

Mixed Habitats

1937. **Abundance and habitat associations of birds wintering in the Platte River Valley, Nebraska.**

Davis, C. A.

Great Plains Research 11(2): 233-248. (2001)

NAL Call #: QH104.5.G73 G755; ISSN: 10525165

Descriptors: grassland birds/ habitat association/ Nebraska/ Platte River Valley/ shrubland birds/ wintering birds/ woodland birds/ avifauna/ community composition/ habitat use/ overwintering/ relative abundance/ United States/ *Agelaius phoeniceus*/ *Eremophila alpestris*/ *Junco hyemalis*/ *Parus atricapillus*/ *Spizella arborea*/ *Sturnella neglecta*

Abstract: The abundance and habitat associations of overwintering birds in Platte River Valley of central Nebraska may influence their long-term survival. I observed a total of 51 species over a three-year period in shrub-grassland, forest, grassland, and cropland habitats during the winter. Grassland habitats had the lowest abundance of wintering birds, while abundances in shrub-grassland, forest, and cropland habitats were higher and similar. Species richness was highest in forests (\bar{x} = 2.97 species) and lowest in grasslands (\bar{x} = 0.73 species) and croplands (\bar{x} = 0.57 species). Overall, horned larks (*Eremophila alpestris*), American tree sparrows (*Spizella arborea*), black-capped chickadees (*Parus atricapillus*), dark-eyed juncos (*Junco hyemalis*), western meadowlarks (*Sturnella neglecta*), and red-winged blackbirds (*Agelaius phoeniceus*) were the most abundant wintering birds in the Platte River Valley. American tree sparrows (34%) accounted for most of the birds in shrub-grasslands, while black-capped chickadees (18%), dark-eyed juncos (11%), and American tree sparrows (10%) accounted for most of the birds in forests. Grasslands were dominated by American tree sparrows (39%) and western meadowlarks (27%), and croplands were dominated by horned larks (43%), red-winged blackbirds (25%), and western meadowlarks (16%). The winter bird community in the Platte River Valley is dominated by woodland-associated species. Many of the woodland-associated species that overwinter in the Platte River Valley have likely benefited from the development of woodlands in the region.
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1938. **Abundance patterns of landbirds in restored and remnant riparian forests on the Sacramento River, California, and U.S.A.**

Gardali, Thomas; Holmes, Aaron L.; Small, Stacy L.; Nur, Nadav; Geupel, Geoffrey R.; and Golet, Gregory H.
Restoration Ecology 14(3): 391-403. (2006)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: conservation measures/ ecology/ population dynamics/ terrestrial habitat/ land zones/ Aves: habitat management/ riparian forests restoration/ abundance patterns/ population size/ forest and woodland/ restored and remnant riparian forests/ riparian habitat/ California/ Sacramento River/ Aves/ birds/ chordates/ vertebrates

Abstract: Riparian vegetation along the Sacramento River-California's largest river-has been almost entirely lost, and several wildlife species have been extirpated or have declined as a result. Large-scale restoration efforts are focusing on revegetating the land with native plants. To

evaluate restoration success, we conducted surveys of landbirds on revegetated and remnant riparian plots from 1993 to 2003. Our objectives were to estimate population trends of landbirds, compare abundance patterns over time between revegetated and remnant riparian forests, and evaluate abundance in relation to restoration age. Of the 20 species examined, 11 were increasing, 1 was decreasing (Lazuli Bunting (*Passerina amoena*)), and 8 showed no trend. The negative trend for Lazuli Bunting is consistent with information on poor reproductive success and with Breeding Bird Survey results. There was no apparent guild association common to species with increasing trends. Nine species were increasing on revegetated and remnant plots, four were increasing on revegetated plots only, three were increasing on remnant plots only, the Lazuli Bunting was decreasing on both, and three species were stable on both. Although many species were increasing at a faster rate on revegetated plots, their abundance did not reach that of the remnant plots. For revegetated plots, "year since planting" was a strong predictor of abundance trends for 13 species: positive for 12, negative for 1. Our study shows that restoration activities along the Sacramento River are successfully providing habitat for a diverse community of landbirds and that results from bird monitoring provide a meaningful way to evaluate restoration success.

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1939. **Addressing global warming and biodiversity through forest restoration and coastal wetlands creation.**

Williams, J. R.

Science of the Total Environment 240(1-3): 1-9. (Oct. 1999)
NAL Call #: RA565.S365; ISSN: 0048-9697.

Notes: Special issue: Managing for biodiversity for the protection of nature.

Descriptors: wetlands/ habitat improvement/ climatic changes/ biodiversity/ environment management/ global warming/ forests/ environmental restoration/ biological diversity/ greenhouse gases/ soil erosion/ wood wastes/ compost/ research programs/ Louisiana/ Mississippi River Valley/ research priorities/ habitats/ erosion control/ protective measures and control/ environmental action/ air pollution

Abstract: The Climate Challenge is a partnership between the Department of Energy and the electric utility industry to reduce, avoid, and sequester greenhouse gases. A portion of the initiative, the sequestration of greenhouse gases, is the focus of this presentation. Over 4 million acres of bottomland hardwood forests were cleared for agriculture in the Mississippi River Valley in the 1970s. Reestablishing these forests would improve depleted wildlife habitats, serve as wildlife corridors, increase biodiversity, and decrease soil erosion. Also, Louisiana is losing coastal wetlands at a rate of approximately 25 square miles/year. This coastal erosion is due to a number of factors and many efforts are currently underway to address the matter. One such effort is the use of material generated in the dredging of navigational canals; however, this material is low in nutrient value, making the regeneration of marsh grasses more difficult. In addition, bottomland hardwood forests and coastal wetland grasses are excellent carbon

sinks' because they take carbon dioxide out of the atmosphere and store it in living plant tissue. Entergy Services, Inc. is an electric utility with a service territory that comprises portions of both the Lower Mississippi River Valley and the Gulf of Mexico coastline. This provides an opportunity to positively address both habitat losses noted above while at the same time addressing global warming, forest fragmentation, and biodiversity. Entergy, through its affiliation with the UtiliTree Carbon Company, is participating in projects that will investigate the feasibility of using bottomland hardwood reforestation on cleared marginal farmlands now managed by the Louisiana Department of Wildlife and Fisheries and the US Fish and Wildlife Service. Entergy has also begun a research project with the Environmental Protection Agency and the state of Louisiana. The research is a compost demonstration project that will utilize wood waste generated through our tree-trimming program as a compost material that will be mixed with low nutrient dredge material to create new coastal wetlands. Taken together, Entergy's initiatives will be able to address global warming through carbon sequestration, restore fragmented forest habitats, reduce coastal erosion and improve the quality of a vital coastal aquatic nursery habitat. Efforts will be made to manage the created habitats for biodiversity. Pulling all these ideas together creates an effect in which the whole is greater than the sum of the parts. In such a synergy of ideas, there are no losers and the winners are both industry participants and the environment.

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1940. Agricultural conservation: Status of programs that provide financial incentives.

General Accounting Office

Washington, DC: GAO; 60 p. (1995).

Notes: Report No.: GAO/RCED-95-169.

<http://www.gao.gov/archive/1995/rc95169.pdf>

Descriptors: economics/ land use/ agriculture/ conservation/ federal programs/ economic analysis/ sociological aspects/ soil conservation/ erosion control/ environmental protection/ pollution control/ habitat improvement/ farms/ water pollution control/ wildlife conservation/ environmental action/ protective measures and control/ watershed protection/ United States

Abstract: The Agriculture Department (USDA) administers 17 programs that provide financial incentives to farmers and ranchers who use conservation measures. Under 10 of the programs, USDA, through direct payments or low-cost loans, helps defray the cost of implementing conservation practices. Under the other seven programs, USDA purchases easements or rents land in order to retire it from agricultural production. The incentive-based conservation programs are intended to encourage voluntary efforts to reduce soil erosion, lessen water pollution, enhance fish and wildlife habitat, and address other conservation concerns. This report provides information on these incentive-based programs since fiscal year 1992, including information on their budgets and levels of activity and on the primary purposes of the conservation measures taken under the programs. GAO also identifies potential options for consolidating them.

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1941. Agricultural land use patterns of native ungulates in south-eastern Montana.

Selting, J. P. and Irby, L. R.

Journal of Range Management 50(4): 338-345. (July 1997)

NAL Call #: 60.18 J82 ; ISSN: 0022-409X [JRMGAQ]

Descriptors: Odocoileus hemionus/ odocoileus virginianus/ antilocapra americana/ wild animals/ habitat selection/ population density/ patterns/ seasonal variation/ agricultural land/ Montana/ Conservation Reserve Program lands

Abstract: Mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and pronghorn antelope (*Antilocapra americana*) use of 6 agricultural land use categories in southeastern Montana were monitored to identify use patterns at specific sites. Alfalfa (*Medicago sativa* L.), bottom rangeland, Conservation Reserve Program (CRP) lands, upland rangeland, wheat (*Triticum aestivum* L.) stubble, and growing wheat were observed during dawn, day, dusk, and night hours over a period of 12 months. Mule deer densities on alfalfa peaked in fall and again in spring. The CRP lands were selected in all seasons. Rangeland sites were most heavily used in winter and summer. White-tailed deer used CRP lands in all seasons except fall. Alfalfa was selected in fall, spring, and summer. Antelope densities on alfalfa were highest in spring and fall, while growing wheat fields were used most in spring. Antelope in the northern study area selected CRP land in all seasons except fall. Densities of animals and patterns of use observed during this study would be unlikely to produce significant impacts on forage or crops at most of our study sites.

This citation is from AGRICOLA.

1942. Agricultural landscapes: Can they support healthy bird populations as well as farm products?

Peterjohn, B. G.

Auk 120(1): 14-19. (2003)

NAL Call #: 413.8 AU4; ISSN: 00048038

Descriptors: agricultural ecosystem/ avifauna/ nature conservation

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1943. Agriculture and wildlife: More than peacefully coexistent.

Johnson, Phyllis E.

Agricultural Research 51(10): 2. (2003)

NAL Call #: 1.98 Ag84 ; ISSN: 0002-161X.

<http://www.ars.usda.gov/is/AR/archive/oct03/form1003.htm>

Descriptors: agricultural practices/ birds/ census-survey methods/ ecosystem management/ habitat management/ insecticides/ livestock/ pesticides/ pollution/ plants/ public relations/ study methods/ wildlife/ *Secale cereale*/ *Triticum* spp./ Maryland

Abstract: This article has notes about the relationship between agriculture and wildlife. The Henry A. Wallace Beltsville Agricultural Research Center (BARC) is home to diverse native wildlife. The 'Green Wedge'- the 30,000 plus acre natural area, which is shared with the U.S. Department of the Interior's Patuxent Research Refuge harbors a native gene pool of worldwide significance. The Agricultural Research Center Insect Biocontrol Laboratory contributes to sustainable agricultural systems by developing naturally derived pest control agents, decreasing the amounts of synthetic insecticides used, reducing undesirable effects of synthetic pesticides, and delaying development of resistance to environmentally friendly insect control

measures. Ten years ago, a sustainable agriculture program was started, and ARS research results were used to grow corn, soybean, wheat, rye, and other crops to feed livestock. BARC scientists are doing agricultural research, and Patuxent scientists are doing wildlife research, and they work together quite nicely in these research projects. There are BARC scientists who both on and off duty promote environmental causes like speaking to the public, participating in Earth Day festivities, or working with agriculture farmer groups. These employees participate on their own in national bird surveys that document the birds of BARC and surrounding lands and contribute to scientific understanding of birds and their migrations. The native flora and fauna at BARC contain the heritage of the farm. Natural biocontrol agents from this gene pool can help further reduce pesticide and fertilizer use on all farms.
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1944. The agroecology of carabid beetles.

Holland, J. M.

Andover, UK: Intercept; 356 p. (2002)

Descriptors: agricultural land/ animal ecology/ biological control agents/ biological indicators/ crop husbandry/ cultivation/ diets/ habitats/ pest control/ predators/ predatory insects/ seed predation/ spatial distribution/ species diversity/ survival/ weeds/ Carabidae/ insects

Abstract: This book, divided into 11 chapters, provides an extensive overview of the recent literature on the ecology and behaviour of carabid beetles inhabiting agricultural land, their role in pest control and in the diet of farmland wildlife, along with a summary of their value as bioindicators. Emphasis is also given on carabid survival, their spatial distribution in agricultural landscapes, their use in agroecosystems and in weed seed predation, carabid assemblage organization and species composition, and the impact of cultivation and crop husbandry practices and of non-crop habitat management on carabid beetles.

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1945. Agroforestry and wildlife management go together on small farms.

Core, J.

Agricultural Research 52: 18-19. (Dec. 2004)

NAL Call #: 1.98 Ag84

Descriptors: agroforestry/ wildlife management/ small farms/ wildlife habitats/ forest wildlife relations/ lowland forests/ silvicultural practices/ Quercus/ frogs/ Ranidae/ toads/ Bufonidae/ songbirds/ birds of prey/ bats/ Chiroptera/ rabbits/ Leporidae/ water birds/ cover crops/ Missouri/ root production method/ soil cultivation and cropping systems/ natural resources, environment, general ecology, and wildlife conservation/ forestry production artificial regeneration

This citation is from AGRICOLA.

1946. Agroforestry and wildlife: Opportunities and alternatives.

Allen, A. W.

In: Agroforestry and sustainable systems symposium proceedings.

Fort Collins, Colo.: U.S. Dept. of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station; pp. 67-73; 1995.

Notes: Literature review; Meeting held August 7-10, 1994, Fort Collins, Colorado. Includes references.

NAL Call #: aSD11.A42 no.261

Descriptors: wildlife/ agroforestry/ ecosystems/ farm management/ land use/ land use planning/ habitats/ fragmentation/ fauna

This citation is from AGRICOLA.

1947. American black duck and mallard breeding distribution and habitat relationships along a forest-agriculture gradient in southern Quebec.

Maisonneuve, C.; Belanger, L.; Bordage, D.; Jobin, B.; Grenier, M.; Beaulieu, J.; Gabor, S.; and Filion, B.

Journal of Wildlife Management 70(2): 450-459. (2006)

NAL Call #: 410 J827; ISSN: 0022541X

Descriptors: aerial survey/ agricultural landscape/ American black duck/ Anas platyrhynchos/ Anas rubripes/ breeding/ habitat model/ mallard/ southern Quebec

Abstract: Although the American black duck (*Anas rubripes*) has been designated a priority species in eastern North America, no systematic survey has been done in the agricultural lowlands of southern Quebec, where the species is suspected to be relatively abundant and cohabits with the mallard (*Anas platyrhynchos*), often considered as a competing species. During the spring of 1998 and 1999, we surveyed breeding waterfowl in 343 4-km² plots distributed in the lowlands of the St. Lawrence Valley and Lac-Saint-Jean, Canada, and in agricultural areas of Abitibi-Temiscamingue, Canada. American black duck densities were higher in dairy farm and forested landscapes (>39 indicated breeding pairs [IBPs]/100 km²) than in cropland landscapes (8 IBPs/100 km²). Mallard densities were similar across all landscape types (30-43 IBPs/100 km²). Habitat modeling using data derived from satellite imagery indicated that the presence of black ducks decreased with increasing areas of corn, ploughed fields, and deciduous forests, whereas it was favored in areas where topography was undulating with slopes of 10-15%. The same parameters had the opposite effect on mallard presence. The odds of black ducks being present were doubled where mallards were present, indicating that both species seem to be attracted to areas supporting adequate habitats, which contradicts the hypothesis of competition between these 2 species to explain for recent declines in the black duck population. Results of our habitat analyses support the hypothesis that habitat changes may be a primary factor leading to these declines. Dairy farm landscapes are of great importance for black ducks, and the conversion of this type of landscape toward a cropland landscape represents a threat to an important portion of the population of this species.

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1948. Amphibian responses to helicopter harvesting in forested floodplains of low order, blackwater streams.

Clawson, R. G.; Lockaby, B. G.; and Jones, R. H.

Forest Ecology and Management 90(2-3): 225-235. (1997)

NAL Call #: SD1.F73; ISSN: 0378-1127

Descriptors: commercial activities/ ecology/ terrestrial habitat/ land and freshwater zones/ Amphibia: forestry/ helicopter harvesting effects on communities/ community structure/ population dynamics/ responses to helicopter timber harvesting/ semiaquatic habitat/ forest and woodland/ floodplain forested wetlands/ community

responses to timber harvest/ Alabama/ community responses to helicopter timber harvesting/ forested wetlands/ Amphibia/ amphibians/ chordates/ vertebrates
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1949. The amphibians and reptiles of the Kissimmee River. II. Patterns of abundance and occurrence in hammocks and pastures.

Donnelly, Maureen A.; Baber, Matthew J.; and Farrell, Christopher J.

Herpetological Natural History 8(2): 171-179. (2001); ISSN: 1069-1928

Descriptors: terrestrial habitat/ land zones/ Amphibia/ Reptilia: terrestrial habitat/ Hammocks/ abundance and occurrence/ grassland/ pasture/ Florida/ Kissimmee River/ pasture habitats/ Amphibia/ amphibians/ chordates/ reptiles/ vertebrates

Abstract: We sampled amphibians and reptiles in two habitats in the Kissimmee River basin using drift fence arrays from March 1997-September 1998. Oak-cabbage palm hammocks and pastures were sampled as part of a more inclusive study of the amphibians and reptiles of the Kissimmee Basin. Hammocks mark the limits of the floodplain, and pastures replaced floodplain vegetation when the river was channelized. Twenty-one species were captured during the study (ten frogs, four lizards, six snakes, and one turtle). An additional species, *Gopherus polyphemus*, was observed near arrays but not captured in traps. Species richness differed between habitats and among sites. Twelve of the 21 species were captured only in oak-cabbage palm hammock, nine species were collected in both habitats, and no species was unique to the pasture habitat. Three species, *Gastrophryne carolinensis*, *Rana sphenoccephala*, and *Scincella lateralis* were captured in all five sites. The greatest number of species were trapped in Hammock C and the lowest number of species were trapped in Pasture C. Patterns of species accumulation differed among sites but were difficult to interpret because of flooding associated with the 1997-98 El Niño Southern Oscillation Event. We found a significant difference in amphibian and reptile abundance among months but no significant difference in abundance between habitats. The abundance of amphibians and reptiles was not associated with variation in rainfall.

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1950. Animal and habitat relationships in the South Platte Basin with emphasis on threatened and endangered species.

Fitzgerald, J. P.

In: *Endangered Species Management: Planning Our Future*, Proceedings of the 6th Annual 1996 South Platte Forum. Greeley, Colorado. Graf, D. and Williams, D. J. (eds.) Fort Collins, CO: Colorado Water Resources Research Institute, Colorado State University; pp. 8; 1995.

Descriptors: United States/ Colorado/ South Platte River Basin/ wildlife habitats/ river basins/ animal populations/ priorities/ wildlife management/ preservation/ spatial distribution/ species diversity/ water development impacts

Abstract: A minimum of 353 species of terrestrial vertebrates reside in or make important seasonal use of habitats in the South Platte River Basin in Colorado. The list includes 252 birds, 69 mammals, 22 reptiles, and 10 amphibians. When species are tied to habitat requisites, the

most critical habitats in priority of management needs/preservation are: 1. Grassland/Prairie; 2. Plains Riparian/Wetlands; 3. Middle to High Elevation Forests. In a management context the two most critical habitat types present the most serious problems. Most of the eastern plains is in private ownership with few incentives available to landowners for protection/habitat management. Habitat is becoming fragmented with less than one-third still in prairie. Water allocation and use patterns as well as human population growth patterns are increasing pressures on remaining plains landscapes, especially at the foothills/plains interface in the basin. Agricultural patterns including increasing use of the Conservation Reserve Program will also likely effect distributional patterns of wildlife, perhaps to the detriment of some species.

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1951. Application of logistic regression analysis of proportional hazard modelling for investigating relationships between habitat and population dynamics of bobwhite quail.

Call, E. M. University of Missouri-Columbia, 2002.

Notes: Wildlife Coop. Unit Report, Thesis

Descriptors: *Colinus virginianus*/ *colinus*/ Phasianidae/ *Colinus virginianus*/ bobwhite/ cover/ cultivated farmland/ grassland/ habitat/ habitat management for wildlife/ modeling/ nests and nesting/ population dynamics/ productivity/ reproduction/ statistics/ survival

Abstract: Objectives were to quantify bobwhite quail survival and reproductive success, and to identify the major habitat factors influencing bobwhite survival and reproductive success. Study was conducted on Reform, Prairie Fork, and Whetstone Creek Conservation Areas.

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1952. Applied disequilibriums: Riparian habitat management for wildlife.

Boyce, M. S. and Payne, N. F.

In: *Ecosystem management: Applications for sustainable forest and wildlife resources*/ Boyce, M. S. and Haney, A. New Haven, Conn.: Yale University Press, 1997; pp. 133-146.

Notes: ISBN: 0-300-06902-2; Conference: Based on a symposium on ecosystem management held at the University of Wisconsin-Stevens Point, 3-5 March, 1994.

Descriptors: forests/ resource management/ riparian forests/ riparian vegetation/ wildlife conservation/ North America

Abstract: The role of riparian zone management is reviewed in the context of ecosystem management, with particular reference to wildlife species in North America. It is concluded that management to maintain or restore disturbance regimes is fundamental to ecosystem management in riparian areas.

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1953. Area requirements of grassland birds: A regional perspective.

Johnson, D. H. and Igl, L. D.

Auk 118(1): 24-34. (2001)

NAL Call #: 413.8 AU4 ; ISSN: 00048038

Descriptors: avifauna/ density/ grassland/ patch size/ prairie/ species occurrence/ United States/ *Agelaius phoeniceus*/ *Ammodramus bairdii*/ *Ammodramus leconteii*/ *Ammodramus savannarum*/ *Circus cyaneus*/ *Cistothorus*

platensis/ *Dolichonyx oryzivorus*/ *Geothlypis trichas*/ *Molothrus ater*/ *Passerculus sandwichensis*/ *Spizella pallida*/ *Sturnella neglecta*/ *Tyrannus tyrannus*/ *Zenaidura macroura*

Abstract: Area requirements of grassland birds have not been studied except in tallgrass prairie. We studied the relation between both species-occurrence and density and patch size by conducting 699 fixed-radius point counts of 15 bird species on 303 restored grassland areas in nine counties in four northern Great Plains states. Northern Harrier (*Circus cyaneus*), Sedge Wren (*Cistothorus platensis*), Clay-colored Sparrow (*Spizella pallida*), Grasshopper Sparrow (*Ammodramus saviannarum*), Baird's Sparrow (*Ammodramus bairdii*), Le Conte's Sparrow (*Ammodramus leconteii*), and Bobolink (*Dolichonyx oryzivorus*) were shown to favor larger grassland patches in one or more counties. Evidence of area sensitivity was weak or ambivalent for Eastern Kingbird (*Tyrannus tyrannus*), Common Yellowthroat (*Geothlypis trichas*), Savannah Sparrow (*Passerculus sandwichensis*), and Western Meadowlark (*Sturnella neglecta*). Red-winged Blackbirds (*Agelaius phoeniceus*) preferred larger patches in some counties, and smaller patches in others. Mourning Doves (*Zenaidura macroura*) and Brown-headed Cowbirds (*Molothrus ater*) tended to favor smaller grassland patches. Three species showed greater area sensitivity in counties where each species was more common. Five species demonstrated some spatial pattern of area sensitivity, either north to south or east to west. This study demonstrates the importance of replication in space; results from one area may not apply to others because of differences in study design, analytical methods, location relative to range of the species, and surrounding landscapes.

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1954. Assessing effects of alternative agricultural practices on wildlife habitat in Iowa, USA.

Santelmann, M.; Freemark, K.; Sifneos, J.; and White, D. *Agriculture, Ecosystems and Environment* 113(1-4): 243-253. (2006)

NAL Call #: S601.A34; ISSN: 01678809.

Notes: doi: 10.1016/j.agee.2005.09.015.

Descriptors: butterflies/ future scenarios/ Iowa watersheds/ landscape change/ wildlife habitat

Abstract: A habitat-change model was used to compare past, present, and future land cover and management practices to assess potential impacts of alternative agricultural practices on wildlife in two agricultural watersheds, Walnut Creek and Buck Creek, in central Iowa, USA. This approach required a habitat map for each scenario based on soil type and land cover, a list of resident species, and an estimate of the suitability of each of 26 habitat classes for every species. Impact on wildlife was calculated from median percent change in habitat area relative to the present. Habitat classes with the highest species richness for native vertebrates were ungrazed riparian forest, upland forest and wet prairie. Differences in habitat composition and configuration were evident among maps of the watersheds for the past, present, and three alternative future scenarios (Production, Water Quality, and Biodiversity). The Production scenario ranked lowest in providing habitat for all native taxa. For most taxa, changes in wildlife habitat due to land use changes in the Biodiversity, Water Quality, and Past scenarios were similar, resulting in greater habitat than either the present

landscape or the Production scenario. For native birds, amphibians, mammals, and rare species in both watersheds, the Biodiversity scenario ranked highest in providing habitat, and the Water Quality scenario was similar to or slightly below the Biodiversity scenario. The Water Quality scenario was similar to or slightly better than the Biodiversity scenario for reptiles and butterflies in both watersheds, and both ranked higher than the Production scenario for these taxa.

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1955. Assessing effects of timber harvest on riparian zone features and functions for aquatic and wildlife habitat.

Taratoot, Mark

Research Triangle Park, N.C.: National Council of the Paper Industry for Air and Stream Improvement; Series: Technical bulletin 775. (1999)

NAL Call #: TD899.P3N34-no.775

Descriptors: logging/ riparian forests/ water pollution/ wildlife habitat/ aquatic habitat/ riparian zones

This citation is from AGRICOLA.

1956. Assessing landowner activities related to birds across rural-to-urban landscapes.

Lepczyk, C. A.; Mertig, A. G.; and Liu, J.

Environmental Management 33(1): 110-125. (2004)

NAL Call #: HC79.E5E5; ISSN: 0364152X

Descriptors: avian ecology/ Breeding Bird Survey/ human dimensions/ human-dominated landscapes/ private land/ social survey/ wildlife management/ fertilizers/ ocean habitats/ plants (botany)/ rural areas/ depredation/ habitat fragmentation/ avifauna/ landowner/ birds/ landscape/ wildlife conservation/ natural resources conservation/ ownership/ Midwest, United States

Abstract: Fluctuations of bird abundances in the Midwest region of the United States have been attributed to such factors as landscape change, habitat fragmentation, depredation, and supplemental feeding. However, no attempt has been made to estimate the collective role of landowner activities that may influence birds across a landscape. To investigate how landowners might influence birds when the majority (> 90%) of land is privately owned, we surveyed all 1694 private domestic landowners living on three breeding bird survey routes (~120 km) that represent a continuum of rural-to-urban landscapes in Southeastern Michigan from October through December 2000. Our survey was designed to investigate (1) the proportion of landowners involved in bird feeding, providing bird houses, planting or maintaining vegetation for birds, gardening, landscaping, applying fertilizer, and applying pesticides or herbicides; (2) whether differences existed between urban, suburban, and rural landowner activities; and (3) whether landowners that carried out a given activity were sociodemographically different from those who did not. Of the 968 respondents (58.5% response rate), 912 (94%) carried out at least one of the activities on their land and the average landowner carried out 3.7 activities. A total of 65.6% fed birds, 45.7% provided bird houses, 54.6% planted or maintained vegetation for birds, 72.7% gardened, 72.3% landscaped, 49.3% applied fertilizer, and 25.2% applied pesticides or herbicides. Significant differences existed between the landscapes, with rural landowners having more bird houses and applying pesticides or herbicides in greater frequency. Similarly,

urban landowners had a greater density of bird feeders and houses, but planted or maintained vegetation in the lowest frequency. Participation in activities varied by demographic factors, such as age, gender, and occupation. Scaling each activity to all landowners, including nonrespondents, across all landscapes indicates that between 14% and 82% of landowners may be engaged in a particular activity, with application of pesticides or herbicides having the least potential involvement (13.9%-55.4%) and gardening having the greatest potential involvement (40.1%-81.6%). Taken collectively, our results indicate that landowners are both intentionally and unintentionally engaged in a wide range of activities that are likely to influence bird populations.
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1957. Assessing the potential impacts of alternative landscape designs on amphibian population dynamics.

Rustigian, H. L.; Santelmann, M. V.; and Schumaker, N. H. *Landscape Ecology* 18(1): 65-81. (2003)
NAL Call #: QH541.15.L35 L36; ISSN: 09212973.
Notes: doi: 10.1023/A:1022936613275.

Descriptors: agriculture/ amphibians/ future scenarios/ Iowa/ landscape change/ population dynamics/ spatially explicit population model/ conservation planning/ ecological impact/ individual-based model/ land use change/ landscape ecology/ population dynamics/ United States
Abstract: An individual-based, spatially explicit population model was used to predict the consequences of future land-use alternatives for populations of four amphibian species in two central Iowa (Midwest USA) agricultural watersheds. The model included both breeding and upland habitat and incorporated effects of climatic variation and demographic stochasticity. Data requirements of the model include life history characteristics, dispersal behavior, habitat affinities, as well as land use and landcover in geographic information systems databases. Future scenarios were ranked according to change in breeder abundance, saturation, and distribution, compared to baseline conditions. Sensitivity of simulation results to changes in model parameters was also examined. Simulated results suggest that while all four species modeled are likely to persist under present and future scenario conditions, two may be more at risk from future landscape change. Although the study species are all widespread generalists regarded as having a low conservation priority, they depend on wetlands and ponds, increasingly endangered habitats in agricultural landscapes. Broader conservation strategies in the region would ensure that these currently common organisms do not become the endangered species of the future.

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1958. An assessment of natural cavity abundance, nest box use, and management recommendations for birds on the Ohio River Islands National Wildlife Refuge, West Virginia.

Sacilotto, Karen A. West Virginia University, 2003.
Notes: Advisor: Anderson, James T.; Thesis/ Dissertation
Descriptors: birds/ nesting boxes/ erosion/ evaluation/ islands/ habitat management/ habitat restoration/ Ohio River Islands National Wildlife Refuge/ Ohio
Abstract: Aquatic habitats connected with Ohio River islands and their back channels (areas where commercial

traffic is prohibited) provide quality habitats for bottomland hardwood wildlife. The back channel side (\bar{x} = 19.93 cavities/50-m radius plot, SE = 2.48) contained more cavities than the navigational channel side (\bar{x} = 11.58 cavities/50-m radius plot, SE = 1.73) (P = 0.007) was lower on the back channel side, while bird diversity (P = 0.025) was higher on the back channel side in 2001. House wrens (*Troglodytes aedon*) (F = 12.91, P = 4.82, P = 0.033), and bird species building moss nests (F = 5.59, P = 0.023) appear to select nest sites based on total area of nest boxes visible. Management should concentrate on restoration of bottomland hardwoods and protection against erosion of the islands.
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1959. Attributes of golden-winged warbler territories in a mountain wetland.

Rossell, C. Reed; Patch, Steven C.; and Wilds, Stephanie P. *Wildlife Society Bulletin* 31(4): 1099-1104. (2003)
NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: Parulidae/ Passeriformes/ Vermivora chrysoptera/ Fringillidae/ behavior/ conservation/ conservation status/ forest habitat/ forested wetlands/ geographic information system/ Graham County/ Tullula Creek/ ecosystems/ habitat characteristics/ habitat composition/ habitat types/ habitat use/ land zones/ montane habitat/ mountain wetland/ mountain wetlands/ North Carolina/ population decline/ wetlands/ shrub habitat/ spatial distribution/ successional habitat/ terrestrial ecology/ territorial defense/ home range-territory/ territory characteristics/ U.S. Fish and Wildlife Service/ GIS/ neotropical migrant/ United States, southeastern region/ territory/ early succession/ golden-winged warbler/ Appalachian Mountains

Abstract: The golden-winged warbler (*Vermivora chrysoptera*) is currently under status assessment for federal listing by the United States Fish and Wildlife Service because of its continual decline in the southern Appalachians and the northeastern United States. To date, no studies have examined the spatial distribution of habitat characteristics of golden-winged warbler territories. We describe the habitat attributes of golden-winged warbler territories ($n=10$) in a mountain wetland in North Carolina using a Geographic Information System (GIS). We compared proportions of 4 habitat types (open, shrub, forest, water), length of edge between forest and each habitat type, and total length of edge between all habitat types among territories, 10-m zones around territories, and the study area. Habitat composition among territories was diverse and included a wide range of areas covered by each habitat type. Territories and the 10-m zones contained less forest ($P= 0.02$, $P= 0.037$) and more total edge ($P= 0.006$, $P= 0.002$) than the study area. The 10-m zones also contained more edge between forest and open habitat than the territories ($P= 0.014$). All other attributes were similar between territories, 10-m zones, and the study area. These results suggest that golden-winged warblers select territories based on their degree of patchiness and structural complexity. Territory boundaries also probably extend farther than is typically delineated by song perches, with peripheral areas likely providing important edge attributes for nesting. Management guidelines for golden-

winged warblers should include maintaining a diverse mosaic of successional habitat types, with particular attention to providing herbaceous openings.

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1960. Avian abundance and diversity in CRP, crop fields, pastures, and restored and native grasslands during winter.

Morris, Kelly

Passenger Pigeon 62(3/4): 217-224. (2000);

ISSN: 0031-2703

Descriptors: birds/ crops/ conservation/ species diversity/ hibernation/ snow/ grass prairies/ meadows/ agricultural conservation programs

Abstract: I compared grassland bird use of land set aside by the Conservation Reserve Program (CRP), crop fields, pastures, and restored and native prairies during winter in southern Wisconsin. Species diversity was highest in crop fields, followed by restored prairie, CP2 (CRP fields planted to native grasses), native prairie remnants, and pastures. Avian abundance (number of individuals seen per hour of observation) was highest in pastures, followed by restored prairie, CP2, crop fields and native prairie. No birds were observed in CP1 fields (CRP fields planted to introduced grasses and legumes). Avian abundance in crop fields and native prairie was higher during periods of incomplete snow cover than during periods with 100% snow cover, while the reverse was true for restored prairie and CP2 sites. The variety of habitats used by grassland birds during winter should be taken into account when management plans are being developed for these species.

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1961. Avian communities on utility rights-of-ways and other managed shrublands in the northeastern United States.

Confer, J. L. and Pascoe, S. M.

Forest Ecology and Management 185(1-2): 193-205. (2003)

NAL Call #: SD1.F73; ISSN: 03781127

Descriptors: habitat selection/ nesting success/ rights-of-way/ shrubland birds/ shrubland management/ succession/ biodiversity/ herbicides/ reforestation/ vegetation/ shrublands/ forestry/ avifauna/ community structure/ conservation management/ cutting/ habitat management/ herbicide/ prescribed burning/ right of way/ shrubland/ United States/ *Molothrus ater*

Abstract: We studied bird density and nesting success on utility rights-of-way (ROW) managed primarily by selective herbicide application in New York, Massachusetts and Maine. For comparison, we also estimated bird density in ROW managed by cutting in New Hampshire and New York and in shrublands managed by fire in the Finger Lakes National Forest (FLNF), New York. On herbicide-managed ROW, we detected a mean of 14.3 individuals and 12.2 species per point count, including many species of early-succession habitat that are declining throughout northeastern United States. Nesting success in forested landscapes of New York, Maine, and Massachusetts was 55% on the ROW, 69% in forests within 20 m of the ROW, and 63% in forests more than 20 m from the ROW. Brown-headed cowbirds (*Molothrus ater*) parasitized 5.3% of the nests and reduced host recruitment by even less. This suggests that ROW in forested areas support high production of shrubland birds and do not exert a measurably harmful effect on forest-nesting birds. Selective

herbicide application on ROW sustained shrubland vegetation and supported high densities and high nesting success. Mechanical cutting lowered the structural diversity of vegetation the following spring and was associated with fewer individual birds and species. Cool burns in early spring produced a high structural diversity of herbs, shrubs and trees and supported a high density of birds and bird species. Long-term maintenance of shrublands by burning will require Supplemental cutting to remove saplings. As reforestation continues to reduce shrubland habitat, probably below pre-colonial levels, active management for early-succession habitat will be necessary to sustain current population levels of numerous species.

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1962. Avian community response to pine-grassland restoration.

Wood, D. R.; Wes Burger, L.; Bowman, J. L.; and Hardy, C. L.

Wildlife Society Bulletin 32(3): 819-828. (2004)

NAL Call #: SK357.A1W5; ISSN: 00917648.

Notes: doi: 10.2193/0091-7648(2004)032

[0819:ACRTPR]2.0.CO;2.

Descriptors: landscape/ midstory removal/ Mississippi/ *Picoides borealis*/ pine-grassland restoration/ prescribed fire/ red-cockaded woodpecker/ songbirds/ avifauna/ community structure/ coniferous forest/ grassland/ habitat management/ habitat structure/ restoration ecology/ Homochitto National Forest/ Mississippi/ *Aimophila*/ *Aimophila aestivalis*/ *Aves*/ Galliformes/ *Icteria virens*/ *Passeri*/ *Passeridae*/ *Picidae*/ *Picoides*/ *Picoides borealis*/ *Vireo*/ *Vireo olivaceus*/ *Vireonidae*

Abstract: Habitat management for an endangered species may affect nontarget communities. We examined avian community response to pine-grassland restoration for red-cockaded woodpeckers (*Picoides borealis*) and traditional United States Forest Service pine sawtimber management at Homochitto National Forest, Mississippi from 1994-1996. Thirteen species were more abundant in pine-grassland restoration stands, whereas 5 species were more abundant in traditionally managed pine sawtimber stands. Mature restored pine-grassland stands had greater avian species richness, total bird abundance, and avian conservation value than traditionally managed pine sawtimber stands. We used logistic regression models in an exploratory analysis to predict occurrence of selected species using stand- and landscape-scale habitat characteristics. Probability of red-eyed vireo (*Vireo olivaceus*) occurrence increased with increasing hardwood canopy cover, and probability of yellow-breasted chat (*Icteria virens*) occurrence increased with increasing grass ground cover. Species richness, total avian abundance, and occurrence of red-eyed vireos and Bachman's sparrows (*Aimophila aestivalis*) increased with increasing values of Shannon's Habitat Diversity Index. Pine-grassland restoration for red-cockaded woodpeckers created vegetation composition and structure at the stand and landscape scales that may benefit numerous avian species of regional conservation concern.

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1963. Avian community structure associated with woodland habitats in fragmented and unfragmented landscapes in western South Dakota.

Kelsey, K. W. South Dakota State University, 2001.

Notes: Project no. SD W-107-R/Study No. 1011; Wildlife Coop. Unit Report - Thesis

<http://wfs.sdstate.edu/wfsdept/Publications/Theses/>

Kelsey,%20Kyle%20W.%20MS-2001.pdf

Descriptors: abundance/ birds/ grassland/ habitat/ habitat management/ population density/ population dynamics/ prairie/ species diversity/ transect survey/ vegetation/ wildlife-habitat relationships/ woodland climax/ South Dakota

Abstract: Purpose was to conduct an initial inventory of prairie woodlands, native and planted, in non-fragmented and fragmented landscapes in the mixed-grass prairie region of western South Dakota. Objectives were to: (1) determine if patch size, vegetation metrics, and landscape characteristics had any effects on avian community structure (species composition, richness, abundance, and density); and (2) evaluate if exist in bird assemblages between planted and native woodlands. The question of whether planted woodlands create habitat for woodland birds of management concern despite their degrading effects on grassland bird habitat is addressed. © NISC

1964. Avian population trends within the evolving agricultural landscape of eastern and central United States.

Murphy, M. T.

Auk 120(1): 20-34. (Jan. 2003)

NAL Call #: 413.8 AU4; ISSN: 0004-8038

Descriptors: Conservation Reserve Program/ migratory birds/ CRP fields/ nesting success/ breeding birds/ North America/ habitat/ grassland/ abundance/ songbirds
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.

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1965. Beaver (*Castor canadensis*) in heavily browsed environments.

Baker, Bruce W.

Lutra 46(2): 173-181. (2003); ISSN: 0024-7634

Descriptors: Castoridae/ Rodentia/ Cervidae/ Artiodactyla/ *Castor canadensis*/ *Cervus elaphus*/ *Cervus canadensis*/ biogeography/ animal interactions/ interspecies relationships/ intraspecies relationships/ heavily browsed environment/ *Castor canadensis*/ *Cervus elaphus*/ Colorado/ Douglas Creek and Rocky Mountain National Park/ food supply/ foods-feeding/ interspecies relationships/ *Salix*/ diets/ habitat use/ land zones/ nutrition/ American beaver/ wapiti/ food/ vegetation/ damage [forest]/ overuse/ habitat change/ den/ ecosystem

Abstract: Beaver (*Castor canadensis*) populations have declined or failed to recover in heavily browsed environments. I suggest that intense browsing by livestock or ungulates can disrupt beaver-willow (*Salix* spp.) mutualisms that likely evolved under relatively low herbivory in a more predator-rich environment, and that this interaction may explain beaver and willow declines. Field experiments in Rocky Mountain National Park, Colorado, USA, found the interaction of beaver and elk (*Cervus elaphus*) herbivory suppressed compensatory growth in willow. Intense elk browsing of simulated beaver-cut willow produced plants which were small and hedged with a high percentage of dead stems, whereas protected plants were large and highly branched with a low percentage of dead stems. Evaluation of a winter food cache showed beaver had selected woody stems with a lower percentage of leaders browsed by elk. A lack of willow stems suitable as winter beaver food may cause beaver populations to decline, creating a negative feedback mechanism for beaver and willow. In contrast, if browsing by livestock or ungulates can be controlled, and beaver can disperse from a nearby source population, then beaver may build dams in marginal habitat which will benefit willow and cause a positive riparian response that restores proper function to degraded habitat. In a shrub-steppe riparian ecosystem of northwestern Colorado, USA, rest from overgrazing of livestock released herbaceous vegetation initiating restoration of a beaver-willow community. Thus, competition from livestock or ungulates can cause beaver and willow to decline and can prevent their restoration in heavily browsed riparian environments, but beaver and willow populations can recover under proper grazing management. © NISC

1966. Biodiversity and ecological value of conservation lands in agricultural landscapes of southern Ontario, Canada.

Milne, R. J. and Bennett, L. P.

Landscape Ecology 22(5): 657-670. (2007)

NAL Call #: QH541.15.L35 L36; ISSN: 09212973.

Notes: doi: 10.1007/s10980-006-9063-5.

Descriptors: anuran/ avian/ biodiversity/ connectivity/ ecological value/ integrated assessment/ multifunctional/ patch size/ rarity/ sub-watershed

Abstract: In eastern North America, large forest patches have been the primary target of biodiversity conservation. This conservation strategy ignores land units that combine to form the complex emergent rural landscapes typical of this region. In addition, many studies have focussed on one wildlife group at a single spatial scale. In this paper, studies of avian and anuran populations at regional and landscape scales have been integrated to assess the ecological value of agricultural mosaics in southern Ontario on the basis of the maintenance of faunal biodiversity. Field surveys of avian and anuran populations were conducted between 2001 and 2004 at the watershed and sub-watershed levels. The ecological values of land units were based on a combination of several components including species richness, species of conservation concern (rarity), abundance, and landscape parameters (patch size and connectivity). It was determined that habitats such as thicket swamps, coniferous plantations and cultural savannas can play an important role in the overall biodiversity and ecological value of the agricultural landscape. Thicket swamps at the edge of agricultural fields or roads provided excellent breeding habitat for anurans. Coniferous plantations and cultural savannas attracted many birds of conservation concern. In many cases, the land units that provided high ecological value for birds did not score well for frogs. Higher scores for avian and anuran populations were recorded along the Niagara Escarpment and other protected areas as expected. However, some private land areas scored high, some spatially connected to the protected areas and therefore providing an opportunity for private land owners to enter into a management arrangement with the local agencies. © 2007 Springer Science+Business Media, Inc.
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1967. Biodiversity of agricultural land: Habitats, species and hotspots.

Usher, M. B.

In: Biodiversity and conservation in agriculture proceedings of an international symposium. Stakis Brighton Metropole Hotel, UK.

Farnham, UK: British Crop Protection Council; pp. 1-14; 1997.

Notes: Literature review.

NAL Call #: SB599.B73-no.69; ISBN: 190139669X

Descriptors: agricultural land/ biodiversity/ species diversity/ genetic diversity/ community ecology/ landscape ecology/ habitats

This citation is from AGRICOLA.

1968. Biodiversity of southeastern Minnesota forested streams: Relationships between trout habitat improvement practices, riparian communities and Louisiana waterthrushes.

Stucker, J. H. University of Minnesota, 2000.

Notes: Degree: M.S.

Descriptors: wildlife-habitat relationships/ interspecies relationships/ habitat management/ policies and programs/ ecology/ nests and nesting/ reproduction/ statistics/ habitat changes/ Minnesota/ Winona County/ Wabasha County/ Fillmore County/ Houston County/ Olmsted County

Abstract: Thesis is divided into the following chapters: (1) Louisiana Waterthrush (*Seiurus motacilla*) Ecology in Southeastern Minnesota; (2) Trout Habitat Improvement

Projects and Avian Communities of Southeastern Minnesota; (3) Trout Habitat Improvement Projects, Macroinvertebrate Communities and Riparian Physical Habitats of Southeastern Minnesota; and (4) Conservation and Management Implications for Riparian Forests: Trout Habitat Improvement and Louisiana Waterthrushes, © NISC

1969. Biological criteria for buffer zones around wetlands and riparian habitats for amphibians and reptiles.

Semlitsch, Raymond D. and Bodie, J. Russell
Conservation Biology 17(5): 1219-1228. (2003)

NAL Call #: QH75.A1C5; ISSN: 0888-8892

Descriptors: conservation measures/ behavior/ ecology/ terrestrial habitat/ Amphibia/ Reptilia: habitat management/ buffer zones/ wetland habitat/ biological criteria/ migration/ terrestrial migration distances/ distribution within habitat/ habitat utilization/ semiaquatic habitat/ wetlands/ biological criteria/ riparian habitat/ amphibians/ chordates/ reptiles/ vertebrates

Abstract: Terrestrial habitats surrounding wetlands are critical to the management of natural resources. Although the protection of water resources from human activities such as agriculture, silviculture, and urban development is obvious, it is also apparent that terrestrial areas surrounding wetlands are core habitats for many semiaquatic species that depend on mesic ecotones to complete their life cycle. For purposes of conservation and management, it is important to define core habitats used by local breeding populations surrounding wetlands. Our objective was to provide an estimate of the biologically relevant size of core habitats surrounding wetlands for amphibians and reptiles. We summarize data from the literature on the use of terrestrial habitats by amphibians and reptiles associated with wetlands (19 frog and 13 salamander species representing 1363 individuals; 5 snake and 28 turtle species representing more than 2245 individuals). Core terrestrial habitat ranged from 159 to 290 m for amphibians and from 127 to 289 m for reptiles from the edge of the aquatic site. Data from these studies also indicated the importance of terrestrial habitats for feeding, overwintering, and nesting, and, thus, the biological interdependence between aquatic and terrestrial habitats that is essential for the persistence of populations. The minimum and maximum values for core habitats, depending on the level of protection needed, can be used to set biologically meaningful buffers for wetland and riparian habitats. These results indicate that large areas of terrestrial habitat surrounding wetlands are critical for maintaining biodiversity.

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1970. Biological effects of agriculturally derived surface water pollutants on aquatic systems: A review.

Cooper, C. M.

Journal of Environmental Quality 22(3): 402-408.

(July 1993-Sept. 1993)

NAL Call #: QH540.J6; ISSN: 0047-2425 [JEVQAA].

Notes: Paper presented at the USDA-ARS Beltsville Agricultural Research Center Symposium XVII, "Agricultural Water Quality Priorities, A Team Approach to Conserving Natural Resources," May 4-8, 1992, Beltsville, MD. Includes references.

Descriptors: aquatic environment/ surface water/ water quality/ sediment/ nutrients/ organic wastes/ pesticides/ heavy metals/ pollution/ agriculture

Abstract: Environmental manipulations and other human activities are major causes of stress on natural ecosystems. Of the many sources of surface water pollutants, agricultural activities have been identified as major contributors to environmental stress, which affects all ecosystem components. In water, agricultural contaminants are most noticeable when they produce immediate, dramatic toxic effects on aquatic life although more subtle, sublethal chronic effects may be just as damaging over long periods. Aquatic systems have the ability to recover from contaminant damage if not seriously overloaded with irreversible pollutants. Thus, contaminant loading level is as important as type of pollutant. Although suspended sediment represents the largest volume of aquatic contaminant, pesticides, nutrients, and organic enrichment are also major stressors of aquatic life. Stream corridor habitat traps and processes contaminants. Loss of buffering habitat, including riparian zones, accelerates effects of pollutants and should be considered when assessing damage to aquatic life. Protection of habitat is the single most effective means of conserving biological diversity. Current available management practices and promising new technology are providing solutions to many contaminant-related problems in aquatic systems. This citation is from AGRICOLA.

1971. Biophysical and ecological interactions in a temperate tree-based intercropping system.

Thevathasan, N. V.; Gordon, A. M.; Simpson, J. A.; Reynolds, P. E.; Price, G.; and Zhang, P.
Journal of Crop Improvement 12(1-2): 339-363. (2004); ISSN: 15427528.

Notes: doi: 10.1300/J411v12n01_04.

Descriptors: agroecosystems/ agroforestry/ biodiversity/ biophysical interactions/ carbon sequestration/ sustainable agriculture/ *Acer/ Aves/ Fraxinus/ Glycine max/ Hordeum vulgare subsp. vulgare/ Juglans/ Mammalia/ Pheretima sieboldi/ Picea/ Populus/ Quercus/ Thuja/ Triticum aestivum/ Zea mays*

Abstract: Tree-based intercropping is considered an excellent farming system and can contribute much to our understanding of sustainable agriculture practices. Our current research goals are to address and quantify the numerous biophysical interactions that occur at the tree-crop interface in order to enhance our understanding of the ecology of tree-based intercropping (a form of agroforestry). In 1987, the University of Guelph established a large field experiment on 30 ha of prime agricultural land in Wellington county southern Ontario, Canada to investigate various aspects of intercropping trees with agricultural crops. A variety of spacing, crop compatibility and tree growth, and survival experiments were initiated at that time, utilizing 10 tree species within the genera *Picea*, *Thuja*, *Pinus*, *Juglans*, *Quercus*, *Fraxinus*, *Acer*, and *Populus*. Two between row-spacings (12.5 m or 15 m) and two within row-spacings (3 m, or 6 m) were utilized in conjunction with all possible combinations of three agricultural crops (soybean, corn, and either winter wheat or barley). Investigations over the last decade have documented several complementary biophysical interactions. Nitrogen (N) transfer from fall-shed leaves to adjacent crops with enhanced soil nitrification as the proposed mechanism was estimated to be 5 kg N ha⁻¹.

Soil organic carbon (C) adjacent to tree rows has increased by over 1%, largely as a result of tree litterfall inputs and fine root turnover. It is estimated that intercropping has reduced nitrate loading to adjacent waterways by 50%, a hypothesized function of deep percolate interception by tree roots. We have also noticed increased bird diversity and usage within the intercropped area as compared to monocropped adjacent agricultural areas, and have recorded increases in small mammal populations. Earthworm distribution and abundance was also found to be higher closer to the tree rows when compared to earthworm numbers in the crop alleys. We speculate that these are indicative of major changes in the flow of energy within the trophic structure identified with intercropping systems. In light of climate change mitigation processes, C sequestration and NO₂ reduction potentials in tree-based intercropping systems were studied and compared to conventional agricultural systems. The results suggest that sequestration of C was 5 times more in the former system than in the latter. Competitive interactions between trees and crops for nutrients, moisture and light were also studied. The tangible benefits that are derived from properly designed and managed tree-based intercropping systems place this land management option above conventional agriculture in terms of long-term productivity and sustainability. © 2004 by The Haworth Press, Inc. All rights reserved.

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1972. Bird communities of prairie uplands and wetlands in relation to farming practices in Saskatchewan.

Shutler, D.; Mullie, A.; and Clark, R. G.
Conservation Biology 14(5): 1441-1451. (2000)
NAL Call #: QH75.A1C5; ISSN: 08888892.

Notes: doi: 10.1046/j.1523-1739.2000.98246.x.

Descriptors: avifauna/ community composition/ farming system/ prairie/ wetland/ Canada/ Aves
Abstract: Modern farm practices can vary in their emphasis on tillage versus chemicals to control weeds, and researchers know little about which emphasis has greater ecological benefits. We compared avifaunas of uplands and wetlands in four treatments: conventional farms, conservation farms (contrasting those that minimized frequency of tillage [minimum tillage] with those that eliminated chemical inputs [organic]), and restored or natural (wild) sites in Saskatchewan, Canada. Of 37 different upland bird species encountered during surveys, one made greater use of farms, four made greater use of wild sites, and the remaining species showed no preference. When all upland species were combined, higher relative abundance occurred on wild than on farm sites, and on minimum tillage than on conventional farms. Wild upland sites also had more species than did conventional farms. Of 79 different species encountered during surveys of wetlands and their margins, most had similar encounter probabilities among treatments, although seven were more common on either organic farms or wild sites. Higher relative abundances were documented in wetland habitat of wild sites and organic farms than of minimum tillage or conventional farms. Wetlands of wild sites had more species than did minimum tillage or conventional farms. Overall, in terms of both avifaunal density and diversity, small treatment effects could be ascribed to differences between conventional and

conservation farms, whereas larger effects were due to differences between farms and wild sites. Wetlands were heavily used by birds in all treatments, suggesting high conservation priority regardless of context.
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1973. Bird observations in five agricultural field types of the Everglades agricultural area in summer and fall.

Pearlstine, Elise V.; Mazzotti, Frank J.; Rice, Kenneth G.; and Liner, Anna

Florida Field Naturalist 32(3): 75-84. (2004);
ISSN: 0738-999X

Descriptors: biodiversity/ biogeography: population studies/ terrestrial ecology: ecology, environmental sciences/ wildlife management: conservation/ restoration planning/ applied and field techniques/ cane field/ fallow field/ sod field

Abstract: The Everglades Agricultural Area (EAA) is a 280,000 ha segment of former Everglades that was drained early in this century and converted to agricultural cultivation. It is near natural Everglades habitat; however, the wildlife of this area remains relatively unknown. We surveyed 18 sites in five agricultural field types for bird presence and abundance from mid-June to December 1999. We compared these EAA sites with four sites at the adjacent Arthur R. Marshall Loxahatchee National Wildlife Refuge (LNWR) and tallied 4,005 individuals and 72 species within the 9 sites. Flooded habitats such as rice and fallow flooded fields contained a larger number of birds and higher species diversity than terrestrial habitats (cane, sod, fallow fields) within the EAA. However, each field type supports a unique assemblage of species and contributes to overall avian diversity of the area. We recommend that flooded habitats be expanded within the EAA, especially on idle lands. There is a need for further study and the inclusion of wildlife in agricultural and restoration planning in the area.

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1974. Birds on organic and conventional farms in Ontario: Partitioning effects of habitat and practices on species composition and abundance.

Freemark, K. E. and Kirk, D. A.

Biological Conservation 101(3): 337-350. (2001)
NAL Call #: S900.B5; ISSN: 00063207.

Notes: doi: 10.1016/S0006-3207(01)00079-9.

Descriptors: bird population declines/ Canada/ canonical correspondence analysis/ farmland birds/ habitat and practices/ Ontario/ organic farms/ variation partitioning/ abundance/ avifauna/ conservation management/ intensive agriculture/ population decline/ species richness/ Aves/ Galliformes

Abstract: Population declines of farmland birds over recent decades in Europe, Canada and the USA have been attributed to more intensive agricultural management. We counted birds during the 1990 breeding season on 72 field sites in southern Ontario, Canada, paired between 10 organic and 10 conventional farms for local habitat to enhance our ability to detect effects of agricultural practices. Of 68 species recorded, 58 were on organic sites, 59 on conventional. Species richness and total abundance were significantly greater on organic than conventional sites based on log-linear regression. Of 43 species analyzed with log-linear regression, eight (18.6%) were significantly ($P < 0.05$) more abundant on organic

than conventional sites and four (9.3%) approached significance ($0.05 < P < 0.10$). Eight of these 12 species had negative population trends for 1967-1998 Breeding Bird Surveys (BBS) in this region. Two of the 43 species analyzed (4.7%) were significantly more abundant on conventional than organic sites and three (7.0%) approached significance. Two of these five species had negative BBS population trends. A canonical correspondence analysis (CCA) of 13 practices and 13 habitat variables explained 44% of total variation (TV) accounted for in a detrended correspondence analysis of bird species composition and abundance. Practices contributed 23.7% of TV, habitat 26%; habitat and practices shared 5.7% with each other and 12% with farm ownership (i.e. clustering of field sites within farms). CCA ordinations indicated considerable mixing of organic and conventional sites across a gradient from sites with many birds species associated with greater habitat heterogeneity and more pasture, winter grain, farmstead and other non-crop habitats (hedgerow, woodland) to sites with few bird species associated with larger fields, more rowcrop and spring grain, more passes and tilling, and use of herbicides and chemical fertilizers. Our results re-emphasize the importance of non-crop habitats, more permanent crop cover, and less intensive management practices to the conservation of avian biodiversity on farmland. [Canadian Crown Copyright]

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1975. Bobwhite quail myths.

White, Bill

Missouri Conservationist 65(8)(2004); ISSN: 0026-6515.
<http://mdc.mo.gov/conmag/2004/08/10.htm>

Descriptors: *Colinus virginianus*/ agricultural practices/ birds/ fences/ habitat alterations/ habitat management/ habitat use/ landowners/ management/ population ecology/ predators/ restoration/ wildlife/ northern bobwhite quail/ Missouri

Abstract: This article has notes about the myths related to quails declining number. One of the common beliefs is that predators are eating all the quail. The main reason behind this, though, is a lack of proper habitat. A survey of landowners at a quail field day showed that 60 percent of the participants were managing their land for quail. Those same 60 percent were seeing more quail on their property. Wooded fence lines and draws not only crowd out quail friendly shrubs and weeds, but they also provide an advantage for quail predators. A Mississippi study found that quail near trees were most susceptible to avian predators like great horned owls and Cooper's hawks. The invasion of trees into quail habitat also has provided additional food sources and dens to such predators as raccoons, skunks. A study shows that quail numbers triple when habitat is managed in a quail-friendly manner. Wooded fence lines and draws can be restored for quail by dropping the trees with a chainsaw. Stumps of undesirable trees should be treated to prevent resprouting. Valuable lumber and wildlife food trees should remain uncut. If brome or fescue is present under these trees, those grasses should be eliminated. The long-term increases in wild turkey and deer populations are not the cause for the decline in quail. They do, though, indicate the reason for the decline.

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1976. Breeding bird population changes in the Gila River Bird Area.

Shook, R. S.

NMOS Bulletin 32(2): 49-50. (2004).

Notes: Published by New Mexico Ornithological Society.

Descriptors: forests/ riparian habitat/ birds/ breeding/ Aves/ fencing/ cattle

Abstract: The Gila River Bird Area, approximately 48 km west of Silver City, Grant Co., New Mexico, was established in 1970 by the Forest Service in order to preserve and restore prime riparian habitat. From 1995 through 1999, eight wetlands were constructed for stream bank stabilization and to create habitat for the endangered (Southwestern) Willow Flycatcher (*Empidonax trailii* extimus). Fencing was also constructed to manage cattle access. Beginning in 1996 periodic avian strip censuses have been conducted to measure changes in avian population numbers. Using linear regression analysis, I compared the average number of detections per km per breeding season for the years 1997 through 2003, for 21 breeding species chosen to represent diversity in both taxonomic and habitat preference. The species chosen were: Mallard (*Anas platyrhynchos*) Common Black-Hawk (*Buteogallus anthracinus*), Wild Turkey (*Meleagris gallopavo*), Killdeer (*Charadrius vociferus*), Yellow-billed Cuckoo (*Coccyzus americanus*), Northern Flicker (*Colaptes auratus*), Western Wood-Pewee (*Contopus sordidulus*), Southwestern Willow Flycatcher, Black Phoebe (*Sayornis nigricans*), Brown-crested Flycatcher (*Myiarchus tyrannulus*), Bell's Vireo (*Vireo bellii*), Lucy's Warbler, Yellow Warbler (*Dendroica petechia*), Common Yellowthroat (*Geothlypis trichas*), Yellow-breasted Chat (*Icteria virens*), Summer Tanager (*Piranga rubra*), Northern Cardinal (*Cardinalis cardinalis*), Red-winged Blackbird (*Agelaius phoeniceus*), Hooded Oriole (*Icterus cucullatus*), Bullock's Oriole (*Icterus bullockii*), and Lesser Goldfinch (*Carduelis psaltria*). Results indicate significant increases in populations of Western Wood Pewees, Brown-crested Flycatchers, Bell's Vireos, Yellow-breasted Chats, and Northern Cardinals. The first two species are forest birds while the remainder prefers dense underbrush. Significant declines occurred in populations of Killdeer and Red-winged Blackbirds owing to decreases in their preferred habitat.

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1977. Breeding bird response to riparian forest management: 9 years post-harvest.

Hanowski, JoAnn; Danz, Nick; and Lind, Jim

Forest Ecology and Management 241(1-3): 272-277. (2007)

NAL Call #: SD1.F73; ISSN: 0378-1127

Descriptors: commercial activities/ terrestrial habitat/ land zones/ Aves: forestry/ riparian forest management/ breeding species response/ forest and woodland/ Minnesota/ Pokegama Lake tributary streams/ breeding species/ response to riparian forest management/ Aves/ birds/ chordates/ vertebrates

Abstract: We previously examined the 3-year response of breeding bird communities to timber harvest in riparian areas using two harvest techniques (full tree harvest (GPL) and cut-to-length (CTL)) along first- to third-order streams in northern Minnesota, USA. We revisited the same 12 sites 9 years post-harvest and compared community composition, total abundance, species richness, and the abundance of bird guilds on harvest plots randomly

assigned to four treatments (three plots per treatment). Analyses revealed a significant response of the bird community to timber harvest in the riparian area. Nine years post-harvest, bird communities in the uncut riparian buffers were statistically indistinguishable from control bird communities. Differences in bird communities between CTL and GPL treatments detected 3 years post-harvest in buffers were no longer evident after 9 years. Breeding bird community composition in harvested buffers became more similar to uncut and control buffer communities in species composition. All treatment buffers continued to have more species and individuals than control buffers; these bird species had affinities for early-successional forests. No differences among forest interior species or ground-nesting birds were evident between treatments 9 years post-harvest. © 2007 Elsevier B.V. All rights reserved. © Thomson Reuters Scientific

1978. Breeding pond selection and movement patterns by eastern spadefoot toads (*Scaphiopus holbrookii*) in relation to weather and edaphic conditions.

Greenberg, Cathryn H. and Tanner, George W.

Journal of Herpetology 38(4): 569-577. (2004)

NAL Call #: QL640.J6; ISSN: 0022-1511

Descriptors: Anura/ Lissamphibia/ Pelobatidae/ *Aristida stricta*/ eastern spadefoot/ longleaf pine/ *Pinus palustris*/ *Scaphiopus holbrookii*/ breeding pond selection/ breeding pond selection/ wildlife movement patterns/ breeding grounds/ climate/ weather/ environmental factors/ habitat use/ Florida, Marion County/ Florida, Putnam County/ Ocala National Forest/ land zones/ North America/ reproduction/ breeding/ *Aristida stricta*/ *Pinus* spp./ wiregrass

Abstract: Eastern Spadefoot Toads (*Scaphiopus holbrookii*) require fish-free, isolated, ephemeral ponds for breeding but otherwise inhabit surrounding uplands, commonly xeric longleaf pine (*Pinus palustris*) and wiregrass (*Aristida beyrichiana*) ecosystem. Fire suppression in the Florida sandhills has the potential to alter upland and pond suitability through increased hardwood densities and resultant higher transpiration. In this paper, we explore breeding and metamorphic emigration movements in relation to weather, hydrological conditions of ponds, and surrounding upland matrices. We use nine years of data from continuous monitoring with drift fences and pitfall traps at eight ephemeral ponds in two upland matrices: regularly burned, savanna-like sandhills (N = 4), and hardwood-invaded sandhills (N = 4). Neither adult nor metamorph captures differed between ponds within the two upland matrices, suggesting that they are tolerant of upland heterogeneity created by fire frequency. Explosive breeding occurred during nine periods and in all seasons; adults were captured rarely otherwise. At the landscape-level, an interaction between rainfall and maximum change in barometric pressure were the top significant predictors of explosive breeding. At the pond-level, rainfall and the change in pond depth during the month prior to breeding were the top significant predictors of adult captures. Metamorphic emigrations occurred following transformation and usually were complete within a week regardless of rainfall levels. Movement by adults and metamorphs was directional, but mean directions of adult emigrations and immigrations did not always correspond. Our results suggest that spadefoot toads are highly

adapted to breeding conditions and upland habitat heterogeneity created by weather patterns and fire frequency in Florida sandhills.

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1979. Buffered wetlands in agricultural landscapes in the Prairie Pothole Region: Environmental, agronomic, and economic evaluations.

Rickerl, D. H.; Janssen, L. L.; and Woodland, R.
Journal of Soil and Water Conservation 55(2): 220-225. (2000)

NAL Call #: 56.8 J822; ISSN: 00224561

Descriptors: agriculture/ crop budgets/ farming systems/ Prairie Pothole Region/ regulations/ wetland buffer strips/ Wetlands Reserve Program/ wetlands/ agronomy/ buffering/ cropping practice/ nutrient cycling/ wetland/ United States

Abstract: A farm site with four seasonal wetlands was chosen in Lake County, S.D. to examine agronomic, environmental, and economic performance of cropped fields with buffered and non buffered wetlands. Buffers were established in blocks around two of the wetlands in 1995. In 1997 and 1998, soil/water/plants were analyzed for nutrient content in the buffered and non buffered wetlands. Results showed that the wetland buffer vegetation effectively removed nutrients, thus reducing nutrient content in wetland soils and vegetation, and cycling captured nutrients through hay and forage crops. Long term budgets were developed for combinations of five wetland management scenarios and three crop farming systems. Net returns from buffered wetland fields were generally lower than net returns from maximum crop production. Net returns were greatest for the Wetland Reserve Program (WRP) or Conservation Reserve Program (CRP) scenarios, regardless of farming system. The results suggest that enrolling wetlands in WRP or CRP has both economic and environmental benefits.

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1980. Burrowing owl nest success and burrow longevity in north central Oregon.

Holmes, Aaron L.; Green, Gregory A.; Morgan, Russell L.; and Livezey, Kent B.

Western North American Naturalist 63(2): 244-250. (2003)
NAL Call #: QH1.G7; ISSN: 1527-0904

Descriptors: Taxidea taxus/ Mustelidae/ Carnivora/ Athene cucularia/ Strigiformes/ Strigidae/ Speotyto cucularia/ behavior/ terrestrial ecology/ burrow destruction/ burrow longevity/ burrow reuse/ migratory population/ nest success/ athene cucularia/ predation/ foods-feeding/ burrows/ farming and agriculture/ productivity/ habitat management/ livestock trampling of burrows/ predators/ mammals/ minimization of burrow trampling by livestock/ Morrow County/ mortality/ natural soil erosion/ nesting success/ Oregon/ environmental factors/ Taxidea taxus/ habitat use/ wildlife-human relationships/ commercial enterprises/ conservation/ wildlife management/ diets/ disturbances/ land zones/ nutrition/ population ecology/ reproduction/ den/ fertility-recruitment/ habitat/ nest/ philopatry/ badger/ burrowing owl

Abstract: We studied nest success, burrow longevity, and rates of burrow reuse for a migratory population of Burrowing Owl (*Athene cucularia*) in north central Oregon from 1995 to 1997. Nest success varied annually from 50% to 67%. Principal causes of nest failure were desertion (26%) and depredation by badgers (*Taxidea taxus*; 13%). Reuse of available nest and satellite burrows in subsequent years was 87% in 1996 and 57% in 1997. Reuse was highest at burrows in sandy soils, which may indicate that nest-site availability is a limiting factor in sandier soil types. Trampling by livestock resulted in the loss of 24% of all burrows between one season and the next, and natural erosion resulted in closure of 17%. Both causes of burrow failure occurred more frequently in soils with a sand component due to their friable nature. We recommend that habitat used by livestock be evaluated for use by Burrowing Owls, that occupied areas be managed to minimize destruction of burrows by livestock, and that predator-control efforts be revised to exclude mortality of badgers.

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1981. Calhoun Point Habitat Rehabilitation and Enhancement Project.

