

If your lake could talk



Maggie Shannon
Maine Lakes Society

Lakes have long memories

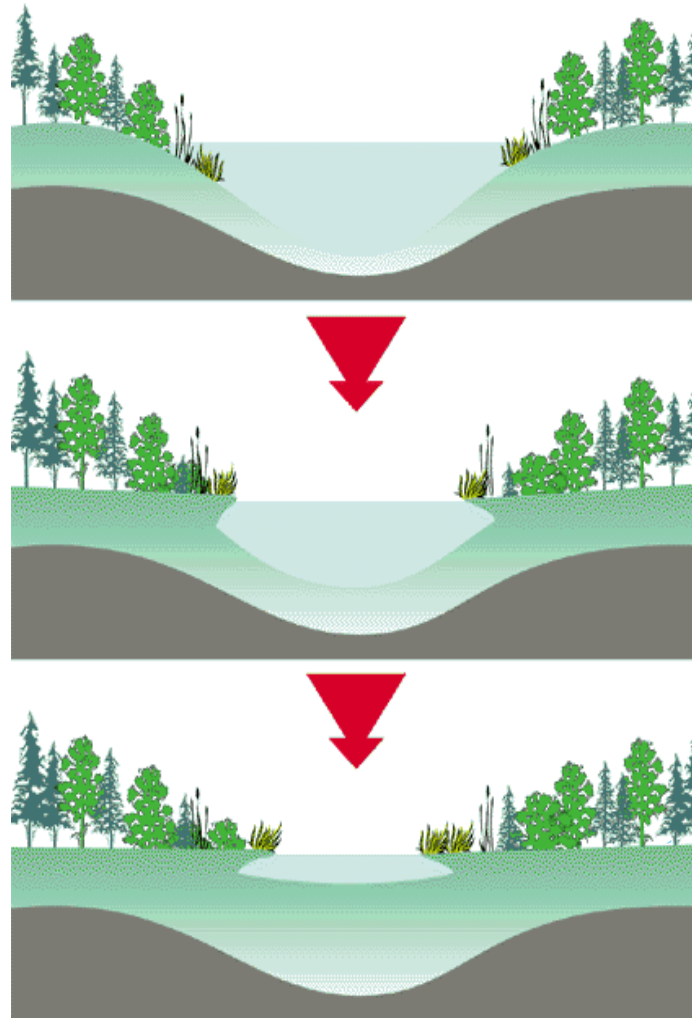


In fact, lakes did speak



Lake Succession

- ▶ Over tens of thousands of years erosion fills the lake basin with soil
- ▶ Phosphorus is a plentiful element that sticks to soil particles
- ▶ It's also a plant food
- ▶ This nutrient feeds plant growth and algal blooms



Every lake in a developing watershed has increasing phosphorus inputs whether apparent yet or not

Since erosion is a force of nature,
and water runs downhill,
and lakes fill the low places,
> **what happens on land ends up in the lake.**

Development increases phosphorus loading 8 to 10 times over natural conditions (MEDEP)

And then, we know ...

- ▶ Northern New England is getting **71% more intense storms** than we did 35 years ago This is expected to increase (CCI, UMO)
- ▶ Ice cover is on average 3 to 4 weeks less now than in 1800 and that means there's **a longer growing season in lakes**
- ▶ **Summers are getting longer and warmer**

53 + 490 = 22% of Maine's great ponds are "at risk from development" (MEDEP)

2018 Algal
Bloom
Georges Pond



When Undisturbed, Lakes Remain Clear for Tens of Thousands of Years



Lakes Are living Systems.

They react to their environment

As we build communities, we

- ▶ Clear vegetation
- ▶ Flatten land for homes, schools, farms, hospitals, shopping centers and the roads that connect them

