



Stewardship Plans for Conservation Sites

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What is stewardship?

- Managing the affairs or property of another
- Who is the “other” in this case?
 - The public?
 - Future generations?
 - Your “neighbor”?
- Caretaking in context

What is it we are trying to manage, steward, conserve, and/or protect?

- Those things that make our lands and waters healthy ...
 - Abiotic (non-living) factors
 - Healthy soil, clean water, clean air
 - Biotic (living) factors
 - Preserving biodiversity
 - Species diversity
 - Genetic diversity
 - Ecosystem diversity



Kinds of stewardship activities on conservation land

- Trail design, maintenance, and monitoring
- Species and habitat inventory, protection, and improvement
- Invasive species removal and control
- Harvesting
- Educational activities



Why create a management plan?

- Forces us to think about what we want to save and why we want to save it
- Gives us a blueprint for stewardship activities
- Lists goals and objectives in one place
- Provides timeline for activities

Not just one for the bookshelves ...

- A management plan should be a dynamic document
- Requires periodic review and revision as goals and objectives are met or change

Steps in Stewardship Planning

- Identify your resources
- Set goals and objectives
- Write management plan
- Implement management objectives
- Monitoring for effectiveness

Types of Resources You Might Have On Conservation Land

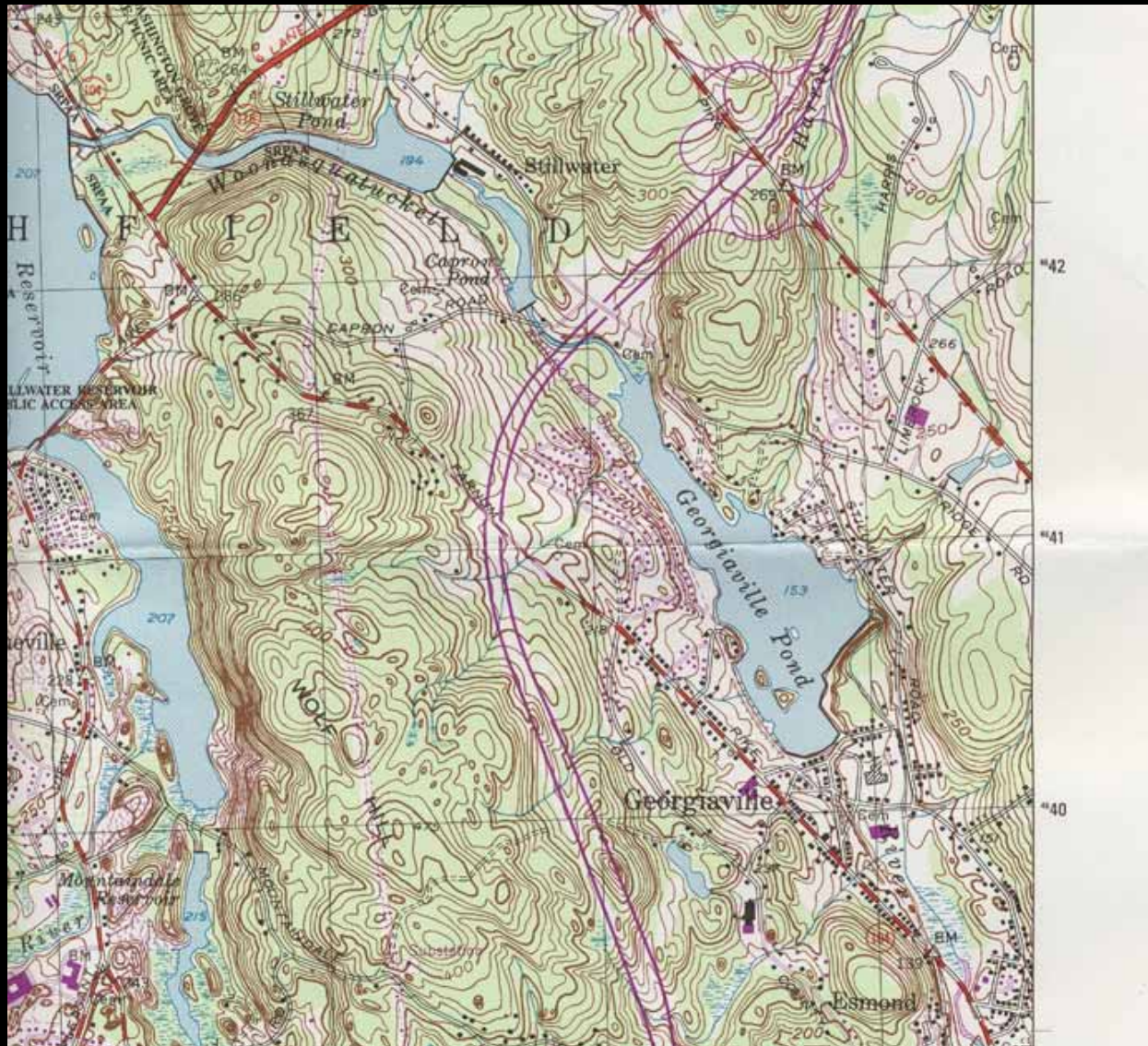
- Natural Resources
 - Habitats (ecological communities)
 - Species of conservation concern
- Cultural and Historical Resources
 - Historic buildings and landmarks
 - Native American sites
- Aesthetic Resources
 - Scenic areas



Source: www.smithfieldri.com

What Can We Inventory From
Existing Documentation?