Miller, D.

In: Proceedings of the 2001 Wetlands Engineering and River Restoration Conference. Hayes D.F. and Hayes D.F. (eds.) Reno, NV; pp. 733-739; 2001. ISBN: 0784405816

Descriptors: agriculture/ dams/ dredging/ floods/ forestry/ project management/ rivers/ sediments/ bottomland forest/ habitat rehabilitation/ biodiversity

Abstract: The U.S. Army Corps of Engineers Environmental Management Program (EMP) is a program for enhancing wildlife habitat in the upper Mississippi River system. In recognition of the benefit of balanced management of the multiple functions that the river performs, the program is funded by the same legislation that provides for improvements to navigation. Calhoun Point, at the confluence of the Illinois and Mississippi Rivers, is a key area within the program; containing abundant bottomland forest, open water, emergent wetlands, and scattered agricultural fields. The current project includes berms to protect the 2,100-acre site from frequent, sediment-laden floods, and to provide a means to perch water on the interior to increase waterfowl habitation. The project also includes stop log structures, sluice gates, and pump sites to move water into, out of, and between the many lakes and sloughs inside the protected area. There is also a dredging component to provide fisheries and reverse some of the siltation that has occurred. The project is currently under design with construction scheduled to begin in early summer 2001. When construction has been completed the area will be managed by the Illinois Department of Natural Resources. This paper describes the design of the project, including information about design criteria, problems that were encountered and their solutions, engineering tools, and coordination among the consultant, the Department of Natural Resources, and the Corps of Engineers.

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1982. **Can cows and fish co-exist?**

Fitch, L. and Adams, B. W.

Canadian Journal of Plant Science 78(2): 191-198. (1998)

NAL Call #: 450 C16; ISSN: 0008-4220

Descriptors: agriculture/ grazing management/ riparian ecosystem

Abstract: Our paper provides an ecological perspective on the interrelationship between livestock grazing and riparian areas through a review of topical literature. We also describe the Alberta Riparian Habitat Management Project (also known as "Cows and Fish"), and draw upon our experience to provide a perspective on future riparian management actions. Those actions should begin with an understanding that prairie landscapes evolved with herbivores, in a grazing regime timed and controlled by season and climatic fluctuations where grazing by native grazers was followed by variable rest periods. Prevailing range management principles represent an attempt to imitate the natural system and describe ecologically based grazing systems. Traditionally, range management guidelines have focused on grazing practices and impacts in upland, terrestrial rangelands, with a lack of attention devoted to riparian areas. Three decades of riparian investigation have quantified the effect unmanaged livestock grazing can have on range productivity and watershed function. We contend that suitable grazing strategies for riparian areas will be developed first by understanding the function of riparian systems and then by applying range management principles to develop riparian grazing strategies. A key step towards determining the fit of livestock grazing is an understanding of the formation of riparian systems and their ecological function. We describe riparian structure, function and process to provide linkages between livestock grazing, riparian vegetation health and stream channel dynamics. We summarize the effects of unmanaged livestock grazing on riparian habitats and fish and wildlife populations. The general conclusion is that unmanaged grazing results in overuse and degradation of riparian areas. The literature provides several options for the development of riparian grazing strategies. We provide an overview of strategies suitable for riparian areas in Southern Alberta which should maintain ecological function and sustained use.

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1983. **Cerulean warbler abundance and occurrence relative to large-scale edge and habitat characteristics.**

Wood, Petra Bohall; Bosworth, Scott B.; and Dettmers, Randy

Condor 108(1): 154-165. (2006)

NAL Call #: QL671.C6; ISSN: 0010-5422

Descriptors: human ecology: anthropology/ terrestrial ecology: ecology, environmental sciences/ wildlife management: conservation/ species abundance/ forest fragmentation/ species occurrence/ edge effect/ mountaintop mining/ reclaimed mine landscape

Abstract: We examined Cerulean Warbler (*Dendroica cerulea*) abundance and occurrence in southwestern West Virginia, where the coal-mining technique of mountaintop removal mining-valley fill converts large contiguous tracts of deciduous forest to forest patches surrounded by early successional habitats. Our study objectives were to quantify abundance and occurrence of Cerulean Warblers relative to (1) distance from the edge of extensive reclaimed grasslands and (2) habitat structure and landscape

characteristics. Cerulean Warbler abundance increased with distance from the edge and edge effects extended 340 m into the forest. Percent occurrence did not vary with distance from mine edge, suggesting a degree of tolerance to the extensive edge occurring at the interface of forest and reclaimed lands. Abundance and occurrence were greater on ridges and midslopes than in bottomlands; consequently, disturbances such as mountaintop mining in which ridges are removed may have a greater impact on populations compared to other sources of fragmentation where ridges are not disturbed. Models based on the information-theoretic approach indicated that Cerulean Warblers were more likely to be present in productive sites on northwest to southeast facing slopes, upper slope positions (midslope to ridgetop), and forests with low sapling density. Cerulean Warbler abundance was positively associated with more productive sites, higher snag density, large blocks of mature deciduous forest, and low amounts of edge in the landscape. In addition to outright loss of forested habitat, mountaintop mining-valley fill alters the spatial configuration of forested habitats, creating edge and area effects that negatively affect Cerulean Warbler abundance and occurrence in the reclaimed mine landscape.

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1984. **The challenge of conservation in agriculture and the role of entomologists.**

Van Hook, T.

Florida Entomologist 77(1): 42-73. (Mar. 1994)

NAL Call #: 420 F662; ISSN: 0015-4040 [FETMAC].

Notes: Literature review; Symposium: Insect Behavioral Ecology--'93. Includes references.

Descriptors: arthropods/ conservation/ sustainability/ landscape ecology/ environmental education/ legislation/ biodiversity/ endangered species act

This citation is from AGRICOLA.

1985. **Changes in avian species composition following surface mining and reclamation along a riparian forest corridor in southern Indiana.**

Lacki, M. J.; Fitzgerald, J. L.; and Hummer, J. W.

Wetlands Ecology and Management 12(5): 447-457. (2004)

NAL Call #: QH541.5.M3 W472; ISSN: 0923-4861

Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ zoogeography/ land zones/ Aves: industry/ surface mining/ impacts on riparian forest corridor community dynamics and distribution/ habitat management/ surface mining habitat reclamation/ community structure/ species composition changes/ riparian forest corridor/ impacts of surface mining and reclamation/ distribution within habitat/ riparian forest corridors role/ riparian habitat/ riparian forest corridors/ community dynamics and distribution/ dispersal/ Indiana/ Warrick County/ Pigeon Creek watershed/ riparian forest corridor community ecology and distribution/ Aves/ birds/ chordates/ vertebrates

Abstract: Data on the response of bird communities to surface mining and habitat modification are limited, with virtually no data examining the effects of mining on bird communities in and along riparian forest corridors. Bird community composition was examined using line transects from 1994 to 2000 at eight sites within and along a riparian forest corridor in southwestern Indiana that was impacted by an adjacent surface mining operation. Three habitats

were sampled: closed canopy, riparian forest with no open water; fragmented canopy, riparian forest with flood plain oxbows; and reclaimed mined land with constructed ponds. Despite shifts in species composition, overall bird species richness, measured as the mean number of bird species recorded/transect route, did not differ among habitats and remained unchanged across years. More species were recorded solely on mined land than in either closed forest or forested oxbow habitats. Mined land provided stopover habitat for shorebirds and waterfowl not recorded in other habitats, and supported an assemblage of grassland-associated bird species weakly represented in the area prior to mining. A variety of wood warblers and other migrants were recorded in the forest corridor throughout the survey period, suggesting that, although surface mining reduced the width of the forest corridor, the corridor was still important habitat for movement of forest-dependent birds and non-resident bird species in migration. We suggest that surface mining and reclamation practices can be implemented near riparian forest and still provide for a diverse assemblage of bird species. These data indicate that even narrow (0.4 km wide) riparian corridors are potentially valuable in a landscape context as stopover habitats and routes of dispersal and movement of forest-dependent and migratory bird species.

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1986. Changes in bird abundance in eastern North America: Urban sprawl and global footprint?

Valiela, I. and Martinetto, P.

Bioscience 57(4): 360-370. (2007)

NAL Call #: 500 Am322A; ISSN: 00063568.

Notes: doi: 10.1641/B570410.

Descriptors: habitat losses/ loss of birds

Abstract: The abundance of birds recorded in the North American Breeding Bird Survey decreased by up to 18 percent between 1966 and 2005. The abundance of US and Canadian resident species decreased by 30 percent, and that of migrants within the United States and Canada decreased by 19 percent. By contrast, Neotropical migrants increased by up to 20 percent. Land-cover changes in northern latitudes therefore seem more consequential for bird populations than those occurring in Neotropical habitats. Lower abundances were most marked for resident breeding birds that used open, edge, and wetland habitats, the environments most affected by human disturbances—particularly urban sprawl—in northern latitudes. The abundance of resident and migrant forest-dwelling birds increased (although trends varied from species to species), with the increases seeming to follow the 20th-century expansion of forest area in northern latitudes, rather than the loss of Neotropical forests. The geographic footprint of changes in bird abundance linked to habitat changes in North America may thus be extending southward, with negative effects on birds that use open habitats and positive effects on forest birds. © 2007 American Institute of Biological Sciences.

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1987. Changes in land use in eastern Kansas, 1984-2000.

Applegate, Roger D.; Flock, Brian E.; and Finck, Elmer J. *Transactions of the Kansas Academy of Science* 106(3-4): 192-197. (2003)

NAL Call #: 500 K13T; ISSN: 0022-8443

Descriptors: biodiversity/ conservation/ terrestrial ecology: ecology, environmental sciences/ LANDSAT thematic mapper images/ brushland/ cropland/ grassland/ habitat availability/ habitat modification/ lakes/ land use change/ landscape ecology/ open water/ population declines/ rural landscape/ urbanization/ watershed ponds/ woodland
Abstract: Populations of ring-necked pheasant (*Phasianus colchicus*), northern bobwhite (*Colinus virginianus*), cottontails (*Sylvilagus* sp.), greater prairie-chicken (*Tympanuchus cupido*), and black-tailed jackrabbit (*Lepus californicus*), have been declining in eastern Kansas for 40+ years. During the same timeframe populations of wild turkey (*Melagris gallopavo*) and tree squirrels (*Sciurus* sp.) have increased. We measured change in land use based on Landsat Thematic Mapper images for spring, summer, and fall of 1984, 1992, and 2000. Open water (lakes, watershed ponds) and woodland increased 17% and 23% respectively during the 16 year period. Cropland declined 6% during the 16-year period. Grassland increased <1% due to CRP, and urbanization permanently removed 26% of all other land uses in the study area. Loss of open land habitat due to increases in woodland, open water, and urbanization has modified habitat for brushland and grassland species such as ring-necked pheasant, northern bobwhite, cottontails, greater prairie-chicken, and black-tailed jackrabbit. At the same time, the increase in woodland area along with increases in timber volume have created additional habitats for wild turkey and squirrels.

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1988. Changes to wildlife habitat on agricultural land in Canada, 1981-2001.

Javorek, S. K.; Antonowitsch, R.; Callaghan, C.; Grant, M.; and Weins, T.

Canadian Journal of Soil Science 87(2 Spec. Iss.):

225-233. (2007)

NAL Call #: 56.8 C162 ; ISSN: 00084271

Descriptors: agroecosystems/ biodiversity/ Indicators/ land use change/ wildlife habitat

Abstract: Agricultural land in Canada comprises cultivated land, hayland and grazing land with associated riparian areas, wetlands, woodlands, and natural grasslands. Although these agro-ecosystems support many species of Canada's native fauna, agricultural land use is dynamic, and changes in agricultural practices can have important implications for biodiversity. We report on Agriculture and Agri-Food Canada's National Agri-environmental Health Analysis and Reporting Program's assessment of wildlife habitat on farmland in Canada. Habitat use matrices were developed for 493 species of birds, mammals, reptiles and amphibians associated with farmland habitat in Canada. We derived patterns of land use from Statistics Canada's Census of Agriculture data and applied them at the soil landscape polygon scale. We developed a proportionally weighted Habitat Capacity index to relate habitat use and land use. A 5% decrease in Habitat Capacity occurred on Canada's agricultural land from 1981 to 2001, associated with an expansion in cropland and a decline in pasture. A regional pattern of small decline in Habitat Capacity is

evident in the Prairie Provinces, where dramatic declines in the use of summerfallow had a positive impact on Habitat Capacity. In eastern Canada, greater decreases in Habitat Capacity occurred, associated with an increase in agricultural intensification. Policies and programs designed to sustain biodiversity should not be developed independently of socioeconomic factors or policies favouring agricultural intensification. We recommend a holistic approach to making policy decisions relevant to environmental and economic sustainability in the Canadian agricultural landscape.

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1989. Climate change and biodiversity conservation in Great Plains agroecosystems.

Guo, QinFeng

Global Environmental Change 10(4): 289-298. (2000); ISSN: 0959-3780

Descriptors: climatic change/ habitats/ agricultural land/ landscape/ biodiversity/ land use/ ecosystems/ research/ wildlife conservation/ resource management

Abstract: Global change and habitat fragmentation are considered with regard to the unique features of the agroecosystems in the Great Plains. In this region, croplands occupy the majority of the landscape, forming mosaics with linear riparian zones and shelterbelts. These three elements play different roles in the maintenance of biodiversity, and their continued effectiveness under a changing climate is critical to maintaining a healthy and productive agricultural ecosystem. This article evaluates current research and discusses future directions. The goal is to provide a scientific base for future conservation biology and wildlife management.

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1990. Clustering and compactness in reserve site selection: An extension of the biodiversity management area selection model.

Fischer, D. T. and Church, R. L.

Forest Science 49(4): 555-565. (2003)
NAL Call #: 99.8 F7632; ISSN: 0015749X

Descriptors: Integer programming/ optimization/ reserve design/ site selection/ biodiversity/ ecosystems/ mathematical models/ planning/ biodiversity management/ forestry

Abstract: Over the last 15yr, a number of formal mathematical models and heuristics have been developed for the purpose of selecting sites for biodiversity conservation. One of these models, the Biodiversity Management Area Selection (BMAS) model (Church et al. 1996a), places a major emphasis on protecting at least a certain area for each biodiversity element. Viewed spatially, solutions from this model tend to be a combination of isolated planning units and, sometimes, small clusters. One method to identify solutions with potentially less fragmentation is to add an objective to minimize the outside perimeter of selected areas. Outside perimeter only counts those edges of a planning unit that are not shared in common with another selected planning unit in a cluster, and, therefore, compact clustering is encouraged. This article presents a new math programming model that incorporates this perimeter objective into the BMAS model. We present an application using data from the USDA Forest Service-funded Sierra Nevada Ecosystem Project (Davis et al. 1996) and show that the model can be solved

optimally by off-the-shelf software. Our tests indicate that the model can produce dramatic reductions in perimeter of the reserve system (increasing clustering and compactness) at the expense of relatively small decreases in performance against area and suitability measures.

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1991. Coastal fisheries enhancement through U.S. Department of Agriculture programs.

Menzel, B. W.

In: American Fisheries Society Annual Meeting of the Worldwide Decline of Wild Fish Populations, Quebec, PQ, Canada; August 10-14, 2003.; Vol. 133.; pp. 60; 2003.

Descriptors: wildlife management/ conservation/ Natural Resources Conservation Service/ U. S. Department of Agriculture/ aquatic habitat quality/ aquatic habitat/ coastal fisheries enhancement/ fisheries resources/ watershed management

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1992. Colony choice in cliff swallows: Effects of heterogeneity in foraging habitat.

Brown, C. R.; Sas, C. M.; and Brown, M. B.

Auk 119(2): 446-460. (2002)

NAL Call #: 413.8 AU4 ; ISSN: 00048038

Descriptors: bird/ colony/ food availability/ foraging behavior/ habitat/ heterogeneity/ nesting/ United States/ Petrochelidon pyrrhonota

Abstract: One potential determinant of colony size in birds is the local availability of food near a nesting site. Insectivorous Cliff Swallows (*Petrochelidon pyrrhonota*) in southwestern Nebraska nest in colonies ranging from 2 to over 3,000 nests, but they feed on so many kinds of insects that direct sampling of food resources is impractical. Instead, we investigated the degree to which swallow colony size was correlated with the extent of different habitat types, land use diversity, and plant species diversity in the colony's foraging range, and used those parameters as indices of potential variation among sites in food availability. Amount of flowing and standing water in the foraging range was a significant predictor of mean colony size across years at a site, with larger colonies associated with more water. The same result held for most years when analyzed separately. The extent of flowing water in the foraging range also was a significant predictor of the frequency with which a site was occupied across years. In addition, univariate tests suggested that the amount of cultivated cropland in the foraging range varied inversely with colony size. Land use diversity, as measured by Simpson's index, increased significantly with colony size, and all of the sites with perennially very large colonies (mean colony size >1,000 nests) were associated with foraging ranges of relatively high land use diversity. Repeatability of colony size across years differed significantly from zero across all sites, but repeatabilities were significantly lower (colony sizes less similar between years) for sites situated in low-diversity habitats and for sites used less often. There was no strong effect of plant species diversity within the foraging range on either colony size at a site or likelihood of site use. We conclude that land use diversity per se (and possibly the extent of water near a site) might influence insect distribution and constrain formation of the larger colonies to certain sites. These findings emphasize that colony choice in Cliff Swallows is complex, reflecting both the socially mediated costs and

benefits of group size that vary among individuals and the effects of habitat heterogeneity that may influence food availability at some sites.

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1993. Comparative demography of burrowing owls in agricultural and urban landscapes in southeastern Washington.

Conway, Courtney J.; Garcia, Victoria; Smith, Matthew D.; Ellis, Lisa A.; and Whitney, Joyce L.

Journal of Field Ornithology 77(3): 280-290. (2006)

NAL Call #: 413.8 B534; ISSN: 0273-8570

Descriptors: Strigidae/ Strigiformes/ Athene cucularia/ burrowing owl/ Speotyto cucularia/ annula fecundity/ biogeography/ clutch size/ conservation/ wildlife management/ farmland/ ecosystems/ habitat use/ habitat management/ land zones/ artificial structures/ nesting success/ population ecology/ reproduction/ productivity/ urban habitat/ Washington/ agriculture/ Athene cucularia/ fecundity/ land use/ natal recruitment/ reproductive success/ shrub-steppe/ density/ brood-egg/ fertility-recruitment/ philopatry/ habitat/ settlement

Abstract: Anecdotal evidence suggests that Burrowing Owls have declined in the state of Washington. We examined the status of these owls in agricultural and urban habitats to better understand the underlying causes of these declines. Nest density was higher in the area dominated by agriculture (0.67 nests/km²) than in the urban area (0.28 nests/km²), and re-use of nest burrows was more common in the agricultural area. We found no difference in mean clutch size between the two areas, but nesting success was higher in the agricultural area. The mean number of fledglings per nesting attempt was higher in the agricultural area (2.02 vs. 1.47), but we found no difference between the two areas in the mean number of fledglings per successful nest (3.2 vs. 3.1). Both natal recruitment (4% vs. 8%) and annual return rate of adults (30% vs. 39%) were lower in the agricultural area than in the urban area, suggesting that the owl population in the agricultural area may not be stable and may be a "sink" population. Due to high burrow fidelity from year to year, and the tendency of some owls in Washington to overwinter, we recommend that legal protection of nest burrows be extended to the nonbreeding season.

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1994. Comparison of chlorpyrifos fate and effects in outdoor aquatic micro- and mesocosms of various scale and construction.

Leeuwangh, P.

In: *Freshwater Field Tests for Hazard Assessment of Chemicals*/ Hill, I. R.; Heimbach, F.; Leeuwangh, P.; and Mattiessen, P. Boca Raton, FL: Lewis Publishers, 1994; pp. 217-248.

Notes: Literature review; Conference: European Workshop on Freshwater Field Tests, Potsdam (Germany), 25-26 Jun 1992; ISBN: 0-87371-940-9.

Descriptors: pesticides/ fate/ pollution effects/ experimental research/ freshwater ecology/ aquatic communities/ fate of pollutants/ aquatic environment/ insecticides/ taxonomy/ water pollution effects/ chlorpyrifos/ aquatic environments/ chlorpyrifos/ effects on organisms/ effects of pollution/ freshwater pollution

Abstract: Various micro- and mesocosms simulating the natural environment have been used to study the fate and effects of the insecticide chlorpyrifos. Literature was reviewed to observe the influence of scale, test design and meteorological conditions on the fate and effects of chlorpyrifos. The disappearance of chlorpyrifos from water is consistent in all studies, despite variation in system dimensions (9 to 450 m³) and in physico-chemical and biological properties. In most studies however, the product has no effect on the physico-chemical characteristics of the water. It is possible that intermesocosm variability, especially that due to the macrophyte biomass at the time of application of the pesticide, obscures subtle effects. The primary effects of chlorpyrifos were consistent in all studies, even though wide differences were apparent in the composition of the main taxonomic groups at the time of application of the pesticide. Indirect effects of chlorpyrifos in micro- and mesocosms are much more variable, in both direction and magnitude. In some, but not all studies, phytoplankton, periphyton, rotifers, oligochaetes, some mollusc taxa and the isopod *Asellus* have shown a tendency to increase in biomass or abundance. Reductions in chlorpyrifos-sensitive invertebrate forage species resulted in transient reduced growth of endemic larval fathead minnows. The complexity of natural ecosystems and the lack of qualitative and quantitative a priori information on trophic structure can make prediction of indirect effects very difficult. In the reviewed literature there were no indications of direct or indirect effects on macrophytes, Coelenterata or Arachnida. No mention was made of other taxa.

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1995. A comparison of raptor densities and habitat use in Kansas cropland and rangeland ecosystems.

Williams, C. K.; Applegate, R. D.; Lutz, R. S.; and Rusch, D. H.

Journal of Raptor Research 34(3): 203-209. (2000)

NAL Call #: QL696.F3J682; ISSN: 08921016

Descriptors: American kestrel/ Buteo jamaicensis/ Circus cyaneus/ Cover type selection/ cropland/ density/ Falco sparverius/ line transect/ northern harrier/ rangeland/ red-tailed hawk/ arable land/ habitat selection/ population density/ rangeland/ raptors/ species diversity/ United States

Abstract: We counted raptors on line transects along roads to assess densities, species diversity, and habitat selection of winter raptors between cropland and rangeland habitats in eastern Kansas. We conducted counts every 2 wk between September-March 1994-98. Species diversity indices did not differ between the two habitats (P = 0.15). We calculated density estimates and cover type selection for Red-tailed Hawks (*Buteo jamaicensis*), Northern Harriers (*Circus cyaneus*), and American Kestrels (*Falco sparverius*). Red-tailed Hawks and Northern Harrier densities were higher in cropland, while kestrel densities did not differ between the two habitats. All three species across both habitats had a general preference for ideland habitat. We believe three factors could explain the higher raptor densities in cropland: increased prey abundance, increased visibility of prey associated with harvested agriculture fields, and/or a higher relative amount of preferred hunting habitat.

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1996. 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.)

Madison, MS: USDA, NRCS, 2000.

Notes: "Technical Report, USDA/NRCS/WHMI-2000."

"December 2000." Includes bibliographical references.

NAL Call #: aS604.6 C66 2000

Descriptors: Agricultural law and legislation---United States/ Agricultural conservation---Government policy---United States/ Wildlife habitat improvement---United States/ Wetland agriculture

Abstract: Contents: Conservation compliance and wetlands conservation provisions of the Omnibus Farm Acts of 1985, 1990, and 1996/ Stephen J. Brady; Grassland bird use of Conservation Reserve Program fields in the Great Plains/ Douglas H. Johnson; Waterfowl responses to the Conservation Reserve Program in the Northern Great Plains/ Ronald E. Reynolds; Impact of the Conservation Reserve Program on wildlife conservation in the Midwest/ Mark R. Ryan; Wildlife responses to the Conservation Reserve Program in the Southeast/ Wes Burger; The value of buffer habitats for birds in agricultural landscapes/ Louis B. Best; Biological responses to wetland restoration: Implications for wildlife habitat development through the Wetlands Reserve Program/ Charlie Rewa; Wildlife Habitat Incentives Program: A summary of accomplishments, 1998-1999/ Ed Hackett; Environmental Quality Incentives Program: Program summary and potential for wildlife benefits/ Anthony Esser, Robert T. Molleur, Paige Buck, Charlie Rewa; Wildlife responses to wetland restoration and creation: An annotated bibliography/ Charlie Rewa; An annotated bibliography for wildlife responses to the Conservation Reserve Program/ Arthur W. Allen
This citation is from AGRICOLA.

1997. Conservation in America: State government incentives for habitat conservation.

Defenders of Wildlife

Defenders of Wildlife 1 (2002).

http://www.biodiversitypartners.org/pubs/CinAReport/Conservation_in_America.pdf

Descriptors: census-survey methods/ conservation/ conservation education/ conservation programs/ Conservation Reserve Program/ ecosystem management/ endangered-threatened species/ funding/ game farms/ habitat alterations/ habitat management/ land acquisition/ land use/ land, private/ land, public/ landowners/ laws-law enforcement/ management/ monitoring/ planning/ population ecology/ preservation/ protection/ public relations/ restoration/ socio-economic studies/ species diversity/ wildlife/ incentives

Abstract: The major cause for the extinction of various species is habitat destruction, which needs to be controlled in order to preserve the wildlife heritage of a country. The authors discuss the efforts taken by the federal and state governments to encourage private landowners in conserving the wildlife heritage. There are many political and public objections to the purchase of private land by the government and hence alternate conservation approaches for preserving the diminishing habitats in privately owned lands need to be carried out by the government. The approaches adopted were based on the incentives given to the landowners for maintaining a healthy habitat. The incentives include direct payments, education/technical

assistance, legal/statutory mechanisms, market institutions, property rights tools, recognition programs, administrative streamlining, and tax relief. A detailed description of these incentives by state governments along with examples of successful programs, summarization of the information collected from 50 states about 400 incentives and programs and results of the research with the incentive type, number of programs, and people involved in it, are listed in this article. Accounts of the amount of land affected by the conservation programs and various methods that need to be adopted by states to further improve their efforts to conserve private lands have been suggested here.

Questionnaires, maps, tables, and charts that reveal the data collected from the survey are presented. It was concluded that the incentives for habitat conservation on private land need a strong support by funding, field studies, data collection, and coordinated planning.

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1998. Conservation of disturbance-dependent birds in eastern North America.

Hunter, W. C.; Buehler, D. A.; Canterbury, R. A.;

Confer, J. L.; and Hamel, P. B.

Wildlife Society Bulletin 29(2): 440-445. (2001)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: birds/ disturbance/ early succession/ fire/ grasslands/ prairies/ savanna/ shrub-scrub/ avifauna/ population decline/ species conservation/ North America
Abstract: Populations of most bird species associated with grassland, shrub-scrub habitats, and disturbed areas in forested habitats (hereafter all referred to as disturbance-dependent species) have declined steeply. However, a widespread perception exists that disturbance-dependent species are merely returning to population levels likely found by the first European explorers and settlers. The fact that many disturbance-dependent bird species and subspecies are now extinct, globally rare, threatened, or endangered challenges that perception and raises the question of balance between conservation efforts for birds dependent upon disturbances and birds more closely associated with mature forests. An overall understanding of the status and trends for these disturbance-dependent species requires reconstruction of at least thousands of years of Native American land use followed by 500 years of post-European settlement. Interpretations herein on how to manage for these disturbance-dependent species should support efforts to conserve all landbirds in eastern North America.

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1999. Conservation of priority birds in sagebrush ecosystems.

Rich, T. D.; Wisdom, M. J.; and Saab, V. A.

In: Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference, General Technical Report-PSW 191/ Ralph, C. J. and Rich, T. D.; Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 589-606.

Notes: Volume 2; ISSN: 0196-2094; Conference held 2002 March 20-24 in Asilomar, California.

http://www.fs.fed.us/psw/publications/documents/psw_gtr191/Asilomar/pdfs/589-606.pdf

Descriptors: Artemisia, Columbia Plateau/ conservation plans/ Great Basin/ greater sage-grouse/ landbirds/

Partners in Flight/ population trends/ public land/ sagebrush

Abstract: Sagebrush ecosystems occupy over 62,000,000 ha of the western US. However, they have been degraded or completely eliminated by agricultural conversion, overgrazing by domestic livestock, invasion of exotic plants, expansion of pinyon and juniper woodlands, uncharacteristic wildfires, and fragmentation. This habitat loss has led to an increasing number of special status species, including 630 plant and animal species of conservation concern. In this paper, we focus on the 22 taxa of sagebrush associated birds that are priorities in Partners in Flight Bird Conservation Plans. These range from sagebrush obligates--Greater Sage-grouse (*Centrocercus urophasianus*), Gunnison Sage-grouse (*C. minimus*), Sage Thrasher (*Oreoscoptes montanus*), Sage Sparrow (*Amphispiza belli*), Brewer's Sparrow (*Spizella breweri*)--to grassland associates such as Short-eared Owl (*Asio flammeus*) and Vesper Sparrow (*Poocetes gramineus*). Partners in Flight has identified five of these species for the continental Watch List--Swainson's hawk (*Buteo swainsoni*), both sage-grouse, the Short-eared Owl, and Brewer's Sparrow--which places them among the highest priority species for conservation action in North America. We also examine the extent to which sage grouse may serve as classic umbrella species for shrubsteppe avifauna. These species tended to occur together--83 pairwise correlations of relative abundance were significant (8.55 expected). Factor analysis of these data showed that species formed groups based on habitat associations much as expected, although sage-grouse aligned more closely with the Vesper Sparrow than expected. Population trends for three major physiographic strata that encompass sagebrush ecosystems--the Columbia Plateau, Wyoming Basin, and Basin and Range--showed the Columbia Plateau to have many more declining population trends. Habitat associations for declining species included both sagebrush and grassland types. Historic (1850) and current population sizes were estimated for 12 priority taxa in the Interior Columbia Basin based on predicted areas of historic and current source habitat. Estimated current population sizes are, not surprisingly, drastically reduced from historic numbers. The Western Meadowlark (*Sturnella neglecta*) showed the least percent reduction and Grasshopper Sparrow the most. For six species that had significant or near significant declines in the Columbia Plateau since 1966 and for which we had historic and current habitat estimates, the estimated historical declines were all remarkably similar to recent trends. Trends and management activities on public lands in Idaho, Oregon, and Washington that may be contributing to disproportionate declines in priority birds include an increase in the area burned annually by wildfire, an increase in the biomass of grazing cattle, and continued fencing and water development that spread negative impacts over an ever greater portion of the landscape. We suggest that conservation of sage-grouse populations in reasonable numbers well distributed across their historical ranges also will provide substantial benefits for many, or even most, other bird species that cooccur with these grouse. Given that more than 57 percent of this habitat is in public ownership and that concern for the future of sage-grouse continues to build, we have all the information and opportunity we need to take action. Indeed, if we cannot successfully conserve sage-grouse and the sagebrush

ecosystem in the US given our theory, our knowledge, and our large blocks of public land, then one wonders how we can succeed for other species elsewhere.

2000. **The Conservation Reserve Enhancement Program.**

Allen, Arthur W.

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. 115-132.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Conservation Reserve Enhancement Program/ landscape scale

Abstract: The Conservation Reserve Enhancement Program (CREP) reflects advancement in U.S. Department of Agriculture agricultural policy by addressing agriculturally related conservation on a multi-farm, landscape scale and establishing funding support and partnerships with state and non-governmental organizations. Underway in 25 states, with more being planned, the CREP addresses environmental issues on the farmed landscape with implications for environmental quality potentially reaching thousands of miles away from where program conservation practices are established. Most CREPs have been initiated only within the last 4 years. Monitoring programs to evaluate CREP performance have been established, but because of time needed to establish vegetative covers, growing participation in the programs over time, and the complexities of landscape-level analysis, quantifiable results are limited. Environmental data related to CREP effects on water quality and wildlife habitats are being collected for future assessments and refinement of the program. By addressing state-identified priorities, landowner needs, and social issues, the CREP offers substantial promise to fully integrate economically viable agricultural production and effective conservation.

2001. **The Conservation Reserve Program and duck production in the U.S. Prairie Pothole Region.**

Reynolds, Ronald E.

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. 33-40.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: ducks/ Conservation Reserve Program (CRP)/ conservation assessment/ Prairie Pothole Region/ nest success/ mallard/ *Anas platyrhynchos*/ Gadwall/ *Anas strepera*/ blue-winged teal/ *Anas discors*/ northern shoveler/ *Anas clypeata*/ northern pintail/ *Anas aguta*/ waterfowl production areas/ wetlands habitats/ wetlands conservation/ Great Plains/ North Dakota/ South Dakota

Abstract: The paper presents a summary the success of the CRP in the Prairie Pothole Region. The Prairie Pothole Region (PPR) of North America has historically been considered the most important area of the continent for many species of waterfowl, particularly upland nesting ducks. CRP cover in the PPR has resulted in significantly increased productivity of ducks from the most important duck breeding area in North America. Ducks produced in

the PPR migrate to virtually every state, province, and territory in North America, Mexico, and several countries in South America. Waterfowl hunters and observers nationwide have been the beneficiaries of the CRP. In order to maintain duck production levels in the PPR, at least 5 million acres (2 million ha) of CRP will need to be targeted toward areas of moderate to high duck density. To maximize duck production and meet other regional migratory bird and upland bird population goals, a total of 8 million acres (3.2 million ha) of CRP cover is recommended (Wildlife Management Institute, 2001). Finally, Swampbuster provisions of the Farm Bill must be continued to protect wetlands habitat critical to breeding waterfowl and broods. Waterfowl enthusiasts nationwide will be looking forward to continuing the benefits of these landmark conservation initiatives.

2002. The Conservation Reserve Program in the Southeast: Issues affecting wildlife habitat value.

Burger, L. Wes

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. 63-92.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: Conservation Reserve Program/ USDA/ Farm Bill/ wildlife conservation/ wildlife habitat/ fish/ United States, Southeast/ cover crops/ forests

Abstract: Provision of wildlife habitat is one of the statutory objectives of the Conservation Reserve Program (CRP); however, the realized wildlife habitat benefits vary regionally in relation to specific cover crop, age, and management regimes. As of February 2005, 1,324,066 ha were enrolled in the CRP in 12 southeastern states. Approximately 57% of southeastern CRP was in 1 of 3 tree cover practices (CP3 new pine, CP3a new hardwood, or CP11 existing trees); 19% as CP10 existing grass (much of which was reenrolled CP1); 4% as CP1 cool-season grass; 3% in CP2 native warm season grasses; and 12% in continuous-signup buffer practices. Targeted conservation practices resulted in enrollment of 75,014 ha of longleaf pine within the longleaf practice and 2,850 ha of hardwoods in the continuous bottomland hardwood practice. Plant communities on CRP fields are not static, but change over time. In the southeastern United States, natural succession progresses rapidly because of fertile soils, long growing seasons, and substantial rainfall. As such, the specific wildlife species that occur on CRP stands will vary over the life of the contract. Wildlife populations at a given point in time will be a function of conservation practice, age of the stand, establishment methods, and mid-contract management regimes. Provision and maintenance of wildlife habitat on CRP fields in the South requires active management. Planned disturbance (disking or fire) should be incorporated into the conservation plan of operation for all grass plantings in the Southeast. Exotic forage grasses may need to be eradicated to accrue substantive wildlife benefits. Tree plantings also require active management. Most pine CP11 plantings are now 15-17 years old and are characterized by closed canopies with dense litter accumulation and little herbaceous ground cover. Thinning, selective herbicide, and prescribed fire would enhance the habitat value of these stands. The CRP has had substantial impact on land use and landscape composition in the

Southeast. However, the wildlife habitat value of fields enrolled in the CRP in the Southeast has been diminished by selection of cover practices with short duration or minimal habitat value (i.e., CP1, CP1 reenrolled as CP10, CP3, CP11). Proactive management of extant CRP acreage and selective enrollment of high-value cover practices (e.g. longleaf pine) will be required to achieve the types of wildlife habitat benefits associated with the CRP in other regions.

2003. The Conservation Security Program: A new conservation program that rewards historic land stewards who have applied and managed effective conservation systems.

Henry, Hank

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. 193-198.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ Conservation Security Program/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ land stewardship

Abstract: The Conservation Security Program (CSP) is a voluntary program that provides financial and technical assistance to promote the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes on tribal and private working lands. Working lands include cropland, grassland, prairie land, improved pasture, and rangeland, as well as forested land that is an incidental part of an agriculture operation. In the first signup, CSP was offered in 18 watersheds located in 22 states. In 2005, the program is available in all 50 states, the Caribbean, and the Pacific Basin. The program provides equitable access to benefits to all producers, regardless of size of operation, crops produced, or geographic location.

2004. Conserving nature, but to what end? Conservation policies and the unanticipated ecologies they support.

Carolan, M. S.

Organization and Environment 19(2): 153-170. (2006); ISSN: 10860266.

Notes: doi: 10.1177/1086026606288061.

Descriptors: contemporary evolution/ environmental management/ future of environmental sociology/ gene banks/ seed banks/ sustainable fishing/ trophy hunting

Abstract: The author examines various cases of conservation policies in practice, and the implication of those practices in terms of the ecologies they support, showing, in the end, that the "nature" being preserved is not always the one intended. In doing this, insights are also gleaned to inform how we should do environmental sociology, and what lies in environmental sociology's future if we work toward this end. The author argues that environmental sociology needs to become more environmental: to be willing to understand sociobiophysical relationships in all their complexity, even in those cases that require a well-grounded understanding of ecosystem processes. Thus, although retaining focus on the historical subject, which shapes conceptions of and ultimately practices toward ecology, we must also begin to view this subject as also an ecological object. The implications of

such an analytic move, in terms of what it means for environmental sociology's future, are then discussed.
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2005. Continuous Conservation Reserve Program: Factors influencing the value of agricultural buffers to wildlife conservation.

Clark, William R. and Reeder, Kathleen F.
 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. 93-114.
<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ agricultural buffers/ wildlife/ fish/ Continuous Conservation Reserve Program
Abstract: The Continuous Conservation Reserve Program (CCRP) principally consists of linear buffer conservation practices designed to remove highly erodible land from production and to improve water quality. The extent of projects differentiates CCRP from the general signup CRP, which focuses on whole-field enrollments. Small sizes and high edge to area ratios have the potential to limit the usefulness of these practices for wildlife. Careful planning and management are keys to gaining the desired wildlife benefits from these plantings, particularly with regard to the role of buffers in the landscape. Evidence that the practices enrolled in the CCRP are used by wildlife is mounting, although studies are still most heavily focused on the avian community. Further study on reproductive success and survival is needed on all species of wildlife using these plantings to determine how the CCRP can best serve wildlife habitat functions.

2006. Core terrestrial habitat for conservation of local populations of salamanders and wood frogs in agricultural landscapes.

Porej, D.; Micacchion, M.; and Hetherington, T. E.
Biological Conservation 120(3): 399-409. (2004)
 NAL Call #: S900.B5; ISSN: 0006-3207

Descriptors: wetlands/ Akaike information criterion/ fish/ glaciated plateau/ habitat preservation/ marbled salamanders/ predation/ red spotted newts/ smallmouth salamanders/ spotted salamanders/ tiger salamanders/ till plains/ wood frogs/ amphibia/ conservation/ Ohio/ *Notophthalmus viridescens viridescens*/ *Rana sylvatica*/ *Ambystoma tigrinum*/ *Ambystoma maculatum*/ *Ambystoma jeffersonianum*
Abstract: Pond-breeding amphibians require aquatic and terrestrial habitats to complete their lifecycles, and preservation of both habitats is necessary for maintaining local populations. Current wetland regulations focus primarily on aquatic habitats, and criteria to define critical upland habitats and regulations to protect them are often ambiguous or lacking. We examined the association between the presence of seven pond-breeding amphibian species and the landscape composition surrounding 54 wetlands located within the Till Plains and the Glaciated Plateau ecoregions of Ohio, USA. We quantified landscape composition within 200 m of the wetland ("core terrestrial zone") and the area extending from 200 m to 1 km from the wetland ("broader landscape context zone"). We constructed binary logistic regression models for each

species, and evaluated them using Akaike Information Criterion. Presence of spotted salamanders (*Ambystoma maculatum*), Jefferson's salamander complex (*A. jeffersonianum*) and smallmouth salamanders (*A. texanum*) was positively associated with the amount of forest within the core zone. Presence of wood frogs (*Rana sylvatica*) was positively associated with the amount of forest within the core zone and the amount of forest within the broader landscape context zone. Presence of tiger salamanders (*A. tigrinum tigrinum*) was negatively associated with the cumulative length of paved roads within 1 km of the site, and presence of red-spotted newts (*Notophthalmus v. viridescens*) was negatively associated with the average linear distance to the five nearest wetlands. Overall salamander diversity was positively associated with the amount of forest within the core zone, and negatively associated with the presence of predatory fish and cumulative length of paved roads within 1 km of the site. Our results confirm the strong association between the structure of surrounding upland areas and amphibian diversity at breeding ponds, and stress the importance of preserving core terrestrial habitat around wetlands for maintaining amphibian diversity.
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2007. Critical elements for biologically based recovery plans of aquatic-breeding amphibians.

Semlitsch, Raymond D.
Conservation Biology 16(3): 619-629. (2002) NAL Call #: QH75.A1C5 ; ISSN: 0888-8892 *Descriptors:* aquatic life/ amphibians/ ecosystems/ habitat management/ breeding/ habitat restoration/ habitat use
Abstract: The global loss of biodiversity and the increasing number of threatened or endangered species have focused attention on conservation and species-recovery strategies. Because current evidence indicates that some amphibians are experiencing population declines, range constrictions, or extinctions, and federal and state agencies have listed many species as threatened or endangered, it is essential to develop sound principles upon which to base recovery plans for different ecosystems, amphibian communities, or species if we are to balance the conservation of amphibian diversity with economic development and a growing human population. I present a framework of biologically based principles that can be used for current species conservation efforts. My goal is to provide the critical elements needed to develop biologically based recovery plans for aquatic-breeding amphibians in any region. This paper is organized in three parts: (1) an overview of critical local population and landscape processes required to maintain amphibian species and threats, (2) the critical elements associated with successful recovery plans, and (3) considerations for measuring success and long-term habitat management. Clearly, we need more basic data on life-history requirements, special adaptations, habitat use, dispersal behavior, and population biology, especially factors influencing long-term persistence for many species. Nevertheless, because some species are in urgent need of conservation action, we cannot afford to wait for additional data; the most important critical elements required to initiate effective recovery efforts for amphibians are known. I hope my discussion will help managers understand the importance of incorporating local population and metapopulation factors into their recovery and restoration plans. I also hope managers begin to think about ultimate

recovery and restoration strategies that consider connectivity among populations across regions and state boundaries.

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2008. The culture of fire in the Southeast.

Palmer, W. E.; Robertson, K. M.; and Masters, R. E. *Transactions of the North American Wildlife and Natural Resource Conference* 69: 354-368. (2004)

NAL Call #: 412.9 N814; ISSN: 0078-1355

Descriptors: forest/ fire/ habitat management/ Red Hills region/ Florida/ Georgia

Abstract: The paper reiterates the ecological importance of frequent fire for management practices and maintenance of upland systems in the South, presenting the Red Hills experience where fire use has remained the dominant land management practice. Obstacles to conducting prescribed fires are summarized. [from paper]

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2009. Deer herbivory as an ecological constraint to restoration of degraded riparian corridors.

Opperman, Jeff J. and Merenlender, Adina M.

Restoration Ecology 8(1): 41-47. (2000)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: conservation measures/ nutrition/ diet/ ecology/ terrestrial habitat/ land and freshwater zones/ Ungulata (Mammalia): habitat management/ food plants/ feeding behavior/ grazing/ riparian woodlands/ corridor restoration/ forest and woodland/ California/ Mendocino County/ Mammalia/ chordates/ mammals/ vertebrates

Abstract: Ungulate herbivory can impact riparian vegetation in several ways, such as by reducing vigor or reproductive output of mature plants, and through increased mortality of seedlings and saplings. Much work has focused on the effects of livestock grazing within riparian corridors, while few studies have addressed the influence of native ungulate herbivory on riparian vegetation. This study investigated the effect of deer herbivory on riparian regeneration along three streams with degraded riparian corridors in Mendocino County, California. We utilized existing stream restoration efforts by private landowners and natural resource agencies to compare six deer exclosures with six upstream control plots. Livestock were excluded from both exclosure and control plots. Three of the deer exclosures had been in place for 15 years, one for 6 years, and two for 4 years. The abundance and size distribution of woody riparian plant species such as *Salix exigua*, *S. laevigata*, *S. lasiolepis*, *Alnus rhombifolia*, and *Fraxinus latifolia* were quantified for each exclosure and control plot. The mean density of saplings in deer exclosures was $0.49 \pm 0.15/m^2$, while the mean density of saplings in control plots was $0.05 \pm 0.02/m^2$. Within exclosures, 35% of saplings were less than 1 m and 65% were greater than 1 m; within control plots, 97% of saplings were less than 1 m in height. The fact that little regeneration had occurred in control plots suggests that deer herbivory can substantially reduce the rate of recovery of woody riparian species within degraded riparian corridors. Exclusionary fencing has demonstrated promising results for riparian restoration in a region with intense deer herbivory.

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2010. Demographic limitations of the ability of habitat restoration to rescue declining populations.

Schrott, G. R.; With, K. A.; and King, A. W. *Conservation Biology* 19(4): 1181-1193. (2005)

NAL Call #: QH75.A1C5 ; ISSN: 08888892.

Notes: doi: 10.1111/j.1523-1739.2005.00205.x.

Descriptors: demographic models/ extinction risk/ habitat fragmentation/ habitat loss/ migratory birds/ neutral landscape models/ habitat fragmentation/ habitat restoration/ migratory population/ population decline/ Aves/ Passeri

Abstract: Habitat restoration is often recommended in conservation without first evaluating whether populations are in fact habitat limited and thus whether declining populations can be stabilized or recovered through habitat restoration. We used a spatially structured demographic model coupled with a dynamic neutral landscape model to evaluate whether habitat restoration could rescue populations of several generic migratory songbirds that differed in their sensitivity to habitat fragmentation (i.e., severity of edge effects on nesting success). Simulating a best-case scenario, landscapes were instantly restored to 100% habitat before, at, or after habitat loss exceeded the species' vulnerability threshold. The vulnerability threshold is a measure of extinction risk, in which the change in population growth rate ($\Delta\lambda$) scaled to the rate of habitat loss (Δh) falls below -1% ($\Delta\lambda/\Delta h \leq -0.01$). Habitat restoration was most effective for species with low-to-moderate edge sensitivities and in landscapes that had not previously experienced extensive fragmentation. To stabilize populations of species that were highly edge sensitive or any species in heavily fragmented landscapes, restoration needed to be initiated long before the vulnerability threshold was reached. In practice, habitat restoration is generally not initiated until a population is at risk of extinction, but our model results demonstrate that some populations cannot be recovered at this point through habitat restoration alone. At this stage, habitat loss and fragmentation have seriously eroded the species' demographic potential such that halting population declines is limited more by demographic factors than the amount of available habitat. Evidence that populations decline in response to habitat loss is thus not sufficient to conclude that habitat restoration will be sufficient to rescue declining populations. ©2005 Society for Conservation Biology.

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2011. Desert water harvesting to benefit wildlife: A simple, cheap, and durable sub-surface water harvester for remote locations.

Rice, W. E.

Environmental Monitoring and Assessment 99(1-3): 251-257. (2004)

NAL Call #: TD194.E5; ISSN: 01676369.

Notes: doi: 10.1007/s10661-004-4030-6.

Descriptors: appropriate technology/ micro-catchment/ water conservation/ water harvester (guzzler)/ crops/ harvesters/ irrigation/ pipe/ polyvinyl chlorides/ precipitation (meteorology)/ desert water harvesting/ drinking trough/ drip irrigation/ mean annual precipitation (MAP)/ surface waters/ appropriate technology/ arid environment/ water management/ water supply/ wildlife management/ water availability/ water management/ farm crops/ harvesting/ irrigation/ piping/ polyvinyl chloride/ precipitation/ storage tanks/ Idaho/ Animalia/ *Artemisia tridentata*/ Aves

Abstract: A sub-surface desert water harvester was constructed in the sagebrush steppe habitat of south-central Idaho, U.S.A. The desert water harvester utilizes a buried micro-catchment and three buried storage tanks to augment water for wildlife during the dry season. In this region, mean annual precipitation (MAP) ranges between about 150-250 mm (6"-10"), 70% of which falls during the cold season, November to May. Mid-summer through early autumn, June through October, is the dry portion of the year. During this period, the sub-surface water harvester provides supplemental water for wildlife for 30-90 days, depending upon the precipitation that year. The desert water harvester is constructed with commonly available, "over the counter" materials. The micro-catchment is made of a square-shaped, 20 mL "PERMALON" polyethylene pond liner (approximately 22.9 m × 22.9 m = 523 m²) buried at a depth of about 60 cm. A PVC pipe connects the harvester with two storage tanks and a drinking trough. The total capacity of the water harvester is about 4777 L (1262 U.S. gallons) which includes three underground storage tanks, a trough and pipes. The drinking trough is refined with an access ramp for birds and small animals. The technology is simple, cheap, and durable and can be adapted to other uses, e.g. drip irrigation, short-term water for small livestock, poultry farming etc. The desert water harvester can be used to concentrate and collect water from precipitation and run-off in semi-arid and arid regions. Water harvested in such a relatively small area will not impact the ground water table but it should help to grow small areas of crops or vegetables to aid villagers in self-sufficiency. © 2004 Springer Science+Business Media, Inc. © 2008 Elsevier B.V. All rights reserved.

2012. Designs for protecting amphibians in managed headwater forests in the U.S. Pacific Northwest.

Olson, Deanna H.; Rugger, Cynthia; and Rundio, David
Northwestern Naturalist 87(2): 181. (2006)
NAL Call #: QL671.M8; ISSN: 1051-1733.

Notes: 2006 Annual Meetings of the Society for Northwestern Vertebrate Biology and the Washington Chapter of the Wildlife Society, held jointly at Evergreen State College, Washington, March 27-April 1, 2006.

Descriptors: *Abies* spp./ Douglas fir/ forests/ treatment/ thinning/ amphibians/ habitat/ Pacific Northwest

Abstract: Headwaters comprise the majority of US Pacific Northwest forest landscapes, and harbor a diversity of endemic species. Thinning of young managed stands is being used on federal lands for wood production, fuels reduction to reduce risk of severe fire, and accelerated development of late-successional forest conditions. Thinning with headwater-stream riparian buffers and upslope-leave islands holds promise for species retention. Specifically, our research examines the effects on instream, bank-dwelling, and upslope amphibians of four riparian buffer widths (6, 15, 70, and 145 m on each side of streams) and three sizes of upslope leave islands (0.1, 0.2, and 0.4 ha circular patches) within a thinned forest matrix (50 to 80 y), which reduced Douglas- fir stands from about 600 trees ha (tph) to 200 tph. Instream amphibians were not affected by joint buffers and upslope thinning in years first and second post-treatment, while some effects were seen on bank and thinned upslope salamander species abundances. Larger leave islands retained habitats and fauna. We are tracking stream species' responses through

year five post-thinning and propose to follow the study through a second entry of thinning, reducing stands to about 80 tph.

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2013. Detailed study of irrigation drainage in and near wildlife management areas, west-central Nevada, 1987-90.

Hoffman, R. J.

Denver, Colo.: U.S. Geol. Survey, Earth Science Information Center, 1994. USGS Water-Resources Investigations Report.

NAL Call #: GB701.W375 no.92-4024C

Descriptors: wetlands/ wildlife habitats/ water quality/ irrigation effects/ public health/ contamination/ toxicity/ heavy metals/ agricultural hydrology/ aquatic life/ bioaccumulation/ water pollution effects/ Nevada/ Stillwater Wildlife Management Area

Abstract: This report presents a summary of the detailed scientific study of Stillwater Wildlife Management Area and other nearby wetlands in west-central Nevada during 1987-90. The work was funded by the National Irrigation Water Quality Program of the U.S. Department of the Interior with the overall objectives of determining (1) the extent, magnitude, and effects of selected water-quality constituents associated with irrigation drainage on fish, wildlife, and human health, and (2) the sources and exposure pathways that cause contamination where adverse effects are documented. Much of the information in this report was summarized from two previously published interpretive reports that were completed to fulfill study objectives. Where applicable, data for the study area from other published sources also were utilized. The results of these studies indicate that the aquatic biota in natural wetlands of the Carson Desert are adversely affected by hydrological and geochemical sources and processes in the Newlands Irrigation Project area. Reactions between water and naturally occurring minerals in the shallow alluvial aquifer increase concentrations of potentially toxic constituents in ground water that eventually enters the wetlands. Once in the wetlands, these constituents are further concentrated by evaporation and transpiration. Water from some agricultural drains that enter Stillwater WMA was acutely toxic to aquatic organisms. The drains in the agricultural areas, which eventually discharge to the wetlands, were also implicated as sites of uptake of selenium and mercury by aquatic organisms.

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2014. Detailed study of irrigation drainage in and near wildlife management areas, west-central Nevada, 1987-90 - Part B: Effect on biota in Stillwater and Fernley Wildlife Management Areas, and other nearby wetlands.

Hallock, R. J. and Hallock, L. L.

Denver, Colo.: U.S. Geological Survey; Water Resources Investigation Report: 92-4024B, 1993.

Descriptors: wetlands/ water pollution effects/ toxicity/ selenium/ dissolved solids/ water quality/ waterfowl/ water control/ wildlife/ irrigation/ drainage/ pollution effects/ Nevada/ Stillwater

Abstract: A water-quality reconnaissance study during 1986-87 found high concentrations of several potentially toxic elements in water, bottom sediment, and biota in and near Stillwater Wildlife Management Area (WMA). This study prompted the U.S. Department of the Interior to initiate a more detailed study to determine the hydrogeochemical processes that control water quality in the Stillwater WMA, and other nearby wetlands, and the resulting effects on biota, especially migratory birds. Present wetland size is about 10% of historical size; the dissolved-solids load in the water in these now-isolated wetlands has increased only moderately, but the dissolved-solids concentration has increased more than seven-fold. Wetland vegetation has diminished and species composition in flow water has shifted to predominant salt-tolerant species in many areas. Decreased vegetative cover for nesting is implicated in declining waterfowl production. Decreases in numbers or virtual absence of several wildlife species are attributed to degraded water quality. Results of toxicity tests indicate that water in some drains and wetland areas is acutely toxic to some fish and invertebrates. Toxicity is attributed to the combined presence of arsenic, boron, lithium, and molybdenum. Biological pathways are involved in the transport of mercury and selenium from agricultural drains to wetlands. Hatch success of both artificially incubated and field-reared duck eggs was greater than/= 90 percent; no teratogenesis was observed. Mercury in muscle tissue of waterfowl harvested from Carson Lake in October 1987 exceeded the human health criterion six-fold.
© ProQuest

2015. Detailed study of selenium and selected elements in water, bottom sediment, and biota associated with irrigation drainage in the middle Green River Basin, Utah, 1988-90.

Stephens, D. W.; Waddell, B.; Peltz, A.; and Miller, J. B. Denver, Colo.: U.S. Geological Survey; Water-Resources Investigations Report 92-4084, 1992. 164 p.
Descriptors: wetlands/ bioaccumulation/ drainage water/ selenium/ water pollution effects/ water pollution sources/ ducks/ irrigation/ water birds/ waterfowl/ wildlife habitats
Abstract: Studies completed at Stewart Lake Waterfowl Management Area, lower Ashley Creek, Ouray National Wildlife Refuge, and Pariette Wetlands, Utah identified several areas where selenium was adversely affecting water quality and creating a hazard to wildlife. The source of contamination at Stewart Lake is drainwater and shallow groundwater from soils derived from Mancos Shale. Median concentrations of selenium in all drainwater discharged to Stewart Lake exceeded the State standard of 5 microg/L established for wildlife protection. Selenium concentrations in all biological tissues sampled at Stewart Lake Waterfowl Management Area were large compared to concentrations in biota from most other sites in the middle Green River basin. Selenium concentrations in Ashley Creek upstream of the City of Vernal generally were less than 1 microg/L but 12 miles downstream averaged 73 microg/L. The source of the contamination was believed to be from inflows of shallow groundwater and surface water originating as seepage from a sewage-lagoon system that flows through Mancos Shale and mobilizes selenium. Waterfowl from the area contained selenium concentrations as large as 27.2 microg/g in muscle tissue, and an eared grebe egg contained 71 microg/g. Selenium contamination of ponds at

Ouray National Wildlife Refuge was limited to a small area on the western part of the refuge and was apparently due to seepage of shallow groundwater into waterfowl ponds. Geometric mean concentrations of selenium in plants, invertebrates, bird eggs, and fish from the North and South Roadside Ponds were larger than concentrations known to cause reproductive failure in mallards. (USGS)
© ProQuest

2016. The development of bottomland forest restoration in the lower Mississippi River Alluvial Valley.

Hayes, R. J.
Ecological Restoration 22: 170-182. (Sept. 2004)
Descriptors: lowland forests/ ecological restoration/ reforestation/ land use/ wetlands/ hardwood/ trees/ forest habitats/ forest policy/ history/ planting/ forest ecology/ forest wildlife relations/ forest management/ silvicultural practices/ Mississippi River/ United States, southeastern region/ plant ecology/ aquatic biology and ecology general/ animal ecology and behavior/ forest management/ land resources
This citation is from AGRICOLA.

2017. Directing spatial patterns of recruitment during an experimental urban woodland reclamation.

Robinson, G. R. and Handel, S. N.
Ecological Applications 10(1): 174-188. (2000)
NAL Call #: QH540.E23 ; ISSN: 10510761
Descriptors: clonal growth/ dispersal/ experimental reclamation/ nucleation/ safe sites/ seed sources/ spatial pattern/ surrounding landscape/ habitat restoration/ nucleation/ recruitment/ restoration ecology/ seed dispersal/ spatial analysis/ woodland/ United States
Abstract: Studies of biological invasions indicate that natural recruitment of new species can occur as a 'nucleation' phenomenon, in which scattered colonization foci spread and coalesce. Ecological reclamation of damaged lands might make use of this potential for enhanced natural dispersal, by inoculating sites with multiple small plantings to attract animal dispersers and other mutualists from nearby remnants of natural habitat. We conducted an experimental test of this proposition. On a 6-ha section of an abandoned municipal landfill in the New Jersey Meadowlands, we installed 16 clusters of 21 trees and shrubs in an array of fenced plots. Clusters contained seven native species known to: (1) attract bird dispersers to introduce propagules from remnants of off-site habitat; (2) contribute propagules by virtue of high reproductive output and clonal growth; and (3) accelerate woodland succession on open, degraded habitats. Average plant size was varied, with half the plots receiving larger trees and shrubs, to test whether woody plant size would enhance any attractive function. An additional eight empty plots were studied to estimate background rates of recruitment and to test for a fencing effect. Site preparation included the addition of 90 cm of fresh substrate, including organic matter, and a cover crop of annual grasses. Recruitment of woody plants inside and surrounding the experimental plots was examined for five years, and results were compared on the basis of treatment and recruitment mode (avian, wind, or clonal dispersal). Woody plant recruitment into experimental plots was rapid and substantial, primarily via dispersal from natural sources. Plots with larger plants attracted significantly more recruits

at the outset, but this difference diminished over time. Fall seed rain samples yielded a mean estimate of 426 seeds/m² within plots. However, size distributions of recruiting woody species increasingly shifted toward larger individuals each year. Experimental manipulations that opened seed beds for woody plant recruitment had short-lived effects, indicating a narrow window of opportunity for establishment. Spread of the planted species themselves was generally weak, although clonal growth contributed substantially to spread on the margins of plots. Most recruitment outside experimental plots was from external sources. A strong proximity component was found for bird-dispersed recruits, which were highly clustered near planted plots, with the highest densities near source populations on the site margin. Wind-dispersed trees and shrubs, by contrast, were not associated with planted plots and were concentrated near one corner of the site. Discounting plot interiors, total recruitment density for the site after 5 yr was ~800 woody stems/ha, 36% via avian dispersal, 10% via clonal spread, and the remainder via wind-borne propagules. New recruits represented 26 woody plant species, all but four from external sources, and only five common species contributed more than a few recruits. We conclude that techniques for manipulating natural seed dispersal hold promise for ecological restoration, provided that background populations are available to supply colonists.

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2018. Distinctiveness, use, and value of Midwestern oak savannas and woodlands as avian habitats.

Grundel, Ralph and Pavlovic, Noel B.

Auk 124(3): 969-985. (2007)

NAL Call #: 413.8 AU4 ; ISSN: 0004-8038

Descriptors: terrestrial ecology: ecology, environmental sciences/ wildlife management: conservation/ forest habitat/ migration/ woodland/ vegetation gradient/ oak savanna

Abstract: Oak savannas and woodlands historically covered millions of hectares in the midwestern United States but are rare today. We evaluated the ecological distinctiveness and conservation value of savannas and woodlands by examining bird distributions across a fire-maintained woody-vegetation gradient in northwest Indiana encompassing five habitats-open habitats with low canopy cover, savannas, woodlands, scrublands, and forests-during migration, breeding, and overwintering. Savannas and woodlands were significantly different in overall bird species composition from open and forest habitats but were often intermediate between open and forest in guild densities. Few bird species were consistently and highly concentrated in savannas or woodlands, and the Red-headed Woodpecker (*Melanerpes erythrocephalus*) was the only species significantly more abundant in savannas and woodlands than in open, scrub, and forest habitats. Fire frequency over a 15-year interval was a significant predictor of bird community composition and was positively related to species diversity, spring transient migrant density, and density of the most threatened species. Each habitat type had characteristics potentially important for avian conservation. Scrub had the highest density of transient migrants, which suggests it plays an important role as migration stopover habitat. More species were significantly concentrated in open or forest habitats than in the other habitats. Lack of species concentration and intermediate community composition suggested that birds

experienced savannas and woodlands more as ecotones than as habitats distinct from forests or grasslands. However, this intermediate character can benefit conservation, as evidenced by savannas and woodlands having the highest density of the most threatened species along this woody-vegetation gradient.

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2019. Distribution and composition of mammalian predators along the Snake River in southwestern Idaho.

Zoellick, B. W.; Ulmschneider, H. M.; and Stanley, A. W.

Northwest Science 79(4): 265-272. (2005)

NAL Call #: 470 N81; ISSN: 0029344X

Descriptors: mammals/ birds/ predators/ nesting/ habitat management/ reduced river flows

Abstract: In 1990-1992, we studied the distribution and composition of a mammalian predator community to assess its potential to impact ground-nesting waterfowl and songbirds on Snake River islands in Deer Flat National Wildlife Refuge in southwestern Idaho. We used scent-station and track-plot surveys to examine visits of mammalian predators to riparian areas on the mainland and to 30 Refuge islands on a 64-km reach of the river. Coyotes, mink, red foxes, raccoons, and striped skunks were widely distributed. Visitation rates of mammalian predators that frequently visited scent stations (coyotes, red foxes, striped skunks, and feral cats) did not differ among upper, middle, and lower segments of the study reach. Tracks of river otters were primarily observed on the upper two-thirds of the study reach that had less agricultural development. Badgers, bobcats, and mountain lions were infrequently detected. Refuge islands provided relatively mammalian predator-free habitat for nesting birds as visitation rates of terrestrial predators to scent stations and track plots in riparian areas on the mainland were generally 2-4 times those on islands at river flows of 184.1 m³/s. Reducing Snake River flows has the potential to increase visits to islands of four terrestrial carnivores (coyotes, raccoons, red foxes, and striped skunks) that were widely distributed on the mainland and important predators of nesting waterfowl. Because mammalian predators were widely distributed, management actions to prevent or reduce predator visits would need widespread application to result in more than localized increases in waterfowl production on Refuge islands. © 2005 by the Northwest Scientific Association. All rights reserved.
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2020. Distribution of bats in fragmented wetland forests of southeast Missouri.

Warwick, Adam; Fredrickson, Leigh H.; and Heitmeyer, Mickey

Bat Research News 42(4): 187. (2001)

NAL Call #: QL737.C5 B328; ISSN: 0005-6227

Descriptors: bottomland hardwood forests/ bats/ Mississippi Alluvial Valley/ remnant forests/ habitat management

Abstract: Bottomland Hardwood wetlands in the Mississippi Alluvial Valley (MAV) were gradually converted to row crops beginning in the mid-1800's. Among states with wetland forests in the MAV, Missouri has the most severe losses and modifications with about 40,000 ha of the original one million ha remaining as small patches of remnant forests in nine southeastern countries. Little is known about remnant

wildlife populations within this highly fragmented landscape and foremost among these taxa is the order Chiroptera. Bats play an important role in bottomland forests as prey for snakes, hawks, owls, skunks, and opossums. Furthermore, bats serve agriculture by controlling common crop pests. We report on the abundance and species richness of bats in three landscapes of varying amounts of forest cover. We also report on the distribution of bats among natural forest remnants, and sites with agroforestry, buffer strips, and windbreaks. The first field season of 5500 net hours and 200 detector hours has revealed that landscapes with medium forest cover are used the most by bat species, with the highest abundance and species richness occurring in buffer strips and natural forest patches. Species of concern such as *Myotis sodalis* and *M. grisescens* have been documented on some study sites. In addition, male little brown bats *M. lucifugus* have been encountered in multiple forest patches, implicating bottomland hardwood forests as important summer habitat. These results are essential to develop landscape-level predictions of bat abundance and species richness in relation to forest cover and habitat type in disrupted floodplain systems.

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2021. Diversity of neotropical migratory landbird species assemblages in forest fragments and man-made vegetation in Los Tuxtlas, Mexico.

Estrada, A. and Coates-Estrada, R.

Biodiversity and Conservation 14(7): 1719-1734. (2005)

NAL Call #: QH75.A1B562; ISSN: 09603115.

Notes: doi: 10.1007/s10531-004-0696-x.

Descriptors: agricultural habitats/ avian diversity/ forest fragmentation/ Los Tuxtlas/ Mexico/ neotropical migrant birds/ forest/ habitat fragmentation/ migratory species/ species diversity/ Veracruz/ Aves/ Capsicum frutescens/ citrus/ Pimenta dioica/ Theobroma cacao/ Zea mays

Abstract: We investigated the presence of Neotropical migratory landbirds in a 90-km² landscape in the region of Los Tuxtlas, Veracruz, Mexico. Using the fixed-radius count point procedure, migratory landbirds were surveyed in 21 forest fragments and in four replicates of shaded (coffee, cacao and mixed) and unshaded (citrus and allspice) plantations, live fences, non-arboreal crops (corn and jalapeno chili pepper) and pastures. The surveys resulted in the count of 4732 birds representing 72 species. While forest fragments accounted for 65% of the total species count, 73% of the birds were counted in the arboreal man-made habitats. Pastures contributed to 10% of the species and to 1% of the individuals counted. Live fences were particularly rich in individuals, accounting for 28% of the birds counted. Rarefaction analysis showed that forest fragments were the sites richest in species, followed by shaded and unshaded plantations and by live fences. Pastures were the habitats poorest in species, followed by non-arboreal crops. Species richness of Neotropical migratory landbirds was associated to vertical and horizontal diversity of vegetation in the habitats investigated. Shaded and unshaded plantations as well as live fences were more similar to forest fragments in species assemblages than non-arboreal crops and pastures. We discuss the conservation value of arboreal agricultural

habitat and of live fences in conjunction with forest fragments as temporary habitats for Neotropical migratory landbirds that stop over or winter in Los Tuxtlas. © Springer 2005.

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2022. Does mallard clutch size vary with landscape composition?

Ball, I. J.; Artmann, M. J.; and Hoekman, S. T.

Wilson Bulletin 114(3): 404-406. (2002)

NAL Call #: 413.8 W692; ISSN: 00435643

Descriptors: arable land/ clutch size/ grassland/ landscape structure/ waterfowl/ United States/ *Anas platyrhynchos*
Abstract: We studied Mallards (*Anas platyrhynchos*) nesting in artificial nesting structures in northeastern North Dakota and compared clutch size between landscapes where proportion of cropland was either high (mean = 68.9%, cropland landscapes) or low (mean = 30.2%, grassland landscapes). Mallard clutch size was significantly related to nest initiation date and landscape composition. Mean clutch size, controlled for nest initiation date, was 1.24 ± 0.33 SE eggs smaller on cropland landscapes than on grassland landscapes. Generality of this pattern across space, time, and type of nesting sites is unknown, as is causation. Demographic importance of variation in clutch size may be influenced by covariation with other demographic variables, such as nest success and abundance of breeding pairs, which also are negatively correlated with landscape proportion of cropland. We suggest that researchers examine relationships between clutch size and landscape composition in both structure-nesting and ground-nesting Mallards, in other geographic areas, and in other duck species.

