

The background image shows a calm lake reflecting the sky and the surrounding landscape. On the far shore, a dense forest of evergreen and deciduous trees covers a hill. In the middle ground, a large, two-story wooden house with a dark roof and a chimney sits on a grassy bank. To the left of the house, a small boat is visible in the water. The overall scene is peaceful and natural.

# Shoreland Restoration

## Changing Cultural Practices

**Amy Picotte, VT Lakeshore Manager**  
**2019 Erosion Control Workshops**  
**Natural Resource Conservation District Training**



Mergansers on Maidstone Lake by Rebecca Scott



Belted kingfisher by Helene Grogan



by Kate Jerome



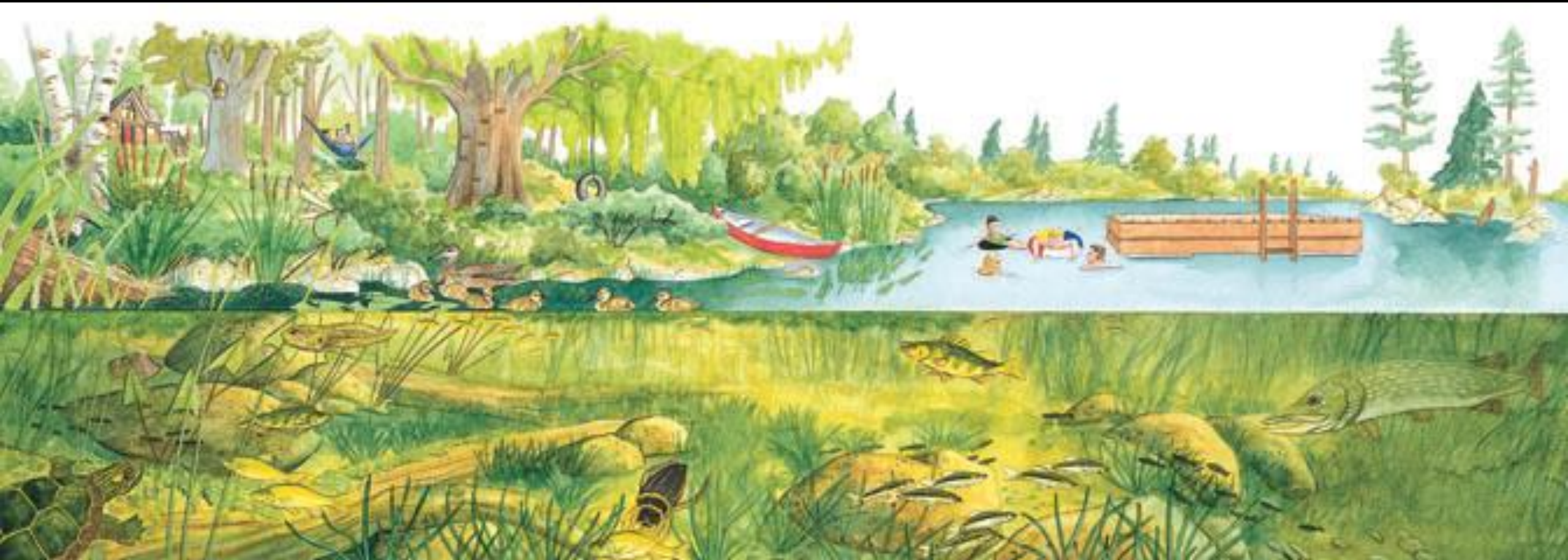












By Michigan Natural Shoreland Partnership



# Native Plants are Essential for Healthy Lake Ecosystems

- 
- 96% of birds depend entirely on insect protein to feed their young
  - Up to 40% of fresh water fish protein comes from insects dropped into the water from native plants

# Dr. Douglas Tallamy's Research on Native Plants

**Black Cherry hosts  
456 insects!**



## Woody Plants

Common Name	Plant Genus	Butterfly/moth species supported
Oak	Quercus	534
Black cherry	Prunus	456
Willow	Salix	455
Birch	Betula	413
Poplar	Populus	368
Crabapple	Malus	311
Blueberry	Vaccinium	288
Maple	Acer	285
Elm	Ulmus	213
Pine	Pinus	203
Hickory	Carya	200
Hawthorn	Crataegus	159
Spruce	Picea	156
Alder	Alnus	156
Basswood	Tilia	150
Ash	Fraxinus	150
Rose	Rosa	139
Filbert	Corylus	131
Walnut	Juglans	130
Beech	Fagus	126
Chestnut	Castanea	125

## Herbaceous Plants

Common Name	Plant Genus	Butterfly/moth species supported
Goldenrod	Solidago	115
Asters	Aster	112
Sunflower	Helianthus	73
Joe pye, Boneset	Eupatorium	42
Morning glory	Ipomoea	39
Sedges	Carex	36
Honeysuckle	Lonicera	36
Lupine	Lupinus	33
Violets	Viola	29
Geraniums	Geranium	23
Black-eyed susan	Rudbeckia	17
Iris	Iris	17
Evening primrose	Oenothera	16
Milkweed	Asclepias	12
Verbena	Verbena	11
Beardtongue	Penstemon	8
Phlox	Phlox	8
Bee balm	Monarda	7
Veronica	Veronica	6
Little bluestem	Schizachyrium	6
Cardinal flower	Lobelia	4

Source:

**Doug Tallamy**

Professor & Chair of  
Entomology and  
Wildlife Ecology  
250 Townsend Hall  
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A single pair  
of breeding  
chickadees  
must catch

7500  
caterpillars  
to rear one  
clutch of  
young

© Debra Brton



# Shoreland Native Plants

## Benefit Wildlife

- Provide Food and Habitat
- Provide Shade for Aquatic Animals
- Cool Water to Hold Dissolved Oxygen for Fish
- Limit Aquatic Plant Growth

