

Protect the Best and Restore the Rest:

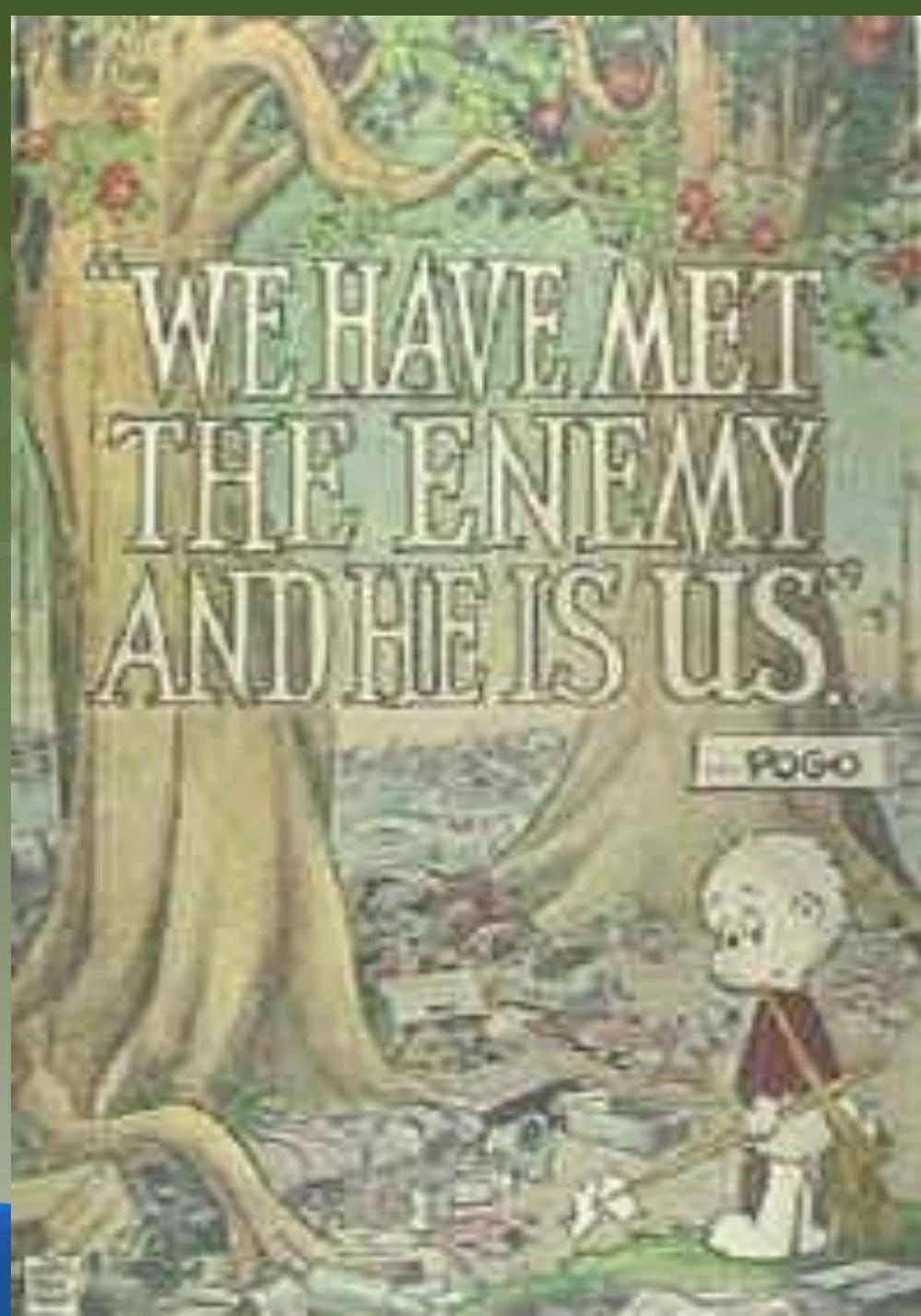
The Value of Rebuilding Watershed
Resilience

Jack Imhof, National Biologist
Trout Unlimited Canada

Presentation Outline

- The Challenge and Apparent Conflict
- Watersheds as Natural Infrastructure
- The Role of Context and Application of Context
- Understanding the Watershed
- Rehabilitation Imperative – Protecting is not enough
- Summary