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2023. Dry creek long-term watershed study: The effects of harvesting in streamside management zones and adjacent uplands of riparian corridors on avian communities in the coastal plain of Georgia.

Grooms, Merideth P.; Lanham, J. Drew; and

Wigley, T. Bently

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. 21-25.

<http://www.treesearch.fs.fed.us/pubs/23305>

Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ land zones/ Aves: forestry/ riparian corridor tree harvesting/ community structure/ habitat management/ riparian corridors/ tree harvesting/ forest and woodland/ Georgia/ Southlands Forest/ birds/ chordates/ vertebrates

Abstract: We evaluated the effects of Best Management Practices (BMPs) harvesting on avian communities associated with headwater streams in the Georgia Coastal Plain. Two watersheds served as references, with no timber harvesting, and two treatment watersheds were clearcut with retention of Streamside Management Zones (SMZs) according to Georgia BMPs for forestry. Bird communities were surveyed in each watershed before and after harvest by variable-distance transect surveys. The bird community surveyed in each watershed was divided into foraging, nesting, and disturbance guilds. A Partners In Flight (PIF) composite score-based index was used to calculate the

conservation value (CV) of those communities. Among variables measured, disturbance guilds showed the most apparent response to harvesting. This response, considered in the context of the CV index response, indicated that there was some changeover from high priority disturbance-sensitive species to moderate/high priority disturbance-tolerant species resulting from harvesting. We recommend the use of PIF scores and associated CV indexes along with other bird community variables in investigations of the value of SMZs for songbirds.

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2024. Ecological approaches to reduce predation on ground-nesting gamebirds and their nests.

Jimenez, J. E. and Conover, M. R.

Wildlife Society Bulletin 29(1): 62-69. (2001)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: avian recruitment/ ducks/ ground-nesting birds/ integrated pest management/ predation/ predator-prey interactions/ wildlife damage management/ anthropogenic effect/ gamebird/ management practices/ predation/ predation risk

Abstract: In human-modified environments, high predation rates on ground-nesting birds and their eggs can be a serious problem. We reviewed the literature to determine the effectiveness of ecological approaches to improve recruitment of ground-nesting birds. Ecological approaches reduce predation rates by modifying natural interactions among predators, prey, and their habitats. These approaches include modification of the predator community, associational defense, use of alternative prey, and habitat or landscape manipulation. These techniques can be applied successfully only under limited conditions and for a specific array of species. Because of this, no management practice is uniformly better than another to increase avian recruitment; different techniques are complementary rather than exclusive. Managers need to select the best technique(s) based on the predator community, local topography, size of the area, the avian species in need of protection, and economics.

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2025. Ecological restoration on Area C of the James K. Herbert Wetland Prairie Preserve, Tulare County.

Kamansky, Bobby; Herbert, James K.; Hansen, Robert B.; and Combs, Carole K.

Grasslands 14(4): 1, 8-10. (2004); ISSN: 1540-6857

Descriptors: biogeography: population studies/ terrestrial ecology: ecology, environmental sciences/ wildlife management: conservation/ Sequoia Riverlands Trust/ wildlife conservation board/ floodplain management/ grassland vegetation/ habitat restoration/ seasonal wetlands/ vegetation management/ water quality/ wildlife enhancement/ wildlife habitat

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2026. Ecological restoration on Area C of the James K. Herbert Wetland Prairie Preserve, Tulare County, Part II: Three-year Project Report.

Kamansky, Bobby; Hansen, Robert B.; and Combs, Carole K.

Grasslands 16(2): 6-9. (2004); ISSN: 1540-6857.

<http://www.cnga.org/library/journal/pdfs/>

GrasslandsSpring06.pdf

Descriptors: biogeography: population studies/ terrestrial ecology: ecology, environmental sciences/ wildlife management: conservation/ Sequoia Riverlands Trust/ wildlife conservation board/ floodplain management/ grassland vegetation/ habitat restoration/ seasonal wetlands/ vegetation management/ water quality/ wildlife enhancement/ wildlife habitat

2027. Ecology and management of scrub-shrub birds in New England: A comprehensive review.

Schlossberg, S. and King, D. I., 2007. 120 pp.

Notes: Submitted to the USDA Natural Resources Conservation Service, Resource Inventory and Assessment Divisions.

<ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/schlossbergkingreport.pdf>

Descriptors: scrub-shrub habitats/ New England/ breeding birds/ early successional habitats/ habitat management/ wildlife management

Abstract: Scrub-shrub habitats in New England contain a diverse and varied breeding bird community. For instance, a shrubby power line corridor may hold Chestnut-Sided Warblers and Eastern Towhees. Clearcuts in coniferous forests may harbor White-throated Sparrows and Magnolia Warblers, and shrubby wetlands may have breeding Wilson's Snipe and Yellow Warblers. Some shrubland birds, like Golden-winged Warbler and Mourning Warbler, nest only in early successional habitats and are rarely found in forests. Others, such as Northern Cardinal or Carolina Wren will breed in closed forests with a shrubby understory. To manage this diverse assemblage of birds and their habitats, it is important to know just what species would actually benefit from the creation of scrub-shrub habitat and which would not. Here, we develop a list of core species breeding in New England shrublands. This list serves as a basis for the literature review and management recommendations that follow. The scope of this review is the six states of New England -- Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine. As mentioned above, the scrub-shrub bird community varies substantially across this region, and we will emphasize these differences throughout this report.

2028. Economic evaluation of on-farm conservation practices in the Great Lakes region of North America.

Stonehouse, D. P.

Environmetrics 10(4): 505-520. (1999); ISSN: 1180-4009.

Notes: Conference: Environmental Statistics: Proceedings of the Conference on Environmetrics, Innsbruck (Austria), 4-8 Aug 1997.

Descriptors: soil conservation/ farms/ cost benefit analysis/ benefits/ economic aspects/ water quality/ agricultural practices/ degradation/ wildlife habitats/ social aspects/ agriculture/ nature conservation/ costs/ riparian vegetation/ pollution control/ soil erosion/ water quality control/ environmental protection/ socioeconomics/ North America/ Great Lakes/ environmental action

Abstract: Agriculture has long been regarded as a major contributor to wildlife habitat despoliation, soil degradation, and downstream watercourse pollution. It would be possible to largely eliminate natural resource degeneration through judicious application of on-farm conservation practices. Farmers have little economic incentive to conserve because, according to previous research, most conservation techniques have been demonstrated to be

unprofitable. The empirical research into three alternative types of conservation practices for this study confirms that two (conservation crops and riparian buffer strips) provide for net costs to farmers, and that the third (conservation soil tillage) is not profitable under all circumstances. At the same time, the research shows that two out of the three sets of practices, namely riparian buffer strips and conservation tillage, can be economically beneficial to society as a whole. This raises the question of whether and to what extent society, as economic gainers, should offer compensation to farmers as economic losers. This study furthermore establishes that not all conservation practices that result in reduced soil erosion will lead to decreased sediment and phosphorus loadings into watercourses; that not all reduced sediment and phosphorus loadings lead to improved water quality; and that, even where an improvement to water quality in chemical, physical, biological and aesthetic terms can be obtained, the costs to society of achieving improvement may exceed the economic benefits. Such outcomes can readily promote disagreements between environmentalists and ecologists on the one hand and socio-economists on the other.
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2029. Economic value of big game habitat production from natural and prescribed fire.

Gonzalez-Caban, Armando; Loomis, John B.; Griffin, Dana; Wu, Elen; McCollum, Daniel; McKeever, Jane; and Freeman, Diane Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; Research Paper-PSW 249, 2003. 38 p.

Notes: Pacific Southwest Research Station Research Paper 249.

<http://www.treesearch.fs.fed.us/pubs/6907>

Descriptors: contingent valuation/ deer hunting benefits/ fire economics/ prescribed burning costs/ travel cost method/ willingness-to-pay

Abstract: A macro time-series model and a micro GIS model were used to estimate a production function relating deer harvest response to prescribed fire, holding constant other environmental variables. The macro time-series model showed a marginal increase in deer harvested of 33 for an increase of 1,100 acres of prescribed burn. The marginal deer increase for the micro GIS model was 16. An additional 3,710 acres of prescribed burn would produce an additional eight deer harvested regardless of the model. For an additional 3,700 acres more of prescribed burn the marginal increase in deer harvested is four and five deer respectively for the macro time-series and micro GIS models. Using the Travel Cost Method the change in consumer surplus or net willingness-to-pay was \$257 per additional deer harvested due to the additional trips in response to increasing deer harvest. The consumer surplus estimate using the Contingent Valuation Method was \$222. Depending on the production function model used the initial deer hunting benefit response to a prescribed burning of 1,100 acres ranges from \$3,840 to \$7,920. An additional increase of 3,710 acres of prescribed burning would produce benefits of \$1,920 regardless of the model used. An extra 3,700 acres more would produce only between \$960 and \$1,200 depending on the model. When compared to the cost of conducting the prescribed burning, the

benefits derived from an increase in deer harvest represent no more than 3.4 percent of the total costs of the first 1,100 acres.

This citation is from Treesearch.

2030. Edge- and area-sensitivity of shrubland birds.

Rodewald, A. D. and Vitz, A. C.

Journal of Wildlife Management 69(2): 681-688. (2005)

NAL Call #: 410 J827; ISSN: 0022541X.

Notes: doi: 10.2193/0022-541X(2005)069

[0681:EAAOSB]2.0.CO;2.

Descriptors: area sensitivity/ birds/ clearcut/ early-successional forest/ edge/ forest management/ shrubland/ avifauna/ forest edge/ habitat management/ habitat use/ patch size/ sensitivity analysis/ shrubland/ North America/ Ohio/ United States/ Arthropoda/ Aves/ *Dendroica discolor*/ *Icteria virens*/ *Passerina cyanea*/ *Spizella pusilla*/ *Vermivora pinus*

Abstract: Populations of shrubland birds in eastern North America have consistently declined since the 1960s, but conservation is hampered by an inadequate understanding of the area requirements of most species. We examined the sensitivity of shrubland specialists to (a) the area of shrub stands and (b) proximity to mature-forest edges, and we evaluated whether habitat characteristics, food resources, or productivity of bird populations could have caused the relationships we identified. In 2002-2003, we used constant-effort mist-netting on 6 small (4-8 ha) and 6 large (13-16 ha) regenerating clearcuts that were 4-6 years post-harvest in southern Ohio, USA. We placed 3 nets at 20, 50, and 80 m from the mature-forest edge (n = 9 nets per site), and we sampled vegetation, fruit, and arthropods at each net. Seven of 8 shrubland specialists, particularly blue-winged warbler, prairie warbler, yellow-breasted chat, indigo bunting, and field sparrow, avoided mature-forest edges, with twice as many birds caught 80 m from edges compared to 20 m. Abundances of most species, especially yellow-breasted chats, were positively correlated with area, though the combined area effect was not statistically significant. We found no evidence of reduced avian productivity in small stands. Neither area nor edge was associated with habitat characteristics, fruit abundance, or arthropod biomass. Our results suggest shrubland birds avoid habitat edges. Thus, small or narrow cuts may not provide optimal habitat for this suite of declining species, and managers should consider options to minimize edge and provide larger patches of shrubland habitats in landscape-scale planning efforts.

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2031. Effect of anthropogenic disturbance and landscape structure on body size, demographics, and chaotic dynamics of Southern High Plains amphibians.

Gray, Matthew James. Texas Tech University, 2002.

Notes: Advisor: Smith, Loren M.

Descriptors: amphibians/ wetlands/ playas/ prairies/ meadows/ precipitation/ rain/ habitat restoration/ body-size/ lowlands

Abstract: Amphibian populations are declining globally. Anthropogenic disturbance of landscapes surrounding wetlands may affect fitness, demographics, and dynamics of amphibian populations. Spatial positioning and relative connectedness of wetlands also may influence population demographics. Thus, I examined the effect of anthropogenic landscape use (cultivation vs. grassland)

and structure on postmetamorphic body size (a fitness correlate), demographics, and dynamics of amphibians at 16 playa wetlands on the Southern High Plains (SHP) of Texas during 1999 and 2000. Amphibian populations were monitored using drift fence and pitfall traps, landscape structure was quantified using spatial analysis software, and dynamics were assessed using difference equations. Postmetamorphic body size of all amphibian species and age classes generally was greater at grassland than cropland playas, and in 1999 (i.e., a wetter year) than 2000. Abundance of New Mexico and plains spadefoots (*Spea multiplicata* and *S. bombifrons*) generally was greater at cropland than grassland playas, and greater for barred tiger salamanders (*Ambystoma tigrinum mavortium*) in 1999 than 2000. Mean daily abundance of amphibians also was positively related to landscape structure indices representing geometric complexity and spatial positioning of wetlands. In general, as landscapes became more complex (e.g., numbers of edges increased) and inter-playa distance decreased, mean daily abundance of amphibians increased. Additional demographic analyses indicated that temporal niche partitioning existed in SHP amphibian populations; however, no differences existed between landuses. Lastly, biological chaos in the amphibian assemblage existed at 1 of 8 cropland and 7 of 8 grassland playas. A stochastic density-dependent Ricker function predicted chaotic dynamics most accurately. Anthropogenic disturbance surrounding wetlands affects body size, demographics, and dynamics of SHP amphibians. Spatial positioning of wetlands and landscape complexity may be as or more important than general landuse in affecting amphibian demographics. Annual differences in body size and abundance suggest rainfall may be important in influencing amphibian populations. Although spadefoot abundance was positively influenced by anthropogenic disturbance, I recommend retention and restoration of grasslands surrounding playa wetlands because landscape cultivation decreased body size and altered amphibian demographics and dynamics from an undisturbed state. These results have important implications in conservation biology, landscape ecology, and basic ecological and mathematical theory.

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2032. The effect of supplemental prey and prescribed fire on success of artificial nests.

Jones, D. D.; Conner, M. L.; Warren, R. J.; and Ware, G. O. *Journal of Wildlife Management* 66(4): 1112-1117. (2002) NAL Call #: 410 J827; ISSN: 0022541X
Descriptors: alternative prey/ artificial nest/ compensatory predation/ Georgia/ nest predation/ nest success/ predation management/ prescribed fire/ supplemental prey/ artificial nest/ nest predation/ nesting success/ prescribed burning
Abstract: Nest predation hinders recruitment of avian species and may be affected by availability of alternative prey and amount of nesting cover. Therefore, we evaluated effects of food abundance (i.e., supplemental prey) and time since prescribed fire on nest success of artificial ground nests. We monitored the fate of 759 artificial ground nests from June to July 2000. No interaction ($P = 0.74$) occurred between fire and supplemental prey treatments. Nest success in prey-supplemented plots (37.6%) did not differ ($P = 0.70$) from control plots (44.9%), and nest success in burned plots (41.8%) did not differ ($P = 0.86$)

from nonburned plots (40.7%). Motion-sensitive cameras placed on feeders revealed that mesomammals accounted for >80% of visits to feeders, indicating that supplemental prey was detected and consumed by mesomammals. Nest predators differed as a function of food abundance, with combined avian and small-mammal predation being greater in prey-supplemented (46.5%) than in control (25.9%) plots. Nest predators also differed as a function of prescribed fire. Avian predation of nests was greater in burned (13.7%) than nonburned (9.9%) plots, whereas small-mammal predation was greater in non-burned (30.9%) than in burned (15.1%) plots. Altering food and cover to manage nest success may result in compensatory predation. Further work to quantify the extent of compensatory predation is needed to fully understand trade-offs of various practices for managing nest predation.

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2033. The effect of woodland proximity and wetland characteristics on larval anuran assemblages in an agricultural landscape.

Babbitt, K. J.; Baber, M. J.; and Brandt, L. A. *Canadian Journal of Zoology* 84(4): 510-519. (2006) NAL Call #: 470 C16D; ISSN: 0008-4301
Descriptors: conservation measures/ nutrition/ diet/ prey/ ecology/ predators/ terrestrial habitat/ man-made habitat/ abiotic factors/ chemical factors/ physical factors/ land zones/ Anura: habitat management/ community structure/ piscean predators/ *Gambusia holbrooki* and *Jordanella floridae*/ Effect on community structure/ agricultural landscape/ semiaquatic habitat/ wetlands habitat characteristics/ agriculture landscape/ forest and woodland/ hardwood hammock patches/ proximity to wetland/ cultivated land habitat/ External pH/ depth/ water depth/ Florida/ Highlands County/ Pisces, Actinopterygii, Cyprinodontiformes, Cyprinodontidae/ amphibians/ chordates/ fish/ vertebrates
Abstract: Changes to landscapes for agricultural activities often result in reduction and fragmentation of forested habitat. Land conversion for cattle ranching in south-central Florida has resulted in increases in pasture land interspersed with remnant patches of hardwood hammock. To examine the importance of these hammocks to anurans, we sampled 78 seasonally inundated wetlands to examine the relative importance of proximity of hardwood hammock patches (>20 ha) and wetland characteristics and used generalized linear models to determine which factors had a significant effect on larval anuran species richness or abundance. Species richness was significantly influenced by pH, conductivity, and water depth. Proximity to hammock did not influence species richness; however, assemblage composition differed between wetlands near hammocks and wetlands surrounded by pasture. Barking treefrogs (*Hyla gratiosa* LeConte, 1856), pine woods treefrogs (*Hyla femoralis* Bose in Daudin, 1800), and oak toads (*Bufo quercicus* Holbrook, 1840) bred only in wetlands within 20, 50, and 200 m of hammocks, respectively. Factors influencing tadpole abundances were species-specific. Retention of seasonally inundated wetlands proximal to large hammocks on ranchlands can provide important habitat for supporting a diverse assemblage of anurans

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2034. Effectiveness of biodiversity indicators varies with extent, grain, and region.

Hess, G. R.; Bartel, R. A.; Leidner, A. K.; Rosenfeld, K. M.; Rubino, M. J.; Snider, S. B.; and Ricketts, T. H. *Biological Conservation* 132(4): 448-457. (2006)
NAL Call #: S900.B5; ISSN: 00063207.

Notes: doi: 10.1016/j.biocon.2006.04.037.

Descriptors: biodiversity hotspots/ extent/ grain/ indicator taxa/ scale

Abstract: The use of indicator taxa for conservation planning is common, despite inconsistent evidence regarding their effectiveness. These inconsistencies may be the result of differences among species and taxonomic groups studied, geographic location, or scale of analysis. The scale of analysis can be defined by grain and extent, which are often confounded. Grain is the size of each observational unit and extent is the size of the entire study area. Using species occurrence records compiled by NatureServe from survey data, range maps, and expert opinion, we examined correlations in species richness between each of seven taxa (amphibians, birds, butterflies, freshwater fish, mammals, freshwater mussels, and reptiles) and total richness of the remaining six taxa at varying grains and extents in two regions of the US (Mid-Atlantic and Pacific Northwest). We examined four different spatial units of interest: hexagon (~649 km²), subcoregion (3800-34,000 km²), ecoregion (8300-79,000 km²), and geographic region (315,000-426,000 km²). We analyzed the correlations with varying extent of analysis (grain held constant at the hexagon) and varying grain (extent held constant at the region). The strength of correlation among taxa was context dependent, varying widely with grain, extent, region, and taxon. This suggests that (1) taxon, grain, extent, and study location explain, in part, inconsistent results of previous studies; (2) planning based on indicator relationships developed at other grains or extents should be undertaken cautiously; and (3) planning based on indicator relationships developed in other geographic locations is risky, even if planning occurs at an equivalent grain and extent.

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2035. The effects of a vegetational corridor on the abundance and dispersal of insect biodiversity within a northern California organic vineyard.

Nicholls, C. I.; Parrella, M.; and Altieri, M. A.

Landscape Ecology 16(2): 133-146. (2001)

NAL Call #: QH541.15.L35 L36; ISSN: 09212973.

Notes: doi: 10.1023/A:1011128222867.

Descriptors: biological control/ landscape ecology/ leafhoppers/ thrips/ vineyards/ biodiversity/ density gradient centrifugation/ egg/ environmental economics/ habitat/ parasitism/ predation/ riparian zone/ species abundance/ United States/ abundance/ dispersal/ habitat corridor/ insect/ landscape ecology/ spatial distribution

Abstract: During 1996 and 1997, two adjacent 2.5 ha organic vineyard blocks (A and B) were monitored to assess the distributional and abundance patterns of the Western grape leafhopper *Erythroneura elegantula* Osborn (Homoptera: Cicadellidae) and its parasitoid *Anagrus epos* Girault (Hymenoptera: Mymaridae), Western flower thrips *Frankliniella occidentalis* (Pergande) and generalist predators. The main difference between blocks was that block A was cut across by a corridor composed of 65 flowering plant species which was connected to the

surrounding riparian habitat, whereas block B had no plant corridor. In both years, leafhopper adults and nymphs and thrips tended to be more numerous in the middle rows of block A and less abundant in border rows close to the forest and corridor where predators were more abundant. The complex of predators circulating through the corridor moved to the adjacent vine rows and exerted a regulatory impact on herbivores present in such rows. In block B all insects were evenly distributed over the field, no obvious density gradient was detected from the edges into the center of the field. Although it is suspected that *A. epos* depended on food resources of the corridor, it did not display a gradient from this rich flowering area into the middle of the field. Likewise no differences in rates of egg parasitism of leafhoppers could be detected in vines near the corridor or in the vineyard center. The presence of riparian habitats enhanced predator colonization and abundance on adjacent vineyards, although this influence was limited by the distance to which natural enemies dispersed into the vineyard. However, the corridor amplified this influence by enhancing timely circulation and dispersal movement of predators into the center of the field.

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2036. The effects of adjacent land use on wetland amphibian species richness and community.

Houlahan, J. E. and Findlay, C. S.

Canadian Journal of Fisheries and Aquatic Science 60(9): 1078-1094. (2003)

NAL Call #: 442.9 C16J; ISSN: 0706-652X

Descriptors: wetlands/ aquatic animals/ forests/ habitats/ land use/ marshes/ nature conservation/ nitrogen/ plant communities/ polluted water/ population density/ roads/ roots/ species richness/ vegetation types/ water pollution/ water quality/ animal communities

Abstract: Habitat destruction and fragmentation have been identified as possible causes of large-scale amphibian declines. Here, we examine the effects of adjacent land use and water quality on wetland amphibian species richness, abundance, and community composition in 74 Ontario wetlands. Species richness was positively correlated with wetland area, forest cover, and the amount of wetlands on adjacent lands and negatively correlated with road density and nitrogen levels. The land-use effects peak at 2000-3000 m. Amphibian abundance was positively correlated with forest cover, distance to wetlands >20 ha, and amount of marsh habitat and negatively correlated with road density. The effects of adjacent land use were strongest at around 200 m. Land-use and water quality effects varied widely across species, although most species are positively correlated with forest cover and amount of wetlands on adjacent lands and negatively correlated with road density and water quality. These results suggest that the effects of adjacent land use on amphibian communities can extend over comparatively large distances. As such, effective wetland conservation will not be achieved merely through the creation of narrow buffer zones between wetlands and intensive land uses, but rather will require maintaining a heterogeneous regional landscape containing relatively large areas of natural forest and wetlands.

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2037. Effects of agricultural cultivation on demographics of Southern High Plains amphibians.

Gray, Matthew J.; Smith, Loren M.; and Brenes, Roberto
Conservation Biology 18(5): 1368-1377. (Oct. 2004)
NAL Call #: QH75.A1C5 ; ISSN: 0888-8892

Descriptors: Amphibial/ farming and agriculture/ agricultural cultivation/ population responses/ community structure/ population density/ agricultural cultivation effects/ semiaquatic habitat/ Texas/ Southern High Plains/ population responses to agricultural cultivation/ playa wetlands

Abstract: Anthropogenic disturbance of landscapes surrounding wetlands is considered a factor in local and global amphibian declines. Few data exist on the effects of agricultural cultivation of wetland watersheds on amphibians, and results from previous studies are contradictory. Our objective was to test the effects of general anthropogenic land use (cultivation vs. grassland) on the demographics of seven species and three age classes of amphibians in the Southern High Plains of Texas. We partially enclosed 16 playa wetlands (4 per land use per year) with drift fences and pitfall traps and monitored relative daily abundance and diversity from 16 May to 17 October 1999 and 19 April to 18 August 2000. In general, relative abundance (i.e., average daily capture) of New Mexico and plains spadefoots (*Spea multiplicata*, *S. bombifrons*) was greater at cropland than grassland playas; the abundance of other species and diversity of the amphibian assemblage was not affected by land use. Also, abundance generally was greater in 1999 than 2000 for metamorph spadefoots and barred tiger salamanders (*Ambystoma tigrinum mavortium*). Differences in spadefoot abundance between land-use types may have been related to low species-specific vagility, resulting in increased nestedness within disturbed landscapes and reduced abundance of a potential keystone intraguild predator in cropland playas. The yearly difference in amphibian abundance was likely related to annual precipitation, which influenced wetland hydroperiod. Agricultural cultivation surrounding wetlands is associated with the increased abundance of some amphibian species, but other demographic and fitness parameters such as temporal demographics, body size, and diet diversity may be negatively affected.

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2038. Effects of agriculture on raptors in the western USA: An overview.

Young, L. S.

In: Proceedings of the Western Raptor Management Symposium and Workshop. Boise, Idaho, USA.)

Pendleton, B. G. (eds.) Washington, D.C.:

National Wildlife Federation;

pp. 209-218; 1989.

Notes: ISSN: 1044-4971; Institute for Wildlife Research, National Wildlife Federation, Scientific and Technical Series No. 12; xi + 317p.

Descriptors: prey density/ foraging/ environmental disturbances/ habitat preservation/ enhancement/ conservation programs/ education/ Farm Bill/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ Conservation Resource management/ Agronomy

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2039. Effects of anthropogenic fragmentation and livestock grazing on western riparian bird communities.

Tewksbury, Joshua J.; Black, Anne E.; Nur, Nadav; Saab, Victoria A.; Logan, Brian D.; and Dobkin, David S.
Studies in Avian Biology 25: 158-202. (2002)
NAL Call #: QL671.S8; ISSN: 0197-9922

Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ land zones/ Aves/ habitat fragmentation/ livestock grazing/ riparian communities/ farming and agriculture/ habitat management/ riparian habitats/ community structure/ United States, western/ birds/ chordates/ vertebrates

Abstract: Deciduous vegetation along streams and rivers provides breeding habitat to more bird species than any other plant community in the West, yet many riparian areas are heavily grazed by cattle and surrounded by increasingly developed landscapes. The combination of cattle grazing and landscape alteration (habitat loss and fragmentation) are thought to be critical factors affecting the richness and composition of breeding bird communities. Here, we examine the influence of land use and cattle grazing on deciduous riparian bird communities across seven riparian systems in five western states: Montana, Idaho, Nevada, Oregon and California. These riparian systems are embedded in landscapes ranging from nearly pristine to almost completely agricultural. We conducted landscape analysis at two spatial scales: local landscapes (all land within 500 m of each survey location) and regional landscapes (all land within 5 km of each survey location). Despite the large differences among riparian systems, we found a number of consistent effects of landscape change and grazing. Of the 87 species with at least 15 detections on two or more rivers, 44 species were less common in grazed sites, in heavily settled or agricultural landscapes, or in areas with little deciduous riparian habitat. The Veery (*Catharus fuscescens*), Song Sparrow (*Melospiza melodia*), Red-naped Sapsucker (*Sphyrapicus nuchalis*), Fox Sparrow (*Passerella iliaca*), and American Redstart (*Setophaga ruticilla*) were all less common under at least three of these conditions. In contrast, 33 species were significantly more common in one or more of these conditions. Sites surrounded by greater deciduous habitat had higher overall avian abundance and 22 species had significantly higher individual abundances in areas with more deciduous habitat. Yet, areas with more agriculture at the regional scale also had higher total avian abundance, due in large part to greater abundance of European Starling (*Sturnus vulgaris*), American Robin (*Turdus migratorius*), Brown-headed Cowbird (*Molothrus ater*), and Black-billed Magpie (*Pica pica*), all species that use both agricultural and riparian areas. Grazing effects varied considerably among riparian systems, but avian abundance and richness were significantly lower at grazed survey locations. Fifteen species were significantly less abundant in grazed sites while only five species were more abundant therein. Management should focus on (1) preserving and enlarging deciduous habitats, (2) reducing cattle grazing in deciduous habitats, and (3) protecting the few relatively pristine landscapes surrounding large deciduous riparian areas in the West.

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2040. Effects of clearcutting and natural regeneration on breeding bird communities of a baldcypress-tupelo wetland in South Carolina.

Mitchell, Laura J.; Lancia, Richard A.; Lea, Russ; and Gauthreaux, Sidney A.

In: Proceedings of an International Symposium: Wetlands and River Corridor Management. Charleston, South Carolina. Kusler, Jon A. and Daly, Sally (eds.)

Berne, N.Y.: Association of Wetland Managers; pp. 155-161; 520 p.; 1989.

NAL Call #: QH541.5.M3P75 1989

Descriptors: wetlands/ lowland forests/ clearcutting/ silvicultural practices/ environmental impact/ birds

2041. Effects of cropland conservation practices on fish and wildlife habitat.

Brady, Stephen J.

In: Fish and Wildlife Response to Farm Bill Conservation Practices, Technical Review 07-1; Bethesda, MD: The Wildlife Society, 2007. pp. 9-23.

<ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/fwfb2.pdf>

Descriptors: aquatic habitat/ conservation practices/ terrestrial habitat/ wildlife species/ wildlife management

Abstract: A literature review of commonly applied cropland soil and water conservation practices and their impact on fish and wildlife habitat is presented. Agriculture has had the most extensive effect on wildlife habitat of any human-induced factor in the United States. Any practice that improves runoff water quality and/or reduces sediment delivery will have beneficial effects to aquatic ecosystems. Many soil and water conservation practices have additional benefits to wildlife when applied in a habitat-friendly manner, but may have little or no benefit when applied otherwise. Wildlife and agriculture can coexist if land is managed to conserve sufficient biological integrity in the form of plant communities and habitat elements compatible with the surrounding landscape.

2042. Effects of fire and agricultural practices on neotropical ant communities.

Castano-Meneses, G. and Palacios-Vargas, J. G.

Biodiversity and Conservation 12(9): 1913-1919. (2003)

NAL Call #: QH75.A1B562; ISSN: 09603115.

Notes: doi: 10.1023/A:1024120600816.

Descriptors: Chamela/ succession/ tropical deciduous forest/ agricultural practices/ ants/ community structure/ ecological impact/ prescribed burning/ species diversity/ Mexico/ Formicidae/ Hymenoptera

Abstract: Fire is extensively used in agricultural management in Mexico. There is little information on the effects of those practices on the abundance and diversity of animals that live within these forest soils. We studied the effect of slashing, burning and land use in a tropical deciduous forest on ant communities in the State of Jalisco, Mexico. The original vegetation (tropical deciduous forest) was modified into a corn field. Sampling was carried out in five stages: before slashing, after slashing, after burning, after seeding and after harvest. We found that very severe fires greatly reduced ant diversity. The most important effect of fire was the reduction of ant density, and the change of species composition and trophic guilds. These changes are relevant in the recycling process of energy in the ecosystem.

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2043. Effects of forest regeneration on songbird movements in a managed forest landscape of Alberta, Canada.

Robichaud, Isabelle; Villard, Marc Andre; and Machtans, Craig S.

Landscape Ecology 17(3): 247-262. (2002)

NAL Call #: QH541.15.L35 L36; ISSN: 0921-2973

Descriptors: ecology/ terrestrial habitat/ land and freshwater zones/ Canada/ Oscines (Passeriformes): distribution within habitat/ habitat utilization/ forest and woodland/ riparian habitat/ Alberta/ Calling Lake area/ riparian buffer/ corridor/ forest regeneration/ Passeriformes/ Aves/ birds/ chordates/ vertebrates

Abstract: Recent studies have shown that barrier effects exist even in relatively vagile species such as forest songbirds. The objectives of this study were to determine whether a 560 x 100 m riparian buffer strip of mature forest was used as a movement corridor by forest songbirds and, if so, to what extent corridor effects persisted as woody vegetation regenerated in the adjacent clearcut. Over a 4-yr period, juvenile movement rates decreased in the riparian buffer strip and increased in the regenerating clearcut. Adult movement rates increased in the riparian buffer strip in the first year after logging, then gradually decreased, while still increasing in the regenerating clearcut. However, both juvenile and adult movement rates were higher in the buffer strip than in an undisturbed control site. Results suggest that most adults we captured held territories in the vicinity of the net lanes, and that most of the juveniles captured were dispersing away from their natal territory. Four years after harvest, juvenile movement rates were higher in the regenerating clearcut than in the riparian buffer strip, but several species had not yet been captured or detected in the regeneration. Our results suggest that the use of the riparian buffer strip as a movement corridor decreased with forest regeneration for both adults and juveniles. However, the buffer strip still acted as a movement corridor for the following species: Philadelphia and Red-eyed Vireos, Red-breasted Nuthatch, and Ovenbird.

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2044. The effects of grazing by Tule elk and cattle on the vegetation dynamics and spider community of coastal salt marshes.

Traut, Bibit H.

In: 87th Annual Meeting of the Ecological Society of America and the 14th Annual International Conference of the Society for Ecological Restoration. Tucson, Arizona August 04-09, 2002; 2002 .

Notes: Meeting abstract.

<http://abstracts.co.allenpress.com/pweb/esa2002/document/14803>

Descriptors: estuarine ecology: ecology, environmental sciences/ wildlife management: conservation/ agricultural open space/ coastal salt marshes/ community structure/ fenced enclosures/ grazing effects/ marsh upland ecotone/ multiple use/ plant biomass/ plant cover/ species richness/ spider diversity/ threatened habitat impacts/ vegetation dynamics/ vegetation richness/ vegetation structure/ wildland areas

Abstract: Salt marshes in the Point Reyes National Seashore (PRNS) are maintained both as wildland areas and agricultural open space. Yet, the impacts of this multiple use is not well understood, and there is concern that grazing the ecotone between the marsh and upland, the high salt marsh, may negatively impact this threatened habitat. The goal of this study was to determine if excluding cattle and Tule elk would result in increased vegetation complexity (structure and richness) and subsequently affect the spider community. Fenced exclosures were erected in the summer of 1999 at Home Bay (PRNS) and White Gulch (PRNS) to assess impacts of grazing by cattle and Tule elk, respectively. Within each marsh, a 20m x 5m mainplot of the high marsh was selected. Within each mainplot, 10 subplots (2m x 2m) were randomly selected, with 5 randomly established as exclosures and the others 5 left unfenced as controls. After two years, spider diversity and plant biomass, cover and height were measured within the inner 1m x 1m area. Both Tule elk and cattle grazing reduced plant biomass and height and led to increased bareground. Plant richness was not significantly different between cattle grazed and ungrazed plots, but individuals of plant species were more evenly distributed in the exclosures. Whereas in those plots grazed by Tule elk, species richness did increase in exclosures, but without a shift in individual species distributions. I had expected to see a response by the spider community to changes in vegetation structure, but there were no significant differences in spider diversity in any of the grazed or ungrazed plots. These results indicate that trophic generalists in a transition zone, the high salt marsh, may be responding to other factors than vegetation structure alone. Furthermore, grazing in the high salt marsh ecotone shifts plant community structure.

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2045. Effects of herbaceous competition control on wildlife habitat quality in piedmont pine plantations.

Keyser, P. D.; Ford, V. L.; and Guynn, D. C.
Southern Journal of Applied Forestry 27(1): 55-60. (2003)
 NAL Call #: SD1.S63; ISSN: 01484419
Descriptors: forage/ habitat/ herbaceous control/ herbicide/ pine management/ wildlife/ seed/ vegetation/ plants (botany)/ plantations/ plants/ seedlings
Abstract: Wildlife biologists have become increasingly concerned about the effects of herbaceous competition control in pine plantations on wildlife habitats. Data from a study designed to test the effectiveness of herbaceous weed control with different site preparation methods were re-analyzed to assess effects on various measures of wildlife habitat quality. Three rates of Oust® (0, 2, and 4 oz/ac) were applied in mid-April the first year to planted loblolly pine seedlings at seven locations (each a complete randomized block design) in the Virginia Piedmont. Site preparation methods used were pile only (two locations), burn only, chop and burn, pile and disk, and Velpar® and burn (two locations). Results were re-analyzed to assess effects of these methods on total herbaceous vegetation coverage, forage coverage, the ratio of forage/cover, species richness, and species diversity. Although total herbaceous coverage and species richness declined in the first year after application on many locations, vegetation rebounded in the second and/or third year. Few significant differences were observed in forage coverage, the ratio of forage to cover, or species diversity. By the third year,

few differences remained among treatment levels. Mechanical site preparation appeared to have less impact on all measures than chemical site preparation. *South. J. Appl. For.* 27(1):55-60.
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2046. Effects of land use management on biotic integrity: An investigation of bird communities.

Glennon, M. J. and Porter, W. F.
Biological Conservation 126(4): 499-511. (2005)
 NAL Call #: S900.B5; ISSN: 00063207.
Notes: doi: 10.1016/j.biocon.2005.06.029.
Descriptors: community/ guild/ human impact gradient/ index of biotic integrity/ land use management/ anthropogenic effect/ community dynamics/ index of biotic integrity/ land management/ land use/ Adirondack Park/ New York [United States]/ Aves
Abstract: We examined the response of bird communities to a gradient of human impact in the Adirondack Park of northern New York State by testing the relationship of land use management types to an Index of Biotic Integrity (IBI) across the Adirondack landscape. We created the IBI by placing birds into 12 different guild categories and scoring study blocks according to relative representation of specialist versus generalist guild types. We investigated three questions relating to the effects of land use management on biotic integrity in the Adirondacks: (1) are there differences in biological integrity among the major land use types; (2) if so, what characteristics of these land use types are associated with high integrity bird communities; and, (3) to what degree is land management regulation effective in maintaining biological integrity in the Adirondack Park? We found significant differences in total, functional, compositional, and structural integrity on five land use types ranging from hamlet to wilderness. In all cases, integrity was lowest in hamlet areas and increased along the gradient to its highest level in wilderness areas. Biotic integrity showed strong groupings of the five land use classes. We found that bird community integrity was strongly related to roadlessness and that birds primarily responded to the distinction between developed and undeveloped land types. In contrast to roads and human development, forest management impacts in the Adirondacks do not appear to be of a high enough intensity to have significant negative impacts on breeding bird community integrity. Clustering of development is a means by which integrity may be safeguarded for the long term in the Adirondack Park.
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2047. Effects of land use on nongame wetland birds in western South Dakota stock ponds, U.S.A.

May, Shawn M.; Naugle, David E.; and Higgins, Kenneth F.
Waterbirds 25(Special Publication 2): 51-55. (2002)
 NAL Call #: QL671; ISSN: 1524-4695
Descriptors: LANDSAT TM imagery data/ National wetlands Inventory maps/ cattle grazing/ cropland landscapes/ grasslands/ habitat use/ land use change/ landscape types/ nesting habitat/ prairie landscapes/ stock ponds/ tillage agriculture/ vegetation cover/ wetlands
Abstract: Tillage agriculture is expanding into western prairie landscapes without knowledge of the effects of land use change on habitats used by nongame wetland birds. In 1999-2000, we surveyed 196 stock ponds within grassland (>95% grass) and cropland (>75% tillage) landscapes to

evaluate effects of land use on nongame wetland bird densities in western South Dakota. Land use and wetlands were delineated from Landsat TM imagery and National Wetlands Inventory maps. Sixteen nongame wetland bird species used stock ponds in western South Dakota, of which nine species were obligate wetland-nesting species. Although densities of seven nongame obligate wetland bird species were similar between landscape types, abundance of Wilson's Phalarope (*Phalaropus tricolor*) was greater in grassland study areas where cattle grazing limited growth of thick-stemmed emergent vegetation and reduced overall vegetative cover in stock ponds. In contrast, the Red-winged Blackbird (*Agelaius phoeniceus*) and Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) were more abundant in cropland landscapes where stock ponds provide abundant over-water nesting habitat (e.g., cattail). If grasslands continue to be converted to cropland, Wilson's Phalarope numbers will likely decrease as blackbird densities increase in stock ponds dominated by monotypic stands of cattail. To circumvent such changes, we recommend that resource managers conserve large tracts of grassland through aggressive easement programs in landscapes at highest risk of agricultural tillage.
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2048. Effects of livestock grazing on small mammals at a desert cienaga.

Hayward, Bruce; Heske, Edward J.; and Painter, Charles W.
Journal of Wildlife Management 61(1): 123-129. (1997)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: conservation/ desert cienaga/ livestock grazing/ population abundance/ resource base/ small/ trophic level interaction
Abstract: Livestock in arid regions often concentrate their grazing in riparian areas, and this activity can have strong effects on native vegetation and wildlife. Small mammals at a desert wetland (cienaga) in southwestern New Mexico were more abundant on 2 1-ha plots from which livestock were excluded over a 10-year period than on 2 similar grazed plots ($P = 0.025$). However, species of small mammals differed in the direction and degree of their responses to livestock exclusion. Differences in mean abundance between grazed versus ungrazed plots could not be demonstrated for any species of small mammal individually because of strong annual variation in abundance and low statistical power of tests. However, the cumulative effect was that small mammals were 50% more abundant on plots from which livestock were excluded. Because small mammals provide an important resource base for many animals at higher trophic levels, even a few livestock enclosures of moderate size could benefit a variety of species of wildlife in desert wetlands.
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2049. Effects of pesticides and other organic pollutants in the aquatic environment on immunity of fish: A review.

Dunier, M. and Siwicki, A. K.
Fish and Shellfish Immunology 3(6): 423-438. (1993);
ISSN: 1050-4648.
Notes: Literature review.
Descriptors: pesticides/ organic compounds/ immunology/ disease resistance/ fish culture/ pollutants/ immunity/ effects on/ aquatic environment/ Pisces/ aquatic

environments/ organic/ Fish culture/ effects on organisms freshwater pollution

Abstract: In the present paper the effects of various pollutants from industry or agriculture on the fish immune system are reviewed. The major xenobiotics involved as immunomodulators are pesticides (insecticides, herbicides, fungicides) and other organic pollutants such as polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB) and tributyltin (TBT). Immunotoxicology in mammals has become a very active discipline, but there remains a scarcity of information concerning fish immunotoxicology. This review gathers the data available on the effects of certain pollutants in the aquatic environment on the humoral and cellular immunity of fish.
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2050. The effects of postfire salvage logging on aquatic ecosystems in the American west.

Karr, James R.; Rhodes, Jonathan J.; Minshall, G. Wayne; Hauer, F. Richard; Beschta, Robert L.; Frissell, Christopher A.; and Perry, David A.
Bioscience 54(11): 1029-1033. (2004)
NAL Call #: 500 Am322A; ISSN: 0006-3568
Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ land zones/ comprehensive zoology: forestry/ watersheds/ habitat protection/ habitat management/ aquatic ecosystems/ ecology/ postfire salvage logging/ forest and woodland/ United States, western region
Abstract: Recent changes in the forest policies, regulations, and laws affecting public lands encourage postfire salvage logging, an activity that all too often delays or prevents recovery. In contrast, the 10 recommendations proposed here can improve the condition of watersheds and aquatic ecosystems.
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2051. Effects of prairie and barrens management on butterfly faunal composition.

Swengel, Ann B. and Swengel, Scott R.
Biodiversity and Conservation 10(10): 1757-1785. (2001)
NAL Call #: QH75.A1B562; ISSN: 0960-3115
Descriptors: conservation measures/ ecology/ terrestrial habitat/ land and freshwater zones/ Papilionoidea: habitat management/ community structure/ forest and woodland/ pine oak barrens/ grassland/ prairie/ United States/ prairie management/ barrens management/ faunal composition/ Papilionoidea/ Heteroneura, Glossata, Lepidoptera, Insecta/ arthropods/ insects/ invertebrates/ lepidopterans
Abstract: During 1990-1997, we recorded 122,138 adult butterflies in transect surveys at 125 pine-oak barrens in northern Wisconsin and 106 tallgrass prairies in six midwestern states grouped into three prairie subregions. Before analysis, we classified the butterflies into three ecological subgroups: specialist of native herbaceous vegetation, grassland (widely occurring in native and degraded herbaceous vegetation), and generalist. We analyzed this dataset both by ecological subgroups and as total butterflies, and by relative density and species richness, to investigate how these different ways of ordinating the same dataset might affect the results. In multiple linear regressions, density and richness of total butterflies and the subgroups related significantly to many non-management factors. In comparisons of more vs. less recent burning, all significant results for most recent burning

were negative. No significant negative relationships were attributed to the longest period since burning. In comparisons of burning vs. idling, all significant results in prairie favored idling, but in barrens favored burning. In comparisons of burning vs. mechanical cutting, all significant results in prairie favored cutting, but no significant differences occurred in barrens. In regressions including all management types, rotational burning (alone or combined with cutting) was significantly positive most often for generalists and never for specialists. Increasing years since last management was always negative in barrens and the southern prairie subregion but always positive in the two northern prairie subregions. Significant management patterns occurred more often in prairie than barrens, which were less fragmented. Specialists were favored by grazing in one northern prairie subregion (but disfavored in the other), haying, single wildfire (testable in barrens only), and increasing years since last treatment in one northern prairie subregion (but disfavored in barrens). Within subregion and subgroup, significant management results for density and richness never conflicted, but density had more significant results than richness. In no instances were the signs opposite when total butterflies and/or any subgroup(s) significantly related to the same management factor in the same type of regression. But what was significant for one sample was often not for another. Thus, management favorable for specialists and total butterflies did not conflict, but the subgroups had varying degrees of sensitivity, rather than opposite responses. Since the specialist (and total) butterflies did not consistently favor one management type over another among subregions, caution should be used in preserve management, to avoid overreliance on one management type over others.

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2052. Effects of prescribed burning on amphibian diversity in a southeastern U.S. National Forest.

Schurbon, J. M. and Fauth, J. E.

Conservation Biology 17(5): 1338-1349. (2003)

NAL Call #: QH75.A1C5; ISSN: 08888892

Descriptors: abundance/ amphibians/ prescribed burning/ species diversity/ United States/ forest

Abstract: Fire alters the abundance and diversity of many species, but its effects on amphibians are poorly known. We tested whether prescribed burning affected amphibian abundance and diversity within the Francis Marion National Forest, South Carolina, by monitoring assemblages at 15 temporary ponds with five different burn histories: 0, 1, 3, 5, and 12 years after burns. We also monitored terrestrial and aquatic environmental variables likely to influence amphibian diversity, such as leaf-litter depth, pond water chemistry, and distance to neighboring ponds. Fire had significant negative effects. Immediate effects (burning during the study) explained 12.8% and 10.8% of the variation in anuran and amphibian abundance, respectively, whereas short-term effects explained 31.8% and 24.6% of variation in amphibian species richness and evenness, respectively. Species richness increased and evenness decreased with time since burn, primarily because salamanders were rarely encountered at sites burned within 2 years. These sites had the shallowest leaf litter and highest soil temperature variances. Environmental factors unrelated to burning also significantly influenced amphibian diversity. Water chemistry explained 31.1% of variation in species richness, 32.2% of evenness, and >25% of anuran,

salamander, and total amphibian abundances. Salamanders were most sensitive to water chemistry factors, particularly pH. Our results suggest that decreasing the frequency of prescribed burns from the current 2-3 years to 3-7 years will better maintain diverse amphibian and plant assemblages. Substituting growing-season burns for the current practice of winter and spring burns would avoid repeatedly interrupting amphibian breeding and would maintain the desired longleaf pine community. 1339. © 2008 Elsevier B.V. All rights reserved.

2053. Effects of prescribed fire, extended harvest, movement, and habitat management on eastern cottontail (*Sylvilagus floridanus*) survival.

Walker, John Matthew. Mississippi State University, 2004.

Notes: Degree: MS; Advisors: Leopold, Bruce D. and Burger, L. Wes

Descriptors: *Sylvilagus floridanus*/ prescribed fire/ habitat management/ breeding/ kernel ranges/ extended harvest
Abstract: For a sample of 351 radio-collared cottontails (*Sylvilagus floridanus*) monitored on Black Prairie Wildlife Management Area (BPWMA), 1997-2003, I examined prescribed fire, extended harvest, movement, and habitat management effects on survival. Breeding and non-breeding season survival increased during the study, concomitantly with increased management intensity. Hourly movement rates did not substantively influence survival. I generated each cottontail's home range kernel to evaluate prescribed burning effects on survival. For both 50% and 95% kernel ranges, percentage of the range burned did not affect cottontail survival. Survival of cottontails in treatment units subjected to October-february harvest (0.36, SE = 0.08) did not differ substantially from those subjected to October-january harvest (0.43 SE = 0.09). Although the direction of the effect supported increased additivity, the magnitude did not provide significant evidence for this, and I concluded that late season harvest did not affect significantly cottontail survival.

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2054. Effects of red-cockaded woodpecker management on bobwhite relative abundance.

Chamberlain, Michael J. and Burger, L. Wes

Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 59: 10-16. (2005)
NAL Call #: SK1.S6; ISSN: 0276-7929

Descriptors: conservation measures/ ecology/ community structure/ population dynamics/ terrestrial habitat/ land zones/ *Colinus virginianus*: relative abundance/ population density/ endangered species habitat management effects on relative abundance of declining gamebird/ forest and woodland/ pine grassland communities/ grassland/ Mississippi/ Southwest/ Homochitto National Forest/ Aves, Galliformes, Phasianidae/ birds/ chordates/ vertebrates
Abstract: Loss of pine-grassland communities has contributed to declines in populations of northern bobwhites (*Colinus virginianus*; hereafter, bobwhite) and red-cockaded woodpeckers (*Picoides borealis*; RCW). However, evolving land management priorities on publicly-owned lands managed by the U.S. Forest Service (USFS) increasingly emphasize restoration of historic cover conditions and habitat for endangered species such as the RCW. These land use changes should benefit pine-grassland species, including bobwhite, but effects are not well understood. Therefore, we monitored abundance and distribution of

breeding bobwhites on the Homochitto National Forest of southwestern Mississippi during 1994-1999. We quantified abundance of breeding bobwhites using call counts in three landscapes that differed in extent of land under management for RCWs (low = 7.5%, intermediate = 46.7%, and high = 66.2%). Bobwhite abundance was closely tied to intensity of management. Landscapes with an intermediate and high proportion of stands dedicated to RCW management had relative abundance of bobwhite 46.9% and 232% greater than that observed in landscapes with a low extent of RCW management. RCW management likely enhances bobwhite habitat through maintenance of pine-grassland communities, and when applied to landscapes, has the potential to improve bobwhite populations locally and regionally.

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2055. Effects of rest, season-long, and delayed grazing of wetlands and adjacent uplands on cattle and waterfowl use.

Ruyle, G. B. University of California, Berkeley, 1980.

Notes: Thesis

Descriptors: habitat management/ grazing/ waterfowl/ wetlands

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2056. Effects of Rodeo and Garlon 3A on nontarget wetland species in central Washington.

Gardner, S. C. and Grue, C. E.

Environmental Toxicology and Chemistry 15(4): 441-451. (1996)

NAL Call #: QH545.A1E58; ISSN: 0730-7268

Descriptors: wetlands/ herbicides/ toxicity/ effects/ weeds/ weed control/ aquatic organisms/ aquatic weeds/ control/ chemical control/ glyphosate/ triclopyr/ nontarget effects/ aquatic invertebrates/ *Lythrum salicaria*/ *Daphnia*/ rainbow trout/ *Lemna*

Abstract: Purple loosestrife, *Lythrum salicaria*, is an invasive wetland perennial that became established in northeastern North America in the early 1800s. Despite its designation as a noxious weed, its distribution has continued to expand. Treatment with herbicides is the most widely used means of controlling purple loosestrife. This study examined the nontarget effects of two herbicides, Rodeo [glyphosate] and Garlon 3A [triclopyr amine], currently used or being considered for use in controlling purple loosestrife in Washington State, resp. Growth and/or survival of duckweed [*Lemna* spp.], *Daphnia*, and rainbow trout were monitored for at least 24 h following an application of each herbicide. Free-living water column and benthic invertebrates were monitored 24 h and 7 d post-spray using activity traps and sediment cores. Neither chemical was associated with significant decreases in survival or growth of the bioassay organisms, with the exception that growth of duckweed was reduced 48 h after exposure to Rodeo. Nor were significant decreases in the abundance of free-living aquatic invertebrates detected following the herbicide applications. Results suggest that neither herbicide, at the application rates used, poses a hazard to aquatic invertebrates in wetlands in central Washington. However, Rodeo, because it is a broad-spectrum herbicide, may pose a greater hazard to nontarget aquatic vegetation.

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2057. Effects of sheep grazing on a riparian-stream environment.

Platts, W. S. Intermountain Forest and Range Experiment Station, U.S. Department of Agriculture, 1981. 6 p. Research Note.

NAL Call #: A99.9 F764Un

Descriptors: grazing/ habitat alterations/ management/ research: rivers and streams/ riparian habitat

© NISC

2058. Effects of streamside forest management on the composition and abundance of stream and riparian fauna of the Olympic peninsula.

Raphael, Martin G.; Bisson, Peter A.; Jones, Lawrence L.; and Foster, Alex D.

In: *Congruent Management of Multiple Resources:*

Proceedings from the Wood Compatibility Initiative workshop, General Technical Report-PNW 563/ Johnson, Adelaide C.; Haynes, Richard W.; and Monserud, Robert A.; Portland, OR: Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture, 2002. pp. 27-40.

Notes: 0363-6224 (ISSN).

<http://www.fs.fed.us/pnw/pubs/gtr563/gtr563a.pdf>

Descriptors: commercial activities/ conservation measures/ ecology/ freshwater habitat/ lotic water/ terrestrial habitat/ land zones/ Vertebrata: forestry/ timber harvesting/ streamside forest management/ stream community/ riparian community/ habitat management/ riparian buffer zones/ streamside forest management regimes/ community structure/ stream fauna/ riparian fauna/ community composition/ forest and woodland/ community composition/ Washington/ Olympic Peninsula/ chordates/ vertebrates

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2059. Effects of timber management on pond-breeding salamanders.

Morris, Katrina M. and Maret, Timothy J.

Journal of Wildlife Management 71(4): 1034-1041. (2007)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: Ambystomatidae/ Caudata/ Lissamphibia/ *Ambystoma maculatum*/ *Ambystoma opacum*/ forests/ ecosystems/ forestry practices/ habitat alterations/ habitat use/ Michaux State Forest/ oak-hickory forest/ Pennsylvania/ timber harvesting/ wildlife-human relationships/ commercial enterprises/ disturbances/ land zones

Abstract: Pond-breeding salamanders spend most of their lives in forested habitat surrounding the vernal pools where they breed. Timber harvesting has been demonstrated to have negative impacts on salamander populations due to changes in soil temperature, soil compaction, and general degradation of habitat. However, little is known about how long it takes for harvested forest habitat to once again become suitable for salamanders. Questions also remain as to whether salamanders will use an area that has been harvested in recent years if an older intact forest area is available. We used drift fences and pitfall traps to capture adult spotted salamanders (*Ambystoma maculatum*) and opacum) migrating to 3 vernal ponds during their breeding seasons. The study area contained tracts of forest that were marbled salamanders (*A. opacum*) migrating to 3 vernal ponds during their breeding seasons. The study area contained tracts of forest that were clear-cut 11-12 years prior to the study. All 3 ponds were surrounded by areas of

clear-cut and intact forest and drift fences were placed in both habitat types. Similar numbers of spotted salamanders entered the ponds from clear-cut and intact forest areas. The number of marbled salamanders migrating to the ponds did not differ between areas of clear-cut and intact forest. These results suggest that clear-cut habitats may become suitable for adult pond-breeding salamanders after a relatively short regeneration period.

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2060. Enhanced avian diversity in Wisconsin pine barrens through aggregated timber harvest.

Niemuth, Neal D. and Boyce, Mark S.

Transactions of the North American Wildlife and Natural Resource Conference 65: 184-199. (2000)

NAL Call #: 412.9 N814; ISSN: 0078-1355

Descriptors: commercial activities/ conservation measures/ terrestrial habitat/ land and freshwater zones/ Aves: forestry/ habitat management/ forest and woodland/ Wisconsin/ aggregated timber harvest/ species diversity/ birds/ chordates/ vertebrates

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2061. Enhancing riparian habitat for fish, wildlife, and timber in managed forests.

Newton, Michael; Willis, Ruth; Walsh, Jennifer; Cole, Elizabeth; and Chan, Samuel

Weed Technology 10(2): 429-438. (1996)

NAL Call #: SB610.W39; ISSN: 0890-037X

Descriptors: conifer (Coniferopsida)/ fish/ Pisces/ animals/ chordates/ fish/ gymnosperms/ nonhuman vertebrates/ plants/ spermatophytes/ vascular plants/ vertebrates/ conservation/ forestry/ riparian habitat

Abstract: The productivity of riparian sites in managed forests can be focused to provide productive fish and wildlife habitat while yielding most of its productive capacity for other than amenity values. Establishment of habitat protection goals and measures of achievement permit flexible approaches for meeting them. Once the protection standards are set, intensive management of the woody cover is logically dependent on minimum disturbance methods, in general, for both vegetation management and harvest. Several currently registered chemical products and non-chemical methods are helpful and safe in achieving both yield and protection goals.

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2062. Environmental implications of excessive selenium: A review.

Lemly, A. Dennis

Biomedical and Environmental Sciences 10(4): 415-435. (1997); ISSN: 0895-3988

Descriptors: selenium: trace metals/ agricultural irrigation/ fossil fuel waste disposal/ human activities/ land management/ public health/ water management

Abstract: Selenium is a naturally occurring trace element that is nutritionally required in small amounts but it can become toxic at concentrations only twice those required. The narrow margin between beneficial and harmful levels has important implications for human activities that increase the amount of selenium in the environment. Two of these activities, disposal of fossil fuel wastes and agricultural irrigation of arid, seleniferous soils, have poisoned fish and wildlife, and threatened public health at several locations in the United States. Research studies of these episodes

have generated a data base that clearly illustrates the environmental hazard of excessive selenium. It is strongly bioaccumulated by aquatic organisms and even slight increases in waterborne concentrations can quickly result in toxic effects such as deformed embryos and reproductive failure in wildlife. The selenium data base has been very beneficial in developing hazard assessment procedures and establishing environmentally sound water quality criteria. The two faces of selenium, required nutrient and potent toxin, make it a particularly important trace element in the health of both animals and man. Because of this paradox, environmental selenium in relation to agriculture, fisheries, and wildlife will continue to raise important land and water-management issues for decades to come. If these issues are dealt with using prudence and the available environmental selenium data base, adverse impacts to natural resources and public health can be avoided.

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2063. Environmental Quality Incentives Program contributions to fish and wildlife conservation.

Berkland, Mark W. and Rewa, Charles A.

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. 171-192.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Environmental Quality Incentives Program

Abstract: The Environmental Quality Incentives Program (EQIP) is a voluntary program whereby the U.S. Department of Agriculture provides technical and financial assistance to active farmers and ranchers to address natural resource concerns such as soil conservation, water quality and quantity, nutrient management, and fish and wildlife habitat. The Natural Resources Conservation Service (NRCS) is working with these landowners to maximize the environmental benefits gained for the expenditures made in the program. Funding has expanded significantly under the 2002 Farm Bill, with the amount of annual funding authorized reaching \$1.3 billion by fiscal year 2007. The EQIP has been used to implement a wide variety of practices that are considered beneficial to many species of fish and wildlife. The NRCS is also beginning to use EQIP to address the needs of declining and other at-risk fish and wildlife species. Few data are available that document fish and wildlife response to EQIP. Program implementation to date is summarized, and recent information on planning of practices with the potential to benefit fish and wildlife resources is examined.

2064. Estimate of crappie entrainment through water discharge from a Nebraska irrigation reservoir.

Fryda, Nicolas J.; Koupal, Keith D.; and Hoback, W. Wyatt

Journal of Freshwater Ecology 21(4): 693-697. (2006)

NAL Call #: QH541.5.F7J68; ISSN: 0270-5060

Descriptors: commercial activities/ ecology/ population dynamics/ freshwater habitat/ lentic water/ man-made habitat/ land zones/ Pomoxis: farming and agriculture/ Irrigation system/ mortality/ population density/ reservoir/ Irrigation reservoir/ entrainment estimate/ water supply system habitat/ Nebraska/ Sherman County/ Sherman

Reservoir/ Pisces, Actinopterygii, Perciformes, Centrarchidae/ chordates/ fish/ vertebrates
Abstract: From June to September in 2004 and 2005, we sampled twice per week from the irrigation canal below the dam to determine entrainment of crappies (*Pomoxis* spp.) from Sherman Reservoir, Sherman County, Nebraska. The estimated total loss from the reservoir was about 1.0 million crappies per year. During both years more crappies were released during nighttime than daytime hours and there was a positive relationship between water discharge and the number of crappies collected. Furthermore, increase in water discharge over 8 m³/S significantly increased the density of entrained crappies.
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2065. Estimating wildlife habitat trends on agricultural ecosystems in the United States.

Brady, S. J. and Flather, C. H.
Proceedings from an Organization for Economic Co-operation and Development Expert Meeting: 156-167. (Nov. 2001).
Notes: ISBN: 9264199209; Conference: Agriculture and Biodiversity: Developing indicators for Policy Analysis held 5-8 November 2001 in Zurich, Switzerland.
Descriptors: agri-environmental indicators/ National Resources Inventory/ NRI/ wildlife habitat/ United States
Abstract: Recent trends (1992-1997) in wildlife habitat on agricultural and grazed ecosystems are reviewed using data from the 1997 National Resources Inventory. Land use changes, the losses and gains of wetlands, and reasons for wetland losses are described. Ecological indices describing spatial pattern and fragmentation of cropland and rangeland habitats are discussed, and geographically explicit summary statistics are presented for the United States. The effect of the Department of Agriculture's Conservation Reserve Program is described as an example of a multi-purpose habitat intervention scheme. Because land resource planners need estimates of habitat quantity and condition, the concept of wildlife habitat management as a secondary use of agricultural lands is reviewed. The uses and limitations of ecological indicators and habitat matrices, including statistical estimates of precision and the need to establish relationships between habitat-based indicators and direct measures of biodiversity, are also discussed.

2066. Evaluating residual tree patches as stepping stones and short-term refugia for red-legged frogs.

Chan-McLeod, Ann C. Allay and Moy, Arnold
Journal of Wildlife Management 71(6): 1836-1844. (2007)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: Anura/ Lissamphibia/ Ranidae/ *Rana aurora*/ British Columbia/ forests/ ecosystems/ forestry practices/ habitat alterations/ habitat management/ habitat use/ residual tree patch retention/ Vancouver Island/ wildlife-human relationships/ Canada/ commercial enterprises/ conservation/ wildlife management/ disturbances/ land zones
Abstract: Temperate pond-breeding amphibians are vulnerable to forest fragmentation because they must access upland terrestrial sites during the nonbreeding season but are prone to desiccation in hot, dry environments without canopy cover. Harvesting techniques that retain live trees in the cut block are advocated for sustaining forest biodiversity, but the effects of these

practices on amphibians are unknown. We studied red-legged frogs (*Rana aurora*) in movement trials to assess: 1) how short-term use of residual trees was affected by tree patch size, streams, and neighborhood features 2) whether residual tree patches were used as stepping stones in negotiating cut blocks; 3) the effects of patch size and patch proximity in altering movement paths; and 4) the effects of retention level and patch size on interpatch distance. Residual tree patches were potentially valuable short-term refugia but their value was size dependent. Virtually all frogs released at the base of single trees or inside small tree clusters left within 72 hours, but the proportion leaving decreased curvilinearly with increasing patch size. Frogs were less likely to leave tree patches with a running stream or where neighborhood stream density was high. Residual tree patches did not systematically alter movement paths. Frogs intercepted residual tree patches mostly at random and had to be within 5-20 m of a tree patch before moving to it in greater proportions than expected by chance. However, amphibian movements were biased toward large (0.8 ha) patches and away from small (0.3 ha) patches 50 m away. Our results indicated that residual trees should not be retained singly but should be aggregated in groups between 0.8 ha and 1.5 ha, preferably in stream locations.
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2067. Evaluation of management practices and farming systems on Missouri wetland wildlife areas: A survey of agricultural cropping systems and wetland management practices on selected Missouri Department of Conservation wildlife areas.

Graber, D. A. Missouri Dept. of Conservation, 1987. 20 p.
Annual Report.
Descriptors: wetlands/ evaluation/ surveys/ cultivated farmland/ farms/ food crops/ habitat management/ questionnaire/ fertilization, soil and water/ water resources management/ plant control/ vegetation/ floods
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2068. Evaluation of management practices and farming systems on Missouri wetland wildlife areas: Determining the nutritional value of selected moist soil seeds and wetland agricultural crops.

Graber, D. A. Missouri Dept. of Conservation, 1989. 13 p.
Descriptors: wetlands/ amino acids/ bioenergetics/ cultivated farmland/ evaluation/ farms/ floods/ food crops/ goose, Canada/ metabolism/ nutrients/ nutrition/ overwintering/ proteins/ seeds/ wildlife management areas/ *Panicum* spp./ *Polygonum amphibium*/ smartweed/ *Sorghum vulgare*/ Missouri
Abstract: Objectives were to determine: (1) by means of proximate analysis, amino acid assay and gross energy assay, the nutrient content of rowcrops and moist-soil plants (largeseed smartweed, milo, corn, wild millet, nodding smartweed, rice cutgrass, nodding foxtail, beggarticks, and soybean) regularly consumed by wintering Canada Geese in Missouri; (2) the true metabolizable energy of these rowcrops and plants for Canada geese; and (3) to what extent the gross energy of Canada goose foods varies when exposed to non-flooded and flooded conditions for 30, 60, 90 and 15 days between September 1987 and March 1988.
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2069. Evaluation of supplemental forages and prescribed burning for white-tailed deer in the Ozarks of Missouri.

Jeffries, A. P.

Columbia, MO: University of Missouri-Columbia, 2000.

Notes: Degree: M.S.; Wildlife Coop. Unit Report

Descriptors: Odocoileus virginianus/ supplemental feeding/ habitat management/ disturbed habitat [fire]/ food supply/ fertilization, soil and water/ food crops seasons/ food elements/ harvests/ mast/ nutrients/ vegetation/ Missouri/ Ozark Plateau region/ Crawford County

Abstract: Thesis is divided into three chapter (study) topics: (1) An Evaluation of Supplemental Forages for White-tailed Deer in the Missouri Ozarks; (2) Effect of Prescribed Burning on Forage Production and Nutrients; and (3) Diet, Nutrition, and Body Characteristics of White-tailed Deer on Woodsvally Farms, Missouri.

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2070. Exploring methods of selecting cropland for conservation.

Feather, P.; Hellerstein, D.; and Hansen, L.

Agricultural Outlook (AO)(No. AO-254): 21-24. (1998)

NAL Call #: aHD1751.A422

Descriptors: agricultural land/ land use/ land management/ environmental protection/ evaluation/ land policy/ environmental policy/ methodology/ conservation/ recreation/ valuation/ economic analysis/ wildlife/ water quality/ erosion/ environmental impact/ attitudes/ hunting/ water recreation/ land diversion/ amenity and recreation areas/ outdoor recreation/ rural recreation/ visitors/ access/ United States/ wildlife viewing

Abstract: The way in which the environmental benefits index (EBI) operates with respect to selecting land for inclusion in the US Conservation Reserve Program (CRP) is detailed. The construction of the EBI relies on the judgements of natural resource experts and programme managers. The scoring system is based on selected factors: wildlife habitat, water quality, erodibility, retention of environmental benefits after contracts expire, air quality and conservation priority areas. An investigation into the value placed by the public on the enhanced recreational benefits which results from the CRP is presented. The analysis focuses on water based recreation, wildlife viewing and pheasant hunting.

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2071. Factors affecting songbird nest survival in riparian forests in a Midwestern agricultural landscape.

Peak, Rebecca G.; Thompson, Frank R.; and Shaffer, Terry L.

