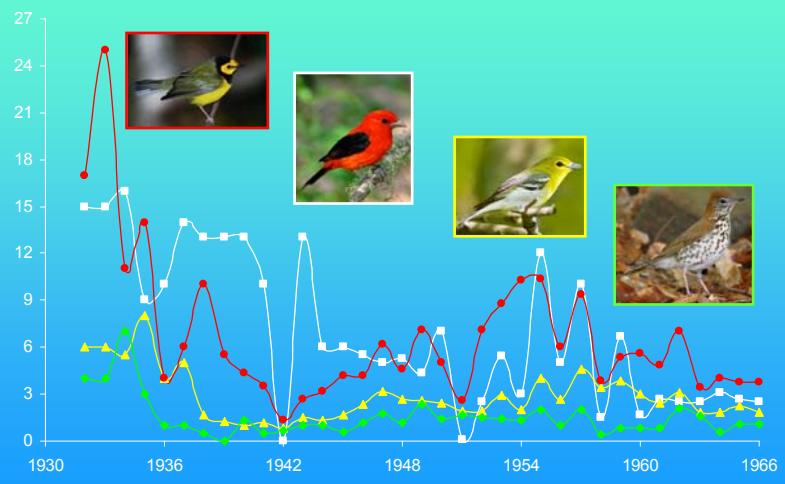
Bird declines a cause for concern
(summary of 47 BBC sites 1937-1995)

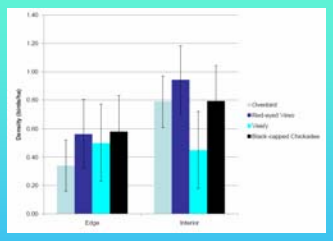


King et al. 2006 Bird Populations 7:1-9

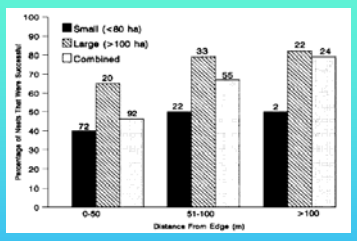
Early studies from Midwest & mid-Atlantic implicated fragmentation

Concern about mature forest birds and "fragmentation"

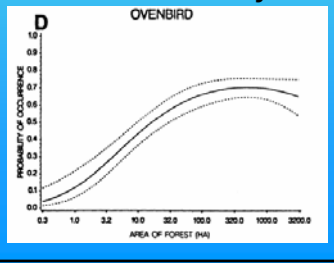
Edge avoidance



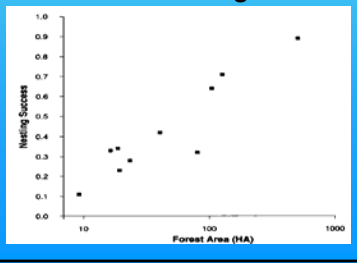
Edge-related nesting



Area sensitivity

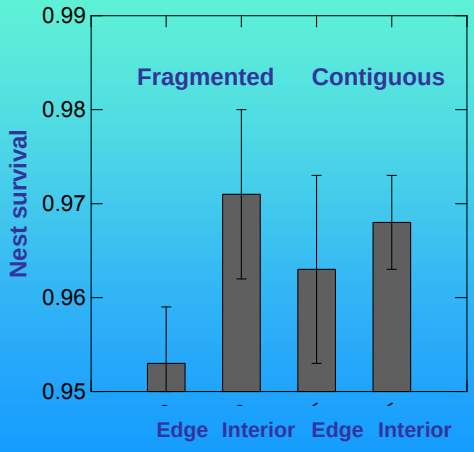


Area nesting



Fragmented Landscape

Fragmentation effects less apparent in forested landscapes



Driscoll and Donovan 2004

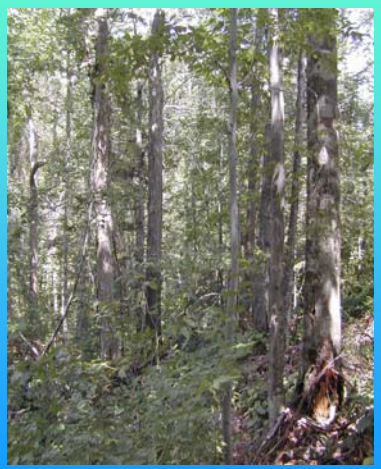
Fragmentation effects related to human commensals

