SHORELINE BENEFITS & MANAGEMENT
CREATING A RESILIENT WATERFRONT SHORELINE AND BUFFER

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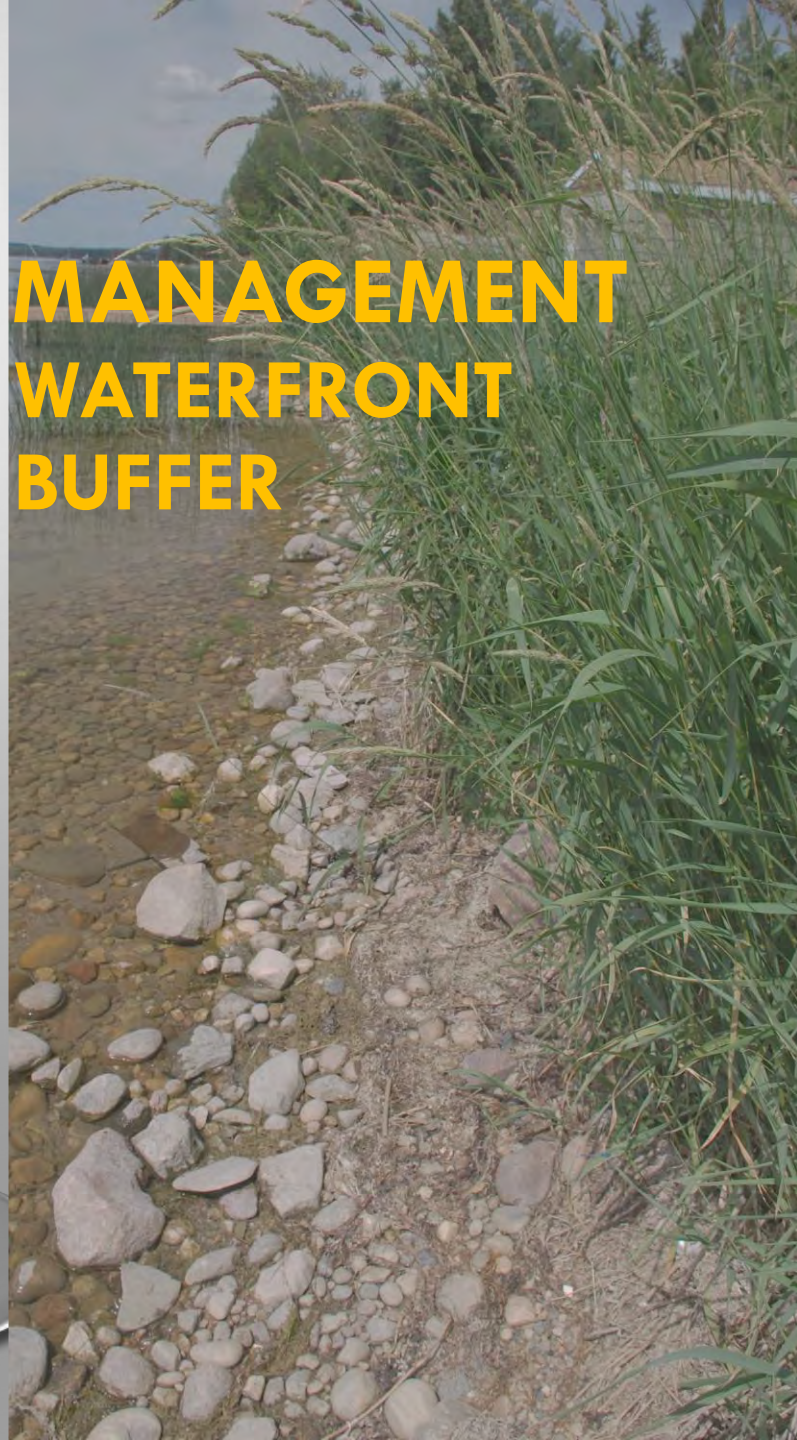
ALBERTA RIPARIAN HABITAT MANAGEMENT SOCIETY - COWS AND FISH

North Saskatchewan Watershed Alliance Lake Stewardship & Restoration Webinar
May 8, 2023



Cows and Fish

Alberta Riparian Habitat Management Society

Our Vision:

Healthy, functioning riparian areas for the benefit of all.

Our Mission:

To promote healthy landscapes by fostering riparian stewardship.

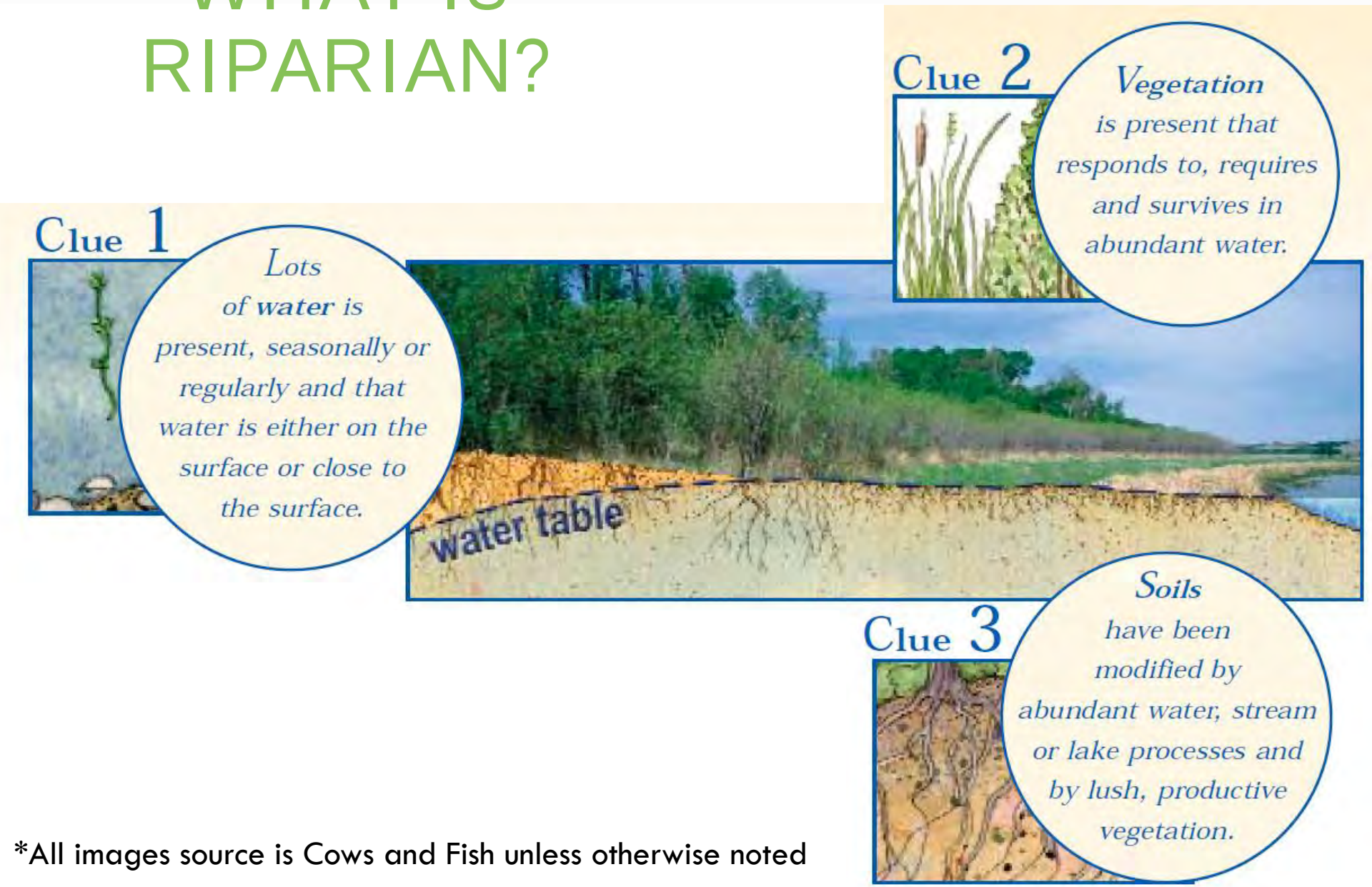
Members and Supporters

Alberta Agriculture and Forestry

Alberta Environment and Parks

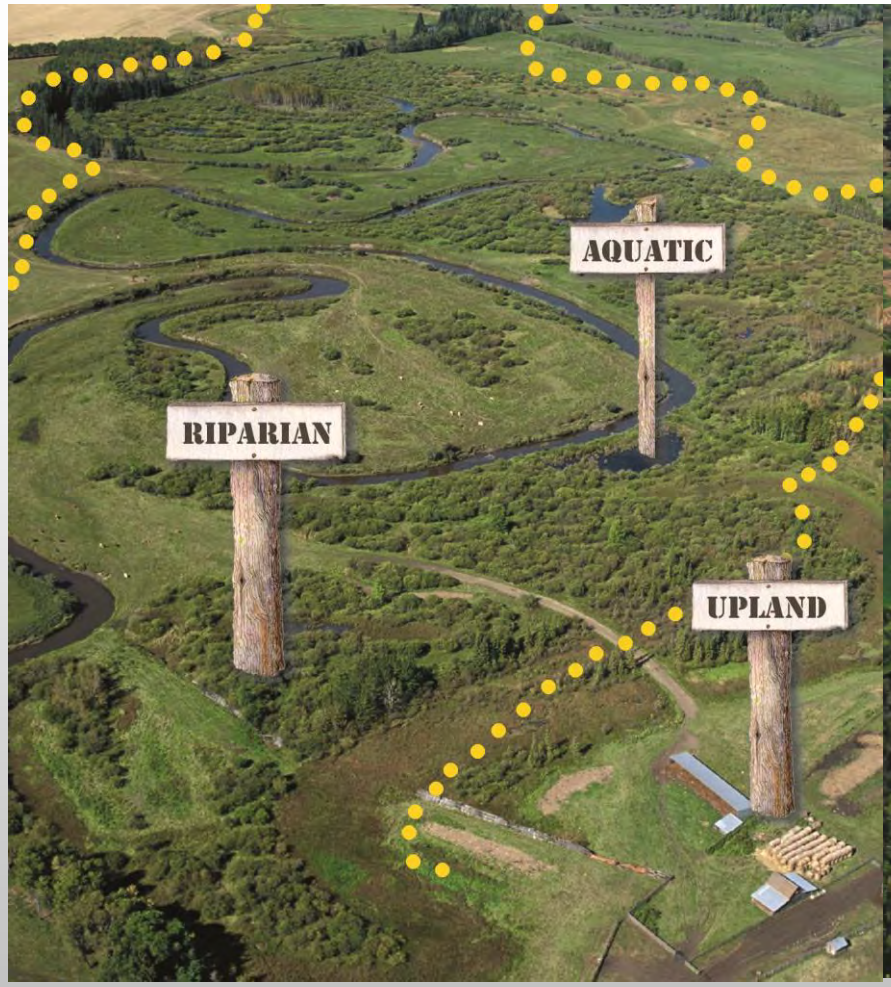
Producers, municipalities and community groups in Alberta

WHAT IS RIPARIAN?

