

# Preservation is Only the Beginning: Using Land Preservation as the First Step Toward Ecological Diversity and Function



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## Takeaways

- **Conservation easements are the first step**
- **Vibrant agriculture and ecological function are NOT mutually exclusive**
- **Easement language is important**
- **Beaver, coyote, deer – don't believe everything you think**



# Conservation easements are where we start



**Habitat – low**

**Diversity – low**

**Food for deer – high**





## Ecological restoration can add to farm bottom line!

- 2 acre marginally wet hayfield
- 150 bales/acre/year
  - \$1500/acre/year
- 2 acre wildlife wetland lease, cost shared thru Soil Conservation District at \$5,000/year



## **Ecological Restoration Easements**

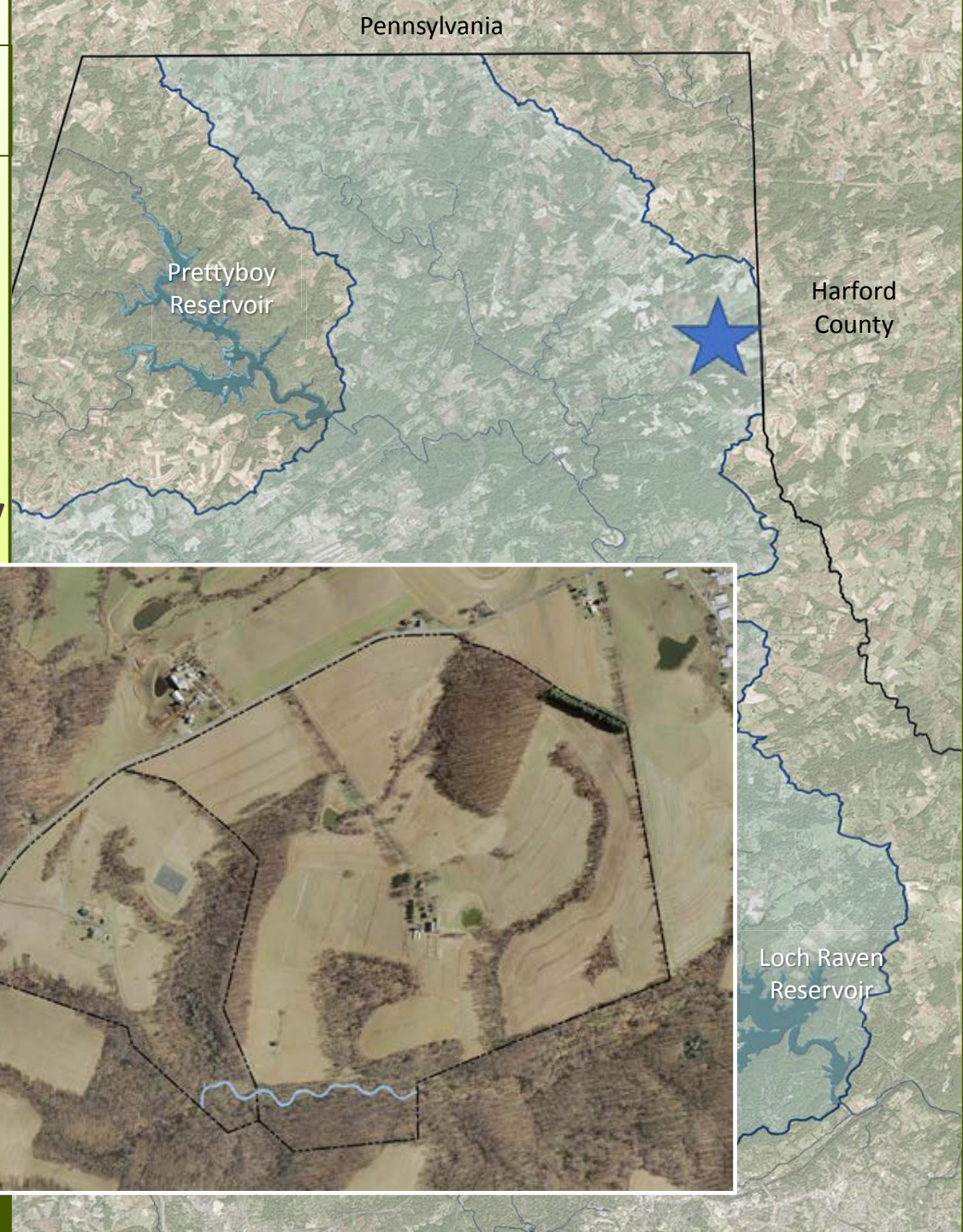
- **Forest Retention**
- **Reforestation**
- **Stream Restoration**
- **Wetland Restoration**
- **Nutrient Credits**