Extensively Forested Landscape

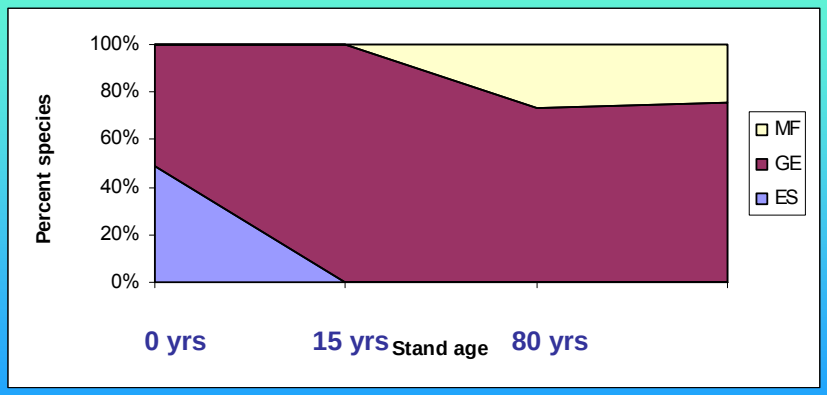
Mature forest, and “matrix” is young forest

Forest systems occupied by diverse bird communities

Forest habitat feature "cover type"



Forest habitat feature "stand age"



All mature forest species present by 80 yrs

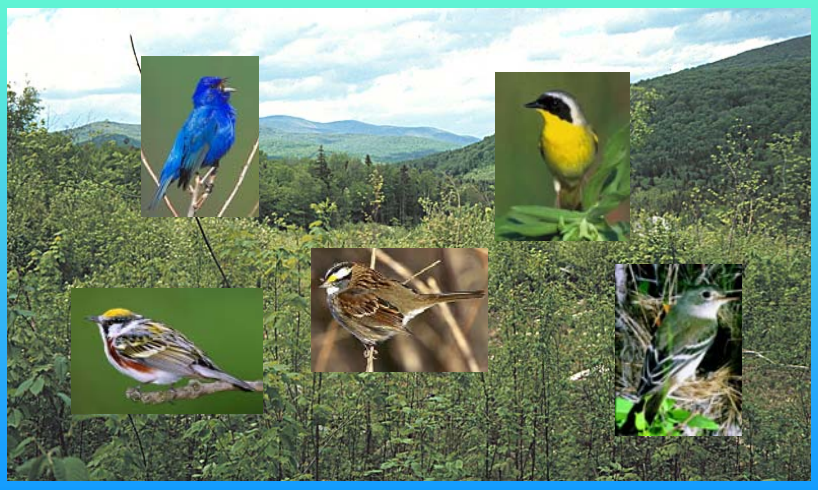
Management for old forest conditions: retention or creation of biological legacies

"Structural elements that provide continuity of ecological processes, species and habitats between mature and regenerating stands, such as live overstory trees, snags, patches of older forest, or forest floor characteristics".

