

SPECIES PROFILE

Ruffed Grouse

Bonasa umbellus

Federal Listing: Not listed

State Listing: Not listed

Global Ranking:

State Ranking:

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ELEMENT 1: DISTRIBUTION AND HABITAT

1.1 Habitat Description

The ruffed grouse uses deciduous and coniferous forests in both upland and wetland settings (DeGraaf et al. 1989). Ruffed grouse are early successional forest specialists. Grouse require four different cover types for drumming, brood rearing, nesting, and wintering. In general, they inhabit brushy, mixed-age woodlands, early successional to mature hardwood and mixed forests, often with aspen and birch as a component. Optimal habitat for ruffed grouse include young (6 to 15-year-old), even-age deciduous stands typically supporting 20-25,000 woody stems/ha (Gullion 1984). These habitats are available to grouse for approximately one decade because stem densities decrease rapidly through natural thinning as succession proceeds (Dessecker and McAuley 2001). Although commonly identified as an “edge” species, ruffed grouse association with habitat edges largely reflects their use of various interspersed forest habitats at different times of the year and their use of marginal habitats where quality habitat is lacking. They typically avoid hard-contrast edges (Dessecker and McAuley 2001).

Old orchards are an ideal fall habitat in New England (DeGraaf and Yamasaki 2001). Catkin-bearing trees are also an indicator of grouse habitat. They use logs or stone walls for drumming sites and dense cover for protection (Brooks and Birch 1988). Hens and

broods prefer areas with a dense understory and fairly open herbaceous ground cover. Grouse nest and feed in hardwood stands and dust themselves in sunny openings. Ruffed grouse use mature woodlands, especially coniferous forests, during winter. When snow is deep and soft, birds will roost in the snow. Otherwise they will roost on the ground or in trees.

1.2 Justification

Ruffed grouse are found throughout much of the eastern United States, yet are common only where extensive tracts of forest dominate the landscape (Dessecker and McAuley 2001). The decline, fragmentation, and isolation of early successional forest habitats may be limiting ruffed grouse recruitment and therefore population densities (Dessecker and McAuley 2001).

1.3 Protection and Regulatory Status

Hunting regulations protect ruffed grouse in New Hampshire.

1.4 Population and Habitat Distribution

The ruffed grouse is a year-round resident in New England. They are more common inland than along the seacoast (DeGraaf and Yamasaki 2001), generally at elevations below 3,000 ft. Development poses a significant threat to grouse habitat in the lower third of the state, but pockets of grouse habitat should persist there for the foreseeable future. The Western Highlands and northern two-thirds of the state continue to provide extensive grouse habitat. Continual harvesting of mature forests of the industrial timberlands of northern New Hampshire produce quality grouse habitat (Robinson 1994).

1.5 Town Distribution Map

Not completed for this species.

1.6 Habitat Map

Habitat conditions suitable for grouse are difficult to map using existing remotely sensed data (see Shrublands habitat profile, section 1.6).

1.7 Sources of Information

Two small game surveys are implemented annually. Small game sighting data are solicited from small game hunters and successful deer bow hunters, and these observations are used as an index of New Hampshire's small game species distribution and abundance. Ruffed grouse drumming routes have been run each spring since 1999. Two routes were established in each Wildlife Management Unit. These surveys are efficient at generating useful population data. Over time, survey results will provide invaluable trend data for management decision-making.

1.8 Extent and Quality of Data

Ruffed grouse have been studied and monitored since colonial times. With the implementation of these surveys in 1999, quality data exist on the relative abundance of these species.

1.9 Distribution Research

A better means of mapping grouse habitat is needed (see Shrublands habitat profile). An effort should be made to increase participation in the Small Game Survey to get better information on the abundance and distribution of grouse throughout the state.

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

Counties will be used as the conservation-planning unit for this habitat because that is the scale at which most information exists and because most technical and financial assistance (from the USDA NRCS, UNH Cooperative Extension, and others) is provided to private landowners by county.

2.2 Relative Health of the Population

Ruffed grouse populations naturally experience irregularly cyclical booms and crashes (Robinson 1994). Cyclical patterns aside, it is difficult to ascertain trends in the state's grouse population since drumming surveys just started in 1999. However, declines in early successional forest habitats and the isolation of these habitats in some landscapes may be limiting ruffed grouse recruitment and therefore population densities in some regions of the state (Dessecker and McAuley, 2001).

Forests in the northeastern United States were historically subject to several sources of disturbance (DeGraaf and Yamasaki 2003). Fire, wind, beaver (*Castor canadensis*), flooding, and Native American activity continually produced early successional forests (DeGraaf and Yamasaki 2003). Largely in response to forest maturation, young forest habitats have now become critically uncommon in much of the eastern United States and especially the Northeast (Brooks and Birch 1988, Trani et al., 2001).

