 1999: 27-30. (2000).
Notes: Minnesota Department of Natural Resources, Division of Fish and Wildlife, Wildlife Populations and Research Unit.
Descriptors: Mammalia/ Aves/ mammals/ birds/ extensive agriculture/ prairies/ Conservation Reserve Program/ wildlife response

289. **Wildlife responses to the Conservation Reserve Program and other land-use changes in Minnesota.**
Guidice, John H.; Haroldson, Kurt J.; Mueller, Jane M.; Kimmel, R. O.; and Berner, A. H.
Minnesota Department of Natural Resources Summaries of Wildlife Research Findings 2001: 47-68. (2002)
Descriptors: conservation measures/ ecology/ community structure/ population dynamics/ terrestrial habitat/ man-made habitat/ land zones/ Lepus townsendi/ Odocoileus virginianus/ Perdix perdix/ Phasianus colchicus/ Sylvilagus floridanus: habitat management/ national parks and reserves/ relative abundance/ population density/ distribution within habitat/ grasslands/ cultivated land habitat/ Minnesota/ grassland species/ Conservation Reserve Program/ land use changes/ Aves, Galliformes, Phasianidae/ birds/ chordates/ Lagomorphs/ mammals/ ungulates/ vertebrates

290. **Wildlife responses to the Conservation Reserve Program in the Southeast.**
Burger, W.
In: A comprehensive review of Farm Bill contributions to wildlife conservation, 1985-2000/ Heard, L. P; Hohman, W. L.; Halloum, D. J.; and Wildlife Habitat Management Institute (U.S.); Series: Technical Report USDA-NRCS-WHMI.
Madison, MS: USDA, NRCS, Wildlife Habitat Management Institute, 2000; pp. 55-73.
NAL Call #: aS604.6 C66 2000
Descriptors: Conservation Reserve Program/ wildlife habitats/ wildlife management/ United States, southeastern region

291. **Will conversion of Conservation Reserve Program (CRP) lands to pasture be detrimental for grassland birds in Kansas?**
Klute, David S.; Robel, Robert J.; and Kemp, Kenneth E.
American Midland Naturalist 137(2): 206-212. (1997)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: Ammodramus savannarum/ Bartramia longicauda/ Molothrus ater/ Spiza americana/ Sturnella magna/ agricultural practices/ behavior/ birds/ conservation/ Conservation Reserve Program/ ecosystems/ farmland/ grasslands/ habitat use/ land use/ management/ nest