Auk 121(3): 726-737. (2004)

NAL Call #: 413.8 AU4; ISSN: 0004-8038

Descriptors: reproduction/ reproductive productivity/ ecology/ population dynamics/ terrestrial habitat/ man-made habitat/ land zones/ Oscines: fledging success/ nest success/ influencing factors/ survival/ nest survival/ forest and woodland/ riparian forest/ riparian habitat/ cultivated land habitat/ agricultural landscape/ Missouri/ Scotland/ Knox and Clark counties/ Aves, Passeriformes/ birds/ chordates/ vertebrates

Abstract: We investigated factors affecting nest success of songbirds in riparian forest and buffers in northeastern Missouri. We used an information-theoretic approach to determine support for hypotheses concerning effects of

nest-site, habitat-patch, edge, and temporal factors on nest success of songbirds in three narrow (55-95 m) and three wide (400-530 m) riparian forests with adjacent grassland-shrub buffer strips and in three narrow and three wide riparian forests without adjacent grassland-shrub buffer strips. We predicted that temporal effects would have the most support and that habitat-patch and edge effects would have little support, because nest predation would be great across all sites in the highly fragmented, predominantly agricultural landscape. Interval nest success was 0.404, 0.227, 0.070, and 0.186, respectively, for Gray Catbird (*Dumetella carolinensis*), Northern Cardinal (*Cardinalis cardinalis*), Indigo Bunting (*Passerina cyanea*), and forest interior species pooled (Acadian Flycatcher (*Empidonax vireescens*), Wood Thrush (*Hylocichila mustelina*), Ovenbird (*Seiurus aurocapillus*), and Kentucky Warbler (*Oporornis formosus*)). The effect of nest stage on nest success had the most support; daily nest success for Gray Catbird and Indigo Bunting were lowest in the laying stage. We found strong support for greater nest success of Gray Catbird in riparian forests with adjacent buffer strips than in riparian forests without adjacent buffer strips. Patch width also occurred in the most-supported model for Gray Catbird, but with very limited support. The null model received the most support for Northern Cardinal. Riparian forests provided breeding habitat for area-sensitive forest species and grassland-shrub nesting species. Buffer strips provided additional breeding habitat for grassland-shrub nesting species. Interval nest success for Indigo Bunting and area-sensitive forest species pooled, however, fell well below the level that is likely necessary to balance juvenile and adult mortality, which suggests that when riparian forests are located within agricultural landscapes, the potential even for wide riparian forests with adjacent buffer strips to provide high-quality breeding habitat is severely diminished for some species.

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2072. Factors influencing soil invertebrate communities in riparian grasslands of the central Platte River floodplain.

Davis, Craig A.; Austin, Jane E.; and Buhl, Deborah A.

Wetlands 26(2): 438-454. (2006)

NAL Call #: QH75.A1W47; ISSN: 0277-5212

Descriptors: conservation measures/ ecology/ terrestrial habitat/ abiotic factors/ physical factors/ land zones/ invertebrata: habitat management/ river flow management/ effect on wet meadow soil community structure/ community structure/ wet meadow soil/ hydrology and topography effects/ conservation implications/ grassland/ wet meadows/ soil community structure/ soil habitat/ wet meadows community structure/ physical factors/ topography/ aridity/ water table depth/ climate and weather/ rain/ Nebraska/ Platte River Valley/ wet meadow soil community structure/ invertebrates

Abstract: In the Platte River Valley of central Nebraska, USA, riparian grasslands (also known as wet meadows) have been severely impacted by a reduction in river flows, causing lower ground-water levels and altered seasonal hydroperiods. The potential impacts of these hydrologic changes, as well as the environmental factors that influence wet meadow soil invertebrate communities, are not well understood. An understanding of the ecological processes that influence these invertebrate communities is crucial for maintaining and restoring wet meadows along the Platte

River. Our objectives were to describe the soil invertebrate community of wet meadows throughout the growing season and to examine the relative roles of abiotic factors in determining patterns in invertebrate community structure. We conducted the study in 12 wet meadows along the Platte River during 1999 and 2000. We identified 73 invertebrate taxa; 39 were considered soil inhabitants. Total biomass was primarily composed of earthworms, Scarabaeidae, Isopoda, and Elateridae, with earthworms and Scarabaeidae accounting for >82%. Differences in river flow and precipitation patterns influenced some soil invertebrates. Earthworms and Scarabaeidae declined dramatically from 1999 (wet year) to 2000 (dry year). The topographic gradient created by the ridge-swale complex affected several soil invertebrate taxa; Scarabaeidae, Diplopoda, and Lepidoptera biomasses were greatest on drier ridges, while Tipulidae and Isopoda biomasses were greatest in wetter sloughs. Responses of earthworm taxa to the topographic gradient were variable, but generally, greater biomasses occurred on ridges and mid-elevations. Water-table depth and soil moisture were the most important variables influencing wet meadow soil invertebrates. Because these communities are linked to the hydrologic processes of the Platte River, future alterations of wet meadow hydrology could shift the distribution patterns of many of these invertebrates and possibly eliminate more moisture-tolerant taxa. To maintain wet meadows and their biotic communities, flow management should focus on regaining as much as possible of the former hydrograph through properly timed flows that provide an adequate hydrologic regime for wet meadows. In addition, restoration of wet meadows will depend on restoring the natural topography of wet meadows.
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2073. Factors limiting mallard brood survival in prairie pothole landscapes.

Krapu, G. L.; Pietz, P. J.; Brandt, D. A.; and Cox, R. R. *Journal of Wildlife Management* 64(2): 553-561. (2000)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: survival/ prairies/ wildlife management/ mathematical models/ juveniles/ clutch/ population dynamics/ *Anas platyrhynchos*/ mallard/ prairie pothole landscapes
Abstract: In order to estimate mallard (*Anas platyrhynchos*) production from managed and unmanaged lands, waterfowl biologists need measurable predictors of brood survival. We evaluated effects of percent of seasonal basins holding water (WETSEAS), percent of upland landscape in perennial cover (PERNCOVER), rainfall (RAIN), daily minimum ambient temperature (TMIN), hatch date (HATCHDATE), brood age (BA; 0-7 or 8-30 days), age of brood females, and brood size on mallard brood survival in prairie pothole landscapes, and developed a predictive model using factors found to have significant effects. Sixteen of 56 radiomarked broods experienced total loss during 1,250 exposure days. Our final fitted model of brood survival contained only main effects of WETSEAS, HATCHDATE, and RAIN. Total brood loss during the first 30 days of exposure was 11.2 times more likely for broods hatched on areas with <17% WETSEAS than those on areas with >59% WETSEAS. Total brood loss was 5.2 times more likely during rainy conditions than during dry periods, and the hazard of total brood loss increased by 5% for each 1-day delay in hatching between 17 May and 12

August. High survival of mallard broods in landscapes where most seasonal basins contain water underscores the importance of maintaining seasonal wetlands as a major component of wetland complexes managed for mallard production. Because early hatched broods have higher survival, we also suggest that waterfowl managers focus their efforts on enhancing nest success of early laid clutches, especially in wet years.
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2074. The farm as natural habitat: Reconnecting food systems with ecosystems.

Jackson, Dana L. and Jackson, Laura L. Washington: Island Press; 296 p. (2002); ISBN: 1559638478.
Descriptors: commercial activities/ conservation measures/ ecology/ man-made habitat/ comprehensive zoology/ farming and agriculture/ habitat management/ agroecosystem management/ ecology/ agroecosystems/ cultivated land habitat/ farmland/ agricultural system ecosystem reconnection/ natural habitat potential
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2075. Farm Bill 2002: A discussion of the conservation aspects of the Farm Bill from a fisheries perspective.

Thomas, D. L.; Pajak, P.; McGuire, B.; Williams, C.; Filipek, S.; and Hughes, R. M. *Fisheries* 26(11): 36-38. (2001)
NAL Call #: SH1.F54; ISSN: 03632415
Descriptors: wildlife management/ Natural Resources Conservation Service/ U. S. Department of Agriculture/ aquatic habitat quality/ coastal fisheries enhancement/ fisheries resources/ watershed management
Abstract: During the spring of 2001, AFS asked members to work on an analysis of the new Farm Bill. David Thomas, chief of the Illinois Natural History Survey, volunteered to chair a committee and a fast-track schedule was established. The mission of the group was to prepare a document suitable for a column in Fisheries that briefly summarized the bill, the implications to fisheries, and perceived deficiencies. The group used as a starting point an earlier AFS document on "Aquatic Habitat Conservation, Recommendations for the 1995 Farm Bill" based on Pajak et al. 1994. A draft document was presented to the Fisheries Administrators Section at the AFS Annual Meeting in Phoenix, Arizona. Review comments were provided by AFS administrators as well as outside reviewers. This document represents a consensus of opinions from a broad cross-section of AFS members but is not a formal position paper of the Society.
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2076. Feeding habitats of spring-migrating blackbirds in east-central South Dakota.

Sawin, Richard S.; Linz, George M.; Bleier, William J.; and Homan, H. Jeffrey
Prairie Naturalist 38(2): 73-84. (2006)
NAL Call #: QH540.P7; ISSN: 0091-0376
Descriptors: nutrition/ feeding behavior/ behavior/ social behavior/ aggregating behavior/ ecology/ habitat utilization/ land zones/ Icteridae: foraging/ flocking/ flock characteristics/ habitat preference/ South Dakota/ activity/ habitat use and behavior/ migratory staging area/ Aves, Passeriformes/ birds/ chordates/ vertebrates

Abstract: Between 27 March and 21 April 1998, we monitored blackbird (Icteridae) activity and habitat selection at a migratory staging area in east-central South Dakota. We used fixed-area observation points located within 201-km² circular plots centered on four wetland basins that were used as night roosts. Each roost was surveyed four times, with the surveys spread evenly throughout the blackbird migration. We recorded the number of blackbird flocks, flock size and composition, habitat used, and behavior (e.g., loafing and feeding). Fifty percent (n = 242) of the 482 flocks recorded in the quadrats was observed loafing in trees of woodlots and shelterbelts. Feeding flocks preferred habitats classified as Corn (e.g., disked, plowed, and stubble corn fields) over two other foraging habitat categories (Cultivated and Grassland). A comparison of proportional availability of Cultivated habitat (soybean (*Lathyrus odoratus*) and wheat (*Triticum aestivum*) stubble, inclusive) against proportional use by feeding flocks indicated that this habitat was avoided. Grassland habitat (hayfields, CRP, and pasture) was used according to its availability. Intensity of Grassland use depended on time of survey (AM and PM), with use greater during the PM survey. A two-factor model (habitat, time, and the interaction term) provided the best parsimonious fit of 15 a priori models tested with Akaike's information criterion (AICC). Selection of foraging habitats by blackbirds might reflect comparable strategies used by other early migrating granivores. This knowledge could help wildlife managers maximize the placement of corn field food plots for optimum benefit to wildlife species.

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2077. Female American black bear use of managed forest and agricultural lands in coastal North Carolina.

Jones, Mark D. and Pelton, Michael R.

Ursus 14(2): 188-197. (2003)

NAL Call #: QL737.C27 I573; ISSN: 1537-6176

Descriptors: *Ursus americanus*/ abundance/ agriculture/ American black bear/ dispersion/ ecological requirements/ habitat/ home-range/ silviculture/ *Glucine max*/ *Pinus* spp./ *Pinus taeda*/ *Triticum* spp./ biotop/ home-range/ North Carolina

Abstract: American black bear use of intensively managed forestry and agricultural environments in the southeastern United States is poorly understood. During 1992-94, we radiomonitored female black bears (*Ursus americanus*) to determine home range and habitat use characteristics in two managed agroforestry environments in the North Carolina coastal plain. These areas represented opposite ends of the land-management spectrum. The Big Pocosin (BP) area was dominated by loblolly pine (*Pinus taeda*) plantations and human activity and development. The Gum Swamp (GS) area contained larger and more numerous remnants of unmanaged forests including bottomlands, mixed hardwoods, upland hardwoods, and pocosins. These unmanaged forests were interspersed with pine plantations and relatively low human activity. Home range and habitat analyses were conducted seasonally and annually using land use-land cover data in a geographic information system (GIS). Spring, summer, and fall home ranges of black bears were larger in the BP than the GS, and GS home ranges were among the smallest reported in the United States. Pocosins, clearcuts, and marshes were frequently preferred over managed pine plantations. Collared bears did not spend large amounts of time in

agricultural areas, but evidence from a companion study suggests that bears depended heavily on crops for food obtained during short feeding forays. Changes in crop rotation patterns from corn, soybeans, and wheat to cotton may reduce agricultural food resources for bears. The continued loss of pocosins and marshes to human development may exacerbate the effects of reduced food crops. Black bears appear to benefit from early-succession habitats created by logging operations. We recommend the development of a coalition of state and federal wildlife agencies, the forest industry, and the agricultural community to discuss landscape effects on black bears in the Atlantic Coastal Plain and implement strategies to address future black bear habitat management in the region.

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2078. Field studies on pesticides and birds: Unexpected and unique relations.

Blus, Lawrence J. and Henny, Charles J.

Ecological Applications 7(4): 1125-1132. (1997)

NAL Call #: QH540.E23 ; ISSN: 1051-0761

Descriptors: dicofol: pesticide/ famphur: pesticide/ pesticide/ DDE: pesticide/ DDT: pesticide/ bird (*Aves*)/ animals/ birds/ chordates/ nonhuman vertebrates/ vertebrates/ eggshell thickness/ population stability/ productivity/ reproductive success/ survival/ trophic level bioaccumulation

Abstract: We review the advantages and disadvantages of experimental and field studies for determining effects of pesticides on birds. Important problems or principles initially discovered in the field include effects of DDT (through its metabolite DDE) on eggshell thickness, reproductive success, and population stability; trophic-level bioaccumulation of the lipid-soluble organochlorine pesticides; indirect effects on productivity and survival through reductions in the food supply and cover by herbicides and insecticides; unexpected toxic effects and routes of exposure of organophosphorus compounds such as famphur and dimethoate; effects related to simultaneous application at full strength of several pesticides of different classes; and others. Also, potentially serious bird problems with dicofol, based on laboratory studies, later proved negligible in the field. In refining field tests of pesticides, the selection of a species or group of species to study is important, because exposure routes may vary greatly, and 10-fold interspecific differences in sensitivity to pesticides are relatively common. Although there are limitations with field investigations, particularly uncontrollable variables that must be addressed, the value of a well-designed field study far outweighs its shortcomings.

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2079. Fire and aquatic ecosystems of the western USA: Current knowledge and key questions.

Bisson, P. A.; Rieman, B. E.; Luce, C.; Hessburg, P. F.; Lee, D. C.; Kershner, J. L.; Reeves, G. H.; and Gresswell, R. E.

Forest Ecology and Management 181: 213-229. (2003)

NAL Call #: SD1.F73; ISSN: 0378-1127.

<http://www.treearch.fs.fed.us/pubs/6025>

Descriptors: forest/ fire/ habitat management/ waters/ ecosystem/ aquatic life/ ecological diversity

Abstract: Understanding of the effects of wildland fire and fire management on aquatic and riparian ecosystems is an

evolving field, with many questions still to be resolved. Limitations of current knowledge, and the certainty that fire management will continue, underscore the need to summarize available information. Integrating fire and fuels management with aquatic ecosystem conservation begins with recognizing that terrestrial and aquatic ecosystems are linked and dynamic, and that fire can play a critical role in maintaining aquatic ecological diversity. To protect aquatic ecosystems we argue that it will be important to: (1) accommodate fire-related and other ecological processes that maintain aquatic habitats and biodiversity, and not simply control fires or fuels; (2) prioritize projects according to risks and opportunities for fire control and the protection of aquatic ecosystems; and (3) develop new consistency in the management and regulatory process. Ultimately, all natural resource management is uncertain; the role of science is to apply experimental design and hypothesis testing to management applications that affect fire and aquatic ecosystems. Policymakers and the public will benefit from an expanded appreciation of fire ecology that enables them to implement watershed management projects as experiments with hypothesized outcomes, adequate controls, and replication.

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2080. Fire and beaver in the boreal forest-grassland transition off western Canada - A case study from Elk Island National Park, Canada.

Hood, Glynnis A. and Bayley, Suzanne E.

Lutra 46(2): 235-241. (2003); ISSN: 0024-7634

Descriptors: Castoridae/ Rodentia/ *Castor canadensis*/ habitat use/ boreal forest-grassland transition area/ prescribed fire/ Alberta/ Elk Island National Park/ fires-burns/ habitat management/ lodge occupancy/ prescribed burning/ environmental factors/ Canada/ conservation/ wildlife management/ land zones

Abstract: Prescribed fire is used as a management tool in many areas throughout the world to restore vegetation communities, reduce fuel loading, and enhance wildlife habitats. However, the effect of prescribed fire on many wildlife species has not been well studied, especially on beavers (*Castor canadensis*). The purpose of our study was to examine whether prescribed fire influences beaver lodge occupancy in the aspen and mixed-wood habitats of Elk Island National Park, Alberta, Canada. In particular, we examined whether lodges in burned habitats experience lower occupancy levels than lodges in unburned habitats, whether the frequency of burns influences lodge abandonment, and whether the distance to suitable habitat potentially accessible from those lodges abandoned following a burn, influence beaver lodge occupancy. Since 1979, over 51% of Elk Island National Park (196 km²) has been burned with the goal of restoring prairie plant communities. We found that fire negatively affected beaver lodge occupancy, an effect compounded with frequent burns. Though prescribed fire is considered an important landscape restoration process, the frequency of prescribed burning should be mitigated to ensure that flooding by beavers can continue as a key process that maintains wetlands on the landscape.

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2081. Fire and birds in the southwestern United States.

Bock, C. E. and Block, W. M.

Studies in Avian Biology (30): 14-32. (2005)

NAL Call #: QL671.S8; ISSN: 01979922

Descriptors: birds/ chaparral/ desert/ fire/ grassland/ mixed-conifer/ pine-oak/ prescribed burning/ riparian/ savanna/ United States, southwestern region/ wildfire/ Aves/ Coniferophyta/ *Juniperus*/ *Pinus edulis*/ *Pinus ponderosa*/ Poaceae

Abstract: Fire is an important ecological force in many southwestern ecosystems, but frequencies, sizes, and intensities of fire have been altered historically by grazing, logging, exotic vegetation, and suppression. Prescribed burning should be applied widely, but under experimental conditions that facilitate studying its impacts on birds and other components of biodiversity. Exceptions are Sonoran, Mojave, and Chihuahuan desert scrub, and riparian woodlands, where the increased fuel loads caused by invasions of exotic grasses and trees have increased the frequency and intensity of wildfires that now are generally destructive to native vegetation. Fire once played a critical role in maintaining a balance between herbaceous and woody vegetation in desert grasslands, and in providing a short-term stimulus to forb and seed production. A 3-5 yr fire-return interval likely will sustain most desert grassland birds, but large areas should remain unburned to serve species dependent upon woody vegetation. Understory fire once maintained relatively open oak savanna, pinyon-juniper, pine-oak, ponderosa pine (*Pinus ponderosa*), and low elevation mixed-conifer forests and their bird assemblages, but current fuel conditions are more likely to result in stand-replacement fires outside the range of natural variation. Prescribed burning, thinning, and grazing management will be needed to return fire to its prehistoric role in these habitats. Fire also should be applied in high elevation mixed-conifer forests, especially to increase aspen stands that are important for many birds, but this will be an especially difficult challenge in an ecosystem where stand-replacement fires are natural events. Overall, surprisingly little is known about avian responses to southwestern fires, except as can be inferred from fire effects on vegetation. We call for cooperation between managers and researchers to replicate burns in appropriate habitats that will permit rigorous study of community and population-demographic responses of breeding, migrating, and wintering birds. This research is critical and urgent, given the present threat to many southwestern ecosystems from destructive wildfires, and the need to develop fire management strategies that not only reduce risk but also sustain bird populations and other components of southwestern biological diversity.

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2082. Fire and shade effects on ground cover structure in Kirtland's warbler habitat.

Probst, J. R. and Donnerwright, D.

American Midland Naturalist 149(2): 320-334. (2003)

NAL Call #: 410 M58; ISSN: 00030031

Descriptors: fire/ habitat management/ passerines/ prescribed burning/ shading/ succession/ vegetation cover/ *Arctostaphylos uva-ursai*/ *Comptonia peregrina*/ *Prunus pumila*/ *Vaccinium angustifolium*

Abstract: Researchers and managers have suggested that a narrow range of ground-cover structure resulting from fire might be necessary for suitable Kirtland's warbler nesting

conditions. Yet, Kirtland's warblers have bred successfully in numerous unburned stands and there is little direct evidence to indicate that ground cover structure is a limiting factor for nest sites or habitat suitability within appropriate landform-ecosystems. We documented the range of percent cover for dominant ground-cover structural components in burned and unburned habitat (stand ages 7-23 y) occupied by Kirtland's warblers. The mean percent cover for the dominant ground-cover structural components was lichen/moss (12.1%), blueberry (*Vaccinium angustifolium*) (9.5%), bare ground and litter (5.6%), sedge/grass (5.2%), deadwood (4.3%), sand cherry (*Prunus pumila*) (3.3%), sweet fern (*Comptonia peregrina*) (2.3%), coarse grass (1.8%) and bearberry (*Arctostaphylos uva-ursai*) (1.2%). Burned sites had significantly more deadwood, sweet fern and lichen/moss cover, while unburned sites had significantly more bare ground and sedge/grass. We also investigated how fire, shade-history (i.e., pre-fire tree crown cover approximated by tree height and density) and succession influenced the percent cover of the dominant ground-cover structural components from 1 to 5-y after wildfire disturbance. The magnitude of differences in percent cover among shade-histories changed through time for the ground-cover components sand cherry, deadwood, grass/sedge and coarse grass. The percent cover of sweet fern, bearberry and bare ground was significantly different between some shade-histories. All dominant ground-cover components showed significant difference between at least one shade-history when compared to an unburned harvested reference stand. This suggests that more similarities exist among the three burned sites than between the burned sites and the unburned reference site. Our results suggest that fire, shade-history and succession influence ground-cover, but that various ground-cover components are affected differently by these factors. Because of the complex role disturbance history plays in maintaining ground-cover in Kirtland's warbler habitat, optimal management prescriptions are difficult to specify, especially when aspects of Kirtland's warbler ecology other than nest location are also considered. Although suitable ground cover structure can result without fire, maintaining prescribed fire is still desirable because this is a historically fire-regulated system. However, the range of ground-cover structures accepted by the Kirtland's Warbler and its resilience to disturbance suggests that suitable ground-cover for Kirtland's warbler could be maintained in some stands without burning after every timber harvest.
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2083. Fire ecology and bird populations in eastern deciduous forests.

Artman, V. L.; Hutchinson, T. F.; and Brawn, J. D. *Studies in Avian Biology* (30): 127-138. (2005)
NAL Call #: QL671.S8; ISSN: 01979922
Descriptors: eastern deciduous forest/ fire history/ fire suppression/ forest-interior birds/ maple/ oak/ prescribed fire/ savanna/ Acer/ Aves/ Quercus/ Sapindaceae
Abstract: Eastern deciduous forests are located across the central portion of eastern North America and provide habitat for a wide diversity of bird species. The occurrence of fire in the region has been associated with the presence of humans for over 10,000 yr. While pre-European fire regimes are poorly understood, fire is widely thought to have promoted and maintained large expanses of oak

forest, woodland, and savanna documented in original land surveys. Forest composition is gradually shifting from fire-tolerant oaks (*Quercus* spp.) to other species (e.g., maples [*Acer* spp.]) and suppression of fire has been implicated as a primary cause. Prescribed fire has been used successfully to restore and maintain oak savannas and has been advocated to improve the sustainability of oak forests. Fire ecology research has addressed short-term effects of prescribed fire on habitat structure, breeding bird populations, and nesting productivity. In the short term, prescribed fire reduces habitat suitability for forest-interior birds that nest on the ground and in low shrubs but provides more favorable conditions for disturbance-dependent birds associated with savannas, woodlands, and early-successional forest. The use of prescribed burning requires tradeoffs in terms of management and conservation because some bird species benefit while others are negatively affected, depending on the degree to which fire changes habitat features. There is a critical need for long-term studies to better understand the effects of different fire regimes on bird populations in the eastern deciduous forest region.
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2084. Fire in North American wetland ecosystems and fire-wildlife relations: An annotated bibliography.

Kirby, R. E.; Lewis, S. J.; and Sexson, T. N. Washington, DC: U.S. Fish and Wildlife Service, 1988. 146 p. Biological Report.
NAL Call #: QH540.U562 no.88(1)
Descriptors: fire management/ wetlands/ wildlife/ North America
Abstract: Provides an annotated bibliography of 319 citations that provide specific research data, summaries of existing knowledge, or site-specific management advice for North America. To this bibliography is appended a supplemental bibliography of all articles cited in the US Fish & Wildlife Service publication series, *Wildlife Review*, years 1935 through the September 1987 issue (Number 206) that discussed any aspect of wildlife management and ecology related to fire management, fire behaviour, or fire effects in North America. The 942 citations in the supplemental bibliography are intended to provide a ready reference to the fire-wildlife literature that can be used to evaluate past, current or proposed use of fire in wildlife habitat management. -from Authors
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2085. Fish and wildlife benefits of Farm Bill conservation programs: 2000-2005 update.

Haufler, Jonathan B.; Galley Krista E. M.; Rooney William R. Bethesda, MD: Wildlife Society; Technical Review 05-2, 2005. 205 pp.
<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>
Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish
Abstract: This publication updates the Heard et al. (2000) report, which summarized information concerning wildlife benefits derived from Farm Bill conservation programs. Since that initial report, the best researched and documented conservation program has been the Conservation Reserve Program, which is discussed in this volume.

2086. Fish and wildlife benefits of the Wildlife Habitat Incentives Program.

Gray, Randall L.; Benjamin, Sally L.; and Rewa, Charles A. In: Fish and wildlife benefits of Farm Bill conservation programs: 2000-2005 update, Technical Review 05-2/ Haufler, Jonathan B.; Bethesda, MD: The Wildlife Society, 2005. pp. 155-169.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Wildlife Habitat Incentives Program

Abstract: The Wildlife Habitat Incentives Program (WHIP) is a voluntary program that encourages the establishment and enhancement of a wide variety of fish and wildlife habitats of national, state, tribal, or local significance. Through voluntary agreements, the Natural Resources Conservation Service (NRCS) provides financial and technical assistance to participants who installed habitat restoration and management practices. Since 1998, nearly \$150 million has been dedicated to the program and over 2.8 million acres involving over 18,000 contracts have been enrolled. A wide range of habitat-enhancement actions are cost-shared through the program, affecting hundreds of target and non-target species. While few quantitative data exist describing how fish and wildlife have responded to terrestrial and aquatic habitats enrolled in the program, the popularity of WHIP among participants and funding partners and anecdotal evidence imply that tangible benefits to target species are being realized. Additional studies are needed to better understand how WHIP projects affect local habitat use by and population response of target and non-target species.

2087. Fish and Wildlife response to Farm Bill conservation practices.

Boyer, Kathryn L.; Brady, Stephen J.; Burger, Loren W.; Clark, William R.; Franklin, Thomas M.; Ganguli, Amy C.; Haufler, Jonathan B.; Helinski, Ronald; Johnson, Douglas; Jones-Farrand, D. Todd; Knight, Scott S.; Manale, Andrew; Reeder, Kathleen F.; Rewa, Charles A.; and Ryan, Mark R. Bethesda, MD: The Wildlife Society; Technical Review 07-1, 2007. 118 pp.

<ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/fwfball.pdf>

Descriptors: aquatic habitat/ conservation practices/ conservation programs/ Farm Bill/ terrestrial habitat/ wildlife species/ wildlife management

Abstract: This document is the second of two literature reviews focused on fish and wildlife and the Farm Bill. It is a conservation practice-oriented companion to the Farm Bill conservation program-focused literature synthesis released in 2005 (Fish and Wildlife Benefits of Farm Bill Conservation Programs: 2000-2005 Update, The Wildlife Society Technical Review 05-2).

2088. Fish and wildlife response to Farm Bill conservation practices: Executive summary.

Haufler, Jonathan B.

In: Fish and Wildlife Response to Farm Bill Conservation Practices; Bethesda, MD: The Wildlife Society, 2007. 5 pp. <ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/fwfb1.pdf>

Descriptors: aquatic habitat/ conservation practices/ Farm Bill/ terrestrial habitat/ wildlife species/ wildlife management

Abstract: This summary describes the scope and purpose of the report Fish & Wildlife Response to Farm Bill Conservation Practices. This publication addresses conservation practices that can be used to provide fish and wildlife benefits through the Farm Bill. It does not specifically focus on investigations of actual Farm Bill funded projects, but rather summarizes investigations that have addressed various benefits or impacts to fish and wildlife resources associated with the primary practices utilized for fish and wildlife objectives within Farm Bill programs. The chapters in this volume do not attempt to provide a complete review of all literature pertaining to these practices, but rather to provide documentation of fish and wildlife responses reported in the literature.

2089. Forest area and avian diversity in fragmented aspen woodland of North Dakota.

Grant, T. A. and Berkey, G. B.

Wildlife Society Bulletin 27(4): 904-914. (2000)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: area requirements/ aspen woodland/ avian diversity/ grassland/ North Dakota/ avifauna/ community dynamics/ grassland/ habitat management/ vegetation cover/ woodland/ United States/ Populus

Abstract: Aspen (*Populus* spp.) woodland is increasing within native grasslands in north-central North Dakota, and this increase concerns land managers. We examined avian associations in aspen groves of various sizes on and near J. Clark Salyer National Wildlife Refuge in 1995-96 to predict how bird communities change as woody plant cover increases within a grassland-dominated landscape. Avian species richness increased as aspen grove size increased, particularly for bird species classified as forest interior, neotropical migrant, ground nesting, or insectivorous. Large (i.e., >100-ha) aspen groves provided suitable habitat for 12 area-sensitive species while also meeting the requirements of more ubiquitous habitat generalists. Conversely, small aspen groves did not support the number or diversity of avian species and were occupied by edge-associated species. None of 53 species recorded in the study were restricted to small aspen groves. We conclude that limiting the spread of aspen woodland into native grassland and eliminating small (i.e., <5-ha) aspen groves where feasible will not adversely impact woodland breeding bird communities. Many avian species occur with greater frequency in aspen woodlands than in eastern deciduous forest. Large woodlands contribute to local avian diversity and may provide habitat for forest species that have shown regional or continental population declines.

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2090. Forest change and stream fish habitat: Lessons from 'Olde' and New England.

Nislow, K. H.

Journal of Fish Biology 67(Sb): 186-204. (Dec. 2005)

Descriptors: conservation/ deforestation/ ecosystem disturbance/ environmental impact/ environmental restoration/ fishery management/ forests/ freshwater fish/ habitat improvement/ identification keys/ land use/ landscape/ migrations/ reforestation/ socioeconomic aspects/ species diversity/ streams/ United States, New England

Abstract: The North Atlantic region has a long history of land use change that has influenced and will continue to

influence stream ecosystems and fisheries production. This paper explores and compares the potential consequences of changes in forest cover for fish production in upland, coldwater stream environments in New England, U.S.A. and the British Isles, two regions which share important similarities with respect to overall physical, biotic and socio-economic setting. Both regions were extensively deforested and essentially no extensive old-growth forest stands remain. In New England, recovering forests, consisting almost entirely of naturally-regenerated native species, now cover >60% of the landscape. Associated with this large-scale reforestation, open landscapes, common in the 19th and first half the 20th century, are currently rare and declining in this region. In the British Isles, forests still cover <20% of the landscape, and existing forests largely consist of exotic conifer plantations stocked at high stand densities and harvested at frequent rotations. While forest restoration and conservation is frequently recommended as a fisheries habitat conservation and restoration tool, consideration of the way in which forests affect essential aspects of fish habitat suggests that response of upland stream fish to landscape change is inherently complex. Under certain environmental settings and reforestation practices, conversion of open landscapes to young-mature forests can negatively impact fish production. Further, the effects of re-establishing old-growth forests are difficult to predict for the two regions (due to the current absence of such landscapes), and are likely to depend strongly on the extent to which critical ecosystem attributes (large-scale disturbances, fish migrations, keystone species, large woody debris recruitment) are allowed to be re-established. Understanding these context-dependencies is critical for predicting fish responses, and should help managers set realistic conservation, management and restoration goals. Management may best be served by promoting a diversity of land cover types in a way that emulates natural landscape and disturbance dynamics. This goal presents very different challenges in New England and the British Isles due to differences in current and predicted land use trajectories, along with differences in ecological context and public perception.

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2091. A functional analysis of streamside habitat use by southern Appalachian salamanders: Implications for riparian forest management.

Petranka, James W. and Smith, Charles K.
Forest Ecology and Management 210(1-3): 443-454. (2005)
NAL Call #: SD1.F73; ISSN: 0378-1127

Descriptors: conservation measures/ ecology/ terrestrial habitat/ land zones/ Plethodontidae: habitat management/ habitat utilization/ functional analysis/ habitat management implications/ Tennessee/ riparian habitat/ North Carolina/ Southern Appalachians/ Amphibia, Lissamphibia, Caudata/ amphibians/ chordates/ vertebrates

Abstract: The appropriate management of streamside forests and use of riparian strips is poorly resolved for many systems because of a lack of understanding of the extent to which riparian forests function as environmental buffers for aquatic species versus core (essential) habitat for semi-aquatic and terrestrial species. We studied streamside forests in western North Carolina and eastern Tennessee, USA, to help delineate their functional value for plethodontid salamanders. We established 30 m x 40 m plots at 17 sites (823-1716 m in elevation) in unmanaged

forests with closed canopies: Plots contained a portion of a seep or first-order stream along one edge and typically extended 36-38 m into the adjoining forest. We examined use of stream and streamside habitats based on captures during area-constrained searches of cover objects. We observed 6423 plethodontid salamanders belonging to 7 terrestrial-breeding and 12 aquatic-breeding species. Terrestrial-breeders (primarily *Plethodon* spp.) comprised 37% of terrestrial specimens and were more abundant at higher elevations. Aquatic-breeders (primarily *Desmognathus* spp.) increased their proportionate use of terrestrial habitat, but declined in overall abundance with elevation. Catches of aquatic-breeders were greatest within 8 m of aquatic habitats (49% of total terrestrial catch of aquatic-breeders), particularly at low elevation sites. The terrestrial zone provided core habitat for one terrestrial-breeder (*D. wrighti*) and six semi-aquatic species (*Desmognathus* spp., *Gyrinophilus porphyriticus* and *Eurycea wilderae*) that were broadly distributed throughout plots, and acted as an aquatic buffer for four highly aquatic species (*Desmognathus* spp.). The remaining species were terrestrial-breeders (*Plethodon* spp.) that were evenly distributed across plots, suggesting that riparian strips would function as important source populations for recolonization following timbering on adjoining land. Because of the vulnerability of plethodontid salamanders to edge effects, effective management of southern Appalachian streamside habitats may require the addition of a terrestrial buffer to protect terrestrial core habitat that immediately adjoins streams and seeps. © 2005 Elsevier B.V. All rights reserved.
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2092. Geospatial analysis of changes in river-channel position and riparian vegetation of the lower Colorado River.

Norman, Laura M.; Webb, Robert H.; Gass, Leila; Yanites, Brian; Howard, Keith A.; Pfeifer, E. D.; and Beard, L. Sue

Proceedings, The Geological Society of America Denver Annual Meeting (Nov. 2004).

Notes: Conference held November 7-10, 2004, Denver, CO; Poster no. 218-9.

http://gsa.confex.com/gsa/2004AM/finalprogram/abstract_79745.htm

Descriptors: aerial photography/ agriculture/ channelization/ climate change/ Colorado River/ Colorado River delta/ conservation/ ecosystems/ fluvial features/ future/ geomorphology/ habitat/ history/ human activity/ hydrology/ Lake Mead/ landform evolution/ landscapes/ Mexico/ models/ prediction/ processes/ remote sensing/ riparian environment/ sediments/ spatial data/ streamflow/ surface water/ variations/ vegetation

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2093. Grassland birds associated with agricultural riparian practices in southwestern Wisconsin.

Renfrew, R. B. and Ribic, C. A.

Journal of Range Management 54(5): 546-552. (2001)
NAL Call #: 60.18 J82 ; ISSN: 0022-409X

Descriptors: grasslands/ population density/ riparian grasslands/ rotational grazing/ species richness

Abstract: Rotational grazing has been proposed as a Best Management Practice for minimizing runoff in Wisconsin agricultural riparian areas. The influence of this land

management practice on grassland birds has not been evaluated in relation to more traditional agricultural land management systems in Midwestern riparian areas. This study compared the grassland bird community in riparian areas in Wisconsin, USA that were rotationally grazed to 2 common land use practices along streams in Wisconsin: continuously grazed pastures and rowcrop fields with 10-m-wide ungrazed buffer strips located along the stream. We calculated total number of birds, the Berger-Parker Index of Dominance, and number of birds ha⁻¹ for each site. Vegetation variables used were height-density, litter depth, and percent bare ground. Bird species richness, species dominance, and density did not differ among land use types. In contrast, grassland bird species of management concern (Savannah Sparrow (*Passerculus sandwichensis*), Eastern Meadowlark (*Sturnella magna*), and Bobolink (*Dolichonyx oryzivorus*)) were found on continuous and rotational pastures but very rarely or never occurred on buffer strips. Contrary to previous research, however, rotationally grazed pastures did not support more of these species than continuously grazed pastures. Bird density was related to vegetation structure, with higher densities found on sites with deeper litter. Within the pasture land use types, there were no consistent differences between species richness and density near the stream (<10 m) and away (>10 m).
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2094. The Grassland Reserve Program: New opportunities to benefit grassland wildlife.

Wood, Floyd and Williams, Jim

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. 147-154.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Grassland Reserve Program/ grasslands/ grazing

Abstract: The Grassland Reserve Program (GRP) was established by the 2002 Farm Bill to provide assistance to landowners in conserving and enhancing ecological value of grasslands while maintaining their suitability for grazing and other compatible uses. In response to long-term declines in grassland acreage and their associated benefits, approximately 524,000 acres have been enrolled since fiscal year 2003 in a variety of long-term rental agreements and easements. The program has proven popular with landowners. Whereas wildlife benefits have likely accrued by protection, enhancement, and restoration of grasslands enrolled, little effort has been made to quantify wildlife response during the first 2 years of program operation. Additional studies are needed to document wildlife benefits achieved.

2095. Habitat availability-preference relationships: Moose case study.

Osko, Terrance James. University of Alberta (Canada), 2004.

Notes: Degree: PhD; Advisor: Hudson, Robert J.

Descriptors: habitat management/ moose/ habitat preference/ habitat use/ Canada

Abstract: Habitat management is driven by results from habitat selection studies that assume the habitats animals

select impart fitness to their populations and are therefore required. Such assumptions are rarely tested yet often are accepted without question and generally applied, potentially leading to mismanagement of wildlife. General application also implies that observed animal preferences for habitats are assumed to be static. I used moose as a case study to investigate whether changing relative abundance of habitat classes can influence the habitat preferences of wildlife and examined how changes in relative habitat abundance might exert that influence. I tested the hypothesis that moose habitat preferences were fixed by comparing habitat use and preferences between 2 groups of moose from the same ecosystem, but which occupied areas differing in relative abundance of the same habitat classes. I used single and multiple linear regression to determine whether the observed preferences were descriptive of moose-habitat relationships that were unique for each group, or whether they were outcomes of a relationship that was common to both. I also assessed whether home range or site selection differed between the same 2 groups in response to physical features in their environment. Both habitat use and preference differed between the 2 moose groups, as did responses to environmental features, suggesting that habitat preferences were conditional upon availability. Regression results supported the hypothesis that contrasting preferences resulted from a common selection process, as well as the alternative, that moose in each group behaved according to unique selection processes. These opposing conclusions were reconciled by the possibility that unique relationships observed at specific places and times can be consolidated to describe comprehensive wildlife-habitat relationships (functional responses) that are responsive to habitat change. Wildlife managers must challenge past generalizations about wildlife-habitat relationships by applying habitat prescriptions as experiments to test hypotheses. Such testing of assumptions that drive habitat prescriptions can improve the act of habitat management as much as the prescriptions are intended to improve habitat. Future research should also seek mechanistic understanding of habitat selection through investigation of the trade-off decisions facing animals as habitat availability changes.
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2096. Habitat conservation for birds in the Mississippi headwaters/tallgrass prairie ecosystem.

Koford, R. and Stallman, H.

Great Plains Research 12(1): 123-139. (2002)

NAL Call #: QH104.5.G73 G755; ISSN: 10525165

Descriptors: declining species/ grassland birds/ habitats/ restoration/ wetlands/ avifauna/ ecosystem management/ grassland/ habitat conservation/ wetland/ United States

Abstract: Land management agencies need to plan and prioritize their activities to best use limited resources. To implement ecosystem management, the US Fish and Wildlife Service has defined watershed-based planning units, such as the Mississippi Headwaters/Tallgrass Prairie Ecosystem. To identify important habitats for migratory birds in this ecosystem, we ranked habitats according to their importance for breeding birds of conservation concern, using rankings of the birds' conservation priority within this ecosystem. Grasslands and wetlands were the highest ranked habitats because 12 (46%) and 9 (25%), respectively, of the species breeding in these habitats had "Partners in Flight" scores greater than 19 (maximum 35).

Shrub-sapling stands and lake habitats ranked next, and forest habitats ranked lowest. The four highly ranked habitats are widespread in the Great Plains. These habitats can contribute to the conservation of a variety of high-priority bird species, if the habitats are restored and managed for birds.

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2097. Habitat fragmentation and the distribution of amphibians: Patch and landscape correlates in farmland.

Kolozsvary, Mary B. and Swihart, Robert K.
Canadian Journal of Zoology 77(8): 1288-1299.
(Aug. 1999)

NAL Call #: 470 C16D; ISSN: 0008-4301

Descriptors: Amphibia/ farming and agriculture/ agricultural fragmentation of forest and wetland/ ecological effects/ community structure/ distribution within habitat/ agriculturally fragmented forest and wetland habitats/ semiaquatic habitat/ agriculturally fragmented wetland ecology/ forest and woodland/ agriculturally fragmented forest ecology/ cultivated land habitat/ agriculturally fragmented forest and wetland/ ecology/ Indiana/ Tippecanoe and Warren Counties/ Indian Pine Natural Resources Area/ agriculturally fragmented forest and wetland habitat ecology

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2098. Habitat fragmentation effects on birds in grasslands and wetlands: A critique of our knowledge.

Johnson, D. H.

Great Plains Research 11(2): 211-231. (2001)

NAL Call #: QH104.5.G73 G755; ISSN: 10525165

Descriptors: birds/ fragmentation/ grasslands/ habitat/ wetlands/ wildlife/ avifauna/ grassland/ habitat fragmentation/ habitat loss/ wetland/ Ammodramus henslowii/ Ammodramus savannarum/ Circus cyaneus/ Dolichonyx oryzivorus/ Passerculus sandwichensis

Abstract: Habitat fragmentation exacerbates the problem of habitat loss for grassland and wetland birds. Remaining patches of grasslands and wetlands may be too small, too isolated, and too influenced by edge effects to maintain viable populations of some breeding birds. Knowledge of the effects of fragmentation on bird populations is critically important for decisions about reserve design, grassland and wetland management, and implementation of cropland set-aside programs that benefit wildlife. In my review of research that has been conducted on habitat fragmentation, I found at least five common problems in the methodology used. The results of many studies are compromised by these problems: passive sampling (sampling larger areas in larger patches), confounding effects of habitat heterogeneity, consequences of inappropriate pooling of data from different species, artifacts associated with artificial nest data, and definition of actual habitat patches. As expected, some large-bodied birds with large territorial requirements, such as the northern harrier (*Circus cyaneus*), appear area sensitive. In addition, some small species of grassland birds favor patches of habitat far in excess of their territory size, including the Savannah (Passerculus sandwichensis), grasshopper (Ammodramus savannarum) and Henslow's (A. henslowii) sparrows, and the bobolink (Dolichonyx oryzivorus). Other species may be area sensitive as well, but the data are ambiguous. Area sensitivity among wetland birds remains unknown since

virtually no studies have been based on solid methodologies. We need further research on grassland bird response to habitat that distinguishes supportable conclusions from those that may be artifactual.

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2099. A habitat network for terrestrial wildlife in the interior Columbia Basin.

Wisdom, Michael J.; Wales, Barbara C.; Holthausen, Richard S.; Hann, Wendel J.; Hemstrom, Miles A.; and Rowland, Mary M.

Northwest Science 76(1): 1-14. (2002)

NAL Call #: 470 N81; ISSN: 0029-344X.

<http://research.wsulibs.wsu.edu:8080/dspace/handle/2376/955>

Descriptors: conservation measures/ terrestrial habitat/ land and freshwater zones/ Vertebrata: habitat management/ endangered taxa/ habitat-network mapping/ endangered status/ forest and woodland/ grassland/ scrub/ conservation/ United States/ Interior Columbia Basin/ endangered taxa/ chordates/ vertebrates

Abstract: Habitat managers need information about landscape conditions in relation to the composite requirements of species that deserve attention in conservation planning. Consequently, we characterized and mapped a broad-scale network of habitats for five suites of terrestrial vertebrates in the 58 million-ha Interior Columbia Basin (Basin). These five suites, referred to as Families, are composed of 44 species whose habitats have declined strongly from historical (circa 1850-1890) to current periods in the Basin, and thus are of conservation focus. Two of the five Families consist of species that depend on old forests. Species in another Family depend on early-seral forests. Species in the remaining Families depend on sagebrush-steppe or open canopy sagebrush and grasslands. For each Family, we characterized current habitat conditions at the scale of the watershed (mean size of 22 500 ha). Each watershed was classified as one of three conditions. Watersheds in Condition 1 contained habitats whose quality or abundance have changed little since the historical period. By contrast, watersheds in Condition 2 or 3 contained habitats that have changed from historical conditions, but in different ways. Watersheds in Condition 2 had habitats of high abundance but moderate resiliency and quality, whereas watersheds in Condition 3 contained habitats of low abundance or low resiliency and quality. The majority of watersheds (59-80%) were in Condition 3 for all five Families, whereas the lowest percentage (5-25%) of watersheds was in Condition 2 for four of five Families. Connectivity among watersheds for all Families appeared low in many parts of the Basin due to spatial gaps associated with areas of habitat extirpation. Our condition maps constitute a broad-scale network of habitats that could be useful for developing multi-species research hypotheses and management strategies for the Basin.

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2100. Habitat selection and use of edges by striped skunks in the Canadian prairies.

Lariviere, S. and Messier, F.

Canadian Journal of Zoology 78(3): 366-372. (2000)

NAL Call #: 470 C16D; ISSN: 00084301

Descriptors: edge effect/ foraging behavior/ habitat selection/ habitat use/ home range/ mustelid/ Canada/ Mephitis mephitis

Abstract: During 1993-1994, we radio-tracked 21 female and 5 male striped skunks (*Mephitis mephitis*) in south-central Saskatchewan, Canada, to assess their patterns of habitat selection. Home ranges of both sexes contained more areas managed for nesting waterfowl and less woodland than the overall study area. When foraging within their home ranges, striped skunks used more wetland and woodland and less cropland relative to other habitat types (managed nesting areas, rights-of-way, farmsteads). Patterns of habitat selection by striped skunks were significantly but weakly correlated with abundance of insects and small mammals. Striped skunks selected undisturbed habitats where ground litter can accumulate, possibly because such habitats also harbor a greater abundance of prey. Our results support the restoration of grasslands for nesting waterfowl. Furthermore, the use of large habitat patches by striped skunks decreased away from edges, suggesting that large patches may serve as refuges for ground-nesting birds.

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2101. Habitat use and survival of northern bobwhite (*Colinus virginianus*) in cropland and rangeland ecosystems during the hunting season.

Williams, Christopher K.; Scott Lutz, R.; Applegate, Roger D.; and Rusch, Donald H. *Canadian Journal of Zoology* 78(9): 1562-1566. (2000) NAL Call #: 470 C16D; ISSN: 0008-4301

Descriptors: ecology/ population dynamics/ man-made habitat/ land and freshwater zones/ *Colinus virginianus* (Phasianidae): survival/ winter/ habitat utilization/ winter cover/ cropland-rangeland comparisons/ terrestrial habitat/ rangeland/ cultivated land habitat/ Kansas/ Lyon County/ survival/ Phasianidae/ Galliformes, Aves/ birds/ chordates/ vertebrates

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2102. Habitat use by meso-predators in a corridor environment.

Frey, S. N. and Conover, M. R. *Journal of Wildlife Management* 70(4): 1111-1118. (2006) NAL Call #: 410 J827; ISSN: 0022541X. Notes: doi: 10.2193/0022-541X(2006)70 [1111:HUBMIA]2.0.CO;2.

Descriptors: corridors/ habitat use/ linear habitat/ predators/ raccoon/ red fox/ striped skunk/ waterfowl
Abstract: Red foxes (*Vulpes vulpes*), raccoons (*Procyon lotor*), and striped skunks (*Mephitis mephitis*) are found throughout the United States, wherever there is suitable denning habitat and food resources. Densities of these predators have increased throughout the Intermountain West as a consequence of human alterations in habitat. Within the Bear River Migratory Bird Refuge (hereafter, refuge), in northern Utah, USA, upland nesting habitat for ducks is limited to the levee banks and roadsides. Red foxes, raccoons, and striped skunks, which prey on upland nesting birds, are also abundant on the refuge. We studied red foxes, raccoons, and striped skunks' use of levees and the edges associated with them within a wetland environment. Red fox, raccoon, and striped skunk locations were negatively correlated with distance to the nearest dike (-0.78, -0.69, and -0.45, respectively). Animals incorporated more roads and/or levees into their home ranges than expected by chance ($\bar{x} = 2.6$; $Z < 0.001$); incorporation of levees was greater during the dispersal season than the

rearing season ($P = 0.03$). Skunk home ranges (average size, 3.0 km²) were oriented along roads and levees ($P = 0.03$), whereas raccoon (average size, 3.6 km²) and fox home ranges (average size, 3.5 km²) were not ($P = 0.93$, $P = 0.13$, respectively). Fox home ranges in the refuge were more oblong in shape than reported elsewhere ($P = 0.03$). However, home-range shapes of raccoons and striped skunks were similar to previous studies ($P = 0.84$, $P = 0.97$, respectively). The use of roads and levees within the refuge increases the possible travel distance and penetration of predators into wetland environments. This contributes to increased depredation of waterfowl nests and to decreased recruitment. Managers of similar areas might decrease depredation of waterfowl by disrupting the linear pattern of corridors, thereby decreasing the congestion of animal roads and levees. This would, then, decrease the encounter rates of predators and prey.

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2103. Habitat use, home ranges, and survival of swift foxes in a fragmented landscape: Conservation implications.

Kamler, J. F.; Ballard, W. B.; Fish, E. B.; Lemons, P. R.; Mote, K.; and Perchellet, C. C. *Journal of Mammalogy* 84(3): 989-995. (2003) NAL Call #: 410 J823; ISSN: 0022-2372

Descriptors: animal sciences/ habitat use/ home range/ survival/ swift fox/ Texas/ *Vulpes velox*/ Joaquin kit foxes/ arid land foxes/ *vulpes velox*/ western Kansas/ North America/ mortality/ macrotis/ rates/ size

Abstract: Habitat loss might be one of the primary reasons for the decline of the swift fox (*Vulpes velox*) in the western Great Plains of North America. From 1998 to 2001, we monitored 42 swift foxes in a landscape interspersed with native short-grass prairies, nonnative grasslands enrolled in the Conservation Reserve Program, irrigated agricultural fields, and dryland agricultural fields. Survival estimates ranged from 0.52 to 0.66 for both adults and juveniles, and the primary causes of death were vehicle collisions (42% deaths) and coyote (*Canis latrans*) predation (33%). Annual home-range size was similar for males and females (10.8 and 10.5 km², respectively). Within the study area, swift foxes selected only short-grass prairies and had lower-than-expected use or complete avoidance of all other habitat types. Our results indicate swift foxes are more specialized in habitat selection than other North American canids; thus, protection of native short-grass prairies might be necessary for their long-term existence.

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2104. Headwater riparian forest-floor invertebrate communities associated with alternative forest management practices.

Rykken, Jessica J.; Moldenke, Andrew R.; and Olson, Deanna H. *Ecological Applications* 17(4): 1168-1183. (2007) NAL Call #: QH540.E23; ISSN: 1051-0761

Descriptors: commercial activities/ ecology/ terrestrial habitat/ land zones/ Invertebrata: forestry/ alternative forest management practices/ forest floor communities/ headwater riparian zones/ community structure/ forest and woodland/ forest floor habitat/ riparian habitat/ headwater stream riparian zones/ Oregon/ Willamette National Forest/ invertebrates

Abstract: Headwater streams and their riparian zones are a common, yet poorly understood, component of Pacific Northwest, USA, landscapes. We describe the ecological importance of headwater stream riparian zones as habitat for forest-floor invertebrate communities and assess how alternative management strategies for riparian zones may impact these communities. We compared community composition of forest-floor invertebrates at increasing distances along trans-riparian (stream edge to upslope) transects in mature forests, clearcuts, and riparian buffers of ≈ 30 -m width with upslope clearcuts. Invertebrates were collected using pitfall traps in five replicate blocks of three treatments each in the Willamette National Forest, Oregon, USA. We measured microclimate and microhabitat variables at pitfall locations. Despite strong elevation and block effects on community composition, community analyses revealed a distinct "riparian" invertebrate community within 1 m of the stream edge in mature forest treatments, which was strongly related to cool, humid microclimate conditions. Invertebrate community composition in buffer treatments was far more similar to that of mature forests than to clearcuts; a pattern mirrored by microclimate. These results suggest that, within our study sites, forest floor invertebrate distributions are strongly associated with microclimate and that riparian buffers of ≈ 30 -m width do provide habitat for many riparian and forest species. Riparian reserves may serve as effective forest refugia and/or dispersal corridors for invertebrates and other taxa, and their incorporation into watershed management plans likely will contribute to meeting persistence and connectivity objectives.
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2105. Henslow's sparrow winter-survival estimates and response to prescribed burning.

Thatcher, Benjamin S.; Kremetz, David G.; and Woodrey, Mark S.

Journal of Wildlife Management 70(1): 198-206. (2006)
NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: Emberizidae/ Passeriformes/ Ammodramus henslowii/ Fringillidae/ Laniidae/ Ammodramus henslowii/ Henslow's sparrow/ Lanius ludovicianus/ loggerhead shrike/ Mississippi sandhill crane/ environmental factors/ burn season/ coastal pine savanna/ coastal plain/ conservation/ wildlife management/ habitat use/ fires-burns/ forests/ ecosystems/ grasslands/ habitat management/ methods and techniques/ pine savanna/ population ecology/ prescribed burning/ radiotelemetry/ survival/ terrestrial ecology/ winter/ winter survival estimates/ wintering habitat/ habitat/ landscape management/ fire/ fertility/ recruitment/ Pinus spp./ Mississippi

Abstract: Wintering Henslow's sparrow (*Ammodramus henslowii*) populations rely on lands managed with prescribed burning, but the effects of various burn regimes on their overwinter survival are unknown. We studied wintering Henslow's sparrows in coastal pine savannas at the Mississippi Sandhill Crane National Wildlife Refuge, Jackson County, Mississippi, USA, during January and February 2001 and 2002. We used the known-fate modeling procedure in program MARK to evaluate the effects of burn age (1 or 2 growing seasons elapsed), burn season (growing, dormant), and calendar year on the survival rates of 83 radiomarked Henslow's sparrows. We

found strong evidence that Henslow's sparrow survival rates differed by burn age (with higher survival in recently burned sites) and by year (with lower survival rates in 2001 likely because of drought conditions). We found some evidence that survival rates also differed by burn season (with higher survival in growing-season sites), although the effects of burn season were only apparent in recently burned sites. Avian predation was the suspected major cause of mortality (causing 6 of 14 deaths) with 1 confirmed loggerhead shrike (*Lanius ludovicianus*) depredation. Our results indicated that recently burned savannas provide high-quality wintering habitats and suggested that managers can improve conditions for wintering Henslow's sparrows by burning a large percentage of savannas each year.

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2106. Herbaceous filter strips in agroecosystems: Implications for ground beetle (Coleoptera: Carabidae) conservation and invertebrate weed seed predation.

Menalled, Fabian D.; Lee, Jana C.; and Landis, Douglas A. *Great Lakes Entomologist* 34(1): 77-91. (2002)

NAL Call #: QL461.M5; ISSN: 0090-0222

Descriptors: conservation measures/ nutrition/ diet/ ecology/ man-made habitat/ land zones/ Carabidae: habitat management/ community structure/ cultivated land habitat/ crop fields/ herbaceous filter strips/ effects on community structure/ Michigan/ Midland County/ Insecta, Coleoptera, Adephaga, Caraboidea/ arthropods/ beetles/ insects/ invertebrates

Abstract: A 9.3-ha crop field flanked by two filter strips was selected to: 1) assess carabid beetle activity-density and community composition and 2) assess post-dispersal weed seed predation by invertebrates in these habitats. Overall during 1997 and 1998, 12,937 carabid beetles comprising 58 species were collected. Greater species richness and activity-density was observed in filter strips than in the field. A multivariate ordination revealed that year of capture and habitat were important variables conditioning carabid beetle communities. While two omnivorous species known to eat weed seeds [*Harpalus erraticus* (Say), *Anisodactylus sanctaecrucis* (F.)] dominated the 1997 captures, two carnivorous [*Pterostichus melanarius* (Ill), *Pterostichus permundus* (Say)] were predominant in 1998. Two omnivorous species, *Harpalus pensylvanicus* (DeG) and *H. erraticus*, were primarily captured in filter strips. Weed seed removal was greater in filter strips than in the field. This study shows that habitat management represents a feasible approach to conserve beneficial organisms in farmlands.
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2107. Herpetofaunal response to gap and skidder-rut wetland creation in a southern bottomland hardwood forest.

Cromer, Robert B.; Lanham, Joseph D.; and Hanlin, Hugh H.

Forest Science 48(2): 407-413. (May 2002)
NAL Call #: 99.8 F7632; ISSN: 0015-749X

Descriptors: Amphibia/ Reptilia/ forestry/ forest gaps/ skidder ruts/ wetland creation/ wetland conservation/ community response/ community structure/ forest and woodland/ bottomland hardwood forests/ man-made habitat/ skidder rut wetlands/ forest habitat/ community responses/ South Carolina/ Barnwell County/ Savannah River site

Abstract: We compared herpetofaunal communities in recently harvested gaps, skidder trails, and unharvested depressional wetlands to assess the effects of group-selection harvesting and skidder traffic on reptiles and amphibians in a southern bottomland hardwood forest. From January 1, 1997 to December 31, 1998 we captured 24,292 individuals representing 55 species of reptiles and amphibians at the Savannah River Site in Barnwell County, South Carolina. Forty-two species (n = 6,702 individuals) were captured in gaps, 43 species (n = 8,863 individuals) were captured along skid trails between gaps and 43 species (n = 8,727 individuals) were captured in bottomland depressions over the 2 yr period. Three vegetation variables and six environmental variables were correlated with herpetofaunal abundance. Salamander abundance, especially for species in the genus *Ambystoma*, was negatively associated with areas with less canopy cover and pronounced rutting (i.e., gaps and skidder trails). Alternatively, treefrog (*Hylidae*) abundance was positively associated with gap creation. Results from this study suggest that group selection harvests and skidder rutting may alter the herpetofaunal species composition in southern bottomland hardwoods by increasing habitat suitability for some species while diminishing it for others. © Thomson Reuters Scientific

2108. High offspring survival of the brown-headed cowbird in an invaded habitat.

Winfree, R.

Animal Conservation 7(4): 445-453. (2004);
ISSN: 13679430.

Notes: doi: 10.1017/S1367943004001544.

Descriptors: brood parasitism/ habitat management/ host-parasite interaction/ passerines/ species conservation/ Aves/ *Molothrus*/ *Molothrus ater*

Abstract: The brood parasitic brown-headed cowbird (*Molothrus ater*) is considered an important threat to bird conservation in North America because it reduces the reproduction of its numerous host species. Prior to the colonisation of America by Europeans, the cowbird was largely confined to the North American prairie region, but it has since invaded forests and other habitats and is now one of the continent's most abundant breeding passerines. The objective of this study was to examine cowbird reproduction with different host communities to determine whether habitat-specific reproduction might contribute to the cowbird's population expansion. Cowbird offspring survival was estimated with hosts breeding in fragmented deciduous forest (a newly invaded habitat) and old fields (a habitat more similar to the cowbird's original range). Offspring survival was 1.8-3.1 times higher in forest compared to old fields and was high enough to cause the cowbird population to increase with most forest hosts. The results suggest that increased offspring survival in an invaded habitat facilitates cowbird population growth. Land management for extensive, continuous forests, which cowbirds are known to avoid, could help control the cowbird population and reduce parasitism levels for the >140 species of cowbird hosts. © 2004 The Zoological Society of London.

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2109. Highly erodible land and Swampbuster provisions of the 2002 Farm Act.

Brady, S. J.

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. 5-16.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Swampbuster/ Conservation Reserve Program/ Wetlands Reserve Program

Abstract: The Farm Security and Rural Investment Act of 2002 continued provisions for the conservation of highly erodible land and wetlands that had been enacted by the omnibus farm acts of 1985, 1990, and 1996. The effects these provisions have on wildlife conservation are reviewed in light of recent data and reports published about those programs. Strong evidence supporting the conservation benefits of these programs includes the significant reduction in cropland soil-erosion rates of 1.3 billion tons per year and the significant reduction in wetland losses due to agriculture in recent periods. The latter is highlighted by net wetland gains on agricultural lands during the period 1997-2002. While these 2 provisions generally do not create wildlife habitat directly, they play a very substantial role in supporting the conservation gains made by other U.S. Department of Agriculture (USDA) conservation provisions. Additionally they provide strong motivation for producers to apply conservation systems on their highly erodible lands, to protect wetlands from conversion to cropland, and to apply for enrollment in the other USDA conservation programs, especially the Conservation Reserve and Wetlands Reserve programs.

2110. Historical and present impacts of livestock grazing on fish and wildlife resources in western riparian habitats.

Ohmart, Robert D.

In: Rangeland wildlife/ Krausman, Paul R. Denver, Colo.: Society of Range Management, 1996; pp. 245-279.

Notes: Literature review.

NAL Call #: SK361.R36 1996

Descriptors: commercial activities/ terrestrial habitat/ land and freshwater zones/ comprehensive zoology: farming and agriculture/ riparian habitat/ livestock grazing/ biological effects/ North America/ biological effects of livestock grazing/ riparian habitats

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2111. The history, status and future needs of fish and wildlife management on private lands as related to USDA agricultural programs.

Heard, L. Pete; Allen, Arthur W.; Best, Louis B.;

Brady, Stephen J.; Burger, Wes; Esser, Anthony J.;

Hackett, Ed; Helinski, Ronald R.; Hohman, William L.;

Johnson, Douglas H.; Pederson, Roger L.;

Reynolds, Ronald E.; Rewa, Charles; and Ryan, Mark R.

Transactions of the North American Wildlife and Natural Resource Conference 66: 54-67. (2001)

NAL Call #: 412.9 N814; ISSN: 0078-1355.

Notes: Meeting: Sixty-sixth North American Wildlife and Natural Resources Conference, Washington, DC, USA, March 16-20, 2001.

Descriptors: 1985 Food Security Act [Farm Bill]/ Conservation Reserve Program [CRP]/ Environmental Quality Incentive Program [EQIP]/ Wetlands Reserve Program [WRP]/ Wildlife Habitat Incentives Program [WHIP]/ agricultural programs/ compliance provisions/ highly erodible land/ land retirement programs/ private land management/ wildlife conservation/ wildlife management: future needs, history, status/ wildlife responses
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2112. How much habitat is enough? Guidelines for restoration and conservation of habitat in the Great Lakes.

Bryan, G. K.

International Association for Great Lakes Research Conference 49: 24-25. (2006).

Notes: Location: South African Institute for Aquatic Biodiversity (SAIAB), Private Bag 1015, Grahamstown, 6140, South Africa.

Descriptors: Great Lakes/ habitats/ habitat management/ habitat rehabilitations/ restoration measures/ management strategies/ watershed management/ urbanization/ urban areas/ watersheds/ catchments/ rivers/ lakes/ policy/ management/ North America

Abstract: How Much Habitat is Enough? A Framework for Guiding Habitat Restoration in Great Lakes Areas of Concern provides 18 guidelines regarding the location, type, and quantity of forest, riparian, and wetland habitat needed to provide for minimum viable wildlife populations. Envisioned as a means to locate restoration projects within Canadian Areas of Concern it is now also widely used as a conservation planning tool and conservation biology primer. Over 40 Natural Heritage Strategies have adapted or adopted Framework guidelines. In 2006 the report 'Area Sensitive Forest Birds in Urban Areas' was released to address the restoration of forest habitat in urbanizing watersheds. The report identified and ranked forest bird 13 stressors, analyzed the loss of forest birds in the Greater Toronto AOC, and discussed mitigation measures. Mitigation measures for area sensitive forest birds in urban watersheds are limited; retaining adequate forest cover and adequate forest interior in much of the rapidly urbanizing lower Great Lakes basin may be seen as a greater priority in terms of songbirds. The report raises questions as to the foci of urban restoration efforts and how new development is planned.

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2113. Impact of a wetland development project on grassland birds in Hardin County, Ohio.

Hoagstrom, Carl W.

Ohio Journal of Science 104(1): A17. (2004)

NAL Call #: 410 Oh3; ISSN: 0030-0950

Descriptors: grassland birds/ constructed wetlands/ ponds/ lowlands/ bird populations/ habitat restoration/ Ohio

Abstract: Ohio Northern University and the Ohio Department of Natural Resources are working together to establish a wetland complex three miles north of Roundhead, Ohio. In light of the concern for grassland bird populations, the impact of this development on the bird of the fields in which the wetlands were established is of interest. Eight walking surveys of the bird fauna were

undertaken in May, June and July of 2002 and repeated in 2003. Diking, digging and seeding for the project were carried out in the spring, summer and fall of 2003. The impact of those disturbances on the grassland birds was explored by comparing the surveys of 2002 and 2003. Estimates of the number of singing males of each species for each year, with the estimate for 2002 given first, were - 15 and 13 Bobolink (*Dolichonyx oryzivorus*); ten and eight Eastern Meadowlarks (*Sturnella magna*); 12 and 14 Grasshopper Sparrows (*Ammodramus savannarum*); two and six Henslow's Sparrows (*Ammodramus henslowii*); two and two Vesper Sparrows (*Pooecetes gramineus*); and six and six Savannah Sparrows (*Passerculus sandwichensis*). Numbers were similar between the two years for each species. Two of the new ponds were dug and diked within the area occupied by the Bobolink colony with no meaningful difference between years. The wetland development activities appeared to have little effect on the bird populations.

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2114. Impact of crop harvest on small mammal populations in Brookings County, South Dakota.

Pinkert, Melissa K.; Meerbeek, Jonathan R.;

Scholten, George D.; and Jenks, Jonathan A.

Proceedings of the South Dakota Academy of Science 81: 39-45. (2002)

NAL Call #: 500 So82; ISSN: 0096-378X

Descriptors: commercial activities/ ecology/ population dynamics/ terrestrial habitat/ man-made habitat/ land zones/ Insectivora/ Rodentia: farming and agriculture/ crop harvesting/ population density/ crop harvesting effects/ distribution within habitat/ grassland/ cultivated land habitat/ agricultural habitats/ South Dakota/ Brookings County/ Mammalia/ chordates/ Insectivores/ mammals/ rodents/ vertebrates

Abstract: In the Midwest, agricultural cropland provides the majority of habitat available to small mammals. In some regions of the Midwest, cropland comprises as much as 70% of the landscape. Importance of these agricultural habitats to small mammals pre- and post-harvest is not well documented. The distribution of small mammals was studied in shelterbelt, grassland, and adjacent cropland habitats pre- and post-harvest in Brookings County, South Dakota from 20 September (before crop harvest) to 15 November 2001 (after crop harvest). Deer mice (*Peromyscus maniculatus*) (n=30) and white-footed mice (*Peromyscus leucopus*) (n= 29) were captured in relatively high numbers when compared to the other species: short-tailed shrews (*Blarina brevicauda*) (n=13), masked shrews (*Sorex cinereus*) (n=7), prairie voles (*Microtus ochrogaster*) (n=4), meadow voles (*Microtus pennsylvanicus*) (n=3), and northern grasshopper mice (*Onychomys leucogaster*) (n=2). Deer mice and white-footed mice were the only inhabitants of cropland. When compared to cropland, proportions of deer mice using the grassland and white-footed mice using the shelterbelt decreased after harvest. Competition among small mammals and predation risks from the short-tail shrew in grasslands and shelterbelts may force deer mice and white-footed mice into habitats such as cropland. Alternatively, the abundance of waste grain after harvest may explain the increased use of cropland. The prairie vole demonstrated a strong use of grassland, while the white-footed mouse used shelterbelt habitats. Cropland

habitats adjacent to shelterbelts and grasslands likely provide a relatively stable food source for small mammal populations.

