Landscaping for Water Quality in the Lakes Region

STORMWATER MANAGEMENT PRINCIPLES AND PRACTICES
MARCH 2018

Julia Peterson
N.H. Sea Grant and UNH Cooperative Extension
Sunapee, N.H.

Soak up the Rain New Hampshire

University of New Hampshire Cooperative Extension

Sea Grant New Hampshire

New Hampshire Department of Environmental Services

National Oceanic and Atmospheric Administration · U.S. Department of Commerce · NOAA

United States Environmental Protection Agency

Principles for Landscaping for Water Quality Benefits

1. STOP the sources of water pollutants
2. INFILTRATE runoff into the ground
3. FILTER pollutants from runoff with plants and soil microbes

1. STOP the Source

For example:

Avoid introducing what's not needed.

Green Grass & Clear Water

Water quality friendly lawn care and fertilizer recommendations for northern New England

According to a recent survey, it's likely that you and your neighbors believe having a lawn that is safe for the environment is very important.* However, some lawn care practices can create water quality problems. Excess nutrients (including nitrogen and phosphorous found in fertilizers) that run off our properties into local waterbodies can trigger algal blooms that cloud water and rob it of oxygen.

Many of us enjoy the time we spend working on our lawns and are willing to try new practices as long as our lawns continue to look good.* Here are some easy practices for creating and maintaining a truly healthy lawn – attractive and safer for the environment.

For additional resources, please visit:

www.extension.unh.edu/Sustainable-Landscapes-and-Turf

Simple Recommendations for Every Lawn

1. Choose the Right Grass Seed

- Consider limiting lawn area to locations where grass will grow easily and will actually be used for outdoor activities.
- Choose grass varieties that require less maintenance. For northern New England, choose seed mixes with higher percentages of turf-type tall fescues, compact-type fall fescues and/or fine fescues. Choose mixes with smaller percentages of Kentucky bluegrass and/or perennial ryegrass.
- In shaded areas, select shade-tolerant turf grasses like fine-leaf and tall fescues.
- Up to 10% of total seed mix can be white clover to help fix nitrogen in soil naturally. Avoid clover if anyone in the household is allergic to bee stings.

2. Don't Overwater

- If irrigating, one inch of water per week is typically enough. Overwatering can lead to runoff and leaching of contaminants into groundwater.

3. Test Your Soil

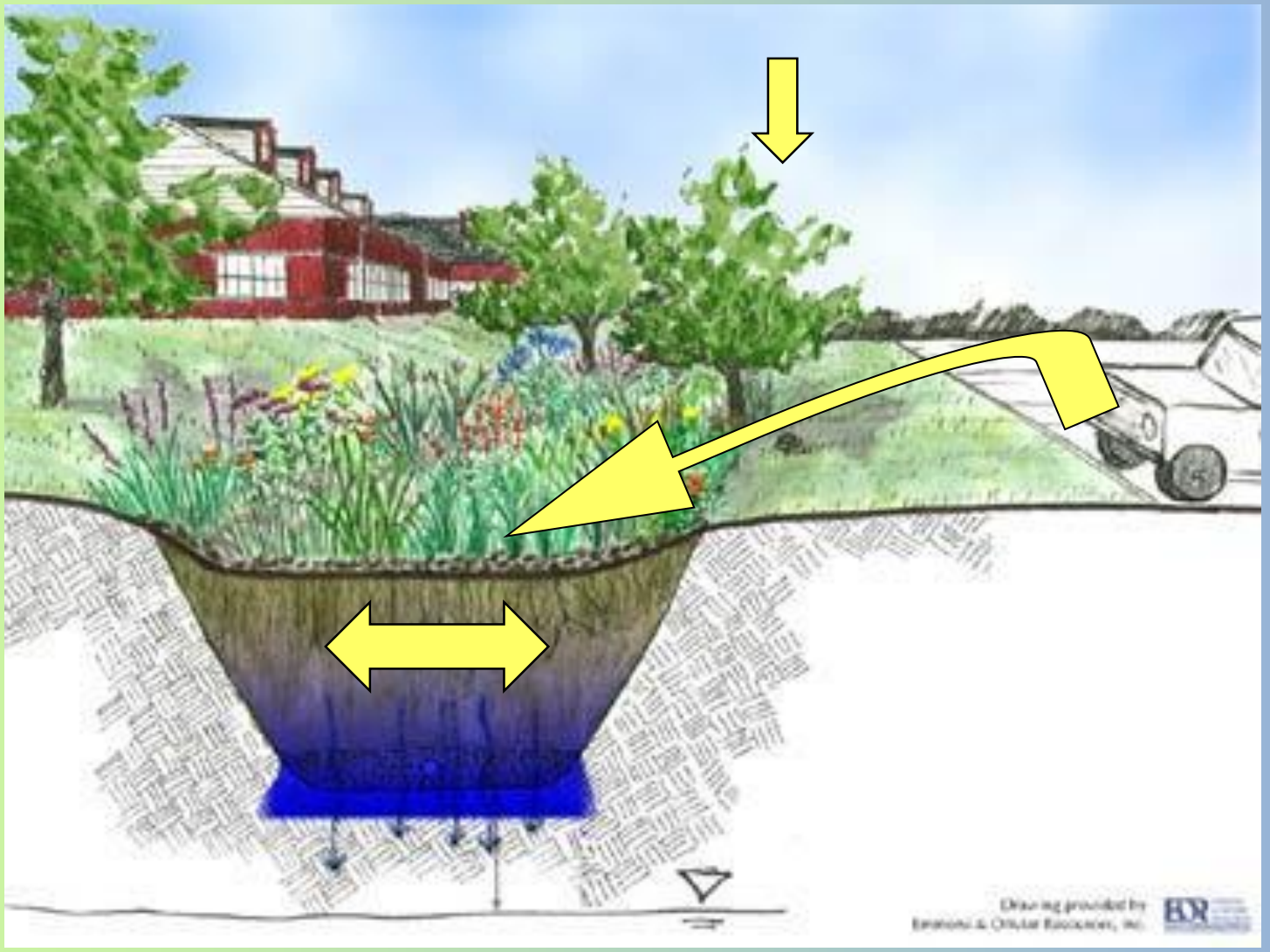
- Sometimes adjusting the soil pH or organic matter are the only treatments needed to improve a lawn. If the soil test results come back as acceptable but your lawn is not, then check for other problems like pest infestations. Learn more at: bit.ly/Test-Your-Soil

4. Mow Smart

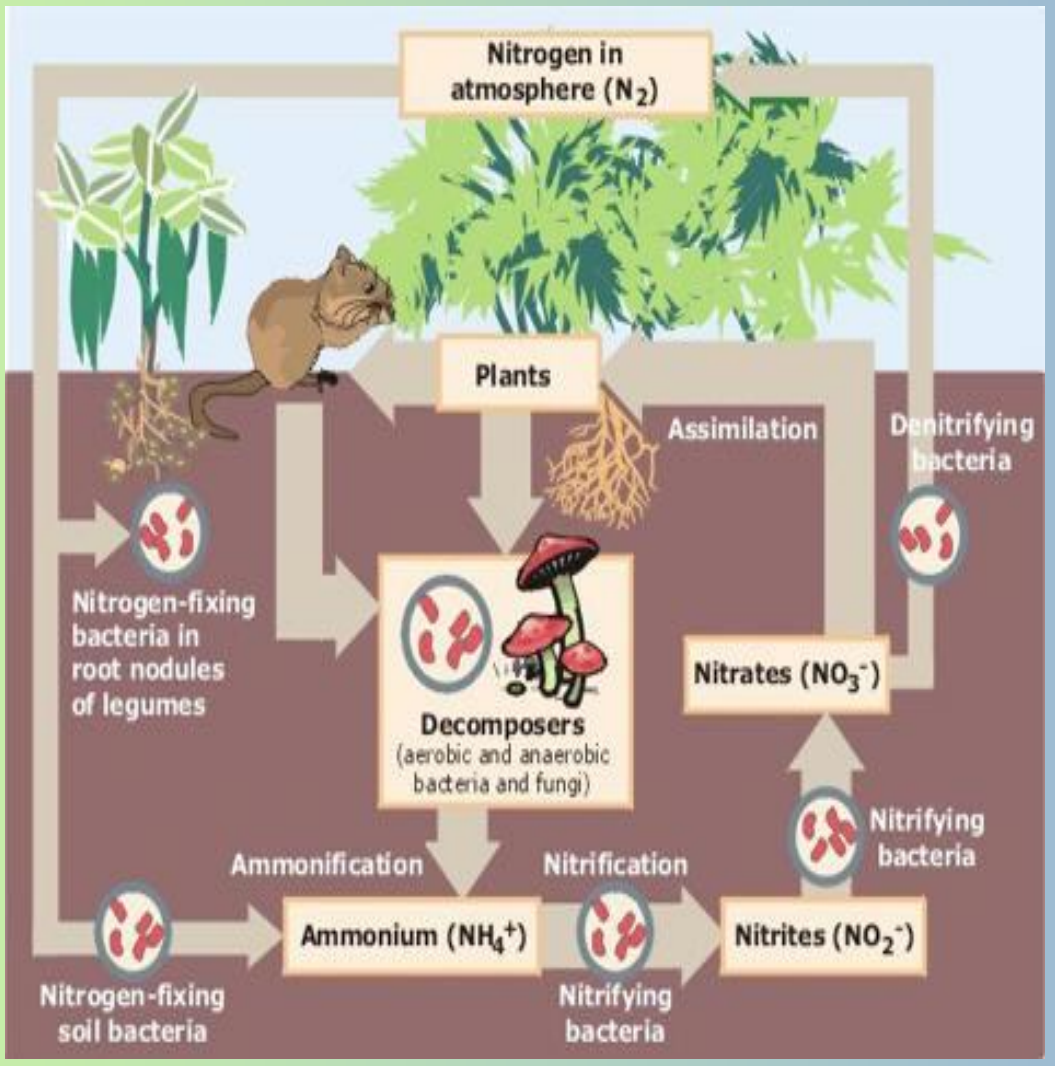
- Mow grass 3" or higher. Cut no more than 1/3 of the blade to encourage longer, stronger turf grass roots. Leave the clippings after mowing to provide a source of low release nutrients.