## Benefit Water Quality

- Stabilize Banks and Prevent Erosion
- Infiltrate and Filter Upland Runoff

## Benefit Property Owners

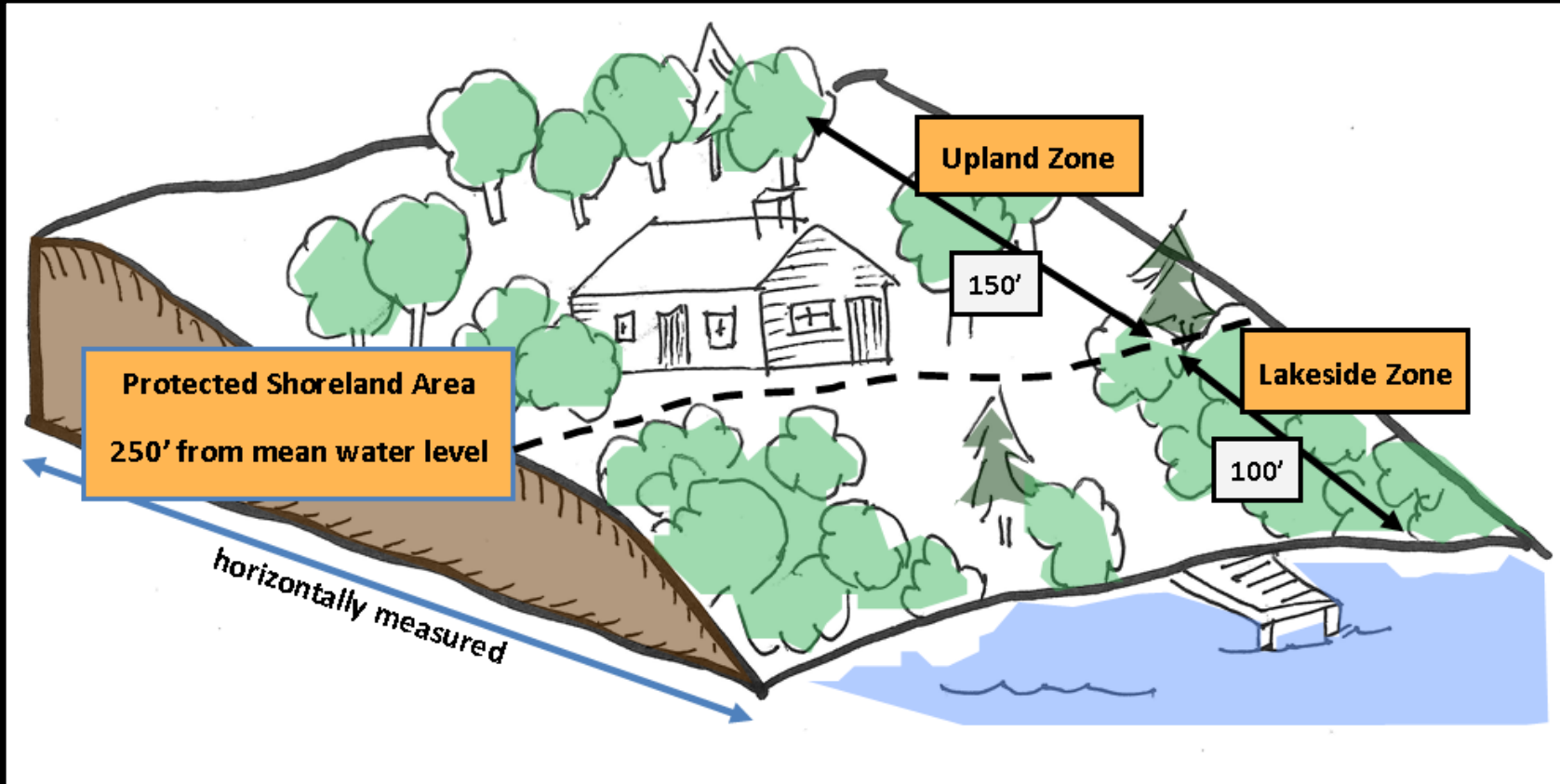
- Build Resiliency Along the Shore
- Protect Shoreland Property and Investments
- Make us Smarter!





# The Shoreland Protection Act - 2014

- Applies to lakes 10 acres or greater in size
- State reviews development practices within 250 feet of a lake's mean water level



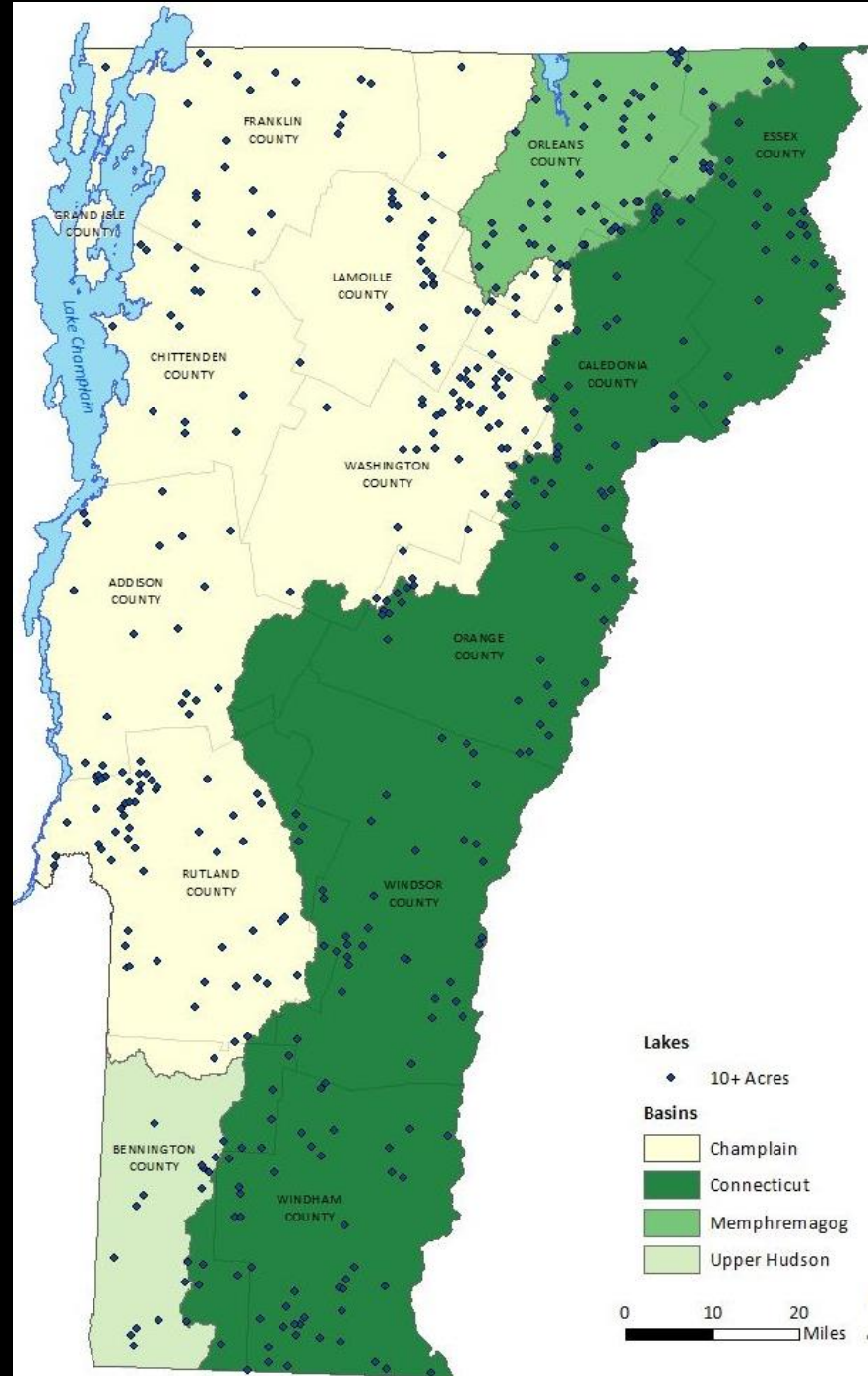
Creation of New Impervious Surface or Cleared Area Triggers a Permit Review