Abandonment of agricultural lands reached a peak in New England in the late 1800s to mid-1900s and a wave of early successional habitats followed (Dessecker and McAuley 2001). Today, such habitats are less common than they were in pre-settlement times in several regions of the northeastern United States (Dessecker and McAuley 2001). On the other hand, the proportion of early successional habitat in northern industrial forests is currently several times that which occurred in pre-settlement times (Dessecker and McAuley 2001).

2.3 Population Management Status

Ruffed grouse are managed by hunting regulations. Season length and daily bag are determined on a bi-yearly basis.

2.4 Relative Quality of Habitat Patches

Because no young forest habitat map was created, it is difficult to assess habitat quality at the patch scale (see Shrubland Habitat Profile).

2.5 Habitat Patch Protection Status

Since no habitat map was generated, the habitat patch protection status of grouse habitat in New Hampshire is unknown. However, given the ephemeral nature of young forest habitats, tree harvesting and other vegetation manipulation techniques will need to be employed to generate suitable habitat for ruffed grouse. This can occur on both public and private land.

2.6 Habitat Management Status

Refer to element 2.6 in the shrubland profile for information on habitat management programs that assist with managing shrubland and other early-successional habitats.

2.7 Sources of Information

Sources of information for element 2 include journal articles, websites, GIS data, and white papers.

2.8 Extent and Quality of Information

It is difficult to assess the amount and condition of young forest habitats without an adequate habitat map to prioritize areas to field check.

ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

3.1.1 Development (Fragmentation, Habitat Loss and Conversion)

(A) Exposure Pathway

Direct loss of shrubland habitat occurs through the conversion of these lands for residential, industrial, and commercial purposes. Development patterns lead to fragmentation of remaining undeveloped habitats, creating smaller patches that may not sustain wildlife populations and promoting generalist predators that prey on shrubland-dependent wildlife (Barbour and Litvaitis 1993, Litvaitis 2005).

(B) Evidence

New Hampshire's population grew by 17.2% from 1990 to 2004--the fastest growing state in the Northeast for the past four decades. New Hampshire has lost more than 17,000 acres of open space to develop-

ment each year in the past five years (SPNHF, unpublished report).

Young forest habitats are important to a large suite of animals, including ruffed grouse (DeGraaf et al. 2005). Wildlife that utilizes young forest habitat conditions benefited from the wave of early successional habitats that followed the peak of farm abandonment in the late 1800s. As forests matured the amount of early successional habitats declined, leading to declines in associated wildlife species. In parts of New Hampshire, especially the southern tier, the amount of young forest habitat of functional quality for wildlife may now be falling below historic levels as current landscape conditions are strikingly different than in pre-settlement times (Brooks 2003, Litvaitis 2003, DeGraaf et al. 2005). Remaining patches of forest are broken up or fragmented into isolated patches. Species with small home ranges (such as ruffed grouse) may be able to occupy the remaining habitat patches. However, even these animals may be hampered by the consequences of human land uses that surround small patches of habitat. Increases in generalist predators may reduce or even eliminate small populations of prey species (Barbour and Litvaitis 1993, Oehler and Litvaitis 1996). Over time, these small patches may contain fewer species than similarly sized patches that are surrounded by extensive forests (Litvaitis 2005).

3.1.2 Altered Natural Disturbance (Natural Succession)

(A) Exposure Pathway

Shrubland-dependent vertebrate wildlife species require dense understory cover; their occurrence is influenced more by the height and density of vegetation than by specific plant communities (Litvaitis 2003). Ruffed grouse colonize a site after a woody understory is well developed (approximately 10 years post disturbance) and disappear from the site approximately 20 years post disturbance as the stand matures (DeGraaf et al. 2005). Hence populations of ruffed grouse and other young forest species shift in space and time in response to natural disturbances and human land uses (Litvaitis 2005). As more open land is converted to development there is less overall space for young forest-dependent species to shift into when natural forest succession or lack of active management makes their current habitat patch unsuitable.

(B) Evidence

The New England landscape has gone through dramatic changes over the last 350 years. In the mid 1800s, 75% of the arable land in central and southern New England was in pasture and farm crops. One hundred years later, New England was once again forested – a result of farm abandonment after richer farm fields opened up in the Midwest (DeGraaf et al. 2005). Today, about 80% of New Hampshire is forested again. However, the second growth forests lack the structural diversity including the range of seral stages present in pre-settlement forests (DeGraaf et al. 2005). The forests have matured, while natural disturbance processes, such as fire, have been disrupted, reducing the amount of early successional conditions (Litvaitis 2003, DeGraaf et al. 2005). The conversion of young forests to residential and commercial development combined with forest maturation (i.e., lack of disturbance) is reducing early successional habitat to levels at or below historical levels (Brooks 2003).