2. Promote INfiltration

3. Promote FILTRATION



Nitrogen Cycle



Review

1. STOP the sources of water pollutants

2. INFILTRATE runoff into the ground

3. FILTER pollutants from runoff with plants and soil microbes

Pop Quiz!


DOGGIE-BAGS®
DOG OWNERS
BE CONSIDERATE
CLEAN UP BEHIND YOUR DOG !
PLEASE TAKE A BAG
SCAN THOLO

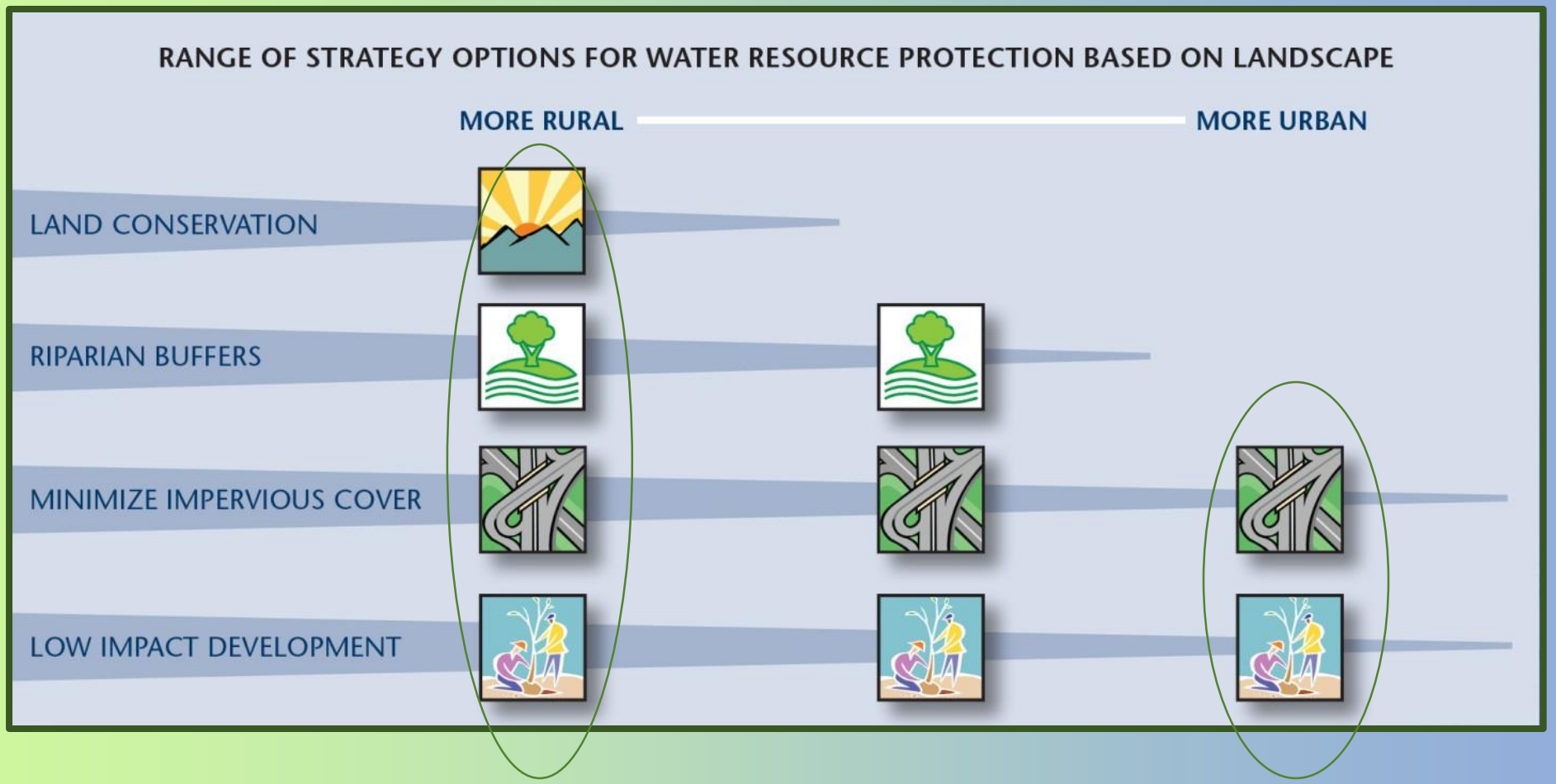

DUMP NO WASTE
DRAINS TO HARBOR


FAIRFIELD
INN
Marriott

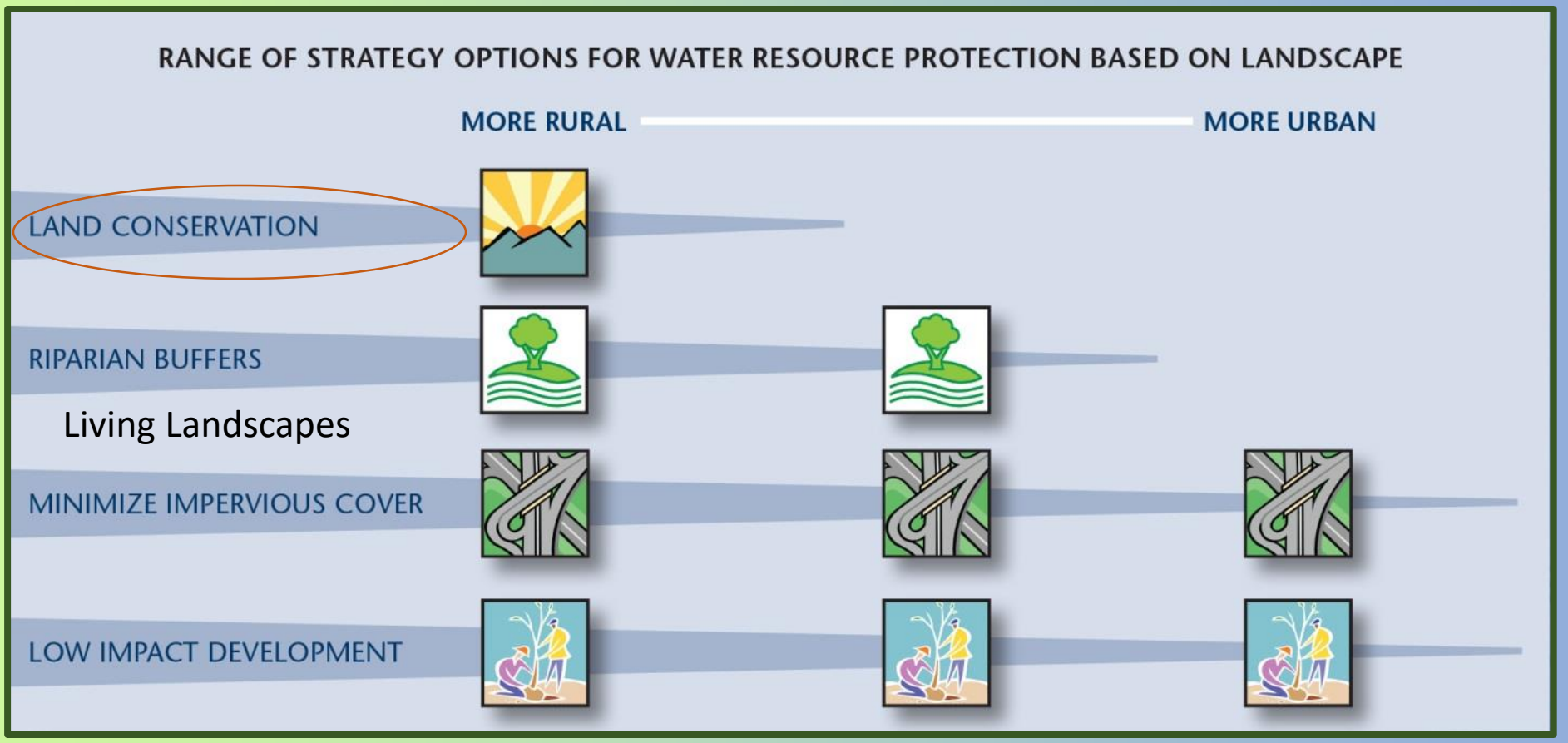
What's a Landscaper to Do?