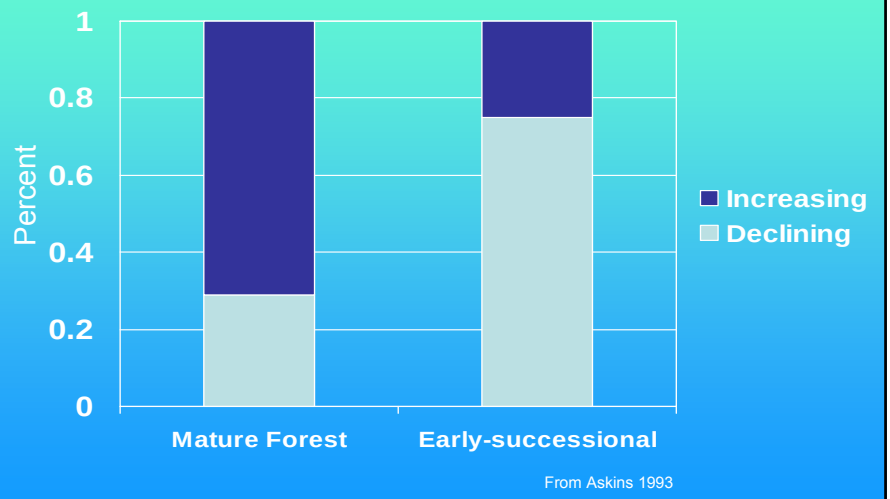
Managing for mature forest birds

Mature forest birds locally displaced by even-aged management

Shrubland birds: Habitat specialists dependant on disturbance

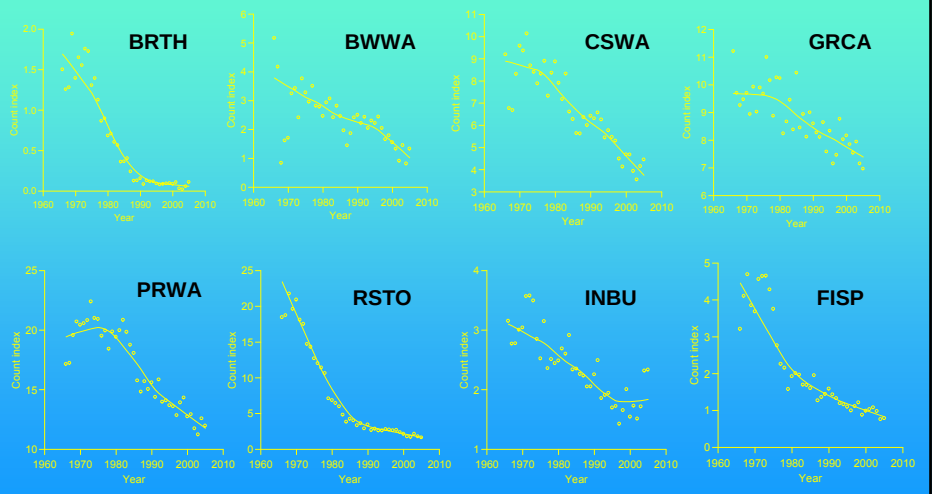


Population trends of mature forest vs. early-successional shrubland birds



From Askins 1993

Declining scrub-shrub birds



Schlossberg and King 2007

At least 2 species recently extirpated from MA

Endangered passerines in the lower 48 states

Endangered passerines in the lower 48 states

Effects of Fuels Reduction and Habitat Restoration on Native Bee Communities in Massachusetts Pitch Pine-Scrub Oak Barrens

Joan C. Milam[1], David I. King[2] and Robert T. Brooks[2].
[1]Department of Natural Resources, University of Massachusetts, Amherst, MA
[2]Northern Research Station, US Forest Service, Amherst, MA

INTRODUCTION: Pitch pine-scrub oak barrens are a globally threatened, fire-dependent habitat that harbors numerous declining, rare, or imperiled plant and animal species. Pitch pine-scrub oak barrens have been reduced by 90% in western Massachusetts. Pitch pine-scrub oak barrens at the Montague Plains WMA require active management to reduce fire risk to adjacent property and to preserve their unique ecological characteristics, and these activities could reasonably be expected to impact native bees.

Given the importance of native bees from the perspective of both the conservation of biodiversity and the economic benefits of pollinator services, we are surveying bee communities on the Montague Plains to: 1. establish baseline information on bee communities, 2. determine how bees are affected by fuels reduction activities and habitat restoration, and 3. make recommendations for managing pitch pine-scrub oak barrens to benefit bee communities.

METHODS: We sampled bees from mid-April through September, 2008 at 30 sampling points ≥ 200 m apart distributed evenly among untreated pitch pine, treated pitch pine, and scrub oak barrens.

Pitch pine | Treated pitch pine | Scrub oak

We sampled bees with bee bowls (Russell et al. 2005) at 2-3 week intervals throughout the season. Six of the points were sampled each visit, the remainder were sampled once. For each sample, we placed 15 bowls, alternating white, florescent yellow and florescent blue, 10 m apart on linear transects. We collected bowls after 24 hrs. Bowls were supplemented with netting on an *ad-hoc* basis.

During each visit, we recorded the presence and species of any plants in flower on each transect, and within the study area as a whole. Also, we measured percent cover of all plant species on each transect using a point intercept method, as well as understory structure with a Robel pole and canopy closure using a sighting tube (James and Shugart 1970).

PRELIMINARY RESULTS: We captured ≈1,500 bees during the study. We are currently sorting and identifying specimens, however preliminary results indicate that bee captures were highest in treated pitch pine, lowest in untreated pitch pine, and intermediate in scrub oak.

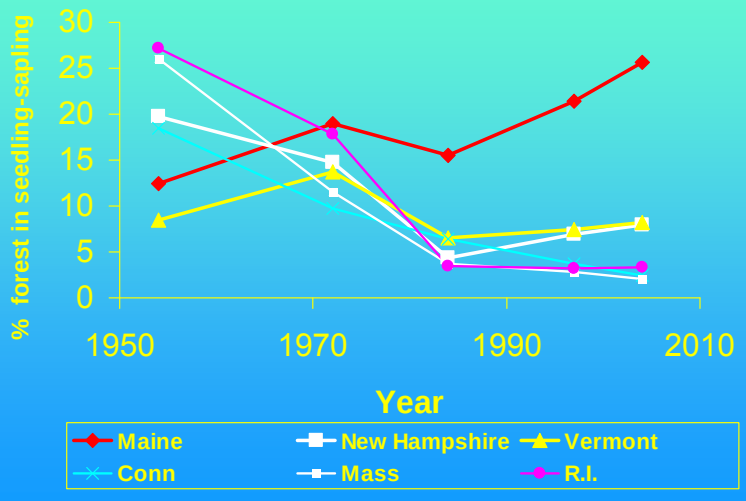
Halictus ligatus | Augochlora pura | Nomada spp. | Megachile latimanus

