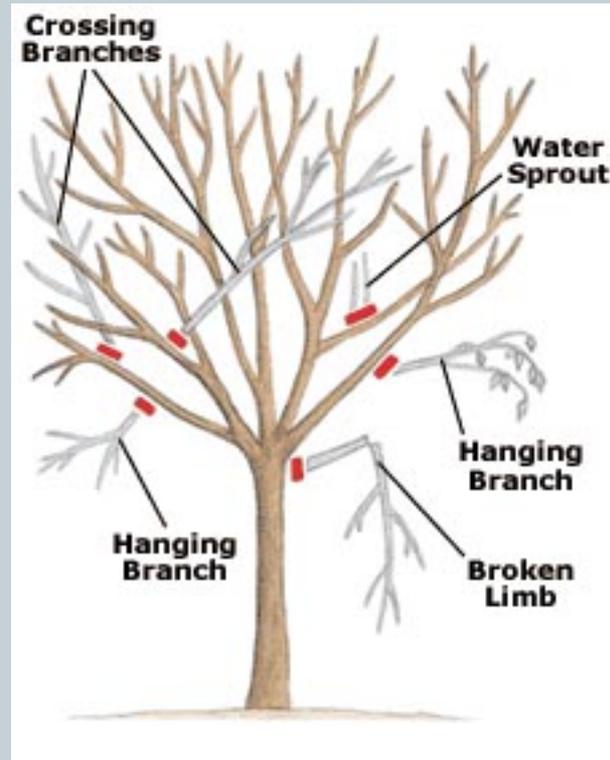




**Canaan Valley
National Wildlife Refuge**

**Commercial Forest
Management for Wildlife
Habitat Creation**

Pruning apple trees



Why is Canaan Valley NWR special?



- **It's the largest wetland and fall migration habitat in WV**
- **“Little bit of Canada gone astray”**
 - it's beyond the range of a typical boreal forest
- **Hundreds of different species thrive in unique habitats here**
 - Virginia northern flying squirrel, Cheat Mountain salamander, brook trout, wood duck, American woodcock, red spruce, quaking aspen, alder, spiraea
- **Ecosystem services**
 - Filters pollutants, prevents erosion and floods, sequesters carbon, attracts pollinators
- **Available Activities**
 - Biking, hiking, cross country skiing, canoeing, kayaking, fishing, hunting, wildlife photography, wildlife viewing, environmental education and interpretation
- **Community Events and Educational Involvement**
- **Our visitors**

Comprehensive Conservation Plan (CCP) 2011



- presents the combination of management goals, objectives, and strategies that we believe will best achieve our vision for the refuge;
- contributes to the mission of the National Wildlife Refuge System (Refuge System);
- achieves refuge purposes; fulfill legal mandates; address key issues;
- incorporate sound principles of fish and wildlife management, and serve the American public.
- will guide management decisions and actions on the refuge over the next 15 years.
- help us communicate our priorities to West Virginia's natural resource agency, our conservation partners, local communities, and the public.
- As part of this process, we have met our requirements to coordinate with the State wildlife and habitat conservation plans under the NWRSA, 16 U.S.C. 668dd(e)(3).

CCP Application



- **Management:**
 - Biological: Diversity, Wildlife Protection, Habitat Enhancement and Creation
 - Public use: Environmental Education and Interpretation, Hunting, Fishing, Observation, Photography
- **Step Down plans:**
 - Habitat Management Plan (HMP) (2017)
 - Fishing plan (plans for 2019)
 - Visitor Services plan (plans for 2019)
 - Inventorying and Monitoring Plan (IMP) (plans 2020)

Refuge Goals in CCP



- **Goal 1:** Maintain and perpetuate the ecological integrity of the Canaan Valley wetland complex to ensure a healthy and diverse wetland ecosystem providing a full range of natural processes, community types and native floral and faunal diversity. FWS 601 FW 3 (biological science integrity-BSI)
- **Goal 2:** Perpetuate the ecological integrity of upland northern hardwoods and northern hardwood-conifer forests to sustain native wildlife and plant communities including species of concern.
- **Goal 3:** Provide and promote through active management a diversity of successional habitats in upland and wetland-edge shrublands, grassland, old fields, and hardwood communities to sustain early successional and shrubland specialists.
- **Goal 4:** Enable visitors of all abilities to enjoy opportunities for wildlife-dependent recreation and education to enhance public appreciation, understanding, and enjoyment of refuge habitats, wildlife, and cultural history.
- **Goal 5:** Collaborate with partners to promote the natural resources of Canaan Valley and the mission of the National Wildlife Refuge System

What do we do?



- **Restoration initiatives**
 - Tree and Shrub plantings – red spruce, aspen, balsam fir
 - Invasive Species Removal – multiflora rose, autumn olive, Japanese Stiltgrass, Japanese knotweed, and garlic mustard
 - CASRI Central Appalachian Red Spruce Initiative
- **Monitoring Initiatives**
 - Vernal pool surveys – wood frogs, spotted salamanders
 - Migrating bird populations – woodcock, northern harrier, golden eagle
 - Mammal populations – flying squirrels, bats, beavers
 - Cheat Mountain salamander –federally threatened
 - Brook trout and red-sided dace study
 - Water quality surveys



Habitat Management Plan (HMP)