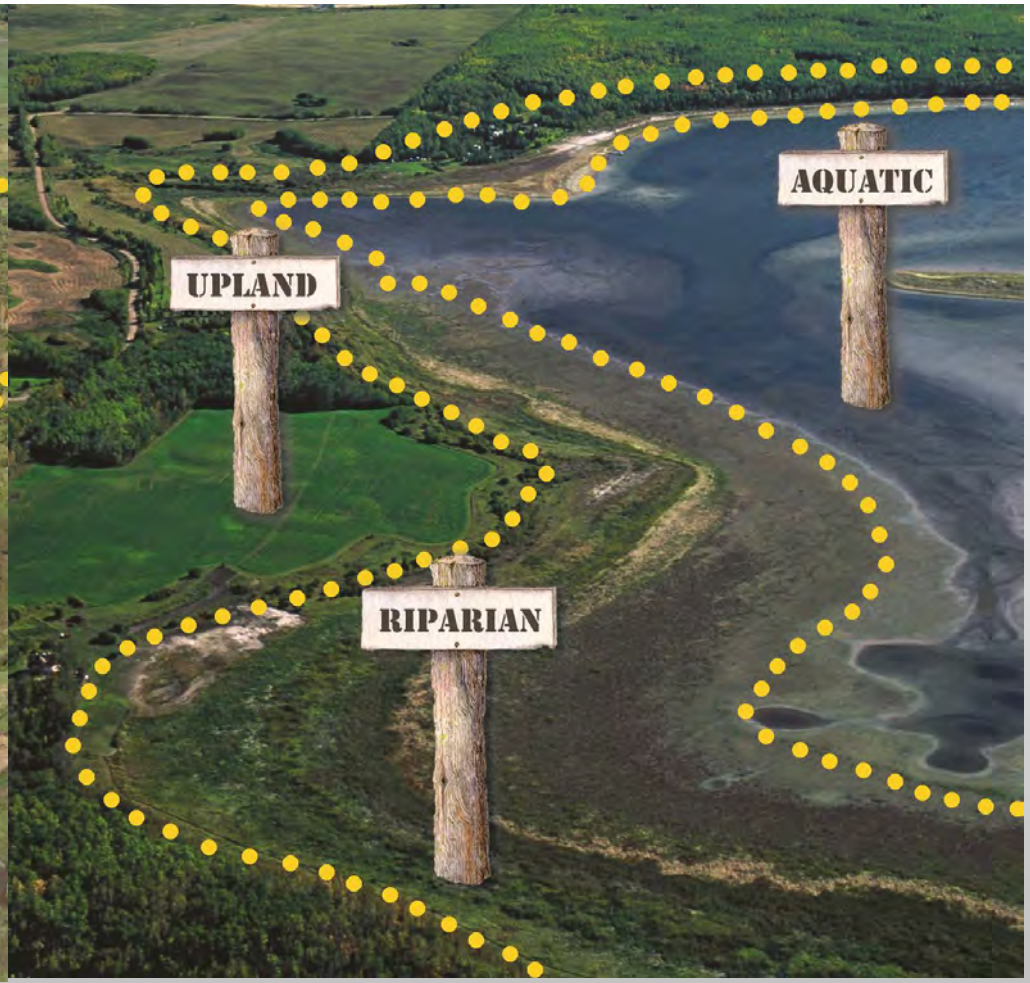


*All images source is Cows and Fish unless otherwise noted

RIVERS AND STREAMS



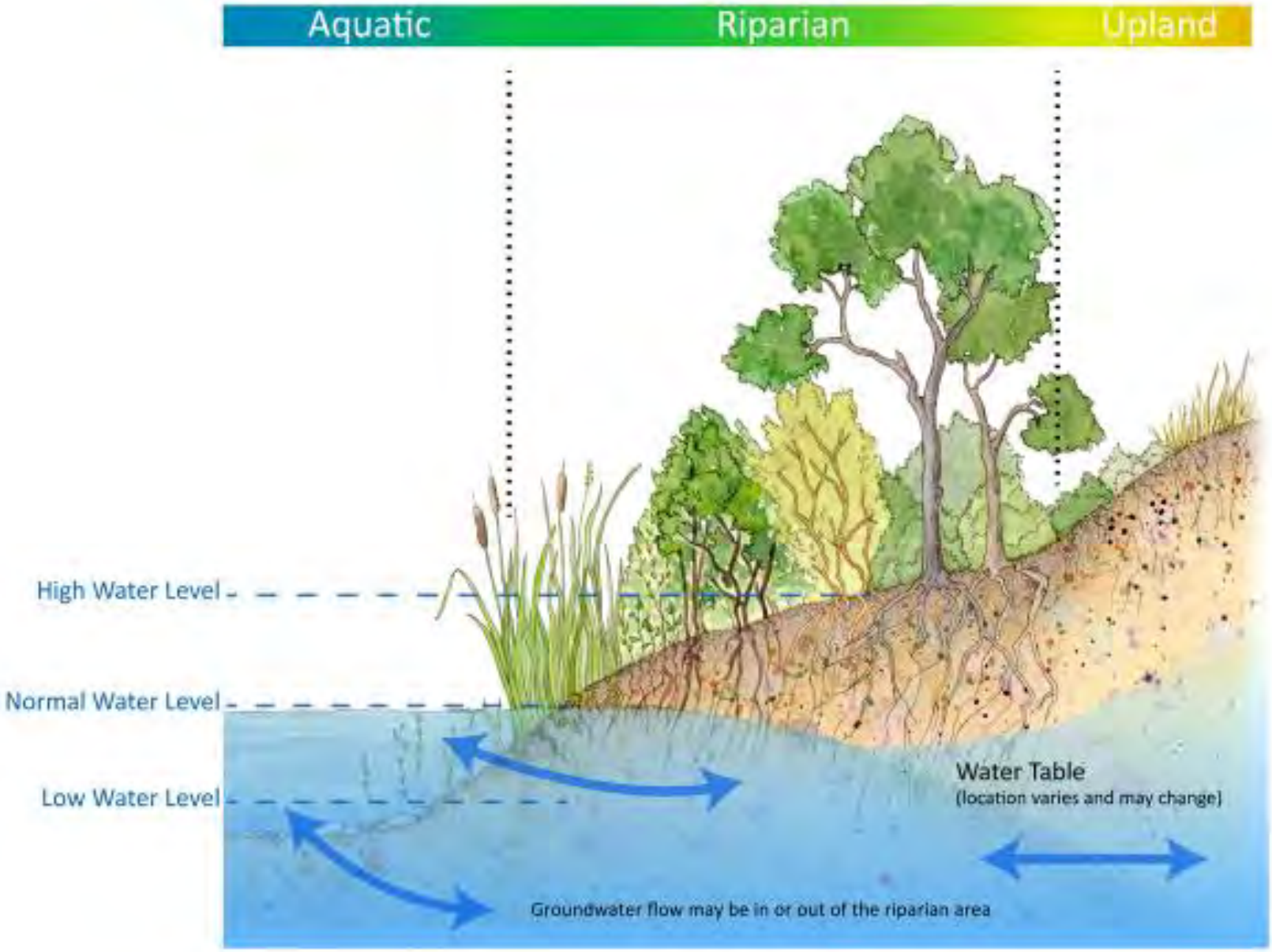
LAKES AND WETLANDS



Riparian areas are dynamic, changing

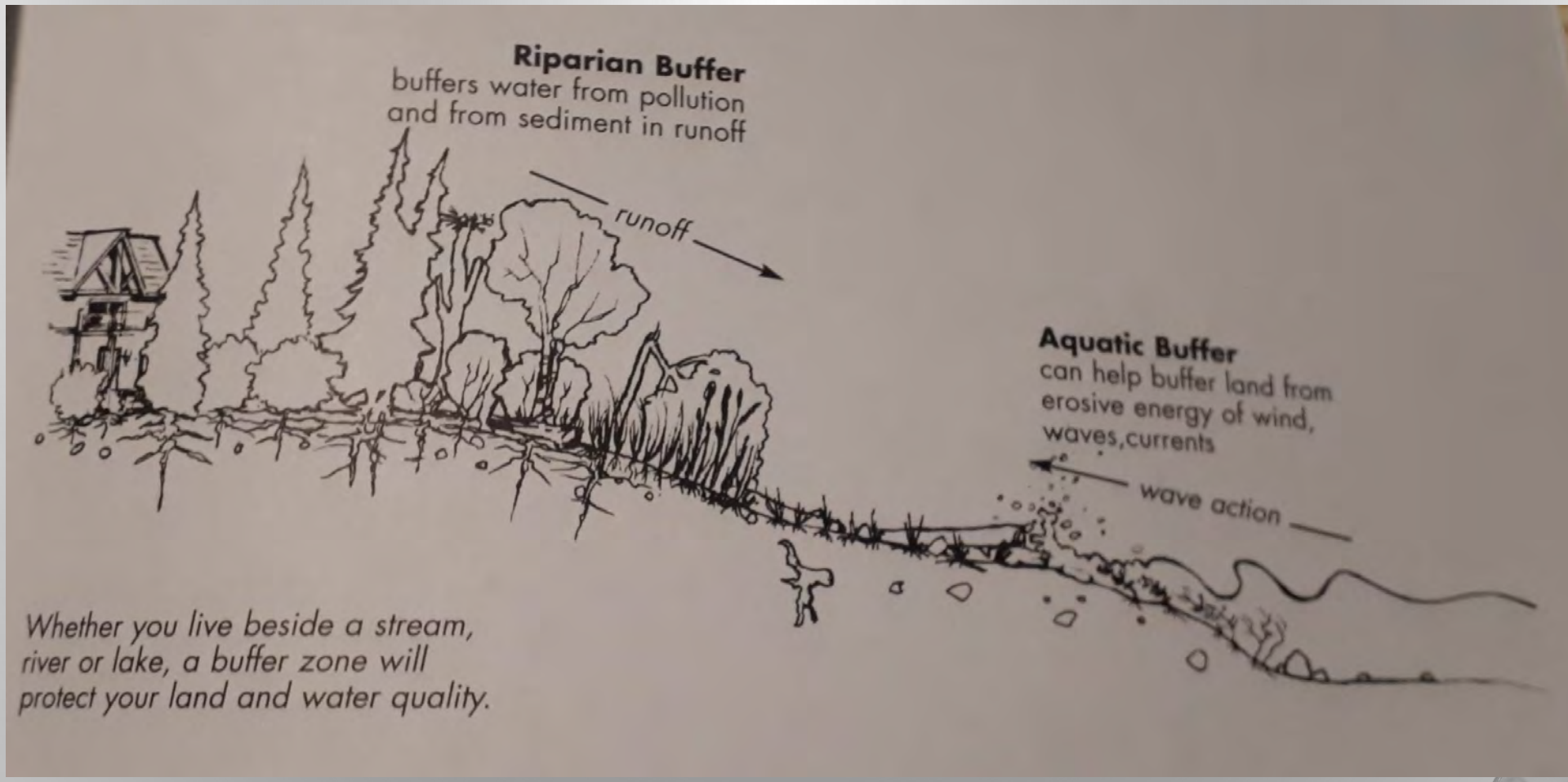
Evolved with fluctuations

Shorelines are Riparian



Water front property can be riparian

Buffers are needed in-lake/stream and on land



Source: On the Living Edge Your Guide for Waterfront Living

HEALTHY SHORELINES ARE SO IMPORTANT

...

- HELP TO MAINTAIN WATER QUALITY
- PREVENT SOIL EROSION
- REDUCE IMPACTS OF HIGH WATER
- PROVIDE WILDLIFE WITH FOOD AND HABITAT
- INCREASE BIODIVERSITY AND RESILIENCY

Slide adapted from PLWA

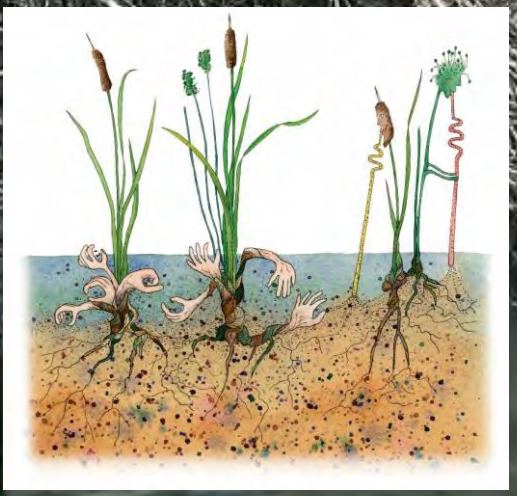
Cows and Fish

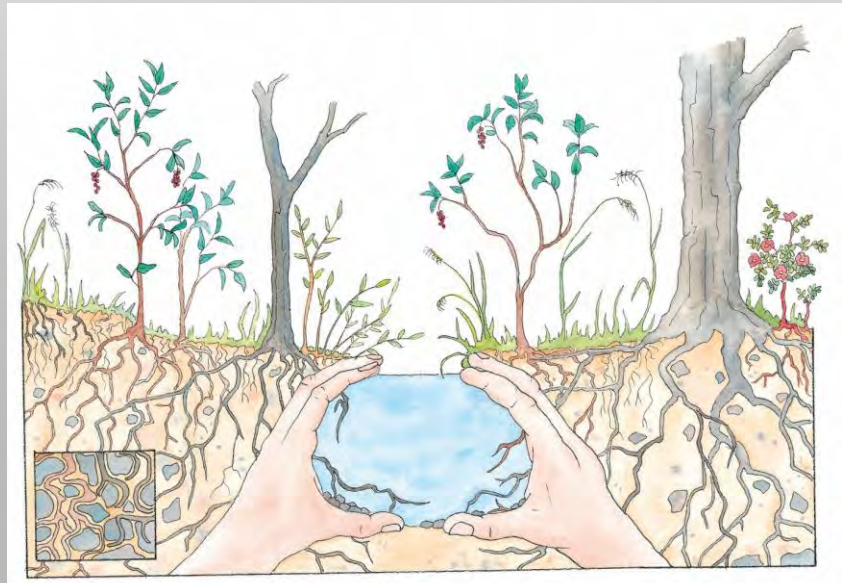
Riparian Functions

- trap and store sediment
- build and maintain banks and shorelines
- store water and energy
- recharge aquifers
- filter and buffer water
- reduce and dissipate energy
- create primary productivity
- maintain biodiversity
- sequester carbon