FUTURE PLANS: Once the specimens have been identified, we will compare bee species richness, species composition, and the abundance of individual species among treatments, with particular attention to rare species and new state or regional records. We will also analyze species richness and abundance in relation to plant species composition and structure, as well as seasonality. Plans for next year include additional sweep sampling, as well as efforts to identify the ecological mechanisms responsible for community differences among treatments. These might include detailed field observations of foraging or nesting, as well as assessment of microclimatic conditions.

REFERENCES: James, F.C. and H.H. Shugart. 1970. A quantitative method of habitat description. American Birds 24:727-736. Russell, K.N., H. Ikerd , and S. Droege. 2005. The potential conservation value of unmowed powerline strips for native bees. Biological Conservation 124:133–148.

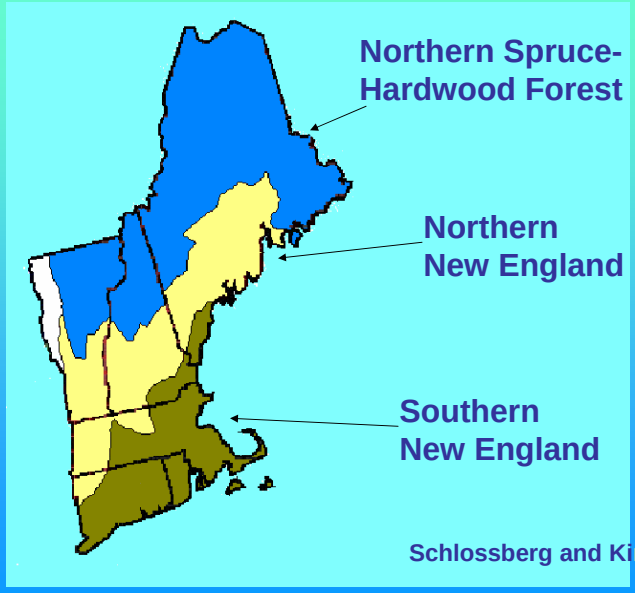
Acknowledgements: We thank the Joint Fire Science Program and the Massachusetts Natural Heritage and Endangered Species Program for their support.

Trends in scrub-shrub habitat in New England

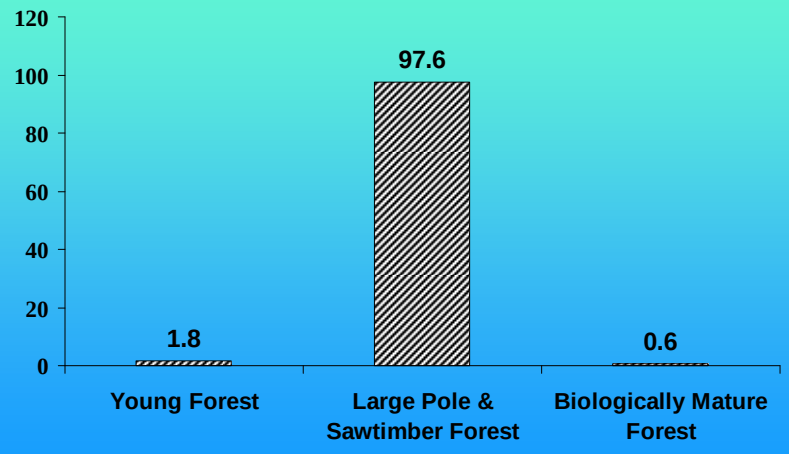


Schlossberg and King 2007

Physiographic regions



Forest age in Massachusetts



Popular misconceptions about scrub-shrub birds

- Scrub-shrub birds were not here historically
- These species are secure in other regions and don't need habitat here
- These species are generalists and can persist in "incidental" habitats.