# Lake Wise Award

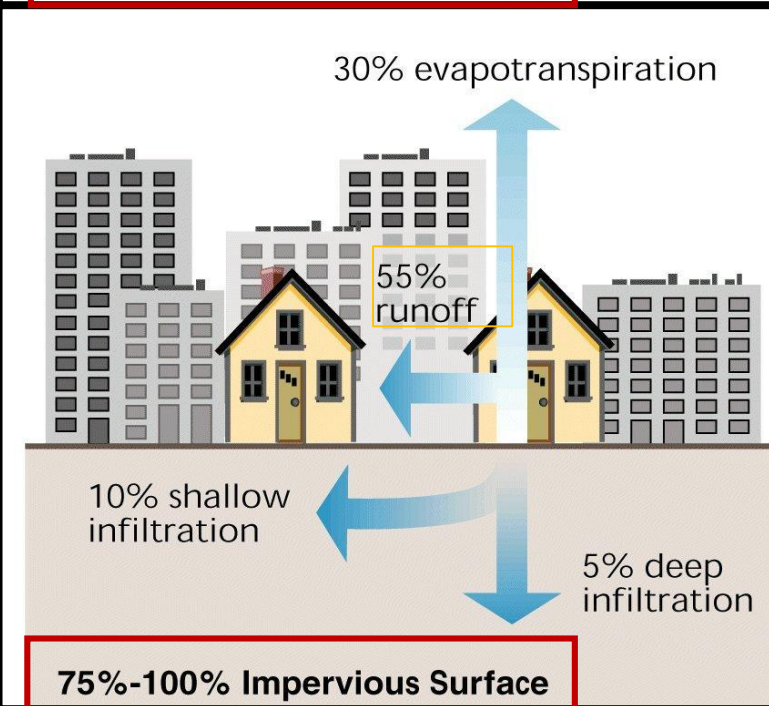
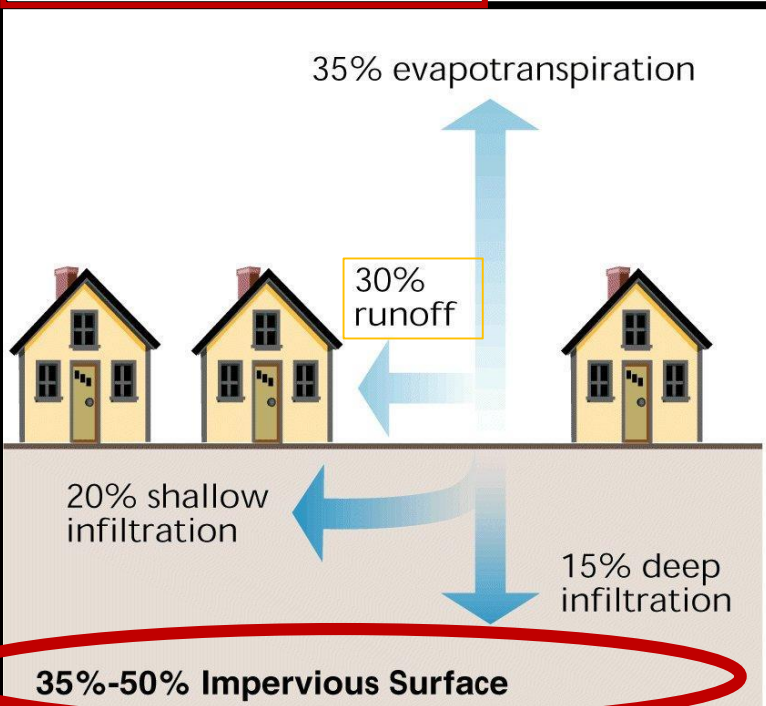
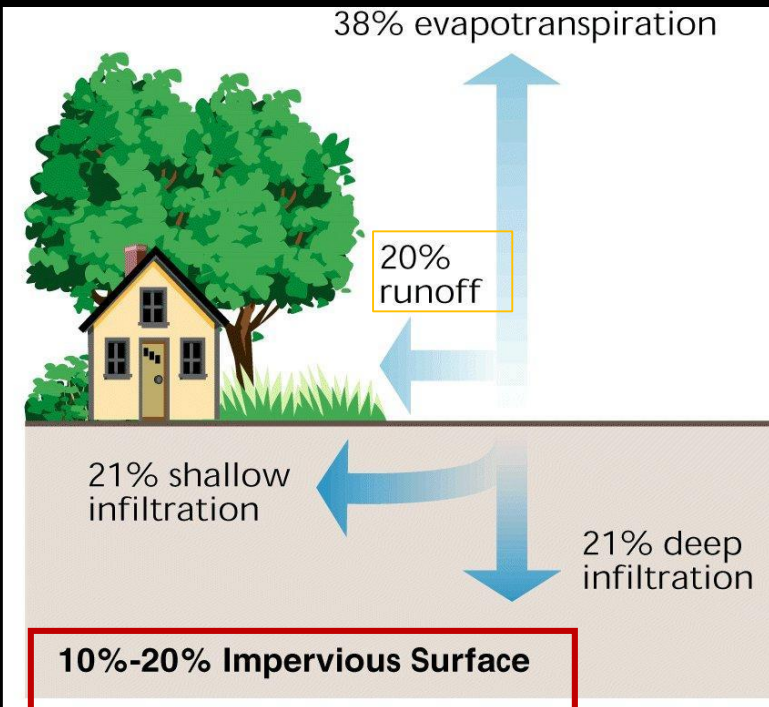
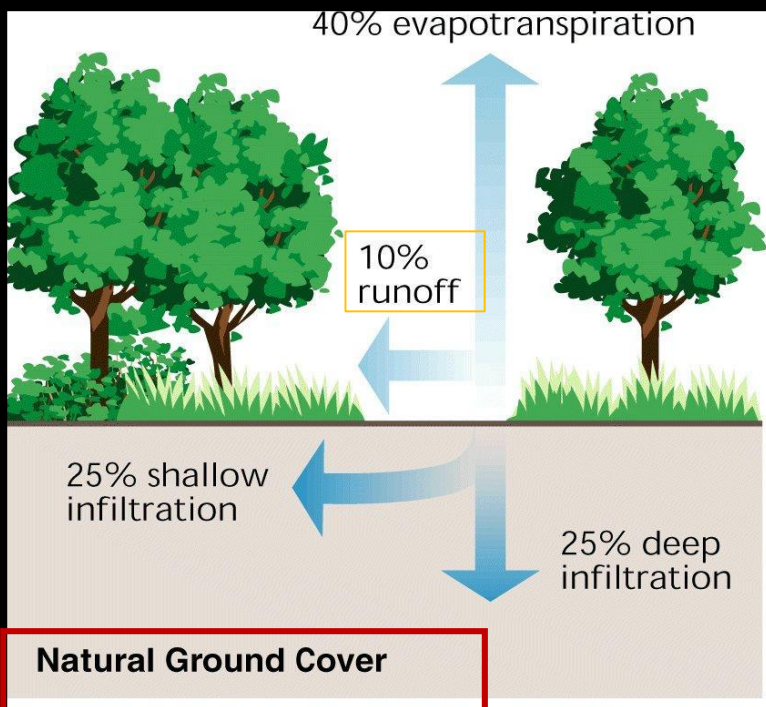