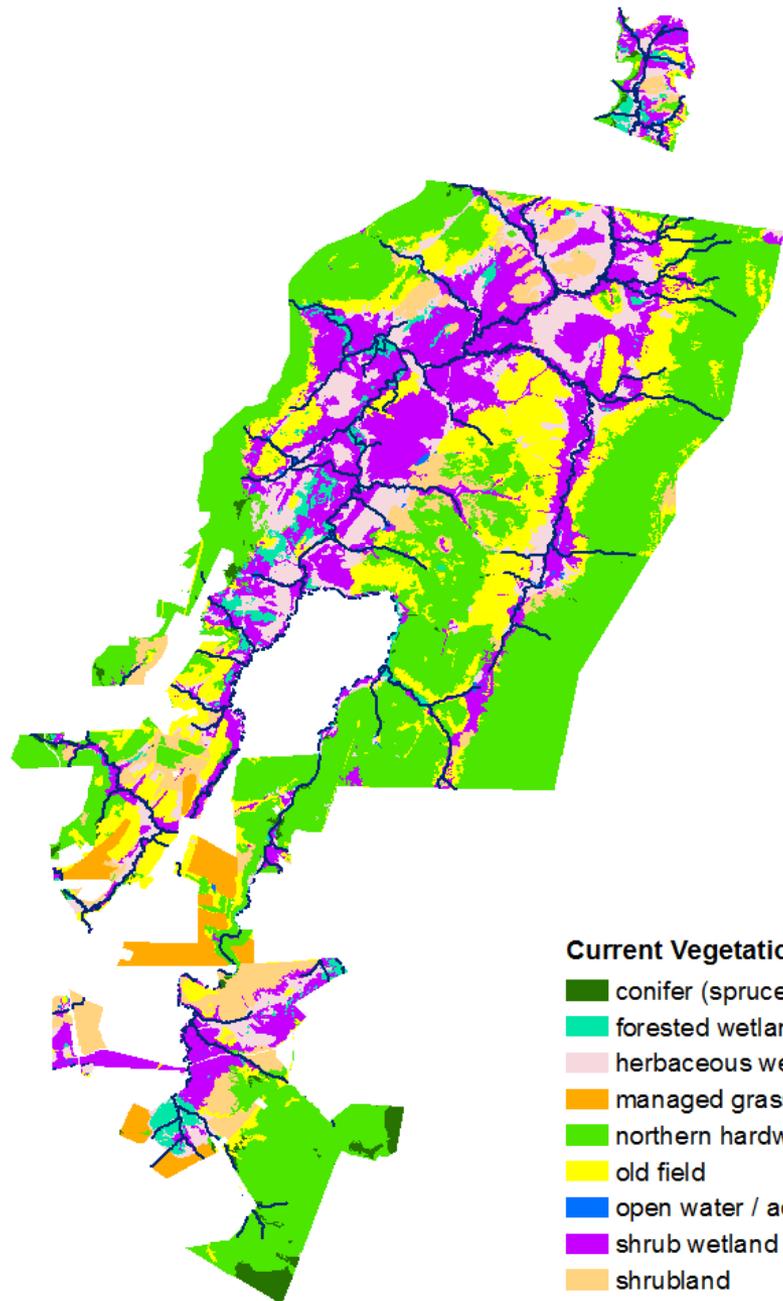


- Habitat Management Plan (283 pages in all) was completed in September 2017.
- This year is the first year staff will implement the Annual Habitat Work Plan (AHWP).
- Provides long term vision and specific guidance on managing habitat for the resources of concern at CVNWR.
- Sets a direction for the next 15 years, with a plan review every 5 years
- Uses of adaptive management to access and modify management activities as research and monitoring may require.

Habitats 16,653 acres



- **Freshwater Wetlands**
 - Forested Wetlands – 416 acres
 - Shrub Wetlands – 3,241 acres
 - Herbaceous Wetlands – 1,938 acres
 - Open Water – 166 acres
- **Upland – Early Successional**
 - Shrubland – 1,050 acres
 - Old Field – 2,558 acres
 - Managed Grasslands – 438 acres
- **Upland Forest**
 - Northern Hardwood Forest – 6,531 acres
 - Conifer/Mixed Forest – 215 acres



Current Vegetation Types

- conifer (spruce) / mixed
- forested wetland
- herbaceous wetland
- managed grasslands
- northern hardwood forest
- old field
- open water / aquatic
- shrub wetland
- shrubland
- Refuge Rivers and Streams



0 0.75 1.5 3 Miles

Decision Making Process HMP



- **Species of concern selected**
- **CCP goals, objectives and strategies revised**
- **Management units delineated**
- **Prescriptions for management types developed**
- **Commercial forest management CD developed**
- **Future decision making tools:**
 - Ecological Site descriptions – NRCS (Some in September and in this summer)
 - Weather studies for frost pockets
 - Habitat Suitability models related to streams.
 - Pollen analysis on peat cores that were completed 2 years ago.

Table 2. Resources of Concern (i.e. Focal Species) and associated habitat types, by management priority, for Canaan Valley National Wildlife Refuge.

