



Grouse Management

BEST PRACTICES

Young forest habitat is extremely important to an entire suite of wildlife species in decline. Ruffed grouse are rapidly declining throughout most of the Eastern US, due to aging forests and West Nile Virus. Fortunately, there is evidence that grouse populations can bounce back more quickly from disease losses where habitat is high-quality and highly-abundant. This guide will aid land managers in promoting young forest habitats for ruffed grouse. Following these basic principles will also enhance the management area for deer, bear, turkey, and a variety of declining songbirds and mammals that rely on young forest.

DECIDING WHERE TO IMPLEMENT GROUSE HABITAT MANAGEMENT

The Grouse Priority Area Siting Tool (G-PAST) identifies locations where ruffed grouse can quickly take advantage of habitat creation, based on landscape variables and nearby source populations.

G-PAST identifies sites where disease risk is LOW, and probability of grouse benefit is HIGH. The tool highlights sites where grouse populations are more likely to be buffered from disease, resilient to change and have higher likelihood of persistence.

View the G-PAST tool here: <https://www.arcgis.com/apps/webappviewer/index.html?id=237e6893b2664b2cb23641d7a5e41d18>

If you have trouble viewing the tool online, consult with the Wildlife Diversity Biologist at the Game Commission region office that serves the county where the land is located. They can assist you in identifying high priority grouse restoration sites. Using G-PAST you can identify areas that have priority landscapes for grouse.

- Zooming in shows specific sites identified as Priority 1, Priority 2 and Priority 3 based on disease risk factors. Priority 3 are 'Good' areas; Priority 2 represent 'Better' areas, and Priority 1 are 'Best' areas for making habitat investments.
- Grouse-focused work completed outside of Priority 1, 2 or 3 areas is unlikely to sustain grouse presence over the long term, unless there are very abundant grouse source populations nearby. Note that young forest restoration work in these areas still provides benefit to other species requiring this habitat.



Jacob Dingel

- The landscape variables included in G-PAST may also inform habitat siting for species where elevation is an important factor in their occurrence (ex. Golden-Winged warbler, Eastern woodrat, Appalachian cottontail, Snowshoe hare).

HABITAT MANAGEMENT TECHNIQUES

Ruffed grouse have different habitat needs in each season of the year. Essential habitat components include drumming cover, brood cover, and nesting cover. Creating a variety of age classes inter-mixed together is the goal of grouse habitat management at the landscape scale. Creating an area that provides food and cover close together is the goal of grouse habitat management at the site scale.

Drumming Cover

Stand Type: forest stand ages 5 to 20 years

Desired Site Condition: Dense areas of shrubs or saplings with canopy height of 5 to 10 feet are heavily used by drumming males and non-reproductive females. These stands can also be important winter cover.

Drumming logs: 12-18" off ground and surrounded by dense small-diameter sapling or shrub cover. Drumming logs should be greater than 13 inches diameter and 20+ feet long.

- Optimum placement of drumming areas is within 125 yards of brood foraging habitats (i.e., herbaceous areas) and/or nesting habitat (medium to large sawtimber stands).
- Leave drumming logs in stand at a rate of 1 to 2 trees/acre. Retain enough residual trees in the stand that a few will fall (or can be felled) over time so that drumming logs are available up to 15 years post-harvest. Drumming logs situated upslope of linear corridors (forest roads, retired and seeded haul roads or log landings, streams, edges of clearings) are highly used by grouse.

Forest Stand: 5 to 20-year-old stands with dense vertical cover

- In Pennsylvania's longest-running habitat management study, males used sites with 3,000 stems/acre as active drumming sites.
- Stands with a dense seedling-sapling structure and/or a well-developed tall shrub layer are optimum.
- Scrub oak stands provide excellent drumming cover.
- High elevation barrens can also make excellent grouse habitat if shrubs/saplings are available within the barrens or along perimeter.

Landscape Goal: 10 to 15% of early successional habitat (0 to 20-year stand age and <20 ft²/acre Residual Basal Area (RBA) adjoining nesting and/or brood areas.

Brood Cover

Stand type: diverse forbs + high stem density in 0 to 5-year-old stands, AND/OR herbaceous clearings that include protective cover (shrubs, brambles, coarse woody debris) along edges, AND/OR canopy gaps in older stands with herbaceous component and protective cover along edges, AND/OR herbaceous/shrub/sapling mosaics created by prescribed fire.



Drumming areas provide grouse with overhead protective cover plus visibility and ease of movement at ground level.

Desired Site Condition: Dense and diverse forb cover (NOT grass) that is more than 6" tall, inter-mixed in areas of high seedling/sapling or shrub thickets.