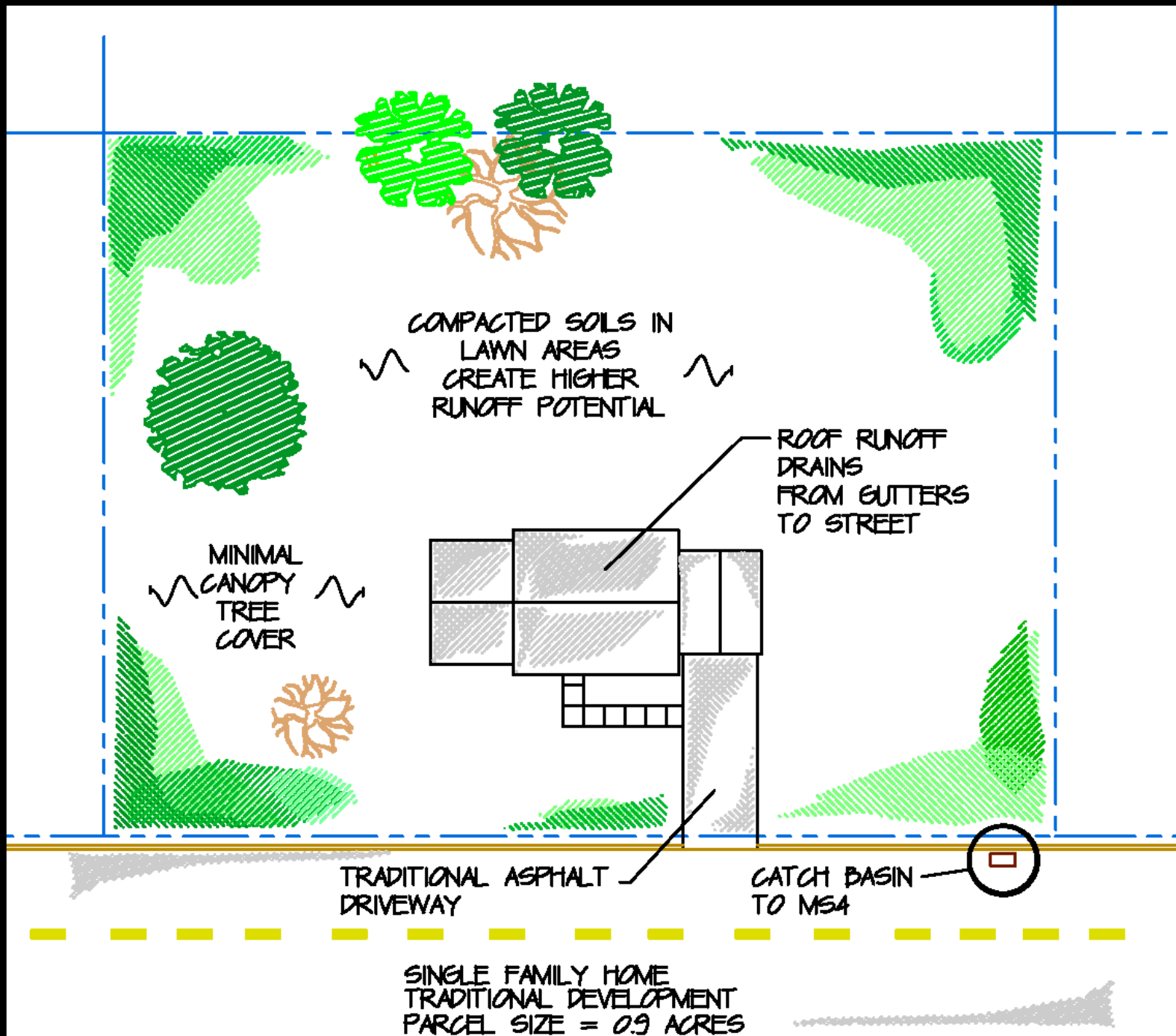


**The Greatest Density of Residential Development is Along Lakeshores**

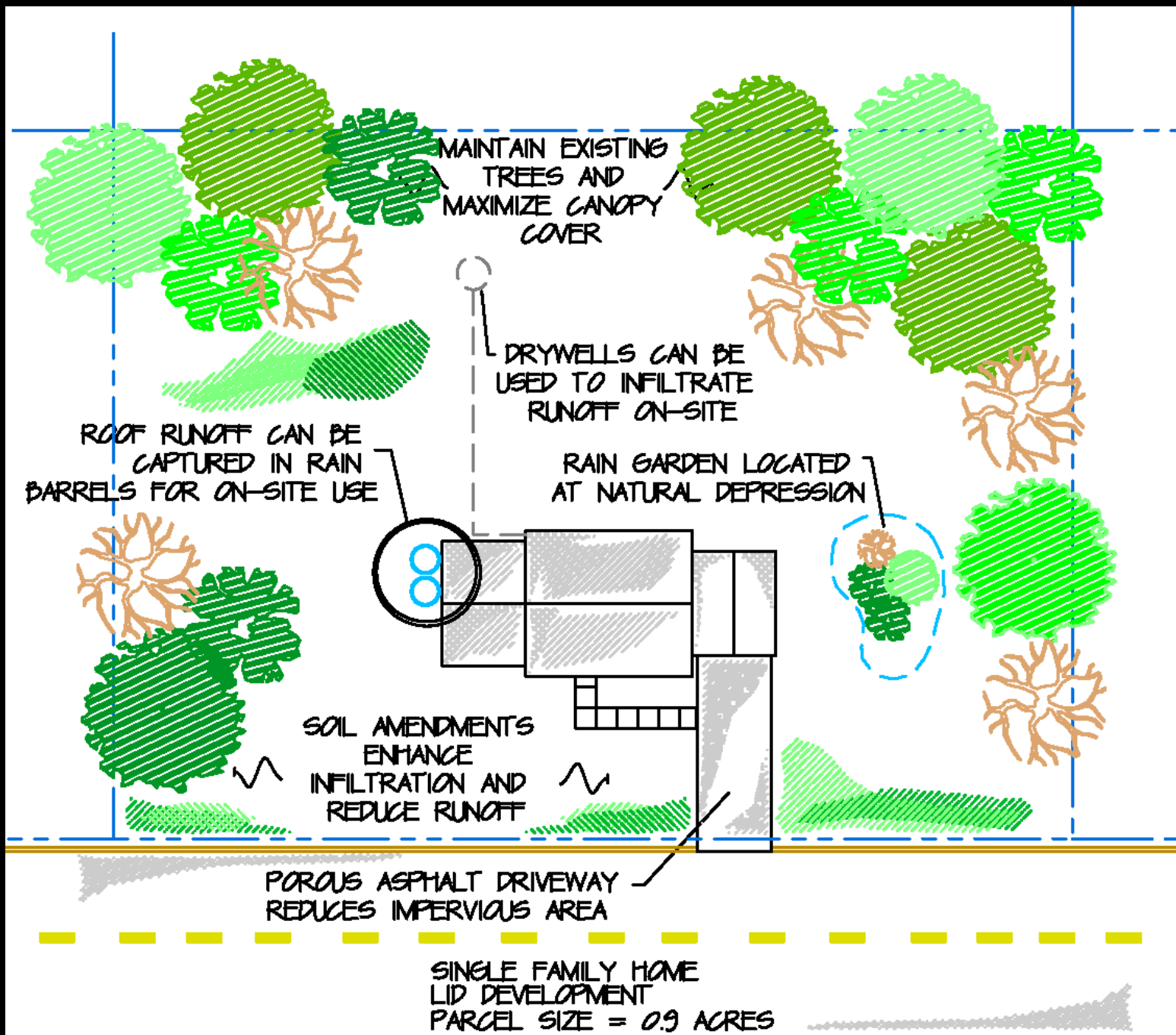


**Period of Shoreland Restoration**





- Runoff: 8.9 in/yr
- Infiltration: 28.1 in/yr
- TSS: 213 lb/ac/yr
- TP: 0.72 lb/ac/yr



- ↓ ■ Runoff: 1.9 in/yr
- ↑ ■ Infiltration: 35.2 in/yr
- ↓ ■ TSS: 68 lb/ac/yr
- ↓ ■ TP: 0.27 lb/ac/yr



April 30, 2011

Shoreline Erosion at North Point of Isle LaMotte, Lake Champlain

Photo: Lake Champlain Basin Program

## Vegetative

- Infiltrate
- Filter
- Benefit Wildlife

## Structural

- Infiltrate
- Filter

# Shoreland BMPs

## DRIVEWAY

### Standards

- Defined and minimized driveway
- Minimized soil compaction
- No erosion
- Runoff channeled away from the lake

### BMPs

- Crowned driveways, good gravel, & rock or grass-lined drainage ditches
- Open-top culverts & rock aprons
- Infiltration trenches
- Vegetated Swales
- Turn-outs
- Waterbars
- Pervious pavement