This changes how stormwater acts

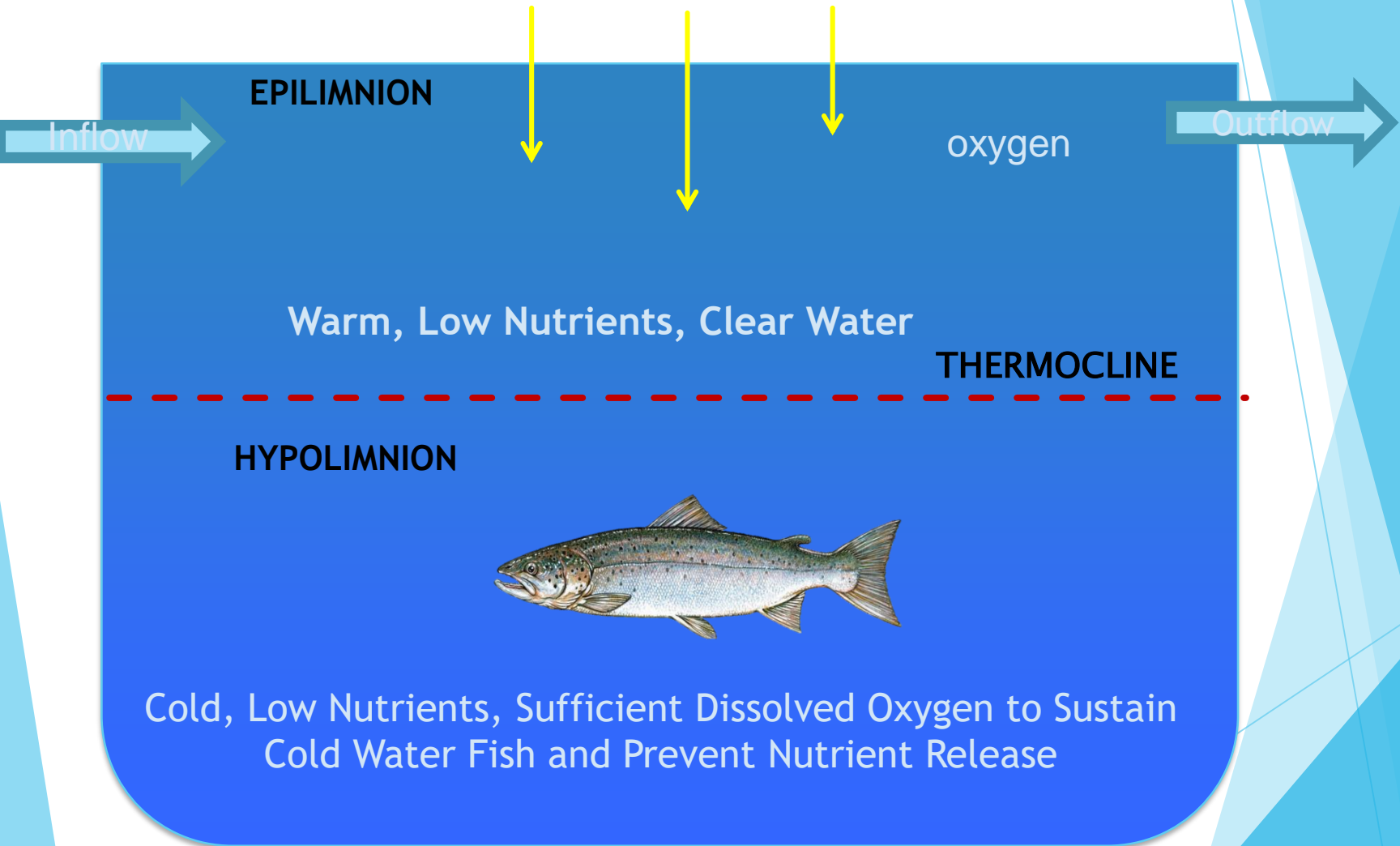
- ▶ More hard surfaces decrease the land's ability to absorb water
- ▶ Less rain soaks in, more of it runs off
- ▶ The runoff travels faster
- ▶ The faster it travels, the more material it carries