## **Non-easement Options**

- **State/Federal Grants –  
Chesapeake Bay  
Restoration**
- **Soil Conservation –  
MACS Cost Share**
- **Farm Bill Programs –  
CREP, Equip**

# First Mine Branch

- 1.3 Square Mile Drainage Area
- Loch Raven Watershed
- Northern Baltimore County
- Use III
- 2,400 linear feet to be restored





# Existing Conditions



DESIGN SUSTAINABILITY REVIEW CHECKLIST

Mandatory Sustainability and Constructability Review at 60% design

INITIAL SITE INVENTORY

- ✓ Rock/Gravel source – Wide variety of gravel size/plenty to salvage d84 ≈ 30 mm
  - Are soil borings necessary/beneficial? Yes would be beneficial
- ✓ Wetland peat layer
  - Beneficial to plot profile? potential wetlands present to be delineated
- ✓ Wetland sod/upland sod sources – quantify – majority of site is completely wooded/source of upland sod
- ✓ Sod grow areas – quantify – large adjacent fields/discussion with the landowner
- ✓ Live stake source – quantify ≈120 trees (via tree survey) surrounded by trees to be used as potential live stake source
- ✓ Root wads/logs – quantify ≈120 trees (via tree survey) in construction area/adequate amount of quality trees
- ✓ Inventory summary spreadsheet completed

DESIGN CONSIDERATIONS

- ✓ Utilize inventory spreadsheet to maximize use of on-site materials
- ✓ Vegetation/wood vs. Rock – a lot of wood
  - Maximize use of vegetation/wood and keep submerged
  - If using Rock, justify – No rock to be used as main structures
- ✓ Are there opportunities to recycle/reuse materials? Yes-trees can be used for structures and adequate riffle material
- ✓ Sun vs. shade, aspect – consider for bioengineering plan is currently forested/and will still have some tree cover
- ✓ Furnished materials available locally - Majority of material can be salvaged on site
- ✓ Reduce Transport Costs
  - Haul Off Reduced by using on-site materials and spoils areas -little/no haul off abundance of on-site material
  - Haul On Reduced by balancing cut/fill -adjacent fields for balance

CONSTRUCTABILITY CONSIDERATIONS

- ✓ Stockpiles
  - Short Dirt - Are locations of spoils areas adequate Yes-large adjacent fields, discuss with landowner if there is anywhere else they may want soil
  - Is the stockpile area large enough for construction needs Yes
- ✓ Is the LOD adequate for efficient construction Yes no restrictions
- ✓ Does the design allow for creativity/flexibility during construction Yes no restrictions
- ✓ Reviewed by Director of Construction at 60% design

FOR PLANS

- ✓ Description of project in 20 years – function, appearance, sediment transport condition (aggrading/degrading)
- ✓ Materials list with salvaged and furnished materials – completed at 90%, need additional construction review
- ✓ Local sources of material identified on plans with contact information – hopefully not required, hopeful to use all materials from on-site