Can Working at the Property Scale Make a Difference?

Opportunities for Communities



Opportunities for **Communities and Individuals**



Living Landscapes

Graphic by Tricia Miller, MillerWorks Graphic Design

Land Conservation and Stormwater

Slide series from Amanda Stone, UNH Cooperative Extension

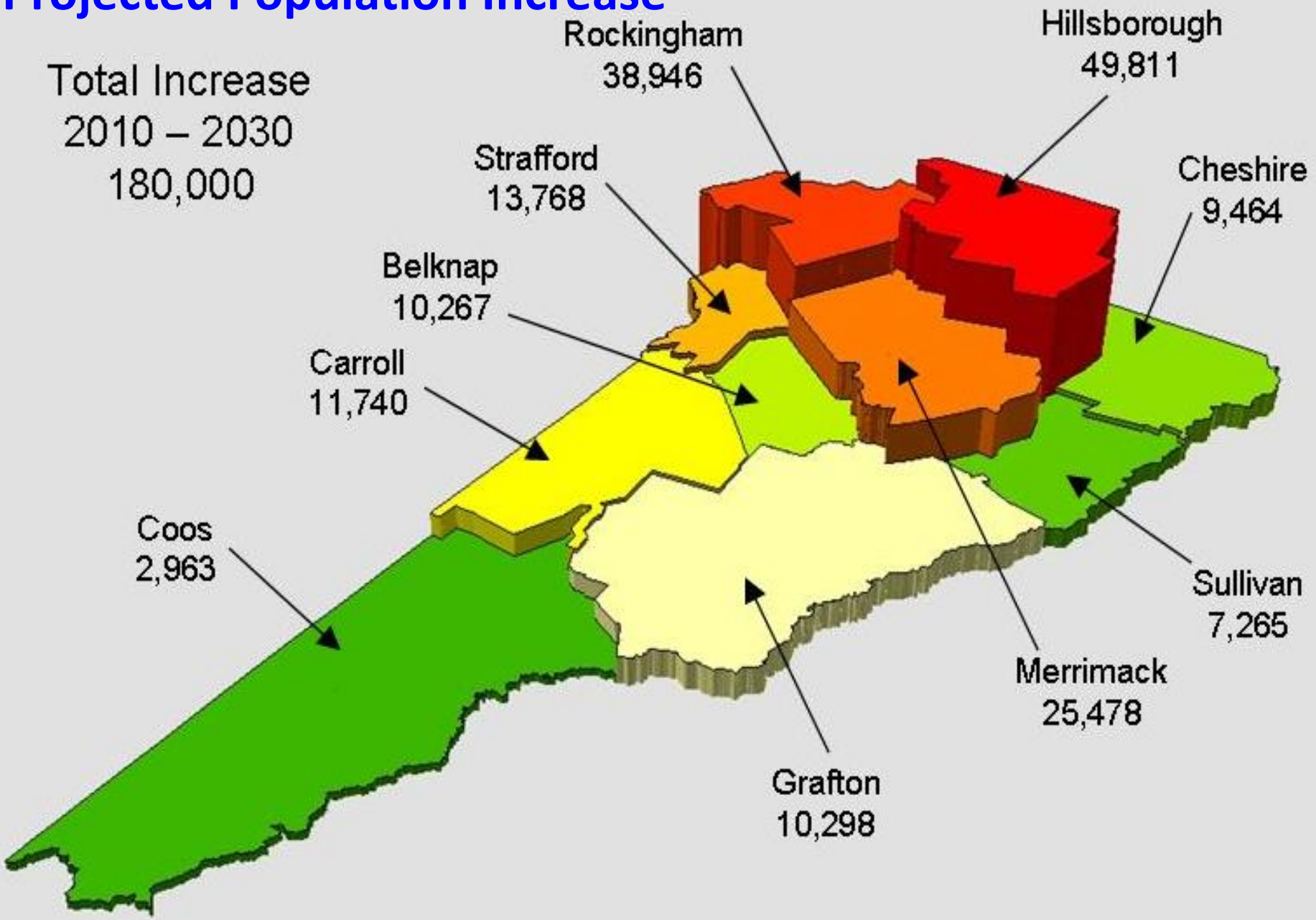
Land Conservation = Permanent Land Protection

Primary Benefits of Land Protection

- Keeps natural systems intact
- Reduces flooding – provides infiltration
- Protects water quality - provides filtration

As well as other social and economic benefits

Projected Population Increase

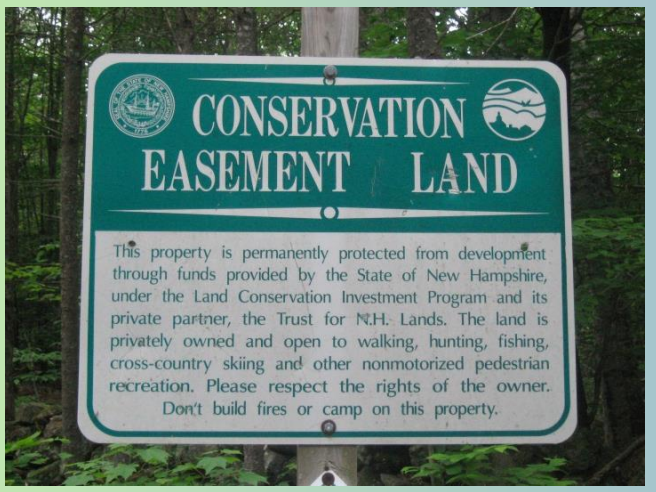


NH's Changing Landscape, SPNHF , 2011

How is Land Conservation Carried Out?