Nature's Filter

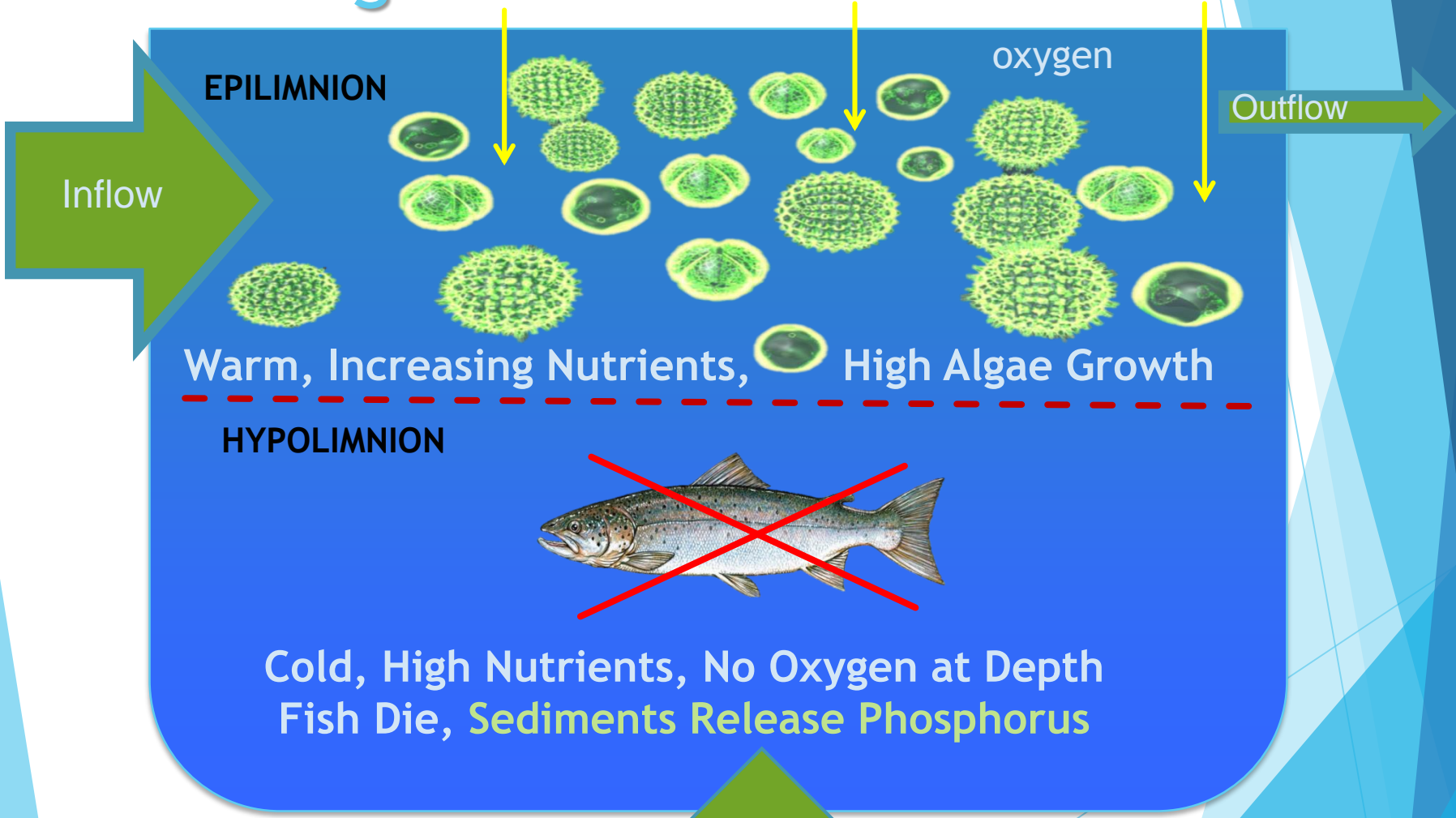


A mixed stand of sturdy vegetation

Lake in ^{near} Equilibrium

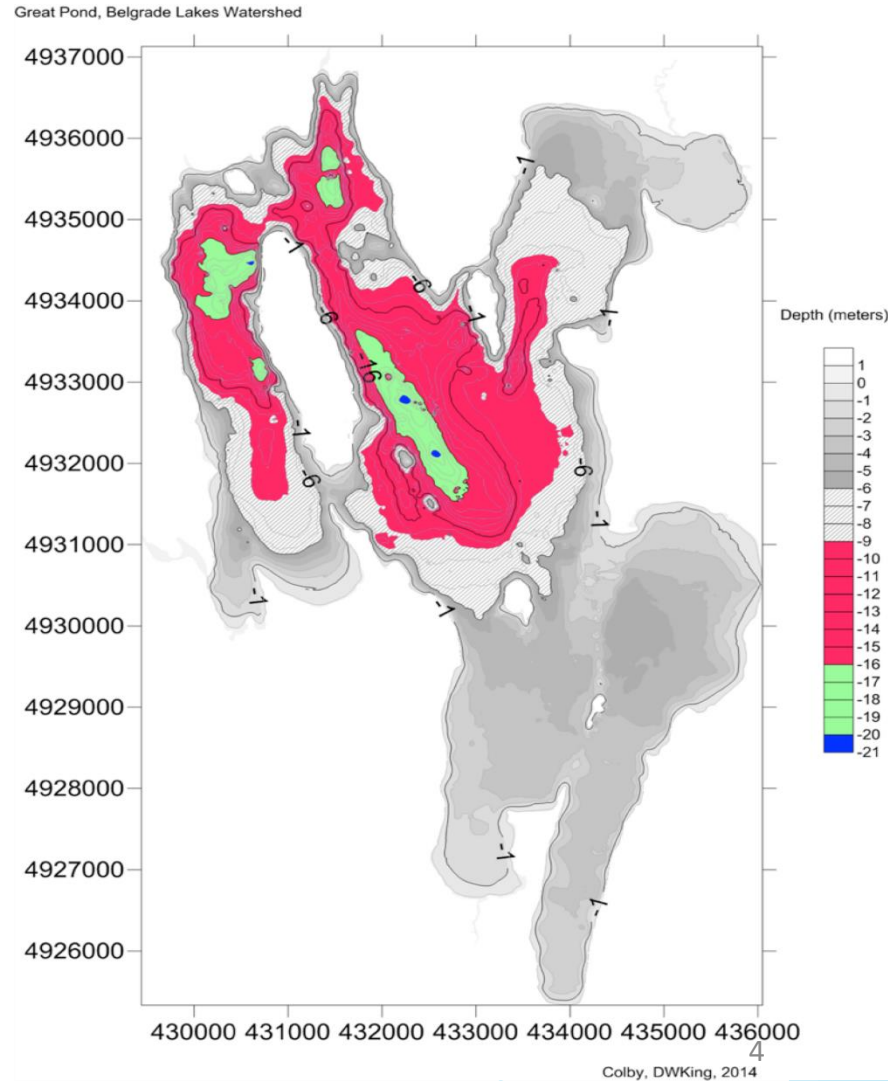


Runoff Enriches Lake Waters Creating a Cascade of Effects



Great Pond in Belgrade 2017

- ▶ Area of anoxia is thirty five times larger than it was 1989
- ▶ This engine of enrichment will keep on pumping phosphorus into the water column every summer



Death by a Thousand Cuts

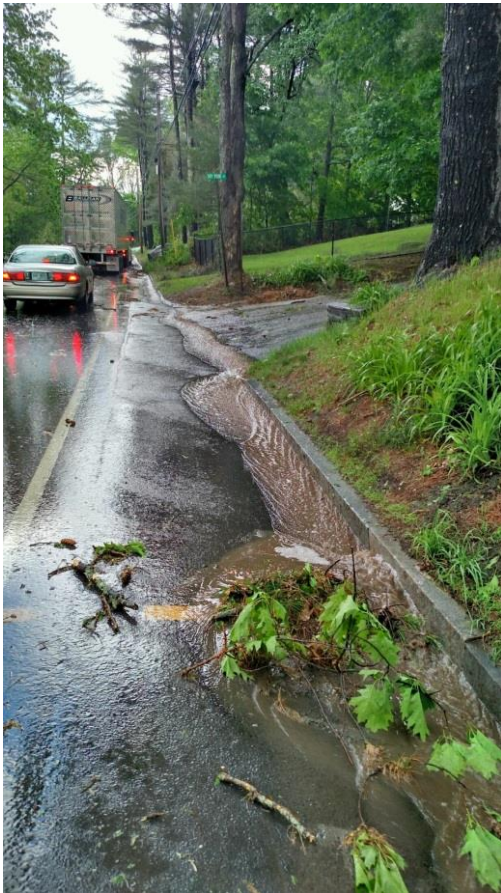


The unintended outcome of many small insults by well-meaning people - *Nonpoint Source Pollution* - is the leading reason lakes bloom and lose value



20 Minute Storm in 2017

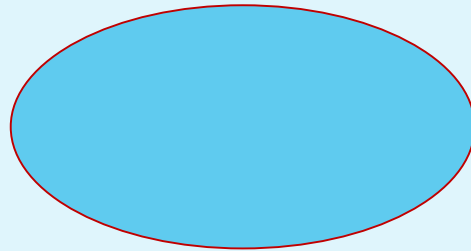
(each soil particle carries phosphorus)



Nonpoint Source Pollution



OF ALL THE BMP's,
BUFFERS
ARE THE MOST SIGNIFICANT



The **shorelands** are
our last chance to stop pollution, fish kills, malodors, unsafe
water, home market value loss and habitat destruction