# What's on Site?



# Design Approach





# Legacy Sediment



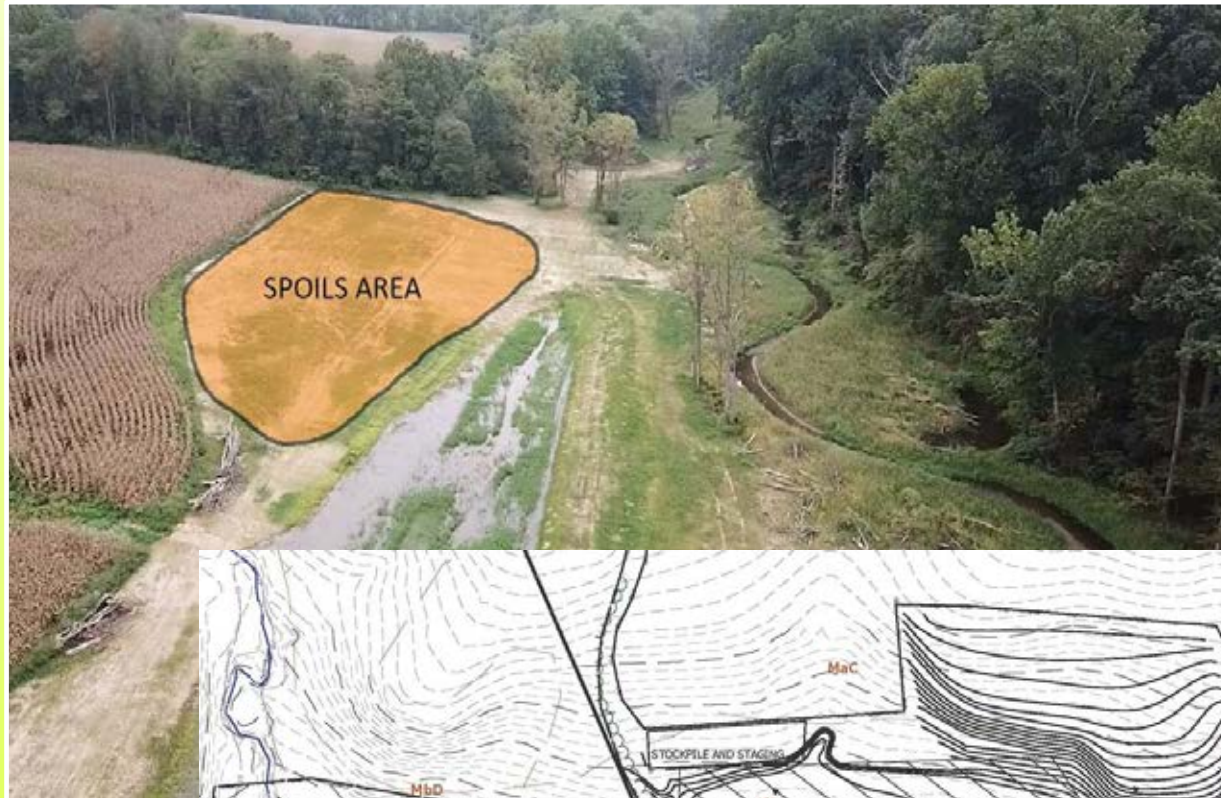
Peat Layer

Cobble Layer

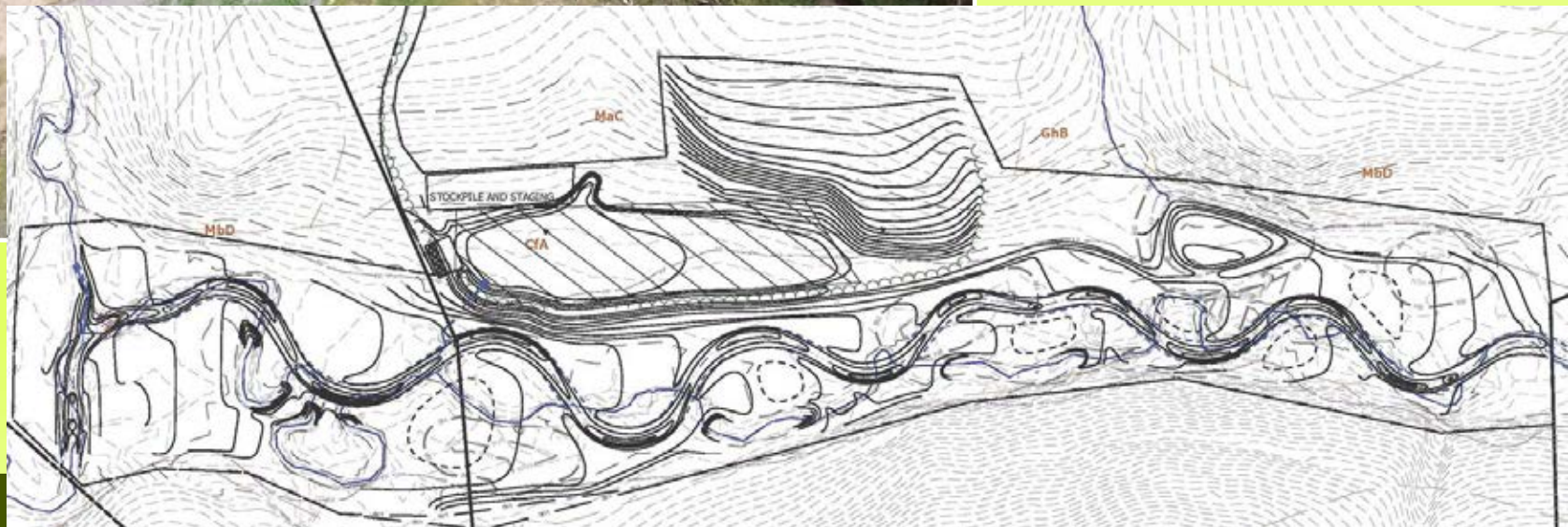
Peat



# Spoil



**Cut: 8,475**  
**Fill: 2,647**  
**Net: 5,827 (CUT)**



# Riffle Material









# Lots O'Wood



# Toewood









**Questions?**



# Conservation Easements

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# Roadmap

- 1. The Objective**
- 2. Legal Aspects of a Successful Project**
- 3. Conservation Easements – Impacts and Options**
- 4. Closing Remarks**

# The Objective

**To improve the ecological function of properties that are subject to a conservation easement.**



# How do we make improvements?

**Create and/or Conserve Forests**

**Restore Streams and Improve Stream Function**

**Create and/or Improve Wetlands**

**Create and/or Improve Habitat**

**A Combination of These Activities**

# Creating Value

## Intrinsic Value

## Economic Value

- The Easement Holder already paid for the conservation easement, or the Owner already received an economic benefit...
- But there is additional value for additional interests.

# Who are the players?

Property Owner

Lenders

Funding Source

Consultant/  
Contractor

Approval  
Authorities

Long-Term  
Steward

Easement  
Holder

# Conservation Easement Implications

## Purpose

- Agricultural Land
- Scenic Views
- Historic Structures

## Restrictive Covenants

- Limits on Construction
- Limits on Commercial Activities (sales of mitigation credits)
- Covenant against further encumbrances

# Options

**Take the position that the project is permitted by the terms of the easement.**

**Ask Approval Pursuant to Express Authority**

- **MALPF Forest Conservation Overlays**
- **MALPF General Overlay**
- **MET Allows Sales of Credits**
- **General Request**
- **County Easement Overlays**