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2115. Impact of riparian buffer guidelines on old growth in western boreal forests of Canada.

Lee, P. and Barker, T.

Forestry 78: 263-278. (July 2005)

Descriptors: riparian buffers/ width/ old growth forests/ boreal forests/ forest management/ streams/ lakes/ fish/ simulation models/ guidelines/ riparian areas/ temporal variation/ spatial variation/ forest stands/ stand composition/ forest succession/ forest ecology/ wetland conservation/ wildlife habitats/ Canada/ buffer width/ riparian area management/ forest canopy types/ plant ecology/ water resources and management/ natural resources, environment, general ecology, and wildlife conservation/ forestry production general

This citation is from AGRICOLA.

2116. Impacts of flooding regime modification on wildlife habitats of bottomland hardwood forests in the lower Mississippi Valley.

Klimas, C. V.; Martin, C. O.; and Teaford, J. W.

Vicksburg, Miss.: U.S. Army Engineer Waterways Experiment Station; Technical Report EI-81-13, 981. 200 p.

Notes: Literature review.

Descriptors: flood plain management/ floods/ forests/ wildlife habitats/ hardwood/ aquatic animals/ logging/ land clearing/ Mississippi River

Abstract: This is a literature review concerning the impacts of flooding regime modification on bottomland hardwood forest wildlife habitats of the lower Mississippi Valley. The composition and structure of the bottomland forest are an important determinant of the quality and type of wildlife habitat available. These forest characteristics are largely influenced by the flooding regime. Overstory diversity and perennial understory diversity and productivity are lowest in near-permanently flooded habitats and increase in areas flooded less frequently and for shorter periods of time. Nonflooded areas are often, but not always, less diverse and productive than infrequently flooded areas. Tree growth, regional habitat diversity, and land clearance patterns may also be influenced by modifications to the hydrologic regime. Bottomland forests are considered productive wildlife habitat due to high soil fertility, abundant moisture, and the diversity and abundance of wildlife food and cover. Modifications in the magnitude, frequency, and duration of flooding are expected to bring about a wide variety of impacts on different species. Impacts of flooding regime modifications are discussed for mammals, birds, reptiles, and amphibians. Aquatic and semiaquatic species are generally adversely affected by flood reduction and are benefitted by normal flooding conditions. Species that are principally terrestrial may be severely impacted by major flooding events, but they may respond more to secondary influences such as land clearing and logging. Where known, both direct and indirect impacts of flooding regime modifications are discussed by species or species groups occurring in the study area.

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2117. Impacts of grazing on wetlands and riparian habitat: A review of our knowledge.

Skovlin, J. M.; Platts, W. S.; Raleigh, R. F.; Carpenter, L. H.; Malechek, J. C.; and Rittenhouse, L. R.

In: Developing strategies for rangeland management/ National Research Council; Series: Westview special studies in agriculture science and policy.

Boulder, Colo.: Westview Press, 1984; pp. 1001-1166.

NAL Call #: SF85.3.D48

Descriptors: wetlands/ riparian habitats/ grazing/ North America/ rangelands

Abstract: In the context of western North America, discusses the effects of range livestock grazing on vegetation, watershed, and fish and wildlife. Grazing strategies to improve habitats are proposed for better decisions in allocating riparian zone uses.

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2118. Impacts of waste from concentrated animal feeding operations on water quality.

Burkholder, J.; Libra, B.; Weyer, P.; Heathcote, S.;

Kolpin, D.; Thorne, P. S.; and Wichman, M.

Environmental Health Perspectives 115(2): 308-312. (2007)

NAL Call #: RA565.A1E54; ISSN: 00916765.

Notes: doi: 10.1289/ehp.8839.

Descriptors: ecology/ human health/ poultry/ swine/ water contaminants/ wildlife

Abstract: Waste from agricultural livestock operations has been a long-standing concern with respect to contamination of water resources, particularly in terms of nutrient pollution. However, the recent growth of concentrated animal feeding operations (CAFOs) presents a greater risk to water quality because of both the increased volume of waste and to contaminants that may be present (e.g., antibiotics and other veterinary drugs) that may have both environmental and public health importance. Based on available data, generally accepted livestock waste management practices do not adequately or effectively protect water resources from contamination with excessive nutrients, microbial pathogens, and pharmaceuticals present in the waste. Impacts on surface water sources and wildlife have been documented in many agricultural areas in the United States. Potential impacts on human and environmental health from long-term inadvertent exposure to water contaminated with pharmaceuticals and other compounds are a growing public concern. This workgroup, which is part of the Conference on Environmental Health Impacts of Concentrated Animal Feeding Operations: Anticipating Hazards-Searching for Solutions, identified needs for rigorous ecosystem monitoring in the vicinity of CAFOs and for improved characterization of major toxicants affecting the environment and human health. Last, there is a need to promote and enforce best practices to minimize inputs of nutrients and toxicants from CAFOs into freshwater and marine ecosystems.

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2119. Implementing shorebird conservation on public lands.

Ciuzio, Elizabeth; Morton, R. Mike; and Ranalli, Nicole

Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 59:

183-190. (2005)

NAL Call #: SK1.S6; ISSN: 0276-7929

Descriptors: conservation measures/ behavior/ man-made habitat/ land zones/ Charadrii: habitat management/ public lands conservation management for migratory species/ migration/ semiaquatic habitat/ cultivated land habitat/ Kentucky/ Aves, Charadriiformes/ birds/ chordates/ vertebrates

Abstract: Working toward fulfilling regional habitat objectives for migratory shore-birds, the Kentucky Department of Fish and Wildlife Resources (KDFWR) constructed moist soil units on three Wildlife Management Areas (WMA) to specifically be managed for stopover habitat. Units either were converted from agriculture land and fitted with water pumps or constructed at the base of a hill to collect rainwater. The most commonly observed shorebirds using these sites and other available habitat on the WMAs were killdeer (*Charadrius vociferus*), pectoral sandpiper (*Calidris melanotos*), and lesser yellowlegs (*Tringa flavipes*). Managing for shallow water habitat on public lands, particularly during fall migration and/or drought years, is key to ensuring that priority shorebirds arrive on the wintering or breeding grounds in good condition. Recommendations include considerations of spatial placement and topography of shorebird units, control of vegetation, and monitoring protocols.

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2120. Implications of food web interactions for restoration of Missouri Ozark glade habitats.

Van Zandt, Peter A.; Collins, Eboni; Losos, Jonathan B.; and Chase, Jonathan M.

Restoration Ecology 13(2): 312-317. (2005)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: Sauria/ *Aster oblongifolius*/ eastern redcedar/ *Echinacea paradoxa*/ *Juniperus virginiana*/ northern fence lizard/ *Rudbeckia missouriensis*/ *Sceloporus undulatus*/ *Schizachyrium scoparium*/ terrestrial ecology/ field survey/ soil/ food web interaction/ glade habitat restoration/ brush pile/ *sceloporus undulatus*/ trophic cascade/ biomanipulation/ *Cedrus* spp.

Abstract: Ozark glades are gaps in forested areas that are dominated by grasses and forbs growing in rocky, nutrient-poor soil. Historically, these open, patchy habitats were maintained by natural and anthropogenic fire cycles that prohibited tree encroachment. However, because of decades of fire suppression, glades have become overgrown by fire-intolerant species such as Eastern red cedar (*Juniperus virginiana*). Current restoration practices include cutting down invasive cedars and burning brush piles, which represent habitat for Northern fence lizards (*Sceloporus undulatus*). Because *Sceloporus* actively consumes herbivores, we hypothesized that the presence of these lizards in and around brush piles might result in a trophic cascade, whereby damage on native plants is reduced. Field surveys across six Missouri glades indicated that lizard activity was minimal beyond 1 m from habitat structures. This activity pattern reduced grasshopper abundance by 75% and plant damage by over 66% on *Echinacea paradoxa* and *Rudbeckia missouriensis* near structures with lizards. A field transplant experiment demonstrated similar reductions in grasshopper abundance and damage on two other glade endemic species, *Aster oblongifolius* and *Schizachyrium scoparium*. These results

demonstrate that future glade restoration efforts might benefit from considering top-down effects of predators in facilitating native plant establishment.

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2121. Importance of hydrologic and landscape heterogeneity for restoring bank swallow (*Riparia riparia*) colonies along the Sacramento River, California.

Moffatt, K. C.; Crone, E. E.; Holl, K. D.; Schlorff, R. W.; and Garrison, B. A.

Restoration Ecology 13(2): 391-402. (2005)

NAL Call #: QH541.15.R45R515; ISSN: 10612971.

Notes: doi: 10.1111/j.1526-100X.2005.00049.x.

Descriptors: bank swallow/ landscape/ metapopulation/ restoration/ riparian/ endangered species/ heterogeneity/ human activity/ passerines/ restoration ecology/ California/ Sacramento River/ *Riparia*

Abstract: Human activities have degraded riparian systems in numerous ways, including homogenization of the floodplain landscape and minimization of extreme flows. We analyzed the effects of changes in these and other factors for extinction-colonization dynamics of a threatened Bank Swallow population along the upper Sacramento River, California, U.S.A. We monitored Bank Swallow distributions along a 160-km stretch of the river from 1986-1992 and 1996-2003 and tested whether site extinctions and colonizations corresponded with changes in maximum river discharge, surrounding land cover, estimated colony size, temperature, and precipitation. Colonization probabilities increased with maximum discharge. Extinction probabilities decreased with proximity to the nearest grassland, decreased with colony size, and increased with maximum discharge. To explore the implications for restoration, we incorporated the statistically estimated effects of distance to grassland and maximum discharge into simple metapopulation models. Under current conditions, the Bank Swallow metapopulation appears to be in continued decline, although stable or increasing numbers cannot be ruled out with the existing data. Maximum likelihood parameters from these regression models suggest that the Sacramento River metapopulation could be restored to 45 colonies through moderate amounts of grassland restoration, large increases in discharge, or direct restoration of nesting habitat by removing approximately 10% of existing bank protection (riprap) from suitable areas. Our results highlight the importance of grassland restoration, mixed benefits of restoring high spring discharge, and the importance of within-colony dynamics as areas for future research. © 2005 Society for Ecological Restoration International.

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2122. Importance of small isolated wetlands for herpetofaunal diversity in managed, young growth forests in the Coastal Plain of South Carolina.

Russell, K. R.; Guynn, D. C.; and Hanlin, H. G.

Forest Ecology and Management 163(1-3): 43-59. (2002)

NAL Call #: SD1.F73; ISSN: 03781127.

Notes: doi: 10.1016/S0378-1127(01)00526-6.

Descriptors: amphibians/ forest management/ herpetofauna/ reptiles/ small isolated wetlands/ South Carolina coastal plain/ biodiversity/ ecology/ forestry/ hydrology/ management/ forest landscapes/ wetlands/

community composition/ forest management/ herpetofauna/ species diversity/ wetland/ United States/ Amphibia/ Coniferophyta/ Reptilia

Abstract: Freshwater wetlands support diverse and unique species assemblages, but the contribution of the smallest of these habitats to regional biodiversity continues to be underestimated, particularly within managed forests. We assessed and compared the richness, abundance, and diversity of herpetofauna at five small isolated wetlands (0.38-1.06 ha) imbedded within a commercial forest landscape in the South Carolina Coastal Plain. Continuous drift fences with pitfall traps that completely encircled the wetlands were used to sample entering and exiting herpetofauna. We also deployed coverboards to sample herpetofauna in the adjacent uplands. We captured 9186 individuals of 56 species (20 amphibians, 36 reptiles) from the five wetlands combined between 1996 and 1998. Although species richness and community composition were similar at the five sites, we found significant differences in herpetofaunal abundance and diversity among wetlands. These differences did not vary with wetland size but were related to environmental and habitat attributes of the surrounding upland stands. Amphibian abundance was positively correlated with basal area of upland conifers but negatively correlated with presence and size of hardwoods, relationships that appeared to be partially influenced by previous stand management. Amphibian diversity (H') increased with conifer diameter but decreased with increasing distance to nearest wetland. Reptile diversity was negatively correlated with upland canopy closure. Our data indicate that small isolated wetlands are focal points of herpetofaunal richness and abundance in managed coastal plain forests and contribute more to regional biodiversity than is implied by their small size or ephemeral hydrology. By incorporating small wetland values and functions into planning objectives, forest managers can significantly enhance the contribution of extensive young-growth forests to regional conservation of biodiversity.

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2123. Increasing and declining populations of northern bobwhites inhabit different types of landscapes.

Veech, J. A.

Journal of Wildlife Management 70(4): 922-930. (2006)

NAL Call #: 410 J827; ISSN: 0022541X.

Notes: doi: 10.2193/0022-541X(2006)70

[922:IADPON]2.0.CO;2.

Descriptors: *Colinus virginianus*/ cropland/ landscape composition/ National Resources Inventory/ North American Breeding Bird Survey/ northern bobwhites/ population/ urbanization

Abstract: Northern bobwhites (*Colinus virginianus*) have been declining in abundance throughout their range for several decades, and perhaps a century. Although wildlife biologists are well aware of this trend, most attempts to understand the declines have examined only a few local populations in a limited geographic area or have examined declines at a very large scale without reference to specific populations. Few studies use a standard protocol for examining trends in local populations throughout the entire natural range of bobwhites. I used the National Resources Inventory, a geographically extensive and intensive database on land cover and use, to characterize the composition and heterogeneity of landscapes inhabited by

bobwhite populations that have been increasing (43 populations), decreasing (468), or become locally extinct (28). I tested bobwhite populations for overall positive or negative change, over the past 10 years or more, using data from the North American Breeding Bird Survey and a randomization test that controls for observer effects. Landscapes occupied by increasing and decreasing populations were, on average, different from one another in composition but not heterogeneity. As predicted, landscapes of decreasing populations tended to have a greater percentage of nonuseable land (e.g., urban and forestland) and a lesser percentage of useable land (e.g., cropland, pastures, and rangeland) as compared to landscapes where bobwhites actually increased. Moreover, landscapes where bobwhites had recently become extinct were different from those where bobwhites were only declining. In particular, a very large percentage of urban land characterized the landscapes of extinct populations. To some extent, landscapes of large (above average) and small (below average) populations also differed as predicted. The results do not point to a single universal explanation for bobwhite declines, but they do clearly show that declining populations inhabit local landscapes that, on average, are very different from those occupied by increasing populations. This knowledge may assist quail biologists and land managers to recognize the general type of landscape where the restoration of bobwhites may be most successful and where extant populations may be most threatened.

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2124. Indiana bats in the Midwest: The importance of hydric habitats.

Carter, Timothy C.

Journal of Wildlife Management 70(5): 1185-1190. (2006)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: forestry/ wildlife management: conservation/ seasonal variation/ snag/ riparian forest/ maternity colony/ bottomland forest/ wetland forest/ day roosting/ foraging resources

Abstract: The endangered Indiana bat (*Myotis sodalis*) requires very specific habitats to provide necessary day-roosting and foraging resources during the spring and summer months throughout its distribution in the eastern United States. Maternity colonies of Indiana bats are almost always found under the exfoliating bark of dead or dying trees. Furthermore, they switch frequently among multiple roosts within large but still somewhat local areas. Therefore, habitats with large numbers of snags or decadent trees are needed to support Indiana bat maternity colonies. These habitats arise naturally and anthropogenically in a variety of ways. However, these conditions often are rare relative to other forest conditions. In the Midwest, such as southern and central Illinois, USA, maternity colonies are more commonly associated with bottomland, riparian, wetland, or other hydric forest types. It is unclear if this occurs because areas with large numbers of snags are more common in these habitats, if maternity colonies prefer these habitats for their foraging resources, or if decades of intensive agriculture have restricted colonies to these habitats. Because many large maternity colonies have been observed in hydric habitats of the Midwest, I hypothesize that these are preferred maternity habitats. Moreover, very few large maternity colonies have been located using upland forest habitats within the region.

Elsewhere, such as in the central and southern Appalachians, maternity colonies have been located in upland areas where bottomland habitats are less extensive. However, these colonies are usually characterized by small numbers of bats and ephemeral persistence. Future conservation efforts for the Indiana bat should focus on protecting and regenerating bottomland habitats along the major river systems of the midwestern United States. It is within these bottomland and riparian habitats that future large and long-term maternity colonies will be established.
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2125. Influence of agricultural landscape structure on a Southern High Plains, USA, amphibian assemblage.

Gray, Matthew J.; Smith, Loren M.; and Leyva, Raquel I. *Landscape Ecology* 19(7): 719-729. (2004)
NAL Call #: QH541.15.L35 L36; ISSN: 0921-2973
Descriptors: biogeography: population studies/ freshwater ecology: ecology, environmental sciences/ wildlife management: conservation/ agricultural landscape structure/ amphibian assemblage
Abstract: Landscape structure can influence demographics of spatially structured populations, particularly less vagile organisms such as amphibians. We examined the influence of agricultural landscape structure on community composition and relative abundance of the 4 most common amphibians in the Southern High Plains of central USA. Amphibian populations were monitored using pitfall traps and drift fence at 16 playa wetlands (8 playas/year) in 1999 and 2000. We quantified landscape structure surrounding each playa via estimating 13 spatial metrics that indexed playa isolation and inter-playa landscape complexity. Multivariate ordination and univariate correlations and regressions indicated that landscape structure was associated with community composition and relative abundance for 2 of the 4 amphibians. Spadefoots (*Spea multiplicata*, *S. bombifrons*) generally were positively associated with decreasing inter-playa distance and increasing inter-playa landscape complexity. Great Plains toads (*Bufo cognatus*) and barred tiger salamanders (*Ambystoma tigrinum mavortium*) usually were negatively associated with spadefoots but not influenced by landscape structure. Composition and relative abundance patterns were related to amphibian body size, which can influence species vagility and perception to landscape permeability. Spatial separation of these species in the multivariate ordination also may have been a consequence of differential competitive ability among species. These results suggest agricultural landscape structure may influence abundance and composition of spatially structured amphibian populations. This also is the first applied documentation that inter-patch landscape complexity can affect intra-patch community composition of amphibians as predicted by metapopulation theory. In the Southern High Plains, landscape complexity is positively associated with agricultural cultivation. Agricultural cultivation increases sedimentation, decreases hydroperiod, alters amphibian community dynamics, and negatively impacts postmetamorphic body size of amphibians in playa wetlands. Thus, conservation efforts should focus on preserving or restoring native landscape structure, hydroperiod, and connectivity among playas to maintain native amphibian populations and historic inter-playa movement.
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2126. Influence of deer, cattle grazing and timber harvest on plant species diversity in a longleaf pine bluestem ecosystem.

Brockway, Dale G. and Lewis, Clifford E. *Forest Ecology and Management* 175: 49-69. (2003)
NAL Call #: SD1.F73; ISSN: 0378-1127.
http://www.srs.fs.usda.gov/pubs/ja/ja_brockway024.pdf
Descriptors: cattle/ grazing/ longleaf pine/ *Pinus palustris*/ deer/ understory/ thinning/ clearcutting
Abstract: Despite a recent slowing in the negative historical trend, losses of naturally-regenerated longleaf pine forests currently continue, largely as a result of conversion to plantations of faster growing pine species. Comparing the impacts of type conversion with silvicultural approaches that maintain longleaf pine and ascertaining their interaction with the influence of other resource management practices, such as grazing, on plant species diversity are essential in discerning the effects of these activities on the long-term sustainability of these ecosystems. A flatwoods longleaf pine bluestem ecosystem, which naturally regenerated following timber harvest during the early 20th century, on the coastal plain of southern Alabama was thinned to a residual basal area of 17 m²/ha or clearcut, windrowed and planted with slash pine (*Pinus elliotii*) seedlings in 1972 and then fenced in 1977 to differentially exclude grazing by deer and cattle. Neither grazing by deer alone nor deer in combination with cattle significantly altered vascular plant cover or species diversity; however, substantial differences were noted between the understory plant communities in the thinned forests and clearcut areas. Woody understory vegetation steadily increased through time, with woody plant cover in clearcuts (41%) dominated by the tree seedlings of *Pinus elliotii* and *Quercus* spp. being greater than that in thinned forests (31%) which were dominated by shrubs, principally *Ilex glabra*. While grass cover dominated by *Schizachrium scoparium* and *Andropogon* spp. remained stable (~81%), the foliar cover of all forbs declined through time (from 42 to 18%) as woody plant cover increased. Although the overall species richness and diversity declined and evenness increased through time, understory species richness and diversity were consistently higher in thinned forests than in artificially-regenerated clearcuts. Despite a modest short-term decline in this differential, indicating a partial recovery of the clearcut areas over time, the disparity in understory plant diversity between thinned forests and clearcuts persisted for at least a decade. Whether grazing includes domestic cattle or is limited to native ungulates, such as white-tailed deer, we recommend that longleaf pine forests not be clearcut and replaced by plantations of other pines, if the ecological diversity is to be conserved, high quality habitat is to be maintained and longleaf pine ecosystems are to be sustained.
This citation is from Treeresearch.

2127. Influence of financial incentive programs in sustaining wildlife values.

Straka, T. J.; Kilgore, M. A.; Jacobson, M. G.; Greene, J. L.; and Daniels, S. E. *Human Dimensions of Wildlife* 12(3): 197-199. (2007); ISSN: 10871209.
Notes: doi: 10.1080/10871200701323173.
Descriptors: economic incentives/ wildlife sustainability/ habitat management/ policy
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2128. Influence of fire on Bachman's sparrow, an endemic North American songbird.

Tucker, J. W.; Robinson, W. D.; and Grand, J. B.
Journal of Wildlife Management 68(4): 1114-1123. (2004)
 NAL Call #: 410 J827; ISSN: 0022541X.
 Notes: doi: 10.2193/0022-541X(2004)068
 [1114:IOFOBS]2.0.CO;2.

Descriptors: Aimophila aestivalis/ Alabama/ Bachman's sparrow/ fire ecology/ Florida/ habitat management/ habitat restoration/ longleaf pine ecosystem/ Pinus palustris/ prescribed fire/ endemic species/ growing season/ habitat management/ habitat restoration/ passerines/ prescribed burning/ Alabama/ Blackwater River State Forest/ Conecuh National Forest/ Florida [United States]/ Aimophila/ Aimophila aestivalis/ Passeri/ Passeridae/ Pinus palustris

Abstract: Bachman's sparrow (*Aimophila aestivalis*), a near endemic songbird of the longleaf pine (*Pinus palustris*) ecosystem, is known to respond positively to prescribed fires. The influence of season (growing vs. dormant) and frequency (1 to ≥ 4 yr since burning) of fire on density of Bachman's sparrows, however, is poorly understood. We examined effects of fire on density of Bachman's sparrows in longleaf pine forests at the Conecuh National Forest, Alabama, and Blackwater River State Forest, Florida, USA. Density of Bachman's sparrows was greater the first 3 years after burning than ≥ 4 years after burning, and season of burning had little effect on the density of Bachman's sparrows. Percent coverage by grass had a greater influence on density of Bachman's sparrows than either season or frequency of burning. Percent canopy cover had a strong negative effect on coverage of grass but had a weaker effect on grass at stands burned frequently during the growing season. Growing-season fires (Apr-Sep) did not adversely affect density of Bachman's sparrows.

Results from our study suggest that management and restoration of longleaf pine communities probably can be accomplished best by burning on a 2-3-year rotation during the growing season, when most fires historically occurred. Suppression of fire, or burning at intervals >4 -5 years, will greatly reduce or eliminate habitat required by Bachman's sparrows.

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2129. The influence of forest management on headwater stream amphibians at multiple spatial scales.

Stoddard, Margo A. and Hayes, John P.
Ecological Applications 15(3): 811-823. (2005)
 NAL Call #: QH540.E23 ; ISSN: 1051-0761

Descriptors: commercial activities/ conservation measures/ ecology/ habitat utilization/ freshwater habitat/ lotic water/ abiotic factors/ land zones/ *Ascaphus truei*/ *Dicamptodon tenebrosus*/ *Rhyacotriton*: forestry/ riparian buffers/ habitat management/ habitat preference/ forest management effects at multiple spatial scales/ stream/ headwater streams/ physical factors/ Oregon/ Oregon Coast range/ Amphibia, Lissamphibia, Anura, Leiopelmatidae/ amphibians/ chordates/ vertebrates

Abstract: Understanding how habitat structure at multiple spatial scales influences vertebrates can facilitate development of effective conservation strategies, but until recently most studies have focused on habitat relationships only at fine or intermediate scales. In particular, patterns of amphibian occurrence across broad spatial scales are not well studied, despite recent concerns over regional and

global declines. We examined habitat relationships of larval and neotenic Pacific giant salamanders (*Dicamptodon tenebrosus*), larval and adult Pacific tailed frogs (*Ascaphus truei*) (hereafter "tailed frogs"), and torrent salamanders (*Rhyacotriton* spp.) at three spatial scales (2-m sample unit, intermediate, and drainage). In 1998 and 1999, we captured 1568 amphibians in 702 sample units in 16 randomly chosen drainages in the Oregon Coast Range. We examined species-habitat associations at each spatial scale using an information-theoretic approach of analysis to rank sets of logistic regression models developed a priori. At the 2-m sample unit scale, all groups were negatively associated with proportion of small substrate and positively associated with stream width or elevation. At the intermediate scale, Pacific giant salamanders, adult tailed frogs, and torrent salamanders were positively associated with presence of a 46-m band of forested habitat on each side of the stream, and larval tailed frogs were positively associated with presence of forest > 105 years old. Aspect was important for Pacific giant salamanders and larval tailed frogs at the intermediate scale. At the drainage scale, all groups except torrent salamanders were positively associated with proportion of stream length having forested bands >46 m in width, but further analysis suggests narrower bands may provide adequate protection for some groups. Population- and community-level responses at broad spatial scales may be reflected in species-level responses at fine spatial scales, and our results suggest that geophysical and ecological characteristics, as well as measures of instream habitat, can be used together to prioritize conservation emphasis areas for stream amphibians in managed landscapes.

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2130. Influence of habitat on distribution and abundance of the eastern woodrat in Kansas.

Beckmann, Jon P.; Kaufman, Glennis A.; and Kaufman, Donald W.
Great Plains Research 11(2): 249-260. (2001)
 NAL Call #: QH104.5.G73 G755; ISSN: 1052-5165

Descriptors: *Neotoma floridana*/ mammals/ distribution/ status/ habitat use/ behavior/ wildlife-habitat relationships/ ecosystems/ forests/ grasslands/ farmland/ nesting sites/ nests-nesting/ hedgerows/ riparian habitat/ density/ habitat alterations/ agricultural practices/ eastern woodrat/ Kansas: Smith County/ Kansas: Osborne County/ Kansas: Russell County

Abstract: Anthropogenic modification of native woodlands and grasslands in the Great Plains has altered the abundance and distribution of many species of mammals. To study habitat effects on the eastern woodrat (*Neotoma floridana*), the authors surveyed nests of the eastern woodrat in woodlands, grasslands, and croplands along 77 km of secondary roads in three counties in north-central Kansas. All nests were located in woodlands ($<2\%$ of habitat), although grasslands and croplands constituted 36% and 62% of habitat surveyed, respectively. In this survey, nests were associated positively with shelterbelts (3.6 nests per 100 m of road edge) but not with shrub patches (1.1 nests per 100 m of road edge) or riparian woodlands (0.3 nests per 100 m of road edge).

Consequently, the authors specifically censused nests in an additional 12 riparian woodlands and 12 shelterbelts. Nests of eastern woodrats were less dense in riparian woodlands (9.4 nests/ha) than in shelterbelts (55.5 nests/ha). Density

of woodrat nests decreased as width of a wooded area increased. Further, nests per 100 m of length of woodland did not increase as the width of woodland increased. These patterns suggest that woodland edge, not woodland interior, is the primary factor in abundance of eastern woodrats in this region. Although the eastern woodrat has previously been considered a woodland species, the authors' results suggest that this assessment is incorrect. Their observations demonstrate that anthropogenic modification of the Great Plains, in the form of planted shelter belts and expanded riparian woodland, likely has increased the distribution and abundance of eastern woodrats, compared to the mid-1800s.

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2131. Influence of headwater site conditions and riparian buffers on terrestrial salamander response to forest thinning.

Rundio, David E. and Olson, Deanna H.

Forest Science 53(2): 320-330. (2007)

NAL Call #: 99.8 F7632; ISSN: 0015-749X

Descriptors: commercial activities/ ecology/ population dynamics/ terrestrial habitat/ land zones/ Caudata: forestry/ thinning/ distribution and density impact and influencing factors/ population density/ forest/ impact of forestry thinning and influencing factors/ distribution within habitat/ forest and woodland/ forestry thinning impact on distribution and density and influencing factors/ Oregon/ Cascade Range and Coast Range/ Amphibia, Lissamphibia/ amphibians/ chordates/ vertebrates

Abstract: Although thinning of young, even-aged forests may accelerate the development of characteristics associated with mature forests, in the short term it may negatively affect some taxa, including terrestrial salamanders. Preexisting site conditions, including down wood, and forest management measures, such as riparian buffers, may moderate these effects, but these relationships are poorly understood. To explore whether down wood and riparian buffer widths might influence short-term responses to thinning, we sampled salamanders using ground searches before and during the first 2 years after experimental thinning at two 45- to 65-year-old headwater forest sites in western Oregon that differed in down wood volume. Prethinning distributions of terrestrial salamanders overlapped one- and two-tree height riparian buffers, and except for red-backed salamanders, overlapped very little with narrower streamside or variable-width buffers. At the site where down wood volume was low, captures of ensatina (*Ensatina eschscholtzii* Gray) and western red-backed salamanders (*Plethodon vehiculum* Cooper) both declined by 40% in thinned areas. In contrast, captures of ensatina and Oregon slender salamanders (*Batrachoseps wrighti* Bishop) were not significantly affected by thinning at the site where down wood volume was high. Our results suggest that site conditions, such as down wood volume, and riparian buffers may influence the effect of thinning on terrestrial salamanders, and demonstrate the tight linkage among management of aquatic, riparian, and upslope resources in headwater forests.

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2132. Influence of land use and climate on wetland breeding birds in the Prairie Pothole Region of Canada.

Forcey, G. M.; Linz, G. M.; Thogmartin, W. E.; and Bleier, W. J.

Canadian Journal of Zoology 85(3): 421-436. (Mar. 2007)

NAL Call #: 470 C16D

Descriptors: birds/ wetlands/ nesting/ breeding/ wildlife habitat/ Prairie Pothole Region/ Prairie Farm Rehabilitation Administration/ Canada

Abstract: Bird populations are influenced by a variety of factors at both small and large scales that range from the presence of suitable nesting habitat, predators, and food supplies to climate conditions and land-use patterns. We evaluated the influences of regional climate and land-use variables on wetland breeding birds in the Canada section of Bird Conservation Region 11 (CA-BCR11), the Prairie Potholes. We used bird abundance data from the North American Breeding Bird Survey, land-use data from the Prairie Farm Rehabilitation Administration, and weather data from the National Climatic Data and Information Archive to model effects of regional environmental variables on bird abundance. Models were constructed a priori using information from published habitat associations in the literature, and fitting was performed with WinBUGS using Markov chain Monte Carlo techniques. Both land-use and climate variables contributed to predicting bird abundance in CA-BCR11, although climate predictors contributed the most to improving model fit. Examination of regional effects of climate and land use on wetland birds in CA-BCR11 revealed relationships with environmental covariates that are often overlooked by small-scale habitat studies. Results from these studies can be used to improve conservation and management planning for regional populations of avifauna.

This citation is from AGRICOLA.

2133. Influence of perennial upland cover on occupancy of nesting structures by mallards in northeastern North Dakota.

Artmann, M. J.; Ball, I. J.; and Arnold, T. W.

Wildlife Society Bulletin 29(1): 232-238. (2001)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: *Anas platyrhynchos*/ mallards/ nesting structure/ North Dakota/ occupancy rates/ perennial cover/ artificial nest/ waterfowl/ wildlife management/ United States/ *Anas platyrhynchos*

Abstract: Artificial nesting structures are considered to be most attractive to nesting female mallards (*Anas platyrhynchos*) in areas where natural nesting cover is scarce, leading to the management recommendation to place structures in agricultural landscapes with little perennial upland cover. In 1997-1998, we compared occupancy rates of 260 nesting structures installed on 13 10.4-km² sites in northeastern North Dakota where amount of wetland habitat was comparable but amount of perennial upland cover was either high (\bar{x} =44.8%, grassland sites) or low (\bar{x} =8.0%, cropland sites). Contrary to expectation, occupancy rates were >4 times greater on grassland sites than on cropland sites (17.8 vs. 3.9%, $P=0.003$). The difference was largely a function of greater average mallard densities on grassland versus cropland sites (15.2 vs. 9.2 pairs/km², $P\leq 0.002$). When pair density was controlled for statistically, occupancy rates of structures did not differ between grassland and cropland sites (14.5 vs. 7.9%, $P=0.22$). We conclude that placing structures in areas with

high mallard density is the most effective way to maximize initial occupancy and that proportion of existing perennial upland cover in a landscape has little direct effect on structure occupancy.

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2134. The influence of salinity on the toxicity of various classes of chemicals to aquatic biota.

Hall, L. W. and Anderson, R. D.

Critical Reviews in Toxicology 25(4): 281-346. (1995);

ISSN: 1040-8444.

Notes: Literature review.

Descriptors: salinity/ toxicity/ aquatic environment/ organophosphorus pesticides/ heavy metals/ biota/ salinity effects/ lethal effects/ exposure tolerance/ pollution effects/ pesticides/ bioaccumulation/ food chains/ aquatic organisms/ effects of pollution/ toxicology and health/ effects on organisms/ environmental effects

Abstract: The objective of this study was to review all available aquatic toxicity literature regarding the effects of salinity on the toxicity of various classes of inorganic and organic chemicals. Toxicity data for studies in which toxicity was assessed at various salinities were organized by chemical classes and trophic groups. Seventy percent of the studies were conducted with either crustaceans or fish. The other 30% were with mollusks, annelids, zooplankton, bacteria, phytoplankton, or fungi. Results from 173 data entries showed that negative correlations (toxicity increasing with decreasing salinity) were reported most frequently (55%), followed by no correlations (27%) and positive correlations (18%). The toxicity of most metals such as cadmium, chromium, copper, mercury, nickel, and zinc was reported to increase with decreasing salinity. This finding is likely related to the greater bioavailability of the free metal ion (toxic form) at lower salinity conditions. There was generally no consistent trend for the toxicity of most organic chemicals with salinity. The one exception to this was reported with organophosphate insecticides, the toxicity of which appeared to increase with increasing salinity. Physiological characteristics of the various test species were important in determining the toxicity of the various classes of chemicals at a range of salinities. Results from various studies showed that euryhaline species were more resistant to toxic conditions at isosmotic salinities due to minimization of osmotic stress. Specific examples showed that fish were more resistant to toxic chemicals at middle salinities when compared with either lower or higher extremes. Life history and ecology of test species were important factors to consider when interpreting salinity/contaminant interaction data.

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2135. Information and farmers' attitudes about pesticides, water quality, and related environmental effects.

Lichtenberg, E. and Zimmerman, R.

Agriculture, Ecosystems and Environment 3: 227-236. (1999)

NAL Call #: S601.A34; ISSN: 0167-8809.

Notes: doi: 10.1016/S0167-8809(99)00053-5.

Descriptors: United States, Mid-Atlantic states/ attitudes/ surveys/ agricultural chemicals/ pesticides/ environmental quality/ wildlife/ drinking water/ information systems/ farms/ agricultural pollution/ sociological aspects/ water quality/ environmental protection/ ecosystem disturbance/

agriculture/ agrochemicals/ perception/ public concern/ occupational safety/ environmental impact/ information exchange/ United States/ farmers' attitudes/ evaluation process/ behavior and fate characteristics/ environmental action

Abstract: This paper investigates the effects of information from different sources on farmers' attitudes regarding the effects of pesticides and other agricultural chemicals on environmental quality using a survey of 2700 farmers in three Mid-Atlantic States. Farmers' beliefs are similar to those of the general public on average, but are distributed more uniformly, suggesting that the farm community may be more polarized on environmental issues than the general public. Farmers regard first-hand sources of information such as direct field observation and pesticide labels as being the most important. Chemical dealers and extension rank next in importance. Farmers who attached greater importance to information from news media and extension expressed greater environmental concern. Farmers who found information from chemical dealers more important expressed greater concern about injury to wildlife and pesticides in drinking water but less concern about general environmental quality problems associated with agricultural chemicals.

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2136. Insect population responses to environmental stress and pollutants.

Pimentel, David

Environmental Reviews 2(1): 1-15. (1994)

NAL Call #: GE140.E59

Descriptors: Insecta/ animals/ arthropods/ insects/ invertebrates/ air pollution/ biosphere/ chemicals/ ecosystem/ fertilizers/ pesticides/ soil pollution/ water pollution

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2137. Insects as indicators of land use in three ecoregions in the prairie pothole region.

Anderson, D. J. and Vondracek, B.

Wetlands 19(3): 648-664. (1999)

NAL Call #: QH75.A1W47; ISSN: 0277-5212

Descriptors: wetlands/ grasslands/ aquatic insects/ prairies/ biological indicators/ roads/ ecology/ diversity relationships/ arable land/ land use/ aquatic communities/ community ecology

Abstract: Populations of insects in the prairie pothole region of North Dakota, USA, were sampled to determine whether relationships existed between community- or taxon-level indicators and 11 land-use types. Insects were sampled with light traps at 126 wetland basins in 3 ecoregions. Sampling was conducted 3 times each year during the spring and early summer of 1995 and 1996. Sites were selected based on the proportion of cropland to grassland, hayland, and Conservation Reserve Program land surrounding wetland basins at 50 and 400 m radii. Other land-use types included in the analyses were woodland, roadways, and 5 wetland types: permanent, semi-permanent, seasonal, temporary, and riverine. In both years, taxa richness, abundance, and diversity were greater for the 2nd (June) and 3rd (July) sampling periods than for the 1st period (May), and indicators were greater in the Drift Plain and Red River Valley ecoregions than in the Missouri Coteau ecoregion. Several significant associations existed between insect indicators and land-use types; however,

rsuperscript 2 values were generally low. Much more of the variance in insect measures was explained by temperature, seasonal, and ecoregion effects. Several associations were significant within individual ecoregions (i.e., abundance of aquatic insects, Caenidae, Scarabaeidae, and Lepidoptera and number of Ephemeroptera families). However, no indicators were found in common for all 3 ecoregions. Several significant associations with land use were identified across all sites (i.e., all ecoregions combined). A small number of the significant relationships found across all sites were related to agricultural land use, and several indicated a negative relationship with grasslands. However, several positive relationships between the chosen insect indicators and riverine wetlands were observed across sites and in the Red River Valley ecoregion for both years and spatial scales (i.e., the abundance of Caenidae, Scarabaeidae, Ceratopogonidae, Hydropsychidae, and Hydroptilidae).
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2138. Integrating wildlife management and agriculture: Conserving biodiversity through long-term partnerships.

Belding, R.; Giuliano, W. M.; Putnam, D.; and Taracido, J. *Proceedings of Conservation of Biological Diversity: A Key to the Restoration of the Chesapeake Bay Ecosystem and Beyond* : 48-51. (2001)

Descriptors: agriculture/ bays/ biodiversity/ ecosystem management/ environment management/ environmental monitoring/ estuaries/ estuarine organisms/ freshwater organisms/ habitat improvement/ land use/ nature conservation/ pollution control/ pollution monitoring/ restoration/ rivers/ species diversity/ water quality control/ watersheds/ wetlands/ Chesapeake Bay/ Maryland, Susquehanna R./ Pennsylvania

Abstract: An association of conservation organizations and private landowners, working collectively under the title of Partners for Wildlife, is implementing an innovative conservation and management program designed to protect biodiversity in the Chesapeake Bay ecosystem and throughout Pennsylvania. This program uses three approaches to address biodiversity issues. First, we are implementing habitat enhancement programs on hundreds of farms in 15 counties, including 5 counties in the Susquehanna River watershed. These programs include (1) the establishment of native grasses in pastures and hay fields, (2) the restoration and protection of wetlands and streams in agricultural lands, and (3) the provision of edge manipulations on farm woodlots. These habitat enhancement techniques are designed to improve biodiversity by providing improved water quality and quantity, and greater floral structure and diversity, which has led to a greater abundance and diversity of fauna. Second, we are conducting extensive research and monitoring to quantify the impacts of our habitat enhancement on biodiversity and farm economics. And third, we are educating landowners on the benefits, not only to the environment, but also to themselves economically. Because these habitat management techniques benefit landowners, many farmers have begun implementing them on their own. This provides not only a long-term solution to decreased biodiversity but also to the declining agricultural community, a win-win situation.

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2139. Interaction of beaver and elk herbivory reduces standing crop of willow.

Baker, Bruce W.; Ducharme, Heather C.; Mitchell, David C. S.; Stanley, Thomas R.; and Peinetti, H. Raul

Ecological Applications 15(1): 110-118. (2005)
NAL Call #: QH540.E23 ; ISSN: 1051-0761

Descriptors: Artiodactyla/ Castoridae/ Cervidae/ Rodentia/ Castor canadensis/ Cervus elaphus/ Colorado/ conservation/ wildlife management/ foods-feeding/ habitat management/ herbivory/ intense browsing/ interspecies relationships/ riparian habitat/ ecosystems/ Salix lasiandra/ willow-beaver restoration/ interspecies relationships/ intraspecies relationships/ diets/ habitat use/ land zones/ nutrition/ Salix spp.

Abstract: Populations of beaver and willow have not thrived in riparian environments that are heavily browsed by livestock or ungulates, such as elk. The interaction of beaver and elk herbivory may be an important mechanism underlying beaver and willow declines in this competitive environment. We conducted a field experiment that compared the standing crop of willow three years after simulated beaver cutting on paired plants with and without intense elk browsing (~85% utilization rate). Simulated beaver cutting with intense elk browsing produced willow that was small (biomass and diameter) and short, with far fewer, but longer, shoots and a higher percentage of dead biomass. In contrast, simulated beaver cutting without elk browsing produced willow that was large, tall, and leafy, with many more, but shorter, shoots (highly branched) and a lower percentage of dead biomass. Total stem biomass after three years was 10 times greater on unbrowsed plants than on browsed plants. Unbrowsed plants recovered 84% of their pre-cut biomass after only two growing seasons, whereas browsed plants recovered only 6%. Thus, the interaction of beaver cutting and elk browsing strongly suppressed the standing crop of willow. We predict that a lack of willow suitable as winter food for beaver can cause beaver populations to decline, creating a feedback mechanism that reduces beaver and willow populations. Thus, intense herbivory by ungulates or livestock can disrupt beaver-willow mutualisms that naturally occur in less competitive environments.

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2140. Interactions between forests and fish in the Rocky Mountains of the USA.

Fausch, K. D. and Young, M. K.

In: *Fishes and forestry: Worldwide watershed interactions and management*/ Northcote, T. G. and Hartman, G. F. Oxford: Blackwell Science, 2004.

Notes: ISBN: 0632058099.

Descriptors: commercial activities/ conservation measures/ ecology/ land zones/ Pisces: forestry/ habitat management/ forestry/ ecology/ forestry practices/ freshwater habitat/ United States/ Rocky Mountains/ chordates/ fish/ vertebrates

Abstract: This paper discusses the linkages among forest ecology, forestry practices and habitat for aquatic biota in the Rocky Mountains of the USA, emphasizing the role of anthropogenic and natural disturbances on large woody debris in forested streams due to its fundamental role in producing fish habitat. Also discussed are the other processes including sediment delivery and allochthonous input of terrestrial invertebrates that affect habitat and fish

abundance including recommended research and management planning at landscape scales to sustain native fishes.

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2141. Jarbidge Cooperative Elk Herd Carrying Capacity Study, 1999 Annual Report: Preliminary estimates of 1999 elk summer range carrying capacity.

Beck, Jeffrey L. and Peek, James M.

Idaho Technical Bulletins(2001/03): 2001-2003. (2001). http://www.blm.gov/id/st/en/info/publications/technical_bulletins/TB01-3.html

Descriptors: Cervus elaphus/ aerial surveys/ arrow grass/ aspen/ balsam poplar/ behavior/ biomass/ biometrics/ browsing/ carrying capacity/ Ceanothus/ census-survey methods/ conservation/ curleaf cercocarpus/ ecosystems/ environmental factors/ feeding sites/ food habits studies/ food supply/ foods-feeding/ grazing/ habitat alterations/ habitat management/ habitat surveys/ habitat use/ Kentucky bluegrass/ livestock/ mammals/ mountain mahogany/ nutrients/ nutrition/ population ecology/ precipitation/ proteins/ sagebrush/ sampling/ season/ shrub grasslands/ snow/ snowberry/ study methods/ techniques/ telemetry/ transect surveys/ wildlife-habitat relationships/ wildlife-livestock relationships/ winter/ elk/ Poa pratensis/ Populus balsamifera/ Populus ssp./ Nevada: elko County
Abstract: The preliminary estimates of carrying capacity for elk (*Cervus elaphus*) in 1999, on the summer range within the Nevada Division of Wildlife Hunt Unit 072 in Elko County, is provided in this annual report. Elk summer habitat selection in the Jarbidge Mountains is closely associated with the woody communities of aspen and curleaf mountain mahogany and some selections are also based on snowbrush ceanothus communities. The authors conducted a study to investigate elk nutritional relationships, examine dietary overlap among elk, livestock, and mule deer, and direct forage availability. A subset of 11 key forage species were selected. The authors analysed the diet of lactating cow elk and assessed their requirement for crude protein (CP) and digestible energy (DE). These requirements are more attainable through consumption of forbs and shrubs; grasses tend to provide lower levels. The dietary overlap between elk and other ungulates in summer and based on the key forage species has been highest between elk and mule deer. The two forage species, which occur in highest concentrations in the summer diets of these ungulates, are lupines and snowbrush. The calculation of the carrying capacity of elk was carried out for the amount of forage remaining in aspen and mahogany communities after seasonal livestock grazing was completed. A large portion of the standing crop is lost due to factors other than direct grazing such as trampling, fouling, and forage senescence. The healthy stands of trees and shrubs including aspen, mountain mahogany, and snowbrush will provide long-term support of viable elk and mule deer populations in the Jarbidge Mountains summer range. Throughout the summer these communities of plants provide browsing and grazing ungulates with high yields of nutritious forbs, graminoids, and shrubs.

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2142. Juvenile dispersal of Franklin's ground squirrel (*Spermophilus franklinii*) from a prairie "island".

Martin, Jason M. and Heske, Edward J.

American Midland Naturalist 153(2): 444-449. (2005)
NAL Call #: 410 M58; ISSN: 0003-0031

Descriptors: ecology/ terrestrial habitat/ man-made habitat/ land zones/ *Spermophilus franklinii*: distribution within habitat/ juvenile dispersal from prairie island within agricultural landscape/ grassland/ cultivated land habitat/ Illinois/ Champaign County/ Urbana/ Mammalia, Rodentia, Sciuridae/ chordates/ mammals/ rodents/ vertebrates
Abstract: Franklin's ground squirrel (*Spermophilus franklinii*) is declining in the eastern portion of its range, and this decline is often attributed to habitat fragmentation. However, the ability of *S. franklinii* to disperse across an agricultural landscape is not known. During spring 2002 we live trapped a small, apparently isolated, population of Franklin's ground squirrels in a 12-ha tallgrass prairie restoration located south of Urbana, Champaign County, Illinois. This prairie "island" was surrounded primarily by row-crop agriculture. We radio-tracked 14 juvenile Franklin's ground squirrels (seven males and seven females) throughout dispersal to determine how far dispersers traveled, the timing of dispersal, if dispersal distance differed between sexes and if the agricultural matrix surrounding the study site was a barrier to movements. Males dispersed farther than females, but individuals of both sexes moved ≥ 1 km from the study site. The farthest movement recorded was by a male who traveled 3.6 km. Dispersal was age-dependent for both sexes, occurring at 9-11 wk of age. Agricultural fields did not seem to hinder movement, probably because dispersal occurred in late July and August before row crops were harvested. Open areas such as roadways, however, may be barriers for some individuals.

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2143. Land cover and bobwhite abundance on Oklahoma farms and ranches.

Guthery, F. S.; Green, M. C.; Masters, R. E.; DeMaso, S. J.; Wilson, H. M.; and Steubing, F. B.
Journal of Wildlife Management 65(4): 838-849. (2001)
NAL Call #: 410 J827; ISSN: 0022541X

Descriptors: call-counts/ *Colinus virginianus*/ land use/ landscape/ northern bobwhite/ Oklahoma/ gamebird/ habitat management/ land use/ landscape ecology/ population estimation/ United States/ *Colinus virginianus*
Abstract: To test prevailing paradigms of habitat management for northern bobwhites (*Colinus virginianus*), we analyzed relations between the abundance of these birds, land-cover classes, and landscape metrics on Oklahoma farms and ranches (200-ha areas; n = 78) during 1998-1999. Based on replicated call-count indices, bobwhites declined (-0.03 to -0.07 males/ha; 95% confidence level here and below) with the quantity of an area in mature woodland, and increased (0.02 to 0.05 males/ha) with the quantity of brushy prairie or early successional woodland. We observed highest populations in the absence of cropland agriculture. Bobwhites declined as Shannon diversity of cover types (-6.0 to -0.01 males/Shannon unit), patch richness (-0.08 to -0.02 males/patch), and the density of woody edge (-0.027 to -0.003 males/m/ha) increased. Bobwhites responded more strongly to the composition of land-cover classes on areas than to the configuration of these classes in areas. Our

results did not support the patchwork agriculture model of bobwhite abundance or the principle of edge. Results were consistent with a hypothesis that predicts bobwhite abundance is a nondecreasing function of usable space in time.

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2144. Land use and habitat gradients determine bird community diversity and abundance in suburban, rural and reserve landscapes of Minnesota, USA.

Chapman, K. A. and Reich, P. B.

Biological Conservation 135(4): 543-557. (2007)

NAL Call #: S900.B5; ISSN: 00063207.

Notes: doi: 10.1016/j.biocon.2006.10.050.

Descriptors: bird community/ development/ diversity/ habitat gradient/ land use/ regional conservation

Abstract: Bird species' community responses to land use in the suburbanizing Twin Cities, Minnesota, USA, were contrasted among reserves, rural lands, and suburbs. For each land use type, bird composition, diversity, and abundance were recorded for 2 years in ≈99 plots in three sampling units (each ≈4500 ha). A habitat gradient defined by canopy structure (grasslands to savannas to forests) was influenced by land use, so ≈300 plots were used to characterize simultaneous variation in bird communities along land use and habitat gradients. At broad scales (aggregate of 33 plots covering ≈4500 ha) suburbs supported the lowest bird richness and diversity and rural landscapes the most, with reserves slightly below rural. Although reserves were like rural lands in diversity of bird communities, they supported more species of conservation concern, particularly of grasslands and savannas. Differences among land use types varied with habitat structure. Suburbs, rural lands, and reserves had similar forest bird communities, but differed in grassland and savanna bird communities. The extensive rural forests are important for the region's forest birds. Suburban grasslands and savannas had low shrub abundance, low native bird richness and high non-native bird richness and abundance. However, total bird richness and diversity were as high in suburban as in rural and reserve plots because high native richness in suburban forests and high non-native species richness in suburban grasslands and savannas compensated for lower native richness in suburban grasslands and savannas. Bird conservation here and in the Midwest USA should protect rural forests, expand grasslands and savannas in reserves, and improve habitat quality overall.

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2145. Landowner attitudes regarding wildlife management on private land in North Carolina.

Daley, S. S.; Cobb, D. T.; Bromley, P. T.; and Sorenson, C. E.

Wildlife Society Bulletin 32(1): 209-219. (2004)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: attitudes/ behavior/ human dimensions/ landowner/ North Carolina/ private land/ telephone survey/ wildlife management/ attitudinal survey/ United States

Abstract: Early-successional habitats across the southeast United States have declined considerably in recent years amid rising human population growth and associated development. Recognizing the declining wildlife populations associated with early-successional habitats and the need for influence over habitat on private land, the North Carolina

Wildlife Resources Commission established the Cooperative Upland Habitat Restoration and Enhancement (CURE) Program in August 2000. The program targets private landowners in 3 select regions of the state (Upper Coastal Plain I, Upper Coastal Plain II, and Western Piedmont). Survey research was conducted in the 3 CURE Program areas to 1) evaluate demographic and landownership attributes of private landowners and associated land-use characteristics, 2) assess regional differences in landowner attitudes and behavior toward wildlife management on private land, 3) identify landowner attributes related to regional differences in attitude or behavior, and 4) evaluate how regional differences will impact future CURE Program guidelines. Landowner attitudes toward wildlife in North Carolina are closely linked to property use and reliance on land for direct economic income (i.e., agricultural production). Landowners who depended on their property for earned annual income were less likely to consider the aesthetic or intrinsic value of wildlife on their land than those who did not rely on their land for income. For some landowners, financial incentives alone appeared sufficient to encourage participation in the CURE Program. Other landowners were less interested in financial rewards. For these landowners, alternative forms of encouragement, such as partnerships with agencies and organizations, might be more effective. Understanding variability in landowner attitudes and behavior toward wildlife habitat is critical to the success of private-land wildlife habitat management programs. In North Carolina the success of the CURE Program will depend on tailoring the program to fit regional differences in landowner values, attitudes, and behavior.

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2146. Landscape changes and ecological studies in agricultural regions, Quebec, Canada.

Jobin, B.; Beaulieu, J.; Grenier, M.; Belanger, L.; Maisonneuve, C.; Bordage, D.; and Filion, B.

Landscape Ecology 18(6): 575-590. (2003)

NAL Call #: QH541.15.L35 L36; ISSN: 09212973.

Notes: doi: 10.1023/A:1026047625427.

Descriptors: agricultural landscapes/ conservation/ ecoregion/ landscape delineation/ NABCI/ Quebec/ wildlife habitat/ agricultural ecosystem/ conservation/ ecoregion/ land classification/ land use/ LANDSAT thematic mapper/ landscape ecology/ multivariate analysis/ remote sensing/ Canada/ North America

Abstract: Most landscape definitions in the western world are based on soil, climatic, or physiographic features and do not integrate humans as an integral part of the landscape. We present an approach where landscape types have been delineated in southern Quebec, Canada based on current land use where anthropogenic and agricultural activities are concentrated as a practical application of the holistic approach in landscape definition. Landsat-TM satellite images were classified and the 27 habitat classes were regrouped into 5 general land cover classes (cash crop, dairy farming, forest, anthropogenic, wetlands) and overlaid onto soil landscape polygons to characterize natural boundary units. Cluster analyses were used to aggregate these polygons into seven agricultural types of landscape forming a gradient from urban and high-intensity cash crop farming activities to landscapes dominated by a mosaic of agriculture and forested areas. Multivariate analyses of raw data and of socio-economic

and farming practices variables were used to describe the defined types of landscape and these were projected over three established land classification systems of southern Quebec (Canadian ecoregions, North American Bird Conservation Initiative regions and Corn Heat Unit regions) to compare their similarity in terms of land cover and for planning of future ecological studies. Because agricultural landscapes are highly dynamic, they are bound to undergo changes in the near future. Our landscape delineation may serve as an experimental setup where landscape dynamics and wildlife populations and community structures could be monitored. Because the information we used to delineate and characterize agricultural landscape types is readily available in other countries, our approach could easily be adapted to similar data sources under and a wide variety of landscape types.

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2147. Landscape characteristics affecting habitat use and productivity of avifauna on stock ponds in western South Dakota.

May, S. M. 2001.

Notes: Project Number: SD W-107-R/Study No. 1011; Wildlife Coop. Unit Report - Thesis

Descriptors: animals, non-game/ birds, marsh-dwellers/ broods and brooding/ habitat/ habitat management for wildlife/ ponds/ population density/ predators/ productivity/ statistics/ surveys/ utilization/ vegetation/ waterfowl/ wetlands/ wildlife-habitat relationships/ South Dakota, western region

Abstract: The effects of local- and landscape-level characteristics (specifically grassland fragmentation) on nongame wetland bird occurrence and density, and waterfowl pair and brood density and rates of productivity were evaluated in 1999 and 2000 in western South Dakota.

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2148. Landscape correlates along mourning dove call-count routes in Mississippi.

Elmore, R. Dwayne; Vilella, Francisco J.; and Gerard, Patrick D.

Journal of Wildlife Management 71(2): 422-427. (2007)
NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: wildlife management: conservation/ landscape/ call count route

Abstract: Mourning dove (*Zenaidura macroura*) call-count surveys in Mississippi, USA, suggest declining populations. We used available mourning dove call-count data to evaluate long-term mourning dove habitat relationships. Dove routes were located in the Mississippi Alluvial Valley, Deep Loess Province, Mid Coastal Plain, and Hilly Coastal Plain physiographic provinces of Mississippi. We also included routes in the Blackbelt Prairie region of Mississippi and Alabama, USA. We characterized landscape structure and composition within 1.64-km buffers around 10 selected mourning dove call-count routes during 3 time periods. Habitat classes included agriculture, forest, urban, regeneration stands, wetland, and woodlot. We used Akaike's Information Criterion to select the best candidate model. We selected a model containing percent agriculture and edge density that contained approximately 40% of the total variability in the data set. Percent agriculture was positively correlated with relative dove abundance. Interestingly, we found a negative relationship between edge density and dove abundance. Researchers should

conduct future research on dove nesting patterns in Mississippi and threshold levels of edge necessary to maximize dove density. During the last 20 years, Mississippi lost more than 800,000 ha of cropland while forest cover represented largely by pine (*Pinus taeda*) plantations increased by more than 364,000 ha. Our results suggest observed localized declines in mourning dove abundance in Mississippi may be related to the documented conversion of agricultural lands to pine plantations.

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2149. A landscape ecology perspective for research, conservation, and management.

Freemark, K. E.; Dunning, J. B.; Hejl, S. J.; and Probst, J. R.

In: Ecology and management of neotropical migratory birds: A synthesis and review of critical issues/ Martin, T. E. and Finch, D. M.

New York: Oxford University Press, 1995; pp. 381-427.

Notes: ISBN: 0-19-508452-7.

Descriptors: wild birds/ landscape ecology/ habitats/ forests/ wetlands/ riparian vegetation/ urban areas/ temperate zones/ neotropical region/ nature conservation/ wildlife management/ management/ wildlife conservation/ United States

Abstract: This paper highlights key concepts of landscape ecology important to the research, conservation and management of neotropical migratory birds. A review is given of empirical studies related to the landscape ecology of neotropical migratory birds in forests, farmland, wetlands, riparian habitats and urban habitats of temperate breeding areas in the USA, and to a more limited extent, on migration stopover areas and neotropical overwintering areas. Research, conservation and management implications for neotropical migratory birds arising from a landscape perspective are discussed.

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2150. Linkage between riparian buffer features and regeneration, benthic communities, and water temperature in headwater streams, western Oregon.

Newton, Michael and Cole, Elizabeth C.

In: Productivity of Western forests: a forest products focus, General Technical Report-PNW 642; Portland, OR: Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 81-101.

Descriptors: freshwater ecology: ecology, environmental sciences/ conservation/ forestry/ water temperature/ riparian forest/ headwater stream/ benthic community/ reforestation

Abstract: Riparian forests can be managed using a range of harvesting and regeneration methods to achieve multiple environmental and economic objectives. In this study, seven low-elevation second- or third-order streams were subjected to either patch clearcutting with no buffers or one-sided narrow buffers divided by uncut reaches. Of these streams, four were sites of intensive regeneration experiments, and the other three evaluated only the effect of harvest pattern on water temperature. Regeneration was successfully installed along four streams with intensive planting experiments in which three clearcuts on each spanned the stream for distances of 90 or 180 m. Regeneration cutting in these drainages included clearcutting to the water's edge in openings amounting to

25% of 1,500-m reaches. Planting tests evaluated three species: Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco var. *menziesii*), western hemlock (*Tsuga heterophylla* (Raf.) Sarg.), and western redcedar (*Thuja plicata* Donn). Douglas-fir was represented by two different stock types, bareroot plug+1 and 1+1 transplants on two sites and bareroot 1+1 and 2+0 seedlings on the other two sites. All regeneration efforts are on a path that will eventually result in conifer-dominated riparian zones, with degree of success influenced by choice of stock type, overtopping cover, animal damage and frost. Damage from deer (*Odocoileus hemionus columbianus* Rich.), elk (*Cervus elaphus canadensis* L.), beavers (*Castor canadensis* Kuhl.) and/or mountain beavers (*Aplodontia rufa* Raf.) occurred on all four stream systems. There were no patterns of beaver or mountain beaver damage among the stock types; browsing on hemlock was minor. Growth status of the plantations at age four was a function of overtopping vegetation where there is low risk of frost damage; freezing temperatures were limiting to seedling growth along one stream. All three of the primary tree regeneration species studied exhibited decreased growth with overtopping. As has been found on upland sites elsewhere, size of seedlings had a strong influence on their competitive ability in riparian zones.

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2151. Livestock effects on reproduction of the Columbia spotted frog.

Bull, E. L. and Hayes, M. P.

Journal of Range Management 53(3): 291-294. (2000)

NAL Call #: 60.18 J82 ; ISSN: 0022-409X.

http://jrm.library.arizona.edu/Volume53/Number3/azu_jrm_v53_n3_291_294_m.pdf

Descriptors: Rana/ ponds/ oval/ grazing/ cattle/ aquatic plants/ surface area/ altitude/ depth/ fish/ habitats/ algae and seaweeds/ dissolved oxygen/ Oregon

This citation is from AGRICOLA.

2152. Living on the edge: Field boundary habitats, biodiversity and agriculture.

Clark, R. G.; Boutin, C.; Jobin, B.; Forsyth, D. J.; Shutler, D.; Leeson, J. Y.; Olfert, O.; and Thomas, A. G. In: Field boundary habitats: Implications for weed, insect and disease management; Series: Topics in Canadian Weed Science 1. Sainte-Anne-de-Bellevue, Quebec: Canadian Weed Science Society, 2005; pp. 113-133.

Descriptors: biodiversity/ boundaries/ carbon sequestration/ erosion/ farming systems/ forage/ grazing/ habitats/ hay/ hedges/ insect pests/ landowners/ landscape ecology/ livestock/ nature conservation/ pesticides/ plant pests/ soil conservation/ surface water/ vertebrate pests/ weeds/ wetlands/ wildlife/ birds/ insects

Abstract: In many agricultural regions of Canada, the most common remnant natural areas are field boundaries, these habitats being linear features or narrow areas located beside cropland. Boundaries are often perceived to harbour noxious weeds, insects and birds that could potentially damage crops or interfere with crop production. Therefore, boundary habitat may be degraded by pesticides, fertilizers, tillage, wind and water exposure, excessive burning, haying and grazing. One conservation objective is to work with land owners to retain and protect existing boundaries, a goal that could be achieved more readily with evidence of benefits and practical ways of managing field margins.

Direct services provided by boundary habitats include control of soil and water erosion, protection (e.g., from agro-chemicals) of surface water used by livestock and people, and provision of forage for livestock through grazing or haying. Boundaries serve as refugia for plants, insects or other animals that are either neutral or beneficial to agriculture. Native plants often are more common farther from field edges and in habitats abutting pastures and hayfields, whereas weeds are more abundant in boundaries adjacent to intensively managed agricultural fields, possibly as a result of competitive advantages or outright loss of native species created by disturbance and agrochemical use. Wildlife has been studied in several countries and under different agricultural settings, but survival and reproductive rates of animals occurring in boundaries are not well known. Relationships between boundary width, height and composition and wildlife value, carbon storage, and protection of surface waters are poorly quantified. Answers to these questions will help land owners, conservation agencies and policy-makers make better decisions about sustainable farm practices.

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2153. Long-term effects of rights-of-way maintenance via the wire-border zone method on bird nesting ecology.

Yahner, R. H.; Ross, B. D.; Yahner, R. T.; Hutnik, R. J.; and Liscinsky, S. A.

Journal of Arboriculture 30(5): 288-293. (2004)

NAL Call #: SB436.J6; ISSN: 02785226

Descriptors: breeding birds/ handcutting/ herbicides/ nesting ecology/ vegetation/ avifauna/ ecological impact/ habitat management/ herbicide/ maintenance/ mowing/ nesting behavior/ right of way/ Allegheny Mountains/ Allegheny Plateau/ Appalachian Plateau/ Aves/ Pipilo/ Pipilo erythrophthalmus

Abstract: The long-term nesting ecology of birds was studied during 2002 and 2003 on the State Game Lands (SGL) 33 Research and Demonstration Area, which is located along a 230-kV transmission right-of-way (ROW) of FirstEnergy (Penelec) in the Allegheny Mountain Region, Centre County, Pennsylvania, U.S. The objectives of this study were to compare nest abundance, success, and placement (1) in handcut versus herbicide-treated study sites (units) and (2) in wire versus border zones. In addition, results from this study were compared to those obtained in a previous study conducted in 1991-1992 on the ROW to better understand the long-term effects of vegetation maintenance management on wildlife. Thirty-three and 26 nests of 10 bird species were noted in 2002 and 2003, respectively. The most frequently encountered nests in 1991-1992 and 2002-2003 were those of bird species adapted to early successional habitats, for example, eastern towhee (*Pipilo erythrophthalmus*), created by the wire-border zone method of vegetation maintenance on the ROW. Thirteen (39%) of 33 nests of all species combined fledged young in 2002 compared to 17 (65%) of 26 nests in 2003. Nesting success in 2003 on the SGL 33 ROW was typical of most studies of bird nesting success in a variety of habitats and was comparable to that recorded in 1991-1992. The low-volume basal unit was more important as nesting habitat than either handcut or mowing plus herbicide units, with nine species nesting in the low-volume basal unit versus only four species in each of the other two units. Thirty-five (59%) of the 59 nests on the

ROW were in wire zones, whereas 24 (41%) nests were in border zones. In conclusion, mowing plus herbicide treatment on a ROW may be the best application of the wire-border zone method in terms of resistance to seedling invasion of undesirable trees, cover-type development in the wire zone, and its value as wildlife habitat. Because early successional habitat is becoming less common in the eastern United States and because species dependent on these habitats are showing populations declines, the maintenance of a ROW via the wire-border zone method is extremely valuable to the long-term conservation of early successional bird species. © 2004 International Society of Arboriculture.

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2154. Long-term monitoring and evaluation of the Lower Red River Meadow Restoration Project, Idaho, U.S.A.

Klein, L. R.; Clayton, S. R.; Alldredge, J. R.; and Goodwin, P.

Restoration Ecology 15(2): 223-239. (2007)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: channels/ ecosystems/ floodplains/ grasslands/ groundwater level/ habitats/ hydrodynamics/ meadows/ monitoring/ population density/ recovery/ riparian vegetation/ rivers/ slope/ species diversity/ streams/ water temperature/ wild birds/ birds/ Salmonidae

Abstract: Although public and financial support for stream restoration projects is increasing, long-term monitoring and reporting of project successes and failures are limited. We present the initial results of a long-term monitoring program for the Lower Red River Meadow Restoration Project in north-central Idaho, U.S.A. We evaluate a natural channel design's effectiveness in shifting a degraded stream ecosystem onto a path of ecological recovery. Field monitoring and hydrodynamic modelling are used to quantify post-restoration changes in 17 physical and biological performance indicators. Statistical and ecological significance are evaluated within a framework of clear objectives, expected responses (ecological hypotheses), and performance criteria (reference conditions) to assess post-restoration changes away from pre-restoration conditions. Compared to pre-restoration conditions, we observed ecosystem improvements in channel sinuosity, slope, depth, and water surface elevation; quantity, quality, and diversity of in-stream habitat and spawning substrate; and bird population numbers and diversity. Modelling documented the potential for enhanced river-floodplain connectivity. Failure to detect either statistically or ecologically significant change in groundwater depth, stream temperature, native riparian cover, and salmonid density is due to a combination of small sample sizes, high interannual variability, external influences, and the early stages of recovery. Unexpected decreases in native riparian cover led to implementation of adaptive management strategies. Challenges included those common to most project-level monitoring - isolating restoration effects in complex ecosystems, securing long-term funding, and implementing scientifically rigorous experimental designs. Continued monitoring and adaptive management that support the establishment of mature and dense riparian shrub communities are crucial to overall success of the project.

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2155. Mallard recruitment in the agricultural environment of North Dakota.

Cowardin, L. M.; Gilmer, D. S.; and Shaiffer, C. W.