Popular misconceptions about scrub-shrub birds

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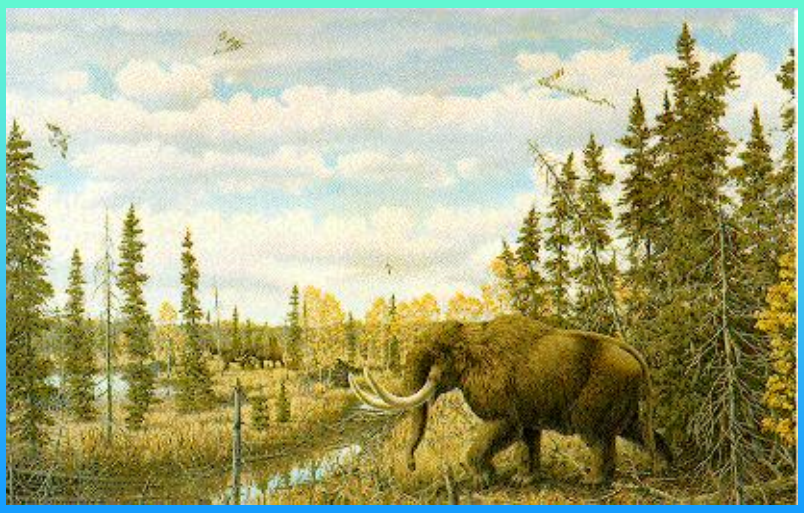
Disturbance History



Popular misconceptions about scrub-shrub birds

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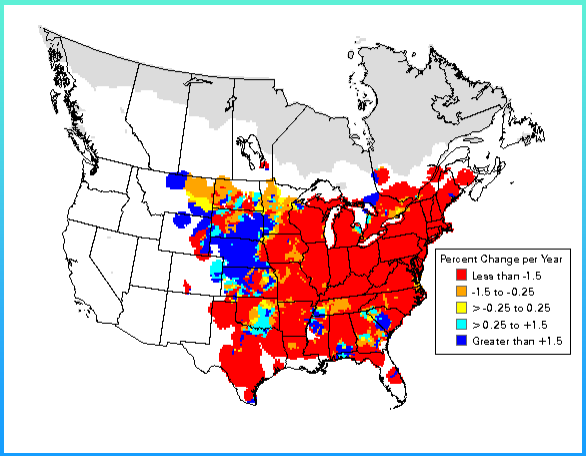
Some species undergoing rangewide declines



Popular misconceptions about scrub-shrub birds

- Scrub-shrub birds were not here historically
- These species are secure in other regions and don't need habitat here
- These species are generalists and can persist in "incidental" habitats.

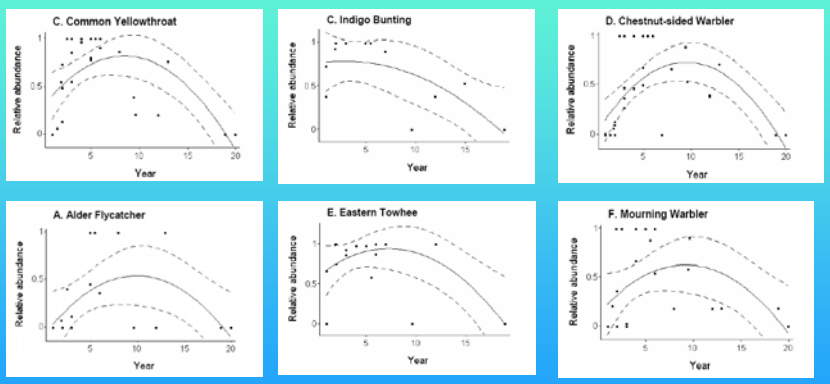
Shrubland birds sometimes considered habitat generalists

Fink et al. 2006

Birds on edges not necessarily breeding

Fink et al. 2006

Bird communities change rapidly with forest succession

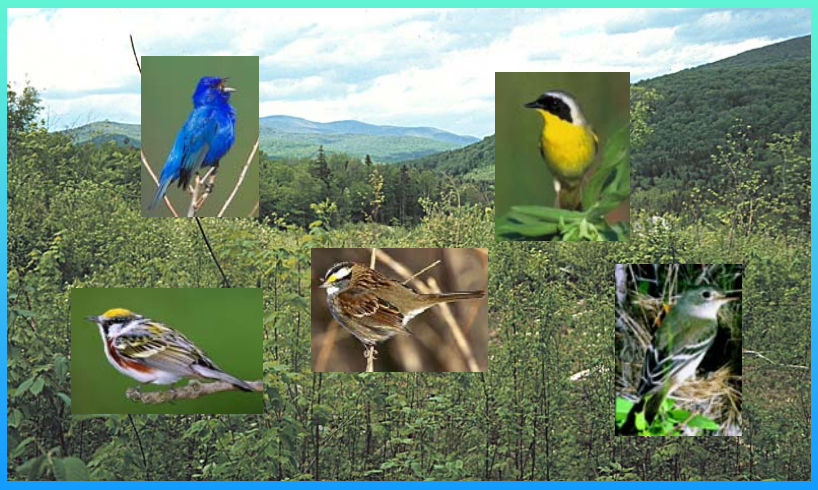


Schlossberg & King 2009. J. Wildl. Manage. 2:226-231

Popular misconceptions about scrub-shrub birds

- Scrub-shrub birds are an integral part of the Northeastern bird fauna
- Many of these species are in jeopardy throughout their ranges
- Most of these species are extreme habitat specialists