Stormwater Management Changes runoff into groundwater



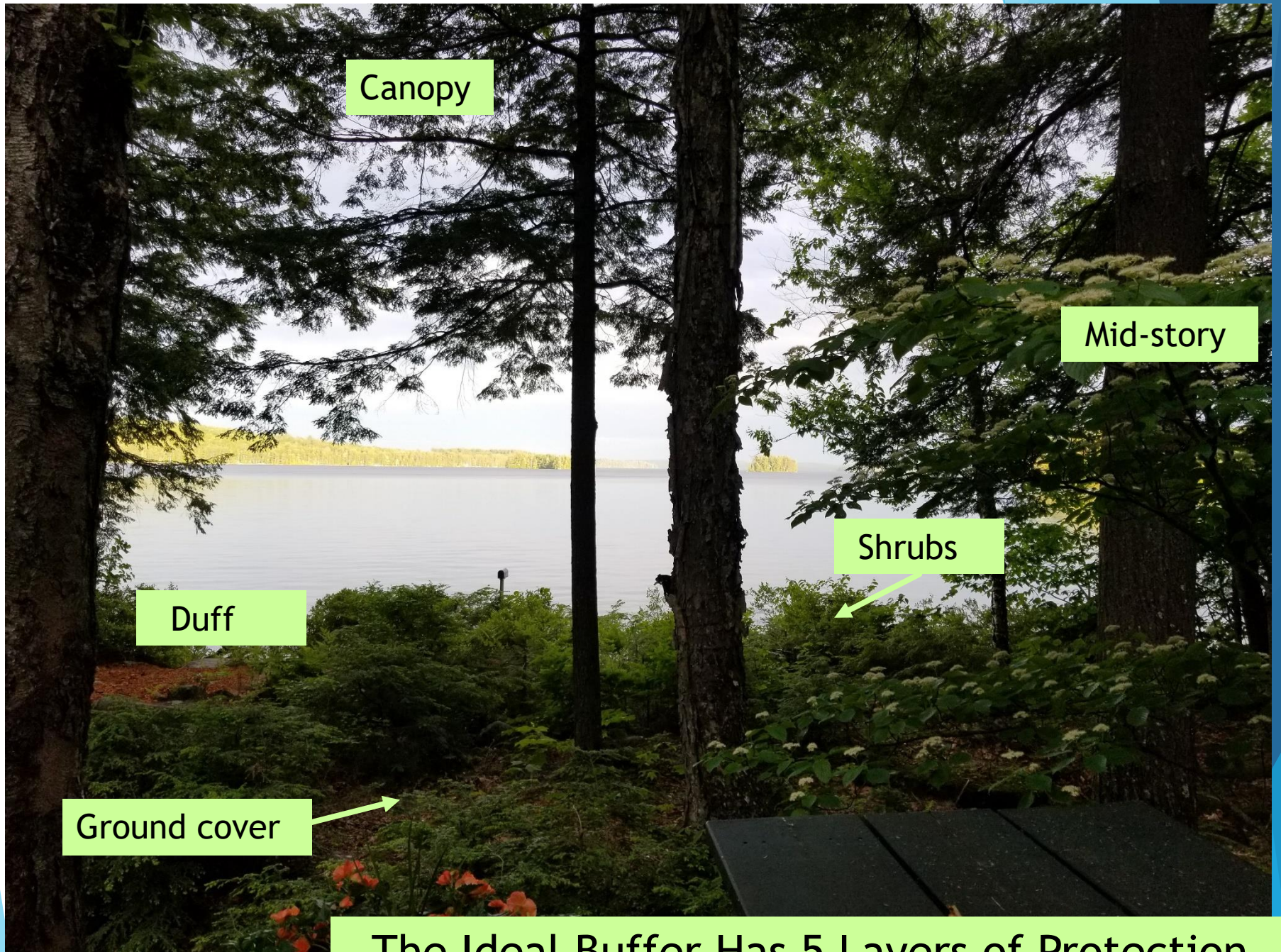
It's Wizard!

Soak rain into the ground,
and hold soil in place

Buffer Services



Slow runoff so it will soak in, create the duff layer, cover soil and anchor it in place, absorb nutrients, filter groundwater, shade and cool land and water, provide shelter and food for wildlife.