Conservation Easement Definition

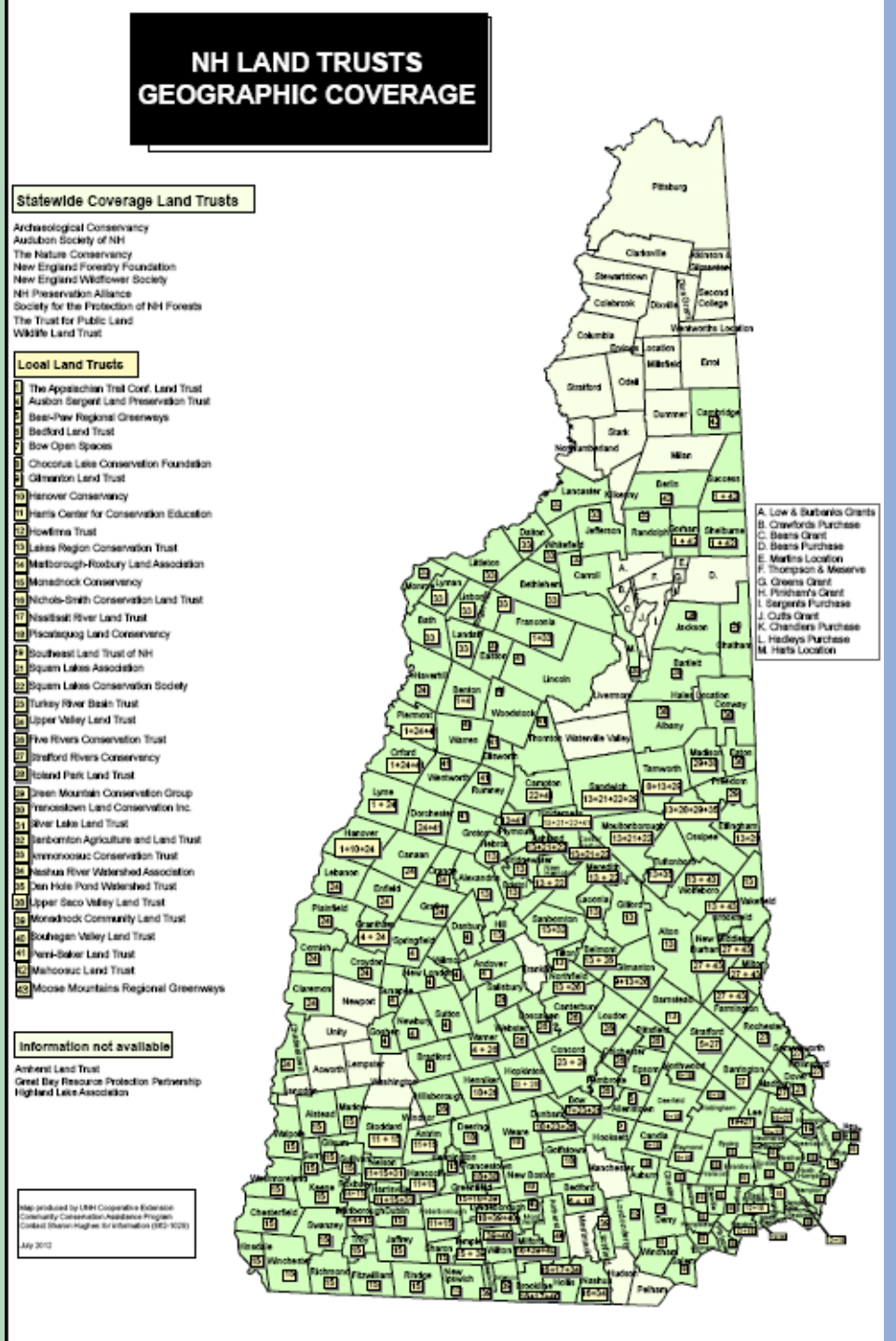
Voluntary legal agreement between a landowner and conservation organization (easement holder) that permanently limits certain uses of the land in order to protect conservation values



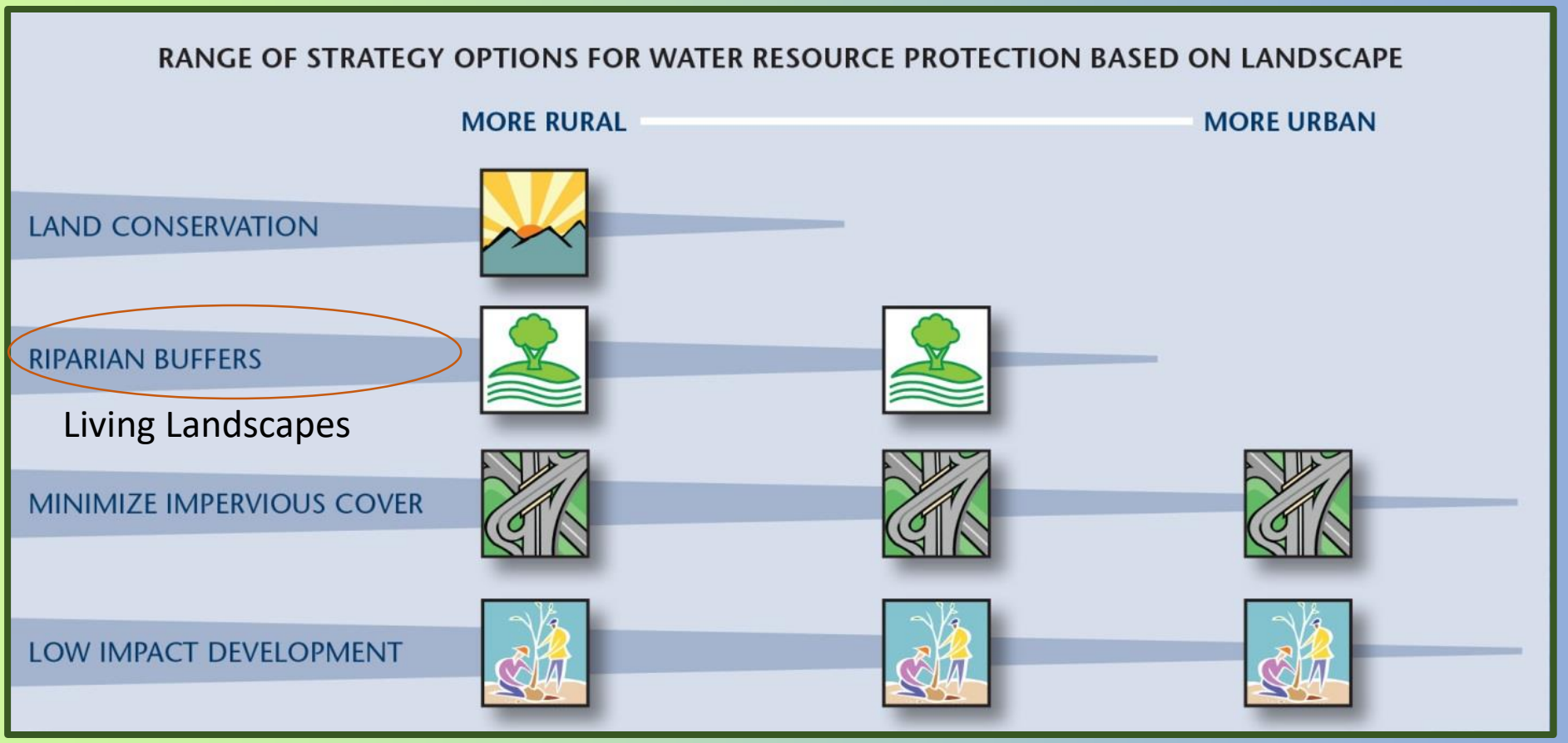
Usually Involves a Land Trust

List of NH Land Trusts and Conservation Groups:

nhltc.org



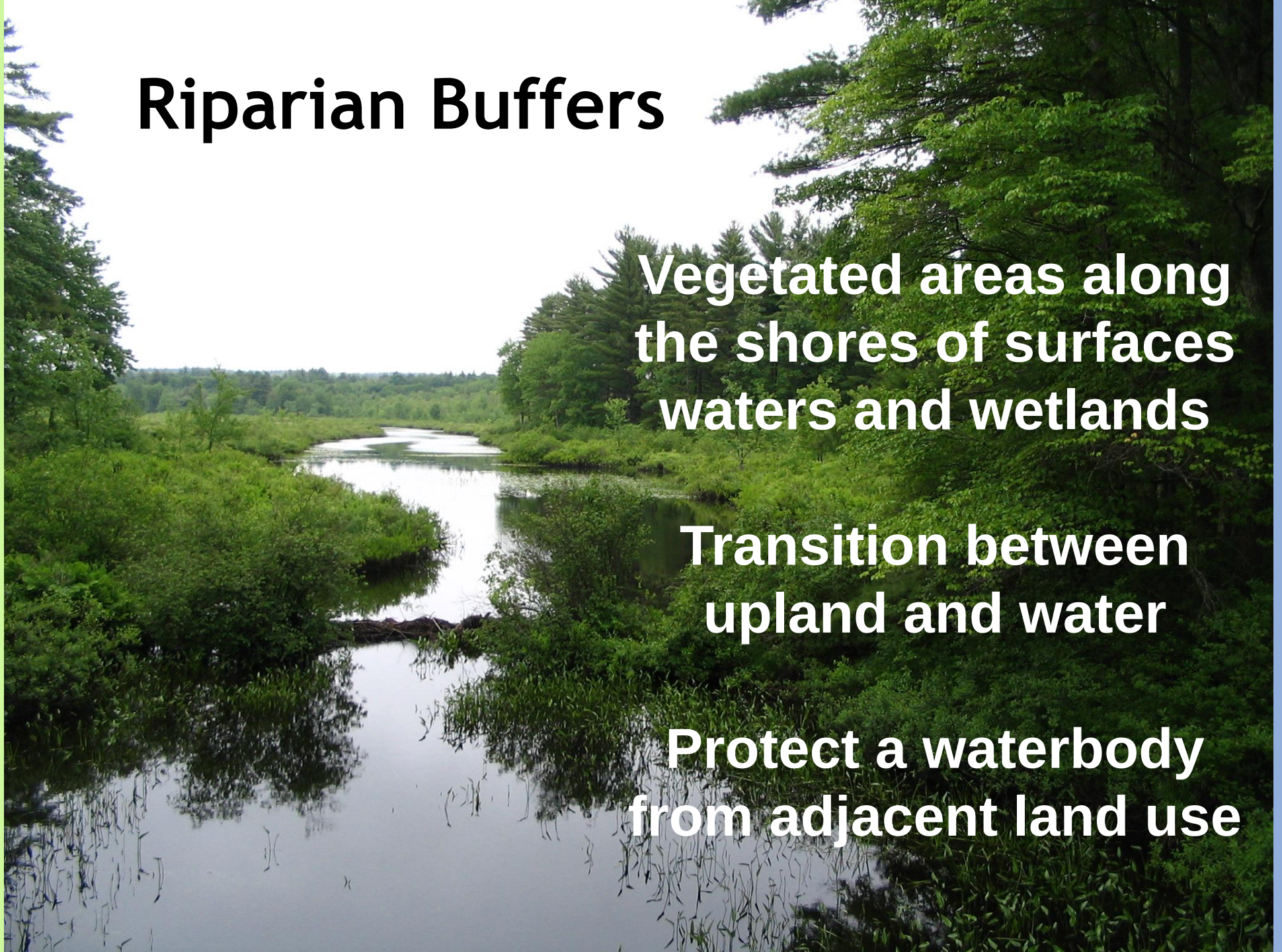
Clean Water Strategies



Living Landscapes

Graphic by Tricia Miller, MillerWorks Graphic Design

Riparian Buffers



Vegetated areas along the shores of surfaces waters and wetlands

Transition between upland and water

Protect a waterbody from adjacent land use

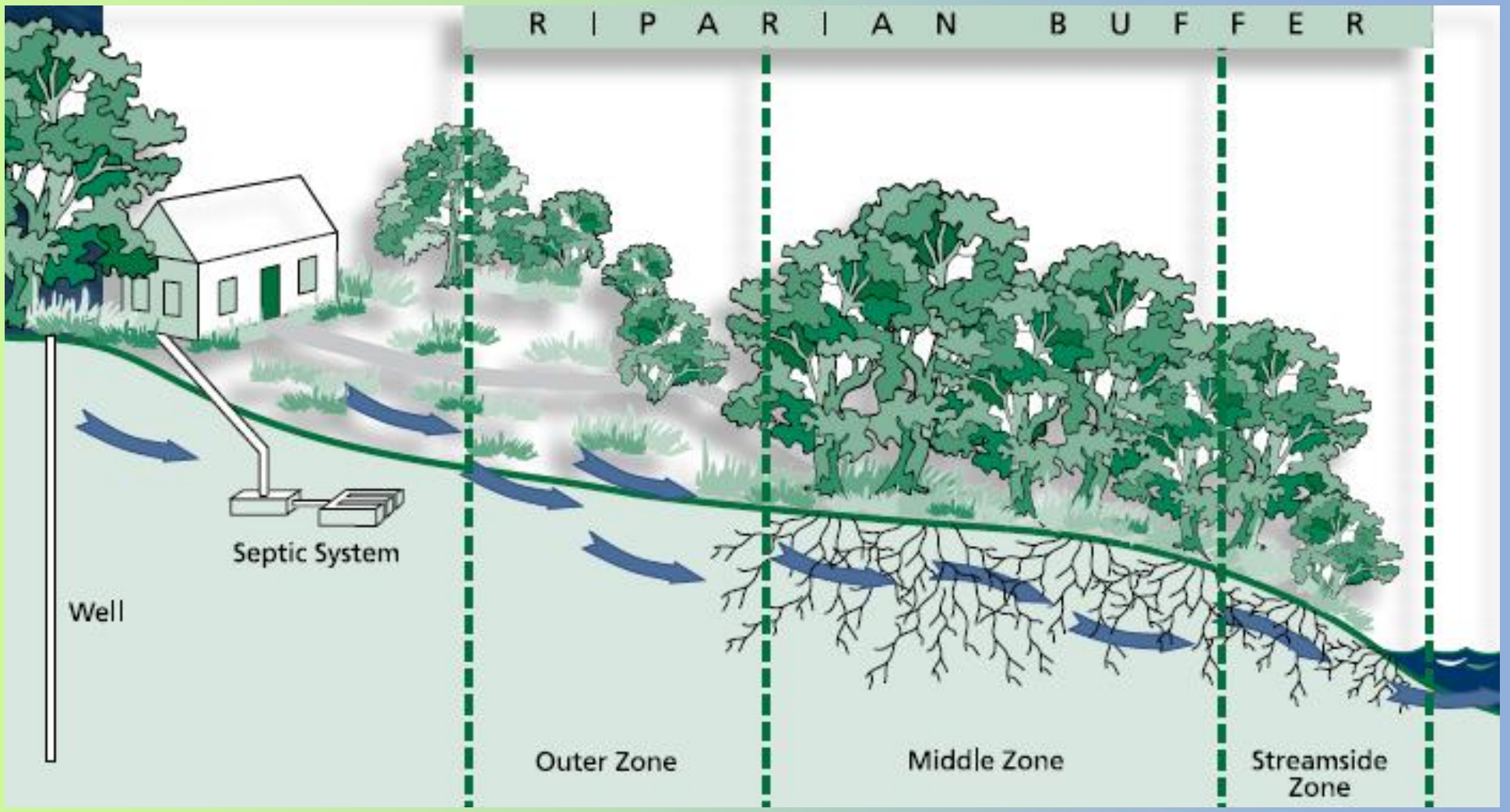
Primary Benefits of Riparian Buffers

Reduce flooding

Protect water quality

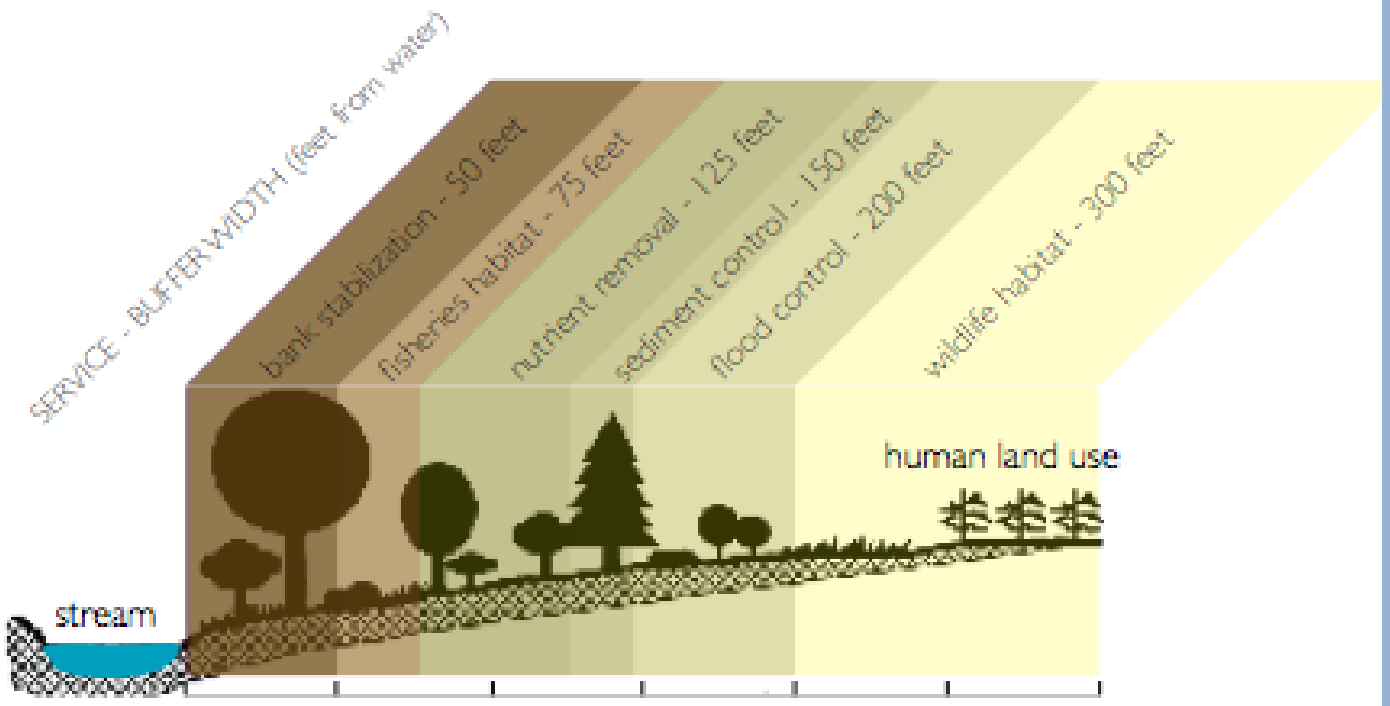
Stabilize banks

Buffers can be naturally present OR planted and maintained



Buffer Widths Affect Benefits