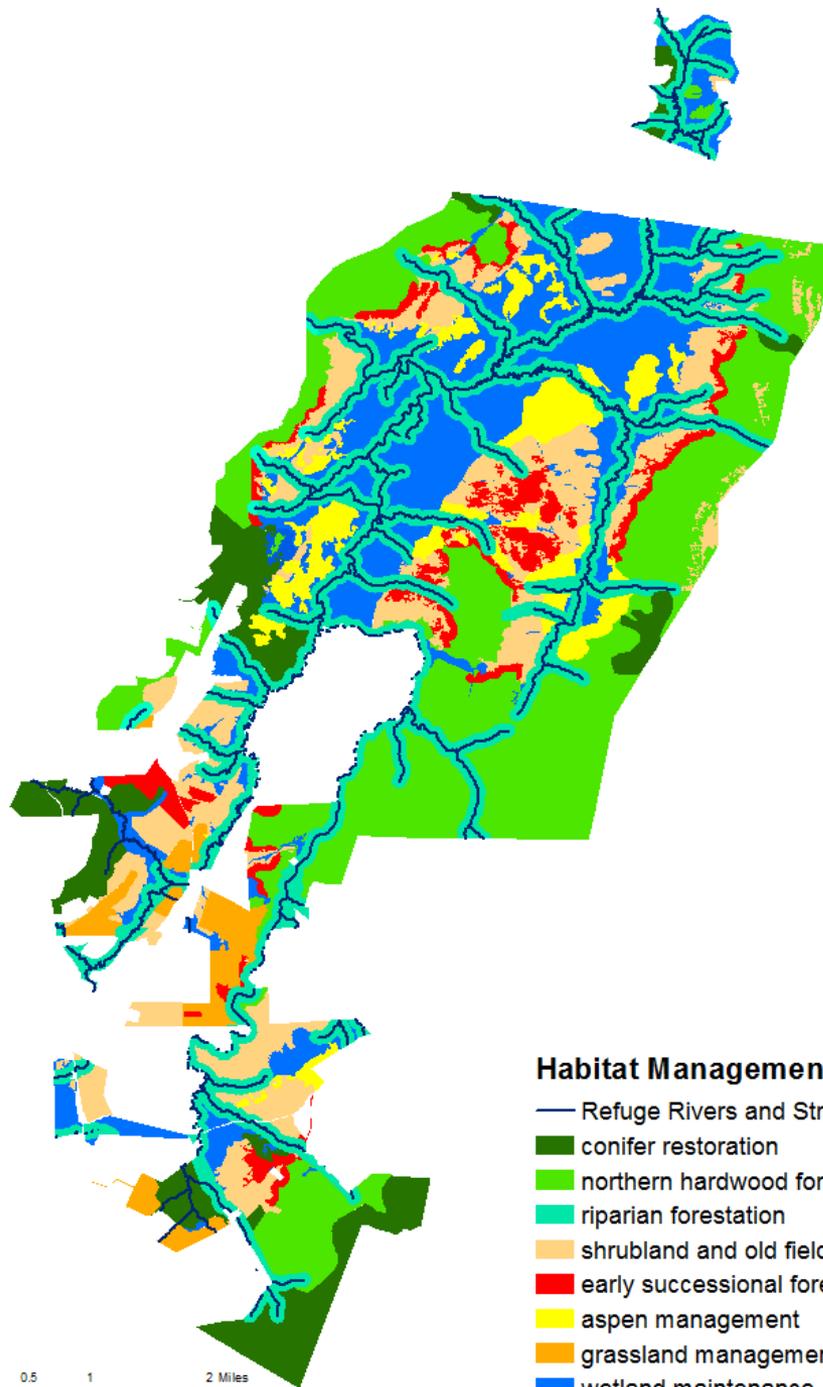
| Associated Habitats High Management Priority | Focal Species | Other Benefitting Species |
|---|---|---|
| Forested Wetlands (Conifer) | Canada warbler and Canaan Fir | Indiana Bat and Blackburnian warbler |
| Shrub and Herbaceous Wetlands | American woodcock and American bittern | alder flycatcher, pink-edged sulfur butterfly and rare herbaceous wetland plant species |
| Forested Wetlands (Aspen Woodlands) | American woodcock and field sparrow | golden-winged warbler, brown thrasher and eastern towhee |
| Open Water / Aquatic (Rivers and Streams and Beaver Pond Complexes) | eastern brook trout and American bittern | reeside dace, American black duck, wood duck, and southern water shrew |
| Conifer (Spruce) / Mixed Forest | Cheat Mountain salamander and black-throated blue warbler | saw-whet owl, fisher, and the Virginia northern flying squirrel |
| Mature Northern Hardwood Forest | Cheat Mountain salamander | Virginia northern flying squirrel and Blackburnian warbler |
| Mature Conifer (Spruce) / Mixed Forest | Cheat Mountain salamander and Blackburnian warbler | black-throated blue warbler, saw-whet owl, Virginia northern flying squirrel, fisher |
| Associated Habitats Medium Management Priority | Focal Species | Other Benefitting Species |
| Northern Hardwood Forest (unfragmented) | black-throated blue warbler | scarlet tanager, worm-eating warbler, eastern wood peewee, black bear, bobcat, and fisher |
| Northern Hardwood Forest Understory (composition and structure) | black-throated blue and Canada warblers | herbaceous plants |
| Northern Hardwood Forest – (Early Successional) | American woodcock and field sparrow | golden-winged warbler, eastern towhee, brown thrasher and Canada warbler |
| Shrubland and Old Field | American woodcock and field sparrow | golden-winged warbler, eastern towhee, and brown thrasher |
| Managed Grasslands | Henslow's sparrow and bobolink | grasshopper sparrow, eastern meadowlark and field sparrow |

(Note: Management priority refers to the likely sequencing of management actions due to multiple factors, not to relative importance of the habitat.)

Managing Habitat on the Refuge

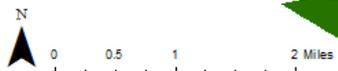


- **Passive management – leaving the refuge as is.**
 - Examples of habitats: herbaceous & forested wetlands and some upland northern hardwood and conifer forests.
- **Active Management – Actively managing the habitat for a certain outcome based on BSI.**
 - Examples of habitats: grasslands, shrublands, young forest, northern hardwood forest, conifer forest
 - Tools used to actively manage the habitat – mowing, disking, girdling trees around a key species, prescribed fire, grazing, haying, tree planting, forest management and active manipulation of the habitat to encourage growth of native species, and removal of invasive species.



