The National Wild Pheasant Conservation Plan

Key Literature:
Federal Farm Bill effects on pheasant habitat, abundance, and demographics

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Note: The literature cited below represents a subset of the information used when making pheasant management decisions related to this topic. It is intended to provide a general sense of the primary research available on the subject, but is not comprehensive. Other information on the topic may also be available in books and technical bulletins that do not lend themselves well to this form of summarization. The list will be periodically updated upon request by National Wild Pheasant Technical Committee members.

Bartmann, R. M. 1969. Pheasant nesting on soil bank land in northern Utah. Journal of Wildlife Management 33:1020-1023.

Abstract: Pheasant (*Phasianus colchicus*) nesting use of soil bank land was observed on a 37719-acre dryland study area in northern Utah during 1964 and 1965. A projected 85 percent of all successful nests were produced on 43 percent of the area retired under the Conservation Reserve Program of the Soil Bank. Absence of nests both years on sample plots in grainfields suggests low nesting use of this type which, together with summer fallow, comprised 41 percent of the area. Recommendations for future land retirement programs in similar dryland situations include early developing plant species and provision for residual cover carry-over for early nesting, long-term contracts, and emphasis within established pheasant range.

Best, L. B., H. Campa, III, K. E. Kemp, R. J. Robel, M. R. Ryan, J. A. Savidge, H. P. Weeks, Jr., and S. R. Winterstein. 1997. Bird abundance and nesting in CRP fields and cropland in the Midwest: a regional approach. Wildlife Society Bulletin 25:864–877.

Abstract: We compared the abundance and nesting success of avian species in Conservation Reserve Program (CRP) fields during the summer with that in rowcrop fields over 5 years (1991-1995) for 6 midwestern states (Ind., Ia., Kans., Mich., Mo., and Nebr.). Field techniques were standardized in all states. CRP fields consisted of either perennial introduced grasses and legumes (CP1) or perennial native grasses (CP2), and the plant species seeded in CRP fields differed within and among the states. Disturbances to CRP fields included mowing (partial or complete), application of herbicides, and burning. The height, vertical density, and canopy coverage of vegetation in CRP fields were measured in each state; values for these measurements were particularly low in Kansas. Mean annual total bird abundance in CRP fields ranged from 4.9 to 29.3 birds/km of transect. The most abundant species on CRP fields differed among states but included red-winged blackbirds (*Agelaius phoeniceus*), grasshopper sparrows (*Ammodramus savannarum*), and dickcissels (*Spiza americana*). Although the total number of bird species was similar in CRP and rowcrop fields across the region, bird abundance was 1.4-10.5 times

greater in the former. Nests of 33 bird species were found in CRP fields compared with only 10 species in rowcrop fields, and the number of nests found was 13.5 times greater in CRP fields. Nest success in CRP fields was 40°/O overall; predation was the greatest cause of nest failure. Long-term farm set-aside programs that establish perennial grass cover, such as the CRP, seem to provide many benefits for grassland birds, including several species for which conservation is a great concern.

Doxon, E. D., and J. P. Carroll. 2010. Feeding ecology of ring-necked pheasant and northern bobwhite chicks in Conservation Reserve Program fields. Journal of Wildlife Management 74:249-256.

Abstract: Gamebird chick survival is dependent on invertebrate availability, and the ability to access insect prey is an important characteristic defining brood habitat quality. Different mixes of warm-season grasses and forbs were established to improve the habitat quality of fields enrolled in the Conservation Reserve Program (CRP) for gamebirds in the Southern Plains. We analyzed the feeding ecology of human-imprinted, 4- to 10-day-old ring-necked pheasant (*Phasianus colchicus*) and northern bobwhite (*Colinus virginianus*) chicks in wheat fields and 4 types of conservation practices (CP) fields enrolled in CRP (CP10, improved CP10, CP2, and CP25) in western Kansas, USA, during June and July, 2004 and 2005. Foraging rates were greatest for bobwhite chicks in improved CP10 and CP25 fields and greatest for pheasant chicks in CP10 and CP25 fields. Vegetation characteristics such as bare ground cover appear to have a significant impact on insect selection, because the diet was more diverse for both species in fields with more bare ground. The CP25 fields provided the best combination of mobility and diet breadth for both species. Although herbicide-treated wheat fields had low feeding rates, we determined non-herbicide-treated fields (i.e., weedy wheat) provided easy mobility and feeding rates similar to CRP fields. We suggest that management of vegetation to benefit gamebirds does not affect species equally. Feeding rates of bobwhite chicks were sensitive to vegetation-influenced mobility. Management of CRP fields for both pheasant and bobwhite chicks can be reconciled by practices that permit more open space at ground level, such as light disking or burning, to permit easier movement for chicks.