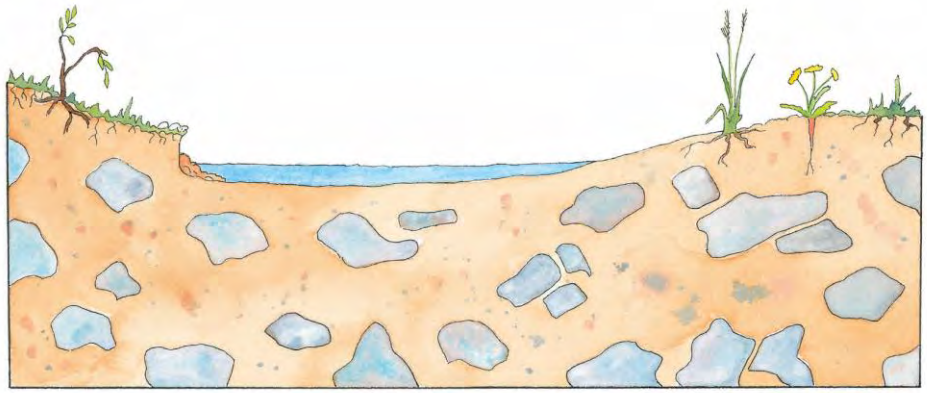
Vegetation –
the root of the solution

DEEP BINDING ROOT MASS RESISTS EROSION





Shallow roots just don't cut it....



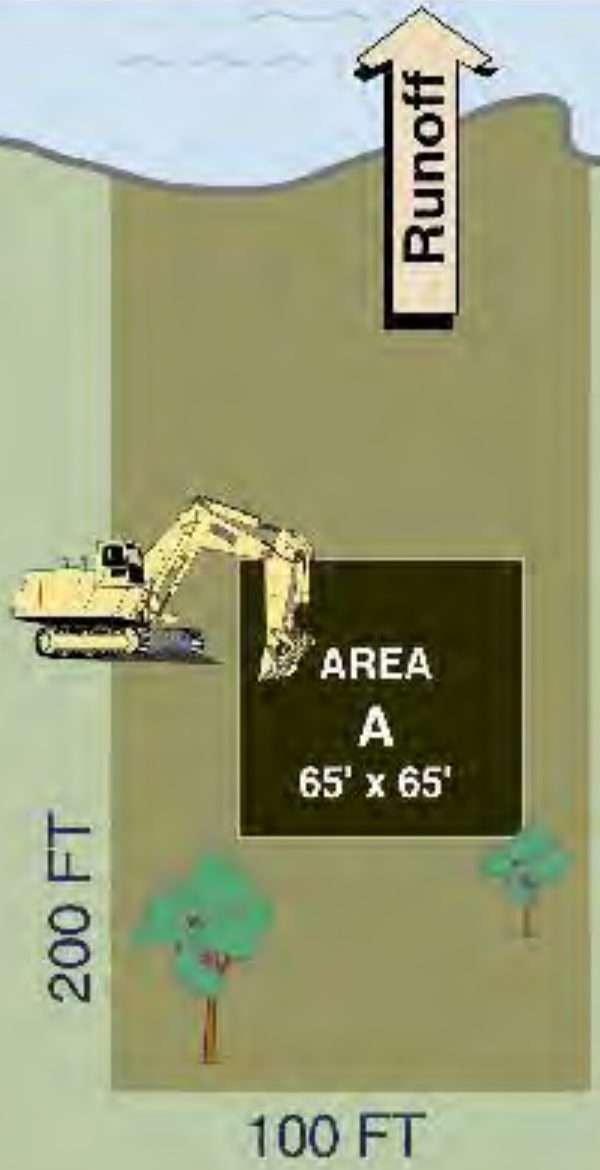

No roots, more big rock – a temporary fix

Lake lot soil losses during construction

IF ONLY AREA A (home site) IS CLEARED:

IMPACT ON LAKE
(June - Sept.)

- 1 ton sediment to lake
- 2 lbs. phos. to lake



IF ENTIRE LOT IS CLEARED

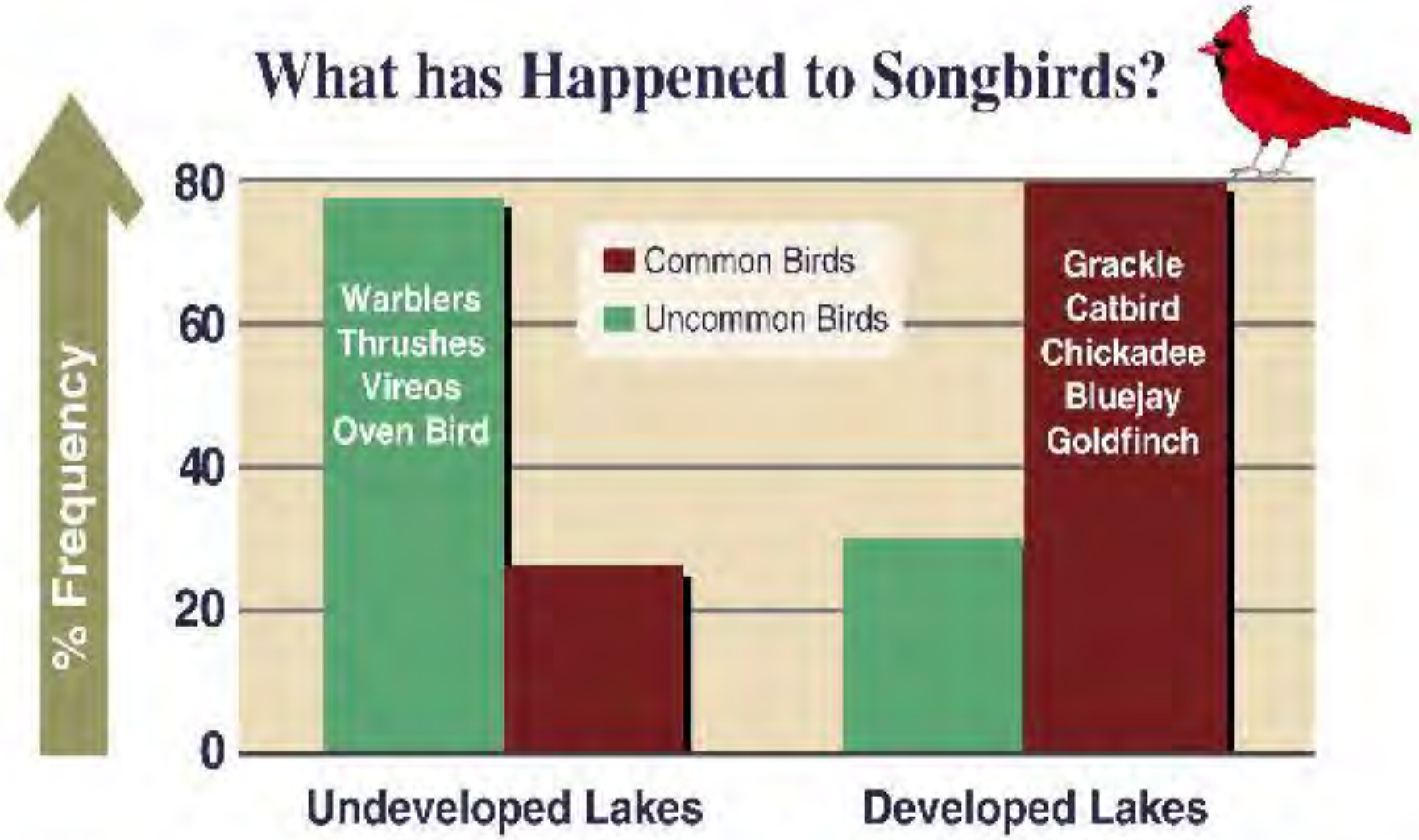
IMPACT ON LAKE
(June - Sept.)

- up to 18 tons sediment to lake
- up to 36 lbs. lbs. phos. to lake

Source: Wisconsin Dept. of Natural Resources

The Wisconsin Lakes Partnership

Shoreland bird trends

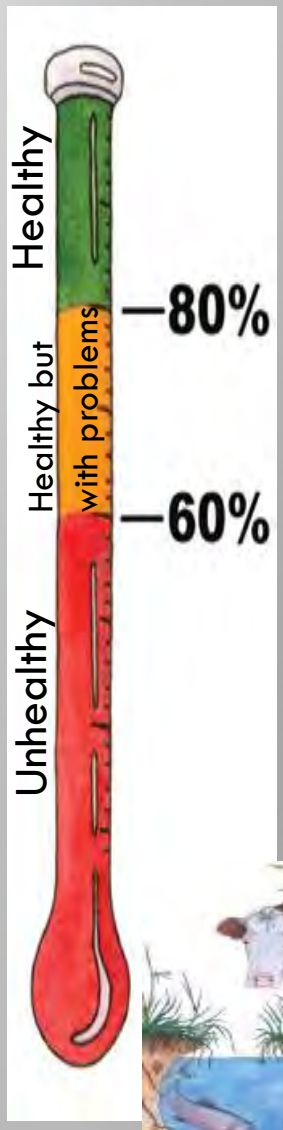


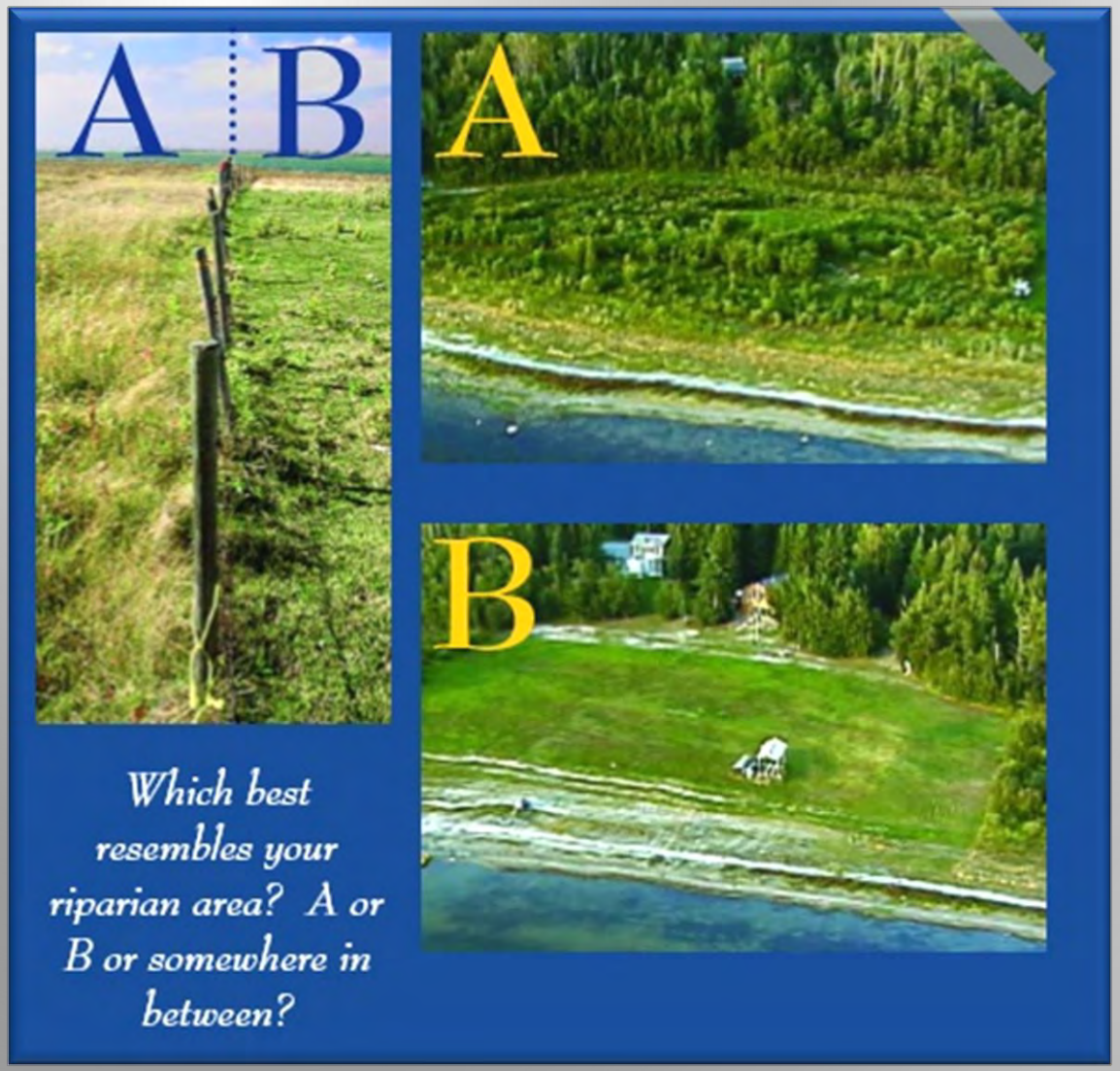
Source: Wisconsin Dept. of Natural Resources