Habitat Management Actions

- Refuge Rivers and Streams
- conifer restoration
- northern hardwood forest management
- riparian forestation
- shrubland and old field management
- early successional forest management
- aspen management
- grassland management
- wetland maintenance



Goal 2, Objective 2: Northern Hardwood Forest



- **Objective 2.1a: Unfragmented Northern Hardwood Forest**
 - Provide unfragmented and closed canopy conditions
 - Benefits black-throated blue warbler & Cheat Mt. Salamander
 - How will we do this: Passive and Active management
 - ✦ Logging road restoration and tree planting

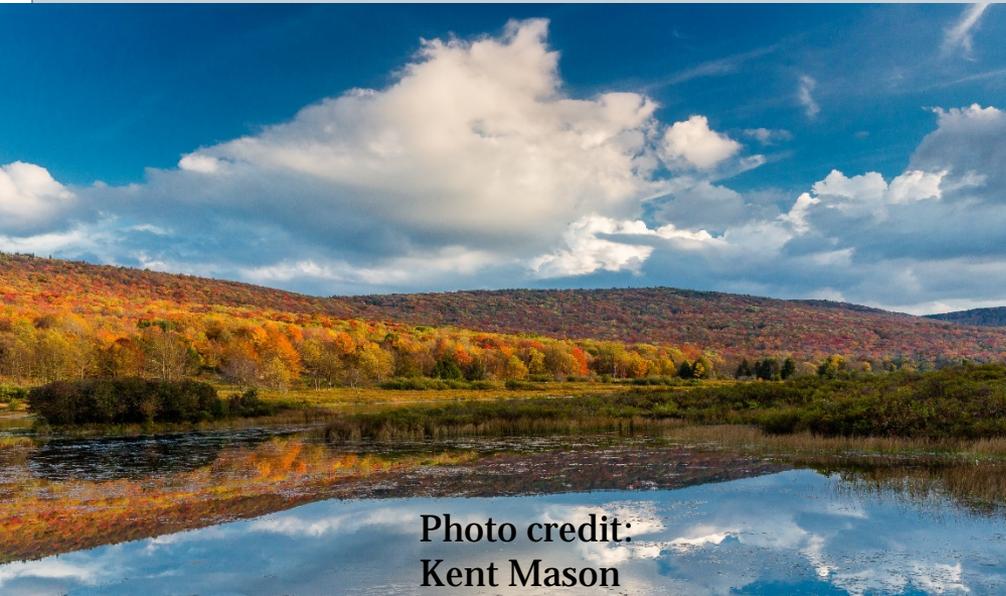


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Kent Mason



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Rodney Campbell

Goal 2, Objective 2: Northern Hardwood Forest