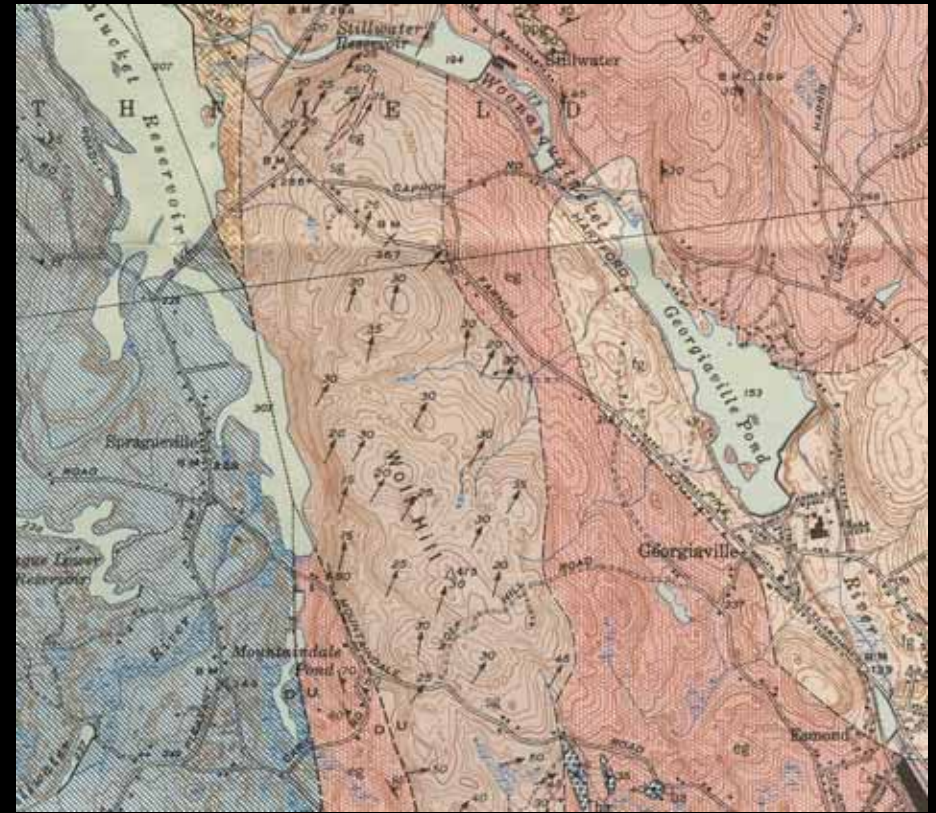
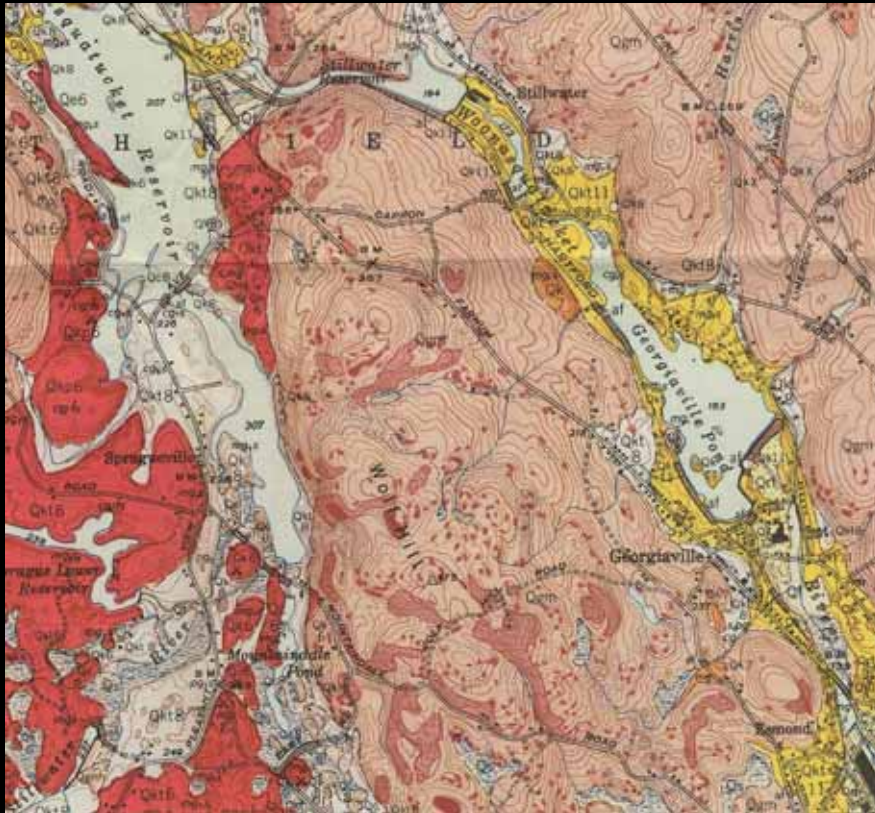
Topographical Features