Management for shrubland birds

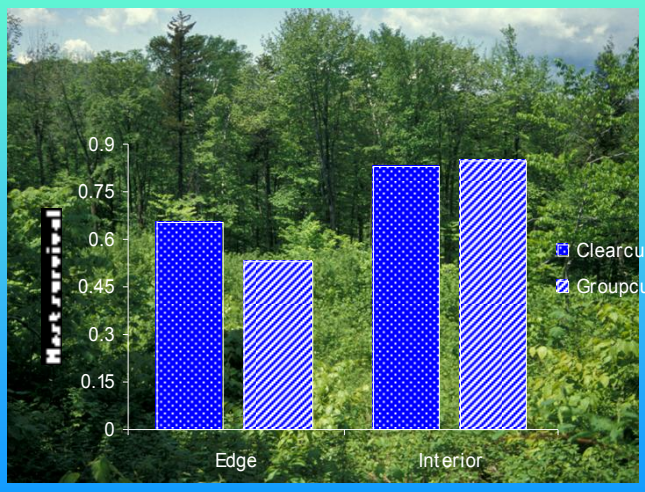


…not accomplished with single-tree selection

…partially accomplished with group selection

Some early successional birds absent from smaller habitat patches

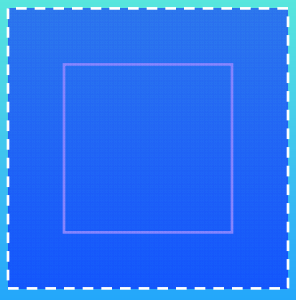
More issues: Edge effects in adjacent forest