ELEMENTS OF A HEALTHY ECOLOGICALLY FUNCTIONING WATERFRONT

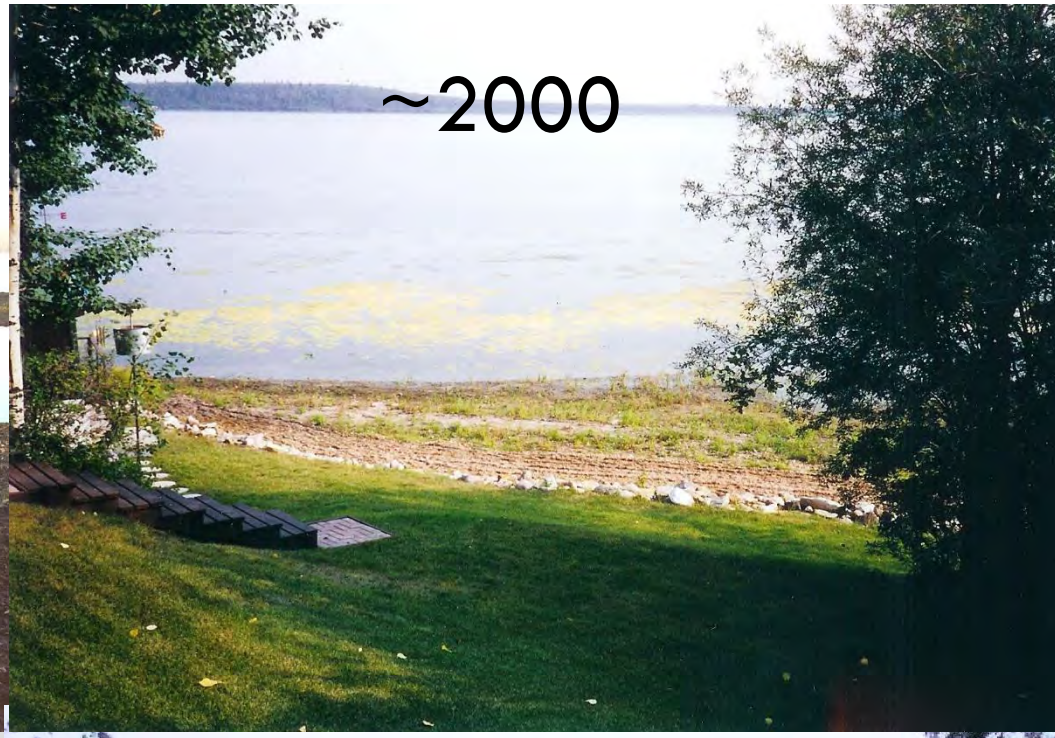
- Well vegetated including emergent
- None to few noxious and prohibited noxious weeds (invasive plants)
- Few disturbance-caused plants
- Diverse community of trees and shrubs with little use or removal
- Plant community close to natural
- Soil structure and topography close to natural, little to no human-caused alterations
- Little to no exposed soil (bare ground) from human activities
- Water levels are allowed to fluctuate naturally

A VISION OF RIPARIAN HEALTH





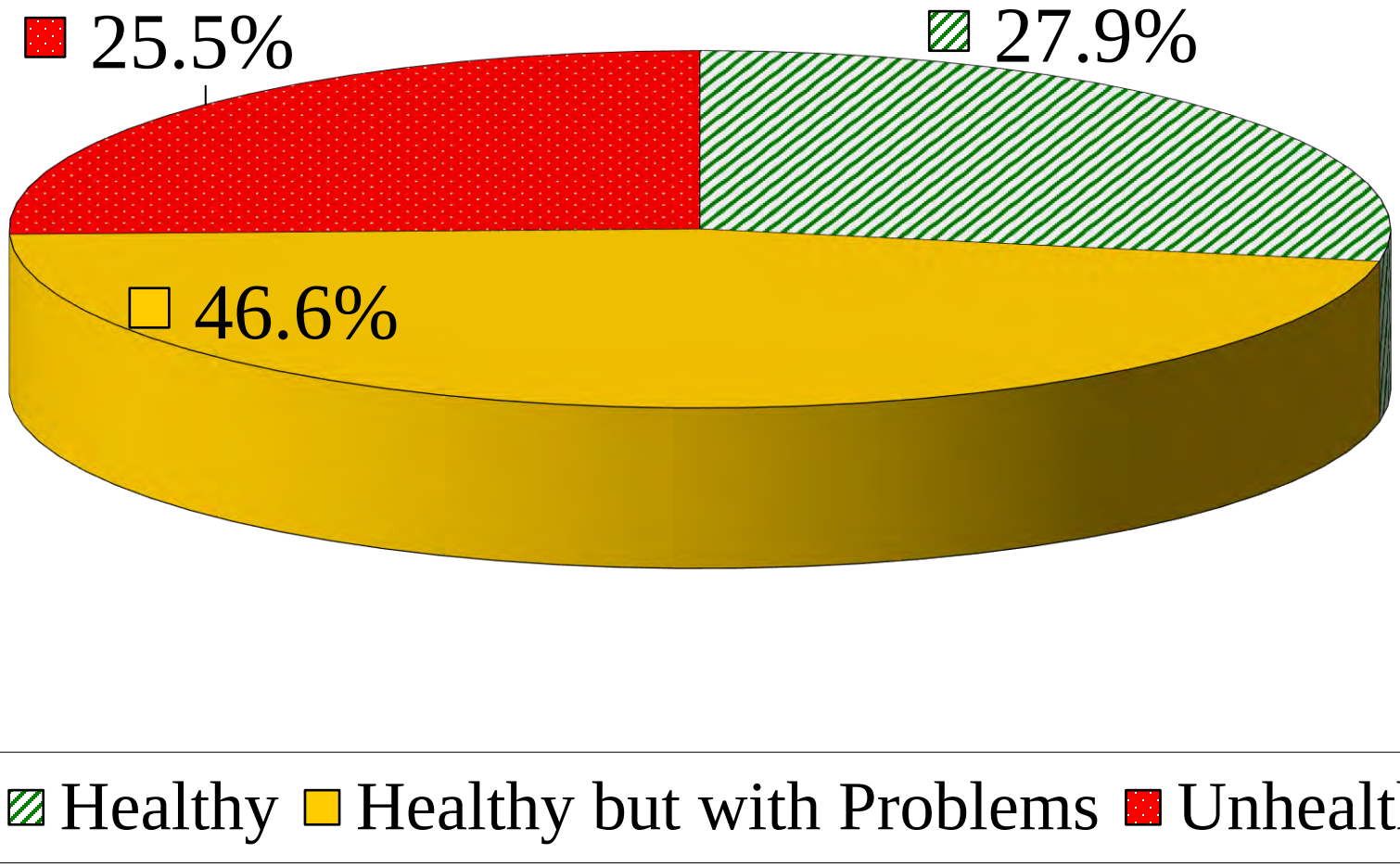

1990s


~2000

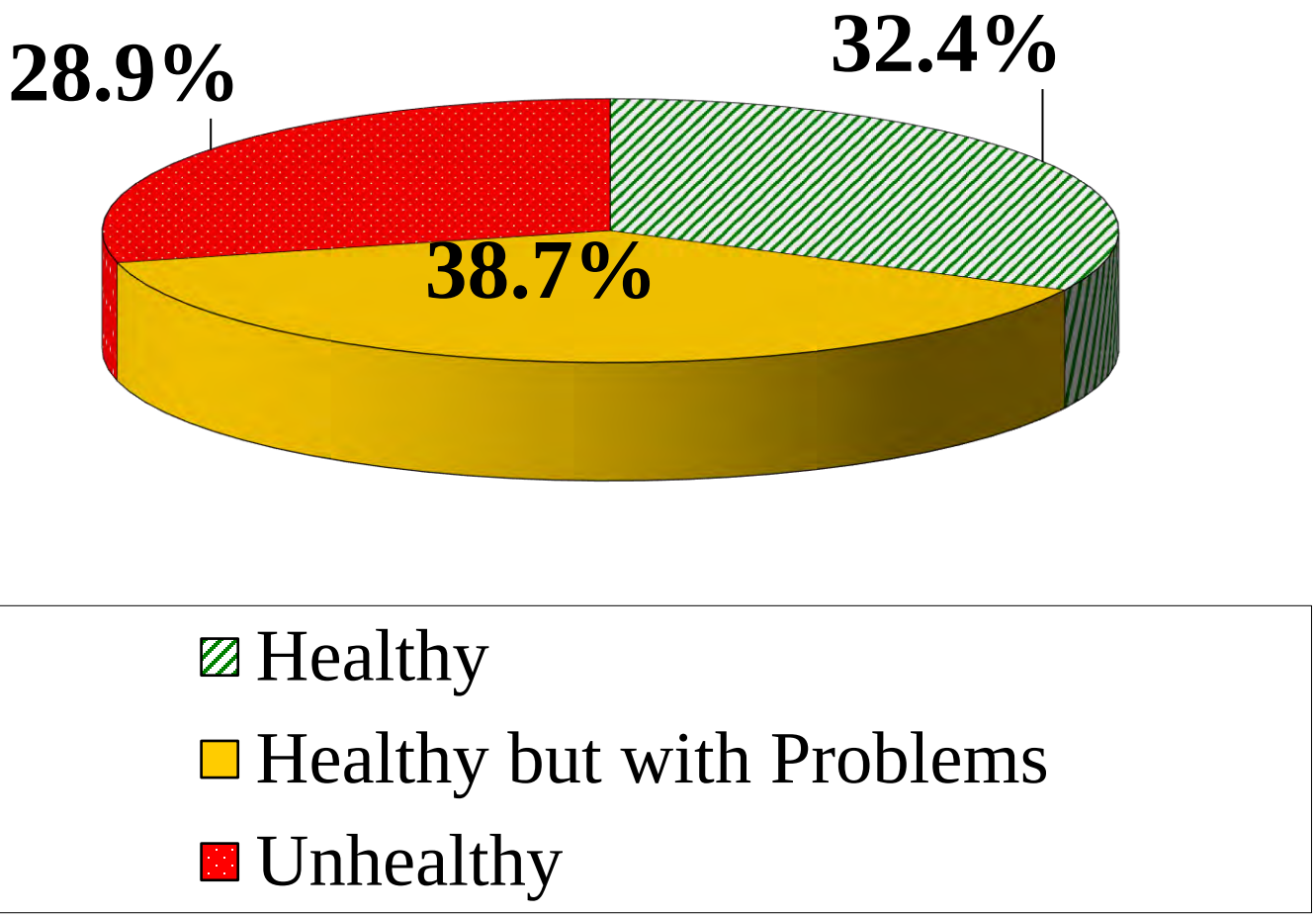

2012


2012

1996 - 2021 Provincial Summary of Riparian Health (n = 3168)



Lakes and Wetlands (n = 595)
1996-2021



Cows and Fish

RIPARIAN MANAGEMENT PRINCIPLES

- Balance demand with available resource
- Effective rest after use
- Avoid sensitive areas and vulnerable times during the year
- Distribute activity to other areas away from shoreline