Aerial Photo



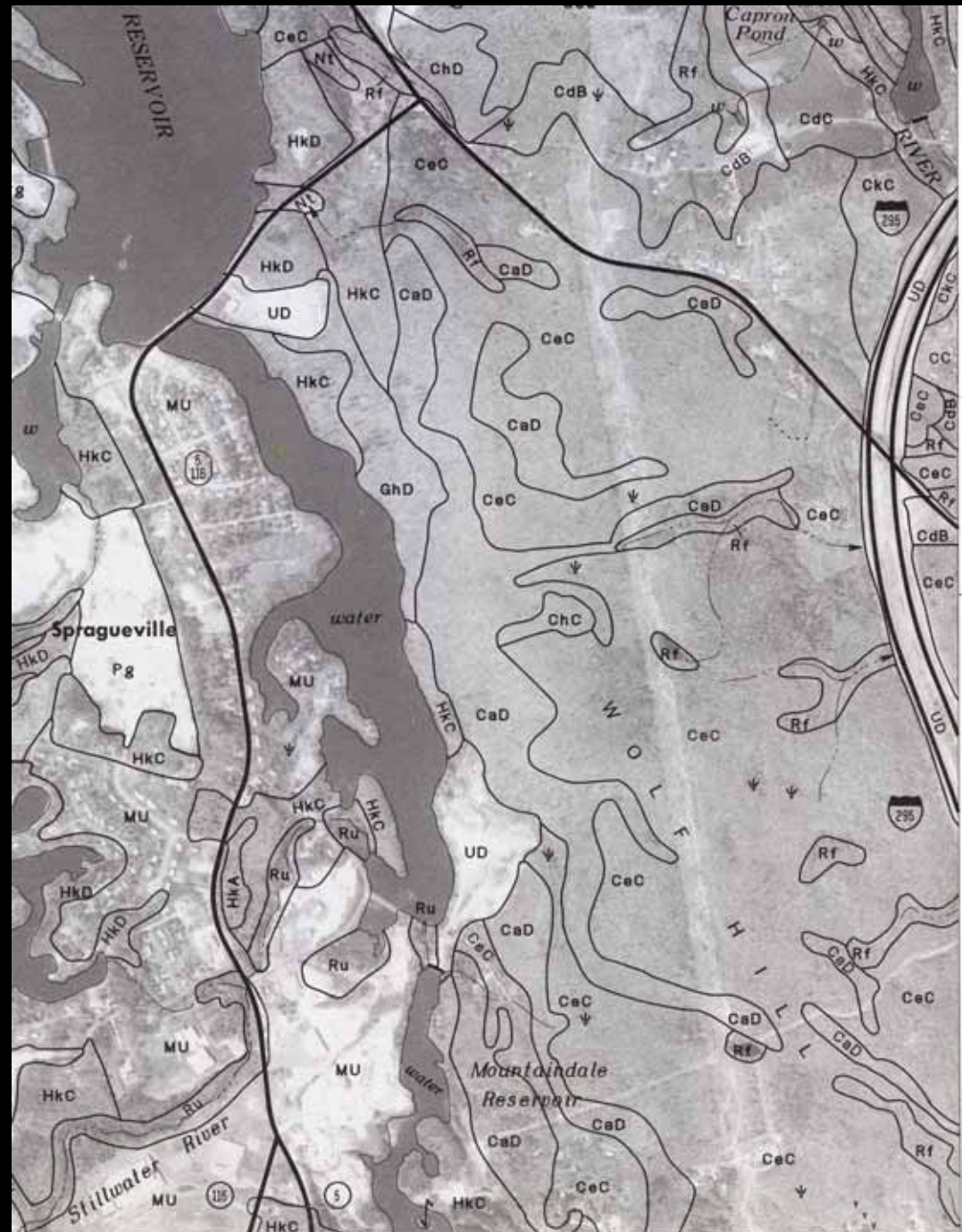
Surficial and Bedrock Geology



Soil Resources

SOIL TYPE LEGEND

- CaD = Canton-Charlton Rock Outcrop Complex
- CeC = Canton-Charlton Fine Sandy Loams
- ChC = Canton-Charlton Very Stony Fine Sandy Loams
- GhD = Gloucester-Hinckley Very Stony Sandy Loams
- HkC = Hinckley Gravelly Sandy Loams, Rolling
- HkD = Hinckley Gravelly Sandy Loams, Hilly
- Rf = Ridgebury, Whitman, and Leicester Extremely Stony Fine



What resources can we use to get our inventory started?

- Topography
 - USGS topographic maps
 - Map Center Store, North Main St., Providence, RI (hard copies)
 - www.dem.ri.gov/maps/index.htm
 - www.topozone.com
 - USAPhotoMaps (www.jdmcox.com)

- Soils
 - Natural Resource Conservation Service (NRCS)
 - Soil Survey of RI
 - www.nesoils.com
 - RIDEM environmental resource maps
 - www.dem.ri.gov/maps/index.htm
- Surficial and bedrock geology
 - USGS maps at Map Center, Providence, RI

- Other resources obtainable through RIDEM environmental resource map
 - Groundwater quality
 - Surface water quality and uses
 - Land use
 - Wetlands

What Should We Inventory On-Site?

- Habitat inventory
- Species inventory



Initial questions for habitat inventory

- Which types of habitats are present on your property?
- What kinds of habitats surround your property?
- What kinds of soils do you have, where are they located, and how do they relate to habitat types present?
- Which types of exotic species, if any, are present on the property?

General Habitat Types on Rhode Island Conservation Sites

Woodlands



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Questions to consider about woodlands ...

- What type of forest? What are the main species present?
- Do the trees appear to be of the same age or a mixture of ages?
- To what degree is the forest fragmented by trails?
- Is the understory open or is there a lot of brush, shrubs, and young trees?
- To what degree are dead and decaying trees present?
- When was the forest last logged or pastured?

Grasslands



Questions to ask about grasslands

- Is the grassland an open field, pasture, hayfield, or forest clearing?
- To what degree are there still native plant species present?
- To what degree is the grassland being invaded by trees and shrubs?
- When was the last time the field was mowed, plowed, hayed, or used for pasture?