**Terminate the Easement**

**Can we build it?**

**Yes, we can!**





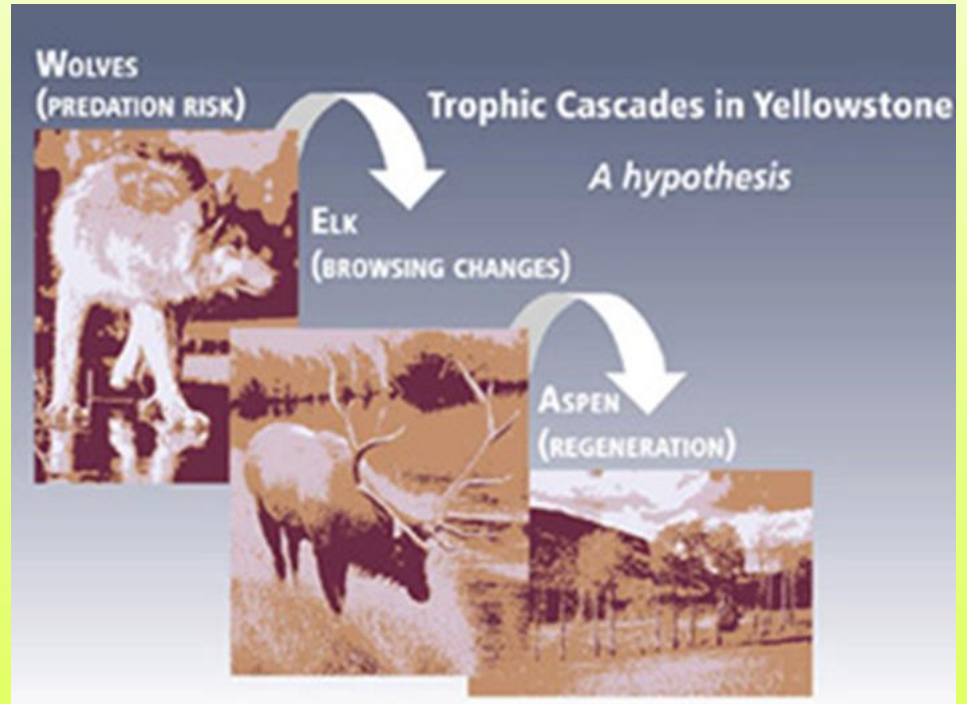
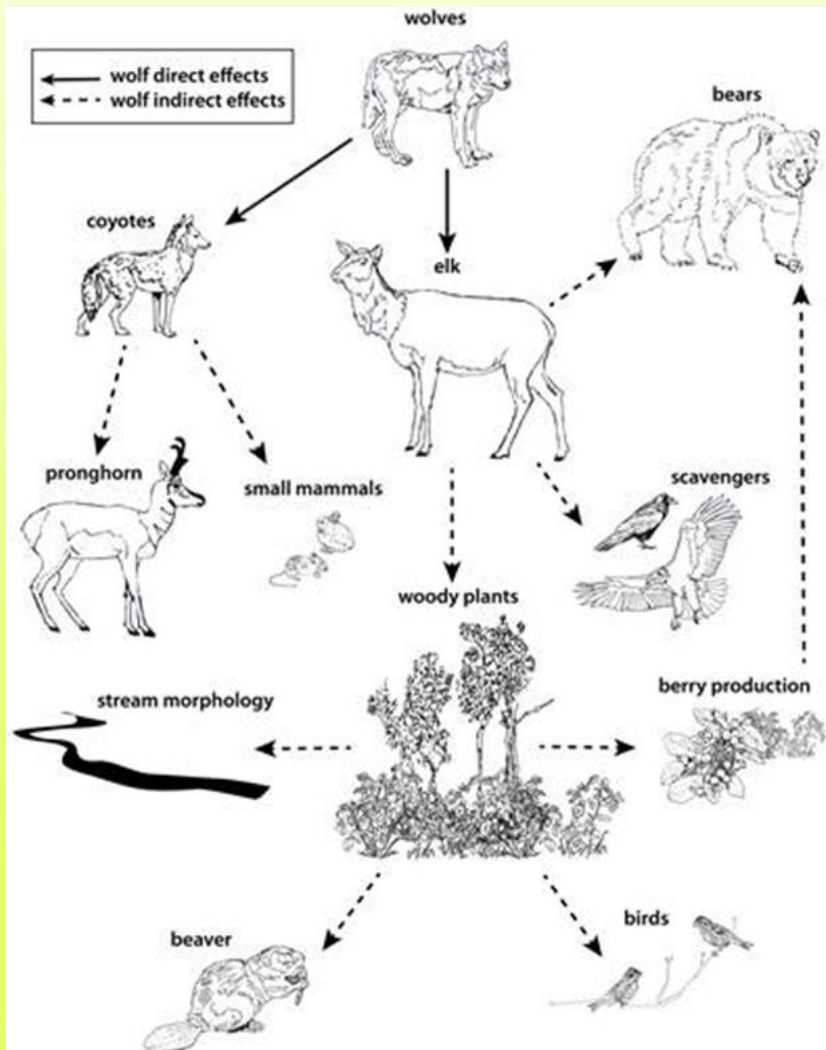
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A scenic rural landscape featuring a stream in the foreground with fallen branches and reeds. In the middle ground, a black cow stands in a grassy field. The background shows a red barn and a line of trees with autumn foliage under a clear blue sky.