King et al. 1998. Cons. Biol. 12:1412-1415

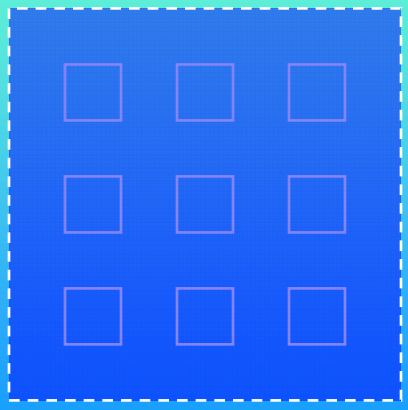
Smaller cuts create more edge effects

1 9-ha clearcut



16 ha affected

9 1-ha groupcuts

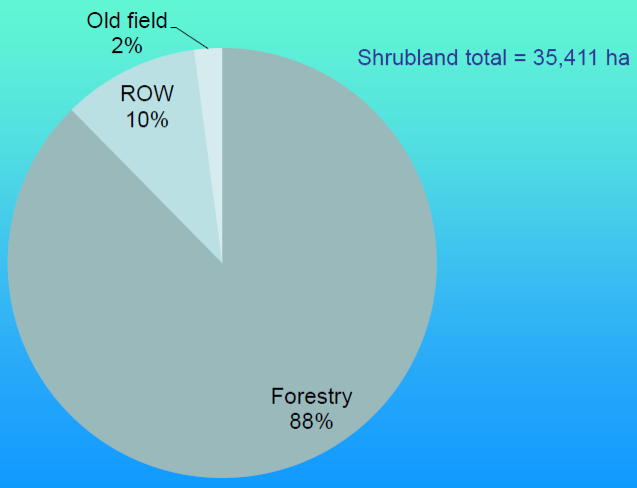


40 ha affected

In “partial cuts”, tolerance to canopy coverage low

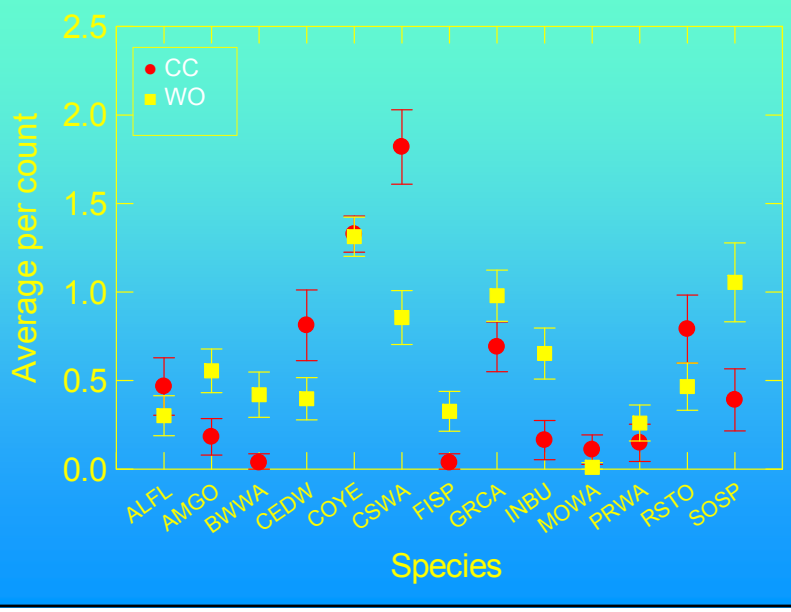
Upland shrublands

(MassGIS/query of landowners/forestry database)

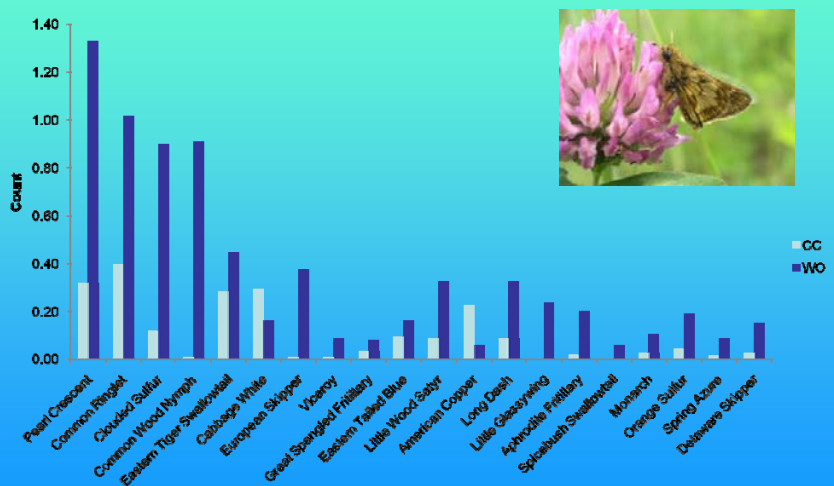


Temporary vs permanent wildlife openings

Clearcuts ≠ Wildlife openings



Clearcuts and wildlife openings complimentary?

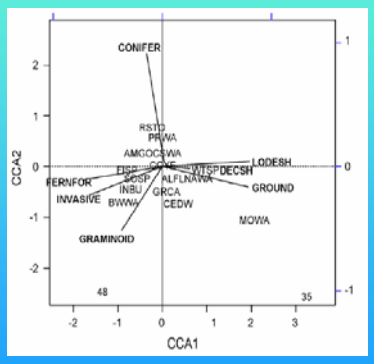


Clearcuts and wildlife openings complimentary?

Mowing vs burning

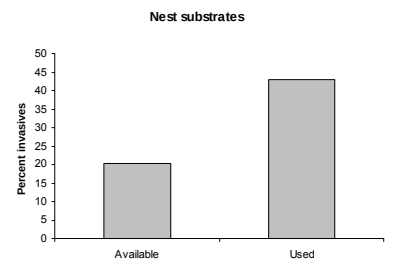
Invasive Plants in Shrublands

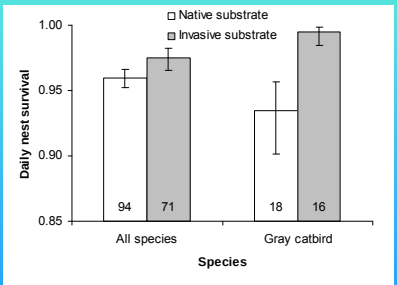
	2004	
	WO	SO
CONIFER	1.57 (0.37)	1.60 (0.40)
BLSH	1.93 (0.27)	2.35 (0.27)
LOBLSH	**4.70 (0.66)**	**7.90 (0.84)**
FERNFORB	**5.67 (0.45)**	**2.15 (0.45)**
GRAMINOID	2.67 (0.46)	1.75 (0.31)
GROUND	**0.43 (0.14)**	**2.60 (0.47)**
INVASIVE	**2.43 (0.39)**	**0.05 (0.05)**
BLTREE	**0.60 (0.24)**	**1.60 (0.55)**