Canopy

Mid-story

Shrubs

Duff

Ground cover

The Ideal Buffer Has 5 Layers of Protection

3 Tiers, 10 Feet Deep is the Minimum Standard for LakeSmart



4 tiers visible here



Highly Civilized Buffer



Buffers Mimic Mother Nature



Taylor-made





Almost One Tier, Shrubs too Sparse, Grass Doesn't Count



Unstable Shore







Stabilize and Infiltrate, both

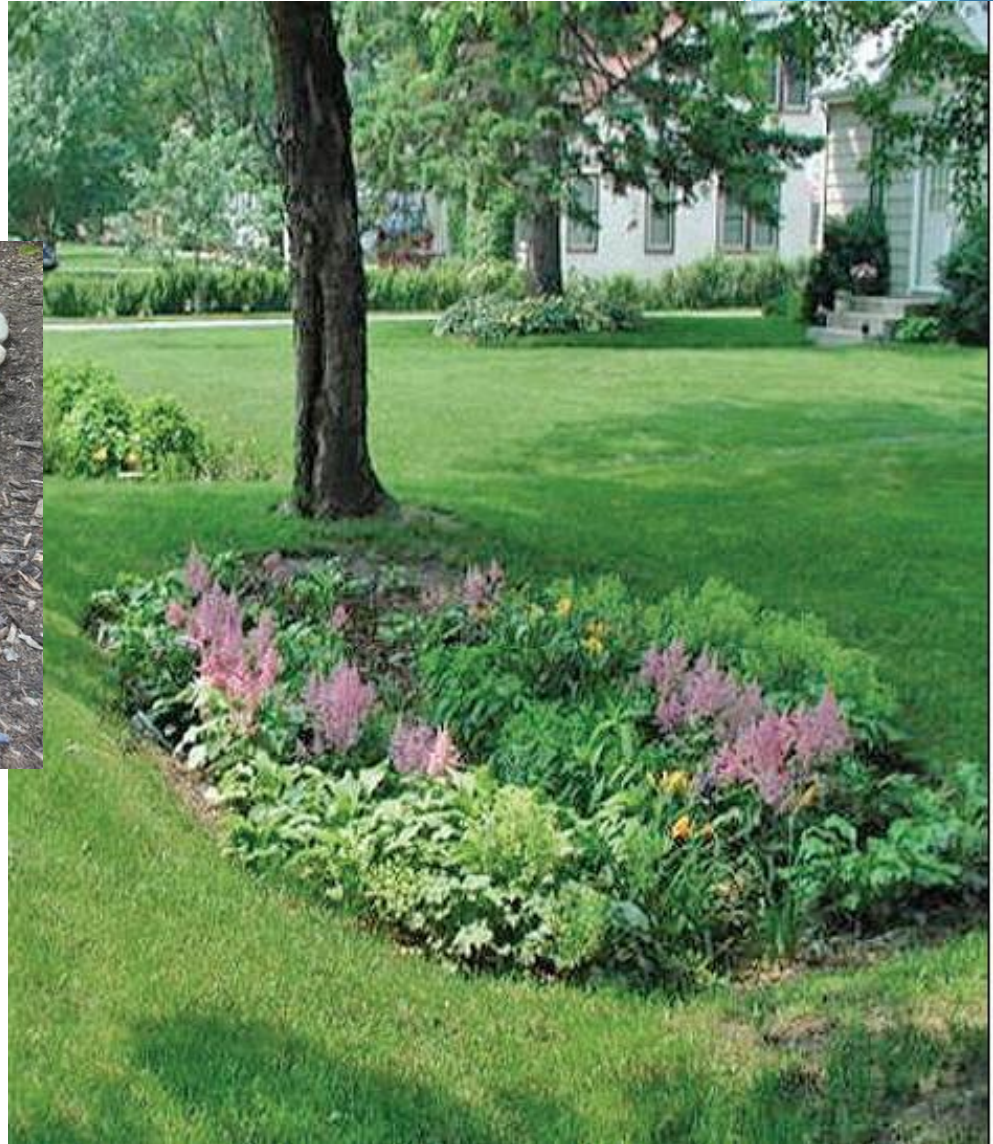


Stabilize and Save





Infiltrate



Driveway Buffer



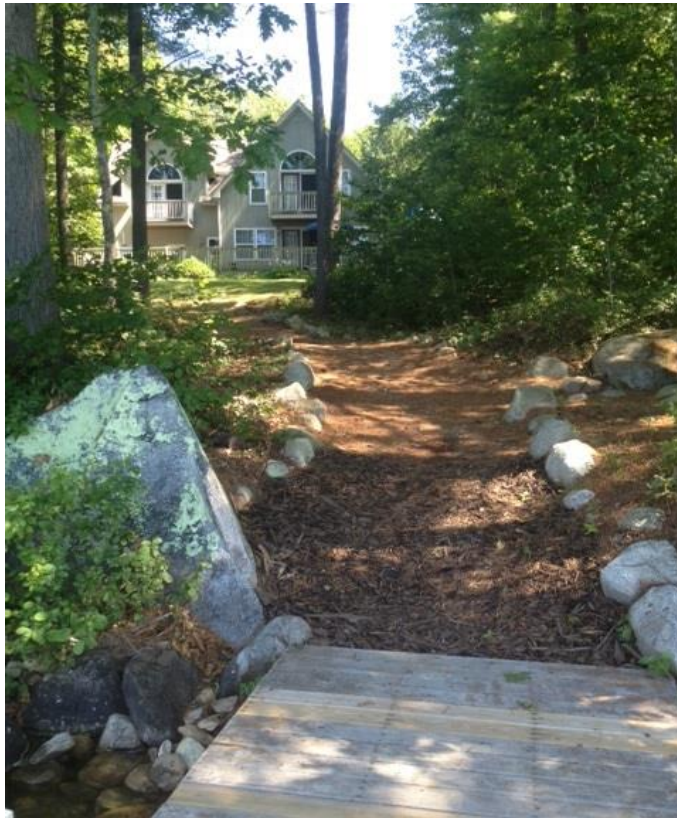
Unprotected Path



