SPECIES PROFILE

Purple Finch

Caprodacus purpureus

Federal Listing: Not listed
State Listing: Not listed
Global Rank: G5
State Rank: S5
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Element 1: Distribution and Habitat

1.1 Habitat Description

Purple finch nest in cool coniferous forests and a variety of other cover types (Wooton 1996) where conifers are present. During winter, purple finch are likely to be distributed by food resources rather than habitat structure or vegetative composition (Wooton 1996). In a New York study area, higher breeding densities were strongly correlated with the ratio of forest edge to forest area and with the density of understory vegetation (Keller 1990, as cited in Wooton 1996). Purple finch also nest in orchards, conifer plantations, and suburbs. Purple finch ability to adapt to these anthropogenic habitats has likely expanded its range.

1.2 Justification

Purple finch populations have declined 1.7% annually ($p<0.05$) throughout its range from 1966 to 2003 (Sauer et al. 2004). In the Atlantic Northern Forest (Bird Conservation Region 14), a conservation-planning unit that includes most of New Hampshire, the 2.43% ($p<0.001$) annual rate of decline has been more severe. Analysis of annual Christmas Bird Count data demonstrates a similar declining trend based on purple finch observation rates in primary wintering range (Bolgiano 2004).

1.3 Protection and Regulatory Status

- Migratory Bird Treaty Act of 1918
- Bird Conservation Region (BCR) 14 high priority species

1.4 Population and Habitat Distribution

BCR 14 supports 11.4% of the purple finch breeding population and some of the highest densities known for the species. The purple finch is found in all 3 of the state's ecoregion sections and was documented in 172 out of 179 priority breeding bird atlas survey blocks (McDermott 1994).

1.5 Town Distribution Map

Not completed for this species.

1.6 Habitat Map

N/A

1.7 Sources of Information

Primary sources of information included peer-reviewed literature, Breeding Bird Survey Database, New Hampshire's Breeding Bird Atlas, and expert consultation.

1.8 Extent and Quality of Data

The annual breeding bird survey, New Hampshire's Breeding Bird Atlas, and numerous local surveys (e.g., White Mountain National Forest Monitoring) provide extensive information on purple finch distribution and abundance. Purple finch habitat associations are poorly described.

1.9 Distribution Research

- Continue annual breeding bird survey routes
- Update New Hampshire's Breeding Bird atlas at 20-year intervals

Element 2: Species/Habitat Condition

2.1 Scale

New Hampshire's 3 ecoregion sections are appropriate for scale because conifer composition, especially spruce fir, differs among them: White Mountains = 120,344 ha, Vermont/New Hampshire uplands = 44,441 ha, and Lower New England = 7,136 ha.

2.2 Relative Health of Populations

Purple finch densities, represented by average number per breeding bird survey route (1966 to 2003), are highest in the White Mountain Section, intermediate in Vermont /New Hampshire Uplands, and lowest in the Lower New England Section (Sauer et al. 2004)

2.3 Population Management Status

No population management is conducted for purple finch.

2.4 Relative Quality of Habitat Patches

The White Mountain Section's greater composition of conifers, especially spruce and fir, provides habitat that likely supports New Hampshire's highest purple finch densities. The Vermont-New Hampshire Upland has the next highest composition of spruce-fir habitat and is intermediate in its purple finch habitat quality. The Lower New England Section's combination of urbanization and lack of spruce and fir provides the lowest habitat quality.

2.5 Habitat Patch Protection Status

Fifty percent of the White Mountain section is in conservation ownership.

2.6 Habitat Management Status

Because large areas of the White Mountain section are in public ownership, management opportunities are significant. Purple finch habitat associations need to be more clearly defined in order to prescribe forest management practices that benefit this species.

2.7 Sources of Information

Peer-reviewed literature, Breeding Bird Survey Data, and New Hampshire Fish and Game GIS

2.8 Extent and Quality of Data

The loss of breeding spruce fir habitat from 1970 to 1983 due to Eastern budworm outbreak (Bolgiano 2004) and interspecific competition with house finch (*Caprodacus mexicanus*) that was introduced to eastern North America in 1930 (Wooton 1996), are offered as explanations for the purple finch's regional decline. Both hypotheses rely on correlation of these events with purple finch population declines without providing evidence of any direct causes.

Purple finch numbers reported for the Christmas Bird Count were twice as high during the 1970 to 1983 outbreak of Eastern spruce budworm (*Choristoneura fumiferana*) than during the preceding and subsequent 20-year periods (Bolgiano 2004). Purple finch populations may have risen as nest productivity increased from this abundant food source. Extensive logging operations to salvage wood damaged by budworm subsequently led to modification of millions of hectares of prime breeding habitat. The purple finch population in the region declined in response to the combined loss of food and habitat that resulted from the budworm outbreak.

Wooton (1996) offers an alternative explanation that competition with the house finch is responsible for the decline. The decline in purple finch in eastern North America correlates with the introduction and establishment of the house finch. Nevertheless, competition, hybridization, or other interspecific perturbations are not well documented.

2.9 Condition Assessment Research

Research is needed to identify factors leading to purple finch declines. In addition, research that clearly describes habitat associations of purple finch in Atlantic Northern Forests will better inform foresters and landowners about habitat enhancement practices. Research that links small-scale habitat features with large-scale land cover data sets is needed to predict how population changes are affected by forestry and eastern budworm damage.

Element 5: References

5.1 Literature

Bolgiano, N.C. 2004. Changes in boreal bird irruptions in eastern North America relative to the 1970s spruce budworm infestation. American Birds 54: 26-33.

Keller, J.K. 1990. Using aerial photography to model species-habitat relationships: the importance of habitat size and shape. New York State Museum Bulletin 471: 34-46.

McDermott, J. 1994. Purple Finch. Pp. 354-355 in Foss, C.R., ed. The Atlas of Breeding Birds in New Hampshire. Arcadia, an imprint of The Chalford Publishing Corporation, Dover, New Hampshire, and the New Hampshire Audubon, Concord, New Hampshire, USA.

Sauer, J.R., J.E. Hines, and J. Fallon. 2004. The North American breeding bird survey, results and analysis 1966-2003. Version 2004.1, U.S. Geological Survey Patuxent Wildlife Research Center, Laurel, Maryland, USA.

Wootton, J.T. 1996. Purple Finch (*Carpodacus purpureus*). In The Birds of North America No. 208 (A. Poole and G. Gill, eds.) The Academy of Natural Sciences, Philadelphia, PA and The American Ornithologists' Union, Washington, D.C.