The National Wild Pheasant Conservation Plan

Pheasant Habitat Management Recommendations for Winter Cover

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Winter Cover Management

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Status

Although long-term trends in pheasant abundance are largely determined by the availability of preferred grassland or agricultural habitats, the presence of appropriate cover types can influence how local or regional pheasant populations respond to severe winter weather. Though the specific composition of this cover varies considerably across North America, cattails, shrub carr, shelter-belts, dense herbaceous vegetation, food plots, brushy woodland edges or fencerows, pine plantations, and sage brush have all been mentioned as providing effective winter cover for pheasants. Even in landscapes where it comprises a small portion of the available habitat, this cover can significantly improve survival during periods of deep snow and cold. Across most of their range in North America, pheasants show little selection for these cover types during other seasons, although Leif (2005) found that male pheasants preferred, but did not require, woody cover during the breeding season. The vertical structure of various winter cover types, their dispersion on the landscape, and their spatial arrangement with respect to summer nesting areas and winter food sources should all be considered by biologists and managers interested in increasing winter survival and pheasant production by promoting specific cover types.

Importance of Winter Cover

As a popular game species, the ring-necked pheasant has received significant attention regarding the factors which affect long-term population trends. Most work has focused on the availability and quality of nesting and brood-rearing habitat, but numerous studies reveal that deep snow and cold temperatures during severe winters can negatively impact survival in the absence of protective cover. For example, Homan et al. (2000) noted that pheasant survival during winter increased 6% with each 1◦C increase in mean weekly maximum temperature, and declined 8% with each 2.5cm increase in snow depth. While this cover can take many forms, in upland areas woody cover types may provide the only protective or thermal cover available.

In early winter, with little snow and moderate temperatures, pheasants may select a variety of habitats but generally prefer dense herbaceous vegetation. Depending on the availability and distribution of these habitats, pheasants may remain widely dispersed throughout the landscape, utilizing erect stands of cool- or warm-season grasses or rank stands of broad-leaved plants for both feeding and roosting cover. In mild winters, pheasants may remain in these habitats throughout the winter season. The ability of these habitats to provide adequate cover, however, will decline with increasing snow depth as less residual cover remains available (Homan et al. 2000). As snow accumulates, herbaceous cover may become obscured or unavailable, necessitating pheasant movement to habitats that continue to provide protection from the weather. In North Dakota, pheasants remained in or near nesting areas in grassland habitats during mild winters, moving to emergent wetland cover (cattail marshes) in years when preferred grasslands were covered in snow. Pheasants only utilized available woody shelterbelts under very extreme conditions when large emergent wetlands were buried in snow (Homan et al. 2000). In this study, woody habitats were considered "emergency cover," and were only utilized when nothing else was available. The selection of winter habitat therefore appears to be sequential and dependent upon snow depth, with pheasants moving from preferred upland grass/forb-dominated cover to dense cattail-dominated wetlands to woody habitats as snow depth increases, dependent upon the relative availability of each cover type (Homan et al. 2000, Lyon 1954).

Grondahl (1953) recorded specific thresholds at which pheasants actively sought out winter cover; at temperatures below -6.7◦C, wind speeds >16 km/hr, and snow depths >15.2 cm, the use of shelterbelts increased. These thresholds may vary depending upon region and availability of various cover types on the landscape. Such movements may lead to higher concentrations of pheasants in available patches of winter cover. Gates and Hale (1974) reported increased pheasant movement to both cattail and shrub carr habitats as snow depths increased on their Wisconsin study area throughout winter.

Though not preferred by pheasants during most of the year, quality winter cover of appropriate structure can lead to increased survival during extreme winter weather events. Gabbert et al. (1999) monitored pheasants during the second-most severe winter on record in South Dakota (1996-97) and found surviving pheasants utilized food plot and shelterbelt habitats containing conifers and dense underbrush almost exclusively during late winter. Within the context of this study, shelterbelts were considered "essential" to pheasant survival in South Dakota during extreme winter weather. In addition, Kimball (1948) used existing weather data to predict that, on average, pheasants face severe winter mortality in South Dakota one year out of six. Conversely, no relation was found between pheasant survival during a winter weather-induced pheasant decline in east-central Illinois (Warner and David 1982) and the abundance, growth form, or landscape configuration of linear woody vegetation established as windbreaks. The latter authors state, however, that "survival of pheasants may have been enhanced if multiple-row plantings of conifers and other dense tracts of timber were common on the landscape" (Warner and David 1982), suggesting that the narrow linear belts of timber present on their study area did not provide sufficient cover to reduce winter mortality. As a generalization, it is appropriate to suggest that winter cover can be an important component of quality pheasant habitat in regions prone to periodic severe winter weather, leading to increased survival and buffering the population against sharp declines during severe winter weather.

The benefits of improved winter pheasant survival concurrent with cover development may also translate into expanded hunting opportunities. Lyon (1961) collected information from hunters in Colorado on areas with varying amounts of woody cover (planted shelterbelts), and found more birds were killed with less effort where woody plantings were present. Additionally, planting shelterbelts in

this area proved to be a more cost-effective means of increasing hunter opportunity than releasing pen-reared birds.