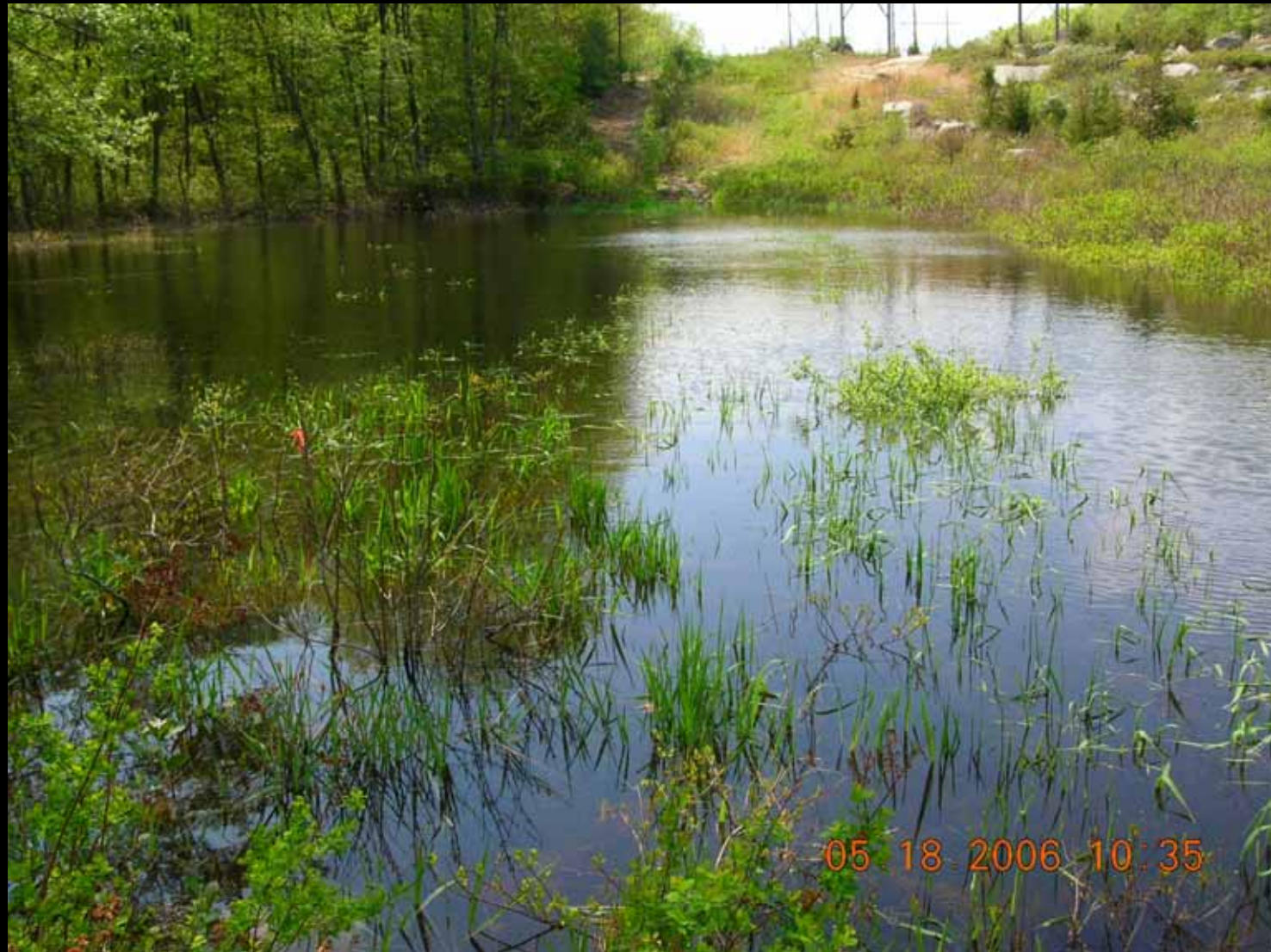
Brush and shrublands



Questions to ask about shrublands

- What sizes are the shrubs? Are they clumped or individuals?
- Do the shrubs produce fruit that might be of value to wildlife?
- Is the shrubland closer to grassland or forest (successional stage)?
- Are the soils wet or dry?
- What is the surrounding habitat like?

Wetlands



Questions to consider about wetlands/aquatic habitats

- What types of wetlands are present? What are their sizes?
- Are they permanent or temporary?
- Are the wetlands isolated or interconnected?
- Is there a stream? Where does it originate?
- Is there open water present?
- What vegetation types dominate the wetlands?
- Has the wetland or surrounding upland been altered in any way by human activities?

Agricultural Land



Source: www.uri.edu

Questions to consider about agricultural lands

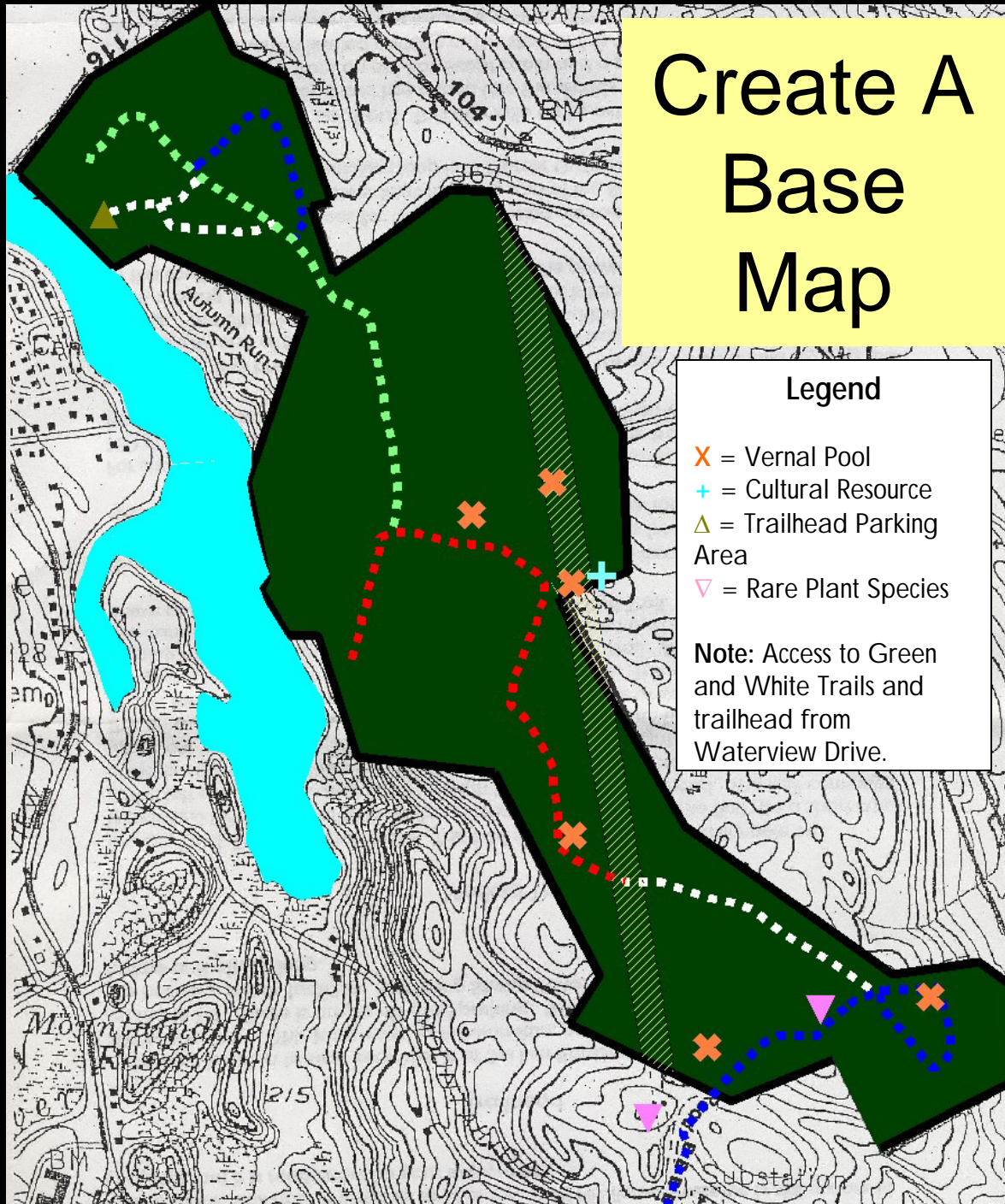
- What crops have been grown most recently?
- What fertilizers or pesticides have been used?
- What irrigation practices have been used?
- Are there areas surrounding the cropland that have not been cultivated and might have wildlife value?

