



# **RESTORATION ON THE MAGNESS FARM**

**Integrating Stream, Wetland,  
Riparian, Floodplain, and  
Groundwater**

**A Model of Regenerative  
Design**

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U.S. Department of Transportation  
**Federal Highway  
Administration**

# BACKGROUND

- Maryland State Highway Administration (MdSHA) Environmental Stewardship Project, not Mitigation for Project Impacts
- TEA-21 Program Funded, with additional MdSHA and County funding contributions
- MdSHA has Adopted Approach of Optimizing Site Restoration Values





# THE MAGNESS FARM STORY

## Drainage 'Improvements'

- Surface drainage ditches
- Subsurface tiles
- Spring developments

Amos Rd

Gradenbaugh Rd

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39°39'36.84" N 76°31'16.84" W

elev 617 ft

Eye alt 2882 ft


























# WHY THIS PROJECT?

- New generation interested in agricultural history and telling that story
- Largest surface ditch developed into a problem
  - Part of farm has never been productive
- Knows thousands of tons of sediment have gone down into Deer Creek (trout waters)



# RESTORATION APPROACH

- 'Fill' excavated ditch to raise channel
- Place rock weirs to control channel incision
- Incorporate bentonite fabric 'plugs' to stop preferential groundwater flow
- Remove groundwater tile drains
- Remove spring development structures



# RESTORATION GOALS

- Safe, non-erosive conveyance of surface water
- Restore wetland hydrology through groundwater restoration and holding water on the landscape
- Restore forested wetland and vernal pool habitats
- Provide water quality benefits for sediments and nutrients



## Regenerating System

Living Systems  
Understanding  
Whole System

## Regenerative

Humans (Hominids)  
PARTICIPATING AS nature –  
Co-evolution of the Whole  
System

## Restorative

Humans DOING THINGS  
TO nature – assisting the  
evolution of Sub-Systems

## Sustainable

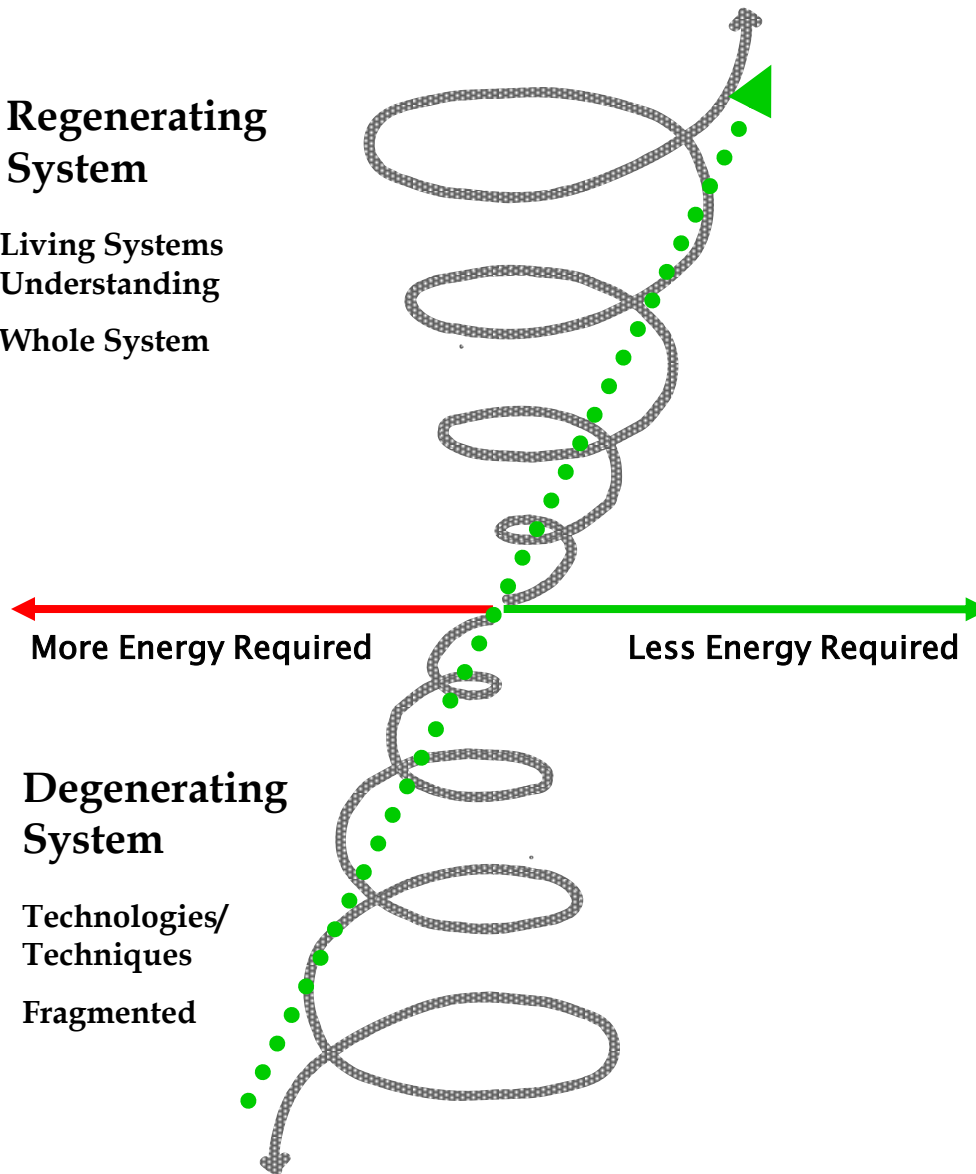
Neutral –  
“100% less bad” (McDonough)

## Green

Relative Improvement  
(LEED, GB Tool, Green Globe, etc.)

## Conventional Practice

“One step better than  
breaking the law” (Croxtan)



# Trajectory of Environmentally Responsible Design

Integrative Design Collaborative and Regenesis 2006 - Bill Reed, reed@integrativedesign.net



























| <b>Project</b>  | <b>Cost</b>             | <b>Benefits</b>  | <b>Value*</b>             |
|---|-------------------------|--|---------------------------|
| Design  | \$87,000                | 7.5 acres of wetland restoration   | \$375,000                 |
| Construction  | \$429,000               | 1100 LF of stream restoration  | \$385,000                 |
| Oversight   | \$43,000                | 66,000 cf water storage/treatment  | \$660,000                 |
| <b><i>Total</i></b>   | <b><i>\$559,000</i></b> | <i>Not Included:<br/>Habitat value, groundwater restoration, aesthetic value, etc. ???</i> | <b><i>\$1,420,000</i></b> |
| <b>Cost/Benefit ratio: 1:2.5</b>  |                         |  |                           |
| *Value is calculated based on a conventional cost of: \$50k/acre wetland; \$350 lf/stream; and, \$10 cf of water storage. |                         |  |                           |

## Magness Farm Integrated Stream and Wetland Cost/Benefit