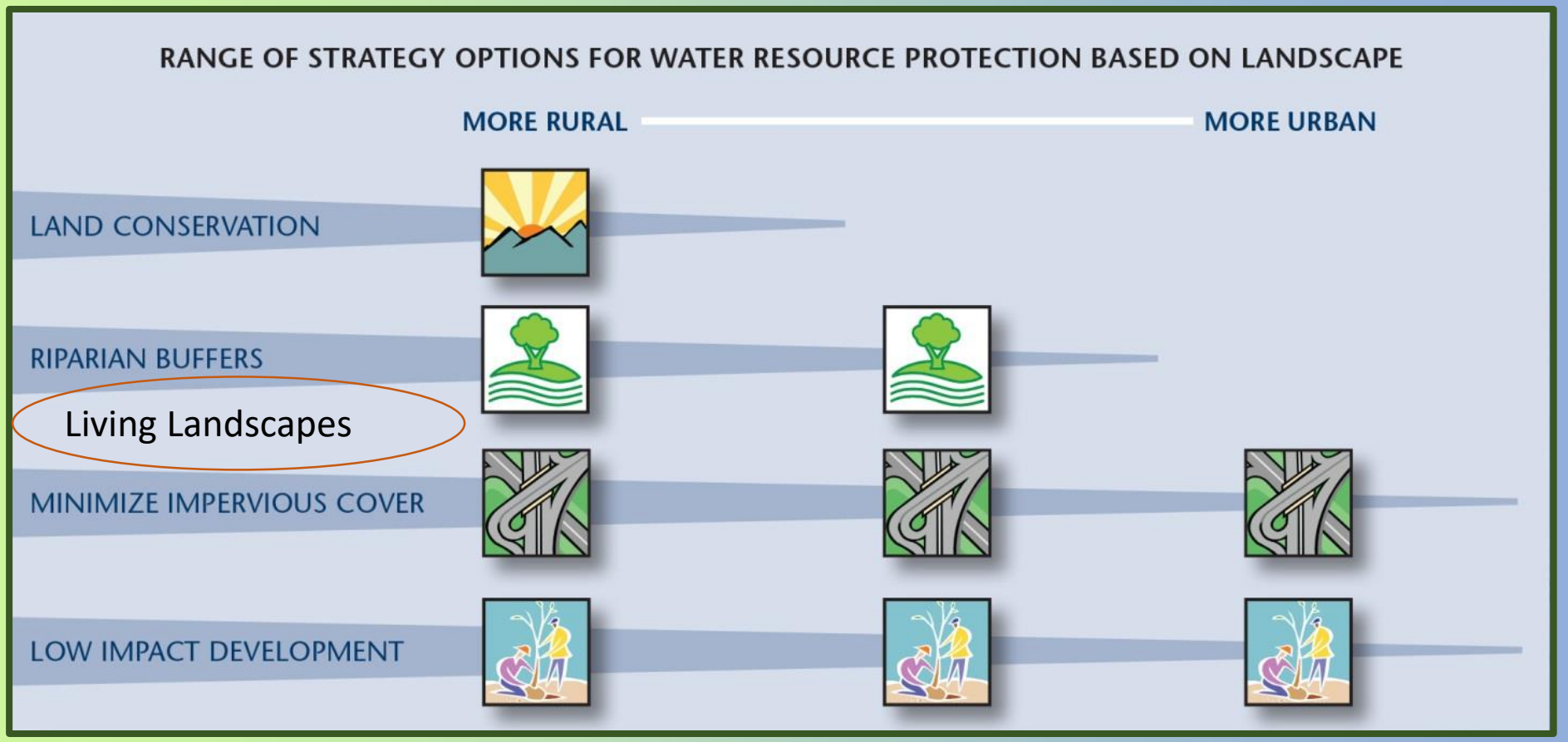
Figure 5. Environmental Services Provided by Various Shoreland Buffer Widths



Source: adapted from Connecticut River Joint Commission, 2000.

As displayed in *Piscataqua Region Estuaries Partnership* Assessment Report

Clean Water Strategies – Living Landscapes

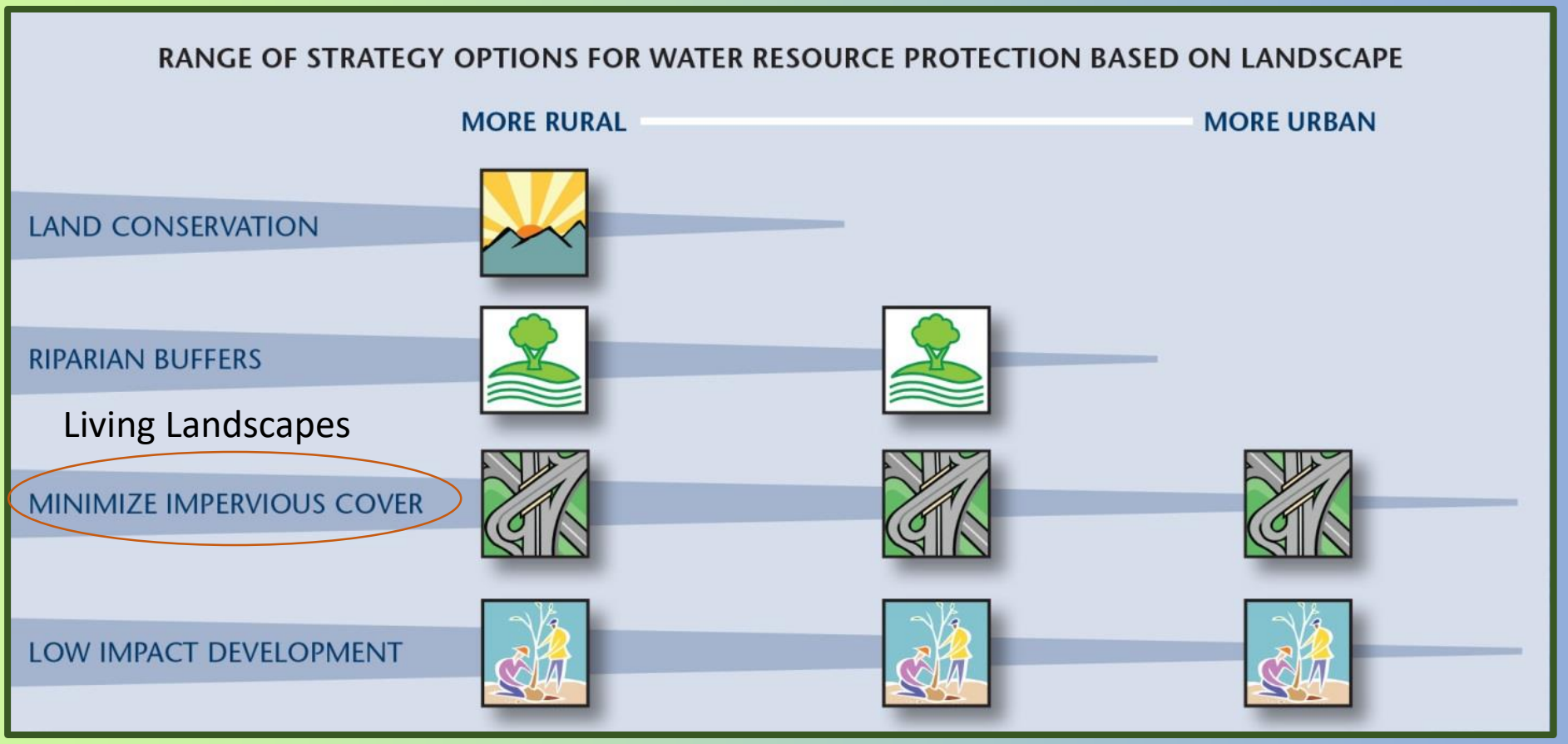


Graphic by Tricia Miller, MillerWorks Graphic Design

Living Landscapes

Image source - http://lindenlandgroup.com/blog

Clean Water Strategies



Graphic by Tricia Miller, MillerWorks Graphic Design

What's Entering the Stormdrain?