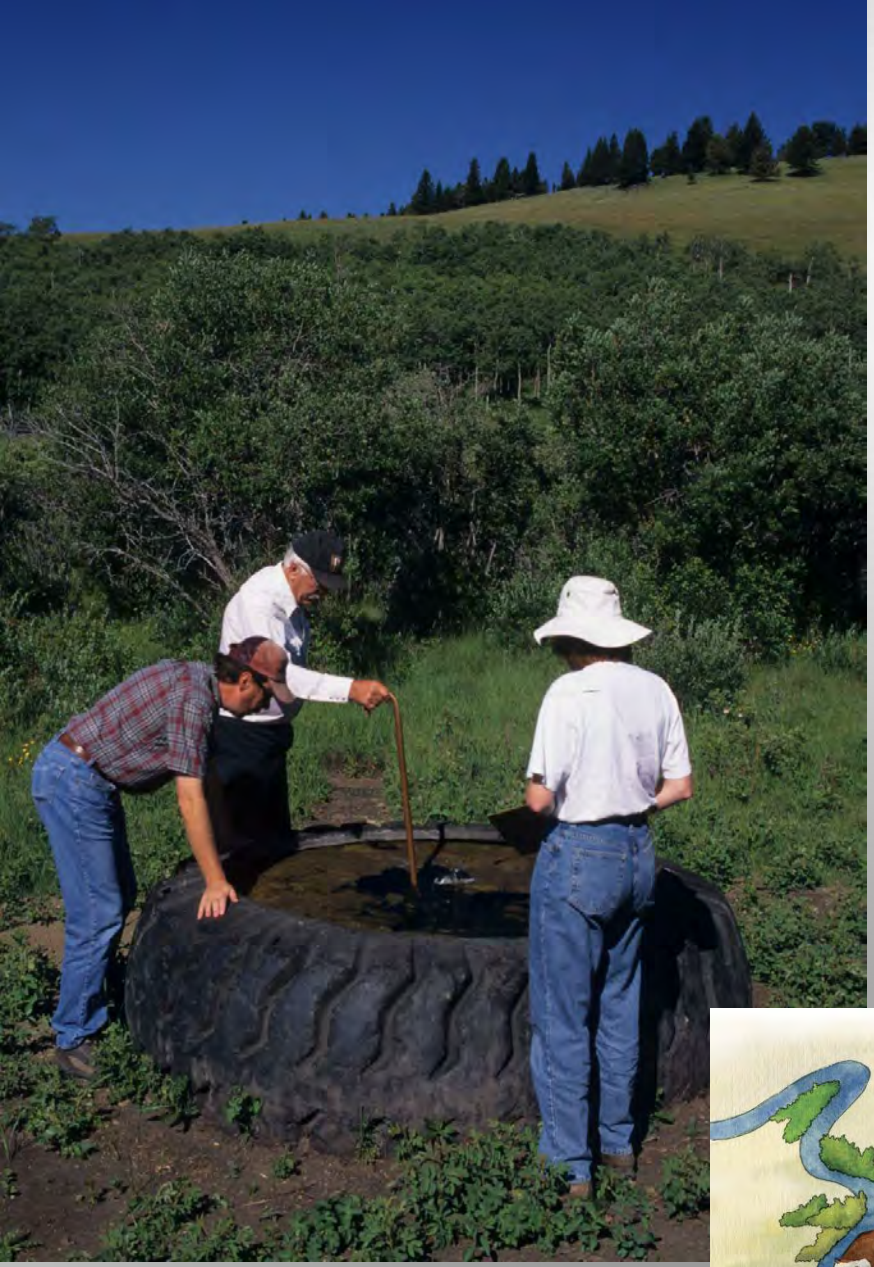
Don't stress it out

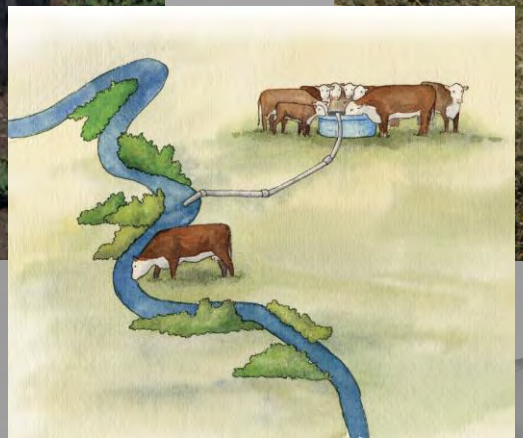
Give it a rest

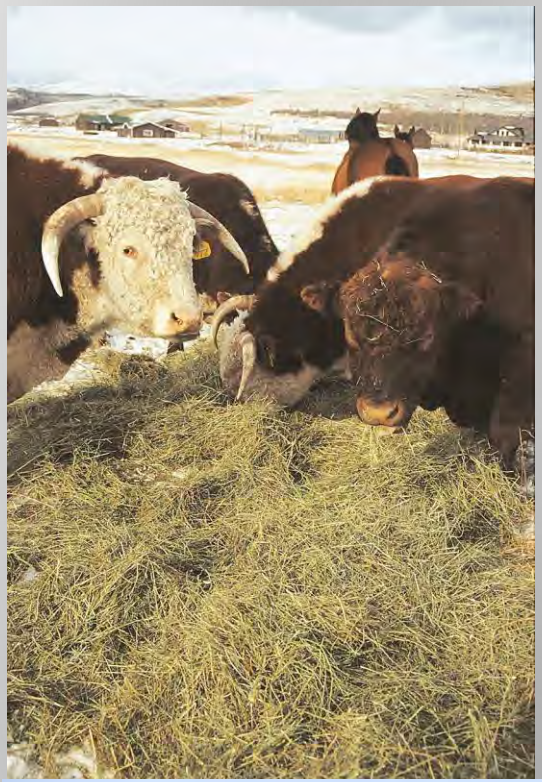
Plan ahead

Give it some space

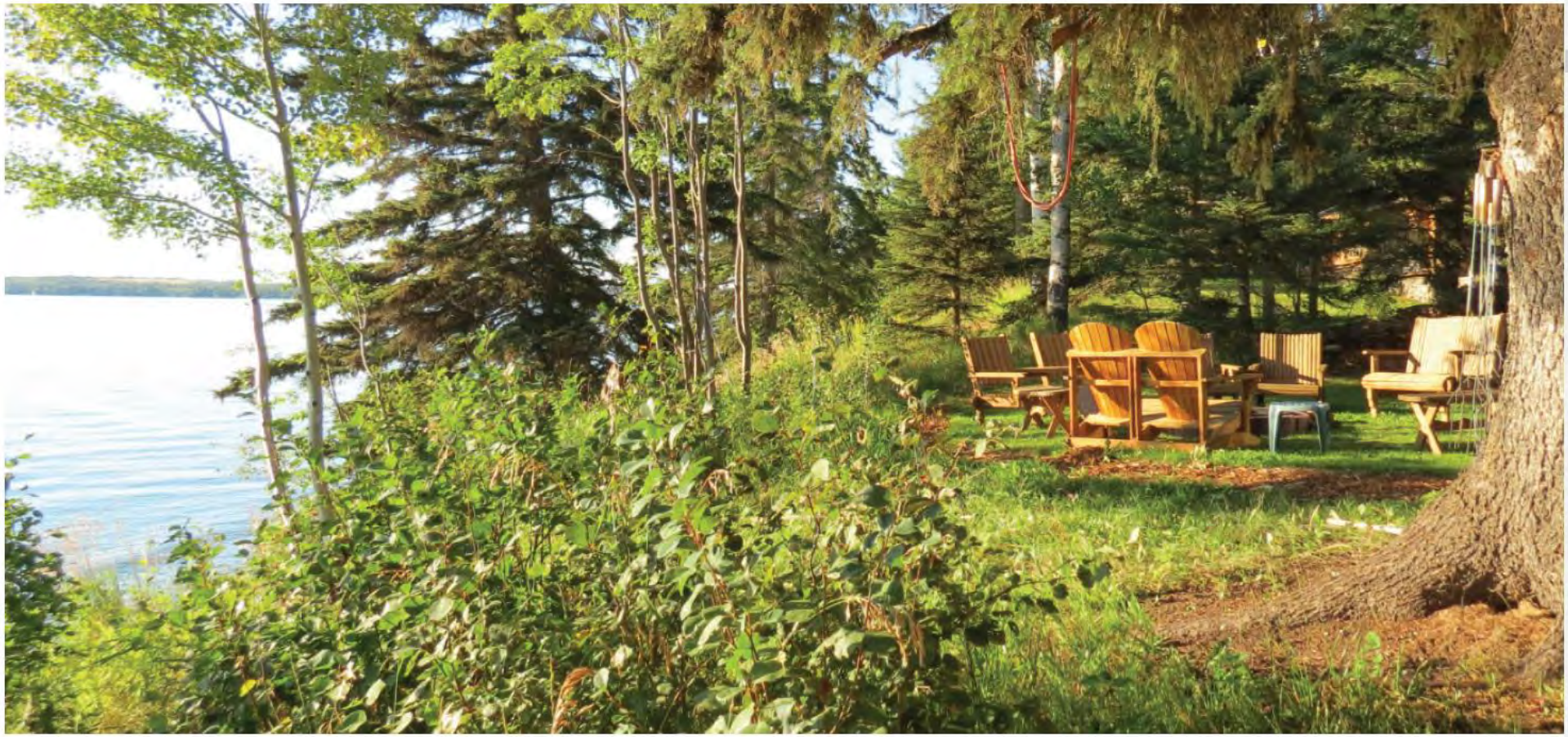
How to improve riparian function and health?







Leaving a riparian fringe – just say yes!



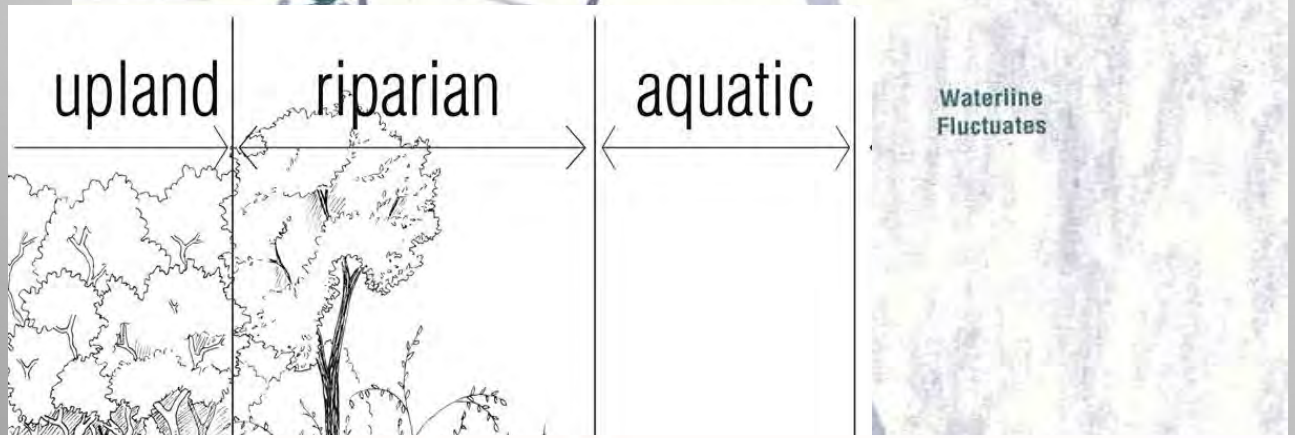
Slide imagery and text courtesy of Leta van Duin