# **Ecosystems Services and Trophic Cascades**



## Trophic cascade scenario: top carnivore removal

before



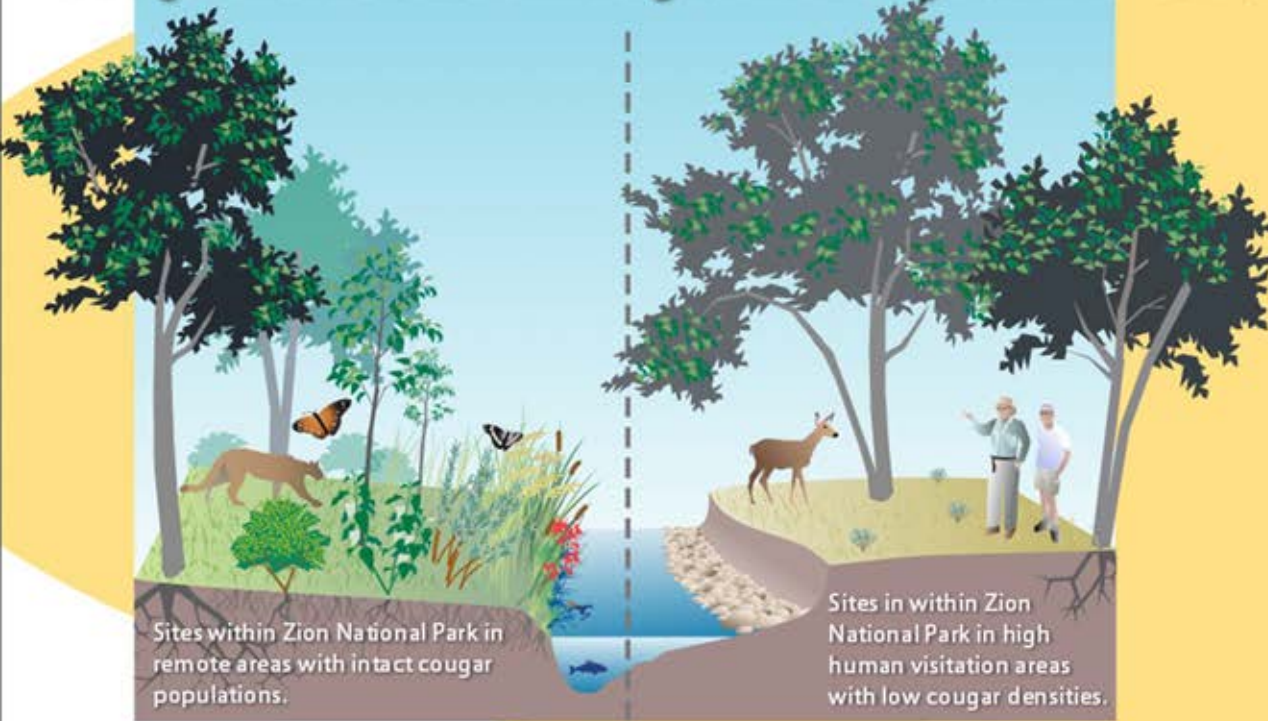
- mix of large and small predators
- diverse plant community
- diverse songbird community
- fewer large herbivores

after



- large predators absent; small predators dominate
- simplified plant community
- lower songbird diversity
- numerous large herbivores

# Cougar Predation Key to Ecosystem Health



Sites within Zion National Park in remote areas with intact cougar populations.