Species Inventory

- Animals, plants, fungi
 - Over several seasons
- Species managed for harvesting
- Rare, threatened, and endangered species
 - List locations:
 - http://odonata.edc.uri.edu/wp-content/uploads/ri_rare_plants_2007.pdf
 - http://odonata.edc.uri.edu/wp-content/uploads/ri_rare_animals_2006.pdf



Create A Base Map



A photograph of a forest stream. The water is dark and still, reflecting the surrounding trees and sky. Several large, moss-covered logs are scattered across the stream. The trees are mostly bare, suggesting a late autumn or winter setting. The overall scene is serene and natural.

Ok, we now know what resources exist on the site ... so now what?

Steps in Stewardship Planning

- Identify your resources
- **Set goals and objectives**
- Write management plan
- Implement management objectives
- Monitoring for effectiveness

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Setting Goals For Your Property

- Begin with the end in mind ...
 - What do you want your conservation land to look like next year? In 10 years? 100 years?
 - What is of value to you, your organization, your constituents, and your neighbors?
- Prioritize goals
- Consider impacts of management decisions on land, water, wildlife, and neighbors

Types of goals you may want to consider ...

- Conservation
- Recreational
- Economic
- Social

Examples of Conservation and Recreation Goals

- Minimizing erosion
- Restoring a particular habitat
- Promote species diversity and/or habitat diversity
- Increase wildlife viewing opportunities
- Create nature trails for hiking



Erosion minimization project at Wolf Hill Forest Preserve, Smithfield, RI

Examples of Economic and Social Goals

- Timber harvesting
- Agriculture and grazing
- Allow access to hunters
- Enroll in state and federal conservation programs (e.g., WHIP grants, agricultural grants)
- Leave something behind for society
- Leaving the land better than you found it
- Improving the environment for the public
- Preserving open space





Goals from Wolf Hill Forest Preserve Management Plan

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Management Goal 1

- *Protect, conserve, and maintain forests, grasslands, shrublands, vernal pools, and other ecosystems present on the Wolf Hill Forest Preserve for present and future generations. Within this goal, there are these specific sub-goals:*
 - Maintain the integrity of the grasslands and shrublands under the power lines as early successional habitat.
 - Diversify the age of the forest, which will increase biodiversity and offer more types of habitat for wildlife.
 - Safeguard vernal pools and other wetlands as sensitive habitats.

Management Goals 2 and 3

- *Plan, promote, and manage public access in such a manner that minimizes threats to sensitive habitats and enhances the value of the visitor's experience.*
- *Promote public awareness of nature and environmental issues by using the property for education, enjoyment, interpretation, and experience.*

Developing Management Objectives

- What is the difference between a goal and an objective?
 - Goals represent your overall ideas of what you want the property to look like
 - Goals are generalities
 - Objectives spell out what you are going to do to meet your goals
 - Objectives are specific and measurable

Writing Good Objectives

- Decide what actions you can take to meet your goals
- Use action verbs
 - Create year-round habitat for migratory birds
 - Reduce erosion along the Woonasquatucket River by stabilizing banks with vegetation in key areas
- The best objectives include the performance task, the conditions under which the task will be completed, and the timeline for completion

Examples of Objectives from the Wolf Hill Management Plan

- Protect two species of rare plants – Goat's Rue and Pale Corydalis – found in early successional habitats on the property.
- Control the spread of invasive species, such as multiflora rose, Russian and autumn olive, and various honeysuckles, through a program of removal and select herbicide applications.
- Develop an appropriate mowing schedule to maintain the grasslands and shrublands, but be protective of rare species.

More examples ...

- Create additional early successional habitat by clear-cutting four acres and allowing that acreage to regenerate naturally over a period of years.
- Plan and construct a kiosk that will be a central location for the dissemination of maps, self-guided tour booklets, and other informational and educational materials.
- Develop a plan that incorporates the use of volunteers for trail maintenance, as well as monitoring human uses and disturbances on the property, particularly as they relate to ATV and ORV intrusions.

Steps in Stewardship Planning

- Identify your resources
- Set goals and objectives
- **Writing the management plan**
- Implement management objectives
- Monitoring for effectiveness

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Sections of the Wolf Hill Preserve Management Plan

- Section 1 – Site Description
 - Legal description
 - Location
 - Property uses
 - Site access and access times
 - Parking areas and trails

- Section 2 – Site History
 - Current ownership and land use
 - Previous ownership and land use
 - Surrounding land use

- Section 3 – Site Resources

- Topography
- Surficial geology
- Bedrock geology
- Soils
- Groundwater
- Surface water

- Wetlands
- Forests
- Grasslands and shrublands
- Rare, threatened, and endangered species
- Aesthetic
- Cultural/historical

- Section 4 – Management Plan
 - Management responsibility
 - Management units
 - Management goals and objectives
 - Prohibited activities
 - Management activities

- Types of management activities
 - Public awareness
 - Informational leaflet
 - Signage and markings
 - Recreational/educational activities
 - Conservation and stewardship activities
 - Surveillance (Trail Stewards)
 - Trail development and maintenance
 - Ongoing species inventory
 - Wildlife habitat improvements
 - Reviews and reporting

- Section 5 – Financial plan and timeline
 - Timeline for completion
 - Cost
 - Sources of funding
- Appendices
 - Assessor's Plat Map
 - Topographical Map
 - Aerial Photograph
 - Current Trails/Facilities and Planned Improvements
 - Surficial Geology Map
 - Bedrock Geology Map
 - Soils Map
 - Forest Inventory Map (being developed)
 - Surrounding Land Use Map
 - Species Inventory List

Steps in Stewardship Planning

- Identify your resources
- Set goals and objectives
- Writing the management plan
- **Implement management objectives**
- Monitoring for effectiveness

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What kinds of things might you want to do to conserve land, water, and species on your conservation site?