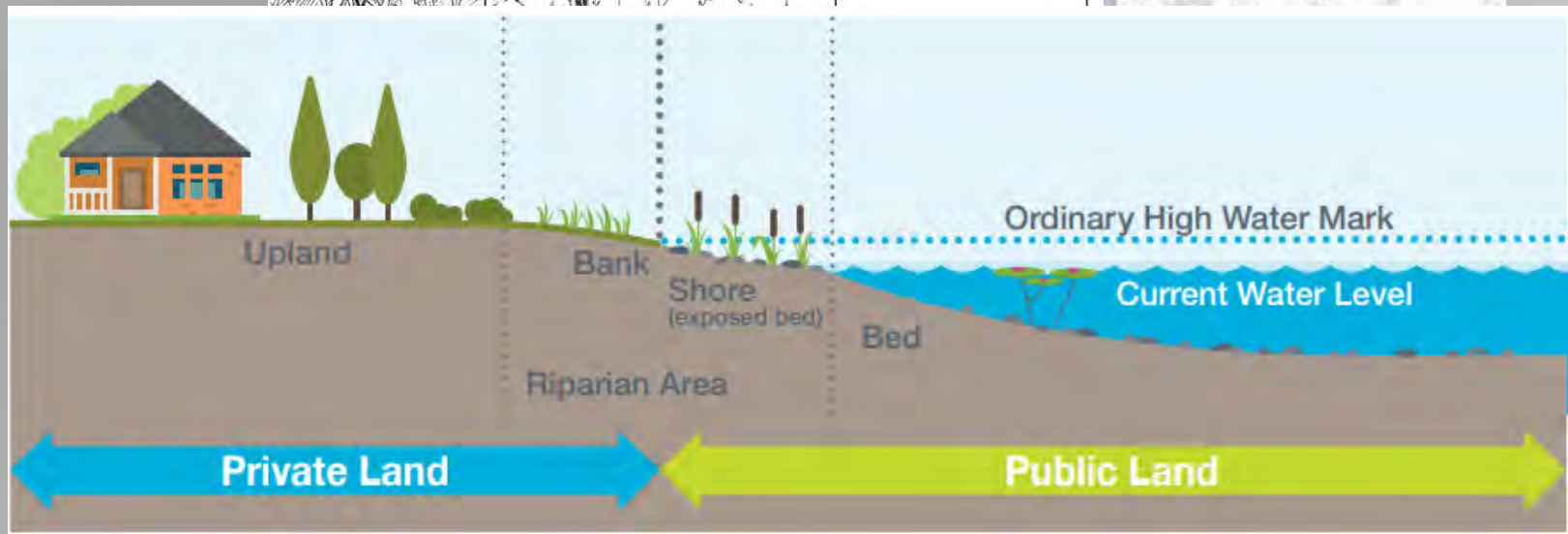
A FEW RIPARIAN MANAGEMENT STRATEGIES FOR RECREATION/ WATERFRONT PROPERTY

- No mow zone
- Let the emergent plants grow
- Minimal access to shore for docks and boat lifts
- Low impact uses directly on shoreline and in riparian area
- Prune for the view
- Plant native plants in yards and gardens and add deep binding roots to the shoreline and riparian area (bioengineering)
- More pervious / “soft” surfaces
- Less big rock and hardened structures
- Respect the Environmental Reserve
- Backlots matter too for Clean Runoff!

POLL
WHAT HAVE YOU TRIED/DONE ON YOUR WATERFRONT

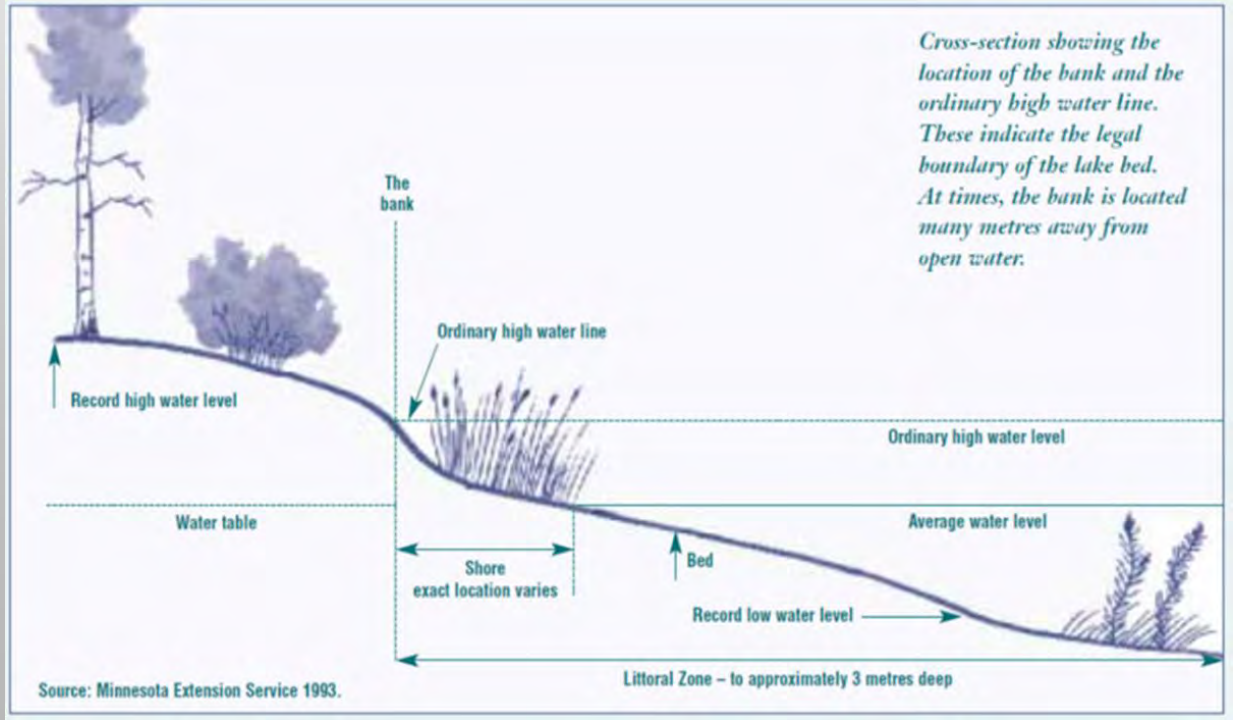
NEAR WATER PROPERTY OWNERSHIP BOUNDARIES MAY VARY WHICH MEANS NOT ALL SITUATIONS ARE EXACTLY THE SAME





WHAT YOU CAN DO WITHOUT AN APPROVAL

- NOTHING BELOW THE HIGH WATER MARK, ON THE BED AND SHORE OR THAT WILL DISTURB, ALTER OR CONTRIBUTE TO DEGRADATION OF THE LAKE, OR THAT GOES AGAINST FEDERAL, PROVINCIAL, MUNICIPAL REGULATIONS
- MANUALLY PICK UP DEAD ORGANIC MATERIAL WITHOUT DISTURBING GOOD VEGETATION. OTHER MEANS NEEDS AN APPROVAL.
- REMOVAL INVASIVE PLANTS – MUST BE SURE THEY ARE INVASIVE.
- PUT IN A SEASONAL PIER.



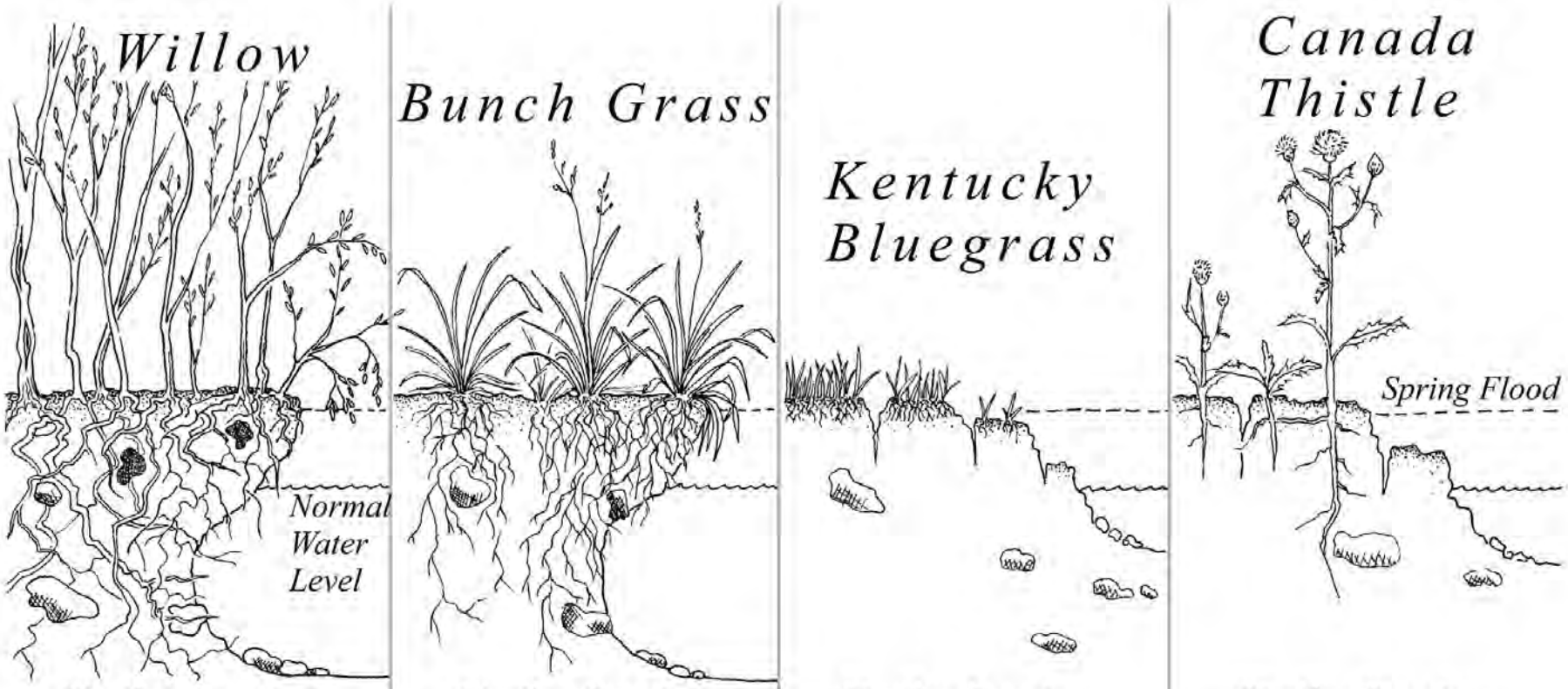
Slide modified from PLWA

WHAT APPROVALS MIGHT BE NEEDED FOR OTHER ACTIVITIES

If in doubt, ask before you start!

Keep it native

Native plants are best adapted to your lake and yard. They are low maintenance, reduce erosion and absorb runoff.



Similar Species:
- Silverberry
- Chokecherry
- Balsam Poplar
- Plains Cottonwood

Similar Species:
- Sedges
- Cattails
- Rushes
- Tufted Hairgrass

Similar Species:
- Plantain
- Dandelion
- Timothy
- Smooth Brome

Similar Species:
- Knapweeds
- Leafy Spurge
- Scentless Chamomile
- Dalmation Toadflax

In this example, willow and bunch grasses provide a deep binding root mass, while Kentucky Bluegrass and Canada Thistle do not.

EMERGENT / AQUATIC SPECIES

Native sedges:
awned sedge (*Carex atherodes*)
small bottle sedge (*Carex utriculata*)
water sedge (*Carex aquatilis*)
woolly sedge (*Carex lanuginosa*)

Native rushes:
creeping spike-rush (*Eleocharis palustris*)
small-fruited bulrush (*Scirpus microcarpus*)
great bulrush (*Scirpus validus / S. acutus*)
wire rush (*Juncus balticus*)

Native grasses:
common tall manna grass (*Glyceria grandis*)

Other:
Common cattail (*Typha latifolia*)

MOIST SITE SPECIES
(High water table / flood prone zone)

Native trees:
balsam poplar (*Populus balsamifera*)

Native willows:
beaked willow (*Salix bebbiana*)
basket / meadow willow (*Salix petiolaris*)
false mountain willow (*Salix pseudomonticola*)
flat-leaved willow (*Salix planifolia*)
sandbar willow (*Salix exigua*)
shining willow (*Salix lucida*) = Pacific willow (*Salix lasiandra*)
yellow willow (*Salix lutea*)

Other native shrubs:
red-osier dogwood (*Cornus stolonifera*)
river alder (*Alnus tenuifolia*)
water birch (*Betula occidentalis*)

Native grasses
Bluejoint (*Calamagrostis canadensis*)
fowl bluegrass (*Poa palustris*)
northern reed grass (*Calamagrostis inexpansa*)
slough grass (*Beckmannia syzigachne*)
tufted hair grass (*Deschampsia cespitosa*)
western wheat grass (*Agropyron smithii*)

DRY SITE SPECIES
(South aspect / steep bank)

Native trees:
balsam poplar (*Populus balsamifera*)
aspen (*Populus tremuloides*)

Native shrubs:

Tall shrubs
choke cherry (*Prunus virginiana*)
pin cherry (*Prunus pensylvanica*)
saskatoon (*Amelanchier alnifolia*)
silverberry (*Elaeagnus commutata*)

Medium height shrubs
common wild rose (*Rosa woodsii*)
northern gooseberry (*Ribes oxyacanthoides*)
wild red raspberry (*Rubus idaeus*)

Short shrubs
buckbrush / snowberry (*Symphoricarpos occidentalis*)
shrubby cinquefoil (*Potentilla fruticosa*)

Native grasses:
green needle grass (*Stipa viridula*)
western wheat grass (*Agropyron smithii*)

* To choose plants that are best suited to your site, a field assessment of local conditions is strongly recommended. For assistance contact Cows and Fish (www.cowsandfish.org).