Erickson, R. E., and J. E. Wiebe. 1973. Pheasants, economics and land retirement programs in South Dakota. Wildlife Society Bulletin 1:22-27.

Abstract: During the era of the Soil Bank program in South Dakota, numbers of nonresident pheasant hunters were correlated significantly with pheasant populations, which in turn were correlated significantly with acres of cropland retired in vegetative cover. Applying the same relationships, a potential increase in nonresident pheasant hunters would result in additional expenditures in excess of $10 million annually if approximately one half of South Dakota's current (1971) 3.4 million acres of retired croplands contained vegetative cover similar to that occurring during the Soil Bank program. At present, no cover exists on most of these 3.4 million acres.

Gates, J. M., and G. E. Ostrom. 1966. Feed grain program related to pheasant production in Wisconsin. Journal of Wildlife Management 30:612-617.

Abstract: A pheasant (*Phasianus colchicus*) nesting study was conducted on 12 square miles of intensively farmed land in east-central Wisconsin during 1961-64. Under the Government Feed Grain Program during this period, 4.3 percent of the area was retired from agricultural production, of which

about half was occupied by cover types suitable for pheasant nesting. At least a 10-percent increase in pheasant production could be attributed to the Program. Nest densities and hatching success on Program lands equaled or exceeded those in other cover types. On the average, 17 percent of the area's successful nests were located in retired cropland. To improve pheasant production on such lands, it is recommended (1) that quantity and quality of nesting cover be increased; (2) that clipping be delayed until after mid-July and only necessary clipping be done; and (3) that longer-term contracts for land retirement be provided.

Haroldson, K. J., R. O. Kimmel, M. R. Riggs, and A. H. Berner. 2006. Association of ring-necked pheasant, gray partridge, and meadowlark abundance to Conservation Reserve Program grasslands. Journal of Wildlife Management 70:1276–1284.

Abstract: Wildlife managers and farm program administrators need information on how much habitat grassland birds need to support or expand their populations. We quantified the relationships between the amount of Conservation Reserve Program (CRP) habitat in 15 agricultural landscapes and relative abundance of ring-necked pheasants (*Phasianus colchicus*), gray partridge (*Perdix perdix*), and meadowlarks (*Sturnella* spp.) in south-central Minnesota, USA, over a 10-year CRP enrollment cycle. For each 10% increase of grass in the landscape, pheasant survey counts increased by an average of 12.4 birds per route in spring and by 32.9 birds per route in summer. Pheasant indices also varied by year, and the magnitude of year effects were equivalent to a change in grass abundance of 26-36%. Regardless of the amount of grass habitat available, partridge indices in our study declined dramatically from a peak in 1990 to a low in 1994-1995. Meadowlark indices increased by an average of 11.7 birds per route in summer for each 10% increase of grass in the landscape, while indices simultaneously declined from 1990 to 1998. Our results indicate that conversion of cropland to CRP grassland in intensively cultivated landscapes is associated with higher population indices of pheasants and meadowlarks, but not partridge. Managers should assess the success of habitat programs over periods of >5 years because population indices may fluctuate dramatically over time with little apparent change in habitat abundance.

Matthews, T. W., J. S. Taylor, and L. A. Powell. 2012. Mid-contract management of Conservation Reserve Program grasslands provides benefits for ring-necked pheasant nest and brood survival. Journal of Wildlife Management 76(8):1643-1652.

Abstract: Conservation Reserve Program (CRP) fields may provide good habitat for nesting and brood rearing ring-necked pheasants (*Phasianus colchicus*) during early stages of succession. But, the success of hens in early successional CRP, relative to late successional CRP and other grassland habitats, has yet to be evaluated. The reproductive period is especially critical for populations of pheasants, and CRP's benefits to hens and chicks may decrease as fields age because of loss of vegetative diversity, decrease in vegetation density, and accumulation of residual litter. During 2005-2006, we evaluated spatial and temporal variation in nest and brood survival for radio-marked hen pheasants in areas of northeastern Nebraska where portions of CRP fields had been recently disced and interseeded (DICRP) with legumes. Nests in DICRP tended to have a higher daily survival rate (0.984; 95% CI: 0.957-0.994) than nests in grasslands (including CRP) that were unmanaged (0.951; 95% CI: 0.941-0.972). The probability of 23-day nest success was 0.696 (95% CI: 0.631-0.762) for DICRP and 0.314 (95% CI: 0.240-0.389) for unmanaged grasslands. Daily brood survival rates varied by habitat type, brood age, and date of hatch. The probability of a brood surviving to day 21 was 0.710 (95% CI: 0.610-0.856). Brood survival rates