Wildlife Monographs 92: 1-37. (1985)

NAL Call #: 410 W64; ISSN: 0084-0173

Descriptors: Anas platyrhynchos (Anatidae)/ wildlife management/ population recruitment/ agricultural land/ nesting site/ agricultural habitat/ breeding season/ nest initiation curves/ reproductive productivity/ population dynamics/ recruitment/ habitat preference/ nesting/ agricultural environment/ semiaquatic habitat/ wetlands/ grassland/ cultivated land habitat/ agricultural population recruitment and management/ North Dakota/ agricultural habitat

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2156. Mammalian toxicology of organophosphorus pesticides.

Sultatos, L. G.

Journal of Toxicology and Environmental Health 43(3): 271-289. (Nov. 1994)

NAL Call #: RA565.A1J6; ISSN: 0098-4108 [JTEHD6].

Notes: Literature review.

Descriptors: organophosphorus pesticides/ toxicity/ adverse effects/ acetylcholinesterase/ enzyme activity/ inhibition/ metabolism/ metabolites/ mammals/ toxicology/ carcinogenesis/ metabolic activation

This citation is from AGRICOLA.

2157. Management of agricultural landscapes for the conservation of neotropical migratory birds.

Koford, R. R. and Best, L. B.

In: Management of Midwestern landscapes for the conservation of neotropical migratory birds, General Technical Report-NC 781/ Thompson, F. R.; St. Paul, MN: North Central Forest Experiment Station, Forest Service, U.S. Department of Agriculture, 1996. pp. 86-88. <http://www.npwr.usgs.gov/resource/habitat/landscap/index.htm>

Descriptors: supporting science/ birds/ bird conservation/ landscape management

Abstract: Discussed management strategies for the management of avian habitat in agricultural landscapes.

2158. Managing for enhancement of riparian and wetland areas of the western United States: An annotated bibliography.

Koehler, D. A. and Thomas, A. E.

Ogden, UT: Rocky Mountain Research Station, Forest Service, U.S. Department of Agriculture; General Technical Report-RMRS 54, 2000. 369 p.

Notes: Rocky Mountain Research Station General Technical Report 54.

Descriptors: fisheries/ geomorphology/ grazing impacts/ hydrology/ riparian habitat/ riparian restoration/ riparian vegetation/ watersheds/ wetlands

Abstract: This annotated bibliography contains 1,905 citations from professional journals, symposia, workshops, proceedings, technical reports, and other sources. The intent of this compilation was to: (1) assemble, to the extent possible, all available and accessible publications relating to riparian management within a single source or document; (2) provide managers, field biologists, researchers, and others, a point of access for locating scientific literature relevant to their specific interest; and (3)

provide, under one cover, a comprehensive collection of annotated publications that could disseminate basic information relative to the status of our knowledge. This citation is from Treesearch.

2159. A mesofilter conservation strategy to complement fine and coarse filters.

Hunter, M. L.

Conservation Biology 19(4): 1025-1029. (2005)

NAL Call #: QH75.A1C5 ; ISSN: 0888-8892

Descriptors: aquatic environment/ conservation/ ecosystems/ fires/ floods/ grasslands/ habitats/ hedges/ logs/ streams/ wetlands

Abstract: Setting aside entire ecosystems in reserves is an efficient way to maintain biodiversity because large numbers of species are protected, but ecosystem conservation constitutes a coarse filter that does not address some species. A complementary, fine-filter approach is also required to provide tailored management for some species (e.g., those subject to direct exploitation). Mesofilter conservation is another complementary approach that focuses on conserving critical elements of ecosystems that are important to many species, especially those likely to be overlooked by fine-filter approaches, such as invertebrates, fungi, and nonvascular plants. Critical elements include structures such as logs, snags, pools, springs, streams, reefs, and hedgerows, and processes such as fires and floods. Mesofilter conservation is particularly appropriate for seminatural ecosystems that are managed for both biodiversity and commodity production (e.g., forests managed for timber, grasslands managed for livestock forage, and aquatic ecosystems managed for fisheries) and is relevant to managing some agricultural and urban environments for biodiversity.

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2160. A meta-analysis of forest cover, edge effects, and artificial nest predation rates.

Hartley, M. J. and Hunter, M. L.

Conservation Biology 12(2): 465-469. (1998)

NAL Call #: QH75.A1C5 ; ISSN: 0888-8892

Descriptors: forests/ predation/ edge effect/ Aves/ birds

Abstract: Landscape fragmentation has been among the most intensely studied topics in conservation biology for decades. The influence of habitat edge has often been investigated as an important feature in fragmented areas, especially with respect to bird nesting success, as evidenced by three recent reviews. Paton (1994) concluded that "current evidence, although equivocal, suggests that predation and parasitism rates are often significantly greater within 50 m of an edge." Andren (1995) examined edge (or patch size) effects in a review of 40 papers and concluded that "edge-related increase in predation seems to be most commonly found inside forests surrounded by farmland and was rarely found in forest mosaics." Major and Kendal (1996) showed that a preponderance of studies "demonstrated a positive correlation between predation rate and the degree of habitat fragmentation," but found "more variable results" regarding edge effects. We believe that none of these papers adequately addressed the issue of whether or not predation rates and edge effects differ between deforested versus forested landscapes. Thus, we decided to evaluate relationships between degree of forest cover in a landscape and (1) avian nest success rates and (2) the existence of elevated predation rates near habitat

edges. We combined data from 13 previous studies in 33 U.S. landscapes to explore patterns of nest predation and landscape composition.

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2161. Model estimation of land-use effects on water levels of northern prairie wetlands.

Voldseth, R. A.; Johnson, W. C.; Gilmanov, T.;

Guntenspergen, G. R.; and Millett, B. V.

Ecological Applications 17(2): 527-540. (2007)

NAL Call #: QH540.E23 ; ISSN: 10510761

Descriptors: grassland management/ grazing/ land use/ landscape condition/ Prairie Pothole Region/ prairie wetland/ waterfowl management/ wetland ecology/ wetland hydrology/ wetland modeling/ wetland water budget/ wetland water level

Abstract: Wetlands of the Prairie Pothole Region exist in a matrix of grassland dominated by intensive pastoral and cultivation agriculture. Recent conservation management has emphasized the conversion of cultivated farmland and degraded pastures to intact grassland to improve upland nesting habitat. The consequences of changes in land-use cover that alter watershed processes have not been evaluated relative to their effect on the water budgets and vegetation dynamics of associated wetlands. We simulated the effect of upland agricultural practices on the water budget and vegetation of a semipermanent prairie wetland by modifying a previously published mathematical model (WETSIM). Watershed cover/land-use practices were categorized as unmanaged grassland (native grass, smooth brome), managed grassland (moderately heavily grazed, prescribed burned), cultivated crops (row crop, small grain), and alfalfa hayland. Model simulations showed that differing rates of evapotranspiration and runoff associated with different upland plant-cover categories in the surrounding catchment produced differences in wetland water budgets and linked ecological dynamics. Wetland water levels were highest and vegetation the most dynamic under the managed-grassland simulations, while water levels were the lowest and vegetation the least dynamic under the unmanaged-grassland simulations. The modeling results suggest that unmanaged grassland, often planted for waterfowl nesting, may produce the least favorable wetland conditions for birds, especially in drier regions of the Prairie Pothole Region. These results stand as hypotheses that urgently need to be verified with empirical data. © 2007 by the Ecological Society of America.

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2162. Modeling annual mallard production in the prairie-parkland region.

Miller, M. W.

Journal of Wildlife Management 64(2): 561-575. (2000)

NAL Call #: 410 J827; ISSN: 0022541X

Descriptors: agriculture/ *Anas platyrhynchos*/ climate/ mallard/ modeling/ prairie-parkland region/ production/ survey/ temperature/ wetlands/ biological production/ environmental factor/ population modeling/ waterfowl/ wildlife management/ North America/ *Anas platyrhynchos*

Abstract: Biologists have proposed several environmental factors that might influence production of mallards (*Anas platyrhynchos*) nesting in the prairie-parkland region of the United States and Canada. These factors include precipitation, cold spring temperatures, wetland abundance, and upland breeding habitat. I used long-term historical

data sets of climate, wetland numbers, agricultural land use, and size of breeding mallard populations in multiple regression analyses to model annual indices of mallard production. Models were constructed at 2 scales: a continental scale that encompassed most of the mid-continental breeding range of mallards and a stratum-level scale that included 23 portions of that same breeding range. The production index at the continental scale was the estimated age ratio of mid-continental mallards in early fall; at the stratum scale my production index was the estimated number of broods of all duck species within an aerial survey stratum. Size of breeding mallard populations in May, and pond numbers in May and July, best modeled production at the continental scale. Variables that best modeled production at the stratum scale differed by region. Crop variables tended to appear more in models for western Canadian strata; pond variables predominated in models for United States strata; and spring temperature and pond variables dominated models for eastern Canadian strata. An index of cold spring temperatures appeared in 4 of 6 models for aspen parkland strata, and in only 1 of 11 models for strata dominated by prairie. Stratum-level models suggest that regional factors influencing mallard production are not evident at a larger scale. Testing these potential factors in a manipulative fashion would improve our understanding of mallard population dynamics, improving our ability to manage the mid-continental mallard population.

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2163. Modeling the ecological trap hypothesis: A habitat and demographic analysis for migrant songbirds.

Donovan, T. M. and Thompson, F. R.

Ecological Applications 11(3): 871-882. (2001)

NAL Call #: QH540.E23 ; ISSN: 10510761

Descriptors: ecological trap/ habitat quality/ landscape management/ neotropical migrant songbirds/ population demography/ population dynamics/ source-sink/ anthropogenic effect/ assessment method/ conservation management/ habitat quality/ population modeling/ songbirds/ source-sink dynamics

Abstract: Most species occupy both high- and low-quality habitats throughout their ranges. As habitats become modified through anthropogenic change, low-quality habitat may become a more dominant component of the landscape for some species. To conserve species, information on how to assess habitat quality and guidelines for maintaining or eliminating low-quality habitats are needed. We developed a source-sink population model that depicted the annual cycle of a generalized migratory songbird to address these questions. We determined how demographic factors, landscape composition (the percentage of high- and low-quality habitat), and habitat selection interacted to promote population persistence or extirpation. Demographic parameters, including adult and juvenile survival, nesting success (probability of a nest successfully fledging one or more young), number of nesting attempts, and number of young fledged per nest, interacted to affect population growth. In general, population growth was more sensitive to adult and juvenile survival than to fecundity. Nevertheless, within typically observed survival values, nest success was important in determining whether the population increased, decreased, or was stable. Moreover, the number of nest attempts by females and the number of young fledged per

nesting attempt influenced population stability. This highlights the need to obtain more complete demographic data on species than simple nest success to assess habitat quality. When individuals selected high- and low-quality habitats in proportion to habitat availability, populations persisted as long as low-quality habitat did not make up >40% of the landscapes. However, when individuals preferred low-quality habitats over high-quality habitats, populations were extirpated in landscapes with >30% low-quality habitat because low-quality habitat functioned as an ecological trap, displacing individuals from high-quality to low-quality habitat. For long-term conservation, we emphasize the need for basic information on habitat selection and life-history characteristics of species throughout their range.

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2164. Modeling the impact of edge avoidance on avian nest densities in habitat fragments.

Bollinger, E. K. and Switzer, P. V.

Ecological Applications 12(6): 1567-1575. (2002)

NAL Call #: QH540.E23 ; ISSN: 10510761

Descriptors: avian nest placement/ edge avoidance/ habitat fragmentation/ habitat interior/ habitat patch/ model/ nest density/ patch size/ avifauna/ density/ edge effect/ habitat fragmentation/ habitat selection/ nest site/ patch size

Abstract: In fragmented landscapes, many species of birds are absent from, or have reduced densities in, small habitat fragments. This pattern may result, at least in part, because birds avoid placing their nests near habitat edges where nest success often is low. We sought to clarify the role played by edge avoidance in producing these patch size effects. Using a numerical approach, we modeled nest densities in patches of different sizes and shapes both for species displaying edge avoidance (i.e., "edge-sensitive" species) and for those not displaying this characteristic (i.e., "edge-insensitive" species). Edge avoidance in our model was defined as a reduced probability of nest placement occurring near a habitat edge. Our model produced the expected result that edge avoidance reduced nest densities in patches of all sizes compared to densities of edge-insensitive species. Surprisingly, however, edge avoidance did not reduce nest densities in small patches relative to large patches, and nest densities actually increased exponentially as patch size decreased for edge-insensitive species. Also unexpected was the result that nests of edge-sensitive species were found in the edge habitat at frequencies only slightly below those expected based on edge area, whereas edge-insensitive species actually had higher than expected nest densities in edge habitat. However, in our model, edge-sensitive species displayed a greater reduction in nest densities near edges when their overall patch density was reduced by half, suggesting that edge avoidance is density dependent. Finally, both types of species showed marked increases in nest densities in linear habitat patches compared to square patches. These patterns were a direct result of our settlement rule that required a female's nest location to be a minimum distance from other nests. This study suggests that knowledge of the settlement rules used by female birds may be a key to accurately demonstrating the existence and assessing the potential consequences of edge avoidance. Detailed observations of marked females immediately following arrival at habitat patches, as well as a comparison of nest

densities, territory sizes, polygyny levels, and use of habitat off territory, would greatly help our understanding of this interesting and important phenomenon.

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2165. Modifying roadside vegetation management practices to reduce vehicular collisions with moose, *Alces alces*.

Rea, Roy V.

Wildlife Biology 9(2): 81-91. (2003)

NAL Call #: SK351.W663; ISSN: 0909-6396

Descriptors: conservation measures/ nutrition/ feeding behavior/ ecology/ population dynamics/ man-made habitat/ *Alces alces*: disturbance by man/ vehicular collisions/ habitat management/ roadside vegetation management to reduce vehicular collisions/ foraging/ roadside habitat/ Mammalia, Artiodactyla, Cervidae/ chordates/ mammals/ ungulates/ vertebrates

Abstract: Vegetation management practices currently used within transportation corridors are primarily aimed at minimising encroaching shrub and tree growth in order to increase driver visibility and road safety. Such practices create prime foraging habitat for ungulates such as moose *Alces alces* by inhibiting forest succession and maintaining early seral shrub communities. Increased foraging activity within the corridor increases the likelihood of encounters between moose and motorists. Moose-related vehicular collisions are costly in terms of material damage claims and have significant negative impacts on public safety and moose populations in many parts of their range. Although several countermeasures have been developed in an attempt to reduce the frequency of these collisions, few have proven effective and even fewer have taken into consideration possible links between roadside vegetation management, the quality of browse regenerating from cut vegetation, and how moose use browse within the transportation corridor. To better understand these relationships, I reviewed the literature on ungulate-related vehicular collisions in combination with literature on plant response to mechanical damage. Many authors recognise the need to reduce the attractiveness of vegetation growing within transportation corridors. To date, diversory feeding, forage repellents, establishment of unpalatable species and elimination of roadside brush have been used. Unfortunately, such techniques are only semi-effective or are not cost-efficient when applied across the landscape. It has long been recognised that the ability of plants to regenerate following mechanical damage is influenced by the timing of damage. Current research suggests that the quality of regenerating plant tissues for herbivores also depends on when plants are cut. Plants cut in the middle of the growing season produce regrowth that is high in nutritional value for at least two winters following brush-cutting as compared to plants cut at other times of the year, and uncut controls. Because roadside brush is generally cut during mid-summer, possible links between the quality of regenerated browse and increases in ungulate-related vehicular collisions during the autumn and winter should be elucidated. Based on this review, I recommend cutting brush early in the growing season and emphasize the need for collaborative long-term research to properly address this issue.

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2166. Monitoring restoration of riparian forests.

Pollock, M. M.; Beechie, T. J.; Chan, S. S.; and Bigley, R. In: *Monitoring stream and watershed restoration*/ Roni, P. Cambridge, MA: CABI Publishing, 2005; pp. 67-96.

Descriptors: benefits/ ecosystem management/ environment management/ environmental monitoring/ fish/ habitat improvement/ habitats/ hardwood/ monitoring/ productivity/ restoration/ riparian vegetation/ riparian vegetation/ streams/ watersheds/ North America
Abstract: Riparian forests are among the most biologically diverse portions of the terrestrial landscape and provide numerous benefits to instream habitat (Salo and Cundy 1987; Naiman et al. 1993; Nilsson et al. 1994; Pollock et al. 1998). Among these important benefits are the transport of large wood, fine organic material, nutrients, sediment, water, and thermal energy to the stream network, such that a natural aquatic environment is maintained. Alterations to riparian vegetation can alter or disrupt these watershed processes, which affect instream parameters such as stream productivity and the abundance of desirable fishes (Swanson and Lienkaemper 1978; Bisson et al. 1987; Lienkaemper and Swanson 1987). Riparian forest conditions largely determine instream conditions. Riparian areas also are a necessary habitat component for many wildlife species (Kondolf et al. 1987; Raedeke 1988). The loss of riparian habitat throughout much of North America and elsewhere is extensive, but the number of successful efforts to restore these systems is growing (Boldt et al. 1979; GAO 1988; Mutz 1989; BLM 1991; NRC 1992; Kattelman and Embury 1996; Wissmar and Beschta 1998). Riparian restoration describes a suite of restorative management techniques that can alter forest development in riparian areas for the purpose of improving instream and riparian habitat conditions (Oliver and Hinckley 1987; Berg 1990, 1995; Kohm and Franklin 1997).

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2167. Movement of forest birds across river and clearcut edges of varying riparian buffer strip widths.

Shirley, S. M.

Forest Ecology and Management 223: 190-199.

(Mar. 2006)

NAL Call #: SD1.F73

Descriptors: wild birds/ wildlife habitats/ forest habitats/ riparian forests/ riparian buffers/ habitat fragmentation/ British Columbia/ forest bird movements/ Vancouver Island animal ecology and behavior/ plant ecology/ aquatic biology and ecology general/ forestry related
This citation is from AGRICOLA.

2168. Multi-scale landscape and seascape patterns associated with marbled murrelet nesting areas on the U.S. West Coast.

Meyer, C. B.; Miller, S. L.; and Ralph, C. J.

Landscape Ecology 17(2): 95-115. (2002)

NAL Call #: QH541.15.L35 L36; ISSN: 09212973.

Notes: doi: 10.1023/A:1016574928706.

Descriptors: Brachyramphus marmoratus/ fidelity/ fragmentation/ landscape/ murrelet/ old-growth/ scale/ spatial/ temporal/ forest/ habitat fragmentation/ habitat management/ nestling/ seabird/ spatial distribution/ temporal distribution/ United States/ Aves

Abstract: Habitat for wide-ranging species should be addressed at multiple scales to fully understand factors that limit populations. The marbled murrelet (*Brachyramphus marmoratus*), a threatened seabird, forages on the ocean and nests inland in large trees. We developed statistical relationships between murrelet use (occupancy and abundance) and habitat variables quantified across many spatial scales (statewide to local) and two time periods in California and southern Oregon, USA. We also addressed (1) if old-growth forest fragmentation was negatively associated with murrelet use, and (2) if some nesting areas are more important than others due to their proximity to high quality marine habitat. Most landscapes used for nesting were restricted to low elevation areas with frequent fog. Birds were most abundant in unfragmented old-growth forests located within a matrix of mature second-growth forest. Murrelets were less likely to occupy old-growth habitat if it was isolated (> 5 km) from other nesting murrelets. We found a time lag in response to fragmentation, where at least a few years were required before birds abandoned fragmented forests. Compared to landscapes with little to no murrelet use, landscapes with many murrelets were closer to the ocean's bays, river mouths, sandy shores, submarine canyons, and marine waters with consistently high primary productivity. Within local landscapes (≤ 800 ha), inland factors limited bird abundance, but at the broadest landscape scale studied (3200 ha), proximity to marine habitat was most limiting. Management should focus on protecting or creating large, contiguous old-growth forest stands, especially in low-elevation areas near productive marine habitat.
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2169. The need to ground truth 30.5 m buffers: A case study of the boreal toad (*Bufo boreas*).

Goates, Michael C.; Hatcher, Kent A.; and Eggett, Dennis L. *Biological Conservation* 138(3-4): 474-483. (2007)
NAL Call #: S900.B5; ISSN: 0006-3207

Descriptors: forestry/ wildlife management: conservation/ conservation buffer/ ground truthing

Abstract: A buffer zone of 30.5 m is commonly used to protect species in riparian and wetland systems. This 30.5 m standard was developed to protect water quality, not biodiversity, and few studies have tested its effectiveness for protecting riparian and wetland species. We tested the standard implementation of 30.5 m buffers to determine if they protect critical habitat for semi-aquatic vertebrate species, using the boreal toad (*Bufo boreas*) as an example. Using radio telemetry of 84 toads in south-central Utah in 2003 and 2004, we found that the standard implementation of 30.5 m buffers did not protect all critical habitats for boreal toads. Managers should consider the following factors when establishing buffer zones: (1) Buffer requirements may vary by time of year. (2) A single year's observation may not be sufficient to establish adequate buffers. (3) Buffer requirements may differ by sex. Finally (4), sites should be ground truthed prior to determining buffer zones. Critically, we found that many small streams and seeps used by toads were outside of buffer zones due to low resolution of GIS mapping layers. After ground truthing and extending 30.5 m buffers around these habitats, the average percentage of all observations within 30.5 m buffers increased from 82.4% to 92.4%. Our data

suggest that ground truthing may be the most important factor in establishing effective buffer zones. © 2007 Elsevier Ltd. All rights reserved.
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2170. Nest-site selection and success of mottled ducks on agricultural lands in southwest Louisiana.

Durham, R. S. and Afton, A. D.

Wildlife Society Bulletin 31(2): 433-442. (2003)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: wetlands/ nesting behavior/ breeding success/ survival/ agricultural land/ habitat selection/ nesting/ breeding sites/ plant populations/ reproductive behavior/ population density/ grazing/ microhabitats/ environment management/ rice fields/ ecological distribution/ agriculture/ aquatic birds/ *Anas fulvigula maculosa*/ *Oryza sativa*/ *Rubus trivialis*/ Louisiana

Abstract: Listing of the mottled duck (*Anas fulvigula maculosa*) as a priority species in the Gulf Coast Joint Venture of the North American Waterfowl Management Plan, coupled with recent declines of rice (*Oryza sativa*) acreage, led us to investigate the nesting ecology of this species on agricultural lands in southwest Louisiana. We examined nest-site selection at macro- and microhabitat levels, nest success, causes of nest failures, and habitat features influencing nest success. We found that female mottled ducks preferred to nest in permanent pastures with knolls (53% of nests) and idle fields (22% of nests). Vegetation height was greater at nests than at random points within the same macrohabitat patch. Successful nests were associated with greater numbers of plant species, located farther from water, and associated with higher vegetation density values than were unsuccessful nests. We determined that mammalian predators caused most nest failures (77% of 52 unsuccessful nests). Our results suggest that nest success of mottled ducks on agricultural lands in southwest Louisiana could be improved by 1) locating large permanent pastures and idle fields near rice fields and other available wetlands, 2) managing plant communities in these upland areas to favor dense stands of perennial bunch grasses, tall composites, dewberry (*Rubus trivialis*), and other native grasses and forbs, and 3) managing cattle-stocking rates and the duration and timing of grazing to promote tall, dense stands of these plant taxa during the nesting season (March-June).

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2171. Neuroptera in agricultural ecosystems.

Stelzl, M. and Devetak, D.

Agriculture, Ecosystems and Environment 74(1/3): 305-321. (June 1999)

NAL Call #: S601.A34; ISSN: 0167-8809 [AEENDO].

Notes: Literature review; Special issue: Invertebrate biodiversity as bioindicators of sustainable landscapes/ edited by M.G. Paoletti. Includes references.

Descriptors: neuroptera/ agricultural land/ ecosystems/ integrated pest management/ biological control/ agriculture/ habitats/ beneficial insects/ predation/ communities/ endangered species/ field crops/ orchards/ indicator species/ predators of insect pests

Abstract: Due to their well known environmental needs, Neuroptera serve as valuable indicator species for assessing the ecology of natural and semi-natural habitats.

In agricultural ecosystems some species of the families Chrysopidae, Hemerobiidae, and Coniopterygidae are known as beneficial predators of plant-sucking insect pests. Mass rearing and mass release of Chrysopids therefore, have become standard methods of biological pest control. The present paper summarizes information on biology and ecology of these three most important Neuropteran families, followed by a description of Neuropteran communities found in different natural and semi-natural ecosystems, with special reference to agroecosystems. Two separate sections deal with red lists of endangered species and integrated control programs. Literature lists are provided for those who want to study Neuroptera in more detail.

This citation is from AGRICOLA.

2172. New opportunities for bird conservation research.

Paul, Ellen and Cooper, Robert J.

In: Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference, General Technical Report-PSW 191/ Ralph, C. J. and Rich, T. D.; Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 1008-1017.

Notes: 0196-2094 (ISSN).

Descriptors: conservation/ land zones/ Aves: conservation measures/ opportunities for conservation research/ North America/ Aves/ birds/ chordates/ vertebrates

Abstract: It is accepted and acknowledged that effective conservation requires a scientific basis, and it is accepted and acknowledged that scientific research benefits conservation. However, there has been little effort to bring together the resources of the research communities-both academic and government-based-with the conservation planning and implementation programs. Most scientific research is driven by either the investigator's own research interests or, on the government side, by the relatively short-term, relatively local management needs of natural resource managers. Also lacking is a comprehensive system to bring new or existing science to the conservation programs and resource managers. Developing a system to help planners and managers find and apply existing data is a critical need. And finally, there is a need to find funding for each of these components-setting the research agenda, conducting the research, and making it available to planners and managers. This session reviewed several promising opportunities to knit together ornithological research and bird conservation work.

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2173. Northern bobwhite population and habitat response to pine-grassland restoration.

Cram, D. S.; Masters, R. E.; Guthery, F. S.; Engle, D. M.; and Montague, W. G.

Journal of Wildlife Management 66(4): 1031-1039. (2002)
NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: *Colinus virginianus*/ Picidae/ bobwhite/ woodpeckers/ abundance/ dispersion/ ecological requirements/ silviculture/ habitat management/ Arkansas/ habitat restoration/ pine-grassland habitat

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2174. Odonata and wetland quality in southern Alberta, Canada: A preliminary study.

Hornung, J. P. and Rice, C. L.

Odonatologica 32(2): 119-129. (2003); ISSN: 0375-0183
Descriptors: commercial activities/ conservation measures/ ecology/ land zones/ North America/ Canada/ *Ischnura verticalis*: Alberta/ Brooks/ Insecta, Odonata/ arthropods/ insects/ invertebrates

Abstract: The relationship between odon. and wetland quality was investigated in Brooks, from May until Sept. 1999. Sixteen study sites were each visited 7 times to survey adult dragonflies and aquatic macroinvertebrates, record environmental parameters, collect water samples, record vegetative characteristics, and assess beef cattle grazing influences. 25 odonate spp. were recorded, of which *Ischnura verticalis* is new to Alberta. A significant negative correlation was detected between cattle presence (measured as percent stems grazed surrounding the wetland) and odon. species richness ($p=0.022$; $r^2=0.322$), general species richness ($p=0.018$; $r^2=0.337$), and the Shannon-Weiner diversity indices ($p=0.060$; $r^2=0.230$) of the study sites. In addition, vegetation species richness and odon. species richness show a positive correlation ($p=0.066$; $r^2=0.221$). A logistic regression establishes that the absence of *Coenagrion angulatum*, *Enallagma ebrium* and *Aeshna interrupta* is associated with high cattle impacts, or low vegetation species richness. This study outlines the effect that cattle can have on wetland odon. species diversity and recommends that measures are taken to protect wetlands, while offering an incentive and reasonable cost/benefit ratio to both rangeland and wetland managers.

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2175. Optimizing landscape configuration to enhance habitat suitability for species with contrasting habitat requirements.

Holzkaemper, Annelie; Lausch, Angela; and Seppelt, Ralf
Ecological Modelling 198(3-4): 277-292. (2006)

NAL Call #: QH541.15.M3E25; ISSN: 0304-3800

Descriptors: biogeography: population studies/ models and simulations: computational biology/ terrestrial ecology: ecology, environmental sciences/ wildlife management: conservation/ spatial optimization model/ mathematical and computer techniques/ land use change/ habitat suitability

Abstract: Heterogeneity of agricultural landscapes is supposed to be of significant importance for species diversity in agroecosystems. However, land use pattern changes may lead to an increase in suitable habitat for some species, but to habitat deterioration for other species with opposing habitat requirements. To investigate the effects of land use changes on different species' habitat suitabilities and to allow a trade off between management objectives, we applied a spatial optimization model. In this paper we present a new approach that integrates a neighbourhood dependent multi-species evaluation of land use patterns into an optimization framework for generating goal-driven scenarios. It is implemented using a genetic algorithm approach that aims at maximizing habitat suitability of three selected bird species (Middle-Spotted Woodpecker, Wood Lark, Red-Backed Shrike) by identifying optimum agricultural land use patterns. The evaluation of habitat suitability is based on landscape metrics calculated within the species' home ranges to incorporate the effects of species responses to landscape

pattern on a territorial scale. The main focus of this study is to explore the potential of this approach for conservation management on the basis of a case study. We investigate where habitat requirements oppose, where they coincide and how a landscape optimized simultaneously for all target species should be characterized. We found that all species would benefit from an increase of deciduous and coniferous forest, a decrease of cropland and grassland in the study area and more heterogeneous land use patterns (smaller patches, more diversity of land use types). Habitat requirements of Red-Backed Shrike contrast most to those of the other two species with respect to landscape composition and configuration. © 2006 Elsevier B.V. All rights reserved.

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2176. Participant observations on environmental and social effects of the Conservation Reserve Program: Results of a national survey.

Allen, Arthur W.

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. 199-205.

<http://www.nrcs.usda.gov/TECHNICAL/nri/ceap/fwbenefit.html>

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wildlife habitat/ Conservation Reserve Program/ program participants/ surveys

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. Over 75% of respondents believed CRP benefits to wildlife were important. Seventy three percent of respondents observed increased numbers of wildlife associated with CRP lands. A majority of respondents (82%) believed the amount of assistance furnished by the U.S. Department of Agriculture related to planning and maintaining wildlife habitat associated with CRP lands was appropriate. 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 less than 30% of respondents, included seeing the CRP as a source of weeds, fire hazard, and attracting unwanted requests for trespass.

2177. Patch and landscape characteristics associated with the distribution of woodland amphibians in an agricultural fragmented landscape: An information-theoretic approach.

Weyrauch, S. L. and Grubb, T. C.

Biological Conservation 115(3): 443-450. (2004)

NAL Call #: S900.B5; ISSN: 0006-3207

Descriptors: wetlands/ landscape/ patches/ habitat fragmentation/ agricultural ecosystems/ ecological distribution/ conservation/ man-induced effects/ land use/ agriculture/ patchiness/ forests/ habitat/ nature conservation/ amphibia/ Ohio/ amphibians

Abstract: In the Midwestern United States, agricultural landscapes with scattered patches of fragmented forest are

common. To investigate the relationship between amphibian distributions and wetland, woodlot, and landscape characteristics, we studied the pond-breeding amphibians within a 15, 450-ha plot in rural north-central Ohio. We surveyed 25 woodlots and one area of continuous riparian forest for amphibians, and each surveyed woodland contained at least one temporary wetland. We used Akaike's Information Criterion (AIC) to evaluate the effectiveness of 13 a priori models in predicting total amphibian species richness, anuran richness, caudate richness, and the presence of individual species in woodlots. We identified 13 species of amphibians within the study plot, and every woodlot contained at least one amphibian species. The most important variable in predicting total amphibian and anuran species richness was hydroperiod. For caudates, woodlot edge-to-area ratio, hydroperiod, pH, and ammonia were important characteristics in predicting species richness. Woodlots within agricultural landscapes are important refuges for amphibians.

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2178. Patch characteristics and landscape context as predictors of species presence and abundance: A review.

Mazerolle, M. J. and Villard, M. A.

Ecoscience 6(1): 117-124. (1999)

NAL Call #: QH540.E366; ISSN: 1195-6860.

Notes: Literature review.

Descriptors: ecosystems/ ecotypes/ variability/ correlation analysis/ species diversity/ abundance/ aquatic organisms/ Reptilia/ Amphibia/ Pisces/ Gastropoda/ Invertebrata/ Vertebrata

Abstract: Studies were reviewed which simultaneously considered landscape-scale and patch-scale effects in order to answer the following question: does the inclusion of landscape characteristics as explanatory variables increase the ability to predict species presence and abundance when local (i.e., habitat patch) conditions are known? The 61 studies selected cover a wide array of taxa, landscape types, and explanatory variables, but many (36%) focused on avian communities in forests fragmented by agriculture. Patch-scale variables had a significant effect on invertebrates, amphibians, reptiles, birds, and mammals in all landscape types. Landscape-scale characteristics also were significant predictors of species presence and abundance for vertebrates (fish, reptiles, amphibians, birds etc.,) but not for the majority of invertebrates (Gastropodaetc.,) in the studies reviewed. Results indicate that both patch and landscape characteristics should be included in models investigating the distribution and abundance of animals, at least for vertebrates. Results from this review suggest that the inclusion of landscape characteristics will enhance conservation strategies if the landscape scale is properly defined with respect to the taxon or taxa under investigation.

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2179. Perceptions of risk associated with use of farm chemicals: Implications for conservation initiatives.

Tucker, M. and Napier, T. L.

Environmental Management 22(4): 575-587. (1998)

NAL Call #: HC79.E5E5; ISSN: 0364-152X

Descriptors: risk/ assessment/ groundwater/ food safety/ agricultural chemicals/ water quality/ food quality/ health/

environmental impact/ farmers' attitudes/ nontarget effects/ pesticides/ agricultural entomology/ Ohio/ corn belt

Abstract: Data were collected from 245 farmers within the Darby Creek hydrologic unit in central Ohio to assess perceptions of risk associated with use of farm chemicals. Farmers were asked to evaluate the level of risk associated with use of agricultural chemicals for water quality, food safety, food quality, health of applicator, health of farm animals, wildlife, beneficial plants, beneficial insects, and human health. Study findings revealed that respondents perceived use of farm chemicals posed little or no threat to any of the assessed items. A composite index was formulated from the responses to the nine items and was titled Perceived Risk. Variance in the Perceived Risk index was regressed against social learning variables. The findings revealed that approximately 32% of the variance was explained by the predictive variables included in the model. It was concluded that the theoretical perspective was somewhat useful for understanding perceptions held about agricultural chemical use at the farm level. The findings are discussed in the context of future conservation and educational-information programmes within the study region.

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2180. Pesticide toxicity endpoints in aquatic ecosystems.

Simon, D.; Helliwell, S.; and Robards, K.

Journal of Aquatic Ecosystem Stress and Recovery 6(2): 159-177. (1998)

NAL Call #: QH541.5.W3 J68; ISSN: 1386-1980.

Notes: Literature review; doi: 10.1023/A:1009920227241.

Descriptors: pesticides/ pollution effects/ nutrients (mineral)/ plankton/ toxicity tests/ bioassays/ ecosystems/ nutrients/ numerical analysis/ fuzzy logic/ model studies/ aquatic environment/ toxicity testing/ multispecies testing/ methods and instruments/ effects of pollution/ toxicology and health

Abstract: To adequately protect aquatic ecosystems from impact by anthropogenic perturbations it is necessary to distinguish what is safe from what is not. This review examines approaches to this problem in relation to primary and secondary effects of pesticides. Understanding nutrient - plankton and plankton - plankton interrelationships on both spatial and temporal scales is important if secondary or indirect effects are to be assessed. Before defining or measuring a toxicity endpoint, consideration must be given to whether to use single species or multispecies tests. Each has its strengths and weaknesses and is reviewed. In single species testing, toxicity endpoints can be more clearly defined but extrapolation of effects to an ecosystem is more difficult than with multispecies testing and can often lead to incorrect conclusions. Interpretation of multispecies testing results are challenging and numerical analysis techniques including methods whose objectives are inference, classification and ordination are required. Conceptual and fuzzy logic modelling techniques promise a solution to the interpretation of multispecies tests.

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2181. Plant and small mammal diversity in orchard versus non-crop habitats.

Sullivan, T. P. and Sullivan, D. S.

Agriculture, Ecosystems and Environment 116(3-4): 235-243. (2006)

NAL Call #: S601.A34; ISSN: 01678809.

Notes: doi: 10.1016/j.agee.2006.02.010.

Descriptors: agroecosystems/ biodiversity/ non-crop and orchard habitats/ small mammals/ species richness/ vegetation/ agricultural ecosystem/ agricultural land/ orchards/ riparian forest/ species richness/ vascular plant/ British Columbia/ Canada/ North America/ summerland/ *Artemisia tridentata*/ *Malus x domestica*/ Mammalia/ Tracheophyta

Abstract: This study was designed to determine the abundance and diversity of vascular plant and small mammal communities in a mosaic of orchard and non-crop habitats in an agricultural landscape. Study areas were located at Summerland, British Columbia, Canada where seven replicate habitats: old field, sagebrush, dwarf, and conventional apple orchards, ponderosa pine forest, hedgerow, and riparian were intensively sampled for vascular plant (1999) and small mammal communities (1999-2003). Total plant species sampled included 104 herbs, 26 shrubs, and 9 trees. Mean crown volume index of herbs was similar among sites. Hedgerow and riparian habitats had substantial shrub layers, and the conventional orchard, pine forest, and riparian habitats had the highest biomass of trees. Total mean species richness of plants was similar, but did range from 12.3 species in old field sites to 32.3 species in sage sites. Overall plant species diversity and structural diversity were highest in the sage, hedgerow, and riparian habitats. Total structural diversity was positively related to total species richness and species diversity of vegetation. Mean total abundance of small mammals ranged from 28.1 to 37.0 ha⁻¹ across old field, sage, and riparian habitats compared with a range of 6.2-16.7 animals/ha in the other habitats. Old field and sage habitats generally had the highest levels of species richness and diversity of small mammals, although the other non-crop habitats were similar to these in some years. Structural diversity of vegetation appeared to be a reasonable indicator of biodiversity, at least for vascular plants and small mammals, and should be included in future assessments of diversity in agroecosystems.

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2182. Plant genotype affects long-term herbivore population dynamics and extinction: Conservation implications.

McIntyre, P. J. and Whitham, T. G.

Ecology 84(2): 311-322. (2003)

NAL Call #: 410 Ec7; ISSN: 00129658

Descriptors: *Aceria parapopuli*/ arthropod galls/ cottonwoods/ Eriophyidae/ hybridization/ plant resistance/ plant-herbivore interactions/ population dynamics/ genotype/ herbivore/ hybridization/ plant-herbivore interaction/ population dynamics/ species conservation/ *Acari*/ *Aceria*/ Animalia/ Arthropoda/ Eriophyidae/ *Populus angustifolia*/ *Populus berolinensis*/ *Populus fremontii*

Abstract: Few studies have linked long-term herbivore population dynamics with plant genetics. In this study we present evidence that plant genotype and hybridization influence the population dynamics of the poplar bud gall mite, *Aceria parapopuli*. Using experimental transfers and a

five-year data set on mite abundance on two cottonwood species (*Populus fremontii* and *P. angustifolia*) and their naturally occurring hybrids, we demonstrated that hybrid trees exhibiting an F1 morphology were, on average, extremely susceptible to *A. parapopuli*. The susceptibility of these hybrids ranged several orders of magnitude and affected the population dynamics of *A. parapopuli* across the five years of study. Populations grew exponentially on susceptible hybrids in every year, eventually reaching a mean of ~140 galls per tree. In contrast, populations fluctuated around low densities (0.01-0.87 galls per tree) on their parental host species. Low gall densities on parental trees resulted in high annual extinction rates (mean = 62%) for mite populations on individual parental trees, in contrast to low annual extinction rates (mean = 7%) for mite populations on hybrid trees. We detected significant differences in gall population growth rates (intrinsic rate of increase, r) among hybrid genotypes across four years of study, ranging from $r = 0$ to $r = 1.5$, demonstrating that plant genotype influences a fundamental component of population dynamics. We argue that plant genotype should also impact metapopulation dynamics, because plant genotype affected the number of available colonists and directly affected mite extinction rates. If other arthropod species exhibit similar traits, these findings have important conservation implications. Because mite population growth and extinction are so closely tied to rare host genotypes, to conserve such species we must preserve rare host genotypes, which would represent a major challenge to current conservation practices that target species rather than genotypes.

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2183. Plasma retinoid profile in bullfrogs, *Rana catesbeiana*, in relation to agricultural intensity of sub-watersheds in the Yamaska River Drainage Basin, Quebec, Canada.

Berube, V. E.; Boily, M. H.; DeBlois, C.; Dassylva, N.; and Spear, P. A.

Aquatic Toxicology 71(2): 109-120. (2005); ISSN: 0166445X.

Notes: doi: 10.1016/j.aquatox.2004.10.018.

Descriptors: 13-cis-4-oxo-retinoic acid/ all-trans-retinol/ amphibians/ pesticides/ retinol/ agricultural practices/ frog/ pesticide residue/ plasma/ pollution effect/ population decline/ vitamin blood level/ Canada/ North America/ Quebec/ Yamaska River/ Amphibia/ *Rana catesbeiana*/ Vertebrata/ *Zea mays*

Abstract: Amphibian populations are decreasing globally and the causes are presently unclear. Retinoids have been extensively studied in other vertebrate classes where they are associated with pleiotropic effects such as susceptibility to disease (including cancer and parasitic infections), deformities and reproduction. To investigate the hypothesis that retinoid homeostasis is influenced by agricultural activities, blood samples were collected from adult bullfrogs, *Rana catesbeiana*, at each of six sub-watersheds chosen to represent a gradient of agricultural intensity within the Yamaska River drainage basin. Samples of surface water were collected at each of the study sites approximately 1 month after spraying and analyzed for 53 pesticides. Male body weight was significantly different ($p < 0.001$) between study sites with the smallest bullfrogs captured from the Riviere a la Barbue sub-watershed associated with high agricultural intensity. A significant

linear regression ($p < 0.001$; $R^2 = 0.176$) was obtained between plasma retinol and body weight. Plasma retinol concentrations were significantly different between study sites ($p < 0.001$) being lowest at both Riviere Noire and Riviere a la Barbue. More than 60% of the land area in these sub-watersheds is under intensive corn-soya cultivation and surface water contained the highest concentrations of the herbicides atrazine, deethyl-atrazine, simazine, metolachlor, dimethenamide, chlopyralide, dicamba and bentazone. Plasma 13-cis-4-oxo-retinoic acid was significantly different ($p < 0.001$) between sub-watersheds, however this effect was apparently unrelated to agricultural intensity. Plasma retinol was negatively correlated ($p = 0.026$; $r = -0.237$) with plasma 13-cis-4-oxo-retinoic acid. These results suggest that retinoid homeostasis in bullfrogs may be influenced by agricultural practices.

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2184. Postfledging survival and movement in dickcissels (*Spiza americana*): Implications for habitat management and conservation.

Berkeley, L. I.; McCarty, J. P.; and Wolfenbarger, L.

Auk 124(2): 396-409. (2007)

NAL Call #: 413.8 AU4 ; ISSN: 00048038.

Notes: doi: 10.1642/0004-8038(2007)124

[396:PSAMID]2.0.CO;2.

Descriptors: agriculture/ dickcissel/ fledgling stage/ grassland birds/ habitat use/ radiotelemetry/ *Spiza americana*/ survival analysis/ tallgrass prairie

Abstract: When land managers incorporate the habitat needs of grassland birds into their planning, they typically rely on management recommendations based on habitat use by adults during nesting. Habitat requirements for other critical life stages are seldom known and may differ from those of nesting adults. Using radiotelemetry, we examined survival and habitat use by juvenile Dickcissels (*Spiza americana*) during the postfledging period. In 2003 and 2004, we monitored 60 fledgling Dickcissels for ≤ 30 days after they left the nest. Mortality rates were highest during the first week after leaving the nest, and only 33% of the fledglings survived the first four weeks after leaving the nest. Estimated mean survival times were 16.9 ± 1.6 days after birds left the nest. In both years, fledgling survival was positively associated with dense vertical and horizontal structure of forbs at nests. Survival tended to be positively associated with vertical grass density on adult territories and negatively associated with patchily distributed forbs on adult territories. Fledgling habitat use was restricted to areas where Dickcissels nested and adjacent fields. Habitats used included corn and soybean fields, grasslands, and wetlands. Our results suggest that the fledgling period is a critical stage for Dickcissels and that fledglings require habitat similar to habitat used for nesting. © The American Ornithologists' Union, 2007.

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2185. The potential of fruit trees to enhance converted habitats for migrating birds in southern Mexico.

Foster, M. S.

Bird Conservation International 17(1): 45-61. (2007); ISSN: 09592709.

Notes: doi: 10.1017/S0959270906000554.

http://www.pwrc.usgs.gov/prodabs/pubpdfs/6728_Foster.pdf

Descriptors: birds/ migration routes/ fruit trees/ habitat restoration/ forest shelterbelts/ Mexico

Abstract: Migration routes used by Nearctic migrant birds can cover great distances; they also differ among species, within species, and between years and seasons. As a result, migration routes for an entire migratory avifauna can encompass broad geographic areas, making it impossible to protect continuous stretches of habitat sufficient to connect the wintering and breeding grounds for most species. Consequently, ways to enhance habitats converted for human use (i.e. for pasture, crop cultivation, human settlement) as stopover sites for migrants are especially important. Shelterbelts around pastures and fields, if planted with species targeted to support migrant (and resident) bird species that naturally occupy mature forest habitats and that are at least partially frugivorous, could be a powerful enhancement tool for such species, if the birds will enter the converted areas to feed. I tested this approach for Nearctic migrant birds during the spring migration through an area in Chiapas, Mexico. Mature forest tree species whose fruits are eaten by birds were surveyed. Based on life form, crop size and fruit characteristics, I selected three tree species for study: *Cymbopetalum mayanum* (Annonaceae), *Bursera simaruba* (Burseraceae) and *Trophis racemosa* (Moraceae). I compared the use of fruits of these species by migrants and residents in forest with their use of the fruits of isolated individuals of the same species in pasture and cropland. All three plant species were useful for enhancing converted habitats for forest-occupying spring migrants, although species differed in the degree to which they entered disturbed areas to feed on the fruits. These tree species could probably enhance habitats for migrants at sites throughout the natural geographic ranges of the plants; in other geographic areas for other target bird groups, other tree species might be more appropriate. © BirdLife International 2007.

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2186. Practical realities of conjunctive management: The middle Rio Grande as an example.

Dumars, C.

Technical Report: New Mexico Water Resources Research Institute 290: 119-122. (1995).

Notes: The Future of Albuquerque and Middle Rio Grande Basin: Proceedings of the 39th Annual New Mexico Water Conference, Albuquerque, NM (USA), 3-4 Nov 1994; New Mexico State University, New Mexico Water Resources Research Institute.

Descriptors: United States, New Mexico, Rio Grande River/ water rights/ management planning/ water resources/ water supply/ water management/ legal aspects/ riparian rights/ legal review/ conjunctive use/ river basin management/ regional planning/ multiple use of resources/ techniques of planning/ environmental action/ conservation, wildlife management and recreation

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2187. Predation and ring-necked pheasant population dynamics.

Riley, T. Z. and Schulz, J. H.

Wildlife Society Bulletin 29(1): 33-38. (2001)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: wildlife management/ predation/ population dynamics/ recruitment/ *Phasianus colchicus*/ Ring necked

pheasant/ management

Abstract: Because ring-necked pheasants (*Phasianus colchicus*) are an important wildlife resource in agricultural ecosystems, we reviewed the role of predators on pheasant population dynamics and suggest management options to ameliorate predation. Predator reduction programs have the potential to increase survival and recruitment, but these parameters decrease once predator control ceases. Extensive application of predator reductions may be ethically questionable, and habitat management directed at moderating the effects of predators at the landscape scale is expensive. An extensive distribution of cover during the nesting and brood-rearing periods can increase pheasant recruitment. Federal agricultural and conservation programs can be used to accomplish many of these landscape habitat improvements, but federal and state agencies must provide the technical assistance to deliver the program options to producers. New federal farm programs aimed at improving avian survival and recruitment must have an evaluation and monitoring component built in to determine their effectiveness. © ProQuest

2188. Predation of artificial nests in a fragmented landscape in the tropical region of Los Tuxtlas, Mexico.

Estrada, A.; Rivera, A.; and Coates-Estrada, R.

Biological Conservation 106(2): 199-209. (2002)

NAL Call #: S900.B5; ISSN: 00063207.

Notes: doi: 10.1016/S0006-3207(01)00246-4.

Descriptors: conservation/ edge effects/ forest fragmentation/ Los Tuxtlas/ Mexico/ neotropics/ nest predation/ artificial nest/ edge effect/ habitat fragmentation/ nest predation/ Mexico/ Aves/ Galliformes/ Mammalia

Abstract: Predation rates of artificial nests were investigated in a fragmented landscape in the lowlands of Los Tuxtlas in southern Mexico. Hen and plasticine eggs were used to assess predation pressure in four habitats: the interior of forest fragments, the forest-pasture edge, corridors of residual forest vegetation and linear strips of live fences across pastures. Three sites per habitat were used in three experimental trials. Hen and plasticine ground nests with three eggs each were alternated every 50 m along transects at each site. Predation rates on each type of nest were monitored for 9 days. Survey of potential avian and mammalian potential nest predators were conducted at each site prior to the experimental trials. Readings of amount of light illuminating the ground were taken by each nest at each site to assess exposure of nests. In general, average predation rates were significantly higher for both hen and plasticine nests in the forest-pasture edge and in the corridors than in the interior of the forest fragments. While birds and mammals were the principal predators on hen eggs in the forests, mammals were responsible for the majority ($\geq 70\%$) of eggs damaged at the other habitats. Surveys of potential nest predators showed that avian and mammalian potential nest predators were significantly more common at the forest-pasture edges and at the other habitats than in the forests. Readings of light reaching the ground suggest that concealment of nests by the vegetation may play an important role in predation risk. Our results are consistent with reports from other Neotropical rainforests indicating an increase of artificial nest predation pressures from forest interior to open habitats. Restoration of forest fragments, allowing the vegetation to grow along the forest-pasture edge and the planting of arboreal crops at the

forest-pasture edges may be measures that could increase cover and nest protection. © 2002 Published by Elsevier Science Ltd.
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2189. Predicting bird response to alternative management scenarios on a ranch in Campeche, Mexico.

Wood, Paul A.; Dawson, Deanna K.; Sauer, John R.; and Wilson, Marcia H.
In: Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference, General Technical Report-PSW 191/ Ralph, C. J. and Rich, T. D.; Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 101-106.

Notes: 0196-2094 (ISSN).

Descriptors: conservation measures/ ecology/ land zones/ North America/ Aves: disturbance by man/ impact of alternative management scenarios on wintering migrants and resident species/ habitat management/ population dynamics/ wintering migrants and resident species/ impact of alternative management scenarios/ Mexico/ Campeche/ Rancho Sandoval/ Aves/ birds/ chordates/ vertebrates
Abstract: We developed models to predict the potential response of wintering Neotropical migrant and resident bird species to alternative management scenarios, using data from point counts of birds along with habitat variables measured or estimated from remotely sensed data in a Geographic Information System. Expected numbers of occurrences at points were calculated for 100 species of birds, under current habitat conditions and under habitat conditions that would result from seven alternative management scenarios for Rancho Sandoval, a cattle ranch and private nature reserve in Campeche, Mexico. Most bird species of conservation concern would benefit from management scenarios that increase the amount of forest, but the highest priority resident species would not. To balance the somewhat conflicting habitat needs of these species and the concerns of ranch managers, we recommend that forest area and connectivity be increased, and pastures be maintained but more efficiently managed to support cattle and the priority resident and migrant birds that require open habitats.

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2190. Proceedings of the 1998 Prairie Fish Habitat Management Workshop.

Winnipeg, MB: Canadian Department of Fisheries and Oceans; Canadian Manuscript Report of Fisheries and Aquatic Sciences 2522, 2000. 164 pp.

Descriptors: Conferences/ environment management/ environmental impact/ habitat/ man-induced effects/ Canada, Alberta/ Canada, Manitoba/ Canada, Ontario/ Canada, Saskatchewan

Abstract: A Prairie Fish Habitat Management Workshop was held at Hecla Island, Manitoba on June 3-5, 1998. The workshop was sponsored by the Department of Fisheries and Oceans, Habitat Management Division (DFO-HM) with input and cooperation from the provinces of Alberta, Saskatchewan, Manitoba and Ontario. Separate breakout sessions dealing with 15 pre-selected topics were held involving 70 workshop participants. The workshop topics centered on key issues and activities with the potential to impact fishes and fish habitats in the four provinces.

Participants (12-15 persons) in each breakout session produced recommendations addressing their assigned topic from a joint federal and provincial perspective. Topics for the workshop included: 1) wild rice 2) applying no net loss quantitatively 3) channelization 4) agricultural trends and impacts 5) road crossings 6) cumulative effects 7) instream flow needs 8) biodiversity 9) whole lake destruction 10) pipeline crossings 11) hydro peaking 12) gravel removal 13) timber harvesting impacts 14) regional scale projects 15) habitat transfer.

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2191. Progress towards understanding the structure, function, and ecological significance of small stream channels and their riparian zones.

Moore, R. D. and Richardson, J. S.
Canadian Journal of Forest Research 33(8): 1349-1351. (2003)

NAL Call #: SD13.C35; ISSN: 00455067.

Notes: doi: 10.1139/x03-146.

Descriptors: ecosystems/ vegetation/ wildlife/ ecology/ community structure/ ecosystem function/ forest management/ riparian zone/ stream

Abstract: Incomplete knowledge of the ecological functions of small streams and their riparian zones, particularly their roles in larger watershed and landscape contexts, contributes to confusion and debate about the levels of riparian vegetation retention required along small streams for the purpose of protecting aquatic ecosystems, riparian wildlife, and water quality. As a consequence, there are marked differences in riparian forestry practices and management among jurisdictions throughout North America. To aid in resolving these issues, a symposium on small streams and their riparian zones was held at The University of British Columbia from 19 to 21 February 2002, which brought together scientists, managers, and practitioners and provided a forum for the presentation and discussion of emerging research results. This special issue includes a selection of papers presented at that symposium as well as one solicited paper.

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2192. Projecting the bird community response resulting from the adoption of shelterbelt agroforestry practices in eastern Nebraska.

Pierce, R. A.; Farrand, D. T.; and Kurtz, W. B.
Agroforestry Systems 53(3): 333-350. (2001)

NAL Call #: SD387.M8A3; ISSN: 0167-4366

Descriptors: bird (Aves): community response, landscape variables/ tree (Spermatophyta)/ animals/ birds/ chordates/ nonhuman vertebrates/ plants/ spermatophytes/ vascular plants/ vertebrates/ agroforestry: shelterbelt plantings

Abstract: Evolving agricultural policies have influenced management practices within agroecosystems, impacting available habitats for many species of wildlife. Enhancing wildlife habitat has become an explicit objective of existing agricultural policy. Thus, there is renewed focus on field borders and the use of shelterbelt agroforestry systems to achieve conservation goals in the Midwest. Two Representative Farms - a 283-ha dryland and 510-ha irrigated farm were created in Saunders County, Nebraska. The Habitat Analysis and Modeling System (HAMS) was used to describe the composition and spatial pattern of the existing farms and surrounding landscape, as well as for the landscapes surrounding selected Breeding Bird Survey

(BBS) routes. Simulated land use changes resulting from the implementation of two shelterbelt scenarios, Agricultural and Wildlife, were incorporated on each Representative Farm and surrounding landscape. Landscape variables which influence breeding bird species richness and community composition as determined from BBS routes were measured on simulated farm landscapes. A more heterogeneous landscape results from implementing either scenario. The percent total woods was a significant determinant of bird species richness on the BBS routes and was important in influencing bird communities at the farm- and landscape-level. Other landscape metrics which influenced the bird community composition on BBS routes were woody edge percentages and edge density values. Policies promoting shelterbelts create edge habitats which ultimately favor birds within the Forest-edge/generalist guild while bird species in need of conservation such as grassland-field species would potentially be negatively affected.

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2193. A quiet crisis: What does the future hold for our wildlife?

Madson, Chris

Wyoming Wildlife 65(9): 15-38. (2001); ISSN: 0043-9819
Descriptors: wildlife-livestock relationships/ wildlife-human relationships/ wildlife-habitat relationships/ wildlife/ wetland-wildlife relationships/ wetland draining/ tuberculosis/ transmission of disease/ supplemental feeding/ roads/ reserves/ refuges/ parks/ population ecology/ plague/ parasites/ diseases/ overwintering/ oil-gas development/ movements/ migration/ management/ mammals/ habitat management/ habitat alterations/ food supply/ fires-burns/ exotic species/ environmental factors/ drought/ corridors/ conservation/ chronic wasting disease/ buildings/ brucellosis/ birds/ behavior/ bacterial diseases/ Wyoming
Abstract: Several species of Wyoming wildlife came back from the brink of extinction when science and management were combined. But there are many new problems facing today's conservationists. The author presents a catalog of the problems faced by Wyoming wildlife and the emerging challenges that conservationists need to meet. Several species, including deer and pronghorns, survive on new shrubs rejuvenated by burns. Fire suppression and grazing by domestic herds have changed the shrub habitat. This affected the wildlife of the region. The prolonged drought of the region affected the reproductive success of many species. Balancing forage use and effective water storage can soften the effects of long term droughts. The occurrence of diseases like brucellosis, chronic wasting disease, and sylvatic plague is another crisis faced by Wyoming wildlife. By 1990, several new species were added to the federal listing of threatened and endangered species in Wyoming. These include Preble's meadow jumping mouse and the lynx. As federal government manages a majority of Wyoming land, habitat management becomes difficult. Loss of wetland habitat has affected Wyoming wildlife considerably. Studies found that wetland types are difficult to re-create as they require careful management of water levels. An increasing human population in Wyoming has increased the demand for outdoor recreation. Introduction of new technology, tools, and vehicles have impacted management issues, ethics, and the public image of recreation. Installation of new gas pipelines and development of natural gas fields adversely

affect the habitat. The introduction of exotic plant and animal species is another area that requires attention by wildlife managers.

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2194. RCA III effects of sediment on the aquatic environment: Potential NRCS actions to improve aquatic habitat.

Castro, Janine.; Reckendorf, Frank.; and United States. Natural Resources Conservation Service.

Washington, D.C.: U.S. Dept. of Agriculture, Natural Resources Conservation Service, 1995. Working paper (United States. Soil Conservation Service) No. 6.

Notes: Title from web page. "August 1995." Description based on content viewed May 3, 2002. Includes bibliographical references.

NAL Call #: aQH541.5.W3C37 1995

<http://www.nrcs.usda.gov/TECHNICAL/NRI/pubs/wp06text.html>

Descriptors: Aquatic ecology---Environmental aspects---United States/ Aquatic resources conservation---United States/ Soil erosion---United States/ Soil conservation---United States/ Sediment transport---United States/ Aquatic organisms, Effect of contaminated sediments on---United States

This citation is from AGRICOLA.

2195. Red-shouldered hawk (*Buteo lineatus*) abundance and habitat in a reclaimed mine landscape.

Balcerzak, Melissa J. and Wood, Petra Bohall
Journal of Raptor Research 37(3): 188-197. (2003)

NAL Call #: QL696.F3J682; ISSN: 0892-1016

Descriptors: conservation/ terrestrial ecology: ecology, environmental sciences/ standardized broadcast call technique/ applied and field techniques/ aerial photographs/ early successional grassland habitat/ forested habitat/ fragmented forest patches/ habitat characteristics/ habitat preferences/ habitat use/ landscape ecology/ landscape fragmentation/ late successional forest habitat/ microhabitat/ mid successional shrub/ pole habitat/ reclaimed mine landscape/ relative abundance
Abstract: Fragmentation of the landscape by large-scale mining may affect Red-shouldered Hawk (*Buteo lineatus*) populations by reducing the amount of forested habitat available in a landscape and by creating fragmented forest patches surrounded by reclaimed mine lands. We examined habitat characteristics and relative abundance of Red-shouldered Hawks in reclaimed mine landscapes within four treatments: early-successional grassland habitat, mid-successional shrub/pole habitat, late-successional fragmented forest habitat, and late-successional intact forest habitat. We quantified microhabitat characteristics within an 11.3-m-radius plot centered on 156 vegetation plots throughout the four treatments. We surveyed 48 stations on and adjacent to three mines for Red-shouldered Hawks using standardized broadcast call techniques during February 2000-January 2001 and measured landscape characteristics within 1000-m buffer zones centered on each station from digitized aerial photographs. Mean abundance of Red-shouldered Hawks was significantly higher in the intact forest ($x=0.07$ detections/point, $SE=0.03$) than the grassland ($x=0.01$, $SE=0.01$) treatment, but did not differ from the fragmented forest ($x=0.03$, $SE=0.01$) or shrub/pole ($x=0.03$, $SE=0.01$) treatments. Most microhabitat characteristics in both

fragmented and intact forest differed from shrub/pole and grasslands. Amount of wetland was the most important characteristic determining presence of Red-shouldered Hawks in a forest-dominated landscape. More wetlands in the landscape may provide abundant amphibians and reptiles, which are important in the diet of Red-shouldered Hawks.

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2196. Regional analysis of associations between avian guilds and habitat variables.

Ross, Bradley D. and Yahner, Richard H.

Journal of the Pennsylvania Academy of Science 77(1): 7-14. (2003)

NAL Call #: Q11.J682; ISSN: 1044-6753

Descriptors: conservation measures/ nutrition/ feeding behavior/ ecology/ habitat utilization/ habitat/ land zones/ Aves: habitat management/ guilds and habitat associations/ regional analysis/ foraging/ community structure/ habitat preference/ habitat/ Pennsylvania/ Centre County/ Ridge and Valley Physiographic Province/ Aves/ birds/ chordates/ vertebrates

Abstract: We examined distributional patterns of avian guilds in relation to habitat data in the Ridge and Valley Physiographic Province, Centre County, Pennsylvania. County-wide avian data (migratory, habitat, and foraging guild classifications) were obtained from the Pennsylvania Breeding Bird Atlas (BBA), and habitat data (cover types, roadways, and streams) were derived from satellite imagery and the state transportation department. Based on linear-regression analyses, certain guild types were positively affected by extensive amounts of herbaceous grasslands (e.g., neotropical migrants) and herbaceous land (e.g., canopy-sallier foragers) and negatively affected by herbaceous cultivated lands (e.g., deciduous forest species) and developed lands (e.g., trunk-bark foragers). Neotropical migrants and canopy-sallier foragers were positively associated with wooded land/herbaceous grassland and wooded land/herbaceous land edges, respectively. However, deciduous and coniferous forest species were negatively associated with herbaceous land and developed land interfacing forest habitat, and trunk-bark foragers were negatively associated by greater amounts of deciduous wooded land/developed land edges. Differences in the abundance of nest predators and brood parasites may be among the reasons why regional species richness differs with various types of land uses or edges. Birds associated with forested habitats were positively correlated with the amount of forestland within BBA blocks; conversely, forest associates were negatively affected by edge habitat. Thus, professionals need to consider the amount and juxtaposition of different land uses as well as the extent and types of edge habitat when creating natural reserves and managing avian communities. Even minor increases in the amount of forest fragmentation and associated increase in edge can make habitat unsuitable for deciduous and coniferous forest species.

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2197. Regional diversity of temporary wetland carabid beetle communities: A matter of landscape features or cultivation intensity?

Brose, Ulrich

Agriculture, Ecosystems and Environment 98(1-3): 163-167. (2003)

NAL Call #: S601.A34; ISSN: 0167-8809

Descriptors: agriculture/ biodiversity/ ecology/ environmental sciences/ cultivation intensity/ habitat heterogeneity/ landscape ecology/ landscape features/ landscape structure/ macro ecology/ regional diversity/ species richness/ temporary wetland community

Abstract: The challenge of finding applicable indicators for sustainable agriculture requires evaluations at regional scales to lead to policy-relevant results. In this study, the regional diversity of temporary wetland carabid beetles was analysed for six landscapes of 10 km² each. The relative importance of landscape features and cultivation intensity for the regional diversity was compared. Total species richness was correlated with the mean soil-indices that were used as indicators of cultivation intensity. This is consistent with studies on local scales, which emphasise the importance of cultivation intensity for arthropod communities. The diversity of wetland and habitat-specific species correlated with the temporary wetlands mean duration of flooding and the density of temporary wetlands, but apart from this, there was no impact of landscape features on diversity. These results do not corroborate concepts of using indices of landscape structure as biodiversity indicators, but the importance of cultivation intensity cannot be too strongly emphasised.

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2198. The relationship between productivities of salmonids and forest stands in northern California watersheds.

Frazey, Sharon L. and Wilzbach, Margaret A.

Western Journal of Applied Forestry 22(2): 73-80. (2007)

NAL Call #: SD388.W6; ISSN: 0885-6095

Descriptors: conservation measures/ biometrics/ ecology/ land zones/ Salmonidae: habitat management/ size/ body length/ biomass/ productivity/ forest stand productivity relationships/ management implications/ small watersheds/ California/ Pisces, Actinopterygii, Salmoniformes/ chordates/ fish/ vertebrates

Abstract: Productivities of resident salmonids and upland and riparian forests in 22 small watersheds of coastal northern California were estimated and compared to determine whether: 1) upland site productivity predicted riparian site productivity; 2) either upland or riparian site productivity predicted salmonid productivity; and 3) other parameters explained more of the variance in salmonid productivity. Upland and riparian site productivities were estimated using Site Index values for redwood (*Sequoia sempervirens*) and red alder (*Alnus rubra*), respectively. Salmonid productivity was indexed by back-calculated length at age 1 of the largest individuals sampled and by total biomass. Upland and riparian site indices were correlated, but neither factor contributed to the best approximating models of salmonid productivity. Total salmonid biomass was best described by a positive relationship with drainage area. Length of dominant fish was best described by a positive relationship with percentage of hardwoods within riparian areas, which may result from nutrient and/or litter subsidies provided by red

alder. The inability of forest productivity to predict salmon productivity may reflect insufficient variation in independent variables, limitations of the indices, and the operation of other factors affecting salmonid production. The lack of an apparent relationship between upland conifer and salmonid productivity suggests that management of land for timber productivity and component streams for salmonid production in these sites will require separate, albeit integrated, management strategies.

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2199. Relative abundance of bobwhites in relation to weather and land use.

Lusk, J. J.; Guthery, F. S.; George, R. R.; Peterson, M. J.; and DeMaso, S. J.

Journal of Wildlife Management 66(4): 1040-1051. (2002)

NAL Call #: 410 J827; ISSN: 0022541X

Descriptors: artificial neural network/ *Colinus virginianus*/ Index of abundance/ land-use variables/ northern bobwhite/ relative abundance/ Texas/ weather/ birds/ land use/ population dynamics/ relative abundance/ weather/ United States/ *Colinus virginianus*

Abstract: Weather and land use are important factors influencing the population dynamics of northern bobwhites (*Colinus virginianus*) in Texas and elsewhere. Using an artificial neural network, we studied the effects of these factors on an index of bobwhite abundance (hereafter, index) in 6 ecoregions in Texas. We used roadside-count data collected by the Texas Parks and Wildlife Department (TPWD) during 1978-1997. Weather variables were June, July, and August mean maximum temperatures, and winter (Dec-Feb), spring (Mar-May), summer (Jun-Aug), and fall (Sep-Nov) rainfall. We also included the proportion of county area in cultivation, the number of livestock per hectare of noncultivated land, and the previous year's bobwhite count in the analyses. The data were partitioned into training and validation data sets prior to analyses. The neural model explained 65% of the variation in the training data ($n = 72$) and 61% of the variation in the validation data ($n = 17$). The most important variables contributing to network predictions were July temperature, fall rainfall, cattle density, and the previous year's bobwhite count. State-level simulation results indicated that the bobwhite index decreased with increasing June temperature and livestock density. The bobwhite index increased with July and August temperature, fall rainfall, and the previous year's bobwhite count. Bobwhite abundance increased with the proportion of county area in cultivation up to approximately 20% cultivation and then declined. Winter, spring, and summer rainfall had little effect on the bobwhite index. Although many relationships appeared approximately linear or were decelerating, proportion of county area in cultivation and livestock density on noncultivated land showed strongly curvilinear responses. Therefore, cultivation up to approximately 20% of county area was beneficial, but the benefits disappeared as cultivation increased beyond this level. Further, at low livestock densities, between 0.15 and 0.40 head/ha, small increases in head/ha resulted in a decrease in the bobwhite index of 156.4%/head/ha. The results also indicated that a potential bias might exist in the survey protocol resulting in artificially inflated counts under some weather conditions.

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2200. Replacing sources with sinks: When do populations go down the drain?