Typical Strategies Used On Conservation Lands

- Hands-off approach
- Managing access
- Managing habitats and biological communities
- Managing for specific species
 - Providing resources
 - Controlling threats
 - Direct manipulation

A photograph showing a muddy streambed with a large rock in the foreground and dry grass in the background. The text "Managing Access" is overlaid in white. The date and time "04.22.2007 17:17" are in the bottom right corner.

Managing Access

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Trail Design and Construction



Source: www.fs.fed.us

Maintaining Trails



Source: www.vhtrc.org



Limiting Access to ATVs



Source: www.startribune.com

Limiting Access For Camping, Making Fires, and Related Activities



Managing Litter and Illegal Disposal



Posting, Signage, and Trail Markers



A photograph of a forest stream with the text "Managing Habitats" overlaid in the center. The stream is surrounded by dense green foliage and trees, with reflections visible in the water. The text is in a white, sans-serif font.

Managing Habitats

Considerations ...

- How much do you want to (or can you) limit human interference?
- How well do you know the regime of disturbances that periodically affect your site?
 - Forest fires, floods, wind and ice storms
 - What role do these play in maintaining certain habitats?
- What are your economic goals, if any?

Forests

Four Basic Facts About Forests

- They cover less than 6% of Earth's surface area
- They are habitat for the majority of Earth's species
- They are being lost far faster than they are expanding
- Most forests are not in reserves
- So, how do we integrate forest management with maintaining biodiversity?



Managing Age Structure



Uneven-aged: a stand with trees of three or more distinct age classes, either intimately mixed or in small groups.



Two-aged: a stand with trees of two distinct age classes separated in age by more than plus or minus 20% of the rotation age.



Even-aged: a stand composed of a single age class of trees in which the range of tree ages is usually plus or minus 20% of the rotation age.

Forests With Uneven Age Structure Have Greater Biodiversity



Managing Species Composition

- Some trees are more desirable to grow and cut than others
- Control species composition by planting seeds or seedlings of desirable species or controlling undesirable species
 - Can have negative consequences for forest biota
 - As a result, forestry managers should favor native tree species

Small Patch Cutting and Regeneration



Prescribed Burning



Source: www.al.nrcs.usda.gov

Minimizing Erosion



Providing Resources

Basic Needs for Any Species

- Food
 - Water
 - Cover
 - Territory
 - Nesting sites
 - Suitable microclimate
-
- Where one or more of these is lacking, it can be provided by conservationists

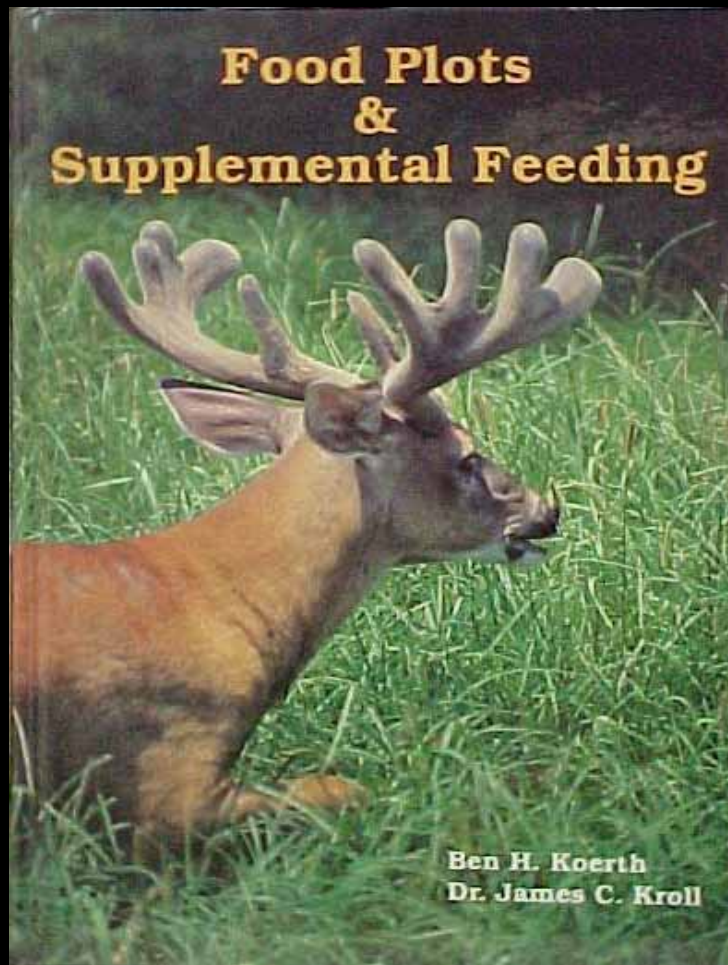
Cultivation of Food Species

- Planting wildflowers that are good for pollinators, other insects, birds, and mammals
- Maintaining host plants for endangered species



Source: whyfiles.org

Supplemental feeding



Source: www.dnr.state.oh.us

Supplementing Physical Environments

- Bird and bat houses (artificial nesting cavities)