Not All Impervious Cover is Created Equal

View from Above

Total IC=

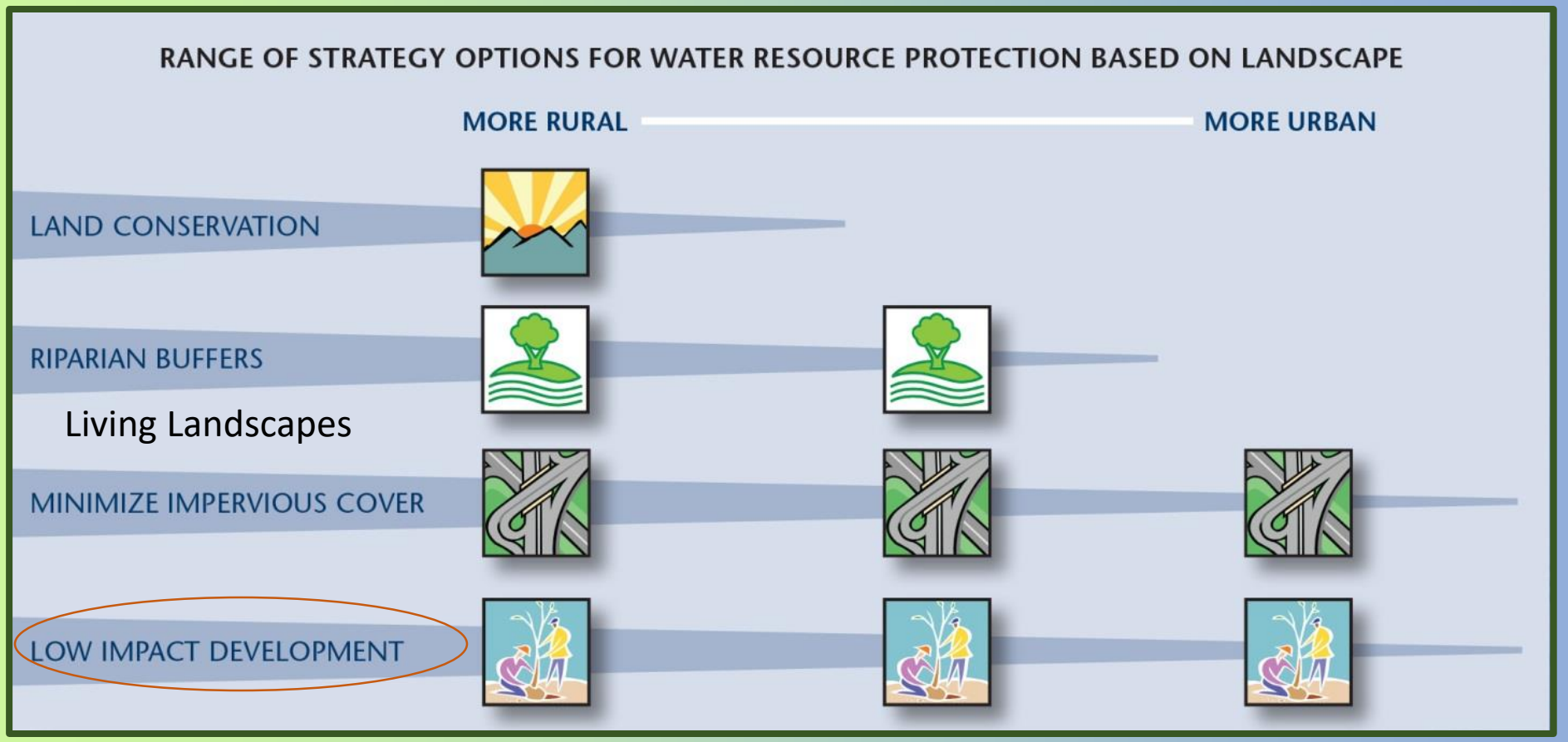
- ALL impervious cover within a catchment area

Effective IC =

- Portion of area where stormwater is “effectively” transported directly to a stream channel or stormwater pipe

Strategy: Limit or Disconnect Impervious Cover

Clean Water Strategies



Living Landscapes

Graphic by Tricia Miller, MillerWorks Graphic Design

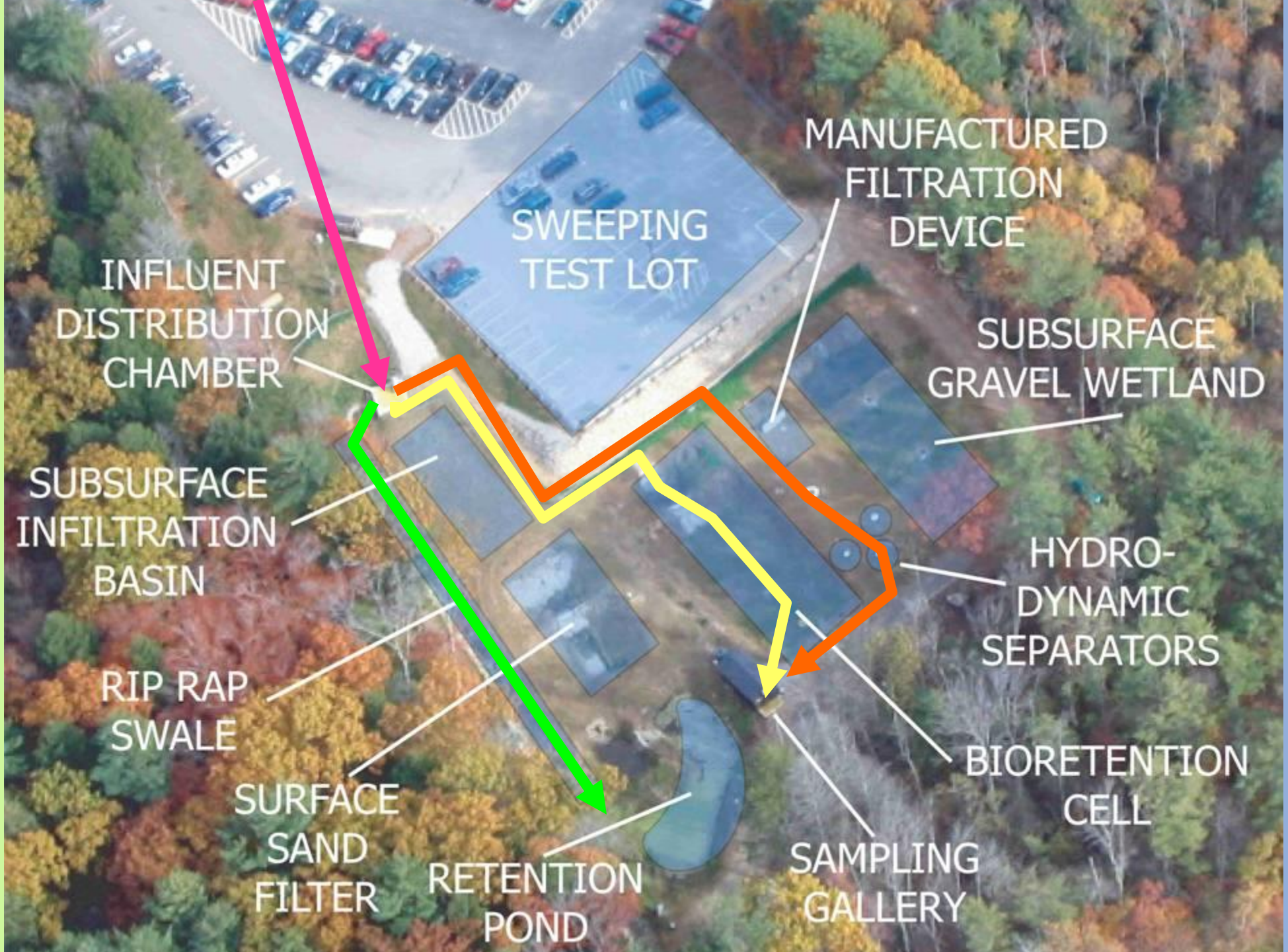
What's a Landscaper to Do?

Courtesy of UCONN Cooperative Extension

Does Low Impact Development Work?