Design and Structure of Winter Cover

Winter habitats selected by pheasants exhibit significant variation in type and species composition, but the underlying feature of quality winter habitat as described in the literature is its ability to provide protective and thermal cover. Structure is likely a much more important determinant of a habitat's utility as winter cover than is species composition. Although a variety of cover types may provide benefit to pheasants during winter, managers can minimize the impact of winter weather on pheasant population dynamics through the thoughtful development of local types most likely to reduce weather-related mortality during severe winter weather.

In general, the type of winter cover developed will be constrained by site conditions, with wetland restoration or enhancement possible in areas with hydric soils, and woody cover development the most effective option in upland areas. Shallow wetland basins can most effectively provide winter cover for pheasants if dense stands of emergent vegetation (cattails, shrubs) are allowed to develop (Homan et al. 2000). However, wetland management efforts often include cattail control in order to prevent monocultures of emergent vegetation from developing and to produce an intermixture of open water and emergent vegetation that maximizes diversity (Mitsch and Gosselink 1993). Man-agers must therefore weigh the relative costs and benefits of managing wetlands strictly as pheasant winter cover as opposed to other possible wildlife- or ecosystem-related goals. Trees that pro-vide raptor perches in and immediately around these wetlands should be removed to minimize winter predation losses. This is especially important given that pheasants may be concentrated in these areas during severe winters. For example, Gabbert et al. (1999) noted that increased pheasant mortality during an especially harsh winter in South Dakota was primarily due to predation; mortality due directly to weather did not differ between this and a milder winter.

Patches of woody cover consisting of large deciduous or coniferous trees generally have little value as winter cover unless they possess a well-developed understory. Shrubby areas along the edge of woodlands or wetlands can provide an important winter refuge for pheasants, particularly if in close proximity to an adequate food source. Livestock grazing, if intense enough to thin the under-story, can reduce the quality of winter cover and should be limited where pheasant production is a goal (Leptich 1992). Pheasants concentrating in woody cover during winter may also be more susceptible to increased predation rates if predator perches or wooded corridors are present. Dense woody cover that provides concealment and protection near the ground (15-200cm in height) is preferable to taller and/or more open types of woody cover.

Developing woody cover as a means of improving pheasant survival requires attention to the resulting physical structure of the patch and consideration of how it will function as protective and thermal cover. Biologists and managers should also take into consideration that the development of adequate woody cover may take 5-15 years following establishment, depending upon the species selected, and will need to determine which native species are best suited to the climate, topography, and soil types in their area.

Optimal woody cover or shelterbelt development in a traditional sense consists of a mixture of conifers and shrubs, often oriented perpendicular to the direction of prevailing winds. At least 2 rows of shrubs should be planted on the windward side to catch the blowing and drifting snow, with multiple rows of conifers on the leeward side. Optionally, a mixture of shrub species in a wide (10-30ft) band may be

planted on the leeward side of the conifers. The shelterbelt should be wide enough to capture snow yet continue to provide residual cover for pheasants (whereas narrow strips consisting of only one or two rows of conifers can more readily become buried by wind-driven snow). Shrub species that spread by rhizomes will produce high stem densities, contributing to the value of the patch as protective cover, and those that either retain fruit (berries or nuts) through winter or produce catkins in late winter will provide pheasants with a winter food source. Conifer species that retain needles and lower branches (e.g., white spruce) will provide greater protection from weather and predators. Consideration of shelterbelt design prior to planting can help ensure benefits to wintering pheasants are maximized, especially in particularly harsh winters.

Winter Cover Recommendations and Opportunities

As important as the presence and composition of winter cover to pheasants during severe winters, is its spatial arrangement relative to other important habitat types on the landscape. High interspersion of grassland nesting cover, winter cover, and food resources increases the likelihood that each may be found within a given pheasant home range, and decreases the distance pheasants need to move in search of resources. Winter movements are energetically costly, and may increase mortality risk. In Wisconsin, pheasants which survived until spring moved less and had smaller home ranges than those which were depredated (Gatti et al. 1989).

The closer winter cover can be placed relative to grassland nesting areas and winter food sources, the better. Numerous telemetry studies reveal that most pheasants move less than a mile between summer nesting habitats and winter cover, with very few moving greater than two miles. This in-formation allows winter cover to be distributed so as to ensure it is available to all birds present on the landscape. Wintering areas should be developed within one, or at the most two, miles of occupied nesting habitat, and no more than three miles from each other. Recommended upland winter cover in Minnesota consists of three acres of woody cover (conifers and shrubs) planted in association with 10 acres of dense herbaceous cover and a two-acre food plot. Establishment of cover near a food source also will minimize both energetic costs and predation risk associated with movement and foraging.
The development of woody cover in landscapes with large blocks of contiguous grassland will result in fragmentation and increase the amount of edge habitat present. This may negatively impact area-sensitive species (e.g., bobolink, grasshopper sparrow) and lead to increased use of the area by woodland-adapted predators (e.g., raccoon, opossum). Such effects should be considered prior to the development of woody cover in grassland landscapes. Increasing edge density has also been associated with increased pheasant mortality in certain landscapes (Schmitz and Clark 1999).

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