Sites in within Zion National Park in high human visitation areas with low cougar densities.

The loss of an important predator, such as wolves or cougar, can affect a broad range of terrestrial and aquatic plant and animal species in an ecosystem—from trees, shrubs, wetland plants, and wildflowers to amphibians, fish, lizards, mammals, and even butterflies.

A new study by College of Forestry researchers found that cougars in Zion National Park—like wolves in Yellowstone National Park—profoundly impact other aspects of the ecosystem. Besides controlling deer populations directly, they also influence the foraging behavior of deer and elk, in what has been called “the ecology of fear.”

Over the past 70 years, the number of human visitors to the park’s Zion Canyon has increased to nearly 3 million per year, while cougars have gradually disappeared. As a result, deer populations have dramatically increased, leading to severe ecological damage, loss of cottonwood trees, eroding streambanks, and declining biodiversity.

This “trophic cascade” of environmental degradation is linked to the increasing presence of humans and the decline of a major predator.

Ripple, W.J. and Beschta, R.L. (2006). Linking a cougar decline, trophic cascade, and catastrophic regime shift in Zion National Park. *Biological Conservation* 133:397-408.



















# Bridge Creek, Oregon

- 10 year study
- Beaver dam analogs
- NOAA funding
  - Objective is to improve salmonid habitat









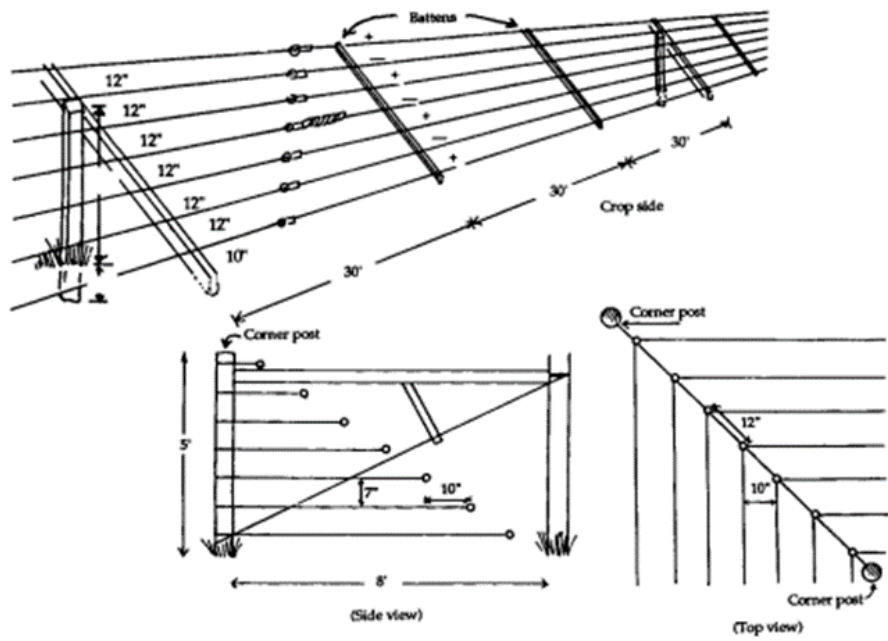
Insert Boordy beaver video



***I now suspect that just as a deer herd lives in mortal fear of its wolves, so does a mountain live in mortal fear of its deer.***