- In Pennsylvania's longest-running habitat management study, sites used by females with broods averaged >8,500 stems/acre.
- Mixed forbs and legumes are most desirable in the herbaceous cover. NO brood use occurs in areas of dense cool season grasses (orchard grass, fescue).
- Brood hens seek out patches of *rubus* species (blackberry, raspberry) and will make heavy use of brood cover near these bramble thickets because of the protective cover for chicks.
- Brood hens do not use areas with low coarse-woody debris available on site or with low forb cover. Coarse woody debris should be available on more than 40% of site and forb cover should make up more than 60% of site.
- Retired haul roads or log landings can be planted with 50 lbs./acre of wheat (if planting in fall) or oats (if planting in spring, summer), 8 lbs./acre of crimson clover, 2 to 4 lbs./acre of white or ladino clover, and 2 lbs./acre of trefoil (or a comparable high-protein mix containing legumes). Allow brambles, shrubs and saplings to grow along the edges of haul roads to serve as protective cover.

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- Shrub thickets are appropriate but avoid shrub thickets so dense that they shade out ground cover (shrub rows or patchy clumps within herbaceous openings are desirable).
- Beware of West Nile Virus potential and avoid creating brood habitat near areas of stagnant water to limit potential for mosquitos. Likewise, avoid creating ruts and low spots that hold stagnant water in areas being managed for broods.
- Prescribed fire can create and maintain brood foraging areas by enhancing herbaceous cover in a stand and creating a desirable mosaic of shrub/sapling/clearings within a forest. However, annual burning has exhibited negative effects on species that nest on the ground.



Diverse forb and shrub cover promotes diverse and abundant insect populations – the sole food source for young grouse chicks.



Retired haul roads planted with protein-rich forbs and adjacent escape cover make excellent brood foraging areas.

- There is concern that frequent fire return intervals may inhibit population growth in areas where nesting and brood habitat is limited. To minimize negative impacts to ground-nesting birds and broods, burns should not be conducted after May 1 unless necessary, and sites should not be burned too frequently.
- In landscapes where young forest or brood cover is extremely limited, the benefits of a late spring burn may outweigh the potential grouse brood mortality. Consult with the Wildlife Diversity Biologist at the Game Commission region office that serves the county where the land is located when considering late spring burns.

Landscape: High quality brood habitat should be located near high-quality nesting habitat (i.e. medium to large sawtimber stands). Brood survival is somewhat higher near roadways, linear edges and forest clearings. Broods often forage within 50 yards of a forest edge.

Nesting Cover

Stand Type: Small and Large Sawtimber size classes near edges and openings AND/OR harvested stands with residual trees and abundant coarse-woody debris left on site

Desired Site Condition: Grouse generally nest in older forest stands with a relatively open understory, often adjoining sapling and/or brood areas. Grouse will nest in sapling stands as long as abundant large-diameter (>6") coarse debris is left in the stand.

- In general, the more coarse-woody debris that is left on site the better for nesting and brood-rearing grouse. Too little coarse woody debris will force hens to nest in exposed locations that are highly-vulnerable to predation.
- If you'd rather walk 2 miles around it than ½ mile through it, that's about right for a nesting or brood area. You want predators to have a tough time traveling through the site, because a high number of voids to search means predator search efficiency is lowered.

Forest Stand: Nesting often occurs in small and large sawtimber stands with average basal area of 100 ft²/acre. If standing trees will be limited in the post-harvest stand, then coarse debris (>6" diam.) should be left in over ~20% of the stand.



Nests often occur in sawtimber-sized stands with relatively open understories that enable the hen to see approaching predators. Often a large tree is used as a backstop, or nests will be placed under downed logs that provide the ability to flush from either side.



Temporary shallow pools with grassy margins and bottoms are highly-productive mosquito breeding areas.

Landscape: Nesting habitat is not limiting for ruffed grouse, though coarse woody debris (stems, large branches) on the ground is often limiting. Management planning should focus on placing drumming and brood cover near nesting areas. Nest success is higher in nests that are within a couple hundred feet of roads, retired haul roads/log landings and other forest openings.

Thermal Cover

Conifers can be an important component of grouse winter habitats, especially in Pennsylvania where the 8+ inches of deep powder necessary for “snow roosting” is not assured, and where freezing rain is common.

- Dense clumps of young conifers reduce exposure to rain and wind and thermal radiation loss.
- As conifer stands mature, self-prune, and shade out understory plants, the structure of the stand becomes more simplified and wildlife value declines.

Water Management

WATCH FOR and DO NOT create production areas for *Culex restuans*, the mosquito vector of West Nile Virus.

- Address site reclamation and ensure surface water drainage.
- Ensure water drains well from haul roads, roadside berms, food plots, parking areas.
- Eliminate wet low spots, equipment ruts, mud puddles and shallow areas of submerged grass that persist or routinely re-fill during June through August.
- Natural wetlands and springtime vernal pools ARE NOT a WNV-risk because they support predator communities.



Small stagnant water bodies produce abundant mosquitoes because they lack aquatic predators.

Do not allow heavy equipment ruts to remain on site after habitat management or timber harvest operations.



Aspen Management

Actively regenerate aspen stands at all opportunities. Where deer browse pressure is high, protect regenerating aspen with deer fencing or by leaving abundant stems/coarse-woody debris in stand to inhibit deer movement through the site.