## RECREATION AREA

Yards, Footpaths, Gardens, Patios

### Standards

- Minimum of 15 ft of vegetation from shoreline
- Minimal lawn area
- Soil erosion is not occurring on site
- No pet waste accumulation
- No solid waste scattered
- No pesticide, fertilizer, or runoff to lake

### BMPs

- Infiltration steps
- Rain gardens
- Waterbars
- Vegetative swales
- **Vegetated Berms**
- Establishing no-mow zones
- Planting and maintaining vegetative zones
- Planning pathways
- Lake-friendly yard maintenance

## STRUCTURES/SEPTIC

### Standards

- Less than 20% of property contains impervious surfaces
- Properly functioning leach field
- No uncovered oil tanks
- No erosion caused from impervious surface runoff

### BMPs

- Dripline trenches
- Infiltration trenches
- Rooftop downspout disconnection and drywells
- Rain gardens
- Vegetated swales
- Septic system primer
- Ensuring septic system quality
- Non-structural

## SHOREFRONT

### Standards

- Natural conditions
- Stable bank
- Minimum of 15 ft width of vegetation area for developed sites
- Minimum of 100 ft width for undeveloped sites
- No unfiltered runoff to the lake
- Shallow water areas natural and not "cleaned up"

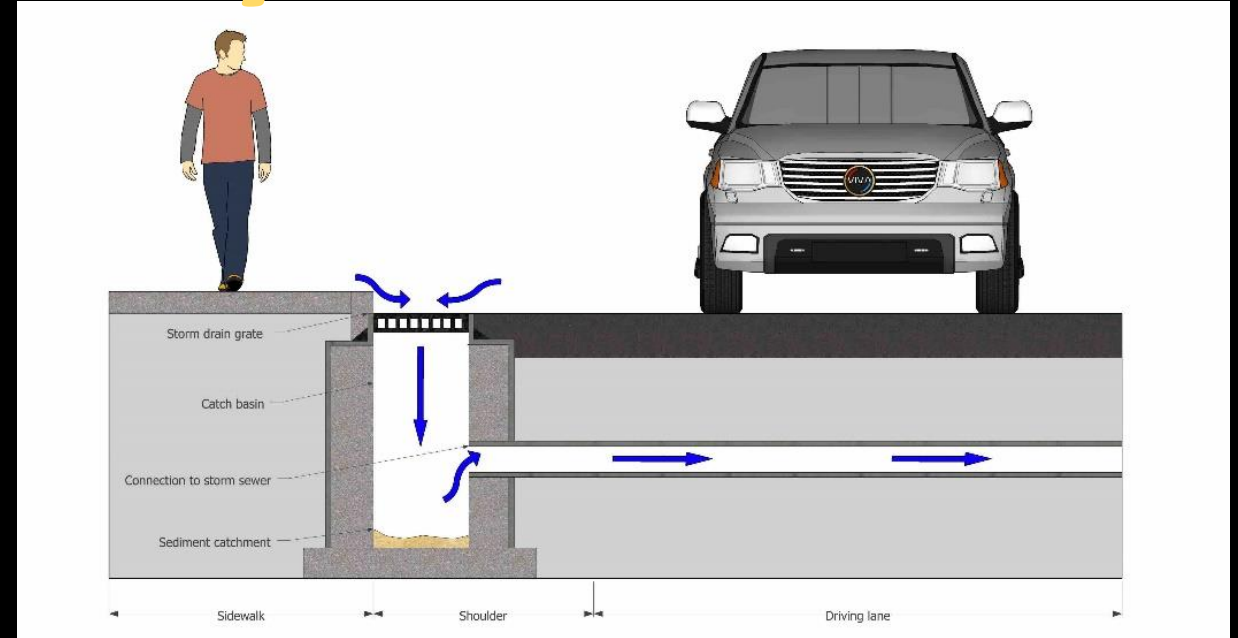
### BMPs

- Conserving lake-shores
- Managing shoreland vegetation
- Resloping, rock toe & riprap
- Live staking
- Establishing no-mow zones
- Planting and maintaining vegetated areas
- Planning pathways
- Waterbars
- Permits needed?



**Harvey's Lake, Barnet**  
**Federation of Vermont Lakes and Ponds**

# Conventional or “Grey” Stormwater



## Convey Stormwater Away Without Treatment

(Farrelly & Brown, 2011; Rowe et al., 2016)

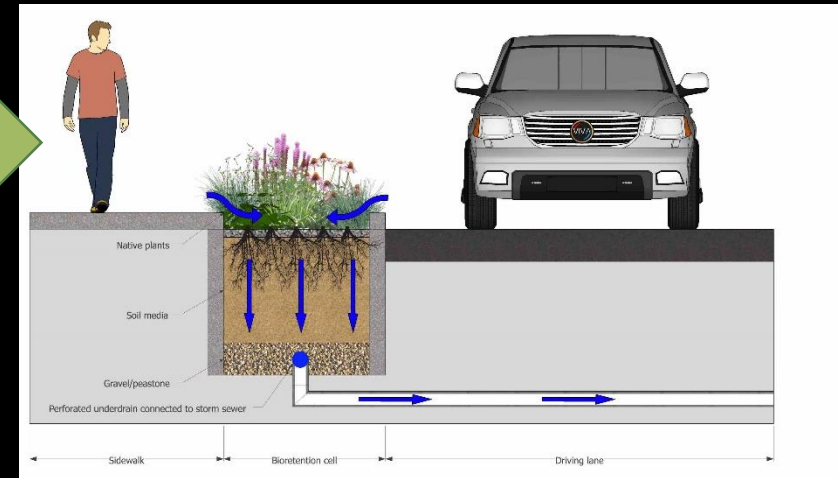
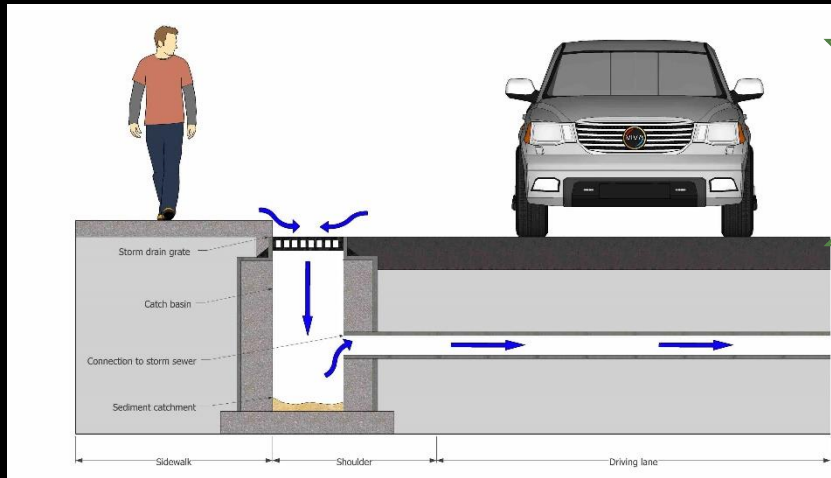
- Drains, Catch Basins, Pipes, Storm Sewers
- Ditches, Culverts



# Green Stormwater Infrastructure

Helps Restore Natural Hydrologic Patterns

Flood Control, Water Purification, Carbon Storage, Temperature Control, Clean Air, Habitat