Research Field Facility at UNH

Tc ~ 19 minutes


SWEEPING
TEST LOT
MANUFACTURED
FILTRATION
DEVICE
INFLUENT
DISTRIBUTION
CHAMBER
SUBSURFACE
GRAVEL WETLAND
SUBSURFACE
INFILTRATION
BASIN
HYDRO-
DYNAMIC
SEPARATORS
RIP RAP
SWALE
BIORETENTION
CELL
SURFACE
SAND
FILTER
RETENTION
POND
SAMPLING
GALLERY

Hydrodynamic Separator

Isolator Row

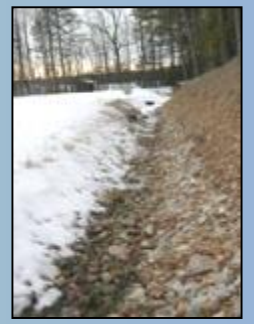
Subsurface Infiltration

Filter Unit

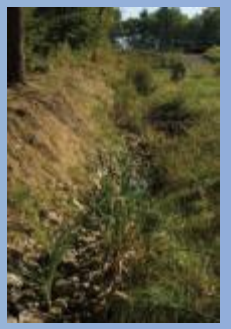
Porous Asphalt

Pervious Concrete

Retention Pond



Stone Swale



Veg Swale

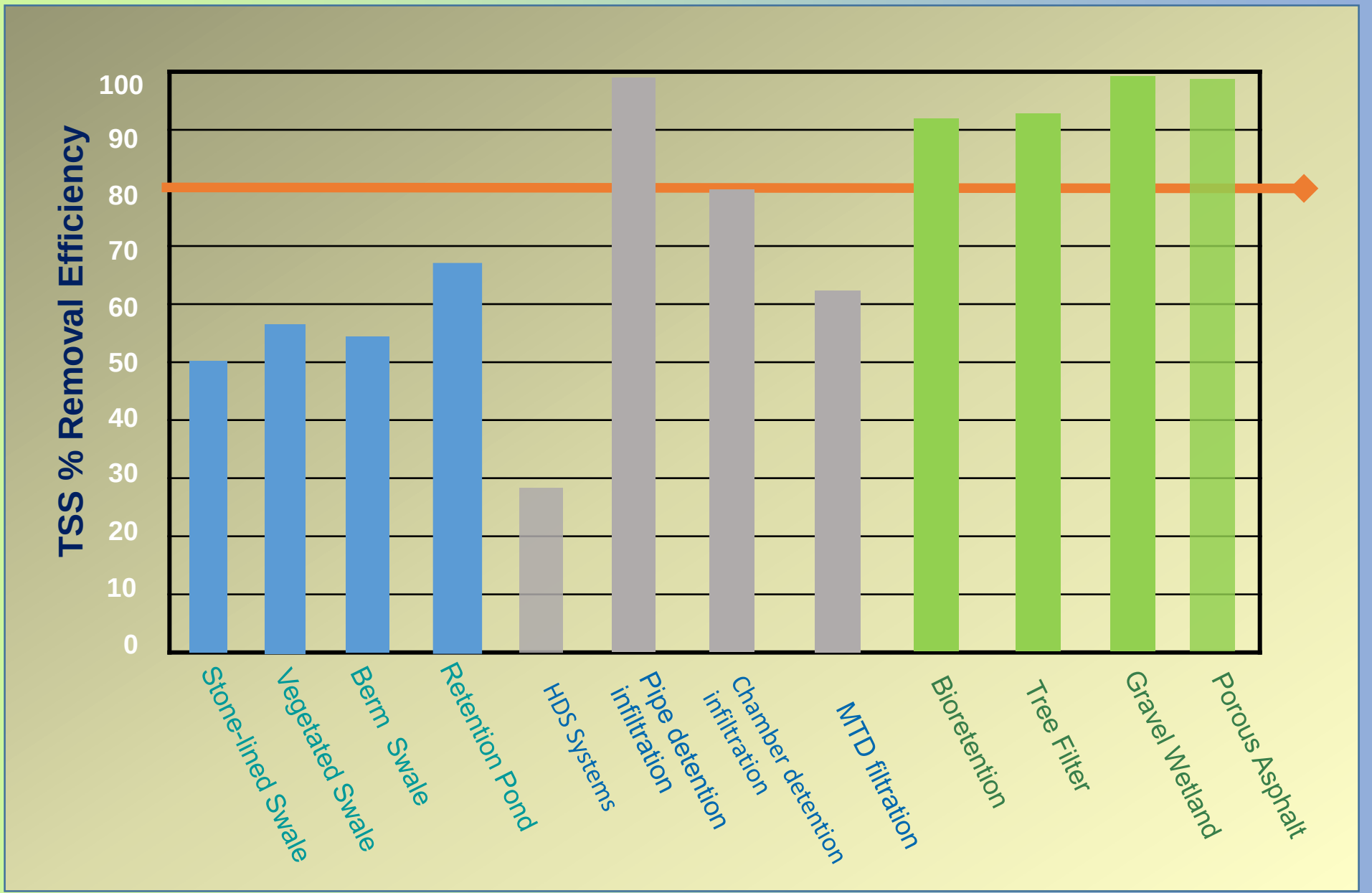
Gravel Wetland

Sand Filter

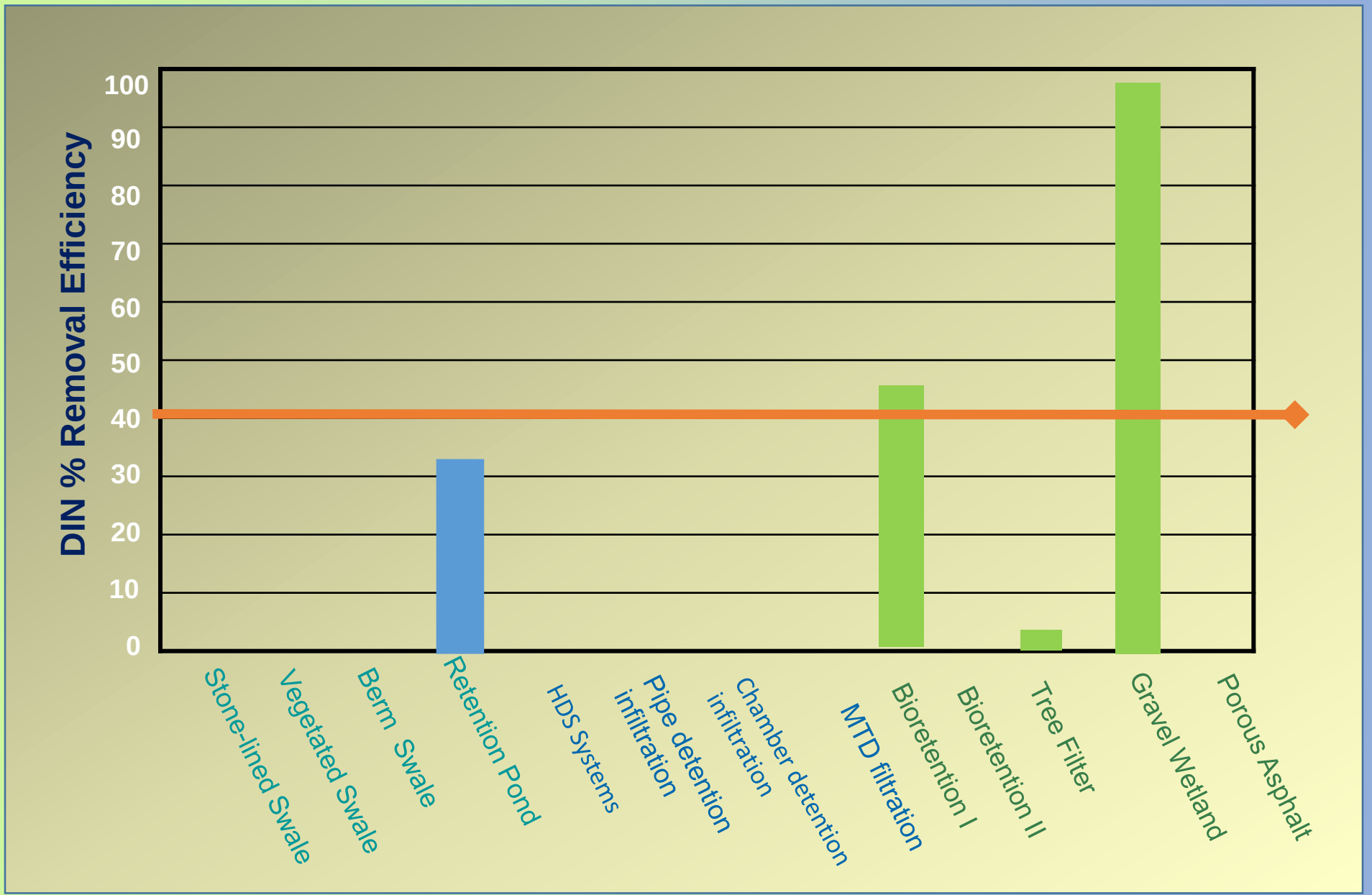
Bioretention Unit

Tree Filter

Total Suspended Solids (TSS) Removal Efficiencies



DIN Removal Efficiencies



“High level treatment typically only occurs with the use of

filtration systems”:

Eg. raingardens, bioretention, tree filters, bioswales, gravel wetlands

Preserve Effectiveness with Maintenance

THANK YOU!