Keagy, Jason C.; Schreiber, Sebastian J.; and Cristol, Daniel A.

Restoration Ecology 13(3): 529-535. (2005)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: Icteridae/ Passeriformes/ *Agelaius phoeniceus*/ Fringillidae/ red-winged blackbirds/ Boulder County/ ecosystems/ conservation/ wildlife management/ grasslands/ habitat management/ habitat quality/ habitat restoration/ land zones/ models and simulations/ prairie/ converted hayfield/ marshes, salt/ source-sink model/ wetland mitigation/ restoration ecology/ source-sink dynamics/ wildlife populations/ habitat change/ wetlands/ mortality/ age/ loss of habitat/ reproduction/ Virginia/ Colorado

Abstract: We investigate the scenario in which some amount of higher quality habitat is destroyed and is then replaced by some undetermined amount of lower quality habitat. We examined how much low-quality habitat would need to be created to maintain the equilibrium population abundance in the entire geographic area. Using a source-sink model, we find that (1) the number of hectares of created habitat per hectare of destroyed habitat must equal the ratio of the high-quality habitat's productivity to the low-quality habitat's productivity, however, (2) if the created habitat is a sink, then there is a threshold fraction of destroyed high-quality habitat below which the initial population abundance cannot be maintained through the creation of habitat. We illustrate these results using data on red-winged blackbirds (*Agelaius phoeniceus*) in two different regions where high-quality habitat is being replaced by or converted into lower quality habitat.

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2201. Representation of landcover along breeding bird survey routes in the northern plains.

Niemuth, N. D.; Dahl, A. L.; Estey, M. E.; and Loesch, C. R.

Journal of Wildlife Management 71(7): 2258-2265.

(Sept. 2007)

NAL Call #: 410 J827

Descriptors: Breeding Bird Survey/ fragmentation/ grasslands/ landscape/ resolution/ roads/ wetlands

Abstract: The North American Breeding Bird Survey (BBS) is used extensively to make inferences about populations of many North American bird species and is increasingly being used for avian conservation planning. How well BBS routes represent the landscape is poorly known, even though accuracy of representation could significantly affect inferences made from BBS data. We used digital landcover data to examine how well landcover within 400-m buffers around BBS routes represented the surrounding landscape (the route neighborhood) for 52 routes in the Prairie Pothole Region of North Dakota and South Dakota. Differences in composition between landcover along BBS routes and the route neighborhood were not statistically significant for upland cover classes. The area of temporary and seasonal wetland basins was accurately represented by BBS routes in our study area, but the area of semipermanent and permanent wetland basins was significantly underrepresented along BBS routes. Number of wetland basins and upland patches was higher along routes. Area of urban, forest, and hay landcover classes was higher along routes, although differences were not statistically significant. Amount of bias in landcover representation was

negatively correlated with the proportion of each landcover type in the study area, but bias was not correlated with area of the route neighborhoods. Differences between landcover along BBS routes and the route neighborhood were primarily attributable to increased anthropogenic activity along roads and siting of roads away from relatively large, deep water bodies. Our results suggest that inferences made from BBS data in our study region are likely biased for species that are associated with deeper-water habitats or are strongly influenced by landscape fragmentation. Inferences made from BBS data for species associated with uplands or shallow wetlands are less likely to be biased because of differences in landcover composition. This citation is from AGRICOLA.

2202. Research on streamside issues through the wood compatibility initiative.

Bolton, Susan and Berman, Cara

In: *Congruent Management of Multiple Resources: Proceedings from the Wood Compatibility Initiative workshop*, General Technical Report-PNW 563/ Johnson, Adelaide C.; Haynes, Richard W.; and Monserud, Robert A.; Portland, OR: Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture, 2002. pp. 93-99.

Notes: 0363-6224 (ISSN); Literature review.

<http://www.fs.fed.us/pnw/pubs/gtr563/gtr563a.pdf>

Descriptors: commercial activities/ conservation measures/ freshwater habitat/ lotic water/ terrestrial habitat/ land zones/ comprehensive zoology: forestry/ forestry regimes/ streamside resources/ wildlife management/ habitat management/ forest ecosystem management/ streams/ forest and woodland/ riparian forests/ riparian habitat

Abstract: Through the Wood Compatibility Initiative (WCI), the Center for Streamside Studies (now the Center for Water and Watershed Studies) at the University of Washington has undertaken a series of research efforts addressing production and protection of forest, fish, wildlife, and other aquatic and riparian resources. These efforts consist of micro-habitat and habitat-unit-scale mechanistic studies, trans-scale studies exploring hierarchical linkages of structure and function, as well as the development of a landscape classification model linking physical and biological processes across scales and integrating terrestrial and aquatic ecosystem components. Wood Compatibility Initiative funded projects have involved collaboration with scientists at the Pacific Northwest Research Station, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Weyerhaeuser Company, the City of Seattle, the Lummi Nation and others. The Center for Streamside Studies has addressed the role of large woody debris in streams, including stream input processes and hydraulic and biologic functions. Other studies have investigated freshwater habitat condition and its relation to salmonid productivity and the role of hyporheic flux in redd selection by salmonids. In collaboration with others, historic riparian stand condition, specifically canopy cover related to stream shading, has been investigated as well as the role of geomorphic variability in affecting stream temperatures. This paper summarizes the results from WCI studies initiated over the past four years.

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2203. Response of birds to fire in the American Southwest.

Bock, Carl E. and Block, William M.

In: *Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference*, General Technical Report-PSW 191/ Ralph, C. J. and Rich, T. D.; Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 1093-1099.

Notes: 0196-2094 (ISSN).

Descriptors: conservation measures/ ecology/ abiotic factors/ physical factors/ land zones/ Aves: habitat management/ prescribed burning/ community structure/ fire response/ United States, southwestern region/ birds/ chordates/ vertebrates

Abstract: Fire was a common prehistoric disturbance in most southwestern grasslands, oak savannas, and coniferous forests, but not in Sonoran and Mojave desertscrub, or in riparian ecosystems. Prescribed burning should be applied, but under experimental conditions that facilitate studying its impacts on birds and other components of biodiversity. Fire plays a critical role in maintaining a balance between desert grassland and Chihuahuan desertscrub, but unburned areas also are important for birds dependent upon woody vegetation and/or heavy grass cover. Understory fire probably once played a critical role in maintaining relatively open oak (*Quercus* spp.), pinyon-juniper (*Pinus- Juniperus*), and ponderosa pine (*Pinus ponderosa*) woodlands and their bird assemblages, while stand replacement fires sustained aspen groves (*Populus tremuloides*) at higher elevations. Carefully controlled prescribed burning, thinning, and grazing management will be needed to return fire to its prehistoric role in these habitats. There is an urgent need for cooperative effort between managers and researchers to implement replicated burns to quantify avian responses in appropriate habitats.

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2204. Response of reptile and amphibian communities to canopy gaps created by wind disturbance in the southern Appalachians.

Greenberg, C. H.

Forest Ecology and Management 148(1-3): 135-144. (2001)
NAL Call #: SD1.F73; ISSN: 03781127.

Notes: doi: 10.1016/S0378-1127(00)00486-2.

Descriptors: coarse woody debris/ gaps/ natural disturbance and herpetofauna/ salamanders/ Southern Appalachian herpetofauna/ southern Appalachian reptiles/ biodiversity/ turbulence/ wind/ amphibian communities/ ecosystems/ canopy gap/ community response/ herpetofauna/ relative abundance/ species richness/ windthrow/ United States/ Amphibia/ Amphiuma means/ Anura/ Bufo americanus/ Caudata/ Reptilia/ Serpentes/ Squamata

Abstract: Reptile and amphibian communities were sampled in intact gaps created by wind disturbance, salvage-logged gaps, and closed canopy mature forest (controls). Sampling was conducted during June-October in 1997 and 1998 using drift fences with pitfall and funnel traps. Basal area of live trees, shade, leaf litter coverage, and litter depth was highest in controls and lowest in salvaged gaps. Percent cover, length, and diameter of coarse woody debris (CWD) were significantly greater in intact gaps than in salvaged gaps or controls. Coarse

woody debris was more decayed and had less bark in controls than gaps. The relative abundance of salamanders and American toads, and species richness and diversity of amphibians did not differ among treatments. In contrast, relative abundance of two lizard species and (marginally) snakes, and species richness and diversity of reptiles was higher in both gap treatments than in controls. Results suggest that higher light in gaps positively influenced reptile abundance, but CWD at the tested levels was not an important determinant of habitat quality. The presence of a partial canopy and other forest features in both gap treatments may have adequately retained the microclimatic conditions required by moisture-sensitive amphibians. Xeric study sites and an associated assemblage of species that are pre-adapted to relatively warm, dry conditions also might partially explain the absence of any significant response by amphibians. In the closed canopy forests of the southern Appalachians, I suggest that salamanders were historically dominant, whereas many reptile species occurred at low densities and depended upon infrequent natural disturbance to create ephemeral patches of suitable habitat. Further study is required to determine what parameters of disturbance influence reptile and amphibian communities, and how these effects might differ along a moisture gradient and among species.

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2205. Response of riparian avifauna to percentage and pattern of woody cover in an agricultural landscape.

Perkins, M. W.; Johnson, R. J.; and Blankenship, E. E. *Wildlife Society Bulletin* 31(3): 642-660. (2003)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: agriculture/ birds/ corridor/ fragmentation/ habitat/ landscape/ riparian/ woody cover/ agricultural ecosystem/ avifaunal/ community structure/ conservation management/ forest cover/ riparian zone/ United States/ *Contopus virens/ Icterus galbula/ Myiarchus crinitus/ Populus deltoides/ Vireo gilvus*

Abstract: To better understand bird response to percentage and pattern of woody cover in agricultural areas, we recorded richness and abundance of breeding birds in 500-m transects along 18 wooded streams in southeastern Nebraska. Transects had differing amounts of woody cover in the surrounding landscape (~2-39%) out to distances of 500, 1,000, and 2,000 m. We grouped bird species as woodland (22 species) or edge (30 species) and analyzed results from the 1999 and 2000 breeding seasons using information theoretic methods. Richness of the woodland group increased with percentage of woody cover out to 500 m, but abundance did not change. In contrast, richness of the edge group was not affected by landscape variables, but abundance increased as percentage of woody cover decreased out to 1,000 m. Eight species increased in abundance and 5 decreased with increasing percentage of woody cover in the landscape out to distances of 500, 1,000, or 2,000 m. The great crested flycatcher (*Myiarchus crinitus*) was not present at sites with $\leq 14.7\%$ woody cover in the surrounding landscape out to 500 m, and the eastern wood-pewee (*Contopus virens*), except for one site, was not present at sites with $\leq 24\%$ woody cover out to 500 m. The Baltimore oriole (*Icterus galbula*) and warbling vireo (*Vireo gilvus*) apparently responded to the presence of large eastern cottonwood (*Populus deltoides*) trees. Management for a diverse

avifauna in fragmented agricultural landscapes should include both local- and landscape-scale variables, including the amount and pattern of woody cover in the surrounding landscape.

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2206. Responses of elk and mule deer to cattle in summer.

Coe, P. K.; Johnson, B. K.; Kern, J. W.; Findholt, S. L.; Kie, J. G.; and Wisdom, M. J.

Journal of Range Management 54(2): A51-A76. (2001)
NAL Call #: 60.18 J82 ; ISSN: 0022-409X.

Notes: "Special Electronic Section".

Descriptors: animal competition/ geographical information systems/ grazing/ pastures/ rangelands/ summer/ wild animals/ cattle/ *Cervus elaphus/ Odocoileus hemionus/ Pinus ponderosa/ Pseudotsuga menziesii/ red deer*

Abstract: Cattle graze seasonally on national forests in the western USA, and mule deer (*Odocoileus hemionus*) and/or elk (*Cervus elaphus*) are sympatric with cattle in most of these areas. But the effects of interspecific interactions in terms of both the resources selected and animal distributions across landscapes are poorly understood. At the USDA Forest Service Starkey Experimental Forest and Range (Starkey), located in northeast Oregon, USA, elk and mule deer were free ranging within a 78 km² study area enclosed by a 2.4 m high fence while cattle were moved among pastures in summer on a deferred-rotation schedule. Elk, mule deer, and cattle were located with an automated telemetry system from 1993-96 and locations were linked to a geographic information system of Starkey. Our objective was to examine responses of elk and mule deer to cattle at several spatial and temporal levels. We compared elk and mule deer distributions, use of plant communities, and resource selection functions in one cattle pasture (24 km²) during early summer (cattle present in odd-numbered years) and late summer (cattle present in even-numbered years). Elk and deer differed in their spatial and temporal responses to presence of cattle. When cattle were present, the proportion of elk locations within the pasture decreased and use of the ponderosa pine/Douglas fir (*Pinus ponderosa/Pseudotsuga menziesii*) plant community within the pasture decreased in early summer and increased in late summer. The cattle resource selection function variable for early summer was not a predictor of elk distributions when cattle were present, but it was a predictor on years when cattle were absent. In late summer, the cattle resource selection function variable was a predictor of elk distributions regardless of presence of cattle. For mule deer distributions the cattle resource selection function variable was not a significant predictor in early summer (cattle present or absent), or in late summer when cattle were present, but it was a negative predictor of mule deer distributions when cattle were absent in late summer. Mule deer use increased or decreased in the opposite direction from elk use in 3 of 4 season/year combinations for both pasture and ponderosa pine/Douglas fir. Our results suggest that competition for forage could occur between elk and cattle in late summer and that species interactions may be stronger between elk and cattle than mule deer and cattle.

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2207. Responses of isolated wetland herpetofauna to upland forest management.

Russell, Kevin R.; Hanlin, Hugh G.; Wigley, T. Bently; and Guynn, David C.

Journal of Wildlife Management 66(3): 603-617. (July 2002)
 NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: Amphibia/ Reptilia/ forestry/ upland forest management/ isolated wetland taxa responses/ / habitat management/ community structure/ population dynamics/ wetland taxa/ upland forest management/ semiaquatic habitat/ isolated wetland/ South Carolina/ Marion County/ Woodbury Tract/ wetland taxa community

Abstract: Because many amphibians and reptiles associated with wetlands also use adjacent terrestrial habitats to complete their life cycles, it has been suggested that undisturbed upland areas are required to maintain populations of these species. To date, however, measured responses of wetland herpetofauna to upland silviculture include only retrospective comparisons or anecdotes without true spatial and temporal references. We used an experimental approach to measure responses of herpetofauna at isolated wetlands in the Coastal Plain of South Carolina, USA, to disturbance of adjacent loblolly pine (*Pinus taeda*) forests. We used drift fences with pitfall traps to sample herpetofauna at 5 wetland sites for 1 year before (1997) and 2 years after (1998-1999) the following treatments were applied to the upland stands surrounding each site: (1) reference (unharvested), (2) clearcutting, and (3) clearcutting followed by mechanical site preparation. Although silvicultural treatments significantly altered overstory and ground-cover characteristics of upland stands, we did not observe any treatment-related changes in the overall richness, abundance, or community similarity of amphibian and reptile communities at the wetlands. Turtles and snakes were less abundant adjacent to clearcut and site-prepared stands 6 months after treatment but not after 1.5 years, possibly in response to physical disturbance of nest sites and changes in ground cover. Fifteen of the 17 species of herpetofauna with ≥ 30 individual captures showed no effects of treatments. Bronze frogs (*Rana clamitans*) entered the wetlands in proportionally higher numbers from clearcuts and site-prepared stands 1.5 years after treatment, possibly in relation to increased standing water in treated stands. In contrast, site preparation appeared to reduce the abundance of black racers (*Coluber constrictor*) 6 months after treatment. In the short term at least, many species of isolated wetland herpetofauna in the southeastern Coastal Plain may tolerate some disturbance in adjacent upland stands. Responses of isolated wetland herpetofauna to upland silviculture and the need for adjacent forested buffers likely depend on the specific landscape context (e.g., natural disturbance regimes) in which the wetlands occur and composition of the resident herpetofaunal community.

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2208. Restoration of aquatic ecosystems: Science, technology, and public policy.

Committee on Restoration of Aquatic Ecosystems - Science, Technology and Public Policy and National Research Council Washington, DC: National Academy Press; 576 pp. (1992)

NAL Call #: QH541.5.W3N38 1992; ISBN: 0309092884.
<http://fermat.nap.edu/catalog/1807.html>

Descriptors: wetlands/ environmental restoration/ aquatic

ecosystems/ rivers/ lakes/ environment management/ United States/ environmental management/ aquatic environments/ conservation, wildlife management and recreation/ environmental action/ basic approaches, concepts, and theory/ reclamation

Abstract: This volume examines the prospects for repairing the damage society has done to the USA's aquatic resources: lakes, rivers and streams, and wetlands. *Restoration of Aquatic Ecosystems* outlines a national strategy for aquatic restoration, with practical recommendations covering both the desired scope and scale of projects and needed government action. It features case studies of aquatic restoration activities throughout the country. With a wealth of data and commentary, the book examines key concepts and techniques used in restoration; common factors in successful restoration efforts; threats to the health of the nation's aquatic ecosystems; approaches to evaluation before, during, and after a restoration project; and the emerging specialties of restoration and landscape ecology--and how they will contribute to better integration of restoration efforts. Individual chapters provide an overview; a selective history of aquatic ecosystem management; planning and evaluating ecosystem restoration; lakes; rivers and streams; wetlands; integrated ecosystem restoration; and a national restoration strategy. An appendix discusses restoration case studies.

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2209. Restoration, reconciliation, and reconnecting with nature nearby.

Miller, James R.

Biological Conservation 127(3): 356-361. (2006)
 NAL Call #: S900.B5; ISSN: 0006-3207.

Notes: doi:10.1016/j.biocon.2005.07.021.

Descriptors: reconciliation ecology/ habitat restoration/ birds/ Aves/ habitat management/ land use gradient/ biodiversity

Abstract: Biotic homogenization is in many ways a function of spatial and temporal scale. Another aspect of this phenomenon that perhaps receives somewhat less attention is related to "the scale of human experience", particularly in the way that people view homogenization. Here, I examine the relationship between scale and efforts to reverse the loss of native species using two case studies in the Midwestern U.S. Both of these are focused on the restoration of prairie, one in a rapidly urbanizing area and one in a rural context. At a large reserve in a rural area, it is possible to restore prairie at a scale that is sufficient to accommodate populations of grassland obligate birds. This is an unrealistic goal, however, for small reserves in the midst of suburban development and rapidly escalating land prices. Small reserves in this context may be suitable for taxa with smaller habitat requirements, but also have a vital role in reversing biotic homogenization by enabling people to experience nature directly. Not only does this improve their quality of life, but may also foster support for efforts to maintain biodiversity in more remote locations. Thus, the goals of conservation and ecological restoration at various points on the land-use gradient are somewhat different but complementary and inter-related. Conservation scientists have an obvious role in the restoration and management of large reserves, but they also have an important part to play in restoring and maintaining elements of biodiversity in cities and suburbs. (© 2006 Elsevier)

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2210. Restoring Iowa's wildlife.

Little, Terry W.

Iowa Conservationist 60(5): 22-31. (2001);

ISSN: 0021-0471

Descriptors: wildlife/ traps-trapping/ techniques/ stocking-transplanting/ restoration/ nets-netting/ management/ hunting and anti-hunting/ history/ habitat use/ ecosystem management/ conservation programs/ conservation/ captive animal care/ breeding/ DDT/ Iowa

Abstract: The author discusses the history of wildlife restoration in Iowa. The wildlife populations Iowa started declining 130 years ago. The Department of Natural Resources started a restoration program for wild turkeys in the late 1970s. New cooperative programs by the National Wild Turkey Federation for wild turkey restoration were also begun. Nearly 75% of Iowa's remaining forestlands were filled with turkeys by 1980s. The turkeys were traded for prairie chickens. The prairie chickens on release in the wild, dispersed and moved from wintering areas to spring mating grounds. The USDA's Conservation Reserve Program planted cool-season grasses. Artificial mating grounds were created and the prairie chickens were released at dawn for breeding. This method proved successful and from 1987 to 1994 more than 549 prairie chickens were released. As the timber, which stands along field edges in Iowa was being destroyed, the ruffed-grouse population also declined. In 1979 an expanded effort was begun and turkeys and pheasants were traded for grouse. In a span of eight years, almost 1243 ruffed grouse were released in Iowa. Trapping pressures and habitat degradation had eliminated river otters from Iowa. Sixteen otters were flown in from Louisiana in 1985 and over 15 years 286 other otters were released at 19 sites. By 1964 the peregrine falcon had a small population due to the use of DDT. Young chicks from breeders having genetically wild breeding stock were used for restoration. The young were fed artificially. In 10 years, 100 falcons were released in urban locations. Trumpeter swans were severely threatened by hunting, egging, and wetland drainage. In 1993, the DNR began a recovery program. Swans obtained from zoos and flightless breeding pairs were established. One hundred swans were produced from these flightless pairs. Ospreys, bald eagle, bobcats, sandhill cranes were also restored. Fees received from hunters and anglers are funding the restoration and conservation efforts.

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2211. Restoring lepidopteran communities to oak savannas: Contrasting influences of habitat quantity and quality.

Summerville, Keith S.; Steichen, Renae M.; and Lewis, Michelle N.

Restoration Ecology 13(1): 120-128. (2005)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: conservation/ forestry/ tall grass prairie/ habitat disturbance/ savanna ecoregion

Abstract: Ecological restoration is deemed important for the long-term conservation of biodiversity, but ecologists still lack an understanding of how habitat availability and habitat quality in a restored system interact to determine species diversity. This problem seems particularly apparent in Tallgrass Prairie and savanna ecoregions, where restored management units represent the majority of extant habitat. In this study, we tested three principal hypotheses, each stating that the diversity of Lepidoptera would be

greater in (1) patches of savanna habitat that were larger; (2) patches that were of higher habitat quality; and (3) patches that had greater connectivity to management units of similar physiognomy. Lepidoptera were sampled in 2003 from 13 unmanaged woodland remnants within Neal Smith National Wildlife Refuge, a 2,292-ha prairie and savanna reconstruction project. We also measured 11 environmental variables within each site to assess variation in habitat quantity and quality. Principal components analysis (PCA) was used to identify major gradients of environmental variation among the 13 sites. Our PCA differentiated among woodlands along three environmental gradients, defined by (1) stand size, shape, topography, and oak dominance; (2) degree of disturbance; and (3) isolation. Total lepidopteran species richness, however, was only predicted by variation in the first principal component. Species richness of Lepidoptera known to be oak specialists was significantly affected by variation along all three PCA gradients. Surprisingly, more isolated woodland remnants contained a greater richness of oak feeders. Our results suggest that approaches to restoring oak savannas should emphasize aspects of both habitat quantity and quality. Beyond making individual management units larger, priority sites for restoration should possess a low importance of trees that are indicative of past habitat disturbance (e.g., Honey locust, White mulberry) even if canopy closure is substantial. Connectivity among restored habitats may benefit savanna moth communities only when habitat linkages contain a flora similar in composition to focal patches.

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2212. Review of 15 years of research on ecotoxicology and remediation of land contaminated by agricultural drainage sediment rich in selenium.

Wu, L.

Ecotoxicology and Environmental Safety 57(3): 257-269.

(Mar. 2004)

NAL Call #: QH545.A1E29; ISSN: 0147-6513

Descriptors: wetlands/ selenium/ land reclamation/ bioaccumulation/ wildlife/ food chains/ grasslands/ vegetation/ soil remediation/ water reservoirs/ sediment pollution/ leaching/ ecotoxicology/ pollution effects/ pollution control/ microorganisms/ salinity effects/ agricultural pollution/ habitats/ reservoirs/ water birds/ methylation/ drainage water/ sediment contamination/ remediation/ contamination/ nesting/ rooted aquatic plants/ safety/ *Gambusia affinis*/ Kesterson Reservoir/ Central Valley/ California/ western mosquitofish/ land pollution/ ecosystems and energetics/ prevention and control/ effects of pollution/ water quality/ soil pollution: monitoring, control, remediation

Abstract: The consequences of elevated Se accumulation at the Kesterson Reservoir National Wildlife Refuge in the Central Valley of California created adverse effects on wildlife and led to extensive research on the behavior of Se in both the wetland and upland ecosystems. Selenium concentrations in water entering the Kesterson Reservoir averaged 300 µg L⁻¹. In pond waters 20-30% of the Se was selenate, while only 2% was selenite in the drainage water entering the reservoir. Submerged rooted aquatic plants fed on by water birds were found to contain 18-390 mg Se kg⁻¹ dry weight. Mosquitofish collected from the San Luis Drain contained 332 mg Se kg⁻¹, and those collected from the ponds ranged from 339 to 380 mg kg⁻¹. Livers of water

birds had Se concentrations ranging from 19.9 to 127 mg kg⁻¹. The high concentrations of Se accumulation in the food chain of the wetland strongly suggest that Se bioaccumulation was the cause of death and deformity of embryos of the waterfowl nesting at the wetland habitat. In June 1986, the Kesterson Reservoir was closed to drain-water inputs, and the wetland was transformed to an upland grassland. New remedial plans were proposed. These new plans involved soil, water, and vegetation management to dissipate Se by bioaccumulation and volatilization through soil microorganisms and plants. The investigations of the potential transfer of Se from farm land into the crop and vegetables in the Central Valley indicated that plant tissue Se concentrations generally fall in a nonseleniferous category, except that the highest Se concentration of cotton was at a threshold where toxicity in animals could occur at a relatively low frequency. At the Kesterson upland grassland habitat, average total Se concentrations ranged from 500 to 8000 µg kg⁻¹ and water-extractable Se ranged from 10 to 700 µg kg⁻¹ in the top 15cm of soil and varied greatly, by a factor greater than 100, among soil samples. Uptake of Se by the plants was profoundly affected by the soil available Se concentration, soil moisture, pH, soil salinity, soil sulfate concentration, soil reoxidation condition, kind of plant species, and soil-management practices. The rate of soil Se dissipation at the Kesterson grassland system was from 1% (low methylation rate) to 5% (high methylation rate) Se inventory per year and it will take from 46 to 230 years to bring the soil Se down to a normal level, 4mg Se kg⁻¹ soil. However, the Kesterson upland grassland habitat had Se bioaccumulation values less than 10% of those of the previous wetland. The potential food-chain contamination at the existing Kesterson grassland is much less problematic. No negative impact on wildlife has been reported for the upland habitat. Plants may contribute to the Se reoxidation process and be able to reduce the movement of Se in the soil. At the Kesterson grassland, the distribution of soil Se is extremely uneven; high levels of soil Se concentrated only in isolated spots. Therefore, leaching of soil Se is not at an area level. It is unlikely that problems of transport of Se from the Kesterson soil to the adjacent uncontaminated environment by leaching can occur.

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2213. A review of factors affecting productivity of bald eagles in the Great Lakes region: Implications for recovery.

Bowerman, W. W.; Giesy, J. P.; Best, D. A.; and Kramer, V. J.

Environmental Health Perspectives 103(4 Supp.): 51-59. (1995)

NAL Call #: RA565.A1E54; ISSN: 0091-6765.

Notes: Conference: Work Session on Environmentally Induced Alterations in Development: A Focus on Wildlife, Racine, WI (USA), 10-12 Dec 1993; Source: Wildlife Development., 1995; Editors: Rolland, R. //Gilbertson, M. //Colborn, T.; Document number: NIH 95-218.

Descriptors: DDT/ reproduction/ *Haliaeetus leucocephalus*/ United States, Great Lakes/ pesticides (organochlorine)/ PCB/ TCDD/ PCB compounds/ birds/ mortality/ water pollution/ eggs/ environmental quality/ polychlorinated biphenyls/ aquatic birds/ freshwater pollution/ environmental impact/ toxicology and health/ pollution effects on organisms

Abstract: The bald eagle (*Haliaeetus leucocephalus*) population in North America declined greatly after World War II due primarily to the eggshell thinning effects of p,p'-DDE, a biodegradation product of DDT. After the banning of DDT in the United States and Canada during the early 1970s, the bald eagle population started to increase. However, this population recovery has not been uniform. Eagles nesting along the shorelines of the North American Great Lakes and rivers open to spawning runs of anadromous fishes from the Great Lakes still exhibit impaired reproduction. We have explored both ecological and toxicological factors that would limit reproduction of bald eagles in the Great Lakes region. Based on our studies, the most critical factors influencing eagle populations are concentrations of environmental toxicants. While there might be some continuing effects of DDE, total PCBs and most importantly 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents (TCDD-EQ) in fishes from the Great Lakes and rivers open to spawning runs of anadromous fishes from the Great Lakes currently represent a significant hazard to bald eagles living along these shorelines or near these rivers and are most likely related to the impaired reproduction in bald eagles living there.

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2214. Riparian and woodlot landscape patterns and migration of neotropical migrants in riparian forests of eastern South Dakota.

Swanson, David L.; Dean, Kurt L.; Carlisle, Heather A.; and Liknes, Eric T.

In: Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference, General Technical Report-PSW 191/ Ralph, C. J. and Rich, T. D.; Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 541-549.

Notes: 0196-2094 (ISSN).

Descriptors: conservation measures/ ecology/ population dynamics/ terrestrial habitat/ land zones/ Aves: habitat management/ riparian corridor woodlands and farmstead woodlots for neotropical migrants/ community structure/ neotropical migrants in riparian corridor woodlands and farmstead woodlots/ population censuses/ forest and woodland/ riparian corridor woodlands and farmstead woodlots/ community structure of neotropical migrants/ riparian habitat/ South Dakota/ Missouri and Big Sioux rivers/ community structure of neotropical migrants in riparian corridor woodlands and farmstead woodlots/ Aves/ birds/ chordates/ vertebrates

Abstract: Woodland habitat types in the northern Great Plains compose only a very small fraction of the total land surface. These woodlands occur primarily as natural riparian forests or as scattered anthropogenic woodlots and shelterbelts. Natural riparian woodlands have been markedly reduced over the past century, but anthropogenic woodlands have increased during this same period. In this paper, we review and synthesize mist net and point count data from riparian corridor woodlands (Missouri and Big Sioux rivers) and farmstead woodlots in southeastern South Dakota to compare neotropical migrant abundance, species richness, diversity, and community similarity in these two habitats during spring and fall migrations. We hypothesized that the larger and more contiguous woodland area and greater vegetative diversity of riparian corridor woodlands relative to woodlots would attract higher numbers and more

species of neotropical migrants. Point count abundances were higher in woodlots than in riparian corridors in both spring and fall, whereas capture rates were similar in spring, but higher in Missouri River woodlands than at other sites in fall. Species richness and diversity were similar in riparian corridors and woodlots at both seasons. Community overlap between riparian corridors and woodlots was high in spring, but was lower in fall. In general, these data suggest that overall abundance and diversity of neotropical migrant communities are similar between riparian corridors and farmstead woodlots, despite some differences for individual species. In addition, recaptured migrants were capable of gaining mass during stopover in woodlots. Farmstead woodlots appear to effectively supplement natural riparian corridor woodlands as stopover sites for neotropical migrants. Thus, conservation of even small woodland parcels may benefit neotropical woodland migrants during migration.
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2215. Riparian buffers and thinning designs in western Oregon headwaters accomplish multiple resource objectives.

Olson, Deanna H.; Chan, Samuel S.; and Thompson, Charles R.
In: *Congruent Management of Multiple Resources: Proceedings from the Wood Compatibility Initiative workshop*, General Technical Report-PNW 563/ Johnson, Adelaide C.; Haynes, Richard W.; and Monserud, Robert A.; Portland, OR: Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture, 2002. pp. 81-91.
Notes: 0363-6224 (ISSN).
Descriptors: conservation measures/ freshwater habitat/ lotic water/ terrestrial habitat/ land zones/ comprehensive zoology: habitat management/ headwater riparian and upland forests/ riparian buffer/ thinning/ multiple resource management/ headwater streams/ forest density management/ buffer design/ forest and woodland/ riparian habitat/ Oregon/ United States, western region/ faunal responses to riparian buffers
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2216. Riparian buffers within a forest thinning context: Effects on stream amphibians and riparian microclimates in headwater drainages.

Olson, Deanna H.; Chan, Samuel S.; Ellenburg, Loretta; and Rugger, Cynthia
Northwestern Naturalist 84(2): 109. (2003)
NAL Call #: QL671.M8; ISSN: 1051-1733
Descriptors: amphibians/ forest management/ thinning/ streams/ aquatic habitat/ habitat management/ microclimates/ temperature/ riparian buffers/ Oregon
Abstract: Management of forested headwaters varies from little consideration of aquatic-riparian resources to creation of subdrainage reserves. Such contrasting approaches have resulted in examination of key headwater resources and their responses to alternative forest management scenarios. In managed forests of headwater subdrainages in northwestern Oregon, we are examining the effects on amphibians and riparian microclimates of 4 no-entry riparian buffer widths (approximately 20, 50 to 75, 250, and 500 ft) in an upslope thinning context (80 trees per acre [tpa], thinned from a regenerated stand density of >300 tpa). Although the dominant species generally persisted in

reaches within all four buffer widths in years one and two post-treatment, several trends are emerging including both increases and decreases in species' relative abundances. Riparian microclimate changes post-thinning included about a 2 degree air temperature increase and three to eight percent relative humidity decrease near the stream within the 50 to 75 ft riparian buffer, during the warmest times of the year. Use of multiple riparian buffer widths at project and stand scales may hedge uncertainty regarding sensitive species' responses to the joint effects of upslope and riparian forest management.
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2217. Riparian communities associated with Pacific Northwest headwater streams: Assemblages, processes, and uniqueness.

Richardson, J. S.; Naiman, R. J.; Swanson, F. J.; and Hibbs, D. E.
Journal of the American Water Resources Association 41(4): 935-947. (Aug. 2005)
NAL Call #: GB651.W315.
Descriptors: riparian areas/ streams/ aquatic habitat/ wildlife/ riparian ecology
Abstract: Riparian areas of large streams provide important habitat to many species and control many instream processes - but is the same true for the margins of small streams? This review considers riparian areas alongside small streams in forested, mountainous areas of the Pacific Northwest and asks if there are fundamental ecological differences from larger streams and from other regions and if there are consequences for management from any differences. In the moist forests along many small streams of the Pacific Northwest, the contrast between the streamside and upslope forest is not as strong as that found in drier regions. Small streams typically lack floodplains, and the riparian area is often constrained by the hillslope. Nevertheless, riparian-associated organisms, some unique to headwater areas, are found along small streams. Disturbance of hillslopes and stream channels and microclimatic effects of streams on the riparian area provide great heterogeneity in processes and diversity of habitats. The tight coupling of the terrestrial riparian area with the aquatic system results from the closed canopy and high edge-to-area ratio for small streams. Riparian areas of the temperate, conifer dominated forests of the Pacific Northwest provide a unique environment. Forest management guidelines for small streams vary widely, and there has been little evaluation of the local or downstream consequences of forest practices along small streams. This citation is from AGRICOLA.

2218. Riparian corridors of eastern Oregon and Washington: Functions and sustainability along lowland-arid to mountain gradients.

Wissmar, Robert C.
Aquatic Sciences 66(4): 373-387. (2004); ISSN: 1015-1621
Descriptors: conservation measures/ ecology/ freshwater habitat/ lotic water/ terrestrial habitat/ land zones/ comprehensive zoology: habitat management/ riparian and fluvial systems along altitude gradient/ riparian corridors and fluvial systems along altitude gradient/ conservation aspects/ river/ fluvial systems along altitude gradient/ ecological functions and stream/ riparian habitat/ riparian

corridors along altitude gradient/ Oregon, eastern region/
ecology of riparian corridors and fluvial systems along
altitude gradient/ Washington

Abstract: Riparian corridors of eastern Oregon and Washington, like those in other regions, comprise small portions of river drainages but provide disproportionately important ecosystem functions. However, most riparian and fluvial (streams and rivers) systems have been greatly altered. Degraded ecosystems commonly reflect influences of land-uses (e. g., mining, logging, road construction, fire suppression, livestock grazing), hydro-developments (e. g., dams, irrigation, flood control) and other human actions. Some important consequences include: degradation and fragmentation of habitats, changes in riparian plant associations, isolated fish populations, and altered flow and sediment regimes. This synthesis paper evaluates some major environmental factors that can influence the sustainability of riparian corridors and fluvial systems along lowland-arid to mountain gradients within river drainages of eastern Oregon and Washington. Four tributary rivers of the Columbia River, the Grande Ronde and John Day Rivers in northeastern Oregon, and the Yakima and Methow Rivers on the eastside of the Cascade Mountains in Washington, provide perspectives on environmental conditions. Factors evaluated include: a) dominant riparian plant associations and distributions in relation to differences in precipitation and temperature regimes along elevation gradients; b) ecological and physiochemical functions of riparian and fluvial systems along elevation gradients; c) long-term historical and contemporary cumulative impacts of human actions; and d) management provisions that could restore and sustain ecosystem functions. Ecological functions of riparian and fluvial systems are viewed as being closely coupled because of their dependence on hydrological (surface and sub-surface) and sediment routing regimes. From a river landscape perspective, achieving greater connectivity can be a key objective for analyzing and integrating the management of riparian and fluvial ecosystems. Effective management should include ensuring the delineation of major limiting factors (e. g., erosion, water shortages and temperatures) and identification of streamside and channel networks that link critical habitats at multiple landscape scales (e. g., locations and spacing of refuge habitats for fish and wildlife). Management actions should encourage the connectivity of reaches and habitats and maintenance of riparian and fluvial functions so interactions can occur. Efforts should include renewal of natural flood and sediment routing regimes and the reestablishment of habitats adjacent to ecologically intact habitats.

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2219. Riparian livestock enclosure research in the western United States: A critique and some recommendations.

Sarr, Daniel A.

Environmental Management 30(4): 516-526. (2002)

NAL Call #: HC79.E5E5; ISSN: 0364-152X.

Notes: Literature review.

Descriptors: commercial activities/ ecology/ terrestrial habitat/ man-made habitat/ land and freshwater zones/ comprehensive zoology: farming and agriculture/ habitat management/ population dynamics/ livestock enclosures/ freshwater habitat/ riparian habitat/ cultivated land habitat/ riparian farming areas/ United States, western region

Abstract: Over the last three decades, livestock enclosure research has emerged as a preferred method to evaluate the ecology of riparian ecosystems and their susceptibility to livestock impacts. This research has addressed the effects of livestock exclusion on many characteristics of riparian ecosystems, including vegetation, aquatic and terrestrial animals, and geomorphology. This paper reviews, critiques, and provides recommendations for the improvement of riparian livestock enclosure research. Enclosure-based research has left considerable scientific uncertainty due to popularization of relatively few studies, weak study designs, a poor understanding of the scales and mechanisms of ecosystem recovery, and selective, agenda-laden literature reviews advocating for or against public lands livestock grazing. Enclosures are often too small (<50 ha) and improperly placed to accurately measure the responses of aquatic organisms or geomorphic processes to livestock removal. Depending upon the site conditions when and where livestock enclosures are established, postexclusion dynamics may vary considerably. Systems can recover quickly and predictably with livestock removal (the "rubber band" model), fail to recover due to changes in system structure or function (the "Humpty Dumpty" model), or recover slowly and remain more sensitive to livestock impacts than they were before grazing was initiated (the "broken leg" model). Several initial ideas for strengthening the scientific basis for livestock enclosure research are presented: (1) incorporation of meta-analyses and critical reviews. (2) use of restoration ecology as a unifying conceptual framework; (3) development of long-term research programs; (4) improved enclosure placement/design; and (5) a stronger commitment to collection of pre-treatment data.

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2220. Risk assessment for conservation under ecological uncertainty: A case study with a stream-dwelling amphibian in managed forests.

Sutherland, Glenn Douglas. University of British Columbia (Canada), 2002.

Notes: Degree: PhD; Advisor: Bunnell, Frederick L.

Descriptors: ecological uncertainty/ decision-making/ forest management/ habitat management/ amphibians/ tailed frog/ *Ascaphus truei*/ risk assessment

Abstract: Quantifying risks of forest and habitat management options are often limited by uncertainties in habitat associations, life history and population trends for resident species. Using the tailed frog *Ascaphus truei*, a headwater stream-dependent amphibian, I: (1) developed hierarchical models of habitat relationships across this species' range in British Columbia; (2) examined plausible life history responses to habitat change, and (3) investigated population persistence outcomes within and among streams to uncertain effects of forest harvesting and disturbance scenarios. To develop habitat association relationships I used classification and regression trees (CART) together with simple and partial Mantel tests. Variables describing biophysical setting at meso- and micro-scales had a greater influence on occurrence and abundance of larval frogs than did adjacent forest practices, possibly because most sampling sites were in disturbed watersheds. Underlying geology was a consistently important determinant of occurrence patterns, with fine-scale stream structure more important in determining

abundance. Using life stage-based population matrix models, I explored consequences of different life history strategies and ranges of habitat productivity and environmental variation on population persistence. Persistence is decreasingly sensitive to changes in growth rates, tadpole and adult survival, and fecundity. Populations also appear more sensitive to changes in survivorship of in-stream stages (eggs, hatchlings and tadpoles) than riparian stages (juveniles/adults). Clinal, elevational, and local reductions in habitat productivity (e.g., shorter growing seasons, reduced light penetration in mid-seral forests) appear as dominant factors mediating how local fluctuations in demographic rates determine risks of loss of small populations, even if environmental variation is relatively low. Using a spatially explicit metapopulation-landscape dynamics model, I explored six plausible hypotheses linking habitat alterations to population dynamics in response to forest harvesting and disturbances. Risks to populations from disturbance depend strongly on assumptions about age at first reproduction. Incremental effects of forest harvesting on risks were small compared with those already incurred through stochastic events (floods, debris flows, climatic variation) or state of the landscape. Once extirpated, population recovery through dispersal appears unlikely. However, key uncertainties about the impacts of harvesting and forest succession on demographic rates render evaluation of alternative riparian protection systems difficult with present knowledge.

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2221. Risk-based multiattribute decision-making in property and watershed management.

Prato, T.

Natural Resource Modeling 12(3): 307-334. (1999); ISSN: 0890-8575.

Notes: Literature review; Publisher: The Rocky Mountain Mathematics Consortium.

Descriptors: decision making/ government policies/ sustainable development/ resource management/ United States, Missouri/ risk/ watershed management/ farming/ agricultural watersheds/ river basin management/ regional planning/ environmental protection/ resource conservation/ models/ MADM/ best management practices/ BMPs/ sustainable use/ watershed protection/ conservation, wildlife management and recreation/ modeling, mathematics, computer applications/ policy and planning/ techniques of planning

Abstract: Determining best management systems for properties and evaluating their sustainability at the watershed scale are useful and important aspects of integrated watershed management. Multiattribute decision-making (MADM) is very useful for modeling the selection of best management systems for properties in a watershed. This paper reviews four MADM approaches including utility theory, surrogate worth tradeoff, free iterative search and stochastic dominance with respect to a function (SDWF). Emphasis is on determining how the first three methods could be used to determine the best (most preferred) combinations of attributes and associated management systems for a property. An application of the expected utility method with risk neutral preferences is presented in which farmer's preferences for five attributes are used to rank five farming systems for an agricultural watershed in Missouri. A framework is presented for assessing the sustainability of

the best management systems for all properties in a watershed and the cost-effectiveness of policies for enhancing sustainable resource management at the watershed scale.

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2222. Riverine floodplain forests of the southeastern United States: Invertebrates in an aquatic-terrestrial ecotone.

Smock, Leonard A.

In: *Invertebrates in freshwater wetlands of North America: Ecology and management/ Batzer, Darold P.; Rader, Russell B.; and Wissinger, Scott A.* New York: John Wiley & Sons, 1999; pp. 137-165.

Notes: Literature review; ISBN: 0471292583.

NAL Call #: QL365.4.A1158

Descriptors: Macroinvertebrata/ life cycle/ riverine flood plain forest/ fauna life history adaptations/ biomass/ productivity/ community structure/ population density/ distribution within habitat/ semiaquatic habitat/ flood plain habitat/ forest and woodland/ forested freshwater wetland/ flooding/ hydrologic cycle/ United States, Southeast © Thomson Reuters Scientific

2223. The role of disturbance in the ecology and conservation of birds.

Brawn, J. D.; Robinson, S. K.; and Thompson, F. R.

Annual Review of Ecology and Systematics 32: 251-276. (2001); ISSN: 00664162.

Notes: doi: 10.1146/annurev.ecolsys.32.081501.114031.

Descriptors: fire/ flood pulse/ habitat selection/ silviculture/ successional habitats/ avifauna/ conservation management/ disturbance/ fire/ flooding/ habitat creation/ population decline/ North America/ Aves/ Vertebrata

Abstract: Natural ecological disturbance creates habitats that are used by diverse groups of birds. In North America, these habitats or ecosystems include grasslands or prairies, shrublands, savannas, early successional forests, and floodplains. Whereas the extent of all natural habitats has diminished significantly owing to outright loss from agriculture and development, the suppression of disturbance by agents such as fire and flooding has led to further losses. Accordingly, the abundances of many bird species adapted to disturbance-mediated habitats have declined as well. In North America, these declines have been more severe and common than those of species associated with less frequently disturbed habitats such as mature or closed-canopy forests. Field studies consistently reveal the direct role of disturbance and successional processes in structuring avian habitats and communities. Conservation strategies involving the management of disturbance through some combination of flooding, application of fire, or the expression of wildfire, and use of certain types of silviculture have the potential to diversify avian habitats at the local, landscape, and regional scale. Many aspects of the disturbance ecology of birds require further research. Important questions involve associations between the intensity and frequency of disturbance and the viability of bird populations, the scale of disturbance with respect to the spatial structure of populations, and the role of natural vs. anthropogenic disturbance. The effects of disturbance and ensuing successional processes on birds are potentially long-term, and comprehensive monitoring is essential.

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2224. The role of earthworms for assessment of sustainability and as bioindicators.

Paoletti, M. G.

Agriculture, Ecosystems and Environment 74(1/3): 137-155. (June 1999)

NAL Call #: S601.A34; ISSN: 0167-8809 [AEENDO].

Notes: Literature review; Special issue: Invertebrate biodiversity as bioindicators of sustainable landscapes/ edited by M.G. Paoletti. Includes references.

Descriptors: earthworms/ indicator species/ sustainability/ evaluation/ monitoring/ environmental management/ environmental impact/ habitats/ agricultural land/ urban areas/ industrial sites/ species diversity/ biomass/ taxonomy/ identification/ soil pollution/ pesticides/ heavy metals/ genetic engineering/ crops/ stress/ orchards/ polluted soils

Abstract: Earthworms, which inhabit soils and litter layers in most landscapes, can offer an important tool to evaluate different environmental transformations and impacts.

Agricultural landscapes, urban and industrialized habitats have some earthworms that represent interesting indicators to monitor different contaminations, to assess different farming practices and different landscape structures and transformations. Species number, abundance and biomass can give easily measurable elements. Ecological guilds can help in comparing different environments. Taxonomy is relatively well known, at least in temperate areas, where species identification is in general easily solved. CD-ROM based programs facilitate rapid identification of collected specimens. The substantial amount of research carried out on these invertebrates has made these soil organisms more promising for further improved and accurate work in assessing sustainability of different environments. In most cases earthworm biomass or abundance can offer a valuable tool to assess different environmental impacts such as tillage operations, soil pollution, different agricultural input, trampling, industrial plant pollution, etc. In rural environments different farming systems can be assessed using earthworm biomass and numbers. This citation is from AGRICOLA.

2225. The role of spiders as predators of insect pests with particular reference to orchards: A review.

Bogya, S. and Mols, P. J.

Acta Phytopathologica et Entomologica Hungarica 31(1-2): 83-159. (1996); ISSN: 0238-1249

Descriptors: predator-prey interactions/ pesticides/ biological control/ Araneae/ Insecta/ agriculture/ applied entomology

Abstract: Spiders are well known predators of insects (including insect pests) but about their role as biological control agents in agroecosystems (particularly in orchards) little is known. In the last decade new information (especially of the behaviour of spiders in different agroecosystems) has become available and this increased expectations about spiders as beneficial organisms. Spiders are a very heterogeneous group of animals with different hunting tactics and therefore, they play a different ecological role. At family level these tactics are rather similar and one species of the group can be used as representative example for ecological studies for the whole family. On the other hand properties and behaviour found in different species of one family can be seen as characteristic for the whole family. A comprehensive review of spiders as natural enemies of pest species of different crops is given

offering information about the expected prey spectrum per family. A qualitative evaluation of pest-spider relationships has been carried out for a whole range of agroecosystems and the results are transposed to spider groups inhabiting the orchard ecosystem. The effect of pesticides on spiders, both from laboratory and field experiments is discussed and it has been shown to be the most important factor influencing spider occurrence and abundance in the field. Thus the pest management system (conventional or IPM or ecological) determines to a great extent the role of spiders can play in controlling pest organisms. Only from a few species occurring in different ecosystems quantitative information of their searching and predatory potential is available resulting in functional response relationships to prey density. A list of methods for further quantitative evaluation of spider impact on pest in getting insight in predation processes is presented.

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2226. Rural riparian restoration.

Small, Stacy

PRBO Observer (119): 4-5. (2000)

Descriptors: agricultural crops/ agricultural practices/ birds/ communities/ ecosystems/ habitat management/ management/ orchards/ plantations/ plantings/ revegetation/ rice/ riparian habitat/ techniques/ wildlife/ California: Sacramento Valley

Abstract: Information is presented on the need for riparian habitat management for bird species in the Central Valley region of California.

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2227. Salamander abundance and amphibian species richness in riparian buffer strips in the Oregon coast range.

Vesely, David G. and McComb, William C.

Forest Science 48(2): 291-297. (2002)

NAL Call #: 99.8 F7632; ISSN: 0015-749X

Descriptors: commercial activities/ conservation measures/ ecology/ community structure/ terrestrial habitat/ land and freshwater zones/ Amphibia: forestry/ habitat management/ riparian buffer strips/ forestry technique/ species richness/ species diversity/ forest and woodland/ Oregon/ Oregon Coast Range/ species richness/ forestry management techniques/ evaluation/ Amphibia/ amphibians/ chordates/ vertebrates

Abstract: Logging and other forest practices are widely reported to be a threat to some amphibian populations in the Pacific Northwest. Riparian buffer strips are one conservation measure that may benefit amphibians in managed forests. However, few amphibian surveys have been conducted in buffer strips. We compared total salamander abundance, amphibian species richness, and sampling proportions for five species of salamanders between 17 managed stands and 12 unlogged, streamside forests in the Coast Range of western Oregon. We also identified relationships between buffer strip width and salamander population indices. Surveys conducted on 20 [X] 40 m plots demonstrated that torrent salamanders (*Rhyacotriton* spp.), clouded salamanders (*Aneides ferreus*), Dunn's salamanders (*Plethodon dunni*), western red-backed salamanders (*Plethodon vehiculum*), total salamander abundance, and amphibian species richness were sensitive to forest practices in riparian areas. We conclude that riparian buffer strips are a useful habitat

management strategy for several salamander species. However, buffer strip widths currently required by state forest practices regulations may not be adequate to prevent local declines in the diversity of amphibian communities.
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2228. Salmon Bay Natural Area pre-restoration monitoring 2004.

Toft, J.; Cordell, J.; and Starkhouse, B. Washington University; Rep. Fish. Res. Inst. Wash. Univ. No. 0503, 2005.

Notes: Responsibility: School of Aquatic and Fishery Science, Fisheries Research Institute, Washington University.

<http://www.fish.washington.edu/Research/Publications/pdfs/0503.pdf>

Descriptors: baseline studies/ biological surveys/ coastal zone management/ habitat improvement/ monitoring/ shoreline restoration/ Puget Sound/ benthic invertebrates/ intertidal zone/ shoreline modifications/ overwater structure/ juvenile salmon/ Salmon Bay/ Chinook salmon/ riparian vegetation/ Washington

Abstract: The Salmon Bay Natural Area (SBNA) is a planned restoration project which will protect and enhance the last largely undeveloped, wooded shoreline on Seattle's Salmon Bay. This is an important location in the migration of endangered populations of juvenile Chinook salmon, since it is directly downstream from the Hiram M. Chittenden Locks. The overall objectives for restoring the shoreline habitat are to improve riparian and upland vegetation, remove the existing overwater structure and associated rip-rap, and enhance intertidal habitat in order to improve rearing opportunities for juvenile salmonids. Fieldwork was conducted during Spring and Summer 2004 at the overwater site and an adjacent reference site, sampling benthic invertebrates, terrestrial insects, fish (via snorkel surveys), and sediment grain size. The overwater site consisted of a recreational house with a deck and an attached floating dock, while the reference site was a stretch of adjacent beach. Two different tidal levels were included in the sampling design, pertaining to the high tidal elevation of the overwater structure at +8 Mean Lower Low Water (MLLW) and the low tidal elevation of the floating dock at +1 MLLW. All measurements of total invertebrate densities showed significantly higher numbers at the reference site as compared to the overwater site. This includes benthic macroinvertebrates, harpacticoid copepods, and terrestrial insects, all important juvenile salmonid prey items. The reference site also had a greater number of taxa with significantly higher densities. Taxa richness of benthic invertebrates was not limited by the overwater structure, as number of taxa were similar at the two sites and even greater at the low tidal elevation overwater structure site for benthic macroinvertebrates. Taxa richness of insects was much higher at the reference site.

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2229. Sampling on private property to evaluate population status and effects of land use practices on the gopher tortoise, *Gopherus polyphemus*.

Hermann, S. M.; Guyer, C.; Hardin Waddle, J.; and Greg Nelms, M.

Biological Conservation 108(3): 289-298. (2002)
NAL Call #: S900.B5; ISSN: 00063207.

Notes: doi: 10.1016/S0006-3207(02)00123-4.

Descriptors: fire/ Gopherus/ land management/ private property/ status survey/ land management/ population size/ private land/ sampling/ species conservation/ United States/ Animalia/ Gopherus/ Gopherus polyphemus/ Polyphemus/ Testudinidae

Abstract: Although private properties are predicted to play an increasingly significant role in conservation, surveys of species of special concern are rare on these lands. We created a template for a multi-county survey of randomly selected sites and sampled for burrows of the gopher tortoise (*Gopherus polyphemus*) in south-central Georgia, USA. Current land use was strongly correlated with tortoise population condition. The highest densities of tortoise burrows were found on lands with open-canopied pine stands that were managed with prescribed fire, a practice associated with types of selection forestry and/or wildlife management. Agricultural sites and unburned areas provided poor habitat and pine plantations were only slightly better. Our estimates of tortoise population densities indicated that the current landscape supports less than 20% of the animals present before implementation of modern land use practices. In addition, our estimate for density of active burrows was approximately one third of that projected for the entire state range 20 years ago by Auffenberg and Franz [Auffenberg, W., Franz, R., 1982. The status and distribution of the gopher tortoise (*Gopherus polyphemus*). In: Bury, R. B. (Ed.), North American Tortoises: Conservation and Ecology (US Fish and Wildlife Service Wildlife Research Report 12). pp. 95-126]. However, some good sites for gopher tortoises remain in south Georgia and our data also suggested that extraordinary conservation actions may not be required if ways can be developed to retain traditional land management practices on private property.
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2230. Seasonal and habitat influences on avifauna of an agricultural impoundment in southwest Florida: Results of a five-year monitoring program.

Main, Martin B. and Allen, Ginger M.

Florida Scientist 70(3): 219-240. (2007); ISSN: 0098-4590

Descriptors: ecology: environmental sciences/ climatology: environmental sciences/ biogeography: population studies/ wildlife management: conservation/ wildlife habitat/ species diversity/ avifauna/ seasonal influence/ habitat influence/ avian assemblage/ agricultural impoundment

Abstract: Agricultural impoundments represent potentially important habitat, but little information is available on the use of these areas by wildlife or how that use varies seasonally. We conducted weekly surveys during a 5-year period to document seasonal, annual, and habitat influences on the avian community of a 10.5-ha agricultural impoundment in southwest Florida. The impoundment included a mix of wetland and upland cover types typical of impoundments in the region. We recorded approximately 113 of the 229 potential native resident and migratory avifauna known to occur in the region, including 5 species of state or federally listed wading birds. Of the 85 species documented, 65% nested in southwest Florida, many of which were augmented by winter migrants. The avian assemblage was relatively evenly distributed and 5 of the 7 defined guilds were represented among the 8 most abundant species. Wetland cover types attracted the most species and birds, many of the most abundant of which

were species known to use wetlands with relatively dense vegetation. Seasonal effects associated with changing wetland conditions and migratory species were principal factors influencing changes in the bird community. Numbers of species and birds were inversely related to the rainy summer months and positively associated with improved foraging conditions created by seasonal changes in water level. Annual effects were less important but species and numbers of birds declined during the year of lowest annual rainfall. Southwest Florida has thousands of hectares devoted to agricultural impoundments, the collective contribution of which may be extremely important for conservation of regional and migratory bird populations, yet almost nothing is known about the value of these habitats in working landscapes or how best to manage them for wildlife.

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2231. Seasonal variation in waterfowl nesting success and its relation to cover management in the Canadian prairies.

Emery, R. B.; Howerter, D. W.; Armstrong, L. M.; Anderson, M. G.; Devries, J. H.; and Joynt, B. L. *Journal of Wildlife Management* 69(3): 1181-1193. (2005)
NAL Call #: 410 J827; ISSN: 0022541X.
Notes: doi: 10.2193/0022-541X(2005)069

[1181:SVIWN]2.0.CO;2.

Descriptors: Cover management/ Initiation date/ mallard/ nesting success/ planted cover/ Prairie Pothole Region/ seasonal variation/ waterfowl/ habitat management/ nesting success/ seasonal variation/ vegetation cover/ waterfowl/ wildlife management/ Canada/ North America/ Anas/ Anas platyrhynchos/ Anatidae

Abstract: Early hatched waterfowl are more likely to enter the breeding population. Managers' primary tool to increase nesting success in the Prairie Pothole Region (PPR) of North America is managing upland vegetation for duck nesting cover. To determine whether managed cover types affect early-season nesting success, we modeled seasonal variation in nesting success using >17,000 duck nests found in managed and unmanaged cover types in prairie Canada from 1993 to 2000. Nesting success was higher in most managed cover types than in unmanaged cover types early in the nesting season. Planted cover appeared to be the best managed cover type for increasing early-season nesting success as it had high early-season nesting success, and was selected by nesting ducks in greater proportion than its availability; however, nesting success in planted cover declined later in the nesting season while nesting success in most unmanaged cover types increased. Nevertheless, even with reduced nesting success late in the season, planted cover was more productive than surrounding unmanaged cover types. Future waterfowl management efforts should focus on providing safe nesting cover early in the nesting season.

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2232. Selection of flooded agricultural fields and other landscapes by female northern pintails wintering in Tulare Basin, California.

Fleskes, J. P.; Jarvis, R. L.; and Gilmer, D. S. *Wildlife Society Bulletin* 31(3): 793-803. (2003)
NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: environment-ecology/ Anas acuta/ California/ habitat selection/ northern pintail/ San Joaquin Valley/

Tulare Basin/ San Joaquin Valley/ habitat use/ Sacramento Valley/ feeding ecology/ waterfowl/ ducks/ shorebirds/ movements/ wetlands

Abstract: Habitat selection and use are measures of relative importance of habitats to wildlife and necessary information for effective wildlife conservation. To measure the relative importance of flooded agricultural fields and other landscapes to northern pintails (*Anas acuta*) wintering in Tulare Basin (TB), California, we radiotagged female pintails during late August-early October, 1991-1993 in TB and other San Joaquin Valley areas and determined use and selection of these TB landscapes through March each year. Availability of landscape and field types in TB changed within and among years. Pintail use and selection (based upon use-to-availability log ratios) of landscape and field types differed among seasons, years, and diel periods. Fields flooded after harvest and before planting (i.e., pre-irrigated) were the most available, used, and selected landscape type before the hunting season (Prehunt). Safflower was the most available, used, and-except in 1993, when pre-irrigated fallow was available-selected pre-irrigated field type during Prehunt. Pre-irrigated barley-wheat received 19-22% of use before hunting season, but selection varied greatly among years and diel periods. During and after hunting season, managed marsh was the most available, used, and, along with floodwater areas, selected landscape type; pre-irrigated cotton and alfalfa were the least selected field types and accounted for less than or equal to 13% of pintail use. Agricultural drainwater evaporation ponds, sewage treatment ponds, and reservoirs accounted for 42-48% of flooded landscape available but were little used and least selected. Exodus of pintails from TB coincided with drying of pre-irrigated fallow, safflower, and barley-wheat fields early in winter, indicating that preferred habitats were lacking in TB during late winter. Agriculture conservation programs could improve TB for pintails by increasing flooding of fallow and harvested safflower and grain fields. Conservation of remaining wetlands should concentrate on increasing the amount and productivity of marsh that is shallow-flooded as pre-irrigated grain fields dry. If pintails were provided with adequate preferred field and marsh habitats, including hunt-day sanctuaries, contaminant risks associated with exposure to drainwater evaporation ponds probably should remain low for these waterfowl even if their abundance in TB increased.

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2233. Setting restoration goals for disturbed Great Lakes island ecosystems: Policy considerations after you've got the data.

Flaspohler, D. J. and Hurley, P. M. In: 47th International Association for Great Lakes Research Conference; Vol. 2004.; pp. 44; 2004.

Notes: Location: South African Institute for Aquatic Biodiversity (SAIAB), (Formerly JLB Smith Institute of Ichthyology), Pvt Bag 1015, Grahamstown, 6140, South Africa.

Descriptors: anthropogenic alterations/ anthropogenic factors/ ecosystem approach/ ecosystem health/ forest habitat/ Great Lakes/ habitat management/ habitat restoration/ policy/ management/ forest environments/ conservation/ rivers/ lakes/ anthropogenic impact/ freshwater environments/ North America

Abstract: Restoration and maintenance of native forest biodiversity on Great Lakes islands requires an understanding of past ecosystem condition including measures of anthropogenic disturbance. To aid restoration and management of Sleeping Bear Dunes National Lakeshore (Michigan, USA we compared patterns of forest woody and herbaceous plant species composition on two islands in northern Lake Michigan, one with no history of white-tailed deer (South Manitou Island [SMI]), and the other with historically (but not currently) high densities of human-introduced deer (North Manitou Island [NMI]). We also compared current to pre-European forest conditions using 19th century survey data, and data collected in 2002. Current forest composition differs substantially from the historic condition. Also, recovery from a period of deer overabundance and excessive browse during the 1970s and early 1980s has progressed at a slow pace, if at all. For example, Canada yew is functionally extirpated, and forest herbs are either absent or far less abundant on NMI than SMI. We believe that active intervention will be necessary for the restoration of certain biodiversity elements. We discuss the conservation and policy issues related to our findings with a particular emphasis on the unique vulnerability of Great Lakes islands to ecological disturbance.

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2234. Short duration grazing and duck nesting: A case history.

Evrard, J. O.; Wisconsin Department of Natural Resources; PUB-SS-745 2000, 2000.

Notes: Research Management Findings 45, published Oct 2000 by the Bureau of Integrated Science Services, Wisconsin Department of Natural Resources. http://www.dnr.state.wi.us/org/es/science/publications/PUBL_RS_745_00.pdf

Descriptors: *Bos taurus*/ Anatinae/ ducks/ cattle/ habitat management/ prairie/ landscape management/ Wisconsin
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2235. Short-term effects of timber harvest on abundance, territory characteristics, and pairing success of ovenbirds in riparian buffer strips.

Lambert, J. Daniel and Hannon, Susan J.

Auk 117(3): 687-698. (2000)

NAL Call #: 413.8 AU4; ISSN: 0004-8038

Descriptors: commercial activities/ reproduction/ reproductive behavior/ behavior/ ecology/ population dynamics/ terrestrial habitat/ land and freshwater zones/ Canada/ *Seiurus aurocapillus* (Parulidae): forestry/ timber harvesting/ abundance/ riparian forest/ pair formation/ pairing success/ territoriality/ territory characteristics/ population density/ forest and woodland/ riparian buffer strips/ riparian habitat/ forest buffer strips/ Alberta/ Parulidae/ Passeriformes, Aves/ birds/ chordates/ vertebrates

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2236. The shortgrass prairie.

Gillihan, Scott W. and Carter, Michael F.

Birding 33(6): 546-551. (2001); ISSN: 0161-1836

Descriptors: adaptation/ agricultural practices/ birds/ conservation/ Conservation Reserve Program/ ecosystems/ grazing/ habitat alterations/ mammals/ neotropical migrants/ playas/ prairies/ riparian habitat/ semi-arid habitat/

wetlands/ wildlife-habitat relationships

Abstract: The shortgrass prairie is at the western edge of the North American grasslands, beginning just east of the Rocky Mountains. The birds living in this region and adapted to the semi-arid climate, include raptors that use cattle and bison bones for nest material, burrowing owls, and sparrows that sing in flight. The Rocky Mountains, which take moisture from Pacific storm-fronts, are responsible for the dry climate of the prairie. The topography, the diverse vegetation, and the climate present on the prairies are described in the article. Livestock and prairie dog grazing plays an important role in the mosaic nature of the prairie. The various habitat types present here are grasslands, lowland riparian areas, wetlands, sand sage prairie, and playa lakes. About 70% of the shortgrass prairie is privately owned, with the remainder being under the jurisdiction of the states and the federal government. The major conservation issues in the shortgrass prairie are habitat loss and habitat alteration. Due to lack of proper irrigation, most of the area is in grassland form only. The current focus of conservation is on the decline of Neotropical migrant bird species, which makes protecting grasslands the highest bird conservation priority. The conservation of shortgrass prairie is under the control of the North American Bird Conservation Initiative (NABCI). The details of the various organizations involved in the prairie conservation and their modes of functioning are discussed in the article.

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2237. Shrub regrowth, antiherbivore defenses, and nutritional value following fire.

Schindler, J. R.; Fulbright, T. E; and Forbes, T. D. A. *Journal of Range Management* 57(2): 178-186. (2004) *NAL Call #:* 60.18 J82 ; ISSN: 0022-409X

Descriptors: chemical composition/ controlled burning/ crude protein/ defence/ fibre content/ grassland management/ grasslands/ mowing/ nutrient content/ nutritive value/ palatability/ plant composition/ plant height/ protein digestibility/ sprouts/ tannins/ *Acacia rigidula*/ *Celtis pallida*/ *Odocoileus virginianus*/ *Prosopis glandulosa*

Abstract: Prescribed fire is a commonly used as a follow-up procedure to mechanical top growth removal methods such as mowing and roller chopping, but the effects of fire on spinescence and tannin content of shrub sprouts produced after mechanical top growth removal are unknown. Following mowing, (1) height, spinescence, and tannin content in sprouts produced after burning; (2) nutrient and fibre contents in sprouts of the 3 study species; and (3) utilization of sprouts of each species in burned and unburned plots were determined in each of blackbrush acacia (*Acacia rigidula*), honey mesquite (*Prosopis glandulosa*), and spiny hackberry (*Celtis pallida*). The study was located in Rob and Bessie Welder Wildlife Refuge in Texas, USA. Averaged across sampling periods, burned blackbrush acacia and honey mesquite had 54% and 94%, respectively, shorter thorns than unburned plants. Burned and unburned spiny hackberry plants had similar thorn lengths. Averaged across species, sprouts of burned plants had similar tannin levels as unburned plants 6 and 12 weeks after burning. Sprouts of burned blackbrush acacia had higher levels of tannin than sprouts of unburned plants 34 weeks after burning. Leaf material from sprouts of burned spiny hackberry plants had higher crude protein and digestible protein than leaf material from unburned plants.

Blackbrush acacia sprouts in burned plots contained lower digestible dry matter and digestible energy than plants in unburned plots. Honey mesquite sprouts in burned plots contained higher digestible dry matter and digestible energy than plants in unburned plots. Burning appears to be a desirable follow-up treatment to mowing because it temporarily increases nutritional value of shrub sprouts, decreases physical defenses, and suppresses growth of shrub species that have low palatability to white-tailed deer.
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2238. Site accessibility and prioritization of nature reserves.

Onal, H. and Yanprechaset, P.
Ecological Economics 60(4): 763-773. (2007)
NAL Call #: QH540.E26 ; ISSN: 09218009.
Notes: doi: 10.1016/j.ecolecon.2006.01.011.
Descriptors: Conservation reserve/ Integer programming/ site accessibility/ species representation
Abstract: Nature reserves not only protect habitat-stressed species but also provide recreation and welfare services to people. Therefore, site accessibility matters in reserve design. This study incorporates public accessibility, determined by urban populations and distances between urban areas and reserve sites, as an additional factor in conservation reserve design besides species representation and economic characteristics of individual sites. An optimization approach is introduced to determine a reserve network with maximum accessibility while satisfying specified representation targets under financial constraints. The paper also presents an empirical application of this approach to endangered/threatened birds in Illinois, USA, and analyzes the tradeoffs between ecological, economic, and social objectives of biological conservation. The results show that: i) the conventional minimal representation approach would result in a small reserve network, but this network would have poor accessibility; ii) public accessibility can be improved significantly by selecting alternative sites with the same amount of conservation budget; iii) further improvement in accessibility can be achieved by enlarging the network, but in this particular case the gains would be insignificant after the first few additional sites; and iv) a regionally integrated conservation plan, as opposed to decentralized conservation efforts, is beneficial for both species protection and social welfare.
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2239. Source habitats for terrestrial vertebrates of focus in the interior Columbia Basin: Broad-scale trends and management implications, Volume 1: Overview.