Before and After - (Both Stormwater and Humans Take the Shortest Path to the Lake)



**Buffer not Compromised by Water Access
(Access always cuts through the buffer, so
precautions should be taken to stop runoff)**





Safe access



No leaks



Strong protection



Another approach



Water Access OK, Protected



Infiltration Patio



Duff, Mid-Story, Canopy = 3



Before and After - Riprap





Identify the layers
here . . .

Do you see duff?

Mid-story trees?



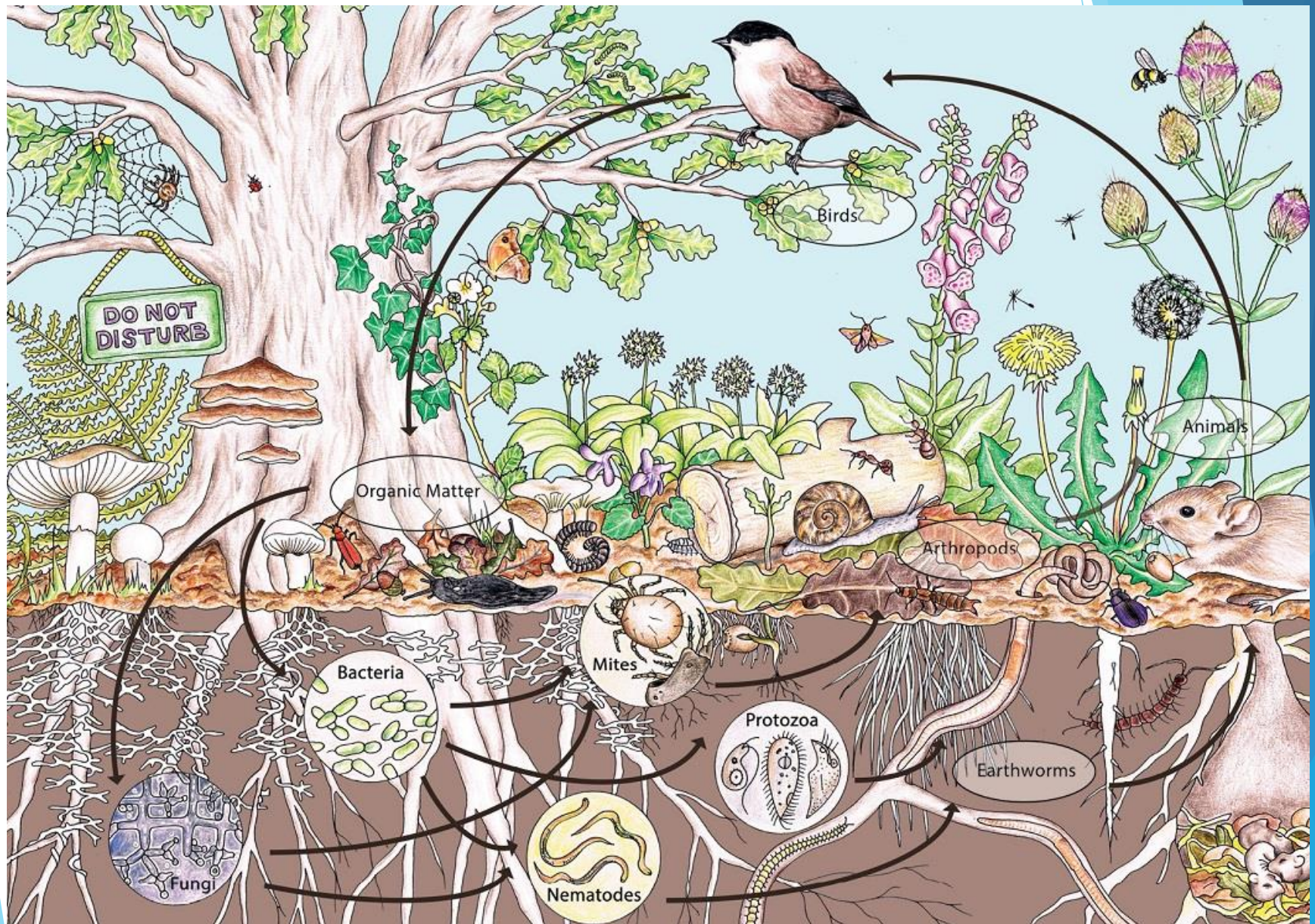
How Many Layers Here?