- **Objective 2.1b: Northern Hardwood Forest Composition and Structure**
 - Provide structural and compositional diversity
 - Benefits black-throated blue & Canada warblers
 - How will we do this: Active management
 - ✦ Uneven-aged management (Single tree and group selection cuts) & fern and beech brush control



Photo credit:
Jeremy Meyer



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Kent Mason

Goal 2, Objective 2: Northern Hardwood Forest



- **Objective 2.1c: Mature Northern Hardwood Forest**
 - Provide late successional characteristics (>200 years old)
 - Benefits Cheat Mountain Salamander
 - How will we do this: Passive and Active management
 - ✦ Uneven-aged management (Single tree and group selection cuts) & fern and beech brush control

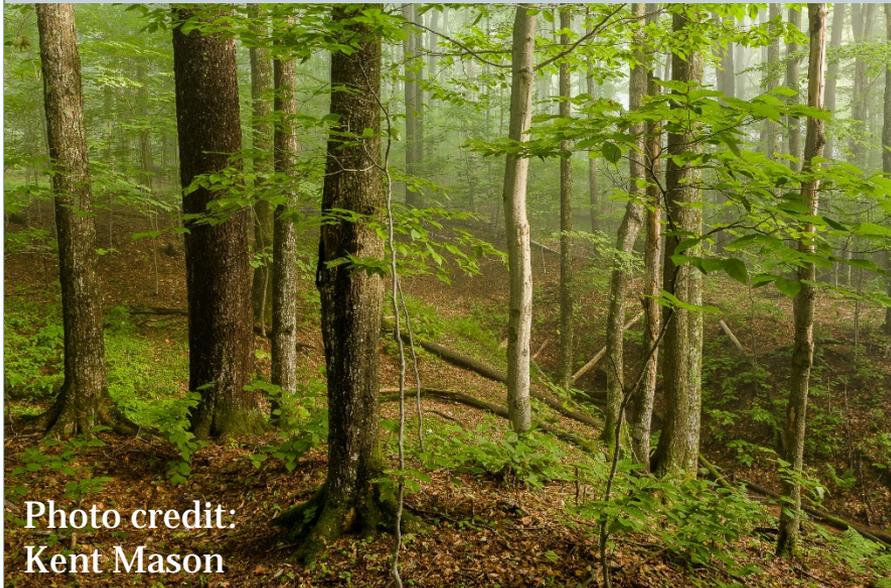
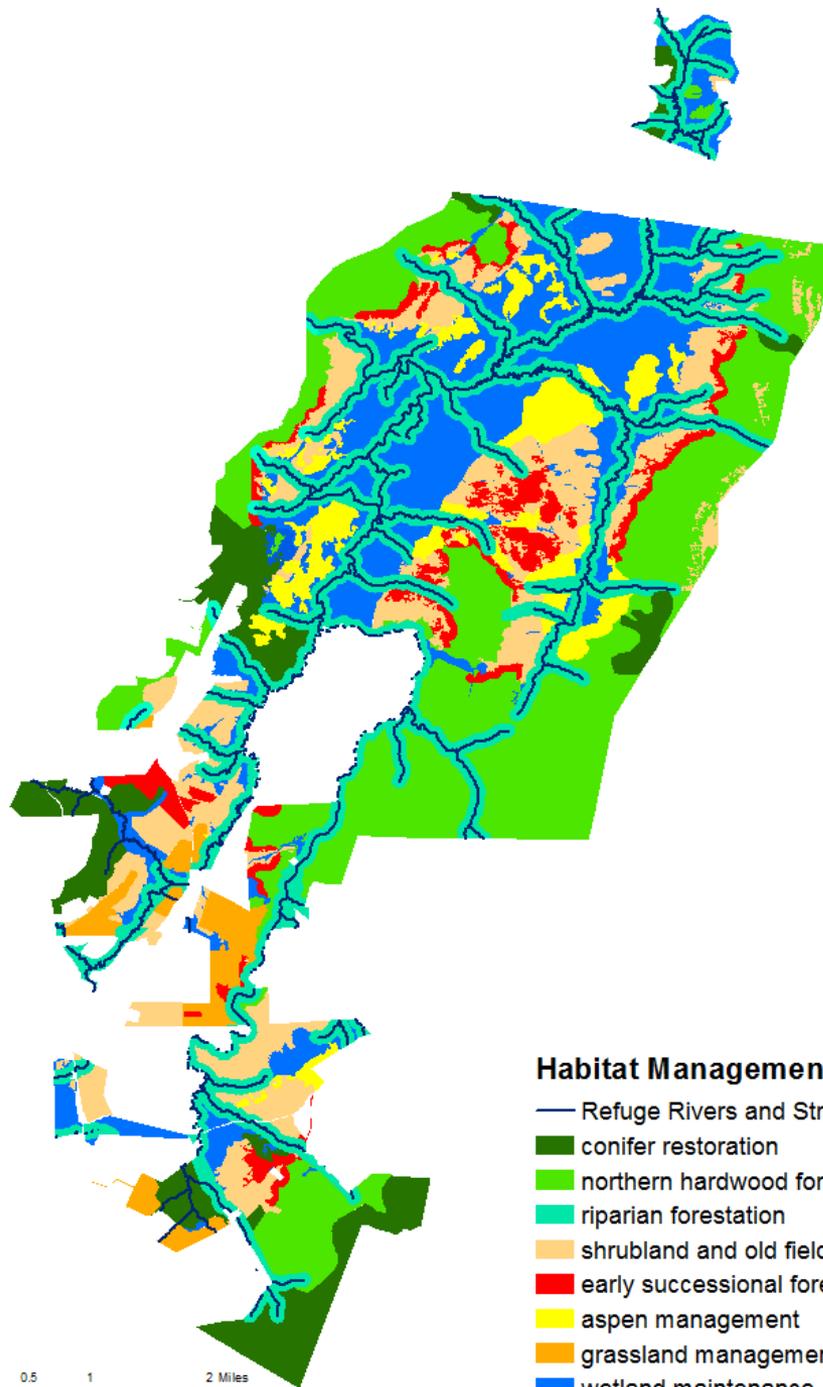