POLL

- NAME THIS PLANT
- HOW DOES IT GROW

PLANTS TO RECOGNIZE & KEEP
EMERGENT PLANTS

PLANTS TO RECOGNIZE & KEEP NON-WOODY

PLANTS TO RECOGNIZE & KEEP WOODY

NATIVE SHRUBS – FRIENDLY TO AGGRESSIVE

Gooseberry
Ribes oxyacanthoides

Red Osier Dogwood
Cornus sericea

Saskatoons
Amelanchier alnifolia

Golden Currant
Ribes aureum

Buckbrush
Symphoricarpos occidentalis

Snowberry
Symphoricarpos albus

Raspberry family Natives, e.g.:
Rubus idaeus
Rubus parviflorus
Rubus pedatus

Wild Rose/ Wood's Rose
Rosa acicularis/ woodsii

Coyote Willow
Salix exigua

Sandbar Willow
Salix interior

Sea Buckthorn
Hippophae rhamnoides

alidp.org

INVASIVE PLANTS TO RECOGNIZE & AVOID

Noxious

INVASIVE PLANTS TO RECOGNIZE & AVOID

Flowering Rush (*Butomus umbellatus*)

Prohibited Noxious

Photo credit: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

INVASIVE PLANTS TO RECOGNIZE, AVOID & REMOVE

Himalyan balsam

Prohibited Noxious

Province of Alberta

WEED CONTROL ACT

Noxious weeds — **control**

A person shall control a noxious weed that is on land the person owns or occupies.

Prohibited noxious weeds — **destroy**

A person shall destroy a prohibited noxious weed that is on land the person owns or occupies.

ALBERTA invasive species COUNCIL

HTTPS://ABINVASIVES.CA

Try it high and dry

Create a "dry land" beach above the high water mark.

Leave it in its place

Natural vegetation such as fallen trees, washed up logs, rooted trees, shrubs, grasses, wild-flowers, cattails and bulrushes create homes for fish, birds and other wildlife.

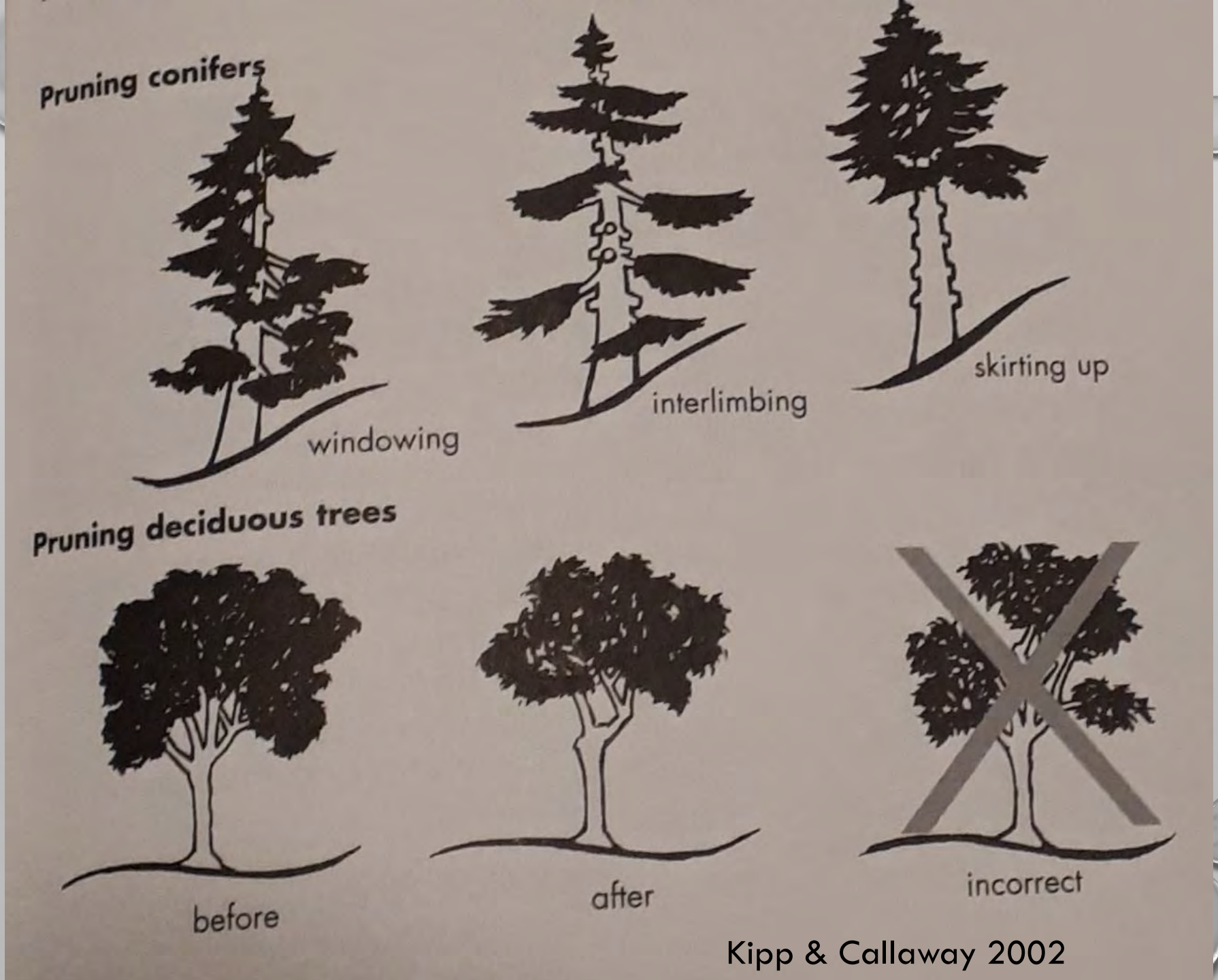
Most shores have fine soils like sand or silt. Leaving shorelines as they are can decrease sediments in the water & save money.

Kipp & Callaway 2002

3. Prune Trees to Open Views

Mature trees help maintain your property and increase its value. They help reduce runoff by breaking the eroding force of rainfall. They shade the ground, helping to retain moisture, and they shade the water, keeping it cool and providing habitat for fish and other wildlife. Trees along bluff crests and shoreline edges stabilize the soil. They also provide you with privacy, shade and wind protection.

Trees can be removed in minutes, but often require a lifetime to replace. Before you cut



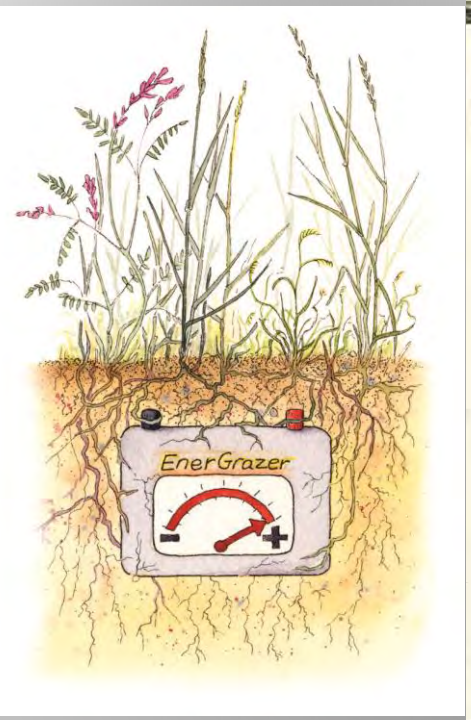
Kipp & Callaway 2002

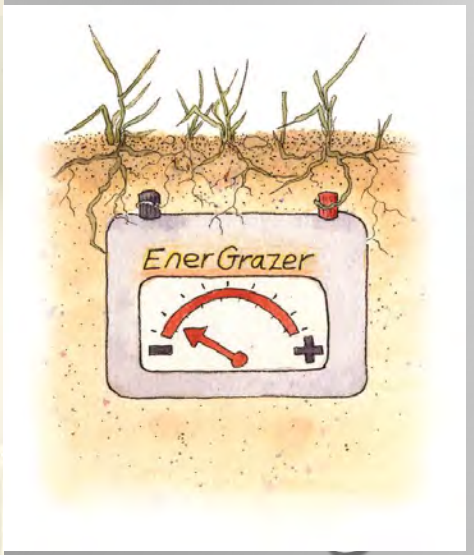
EMBRACE THE MESSINESS

2015

2019

NARROW THE PATH/NO-MOW


EnerGrazer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TAKE ADVANTAGE OF ROOTED MATERIAL - BIOENGINEERING

Bioengineered gathering space
(City of Calgary Bioengineering Demonstration and Education Project)

Bioengineering can be defined as:
"an approach incorporating living and non-living plant materials, in combination with natural and synthetic support materials for slope stabilization, erosion reduction, and vegetation establishment."

THE UNITED STATES DEPARTMENT OF AGRICULTURE, PART 654, NATIONAL **ENGINEERING HANDBOOK, "STREAM RESTORATION DESIGN", AUGUST 2007.**

TAKE ADVANTAGE OF ROOTED MATERIAL - BIOENGINEERING

Living Crib Wall for Bank Protection
(City of Calgary Bioengineering Demonstration and Education Project)

TAKE ADVANTAGE OF ROOTED MATERIAL - BIOENGINEERING

Cross section drawing of vegetated riprap for bank protection

Example methods for combining rock and woody vegetation

- Live staking (joint planting)
- Willow bundles
- Bent poles
- Brush layering and poles

Vegetated Riprap, Vegetated Riprap Applications ~ Innovative Techniques (terraerosion.com)

https://dirttime.tv/wp-content/uploads/2018/04/Vegetated-Riprap.pdf

TAKE ADVANTAGE OF ROOTED MATERIAL - BIOENGINEERING

Wattle Fence for Bank Protection

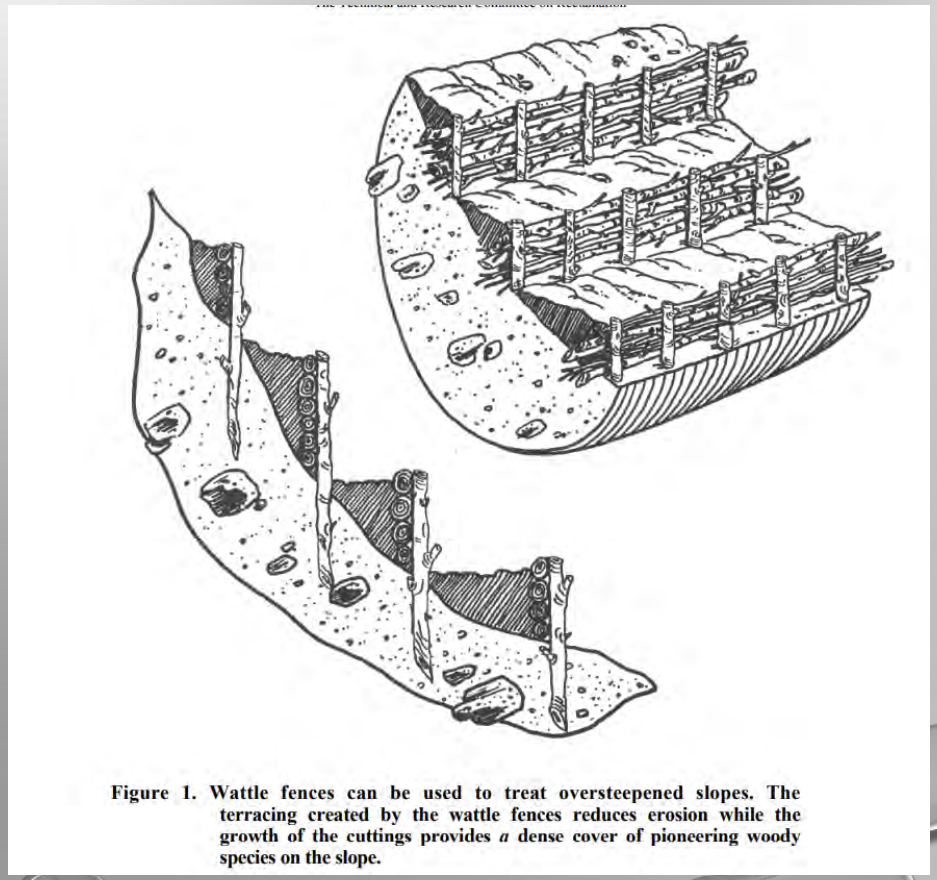


Figure 1. Wattle fences can be used to treat oversteepened slopes. The terracing created by the wattle fences reduces erosion while the growth of the cuttings provides *a* dense cover of pioneering woody species on the slope.