King et al. 2009. For. Ecol. and Manage. 257:421-426

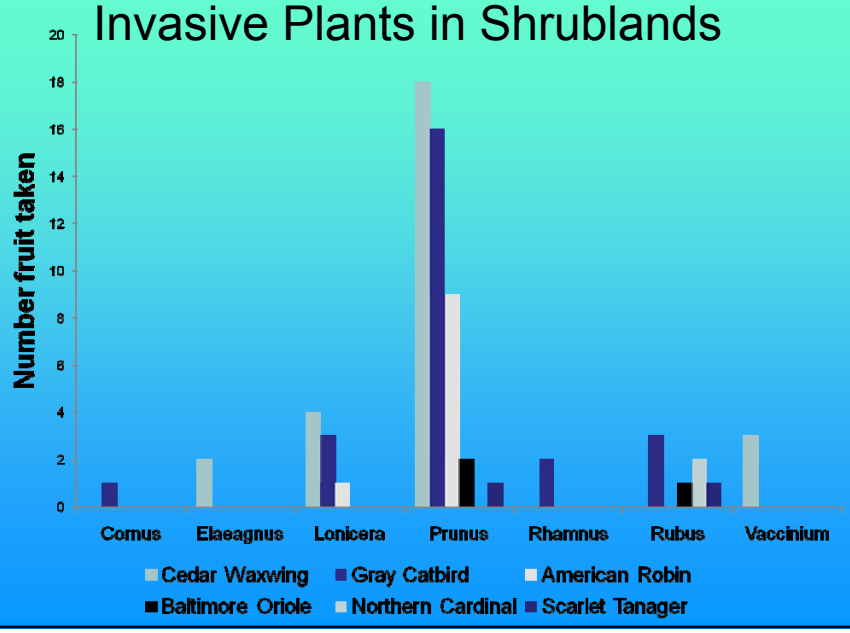
Invasive Plants in Shrublands





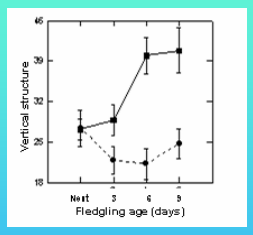
Schlossberg and King 2010 Animal Conservation 13:286–293

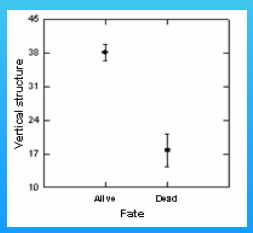
Invasive Plants in Shrublands



Additional values of shrublands - Post-fledging habitat

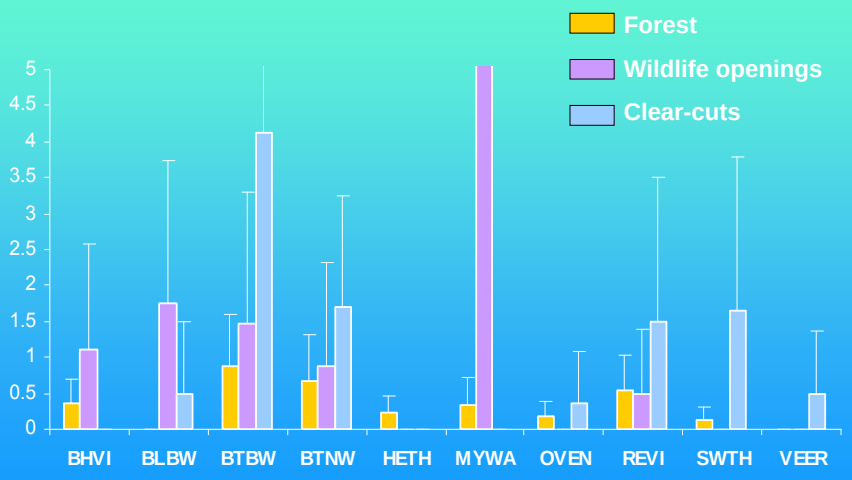
Mature forest birds switch habitat after leaving the nest





King et al. 2006. J. Zool 269:414–421

Many “forest species” most abundant in scrub-shrub habitat during the postfledging period



C. Chandler 2007

Forestry for the Birds

- In forested landscapes, forestry doesn’t create fragmentation
- Shrubland birds, which continue to decline, are habitat specialists
- Even-aged management most efficient for managing shrubland birds
- Mature forest birds may benefit from shrubland habitat
- Invasives maybe inferior to natives


Thanks to…
• Natural Resources Conservation Service Resource Inventory and Assessment Division
• Massachusetts Division of Fisheries and Wildlife
• White Mountain National Forest
• Northern Utilities Foundation
• Massachusetts Audubon Society
• Connecticut Department of Environmental Protection
• Massachusetts Department of Environmental Conservation
• Mr. Paul Strassburg, the Ouimet Family, and numerous field assistants