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Habitat Management Actions

- Refuge Rivers and Streams
- conifer restoration
- northern hardwood forest management
- riparian forestation
- shrubland and old field management
- early successional forest management
- aspen management
- grassland management
- wetland maintenance

Goal 2, Objective 3: Conifer (spruce & hemlock) Forest



- **Objective 2.2a: Mature Conifer Forest**
 - Provide late successional characteristics (>200 years old)
 - Benefits Cheat Mountain Salamander & Blackburnian Warbler
 - How will we do this: Passive and Active management
 - ✦ Tree planting and conifer release (non-commercial)



Photo credit:
Isaac Sanchez

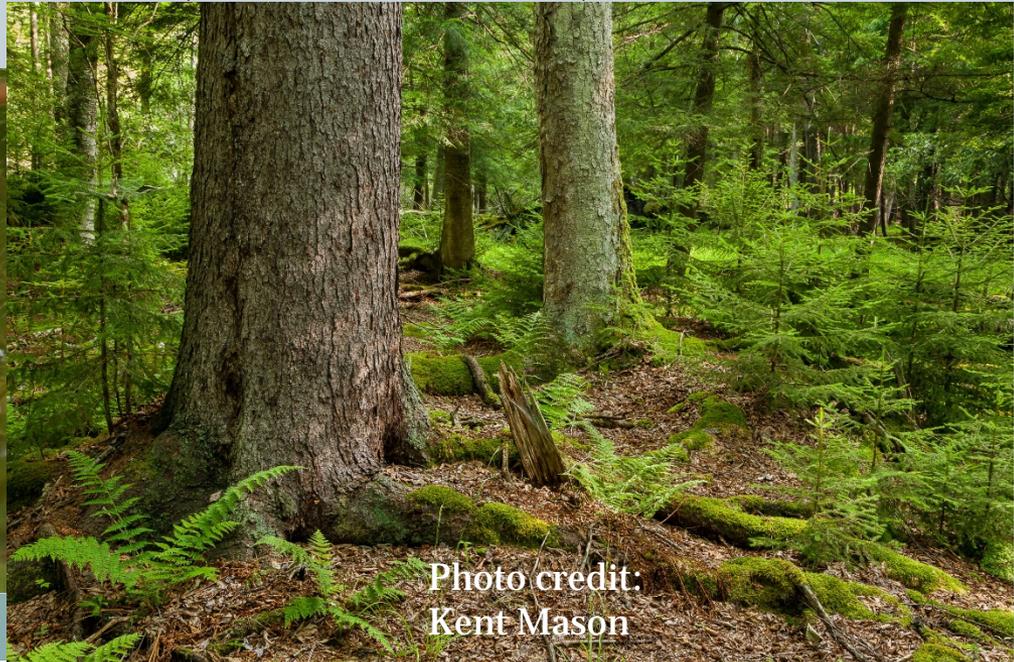


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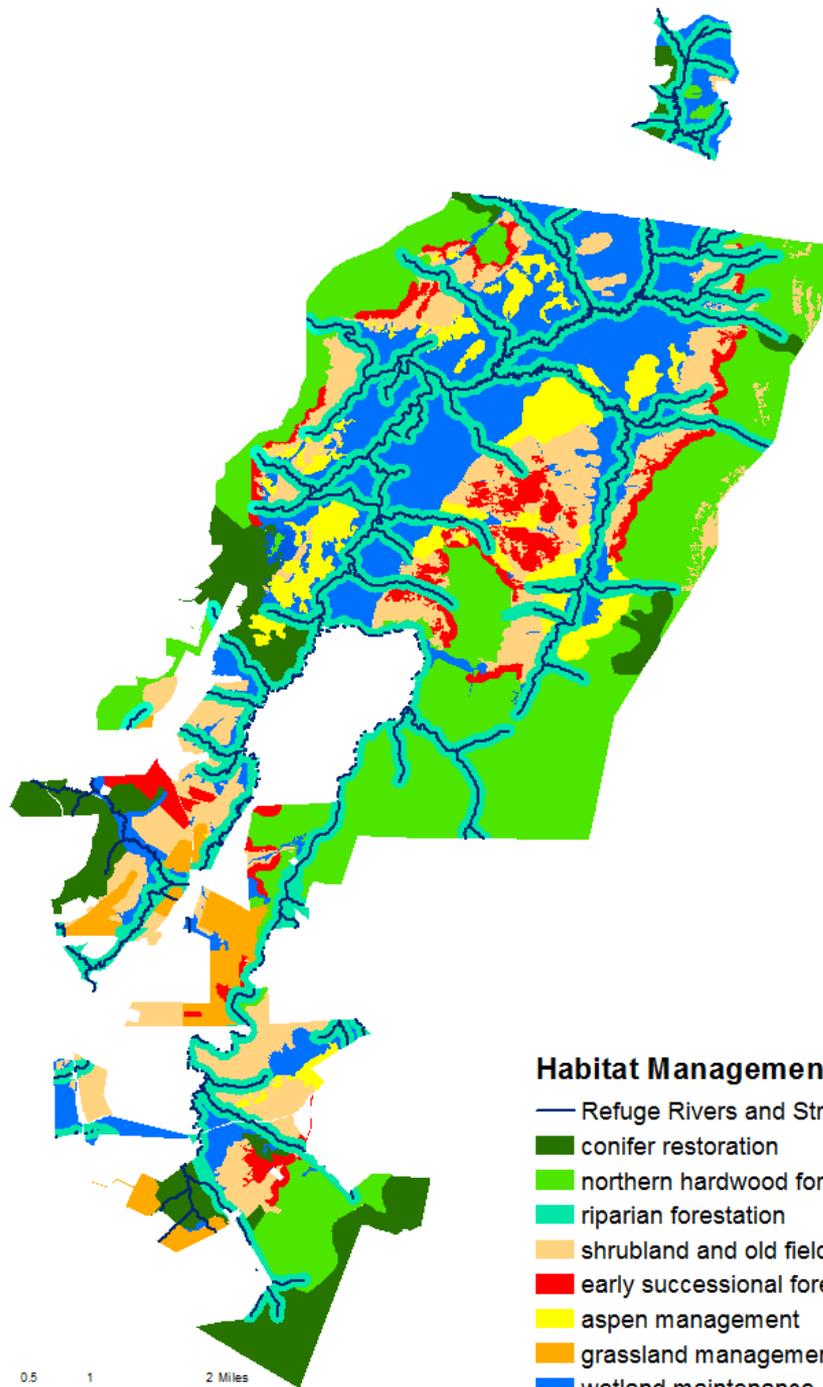
Goal 2, Objective 3: Conifer Forest



- **Objective 2.2b: Conifer/Mixed Forest (composition and connectivity)**
 - Provide 25% conifer in mixed stands (canopy & understory) & create forest connections
 - Benefits black-throated blue warbler & Cheat Mt. Salamander
 - How will we do this: Active management
 - ✦ Uneven-aged management, tree planting and conifer release (non- and commercial)

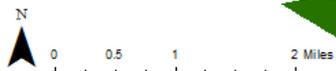


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Habitat Management Actions

- Refuge Rivers and Streams
- conifer restoration
- northern hardwood forest management
- riparian forestation
- shrubland and old field management
- early successional forest management
- aspen management
- grassland management
- wetland maintenance