Forest Edge Management: Patchy borders of high-protein forbs and escape cover (shrubs) provide critical protection and produce food in all seasons

- Improve forest edges by dropping the tallest trees within a 50 to 100 ft perimeter around forest openings, pipelines, food plots, etc. The smaller trees and understory remaining will create a “feathered edge” that provides high-quality protective cover for nesting hens and broods.
- Allow this perimeter to fill in with a patchy mosaic of shrubs and forbs.
- If dropping is not feasible, create high-quality edges by not mowing herbaceous openings within 50 to 100 ft of the forest edge.



Harvested aspen stands regenerate with high stem densities favorable for grouse habitat, and aspen provides grouse food in every season.

Grouse Food Management: When preparing a stand for harvest, retain understory and mid-story diversity in the stand so there are productive food sources in all seasons. Focus on species that produce high-value fruits and buds in late winter/early spring prior to green up.

- Critically-important late winter food plants (buds, seed, twigs, dried fruit) include: grape, aspen, cherry, blueberry/huckleberry, oak, greenbrier, hornbeam, viburnum, serviceberry.

- Evergreen herbaceous plants, such as clump ferns, are extremely important winter grouse foods.
- Contact the Wildlife Diversity Biologist at the Game Commission region office that serves the county where the land is located for a detailed list of important late-winter grouse foods in your region.

The invasive spotted-wing fruit fly (*Drosophila suzukii*) is attracted to large patches of single-species fruit producers (such as *Rubus*). This fly damages many important late-winter foods used by grouse. Planning for this now should pay off as this invader becomes more common and more destructive.

- Manage for diversity in soft mast species. The fruit fly appears to be less-damaging in a thicket made up of diverse fruit producers.
- Soft-mast species resistant to the fruit fly which may be worth planting or enhancing in your work area include crabapple, hawthorn, sumac, cranberry, and partridgeberry.

Powerline and Pipeline Management: Consider patch cutting along pipeline/powerline corridors to create multiple pockets of young forest connected by the linear corridor.

- Young forest patches of up to 20 to 50 acres, in different age classes and scattered along the length of linear corridors, will be less vulnerable to predation than a long continuous shrubby edge that lines the corridor.
- Grouse are ‘edge species’ only by hardship: A sizeable patch of habitat is always better than a long thin stretch of habitat.

Commercial Habitat Management: Increasing the proportion of young forest in and near areas where grouse occur is more important than any other factor for grouse at this time.

- Consult with a local consulting forester to see how you can assist in the process of creating more young forest.
- The National Grouse Management Plan (2008) defined optimum grouse management RBA in both aspen and oak systems:
 - ◊ **Aspen-birch forests:** if residual trees are to be retained in clearcut patches, residual basal area should be < 10 to 15 sq. ft./acre and residual trees should be clumped.

- ◊ **Oak- or maple-dominated or other moderately shade-intolerant forests:** If residual trees are to be retained in clearcut patches, residual basal area should be < 25 sq. ft./acre and residual trees should be clumped.
- ◊ **Appalachian oak forests:** Maintain a mosaic of young stands (< 20 years old) well-interspersed with mature stands (> 40 years old) to provide both protective cover and a source of hard mast.

Additional recommendations from the National Grouse Plan (2006):

- If deer browse can be limited, promote multiple small-patch habitats (10+ acres) in areas with abundant grouse habitat nearby, or as protective corridors between larger habitat patches. Note that high deer numbers will quickly consume regenerating trees in these small patches.
- Large-patch habitats are beneficial in landscapes where small-diameter forest is both rare and isolated or where ungulate browsing may hinder the survival of regenerating stems.
- Distribute habitat patches spatially so that food sources and important protective habitats are near one another or are connected by corridors/small patches of adequate protective cover.
- Focus land management in oak-hickory forests on creating interspersed nest and brood habitat to increase chick survival and recruitment.
- Shelterwood, clearcut with reserves and/or group selection treatments can improve the amount of hard mast production and the interspersed of adult escape cover and food resources.
- In mixed-mesic forest types, traditional clearcut treatments/overstory removal is recommended.

Other Considerations:

- Some areas may require longer term prep work to be ready for commercial timber operations (ex. prescribed fire, crop tree release, thinning, TSI, that retain >20 ft²/acre RBA). If this is the case in areas that have minimal early successional habitat and remaining grouse populations, work with a local consulting forester to identify potential smaller areas that could immediately be harvested to create grouse habitat. These 'life rafts' are important for holding grouse in an area until final harvest occurs in the prepped stands.
- Low value or degraded stands may provide

opportunities to create the 'life rafts' described above. Consult with a local consulting forester to see if such opportunities exist on your land. Small 'life raft' areas (< 50 acres) may need to be protected from deer browse by leaving abundant coarse-woody debris on the site, or fencing. Consult a local consulting forester for guidance.

- Even-aged management in stands dominated by aspen, birch, beech, red maple or other low-value species could carry grouse in an area until nearby commercial operations are feasible.
- Barrens, which may never be commercially viable stands, are also good candidates to increase early successional habitat. Barrens management is a specialized technique. Consult with Game Commission BWHM staff experienced in managing these sites.
- Improving grouse habitat within 1 to 2 miles of where grouse occur is likely to produce greatest results.

References

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