Slam Dunk Buffer



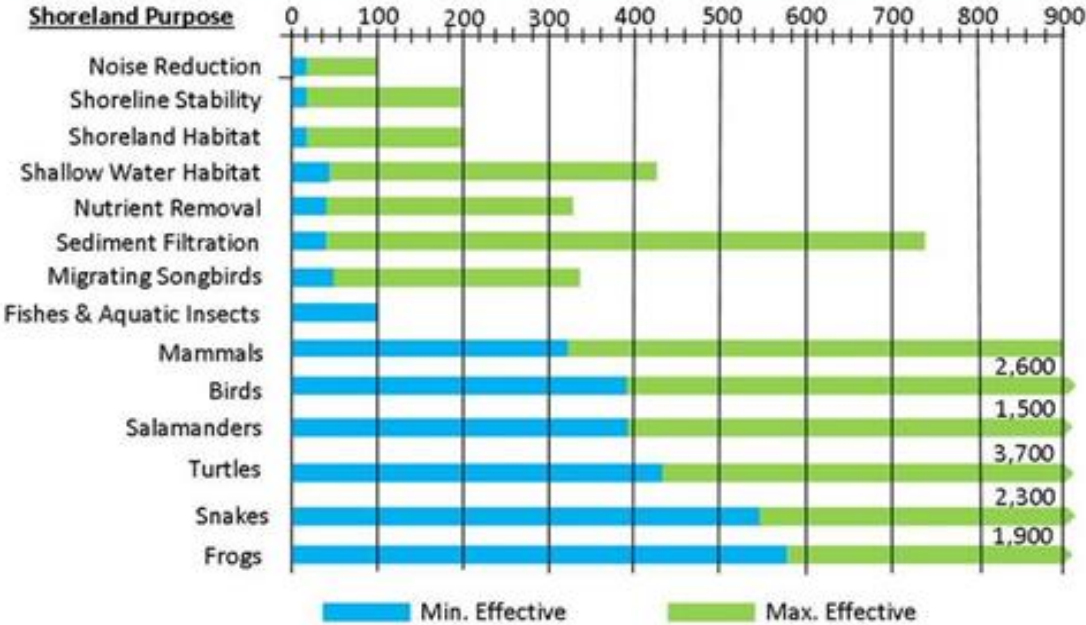
Connectivity



Buffer Services

Natural Lakeshore Vegetation:

- filters and cleans dirty runoff from uphill land uses
- provides shoreland and shallow-water habitat
- stabilizes banks
- increases lake aesthetics



Additional Factors that Impact Shoreland Effectiveness:

- Density and Composition of Shoreland Trees and Shrubs
- Slope
- Land Use above the Shoreland Area

The way life should be