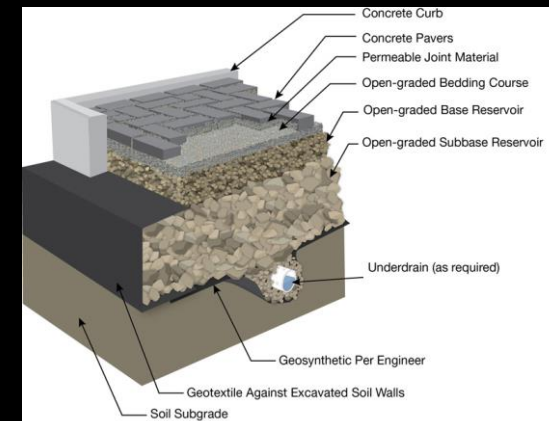
Infiltration Trench



Green Roof



Storm Water Tree Pits



Pervious Pavers & Pavement

# Geosyntec in Acton, MA





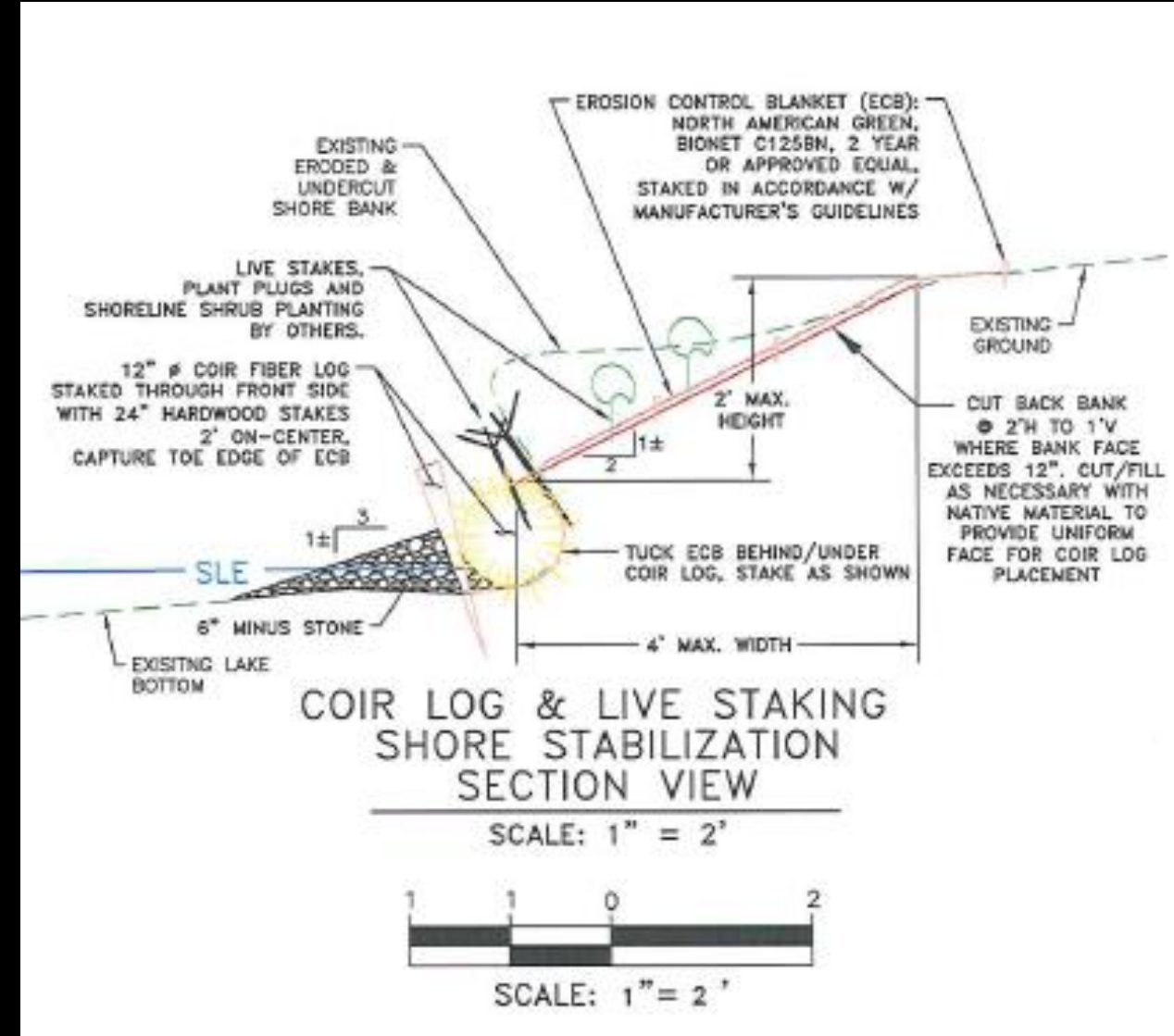


# Re-Thinking Suburbia land



# 2015 Bioengineering – Fiber Coir Rolls

VTDEC Facilities Engineering and Lake Wise





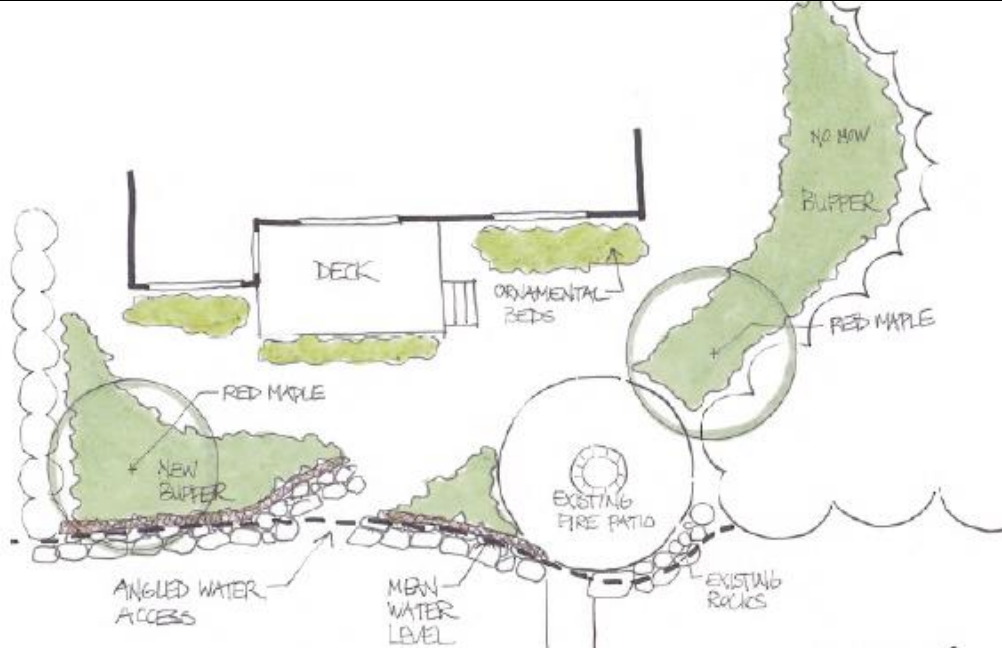
**Bioengineering Practices to Restore Living Shorelands**