Goal 3, Objective 3: Early Successional Habitat

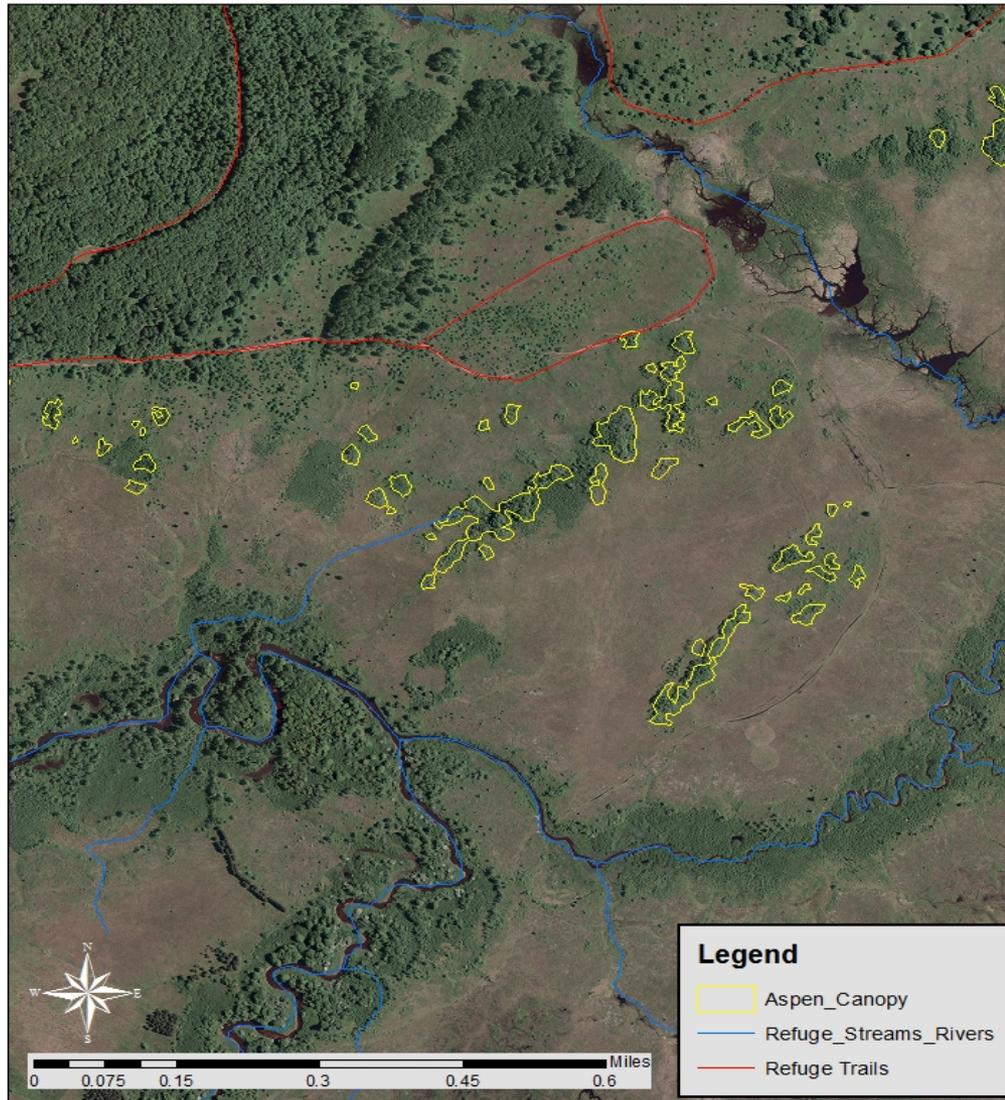


- **Objective 3.1: Aspen Woodlands**
 - Provide early successional characteristics (young forest)
 - Benefits American woodcock and field sparrow
 - How will we do this: Active management
 - ✦ Tree planting and even-aged management (non-commercial & commercial)



Aspen Management Example

2018 Aspen Cut Potential Locations



Goal 3, Objective 3: Early Successional Habitat



- **Objective 3.2: Northern Hardwood**
 - Provide early successional characteristics (young forest)
 - Benefits American woodcock and field sparrow
 - How will we do this: Active management
 - ✦ Even-aged management (Commercial tree removal)



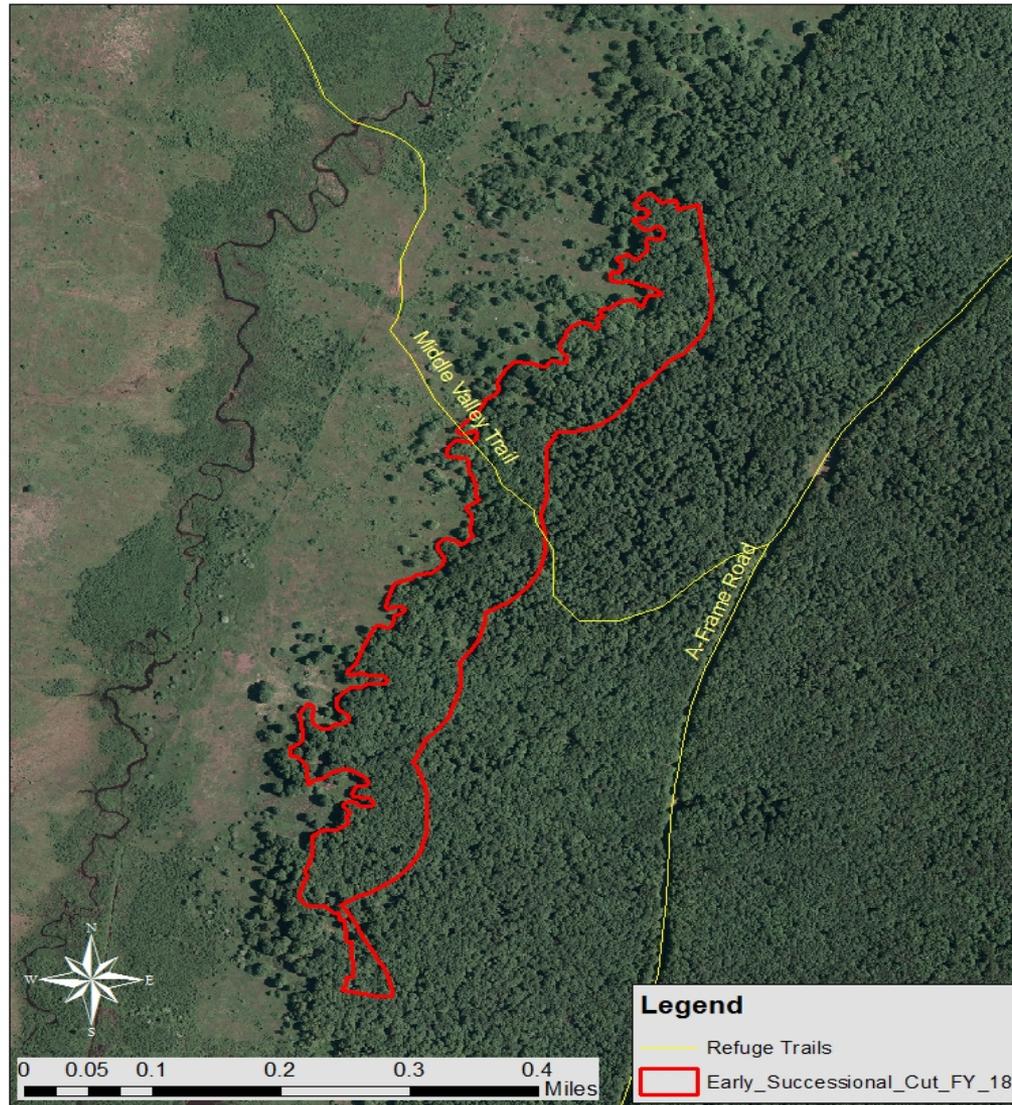
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Kent Mason