3.2 Sources of Information

Sources of information on threats to ruffed grouse and young forests included peer-reviewed scientific papers, GIS-analysis in reports by New Hampshire organizations, and gray literature.

3.3 Extent and Quality of Data

The decline in young forest habitats and their associated wildlife species is well documented.

3.4 Threat Assessment Research

No further research on threats seems warranted.

ELEMENT 4: CONSERVATION ACTIONS

4.1.1 Habitat Conservation, Habitat Protection

(A) Direct Threats: Development

(B) Justification

The pattern and magnitude of loss of open space in New Hampshire, especially the southern part of the state, is a major threat to sustaining wildlife habitats including early successional forests. Permanently protecting large blocks of forest suitable for forest management and the creation of young forest stands,

especially in the south, will provide an opportunity to manage for natural early successional forests.

Fee simple acquisition of priority forest areas by NHFG or other partners will enable these agencies to manage for the range of wildlife species that depend on them, including ruffed grouse. Conservation easements can be used to ensure long-term management of these habitat types by private landowners. Given the pace of development and loss of open space in New Hampshire, this conservation action should receive priority, especially in the southern part of the state. Once lands are permanently protected the decision cannot be reversed, however, management decisions to benefit priority wildlife species can be adapted as needed.

(C) Conservation Performance Objective

The conservation objective is to permanently protect, through fee simple acquisition or conservation easements, forested habitats that provide opportunity to manage for young forest habitat conditions.

(D) Performance Monitoring

The measurable component is the acres of forestland that are permanently protected and managed.

(E) Ecological Response Objective

The ecological objective is to ensure that populations of ruffed grouse and other priority wildlife successfully reproduce in these permanently protected forestlands.

(F) Response Monitoring

Populations of ruffed grouse should be monitored to determine their reproductive success and to determine if additional management is needed to provide suitable habitat.

(G) Implementation

Habitat maps developed for the WAP will be analyzed to determine which remaining blocks of forested habitats provide the best opportunity for forest management including the establishment of young forest conditions (see Shrublands habitat profile).

(H) Feasibility

The ephemeral nature of early successional forests makes it difficult to permanently protect them. The best approach may be to identify large blocks of

forest that provide opportunity for forest management. The New Hampshire Land and Community Heritage Investment Program is a critical resource for maintaining and protecting large forest blocks, if new funds become available. Although permanent land conservation is typically more expensive than other conservation measures, this action may be required to sustain young forest-dependent wildlife.

4.1.2 Vegetation Management, Restoration, and Management

(A) Direct Threat: Altered Natural Disturbance (Natural Succession)

(B) Justification

Since young forest habitats are relatively short-lived (20 to 25 years in most cases), periodic management is needed to maintain this habitat type. Managing forest vegetation for a specific height and density should encourage many early successional species, depending on spatial scale and landscape context. Creating small patches of young forest habitats in a developing landscape may not yield desired results because of competing pressures of predation, disturbance, and the effect of fragmentation on wildlife movement. Managed habitats should be positioned near existing patches of shrubland, wetland, or a beaver flowage to maintain landscape-scale connectivity. Initially, the size of timber harvests would be larger than natural disturbances to offset the shortfall in early-successional habitat that currently exists (for example 4-10 ha) (Litvaitis 2005). As forests mature, management efforts (especially timber harvests) could then be patterned after canopy gaps (Runkle 1991) or modified to specific silviculture practices of a region (Seymour et al. 2002) if other forms of early-successional habitats (e.g. native shrublands and beaver impoundments) are adequately represented.

(C) Conservation Performance Objective

The conservation objective is to provide adequate young forest habitat conditions to sustain populations of ruffed grouse and other young forest-dependent wildlife.

(D) Performance Monitoring

The measurable component is the number and acreage of areas managed as young forest habitat.

(E) Ecological Response Objective

The ecological objective is to increase the amount of functional young forest habitat that supports ruffed grouse and other habitat associates.

(F) Response Monitoring

Drumming surveys in managed areas could be used as an index of abundance, and over time, indicate success of grouse management.

(G) Implementation

Large forested blocks suitable for forest management will first need to be identified. If in public ownership, then resource managers can manage the habitat. If on private lands, then an education and outreach program could be directed at landowners to maintain diverse habitats on their lands, including early successional habitats. UNH Cooperative Extension and the New Hampshire Coverts Program have an extensive network of landowners interested in wildlife and could be valuable partners in developing the means to educate landowners and facilitate forest management on private lands.

(H) Feasibility

NHFG can work with its state and federal partners to develop management plans on public lands that promote a variety of forested stages including blocks of young forests, and developing an education campaign on the importance of maintaining a suite of forested conditions including young forest habitats.

4.2 Conservation Action Research

An important step in maintaining young forest habitat conditions is the identification of large forest blocks conducive for forest management.

ELEMENT 5: REFERENCES

5.1 Literature

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