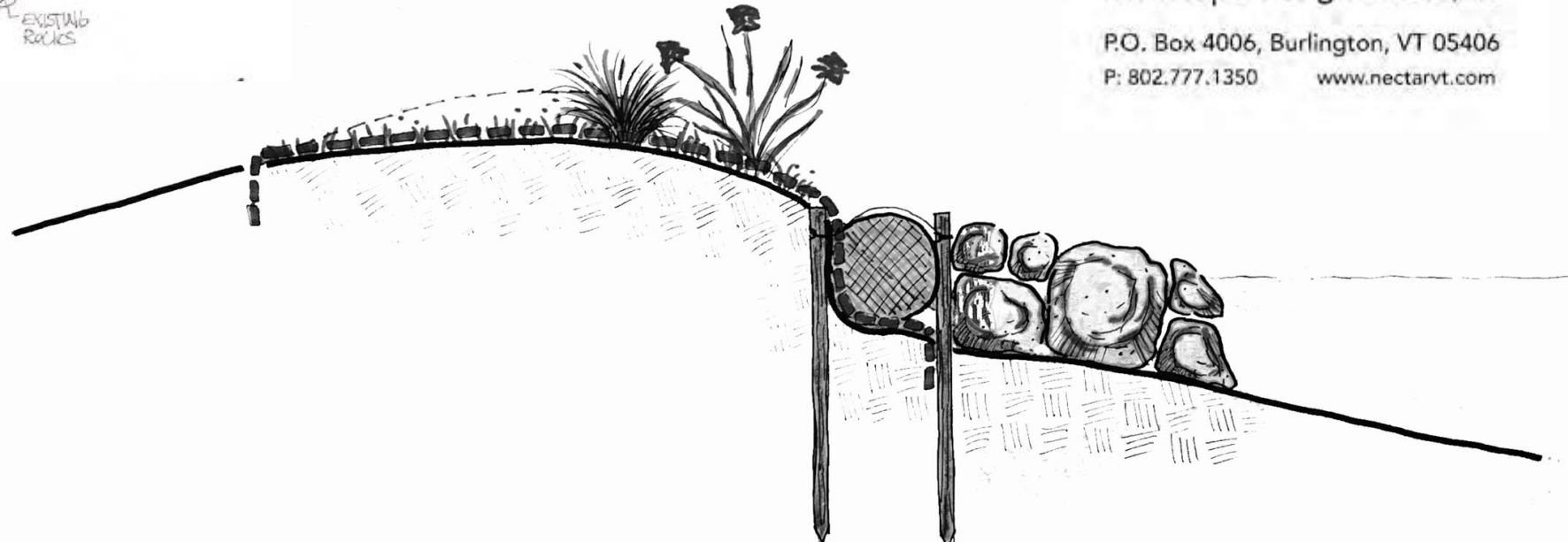
October 2018 – Three Years Later



# Heather Robinson from Essex NRCD and Northwoods Stewardship Center



Maidstone Lake



**NECTAR**

landscape design studio, llc

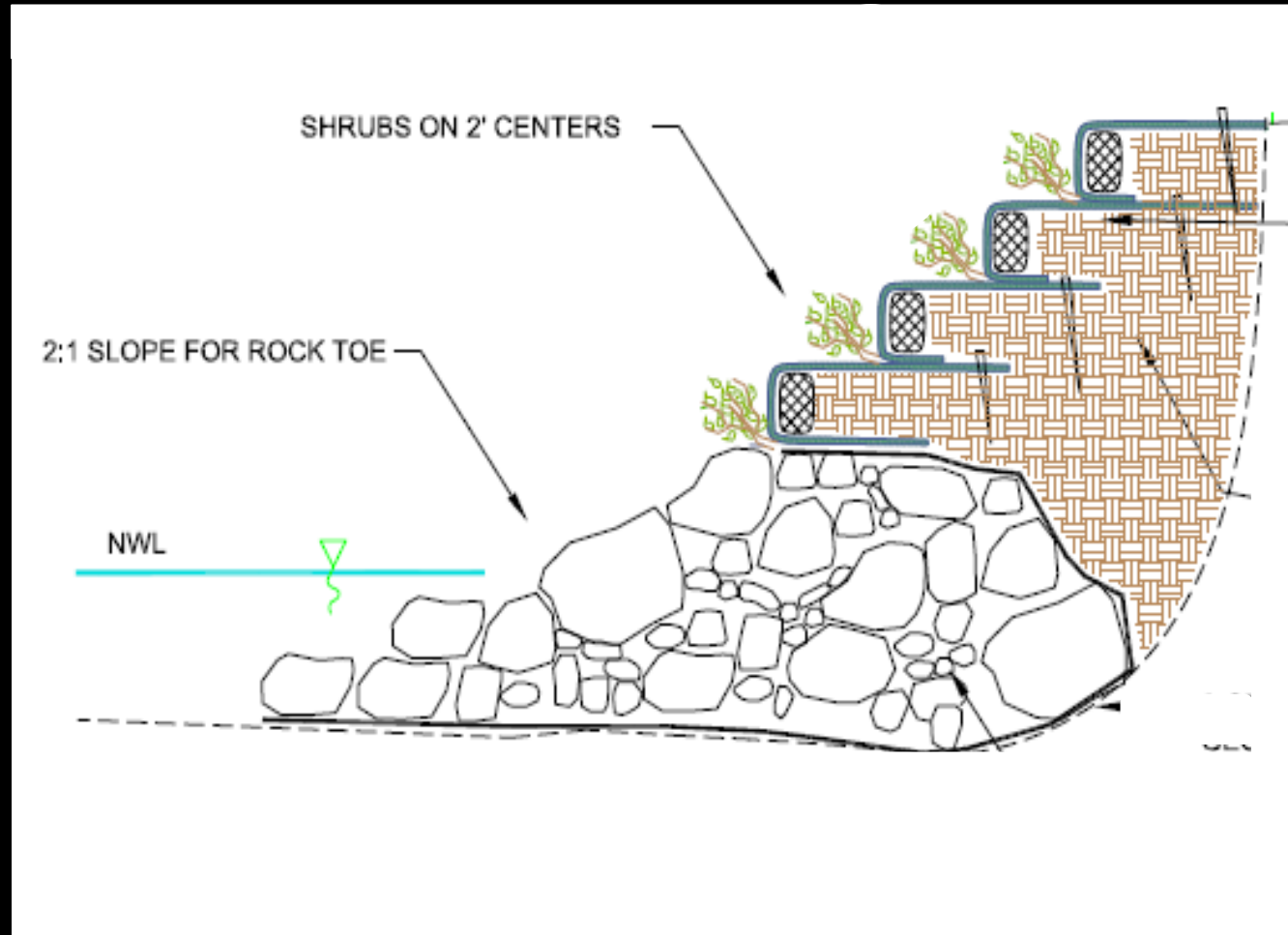
P.O. Box 4006, Burlington, VT 05406

P: 802.777.1350 [www.nectarvt.com](http://www.nectarvt.com)