Wisdom, M. J.; Holthausen, R. S.; Wales, B. C.; Hargis, C. D.; Saab, V. A.; Lee, D. C.; Hann, W. J.; Rich, T. D.; Rowland, M. M.; Murphy, W. J.; and Eames, M. R. Portland, OR: Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture; General
Technical Report-PNW 485, 2000. 156 p.
Notes: 00929654 (ISSN).
Descriptors: cluster analysis/ conservation/ forest management/ habitat/ habitat condition/ habitat management/ habitat trend/ Interior Columbia Basin/ Interior Columbia Basin Ecosystem Management Project/ landscape analysis/ landscape ecology/ monitoring/

population viability/ rangeland management/ restoration/ sink environment/ source/ source environment/ source habitat/ source habitats/ spatial analysis/ species groups/ species of focus/ terrestrial vertebrates/ validation research/ viability/ wildlife/ wildlife-habitat relations/ conservation management/ ecosystem management/ habitat management/ habitat quality/ landscape ecology/ source-sink dynamics/ vertebrate/ United States
Abstract: We defined habitat requirements (source habitats) and assessed trends in these habitats for 91 species of terrestrial vertebrates on 58 million ha (145 million acres) of public and private lands within the interior Columbia basin (hereafter referred to as the basin). We also summarized knowledge about species-road relations for each species and mapped source habitats in relation to road densities for four species of terrestrial carnivores. Our assessment was conducted as part of the Interior Columbia Basin Ecosystem Management Project (ICBEMP), a multiresource, multidisciplinary effort by the USDA Forest Service (FS) and the USDI Bureau of Land Management (BLM) to develop an ecosystem-based strategy for managing FS and BLM lands within the basin. Our results indicated that habitats for species, groups, and families associated with old-forest structural stages, with native grasslands, or with native shrublands have undergone strong, widespread decline. Implications of these results for managing old-forest structural stages include consideration of (1) conservation of habitats in sub-basins and watersheds where decline in old forests has been strongest; (2) silvicultural manipulations of mid-seral forests to accelerate development of late-seral stages; and (3) long-term silvicultural manipulations and long-term accommodation of fire and other disturbance regimes in all forested structural stages to hasten development and improvement in the amount, quality, and distribution of old-forest stages. Implications of our results for managing rangelands include the potential to (1) conserve native grasslands and shrublands that have not undergone large-scale reduction in composition of native plants; (2) control or eradicate exotic plants on native grasslands and shrublands where invasion potential or spread of exotics is highest; and (3) restore native plant communities by using intensive range practices where potential for restoration is highest. Our analysis also indicated that >70 percent of the 91 species are affected negatively by one or more factors associated with roads. Moreover, maps of the abundance of source habitats in relation to classes of road density suggested that road-associated factors hypothetically may reduce the potential to support persistent populations of terrestrial carnivores in many subbasins. Management implications of our summarized road effects include the potential to mitigate a diverse set of negative factors associated with roads. Comprehensive mitigation of road-associated factors would require a substantial reduction in the density of existing roads as well as effective control of road access in relation to management of livestock, timber, recreation, hunting, trapping, mineral development, and other human activities. A major assumption of our work was that validation research will be conducted by agency scientists and other researchers to corroborate our findings. As a preliminary step in the process of validation, we found high agreement between trends in source habitats and prior trends in habitat outcomes that were estimated as part of the habitat outcome analysis for terrestrial species within the basin. Results of our assessment also were assumed to

lead to finer scale evaluations of habitats for some species, groups, or families as part of implementation procedures. Implementation procedures are necessary to relate our findings to local conditions; this would enable managers to effectively apply local conservation and restoration practices to support broad-scale conservation and restoration strategies that may evolve from our findings.
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2240. Southeastern Arizona Turkey Management Plan.
Heffelfinger, J.; Wakeling, B.; Millican, J.; Stone, S.; Skinner, T.; Fredlake, M.; and Adkins, M.
Phoenix, AZ: Arizona Game and Fish Department, 2000. 25 p.

Notes: Project Number: AZ W-053-M.
http://www.azgfd.gov/pdfs/h_f/management/SoutheasternArizonaWildTurke%20ManagementPlan.pdf
Descriptors: burning/ control/ cutting/ diet, artificial/ fertilization, soil and water/ fire/ grazing/ habitat management for wildlife/ harvests/ history/ mast/ planning, strategic/ planting/ population distribution/ predators/ seedlings/ stocking-transplanting/ surveys/ turkeys/ water/ wildlife management/ Arizona/ Huachuca Mountains
Abstract: The purpose of this plan is to provide guidance to agencies and organizations involved in the conservation and management of turkeys and their habitat. Strategies are listed for various management actions which are based on research or management experience. Insufficient information at this time precludes a more detailed implementation schedule with specific projects and funding needs. The information and strategies contained in this plan should help guide the development of such specific actions. Specific projects are already being planned and will be funded and implemented on an individual basis.
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2241. Species diversity, richness, and evenness of ground beetles in wheat fields and adjacent grasslands and riparian zones.

French, B. Wade and Elliott, Norman C.
Southwestern Entomologist 26(4): 315-324. (2001);
ISSN: 0147-1724
Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ man-made habitat/ land and freshwater zones/ Carabidae: farming and agriculture/ habitat management/ community structure/ grassland/ grasslands adjacent to wheat fields/ riparian habitat/ riparian zones adjacent to wheat fields/ cultivated land habitat/ wheat fields/ Oklahoma/ Stillwater/ Carabidae/ Caraboidea, Adepaga, Coleoptera, Insecta/ arthropods/ coleopterans beetles/ insects/ invertebrates
Abstract: Natural habitats adjacent to or near agricultural fields harbor a variety of beneficial arthropods that assist in pest control. Ground beetles are polyphagous predators of various agricultural pests and often colonize cereal fields from adjacent habitats. Our objective was to measure the richness, diversity, and evenness of ground beetles in the interiors and boundaries of winter wheat fields and adjacent grasslands and riparian zones, and suggest strategies for managing carabid diversity and abundance in agricultural landscapes. We used pitfall traps to study ground beetles in winter wheat fields and in adjacent riparian zones and grasslands from 1993 through 1997 in north-central Oklahoma. During autumn, winter, and spring, species richness, evenness, and diversity were generally higher in

the natural habitat interiors and the edges than in the interiors of wheat fields. We suggest adding grassy strips to wheat fields and extending the saum (zone of perennial herbs and grasses) adjacent to wooded riparian habitats to supplement numbers and diversity of ground beetles in the agricultural landscape.
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2242. Species richness and nesting success of neotropical migrants in natural and anthropogenic woodlands.

Gentry, Dale J. and Swanson, David L.
South Dakota Academy of Science: Proceedings 80: 361. (2001)
NAL Call #: 500 SO82; ISSN: 0096-378X
Descriptors: woodlots/ nesting habitats/ Great Plains/ birds/ predation/ nesting success/ coastal habitat/ neotropical migrants/ rivers/ shelterbelts/ fragmented habitats
Abstract: Historic woodland nesting habitat for Neotropical migrant songbirds in the Northern Great Plains consists primarily of riparian habitat surrounding streams and rivers. These deciduous woodlands have become narrower as trees were cleared to make the land available for agriculture. Since then, new habitats for woodland nesting birds have arisen in the form of anthropogenic woodlots and shelterbelts. A decreased nesting success is associated with isolated and fragmented habitats due to increased rates of both nest predation by mammalian and avian predators, and brood parasitism by Brown-headed Cowbirds at forest edges. We compared nesting success in the two habitats to determine if Neotropical migrants are more successful nesting in reduced natural habitats or in anthropogenic woodlots. We also determined density and relative abundance of breeding birds with point counts four times during the summer. A total of 46 nests were found. Calculation of Mayfield nesting success on the nests in each habitat resulted in higher nesting success in the anthropogenic woodlands (0.543) than in the riparian areas (0.249) although we were not able to compare them statistically due to low sample size. Density and relative abundance were compared between habitats with an ANOVA and no significant differences were detected. These results represent only one field season, two more are planned before final results will be determined.
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2243. Spiders in decomposition food webs of agroecosystems: Theory and evidence.

Wise, D. H.; Snyder, W. E.; Tuntibunpakul, P.; and Halaj, J.
Journal of Arachnology 27(1): 363-370. (1999)
NAL Call #: QL451.J6 ; ISSN: 0161-8202.
Notes: Literature review.
Descriptors: decomposition/ conservation tillage/ grazing/ mineralization/ nutrients/ pastures/ predation/ predators/ prey/ productivity/ subsidies/ tillage/ ecology/ Araneae/ arthropods/ Arachnida/ invertebrates/ animals
Abstract: The involvement of spiders in decomposition food webs has the potential to affect agricultural productivity through two quite different types of interactions (1) cascading, top-down effects of spider predation on rates of nutrient mineralization - spider- initiated trophic cascades in the detrital food web that could alter rates of decomposition and release of nutrients to plants, and (2) a bottom-up linkage, through spiders, between decomposition and grazing food webs - energy from the detrital web

contributing to elevated spider densities, which in turn might reduce pests and enhance net primary production. Scant experimental evidence exists to refute or support either hypothesis. The first set of interactions is most likely to be of significance in no-till and conservation tillage farming. In theory, spiders have the potential to enhance productivity by increasing rates of mineralization, but theory also predicts that spiders, by preying on important detritivores and fungivorous, depress rates of litter decomposition. Field experiments by Kajak et al. have uncovered such negative effects of spiders in mown pastures. Although this negative effect could reduce plant growth, the expected time lags in most types of crops suggest that the overall impact of spiders on plant production will be determined more by the interactions comprising the second hypothesis. However, the later hypothesis, that bottom-up control processes in the decomposition web affect crop productivity via energy subsidies to spiders and other generalist predators in the grazing web, remains conjecture without clear experimental confirmation. This hypothesis should be tested in agroecosystems in which detritus-based food webs can feasibly be manipulated.

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2244. Stop! Look! And listen!

Clawson, Rick

Missouri Conservationist 64(3): 23-27. (2003); ISSN: 0026-6515.

<http://mdc.mo.gov/conmag/2003/03/50.htm>

Descriptors: birds/ census-survey methods/ communities/ conservation/ ecosystems/ habitat alterations/ habitat management/ reserves/ refuges/ parks/ techniques/ wildlife-habitat relationships/ eastern meadowlark/ dickcissel/ gray catbird/ common yellowbird/ cardinal/ rufous-sided towhee/ yellow-billed cuckoo/ eastern wood-pewee/ blue-gray gnatcatcher/ summer tanager/ rose-breasted grosbeak/ great crested flycatcher/ Kentucky warbler/ bobwhite quail/ mourning dove/ Missouri

Abstract: Ever since the incorporation of Whetstone Creek Conservation Area, Missouri, in 1977, several conservation department managers have strived to alter the landscape using a variety of land management practices so as to attract a range of wildlife including songbirds. Recent practices include controlled burning, grazing, haying, and grain planting in the open lands, and timber cutting and thinning in the forestlands. These changes in habitat result in changes in the array and population of birds as diverse birds need diverse habitat for survival. The Breeding Bird Survey, conducted by driving on roads and recording the number of birds seen or heard, is an effective instrument to examine the changes. One such survey was done in June 2002. The population of grasshopper sparrows had declined as the required habitat of sparse grassland was missing. Despite the presence of dense tall grassland, a perfect environment for Henslow's sparrow, their numbers are expected to be only one or two. The past trends showed their absence despite a conducive environment. Contrary to the past figures the numbers of mourning doves have declined. The bobwhite quail figure has increased, confirming results of previous surveys. Red-winged blackbirds adapt to a variety of habitats and thus the change in the landscape has not reduced their numbers. The habitats of other birds like yellow-breasted chats, indigo buntings, and field sparrows have increased due to natural and deliberate insertion of fencerows and field

borders. Although this form of survey has its limitations and thus should be used in conjunction with other measures, the results strengthened the belief that changes in habitat does influence the composition and number of birds.

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2245. Stream buffer effectiveness: Macroinvertebrate and salamander species as bioindicators of ecosystem stress, Coastal Plain, Georgia.

Muenz, Tara K.; Golladay, Stephen W.; and Vellidis, George

Ecological Society of America Annual Meeting, Proceedings 87(2002)

NAL Call #: QH540.E365.

Notes: 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.

Descriptors: conservation/ freshwater ecology: ecology, environmental sciences/ best management practices/ BMPs/ agricultural impacts/ ecosystem stress/ ground water systems/ stream buffer/ water quality

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2246. Summary of national standards and guidelines for pesticides in water, bed sediment, and aquatic organisms and their application to water-quality assessments.

Nowell, Lisa H.; Resek, Elizabeth A.; Geological Survey (U.S.); and United States. Environmental Protection Agency.

Sacramento, Calif.: U.S. Geological Survey; vi, 115 p.: ill.; Series: U.S. Geological Survey open-file report 94-44. (1994).

Notes: Open-File Report 94-44; Spine title: National standards and guidelines for pesticides in water, bed sediment, and aquatic organisms. Includes bibliographical references (p. 48-51).

NAL Call #: SB970.4.U6N69 1994

Descriptors: Pesticides---Government policy---United States/ Pesticides---Law and legislation---United States/ Pesticides---Environmental aspects---United States/ Water---United States---Pesticide content
This citation is from AGRICOLA.

2247. A survey of research on riparian responses to silviculture.

Cunningham, Patrick G.

In: *Congruent Management of Multiple Resources: Proceedings from the Wood Compatibility Initiative workshop, General Technical Report PNW 563/ Johnson, Adelaide C.; Haynes, Richard W.; and Monserud, Robert A., eds.; Portland, OR: Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture, 2002. pp. 73-79.*

<http://www.fs.fed.us/pnw/pubs/gtr563/gtr563a.pdf>

Descriptors: conservation/ forestry/ terrestrial ecology: ecology, environmental sciences/ riparian management/ applied and field techniques/ upslope forest stand management/ applied and field techniques/ aquatic conservation strategy/ Bureau of Land Management/ Northwest Forest Plan/ density management studies/ observational studies/ riparian processes/ riparian area processes/ riparian buffer studies/ riparian related questions/ silviculture: riparian responses/ upslope

management activities: riparian system impacts/ vegetation
Abstract: Some of the most critical issues that federal land managers and researchers are facing in the Pacific Northwest are centered around riparian processes and management, and how upslope management activities affect riparian systems. Researchers are developing a literature on riparian-related questions dominated by observational studies of riparian-area processes, vegetation, and wildlife species. Some experiments were conducted, and more are on the way. Issues that led to the development of the Northwest Forest Plan motivated many of these past and present studies. Very few of these studies, however, have examined the relation between upslope forest stand management and its effects on riparian ecosystems. The Bureau of Land Management density-management and riparian-buffer studies are among the few exceptions to this development. Some questions are emerging from this and other work that, when addressed, will help researchers and managers better understand the interactions between upslope forest management and riparian ecosystems.
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2248. Survey of state programs for habitat, hunting, and nongame management on private lands in the United States.

Benson, D. E.
Wildlife Society Bulletin 29(1): 354-358. (2001)
 NAL Call #: SK357.A1W5; ISSN: 00917648
Descriptors: access/ fee-hunting/ habitat management/ hunting/ leasing/ nonconsumptive use/ nongame management/ stewardship/ wildlife enterprises/ habitat management/ private land/ wildlife management/ United States
Abstract: I conducted a study of state wildlife agency administrators to document access, leasing, and management programs of state wildlife agencies that assist hunted and nonhunted wildlife and recreation management on private lands. The study serves as a comparison with surveys about access and management programs on private lands that were conducted about 15 years earlier by other authors. Administrators (96%) believed that access to private land was important for their organizations' objectives. Access opportunities for hunting had decreased (45%) and leasing of lands for hunting had increased (69.4%) over the past 15 years. Demands for access to view wildlife on private lands were minor (66%). Habitat management on private lands that were leased either increased (39%), remained the same (39%), or was unknown (22%). Habitat management on lands that were not leased was believed to have increased (42%), stayed the same (42%), or was unknown (16%). The 4 most important management practices suggested for landowners who are considering wildlife, habitat, and hunting on their lands were habitat practices (69%), access and hunter management (12%), planning and enterprise management (11%), and animal population management (8%). More cooperation, empowerment of landowners, technical support, educational assistance, and funding were identified goals for public wildlife agencies and private landowners to effect proper management of all wildlife, habitats, and users on private lands.
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2249. Terrestrial movements of juvenile and adult tailed frogs in relation to timber harvest in coastal British Columbia.

Wahbe, Tanya R.; Bunnell, Fred L.; and Bury, R. Bruce
Canadian Journal of Forest Research 34(12): 2455-2466. (2004)
 NAL Call #: SD13.C35; ISSN: 0045-5067
Descriptors: Anura/ Leiopelmatidae/ Lissamphibia/ *Ascaphus truei*/ timber harvest/ clearcutting/ forestry practices/ wildlife habitat/ habitat use/ tailed frog/ Pacific Northwest/ North America
Abstract: Tailed frog (*Ascaphus truei* Stejneger) populations are at risk in much of the Pacific Northwest, and recolonization of sites may be slow postlogging. To examine the terrestrial movements of *Ascaphus* in clearcuts and old growth, we employed pitfall traps and drift-fence arrays installed along streams and 100 m into upland habitat. In the fall, we captured frogs farther from streams in old growth than in clearcuts, and more frogs were captured ≤ 25 m from streams in clearcuts. Stronger stream affinity in clearcuts was most evident with juvenile frogs, which exhibited more upstream movements than adults. Compared with inland sites where frogs remained close to streams (e.g., 12 m), frogs at our coastal sites were captured at greater distances from streams (≥100 m), having lower stream affinity than frogs at inland sites. Long-distance overland movements appear more likely where forested stands are present. Aggregations of *Ascaphus* at individual streams may not represent distinct populations and should not be managed as distinct units. Preserving groups of interconnected streams within watersheds instead of individual streams will improve the conservation status of *Ascaphus*. Population monitoring can ensure conservation measures promote long-term persistence.
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2250. Threatened and endangered species on U.S. Department of Defense lands in the arid west, USA.

Tazik, D. J. and Martin, C. O.
Arid Land Research and Management 16(3): 259-276. (2002); ISSN: 15324982.
 Notes: doi: 10.1080/153249802760284801.
Descriptors: desert wildlife/ land management/ military lands/ species conservation/ arid region/ endangered species/ habitat loss/ land management/ United States/ riparia
Abstract: Department of Defense (DOD) lands in the arid western United States provide important habitat for many threatened and endangered species (TES). We explore the status of these species and evaluate threats to their survival and recovery. Thirty-two military sites located in the Chihuahuan, Sonoran, Mojave, and Great Basin deserts collectively support 34 listed and candidate species and one delisted species. We assess the relationship between the status of these species and land degradation by categorizing species according to major habitat type and enumerating the major threats to their survival and recovery. Habitat loss and degradation due to increasing human activities throughout the region are the most significant factors affecting these species. Urban and suburban development, agricultural conversion, and overgrazing are most important among Arid Grassland/Desert Scrub species, while hydrologic alternation is notable among Riparian and Aquatic species. Nonnative species impact TES through habitat modification,

as well as direct predation and competition. Specific conservation issues are discussed for selected species. While military disturbances have the potential to impact many of these species, poor watershed management practices of the past and the influx of humans are primarily responsible for the current status of TES and the ecosystems upon which they depend. Their continued survival and recovery requires coordinated conservation activities at the regional level.

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2251. Two species in one ecosystem: Management of northern bobwhite and red-cockaded woodpecker in the Red Hills.

Engstrom R. T. and Palmer W. E.

In: Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference, General Technical Report-PSW 191/ Ralph, C. J. and Rich, T. D.; Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2005. pp. 1151-1157.

Notes: Volume 2; Responsibility: Pacific Southwest Research Station; U.S. Forest Service General Technical Report series; ISSN: 0196-2094; Bird Conservation Implementation and Integration in the Americas: Third International Partners in Flight conference held 2002 March 20-24 in Asilomar, California.

http://www.fs.fed.us/psw/publications/documents/psw_gtr191/Asilomar/pdfs/1151-1157.pdf

Descriptors: Colinus virginianus/ bobwhite/ theory-model/ ecological requirements/ habitat/ forest/ habitat management/ landscape management/ Florida/ Georgia

Abstract: Sport hunting for Northern Bobwhites (*Colinus virginianus*) is the reason that approximately 300,000 acres of semi-wild lands still exist in the Red Hills region of north Florida and south Georgia. Use of fire for management and relatively large (400 to 4,000 ha), contiguous land ownerships permitted populations of bobwhite and Red-cockaded Woodpecker (*Picoides borealis*) to persist in the Red Hills as regional populations of these two species declined precipitously. Three factors play important roles in the habitat shared by these species: canopy cover, canopy tree species composition, and ground cover composition. These factors affect quality of fuel, which influences the occurrence of fire (ecological stability) and the costs of land management (economic stability). We used simple habitat models for these species to examine tradeoffs that optimize habitat conditions for each species. Maintaining conditions that enable healthy populations of both species to co-exist into the 21st century will require innovative management tools, including habitat restoration, and serious interest in conservation within the community of landowners.

2252. Upland game species use of no-till corn sites harvested by steers in a pasture and agroforestry setting in east central Mississippi.

Manning, Dawn Holland. Miss. State University, 2006.

Notes: Advisor: Boyd, Michael E.

Descriptors: game species/ no-tillage/ corn/ harvesting/ livestock/ pastures/ Mississippi/ mourning dove/ Zenaida macroura/ white-tailed deer/ *Odocoileus virginianus*/ eastern wild turkey/ *Meleagris gallopavo silvestris*/ northern bobwhite quail/ *Colinus virginianus*/ wildlife/ nutrition

Abstract: Due to vegetation conditions and waste grain availability, steers harvesting corn planted using no-till

technology may attract numerous wildlife species. Using this technique in a pasture or agroforestry setting creates desirable open foraging habitat providing: grain, soft mast, and grass seeds available during and after steer harvesting. The objective was to evaluate the utilization of corn fields harvested by steers on Mourning Dove (*Zenaida macroura*), White-tailed Deer (*Odocoileus virginianus*), Eastern Wild Turkey (*Meleagris gallopavo silvestris*), and Northern Bobwhite Quail (*Colinus virginianus*) numbers. In Study I, 2 steer harvested sites (SHS) and 2 conventionally harvested sites (CHS) were monitored measuring Mourning dove use. Study II incorporated agroforestry techniques comparing: steer harvested plots (SHP), unmanaged pine plots (JPP), and thinned pine plots (TPP) contained on 2 different sites. Mourning dove numbers were significantly greater on SHS and SHP in both studies. No significant difference with respect to sites, but a significant difference with respect to treatments within sites was detected. Deer numbers were significantly greater on SHP. Steers grazing no-till corn attracted wildlife by creating desirable habitat, optimum foraging conditions, and a long-term food source (>6 months).

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2253. USDA conservation programs: A look at the record.

Hansen, L. and Claassen, R.

Agricultural Outlook (AO) 284: 22-25. (2001)

NAL Call #: aHD1751.A422

Descriptors: agricultural sector/ conservation/ constraints/ environmental policy/ environmental protection/ erosion/ evaluation/ habitats/ soil conservation/ wetlands/ wildlife

Abstract: This paper reports on the findings of studies that examined the performance of USDA conservation programmes. These studies, in general, point to significant environmental benefits from soil conservation and wildlife restoration: soil erosion is down; wildlife habitat has improved; and wetlands are protected/restored. Remaining agri-environmental problems that have to be addressed are discussed.

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2254. Use of Maryland biological stream survey data to determine effects of agricultural riparian buffers on measures of biological stream health.

Barker, Linda S.; Felton, Gary K.; and Russek Cohen, Estelle

Environmental Monitoring and Assessment 117(1-3): 1-19. (2006)

NAL Call #: TD194.E5; ISSN: 0167-6369

Descriptors: commercial activities/ conservation measures/ ecology/ freshwater habitat/ lotic water/ land zones/ comprehensive zoology: farming and agriculture/ agricultural riparian buffers/ Importance assessment/ use of stream ecology survey data/ habitat management/ community structure/ streams/ survey data use to assess importance of agricultural riparian buffers/ environmental indicators/ stream ecology/ stream/ ecology/ Maryland/ Coastal Plain and Piedmont regions

Abstract: This study was undertaken to determine the importance of riparian buffers to stream ecology in agricultural areas. The original Maryland Biological Stream Survey (MBSS) data set was partitioned to represent agricultural sites in Maryland's Coastal Plain and Piedmont regions. ANOVA, multiple linear regression (MLR), and

CART regression tree models were developed using riparian and site catchment landscape characteristics. MBSS data were both stratified by physiographic region and analyzed as a combined data set. All models indicated that land management at the site was not the controlling factor for fish IBIs (FIBI) at that site and, hence, using FIBI to evaluate site-scale factors would not be a prudent procedure. Measures of instream habitat and location in the stream network were the dominant explanatory factors for FIBI models. Both CART and MLR models indicated that forest buffers were influential on benthic IBIs (BIBI). Explanatory variables reflected instream conditions, adjacent landscape influence, and chemistry in the Coastal Plains sites, all of which are relatively site specific. However, for Piedmont sites, hydrologic factors were important, in addition to adjacent landscape influence, and chemistry. Both Coastal Plain and Piedmont CART models identified several hydrologic factors, emphasizing the dominant control of hydrology on the physical habitat index (PHI). Riparian buffers were a secondary influence on PHI in the Coastal Plain, but not in the Piedmont. Between 40% and 70% of the variation in FIBI, BIBI, and PHI was explained by the "easily obtainable" variables available from the MBSS data set. While these are empirical results specific to Maryland, the general findings are of use to other locations where the establishment of forest buffers is considered as an aquatic ecosystem restoration measure. © Thomson Reuters Scientific

2255. The use of riparian forest strips by small mammals in a boreal balsam fir forest.

Darveau, Marcel; Labbe, Paul; Beauchesne, Patrick; Belanger, Louis; and Huot, Jean

Forest Ecology and Management 143(1-3): 95-104. (2001)
NAL Call #: SD1.F73; ISSN: 0378-1127

Descriptors: commercial activities/ conservation measures/ ecology/ terrestrial habitat/ land and freshwater zones/ Canada/ Mammalia: forestry/ riparian forest/ habitat management/ forestry practices/ habitat utilization/ forest and woodland/ riparian habitat/ habitat use/ Quebec/ Laurentian Mountains/ La Foret Montmorency/ Mammalia/ chordates/ mammals/ vertebrates

Abstract: Because riparian forest strips are perceived to buffer aquatic ecosystems from logging-related disturbance, they are usually not harvested. However, their value as refuges for terrestrial wildlife is unknown. We conducted two live-trapping experiments in the riparian zone adjacent to rivers in a boreal balsam fir (*Abies balsamea*) forest in Quebec. In the first experiment, we compared late summer use, during 4 separate years, of different width riparian strips (20, 40, 60 m, and control [>300 m wide]), and different stand thinning intensities (20 m intact and 20 m thinned of 1/3 of all trees) on resident small mammals. We found no differences in the densities of the most common species, *Clethrionomys gapperi* and *Peromyscus maniculatus*, among strip types or among years ($P>0.05$). We also tested for edge effects in large strips (60 m and controls). In controls, *C. gapperi* was less abundant in the first 20 m adjacent to the river ($P=0.004$) while *P. maniculatus* was more abundant ($P=0.02$) in that area. Neither species, however, showed an edge effect in the 60 m-strips ($P>0.10$). In the second experiment, we monitored small mammals over eight consecutive weeks in a 160 m [x] 170 m quadrat enclosing a 20 m-thinned forest strip and a clear-cut to investigate some aspects of the role

of riparian strips at the landscape scale. During that time, *Microtus pennsylvanicus*, which was nearly absent from our study area in the previous years, invaded the clear-cuts and apparently confined *C. gapperi* and *P. maniculatus* to forest remnants such as 20 m-wide strips. A conclusion that emerges from this study and related studies on birds is that some species prefer larger strips or non-riparian habitats whereas others prefer narrow strips along riparian habitats. We recommend that managers ban the all-encompassing norms and manage for heterogeneity at different scales. Because our study was conducted at the stand scale and because it is not accompanied with an evaluation of the socio-economic aspects of riparian management, we cannot determine the proper mixture of strips in the landscape. However, our results could help managers to enhance the key-role of riparian ecosystems in maintaining regional biodiversity and contribute to the maintenance of local biodiversity by creating refuges for terrestrial wildlife. © Thomson Reuters Scientific

2256. Using adaptive management to meet conservation goals.

Franklin, Thomas M.; Helinski, Ronald; and Manale, Andrew

In: *Fish and Wildlife Response to Farm Bill Conservation Practices*; Bethesda, MD: The Wildlife Society, 2007. 11 pp.
<ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/fwfb8.pdf>

Descriptors: aquatic habitat/ conservation practices/ terrestrial habitat/ wildlife species/ wildlife management

Abstract: This publication provides natural resource professionals with guidance on doing an effective job of managing natural resources. Their decision-making process should produce the kind of results desired by the public, elected officials, and their agencies' leadership. With billions of dollars spent each year on managing natural resources, accountability is more important than ever. Producing results is the key to success. Managers must have the necessary data to make enlightened decisions during program implementation -- not just at the conclusion of a program. Adaptive management is described as an adapt-and-learn methodology as it pertains to implementing Farm Bill conservation practices. Four regional case studies describe how adaptive management is being applied by practicing fish and wildlife managers. Indicators were identified to monitor and evaluate contributions to fish and wildlife habitat for each of the case studies. Data collected at each stage of the studies were used to make mid-course adjustments that enabled leadership to improve or enhance ongoing management actions.

2257. Using an IBI to assess effectiveness of mitigation measures to replace loss of a wetland-stream ecosystem.

Teels, B. M.; Mazanti, L. E.; and Rewa, C. A.

Wetlands 24(2): 375-384. (June 2004)

NAL Call #: QH75.A1W47

Descriptors: abundance/ aquatic habitat/ artificial wetlands/ baseline studies/ beavers/ biological surveys/ carnivores/ community composition/ construction/ dominant species/ ecosystem management/ ecosystems/ environmental monitoring/ fish populations/ habitats/ impoundments/ indigenous species/ lentic environment/ lotic environment/ man-induced effects/ monitoring/ natural resources/ reservoirs/ restoration/ species diversity/ standards/ streams/ surveys/ watersheds/ *Etheostoma*/ Virginia

Abstract: Approximately 7.3 hectares of wetlands, composed of six separate cells, were created to mitigate the loss of a 6-hectare, beaver-influenced, wetland-stream complex destroyed by the construction of a multi-purpose impoundment in the Cedar Run watershed in Fauquier County, Virginia, USA. The mitigation action physically replaced the lost wetlands and was judged successful in meeting planned objectives and regulatory requirements (which did not include standards for biota). A pre-project fish survey conducted in 1974 in the wetland-stream complex and three nearby streams provided a baseline condition from which to assess project impacts on fish, as determined from yearly surveys in the cells and the stream reach immediately upstream. In addition, fish communities were sampled at 157 stream locations within the northern Virginia Piedmont from 1997 to 1999 to establish a regional Index of Biotic Integrity (IBI) based on fish assemblages. A modification of that IBI was developed to assess the effectiveness of the mitigation based on 22 stream segments that were heavily influenced by beaver. Pre- and post-project conditions were assessed by gauging them against the wetland-stream complexes using this IBI. The IBI score for the mitigation area dropped from the pre-project 34 to 18 the first year after construction and ranged from 18 to 28 over the ten-year post-project monitoring period. A reduction in the number of native species was observed, and there was a dramatic shift in composition and relative abundance within key species groups. In general, the mitigation benefited species favoring lentic environments over those preferring lotic environments and had negative effects on trophic and habitat specialists and less tolerant species. Scores for the mitigation cells were lower than scores for the original wetlands for the following IBI metrics: number of darter species, number of minnow species, percent of the assemblage comprised of the single most dominant species, percent of tolerant individuals, percent of benthic invertivores, and percent of specialist carnivores minus tolerants. Upstream reach IBI scores also diminished over the same 10-year period, although more gradually. The IBI showed that, despite meeting all regulatory requirements, the mitigation failed to replace the original fish community in the wetland-stream complex and adversely impacted additional stream habitat. Using tools such as an IBI to monitor biological condition can help planners effectively mitigate unavoidable project impacts and avoid the unintended loss of important natural resources caused by compensatory mitigation actions.

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2258. Using economic and regulatory incentives to restore endangered species: Lessons learned from three new programs.

Wilcove, D. S. and Lee, J.

Conservation Biology 18(3): 639-645. (2004)

NAL Call #: QH75.A1C5 ; ISSN: 08888892

Descriptors: conservation banking/ endangered species/ incentives/ private land/ safe harbor

Abstract: We studied three new incentive-based programs for restoring endangered species on private lands in the United States: safe harbor, Environmental Defense's Landowner Conservation Assistance Program, and conservation banking. For each program, we gathered data on the number of participating landowners, the number of species targeted for assistance, and the cumulative acreage of enrolled land. Measured in this way, both safe

harbor and the Landowner Conservation Assistance Program have been remarkably successful. Landowners are drawn to three aspects of these programs: (1) the removal of regulatory burdens associated with attracting endangered species to their property; (2) technical guidance on how to restore habitats for endangered species; and (3) cost-share assistance for habitat restoration. Technical guidance appears to be more important than either regulatory relief or financial assistance in securing the cooperation of some landowners. Assessing the success or failure of conservation banking proved more difficult, given the relatively small number of banks created to date and the lack of any centralized database on them. However, nearly half of the 47 endangered-species conservation banks we surveyed have sold credits, indicating some success in either acquiring or restoring essential habitats.

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2259. Using NatureServe information to assess conservation practice effects on at-risk species.

Natural Resources Conservation Service Natural Resources Conservation Service, 2007. 5 pp.

ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/natureservesciencenote.pdf

Descriptors: conservation practices/ wildlife species/ geospatial models/ environmental impact/ aquatic species/ watersheds

Abstract: This publication provides a summary of the NatureServe pilot project to determine if existing datasets could be used to assess effects of conservation practices on at-risk species. Natural Heritage species-occurrence data and geospatial models for predicting species distribution hold promise for assessing the effects of conservation practices on at-risk species. Lack of comprehensive geospatial digital data on conservation practice application hinders quantification of practice effects on wildlife. If Missouri pilot project data can be shown to apply to practice-to-species relationships nationwide, 89 percent of conservation practices nationwide have positive, neutral, or mixed effects on most terrestrial wildlife and 79 percent have expected positive or neutral effects on most aquatic biota.

2260. Using NatureServe information to assess Farm Bill practice effects on at-risk species and habitats.

Comer, P.; Diamond, D.; Sowa, S.; Goodin, K.; Purcell, D.; Butler, D.; Cook, E.; Hamilton, C.; Hammerson, G.; Master, L.; Nigh, T.; Ormes, M.; True, D.; and White, B. Arlington, VA: NatureServe, 2007. 94 p.

Notes: This study was funded by USDA Natural Resources Conservation Service under agreement # 68-3A75-5-146.

Descriptors: conservation practices/ environmental impact/ wildlife species/ wildlife habitat/ Farm Bill/ conservation impact

Abstract: NatureServe, in cooperation with USDA-NRCS, University of Missouri Resource Assessment Partnership (MoRAP) and Missouri Department of Conservation, completed a pilot research project to develop and evaluate methods for assessing benefits of conservation practices on at-risk wildlife species and habitats in Missouri. Our key objective was to utilize NatureServe data and other data sources to demonstrate processes that could both evaluate

the impacts of currently implemented conservation practices as well as help prioritize future Farm Bill program allocations.

2261. The value of buffer zones for the conservation of biodiversity.

Boatman, N. D.

In: Brighton Crop Protection Conference: Pests and Diseases, 1998: Proceedings of an International Conference. Brighton, UK; Vol. 3.

Farnham, UK: British Crop Protection Council; pp. 939-950; 1998.

Notes: Literature review.; ISBN: 0-901396-52-5

Descriptors: biodiversity/ availability/ agricultural land/ habitats/ nutrients/ pesticides/ pollution/ sediment/ aquatic environment/ environment/ agricultural entomology

Abstract: Buffer zones can give conservation benefits by reducing pollution of adjacent habitat, and by improving resource availability or habitat value within the buffer zone itself. The effect of pollution of aquatic and terrestrial non-crop habitats by sediments, nutrients and pesticides are reviewed, and the potential for additional benefits arising within buffer zones on farmland is considered, with particular reference to management prescriptions supported by the various Agri-Environment schemes.

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2262. The value of farm programs for providing winter cover and food for Minnesota pheasants.

Haroldson, Kurt; Giudice, John; Krueger, Wendy; and Krueger, W.

In: Summaries of Wildlife Research Findings 2004/ Wingate, Paul J.; Kimmel, Richard O.; Lawrence, Jeffrey S.; and Lenarz, Mark S.

St. Paul, Minnesota: Department of Natural Resources Division of Fish and Wildlife, Wildlife Populations and Research Unit, 2004; pp. 21-30.

<http://www.dnr.state.mn.us/publications/wildlife/research2004.html>

Descriptors: Phasianus colchicus/ common pheasants/ ring-necked pheasants/ agriculture/ habitat/ abundance/ Minnesota/ winter habitat/ habitat management/ geographic information systems

Abstract: The purpose of this study is to determine how much winter habitat is needed to sustain local populations of ring-necked pheasants (*Phasianus colchicus*) over a range of winter conditions. We estimated relative abundance of pheasant populations on 36 study areas using roadside surveys. In addition, we estimated amounts of winter cover, winter food, and reproductive cover on each study area by cover mapping to a geographic information system (GIS). During 2003-2004, pheasant indices varied in association with weather and habitat. A preliminary evaluation indicated that mean pheasant indices were positively related to habitat abundance in most, but not all, regions. Future work will include continued pheasant surveys for at least three additional years, improved estimates of habitat abundance, and more complex analysis of the association between pheasant indices and habitat parameters. A final product of this project will be a GIS habitat model that managers can use to target habitat development efforts where they may yield the greatest increase in pheasant numbers.

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2263. Variation in ant populations with elevation, tree cover, and fire in a pinyon-juniper-dominated watershed.

MontBlanc, E. M.; Chambers, J. C.; and Brussard, P. F. *Western North American Naturalist* 67(4): 469-491. (2007) *NAL Call #:* QH1.G7.

http://www.sagestep.org/educational_resources/bibliographies/articles/MontBlanketal2008.pdf

Descriptors: ants/ prescribed fire/ Great Basin/ ecosystem management/ altitude

Abstract: Climate change and fire suppression have facilitated expansion of pinyon-juniper woodlands into sagebrush-steppe ecosystems of the Great Basin, USA, resulting in a loss of biological diversity. To assess the effects of using prescribed fire in restoration efforts, ant abundance, species richness, and composition were examined pre- and post-burn along the elevation and tree cover gradients encompassed by a pinyon-juniper woodland in a central Nevada watershed. Ants were sampled using pitfall traps in 6 sites for the elevation study and in 2 sites for the tree cover study, representing paired burn and control sites in a randomized block design. Vegetation and ground cover variables were also sampled to determine how variation in ant populations was correlated with differences in vegetation and ground cover. Ant species richness remained unchanged for all treatments. Tree cover had no significant effect on ant populations. Significantly more ants were trapped after the burn treatment on burn plots. Variation in ant populations was not directly correlated with any of the vegetation or ground cover variables. According to ANOVA and multivariate analyses, elevation had the greatest effect on changes in ant communities, likely due to increased moisture availability. Our results suggest that management for conservation of sagebrush-steppe ecosystems in this and similar watersheds should include a range of elevations to ensure maximum ant species diversity.

2264. Variation in terrestrial habitat use by four pool-breeding amphibian species.

Regosin, J. V.; Windmiller, B. S.; Homan, R. N.; and Reed, J. M.

Journal of Wildlife Management 69(4): 1481-1493. (2005) *NAL Call #:* 410 J827; ISSN: 0022541X

Descriptors: Ambystoma laterale/ Ambystoma maculatum/ buffer zone/ density/ migration distance/ Notophthalmus viridescens/ Rana sylvatica/ terrestrial ecology/ vernal pool

Abstract: We conducted a 2-year study of terrestrial habitat use by spotted salamanders (*Ambystoma maculatum*), blue-spotted salamanders (*A. laterale*), wood frogs (*Rana sylvatica*), and eastern newts (*Notophthalmus viridescens*) within blocks of forest enclosed by drift fencing and pitfall traps in the vicinity of a single breeding pond. Adult winter densities within forest habitat <100 m from the breeding pond were low for all species (range 0.1-1.9 individuals/ 100 m², n = 6 enclosures). During our 2-year study, at least 40% of wood frogs, 52% of blue-spotted salamanders, and 60% of spotted salamanders wintered >100 m from the breeding pond. Males tended to winter closer to the breeding pond than did females. Adult wood frogs and eastern newts were largely absent from upland forest adjacent to the breeding pond during spring and summer, but they entered these areas in significant numbers to winter. Analyses of net flow of amphibians resulting from fall movement suggest that summer and winter densities of

Ambystoma salamanders remained similar, while there were large increases in wood frog and eastern newt densities within terrestrial habitats near the breeding pond during fall. These results support a growing body of evidence that maintenance of suitable terrestrial habitat beyond 100 m from breeding pools is important for maintaining pool-breeding amphibian populations. Narrow protected buffer strips around breeding ponds might be even less effective than previously thought due to the disproportionate representation of males within these areas.

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2265. Vegetation management and ecosystem disturbance: Impact of glyphosate herbicide on plant and animal diversity in terrestrial systems.

Sullivan, Thomas P. and Sullivan, Drusclia S.

Environmental Reviews 11(1): 37-59. (2003)

NAL Call #: GE140.E59; ISSN: 1181-8700

Descriptors: glyphosate herbicide: pesticide, soil pollutant, toxin/ Alces alces [moose] (Cervidae): bioindicator/ Capreolus capreolus (Cervidae): bioindicator, deer/ Lepus spp. [hare] (Leporidae): bioindicator/ Odocoileus spp. (Cervidae): bioindicator, deer/ plant (Plantae): bioindicator/ animals/ Artiodactyls/ chordates/ Lagomorphs/ mammals/ nonhuman mammals/ nonhuman vertebrates/ plants/ vertebrates/ agro ecosystem/ biodiversity/ crop production/ forest ecosystem/ species richness/ temperate climate/ terrestrial ecosystem/ vegetation management/ weed control

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2266. Viewpoint: Benefits and impacts of wildlife water developments.

Rosenstock, S. S.; Ballard, W. B.; and DeVos, J. C.

Journal of Range Management 52(4): 302-311. (July 1999)

NAL Call #: 60.18 J82; ISSN: 0022-409X [JRMGAQ].

Notes: Literature review.

Descriptors: game birds/ water resources/ arid lands/ predators/ wildlife management/ Ovis canadensis/ Odocoileus virginianus/ Odocoileus hemionus/ Chiroptera/ Antilocapra americana/ wild birds/ desert rodents/ Lagomorpha/ adverse effects/ reptiles/ water quality/ cost benefit analysis/ duration/ experimental design/ Callipepla/ Zenaida

Abstract: Resource managers in the western United States have long assumed that water was a key limiting factor on wildlife populations in arid habitats. Beginning in the 1940s-1950s, state and federal resource management agencies initiated water development programs intended to benefit game species and other wildlife. At least 5,859 such developments have been built in 11 western states. Most state wildlife management agencies in the western United States have ongoing wildlife water development programs that vary greatly in extent. Ranchers and range managers also have developed water sources for livestock, many of which also are used by wildlife. Recently, critics have suggested that wildlife water developments have not yielded expected benefits, and may negatively impact wildlife by increasing predation, competition, and disease transmission. Based upon a comprehensive review of scientific literature, we conclude that wildlife water developments have likely benefitted many game and non-game species, but not all water development projects have yielded expected increases in animal distribution and

abundance. Hypothesized negative impacts of water developments on wildlife are not supported by data and remain largely speculative. However, our understanding of both positive and negative effects of wildlife water developments is incomplete, because of design limitations of previous research. Long-term, experimental studies are needed to address unanswered questions concerning the efficacy and ecological effects of water developments. We also recommend that resource managers apply more rigorous planning criteria to new developments, and expand monitoring efforts associated with water development programs.

This citation is from AGRICOLA.

2267. Water for wildlife: Improving access and reducing mortality for bats and other wildlife at livestock water developments.

Taylor, Daniel A. R. and Tuttle, Stuart R.

Bat Research News 47(4): 152. (2006)

NAL Call #: QL737.C5 B328; ISSN: 0005-6227.

Notes: Papers presented at the 36th Annual North American Symposium on Bat Research, Wilmington, North Carolina, 18-21 October 2006.

Descriptors: Chiroptera/ terrestrial ecology/ bat mortality/ water shortages/ livestock water developments/ wildlife drinking water/ livestock troughs

Abstract: Livestock water developments are often one of the few water sources available to wildlife on arid western rangelands. Bats are especially vulnerable to water shortages, sometimes losing up to 50% of their body weight in evaporative water loss daily. Drinking rates of more than one bat/sec are not uncommon at livestock troughs. Without proper wildlife escape structures and maintenance, significant mortality to bats and other wildlife can occur at livestock troughs. Recent evidence suggests thousands of birds and mammals are drowned annually, including protected species. We evaluated more than 370 livestock troughs from several western states and conducted experiments on the effects of water development configuration and water level on bat access. Although wildlife escape structures are mandatory on most federal rangelands, they were present in <7 percent of the trough we inspected and >50 percent were obstructed by fencing or bracing. Bats required 3-6 times the number of approaches to successfully drink from troughs with obstructions. The ratio of successful to unsuccessful drinking attempts changed from 2:1 to 1:2 when water levels were lowered by 12" in smaller troughs. Fortunately, wildlife escape structures can be built and installed inexpensively and alternative fencing and bracing methods can facilitate bat access while still meeting livestock management objectives. To address these issues, BCI and the USDI-Natural Resources Conservation Service initiated the water for Wildlife Project to raise awareness among range and wildlife managers about the importance of livestock waters to bats and other wildlife, to evaluate existing conditions for wildlife at livestock waters, and to publish a comprehensive manual on developing wildlife-friendly livestock waters.

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2268. Water, water everywhere but not a place for fish: Tackling water and fish habitat management for productive fisheries in North America.

Taylor, W. W.; Hughes, S. M.; and Mueller, K. B.
Transactions of the North American Wildlife and Natural Resource Conference 71: 131-149. (2006)
 NAL Call #: 412.9 N814; ISSN: 0078-1355
Descriptors: natural resource management/ water management/ habitat conservation/ aquatic habitat/ wildlife habitats/ Wildlife Habitat Incentives Program/ natural resource policy/ water policy/ water resources/ fish/ fisheries/ North America/ habitat management/ National Fish Habitat Initiative
 This citation is from AGRICOLA.

2269. Waterbird communities and habitat relationships in coastal pastures of northern California.

Colwell, M. A. and Dodd, S. L.
Conservation Biology 9(4): 827-834. (1995)
 NAL Call #: QH75.A1C5 ; ISSN: 0888-8892
Descriptors: pastures/ habitats/ coastal areas/ plant height/ grazing/ wild birds/ waterfowl/ grasslands/ permanent grasslands/ wetlands/ nature conservation/ wild animals
Abstract: Waterbird (including geese) assemblages (diversity, composition, and species' densities) were examined in 20 pastures near Humboldt Bay, California, in relation to habitat characteristics (vegetation height, soil penetrability, water depth), abundance of invertebrates (worms and other invertebrates), and presence of livestock. From October 1991 to May 1992, 29 species and 10 776 birds were observed, most (78%) of which foraged. Nonrandom pasture use by birds resulted in a highly clumped spatial distribution. Habitat characteristics of pastures were correlated with this nonrandom pattern: waterbird diversity and densities of three sandpiper species and one gull species correlated negatively with vegetation height; densities of two plover species correlated negatively with soil penetrability; and waterfowl densities correlated positively with water depth. Species composition varied among pastures. Wading birds used pastures with tall vegetation, shorebirds and gulls frequented short-grass pastures, and waterfowl used flooded pastures. Both the presence of waterbirds and their densities increased in association with livestock. In coastal areas where much intertidal habitat has been reclaimed as pastureland, pastures offered valuable habitats to nonbreeding waterbirds. It is suggested that grazing in coastal pastures can be used to provide a mosaic of vegetation heights, which would yield greater waterbird diversity as well as higher densities of some species.
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2270. Wetland mitigation and amphibians: Preliminary observations at a southwestern Illinois bottomland hardwood forest restoration site.

Mierzwa, Kenneth S.
Journal of the Iowa Academy of Science 107(3-4): 191-194. (2000)
 NAL Call #: Q11.J68; ISSN: 0896-8381
Descriptors: conservation measures/ terrestrial habitat/ land and freshwater zones/ Amphibia: habitat management/ wetland mitigation/ forest habitat/ semiaquatic habitat/

wetland/ habitat mitigation/ forest and woodland/ hardwood forest/ Illinois/ Mid America Airport/ a chordates/ vertebrates
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2271. Wild bee species increase tomato production and respond differently to surrounding land use in northern California.

Greenleaf, Sarah S. and Kremen, Claire
Biological Conservation 133(1): 81-87. (2006)
 NAL Call #: S900.B5; ISSN: 0006-3207
Descriptors: commercial activities/ nutrition/ diet/ associations/ mutualism/ man-made habitat/ land zones/ *Anthophora urbana*/ *Bombus vosnesenskii*: pollination/ *Solanum lycopersicum*/ land use/ tomato production/ California/ Insecta, Hymenoptera, Apocrita, Aculeata, Apoidea, Apidae/ arthropods/ Hymenopterans/ insects/ invertebrates
Abstract: Pollination provided by bees enhances the production of many crops. However, the contribution of wild bees remains unmeasured for many crops, and the effects of anthropogenic change on many bee species are unstudied. We experimentally investigated how pollination by wild bees affects tomato production in northern California. We found that wild bees substantially increase the production of field-grown tomato, a crop generally considered self-pollinating. Surveys of the bee community on 14 organic fields that varied in proximity to natural habitat showed that the primary bee visitors, *Anthophora urbana* Cresson and *Bombus vosnesenskii* Radoszkowski, were affected differently by land management practices. *B. vosnesenskii* was found primarily on farms proximate to natural habitats, but neither proximity to natural habitat nor tomato floral abundance, temperature, or year explained variation in the visitation rates of *A. urbana*. Natural habitat appears to increase *B. vosnesenskii* populations and should be preserved near farms. Additional research is needed to determine how to maintain *A. urbana*. Species-specific differences in dependency on natural habitats underscore the importance of considering the natural histories of individual bee species when projecting population trends of pollinators and designing management plans for pollination services. Thus, to maintain an entire bee community, multiple approaches, including maintaining natural habitat, should be implemented. © 2006 Elsevier Ltd. All rights reserved
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2272. Wildfire, fuel reduction, and herpetofaunas across diverse landscape mosaics in northwestern forests.

Bury, R. Bruce
Conservation Biology 18(4): 968-975. (2004)
 NAL Call #: QH75.A1C5; ISSN: 0888-8892
Descriptors: commercial activities/ conservation measures/ ecology/ population dynamics/ freshwater habitat/ lotic water/ terrestrial habitat/ abiotic factors/ land zones/ forestry/ burning practices/ abundance/ habitat management/ population size/ streams/ forest fire/ forest and woodland/ United States, northwestern region/ Amphibia/ amphibians/ chordates/ reptiles/ vertebrates
Abstract: The herpetofauna (amphibians and reptiles) of northwestern forests (U.S.A.) is diverse, and many species are locally abundant. Most forest amphibians west of the Cascade Mountain crest are associated with cool,

cascading streams or coarse woody material on the forest floor, which are characteristics of mature forests. Extensive loss and fragmentation of habitat resulted from logging across approximately 50% of old-growth forests in northern California and approximately 80% of stands in Oregon and Washington. There is a complex landscape mosaic and overlap of northern and southern biotic elements in the Klamath-Siskiyou Region along the Oregon and California border creating a biodiversity hotspot. The region experiences many low-severity fires annually, punctuated by periodic major fires, including the Biscuit fire, the largest in North America in 2002. In the fire's northern portion, severe fire occurred on >50% of stands of young, managed trees but on only about 25-33% of old-growth stands. This suggests that the legacy of timber harvest may produce fire-prone stands. Calls for prescribed fire and thinning to reduce fuel loads will remove large amounts of coarse woody material from forests, which reduces cover for amphibians and alters nutrient inputs to streams. Our preliminary evidence suggests no negative effects of wildfire on terrestrial amphibians, but stream amphibians decrease following wildfire. Most reptiles are adapted to open terrain, so fire usually improves their habitat. Today, the challenge is to maintain biodiversity in western forests in the face of intense political pressures designed to "Prevent" catastrophic fires. We need a dedicated research effort to understanding how fire affects biota and to proactively investigate outcomes of fuel-reduction management on wildlife in western forests.

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2273. **Wildlife and fish conservation through the Farm Bill.**

Gray, R. L. and Teels, B. M.

Wildlife Society Bulletin 34(4): 906-913. (2006)

NAL Call #: SK357.A1W5; ISSN: 00917648.

Notes: doi: 10.2193/0091-7648(2006)34

[906:WAFCTT]2.0.CO;2.

Descriptors: conservation programs/ Conservation Reserve Program/ Conservation Security Program/ Environmental Quality Incentives Program/ Farm Bill/ Grassland Reserve Program/ Sodbuster/ Swampbuster/ Wetlands Reserve Program/ Wildlife Habitat Incentives Program

Abstract: Private lands constitute 70% of the land base in the United States and are important to the conservation of fish and wildlife. The last 4 Farm Bills established a variety of conservation programs that integrate fish and wildlife habitat as an important consideration in farm policy. These programs provide cost-sharing opportunities, technical assistance, and other financial incentives to restore or enhance habitats, and protect habitats through long-term or permanent conservation easements. The programs are providing landscape-scale habitat changes, resulting in increased populations of many species.

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2274. **Wildlife benefits of the Wetlands Reserve Program.**

Rewa, Charles A.

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. 133-146.
ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/fwbenefits8.pdf

Descriptors: conservation programs/ USDA/ Farm Bill/ wildlife conservation/ wetlands/ wildlife/ fish/ Wetlands Reserve Program/ NRCS/ conservation buffers/ wildlife habitat

Abstract: Since its initial authorization in 1990, more than 1.6 million acres of primarily drained or degraded wetlands on agricultural lands have been enrolled in the U.S. Department of Agriculture's (USDA) Wetlands Reserve Program (WRP). The Natural Resources Conservation Service (NRCS) and its partners are working with landowners to restore these lands to ecologically productive wetland and upland buffer habitats. Numerous studies have documented the value of restored and created wetlands to fish and wildlife resources. However, few objective studies have been completed that document fish and wildlife response to wetlands enrolled in and restored through WRP. Preliminary results of some studies underway indicate that wildlife use of WRP sites is comparable to or exceeds that of non-program restored wetland habitats. In addition, anecdotal reports on some WRP restored wetland complexes indicate that wildlife response has been greater than expected. Additional studies are needed to enable WRP program managers and participants to better understand how lands enrolled in the program affect local fish and wildlife use and the landscape factors that affect wildlife community dynamics and population trends influenced by the lands enrolled. Elements of USDA's Conservation Effects Assessment Project are intended to begin addressing this need.

2275. **Wildlife damage management research needs: Perceptions of scientists, wildlife managers, and stakeholders of the USDA/Wildlife Services program.**

Bruggers, Richard L.; Owens, Richard; and Hoffman, Thomas

International Biodeterioration and Biodegradation 49(2-3): 213-223. (2002)

NAL Call #: QH301.I54; ISSN: 0964-8305

Descriptors: bird (Aves): pest/ human (Hominidae)/ mammal (Mammalia): pest/ animals/ birds/ chordates/ humans/ mammals/ nonhuman mammals/ nonhuman vertebrates/ primates/ vertebrates/ USDA/ APHIS Wildlife Services Program/ administrative guidance/ agriculture/ aquaculture/ aviation/ invasive species/ legislative guidance/ livestock/ overabundant populations/ research needs assessment/ scientist perceptions/ stakeholder perceptions/ timber/ wildlife damage management research/ wildlife manager perceptions/ wildlife borne diseases/ wildlife-human conflicts

Abstract: This paper presents the results of a nationwide research needs assessment of the important wildlife-human conflict issues and associated research needs of the USDA/APHIS-Wildlife Services (WS) program and its stakeholders. Thirty-six WS State Directors, 23 WS/National Wildlife Research Center (NWRC) scientists and 6 members of the National Wildlife Services Advisory Committee (NWSAC) to the US Secretary of Agriculture responded to a request for participation. This paper compares these current research needs with previous regional and national research needs assessments for wildlife damage management in the United States. Important national problems identified included issues related to aviation, timber, agriculture, aquaculture, and livestock industries, as well as wildlife-borne diseases, invasive species, and overabundant wildlife populations.

This assessment provides useful input, along with legislative and administrative guidance, to NWRC for allocating resources to specific research projects that address the WS program's needs for knowledge and new methods.

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2276. Wildlife exposure to organophosphorus insecticides.

Sanchez Hernandez, J. C.

Reviews of Environmental Contamination and Toxicology 172: 21-63. (2001)

NAL Call #: TX501.R48; ISSN: 0179-5953 [RCTOE4].

Notes: Literature review.

Descriptors: organophosphorus insecticides/ exposure/ cholinesterase/ markers/ monitoring/ wildlife/ nontarget organisms

This citation is from AGRICOLA.

2277. Wildlife Habitat Incentives Program: A summary of accomplishments, 1998-1999.

Hackett, 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. 117-124.

NAL Call #: aS604.6 C66 2000

Descriptors: Wildlife Habitat Incentives Program [WHIP]/ wildlife habitats/ wildlife management/ endangered species/ ecological restoration/ landowners/ *Colinus virginianus*/ *Salmo salar*/ conservation programs

2278. Wildlife-habitat relationships in Oregon and Washington.

Johnson, D. H. and O'Neil, T. A.

Corvallis, OR: Oregon State University Press. (2001)

Descriptors: vertebrates/ habitat/ habitat change/ habitat management/ vegetation/ landscape/ topography/ agriculture/ silviculture/ settlement/ Washington/ Oregon

Abstract: Book contains chapters on "Wildlife habitats: Descriptions, status, trends, and system dynamics,"

"Wildlife of Agriculture, Pastures, and Mixed Environs,"

"Wildlife of Riparian Habitats," "An Overview of Models and

Their role in Wildlife Management," "Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management," among others.

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2279. Wildlife issues for the 2002 Farm Bill.

Franklin, T. M. and Rowse, B. H.

Wildlife Society Bulletin 29(2): 731-733. (2001)

NAL Call #: SK357.A1W5; ISSN: 00917648

Descriptors: agriculture/ Conservation Reserve Program/ Conservation Securities Act/ Farm Bill/ wildlife conservation/ wildlife management

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2280. Wildlife use of water catchments in southwestern Arizona.

O'Brien, C. S.; Waddell, R. B.; Rosenstock, S. S.; and Rabe, M. J.

Wildlife Society Bulletin 34(3): 582-591. (2006)

NAL Call #: SK357.A1W5; ISSN: 00917648.

Notes: doi: 10.2193/0091-7648(2006)34

[582:WUOWC]2.0.CO;2.

Descriptors: Arizona/ catchment/ habitat improvement/ Sonoran Desert/ video monitoring/ water development

Abstract: Construction of water developments has been used as a wildlife-habitat improvement technique in desert environments since the 1940s. Use of water developments by wildlife has been described in anecdotal observations, through water-hole counts, and with triggered still-cameras, but few studies have directly quantified wildlife use. We used video surveillance equipment to document wildlife use of 3 water catchments located in the Sonoran Desert, southwestern Arizona, USA, from June 2000 to November 2003. For each visitation, we recorded time of day, season of use, and activities engaged in, and we correlated visits with temperature and relative humidity. We logged 37,989 observation hours and documented 34 species using the water catchments. Most of the species recorded visited water catchments year-round with use peaking during June and July. The number of visits by nongame species (i.e., bats, raptors, mammalian predators, and rodents) exceeded the number of visits by game species (mule deer [*Odocoileus hemionus*], doves [*Zenaida* spp.], and Gambel's quail [*Callipepla gambelii*]). Visitation frequency for turkey vultures (*Cathartes aura*), owls, diurnal raptors, mule deer, coyotes (*Canis latrans*), and other mammalian predators increased with temperature. Most visits culminated in the animal drinking water. Other activities recorded were bathing, consumption of plant material and carrion, and intraspecies and interspecies interactions. We recorded 8 predation attempts: 4 by avian predators and 4 by bobcats (*Lynx rufus*). Although we documented that a number of species frequented water catchments, our observations do not prove need. However, we believe our observations do provide support for constructing water catchments that can accommodate a wide diversity of species.

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2281. Wildlife wins through the conservation seed program.

Crane, J.

Forest Landowner 60(2): 46-49. (2001)

NAL Call #: SD144.A15F67; ISSN: 10879110

Descriptors: agriculture/ carbohydrates/ nutritional tonnages/ forestry/ agriculture/ animals/ forestry/ seeds/ wildlife

Abstract: The steps taken by hunters and outdoor enthusiasts to plant food plots and cover strips to benefit wildlife and to improve hunting is presented. The food plots planted in the correct places in a sufficient percentage of total land acreage results in greater wildlife numbers. These crops are shown to provide high amounts of carbohydrates necessary for wildlife to maintain energy and body heat during the winter months.

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2282. Winter bird communities in afforestation: Should we speed up or slow down ecological succession?

Hamel, P. B.; Twedt, D. J.; Nuttle, T. J.; Woodson, C. A.; Broerman, F.; and Wahome, J. M.
 In: Proceedings of a Conference on Sustainability of Wetlands and Water Resources: How Well Can Riverine Wetlands Continue to Support Society into the 21st Century?, General Technical Report-SRS 50/ Holland, Marjorie M.; Warren, Melvin L.; and Stanturf, John A.; Asheville, NC: Southern Research Station, Forest Service, U.S. Department of Agriculture Southern Research Station, Forest Service, U.S. Department of Agriculture, 2002. pp. 98-108.

http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs050.pdf

Descriptors: afforestation/ agricultural land/ alluvial land/ habitats/ plant succession/ population density/ species richness/ wild birds/ wildlife management/ winter/ birds

Abstract: Recent assessments of afforestation on agricultural lands in the Mississippi Alluvial Valley imply the importance of quickly developing vertical forest structure to benefit wildlife. Examining this assumption, we find that mammals and birds occur through the full successional sere as targets of proactive management and control. Different species of animals thrive in structures available at different times during succession. Thus, forest managers' choices of strategies favor species' success differentially. Early successional species, particularly those avian communities occurring during winter, have heretofore been considered only in passing. However, because they occur in areas where herbaceous plants dominate vegetation structure, these communities include species otherwise rare or absent from the landscape. Extensive afforestation in the Mississippi Alluvial Valley provides ephemeral habitat for birds that winter in herbaceous areas. To provide habitat for winter birds, managers may wish to consider maintaining large tracts in herbaceous vegetation similar to that occurring 3 to 7 years after cessation of farming activities.

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2283. Winter habitat use and survival of female ring-necked pheasants (*Phasianus colchicus*) in southeastern North Dakota.

Homan, H. J.; Linz, G. M.; and Bleier, W. J.
American Midland Naturalist 143(2): 463-480. (2000)
 NAL Call #: 410 M58; ISSN: 00030031

Descriptors: bird/ habitat use/ survival/ wetland/ United States/ *Phasianus colchicus*/ *Typha*

Abstract: From 1992 to 1995 we used radiotelemetry to monitor winter habitat selection and survival of female ring-necked pheasants (*Phasianus colchicus*) in southeastern North Dakota. We captured 100 birds at nine sites in six study blocks centered on cattail-dominated (*Typha* spp.) semipermanent wetlands. Pheasants showed nonrandom habitat use at two hierarchical scales. At the second-order scale (23-km² blocks) semipermanent wetlands were preferred during two winters in which habitat selection could be assessed (1992-1993 and 1994-1995). An additional second-order preference for grass-covered uplands was shown during the mild 1994-1995 winter. At the third-order scale (home-range) pheasants preferred the edges of wetlands in 1992-1993 and 1994-1995. The central portions of wetlands were preferred in 1992-1993 and used proportionately in 1994-1995. Seasonal wetlands were avoided at the third order scale during 1992-1993 and

1994-1995. The average winter survival rate was 0.41, with rates ranging from 0.04-0.86 and differing significantly among winters. Survival was lower during early winter and midwinter periods for birds weighing less than 1090 g and for birds captured in semipermanent wetlands under private ownership. A 1 C increase in the mean weekly maximum temperature decreased the probability of death by 0.06 and a 2.5 cm increase in new snow raised the probability of death by 0.08.

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2284. Wintering raptor use of hybrid poplar plantations in northeastern Oregon.

Moser, Brian W. and Hilpp, G. Keith
Journal of Raptor Research 37(4): 286-291. (2003)
 NAL Call #: QL696.F3J682; ISSN: 0892-1016.

Notes: Translation by: Marquez, C.

Descriptors: conservation measures/ ecology/ man-made habitat/ land zones/ Falconiformes/ *Nyctea scandiaca*: habitat management/ habitat utilization/ winter use of tree plantations/ habitat management implications/ cultivated land and shrub steppe/ terrestrial habitat/ shrub steppe/ cultivated land habitat/ Oregon/ Columbia Basin/ Aves, Strigiformes, Strigidae/ birds/ chordates/ vertebrates

Abstract: We studied wintering raptor use of hybrid poplar (*Populus* spp.) plantations in comparison to surrounding cover types in the Columbia Basin of northeastern Oregon. Diurnal raptors were surveyed in shrub-steppe, poplar plantations, and irrigated croplands. Logistic regression analyses suggested that the three most common raptors, Red-tailed Hawks (*Balm jamaicensis*), American Kestrels (*Falco sparverius*), and Northern Harriers (*Circus cyaneus*) were associated with croplands, interiors of 1-yr-old plantations, and plantation edges. Shrub-steppe was also selected as a significant predictor of sites with American Kestrels. The best model for the Northern Harrier also included the interior of 2-yr-old plantations, but excluded croplands and edges of older plantations. Plantations and plantation edges appeared to be used by wintering raptors disproportionately to their availability. Our data suggest that maximizing plantation edges and managing for a variety of plantation ages within this landscape will likely provide suitable habitat for wintering raptors in this region.

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2285. Wolf habitat analysis in Michigan: An example of the need for proactive land management for carnivore species.

Gehring, Thomas M.; Potter, Bradly A.; and
Wildlife Society Bulletin 33(4): 1237-1244. (2005)
 NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: Canidae/ Carnivora/ *Canis lupus*/ *Canis lupus*/ gray wolf/ biogeography/ carnivore-human conflict/ conservation/ wildlife management/ habitat use/ habitat analysis/ colonization/ habitat management/ integrated management/ land zones/ livestock depredation/ Northern Lower Peninsula/ potential recolonization/ proactive land management/ recolonization/ roads/ gray wolf/ carnivores/ habitat evaluation/ Michigan

Abstract: Gray wolves (*Canis lupus*) likely will recolonize the northern Lower Peninsula of Michigan (NLP). As such, land managers would benefit from information on the amount, distribution, and quality of potential wolf habitat in this region. We estimated that 2,198-4,231 km² of favorable wolf habitat exist in the NLP, supporting an

estimated population of 40-105 wolves. Favorable habitat was fragmented by road networks and was predominantly located in the northeastern part of the state on private land. We discuss the management of wolves in the NLP as a case study of wolf recolonization in a landscape that has a relatively high road density and agricultural lands that likely will be sources of conflict with wolves. We provide a hierarchical model for consideration in proactively managing landscapes that already or likely will contain several carnivore species concomitant with human land use. We suggest that this case study and our hierarchical model offer insight into how proactive land management should occur for wolves and other carnivores in the northern Great Lakes Region and other human-altered landscapes.

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