**Aldo Leopold. A Sand County Almanac, 1949**



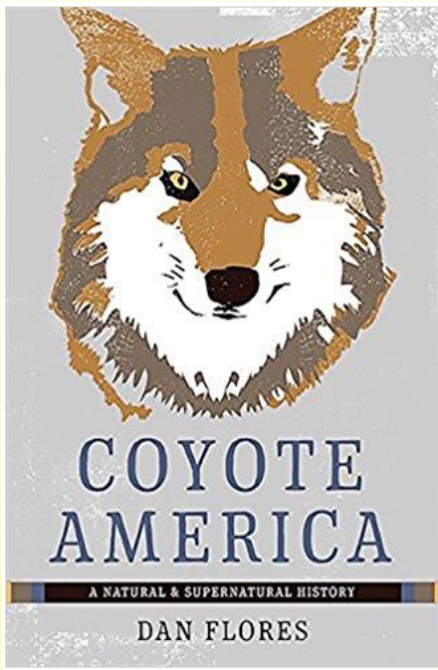


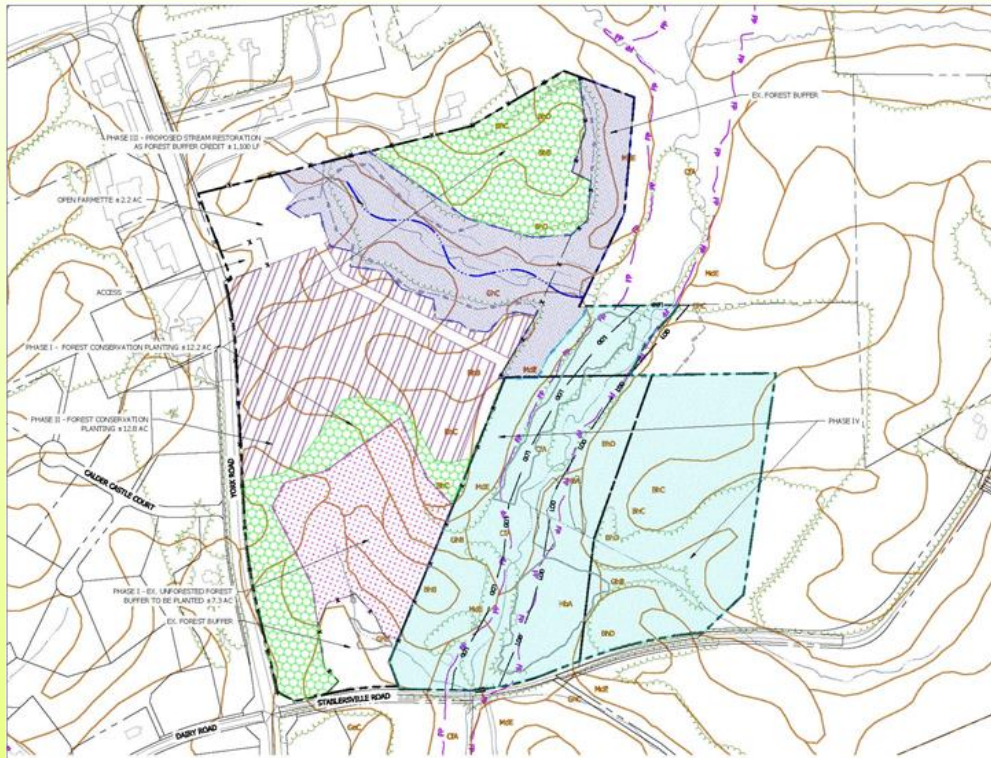
**Deer Exclusion Fencing:**

Eliminates need for tree shelters. 70% cost savings over tree shelters.

Soil ripping, heavy organic inputs prior to forest planting







## **Fourth Mine Branch Property**

- **Purchased 12/17**
- **Reforestation (County)**
- **Forest Retention (County)**
- **Stream Restoration (TMDL)**
- **Maryland Environmental Trust Easement, proposed 12/18**



Photo Credit: Johan Hogervorst



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# Questions?



**ecotone**  
ecological restoration

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