# Lake Bomoseen Shoreland Restoration

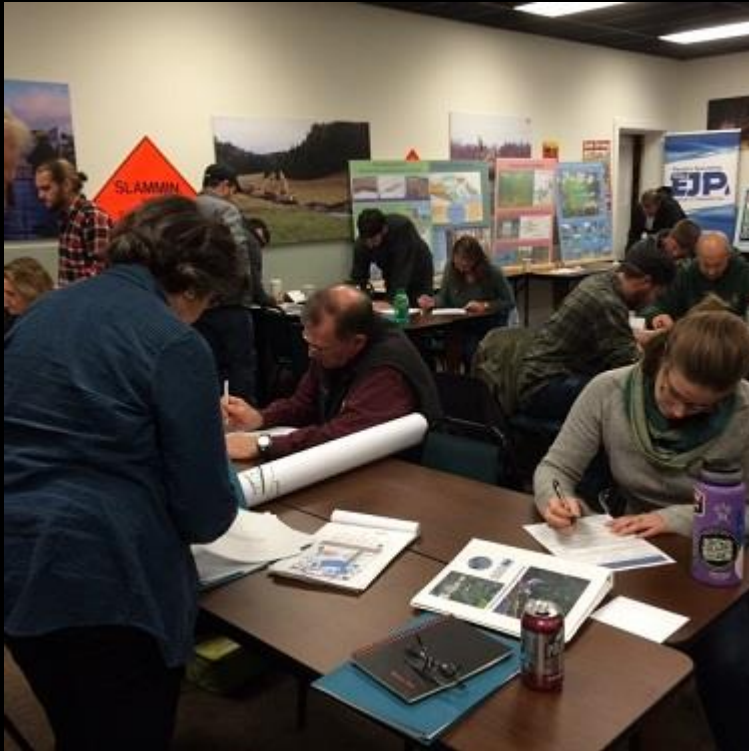


# 2017 Living Shoreland – Encapsulated Soil Lifts



# Natural Shoreland Erosion Control Certification Program

## Every November



Professionals Certified in Natural Shoreland Erosion Control Practices							Natural Resource Specialist Regulatory / Administrative Environmental Consultant Tree Care / Forester Landscaper / Gardener Engineering Design Shoreland Homeowner Construction							
First Name	Last Name	Participant Company	Participant Town	State	Email and/or Web Site	Phone								
Gerard	Peters	Peters' General Contracting, Inc.	Albany	VT	<a href="mailto:gpeters9949@gmail.com">gpeters9949@gmail.com</a>	802-755-6743							X	
Sam	Peters	Peters' General Contracting, Inc.	Albany	VT	<a href="mailto:sampeters37@gmail.com">sampeters37@gmail.com</a>	802-735-6743			X					X
Gerard	Peters	Peters' General Contracting Inc.	Albany	VT	<a href="mailto:gpeters9949@gmail.com">gpeters9949@gmail.com</a>	802-755-6743								X
Dwight	Jarvis	Jarvis & Sons Inc	Ascutney	VT	<a href="mailto:djarvis2@comcast.net">djarvis2@comcast.net</a>	802-674-2836								
Philo E	Marcotte	Earth Surveys LLC	Barnet	VT	<a href="mailto:earthsurveysllc@gmail.com">earthsurveysllc@gmail.com</a>	802-473-0204	X							
Shane	Stevenson		Barnet	VT		802-535-1814								X
Richard	Stevenson	Stevenson Construction	Barnet	VT	<a href="mailto:rpstevenson@hotmail.com">rpstevenson@hotmail.com</a>	802-633-4960								X
Kyle	Bellavance	K. Bellavance Land Works	Barre	VT	<a href="mailto:kyle@bellavancelandworks.com">kyle@bellavancelandworks.com</a>	802-279-8488		X						X
Craig	Chase	Chase & Chase Land Surveying & Septic Designers, Inc.	Barre	VT	<a href="mailto:cdchase@chasesurveyors.com">cdchase@chasesurveyors.com</a>	802-479-9636	X							
Tom	Emler	Capitol Earthmoving, Inc.	Barre	VT	<a href="mailto:tom@capitolearthmoving.com">tom@capitolearthmoving.com</a>	802-279-8488								
Gene	Gravel	K. Bellavance Land Works	Barre	VT	<a href="mailto:kyle@bellavancelandworks.com">kyle@bellavancelandworks.com</a>	802-279-8488		X						X
Barbara	MacGregor	ANR - Forest Parks and Recreation	Barre	VT	<a href="mailto:barbara.macgregor@vermont.gov">barbara.macgregor@vermont.gov</a>	802-476-0171				X				
Katrina	McCurdy	Everett S Prescott Inc.	Barre	VT	<a href="mailto:katrina.mccurdy@esprescott.com">katrina.mccurdy@esprescott.com</a>	802-223-2385								
Brian	Segit	Everett S Prescott Inc.	Barre	VT	<a href="mailto:brian.segit@esprescott.com">brian.segit@esprescott.com</a>	802-223-2385								
James	Bowes	Bowes Environmental, LLC	Barton	VT	<a href="mailto:jbowes@bowesenvironmental.com">jbowes@bowesenvironmental.com</a>	802-839-9241					X			
George	Carpenter	J.P. Sicard, Inc.	Barton	VT	<a href="mailto:info@jpsicard.com">info@jpsicard.com</a>	802-525-9506								X
Tim	Crown	J. P. Sicard, Inc.	Barton	VT	<a href="mailto:timlahar@kingdomgravel.com">timlahar@kingdomgravel.com</a>	802-525-9506								
Brad	Drake	J.P. Sicard, Inc.	Barton	VT	<a href="mailto:brad@jpsicard.com">brad@jpsicard.com</a>									
AJ	Galfetti	J. P. Sicard, Inc.	Barton	VT	<a href="mailto:aj@jpsicard.com">aj@jpsicard.com</a>	802-525-9506								X
Sean	Guyette	JP Sicard Inc	Barton	VT	<a href="mailto:jamie@jpsicard.com">jamie@jpsicard.com</a>	802-525-9506								X
Tim	Lahar	Kingdom Gravel and Aggregate	Barton	VT	<a href="mailto:timlahar@kingdomgravel.com">timlahar@kingdomgravel.com</a>	802-525-9506								

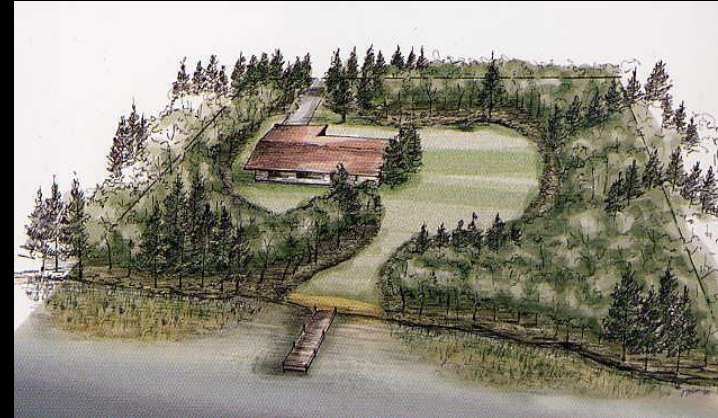
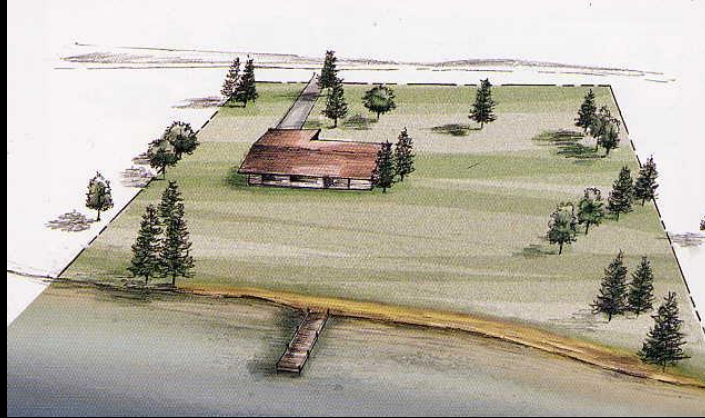
# 2018 MRGP

## *What does this mean for Lakes?*

*NO Cutting of Vegetation within  
250 feet of a Lake!*



# GSI Low Tech Solutions



BEER  
The Best Brews  
for Workout  
Recovery

EXPEDITIONS  
An Afghan  
Woman's  
Historic Climb

TRAVEL  
Stress-Free  
Family Vacation  
Guide

GEAR  
Surf, SUP,  
and Saltwater  
Essentials

LIVE BRAVELY

# Outside

SPECIAL REPORT: THE NATURE CURE

## SCIENCE'S NEWEST MIRACLE DRUG IS FREE

OPEN HERE FOR COMPLIMENTARY DOSE





# Enjoy a Living Shoreland

Amy Picotte, VTDEC Lakeshore Manager

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