Source: www.ahsdirect.co.uk



Mike Dunn

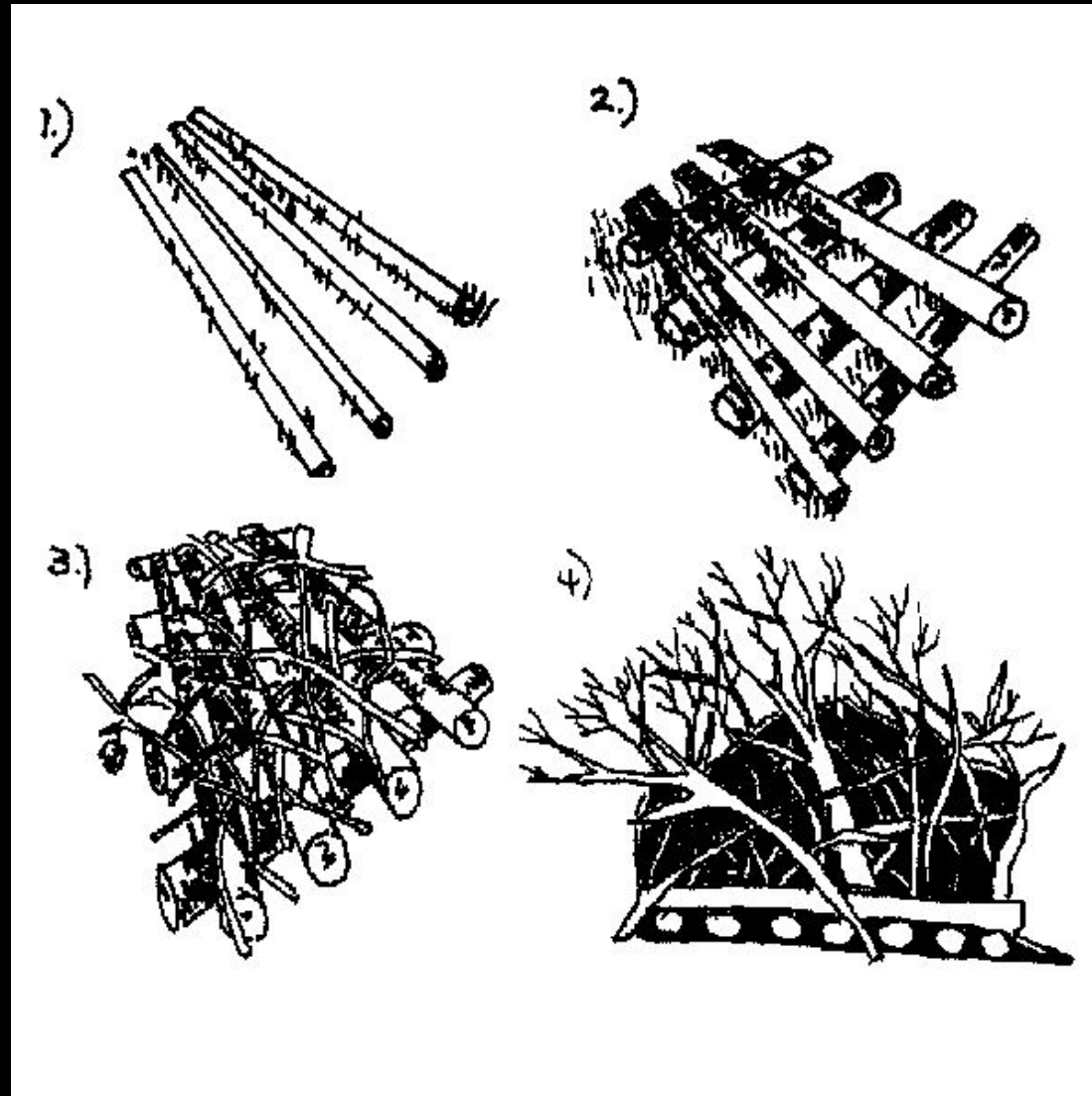
Source: www.naturalsciences.org

Brush Piles For Wildlife Cover



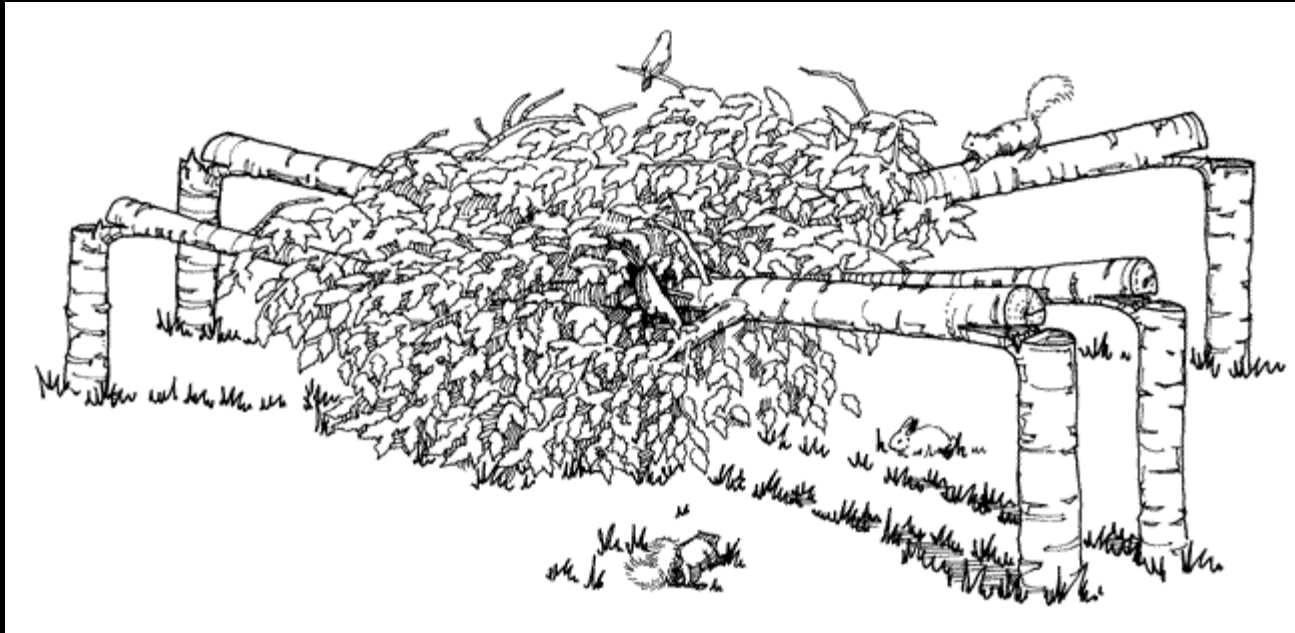
Source: www.wildtrees.co.uk

Constructing Brush Piles



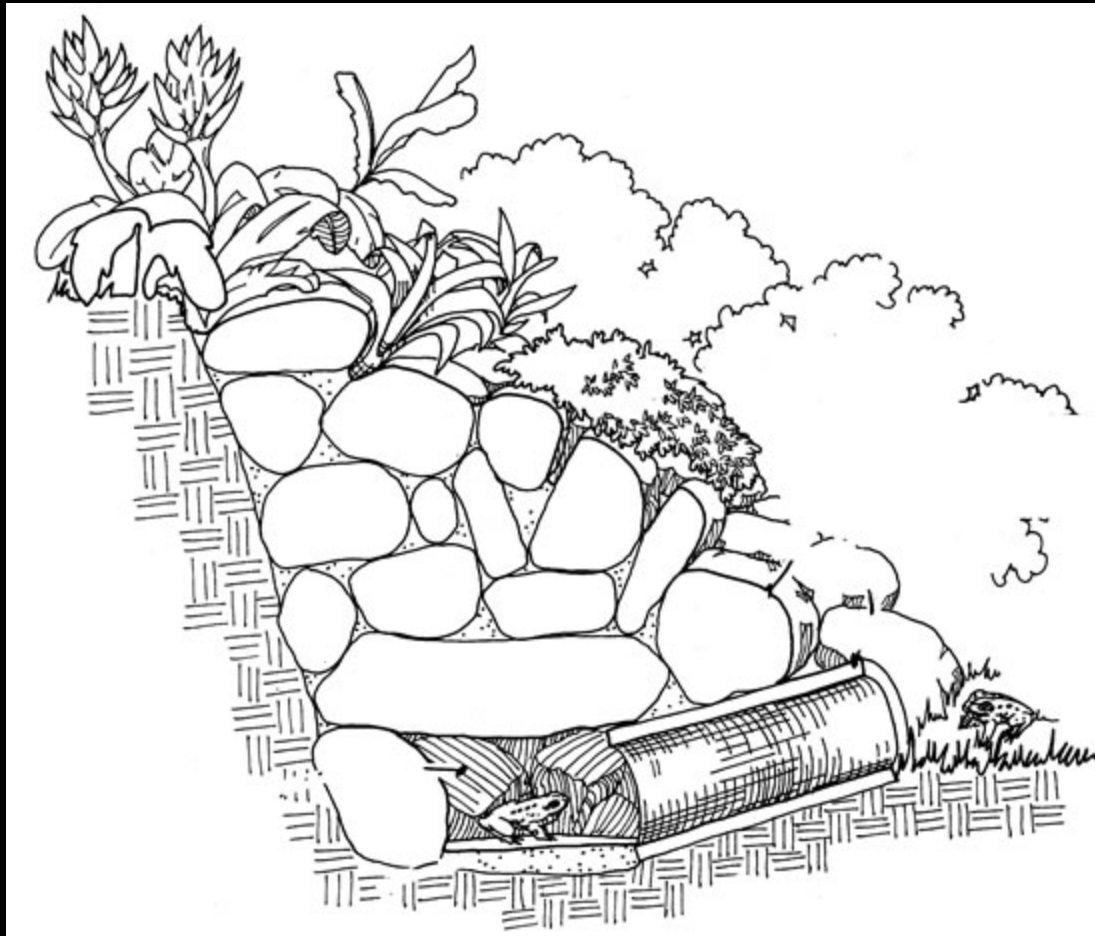
Source: www.ehow.com

Constructing Brush Piles



Source: wdfw.wa.gov/wlm/living/rabbits.htm

Rock Piles for Wildlife Cover (Especially Reptiles and Amphibians)



Source: www.wdfw.wa.gov

Supplementing Other Requirements

- Thinning forest to allow more light for growth of endangered small whorled pogonia in Maine



Source: courses.bio.psu.edu

Controlling Threats

Mowing Grasslands



Source: www.in.gov/dnr/fishwild/hunt/HMFSMowing.pdf

Controlling Invasive Species

Purple Loosestrife
Lythrum salicaria



08

Tartarian honeysuckle
Lonicera tatarica



Spotted Knapweed
Centaurea maculosa



Asiatic Dayflower
Commelina communis



Controlling Invasives



Limiting Harvesting

- Limit how many plants or animals can be harvested in given time period
- Limit who is allowed to harvest
 - Licensing, lottery, age, locals only, for a living only
- Limit when harvesting is allowed
 - After the breeding season
- Limit where harvesting is allowed
- Limit how harvesting is allowed
 - Guns, trapping, bow and arrow, trawl nets, etc.
 - Eliminate/minimize incidental harvest

Limiting Indirect Human Threats

- Minimizing road kills using amphibian tunnels and other migration corridors
- Excluding people from sensitive habitats
- Restricting boat speeds
- Silhouettes on windows to reduce bird collisions



Source: www.fhwa.dot.gov

Using Your Site For Education



Direct Manipulation

Translocation

- Three forms
 - Introduction of organisms to new sites outside of their historical range
 - Reintroduction of organisms to environments from which they were extirpated
 - Augmentation of small, existing populations by adding individuals obtained from elsewhere

Some Species That Have Been Reintroduced



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Head Starting

- Reduce mortality in the stages of survivorship where the species is most vulnerable by raising in captivity



Steps in Stewardship Planning

- Identify your resources
- Set goals and objectives
- Write management plan
- Implement management objectives
- **Monitoring for effectiveness**

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Monitoring For Effectiveness

- After undertaking any stewardship activity, there must be an evaluation of whether that activity or objective was achieved
 - Photographic evidence
 - Biodiversity surveys (before and after)
 - Ongoing species inventories
 - Get the help of local specialists

References

- Sargent, M.S and Carter, K.S., ed. 1999. Managing Michigan Wildlife: A Landowners Guide. Michigan United Conservation Clubs, East Lansing, MI. 297pp. Available on-line at: http://www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/landowners_guide/Introduction/index.htm

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