increased with time spent in DICRP and as the brood aged. Survival decreased as broods spent more time in cropland and peaked seasonally with broods that hatched on 15 June. Brood survival probability, to 21 days, would be reduced to 0.36 (95% CI: 0.100-0.701) if broods in our sample had not used DICRP. We combined nest and brood survival in a productivity model that suggested 2,000 hens, in a landscape with no DICRP, would produce 1,826 chicks, whereas the same hens in a landscape of 100% DICRP would produce 5,398 chicks. Production of first-year roosters more than doubled when hens nested in DICRP. Without DICRP, population growth rates of pheasant populations usually declined; with DICRP, populations stabilized with an annual survival rates of 0.3 or greater. The positive response of nest and brood survival to discing and interseeding CRP provides further evidence that CRP fields must be managed to optimize wildlife benefits.

Matthews, T. W., J. S. Taylor, and L. A. Powell. 2012. Ring-necked pheasant hens select managed Conservation Reserve Program grasslands for nesting and brood-rearing. Journal of Wildlife Management 76:1653-1660.

Abstract: The Conservation Reserve Program (CRP) has provided critical wildlife habitat for many species since 1985. However, the quality of this habitat for early successional species, such as ring-necked pheasant (*Phasianus colchicus*), may decrease with field age. Late successional grasslands may lack valuable vegetative and structural diversity needed by pheasants, especially during nesting and brood-rearing stages. Since 2004, the United States Department of Agriculture has required new CRP contracts to include plans for mid-contract management, which could include discing and interseeding. The benefits of such practices have not been assessed, and continuation of current policy could be affected by the lack of information to support such practices. During 2005-2006 we evaluated nesting and brood-rearing habitat used by radio marked hen pheasants in areas of northeastern Nebraska where portions of CRP fields had been recently disced and interseeded with legumes. Pheasant hens selected managed portions of CRP fields for both nesting and brood-rearing. Hens selected nest sites with greater forb cover and vertical density. Hens with broods also selected sites with greater forb composition. Discing and legume interseeding appeared to be an effective strategy for increasing pheasant use of CRP fields.

Nielson, R. M., L. L. McDonald, J. P. Sullivan, C. Burgess, D. S. Johnson, D. H. Johnson, S. Bucholtz, S. Hyberg, and S. Howlin. 2008. Estimating the response of ring-necked pheasants (*Phasianus colchicus*) to the Conservation Reserve Program. Auk 125:434-444.

Abstract: We evaluated associations between the Conservation Reserve Program (CRP) and Ring-necked Pheasant (*Phasianus colchicus*) populations by modeling Breeding Bird Survey (BBS) counts of Ring-necked Pheasants during 1987–2005 along 388 routes in nine states. Ring-necked Pheasant counts were analyzed as overdispersed Poisson counts in a Bayesian hierarchical model estimated with Markov-chain Monte Carlo methods. This approach allowed for simultaneous estimation of the relationships between BBS counts and various habitat types, including CRP habitat types, for multiple regions and across the entire study area. The predictor variables included at a time trend and percentages of major National Land Cover Dataset 1992 and CRP habitat types within a 1,000-m buffer around each route, along with other patch metrics. The deviance information criterion was used as a guide to help identify the most parsimonious model. We estimated that, on average, there was a positive association of Ring-necked Pheasant counts with the amount of CRP herbaceous vegetation within a 1,000-m buffer around a route. The analysis can be repeated periodically to model changes in Ring-necked Pheasant populations

associated with new CRP enrollments and expiration of existing CRP contracts on a large scale. Our methodology can also be extended to other species and to other states and regions.

Riley, T. Z. 1995. Association of the Conservation Reserve Program with ring-necked pheasant survey counts in Iowa. Wildlife Society Bulletin 23: 386-390.

Abstract: More than 880,000 ha of Iowa farmland were enrolled in the Conservation Reserve Program (CRP) from 1986-1991. I evaluated the relationship between CRP enrollment and ring-necked pheasants (*Phasianus colchicus*) in Iowa and how cropland and weather affected that relationship. Six percent of the land area in Iowa was enrolled in the CRP between 1986 and 1991. Pheasant numbers in Iowa increased 30% during the first 5 years of the CRP compared to a similar period before the program began ($P = 0.026$). Numbers increased 34% ($P < 0.018$) in counties with >70% cropland and 26% ($P = 0.12$) in counties with 50-70% cropland. I did not detect increases in pheasant numbers in counties with <50% cropland ($P > 0.71$). Pheasant numbers were positively related to the CRP, but this function was also influenced by percent cropland and cumulative snowfall.

Rodgers, R. D. 1999. Why haven't pheasant populations in western Kansas increased with CRP? Wildlife Society Bulletin 27:654–665.

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