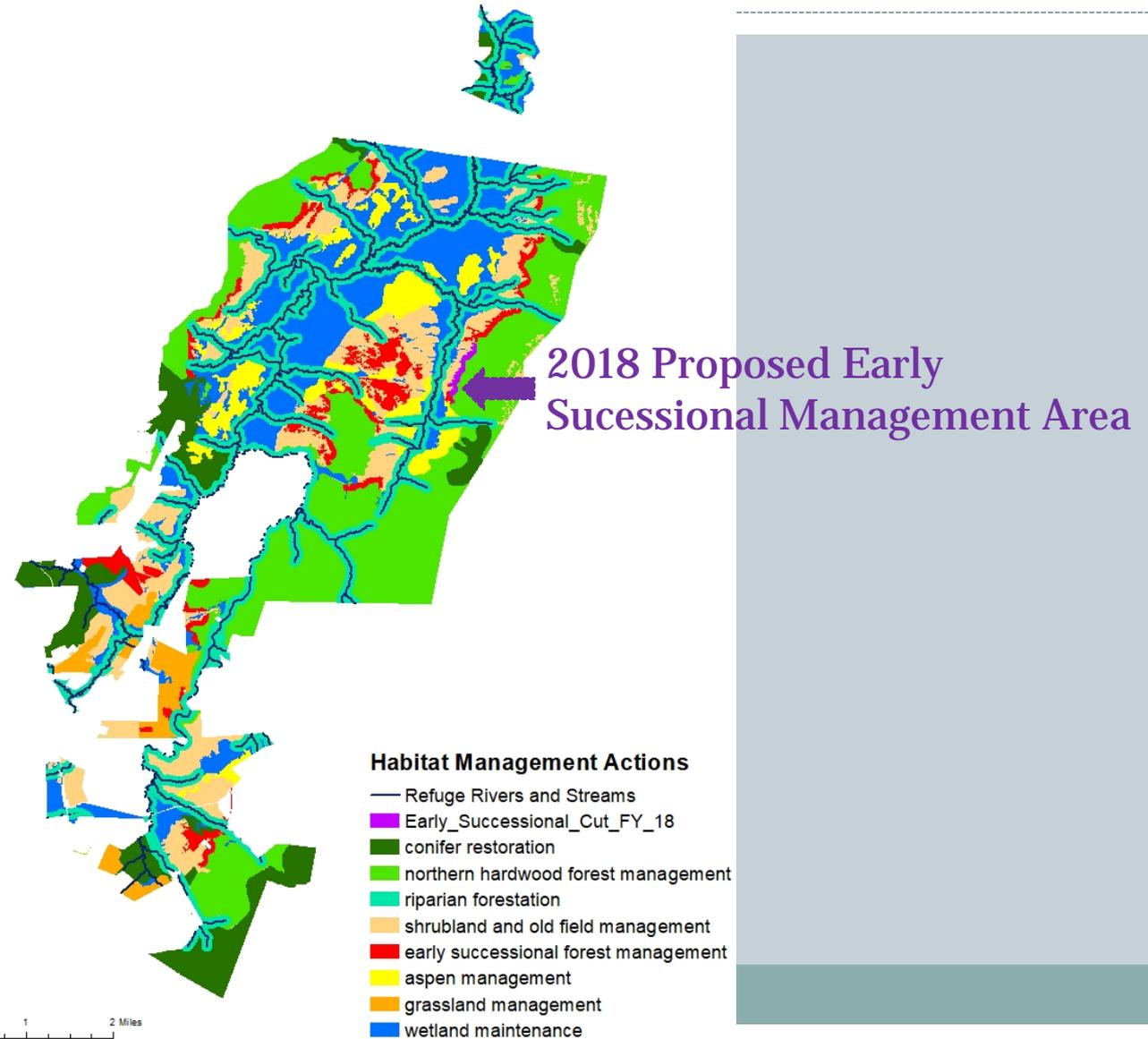
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Jim Hudgins

Early Successional Example

Tentative Early Successional Management



Early Successional in Relation to Refuge Area



How much of the Refuge will be cut Commercially?



- **Northern hardwood forest**
 - Commercial cutting & only selective harvests
 - Total acres is undetermined until complete forest inventories are completed. Will be at least 10% of all refuge acres.
- **Conifer forest**
 - Little to no commercial cutting & only selective harvests
- **Early successional forest (includes northern hardwood and aspen forests)**
 - 10% of all refuge acres
 - ~ 30-40 acres cut each year
 - Cut areas will be put on a 40 year rotation
 - Commercial and non-commercial cutting

Commercial Forest Management Process



- Forest inventory: before sale for specific stands and over all forested areas to determine future prescription
- Bid process: information sent to loggers, bid received and selection made
- Management: occurs with oversight by Refuge staff
- After cutting: inspection of site and close out
- Monitoring: woodcock, breeding birds, vegetation
- Adaptive management: based on monitoring and research results
- HMP review and update every 5 years

Next steps



- Public reads and comments on the Forest Management Compatibility Determination (CD).
- The Refuge will respond to all comments.
- Once the commenting period is over, we will begin implementing forest management.
- Continue communication about forest management on the refuge via announcement and interpretation.
- The staff at CVNWR will apply the best management practices, adaptive research & management, and sound science to manage forest habitats for wildlife.

Any Questions????