http://chapter.ser.org/westerncanada/files/2015/01/2002-polster.pdf

WATERFRONT IMPROVEMENT PROJECT EXAMPLE

Waterfront Improvement Project example

and Cows & Fish / ALIDP
Street2Stream
Demonstration Site

PLANTING PLAN

Prepared by: Leta van Duin
leta@alidp.org 403.242.3912
REV 0. Sept. 7, 2016

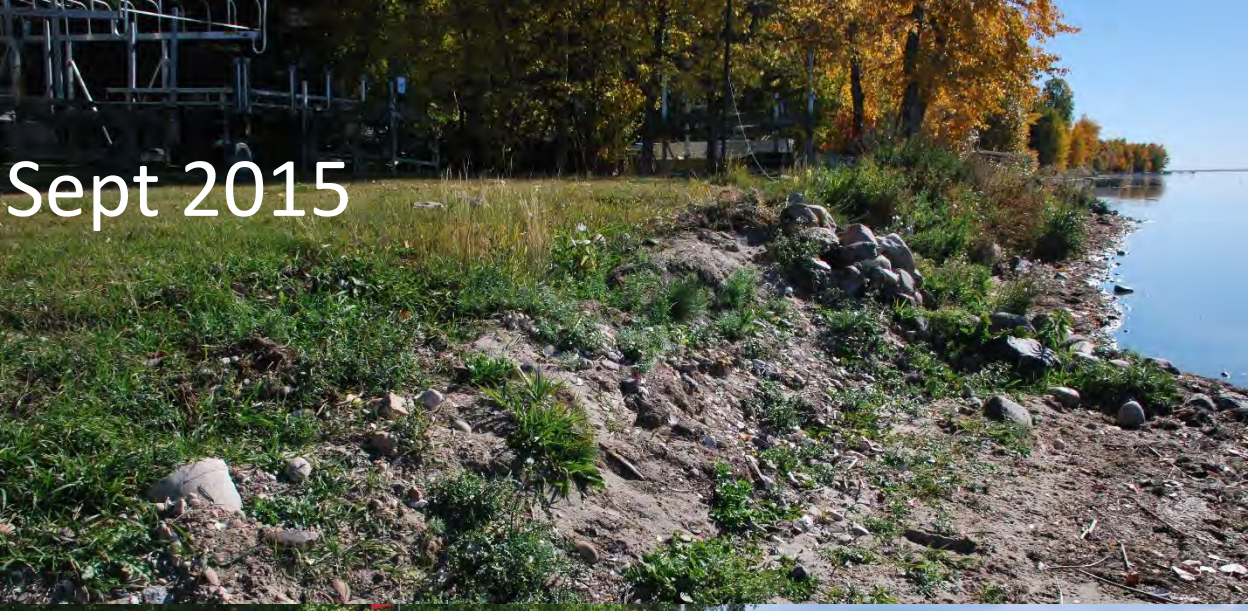
2015 yard

-Lawn grass

2016 yard

-Native plant bed (forbs & shrubs)

-Hemp matting, native grass seed mix



<u>2015 shoreline</u>

-bare soil

-invasive plants

-few native species

-high disturbance

<u>2016 shoreline</u>

-less disturbance

-invasive plant removal (ongoing)

-native species responded

-willow stakes/ fascines

2021horeline

-less disturbance

-invasive plant removal (ongoing)

-native plant species responded (plus beaver)

-willow stakes limited success

-fascines moderate success

2018 Riparian Health Score 41%

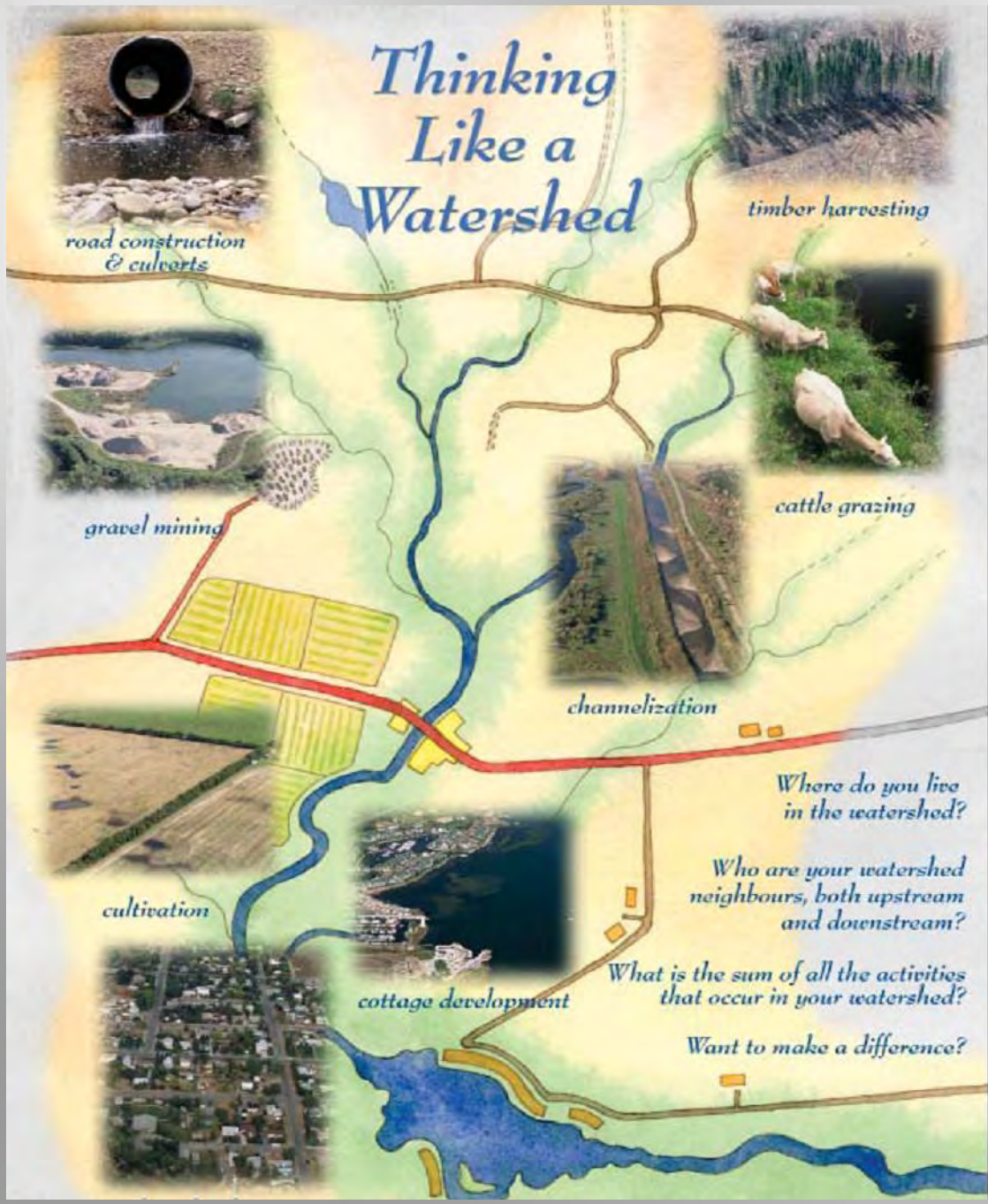
WATERFRONT AND RIPARIAN REHABILITATION LESSONS TO SHARE

- A diversity of partners makes for a communications challenge sometimes but if they are the right partners the end result is a better product so stick with it
- Invasive plant/Weed management needs to happen sooner than later and needs to be on-going
- Having baseline riparian health data helps guide a project and serves as a point in time to measure progress from
- Restoration/Repairing is more difficult, more costly than minimising impacts from the start
- Know the rules and regulations before you start– If you don't know, ask!
- If you build it, they will come – be prepared
- Recovery takes time

(often more than a few years)

WATERFRONT AND RIPARIAN REHABILITATION LESSONS TO SHARE

- No matter where you live, you are part of a watershed
- Activities away from the water can impact the water
- Everything is connected



Protecting Shorelines & Streambanks - *Naturally!*

The streambank or lakeshore you stand on
and water-worked materials: silt, sand, clay,
What holds shores and banks together and
continuously moving? The riparian areas of
are glued together by a diversity of plants w
root systems. Substantial reinforcement is
trees and shrubs.

Riparian areas are the green zones around
emerald threads of water-loving vegetation t
and the lush fringe in valleys. They are the
transition zones that divide uplands from wa

Looking at my Lakeshore
riparian health checklist

Sheet

Riparian Areas

Riparian areas are moist areas of water-loving plants that border a lake, wetland, stream or river. They are very important ecologically, socially and economically. A healthy riparian area helps reduce bank and shoreline erosion, trap sediments, filter pollutants, improve water quality and provide forage and fish and wildlife habitat. Riparian areas can be part of your property, part of the shoreline and within environmental and municipal reserves.

How do you know if your riparian area is healthy? Take a look at the photos at the right. Does your riparian area look like one of these or does it lie somewhere in between? To
f the riparian area on
the checklist below:

Which best resembles your riparian area? A or B or somewhere in between?

Growing Restoration
Natural Fixes to Fortify Streambanks

Planning on restoring an eroding bank or other area?

Success of any restoration project often depends on the right tools and the right material. In soil bioengineering treatments for streambank stabilization, the right material is generally the kind of live plant material that is found locally. These trees and shrubs will

Lakeshore Riparian Health CHECKLIST

the eleven questions below to find out how healthy your lakeshore is. If you are unsure
n answer, leave it blank.

85% or more of the riparian area is covered with vegetation (of any kind)	Yes ☐	No ☐
More that 50% of the riparian plants are as tall as your knees.	Yes ☐	No ☐
Cattails or bulrushes are growing in the riparian area	☐	☐

Riparian Health Assessment
for Lakes, Sloughs and Wetlands

GREEN ZONE

CARING FOR THE

Riparian Health Assessment
for Streams & Small Rivers

April 2020

Field Workbook

CARING FOR THE GREEN ZONE

Riparian Areas

A User's Guide to Health

Cows and Fish

RESOURCES AVAILABLE TO YOU

- PRESENTATIONS, WORKSHOPS, FIELD DAYS
- ONE-ON-ONE VISITS
- GROUP VISITS
- LITERATURE AND INFORMATION
- YOUTH EDUCATION
- RIPARIAN HEALTH INVENTORY AND ASSESSMENT
- FACILITATE COMMUNITY PROCESS
- PARTNERSHIPS AND NETWORKING

www.cowsandfish.org

THANK YOU!

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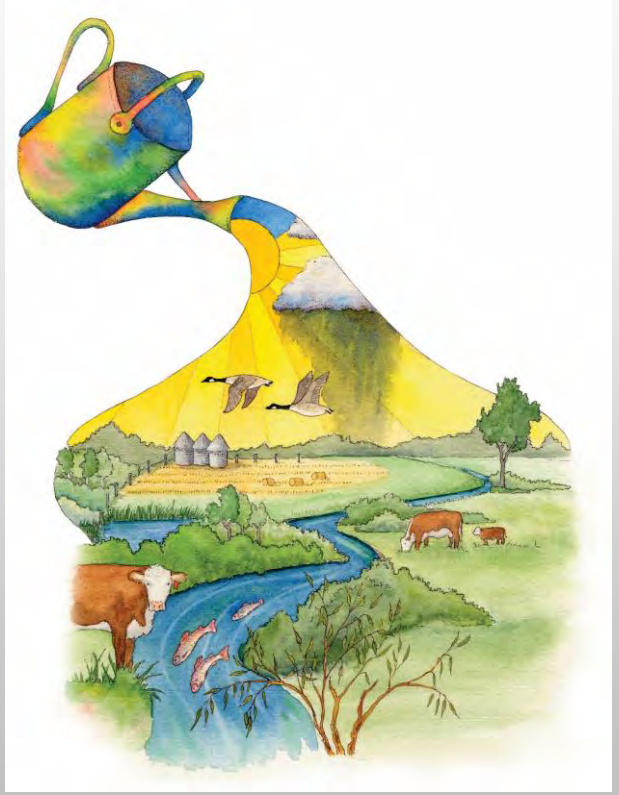

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