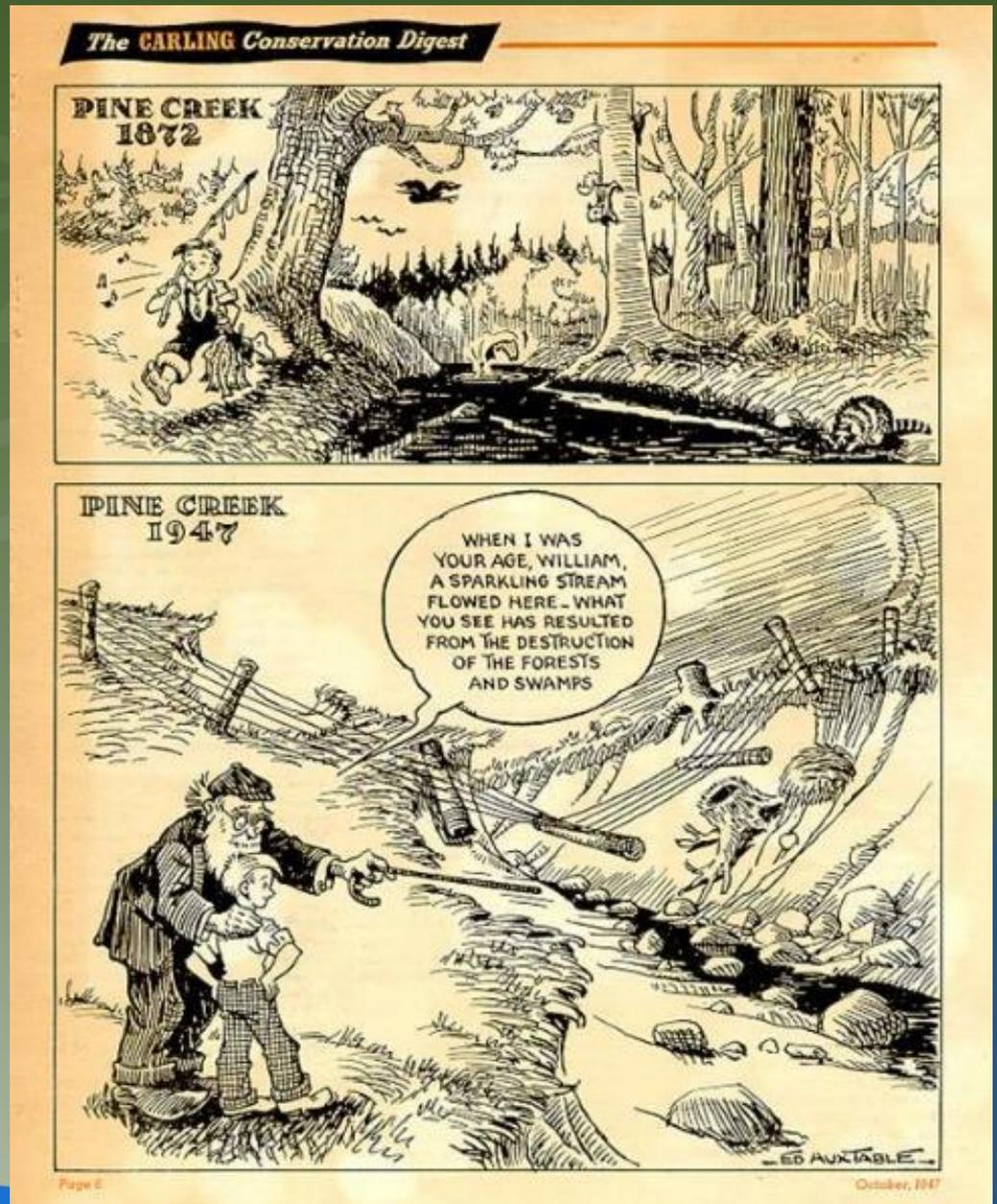
The Challenge...



Who says we
don't know any
better?

What do we
need to know to
move forward?

(Carling Conservation Digest –
October 1947)



The effort to control the health of land has not been very successful. It is now generally understood that when soil loses fertility, or washes away faster than it forms, and when water systems exhibit abnormal floods and shortages, the land is sick.

Aldo Leopold, 1949, Sand County Almanac

The Apparent Conflict

- Managing watersheds, water and watercourses on the landscape is necessary for production of food, recreation, livestock, industry and water supplies
- Is there a value for land and water not in active use... often termed “Wasteland”?
- Are not our watersheds, rivers and streams our “Natural Infrastructure”?!



Value of Natural Infrastructure

- Values:

- Water storage, supply and management
- Cleansing of water and health of the land
- Recreation and food sources
- Habitat for living things
- Spiritual and Physical Well-being

- Conditions to strive for:

- Better management of water in and on the landscape
- Stream competence : move water and sediment while maintaining its form
- Low maintenance costs and sustainable
- Healthy riparian areas and floodplains
- Safer and more sustainable human environ
- Healthy physical habitat for animals
(maintain healthy food web)



What Is A Watershed?

A Watershed is the area drained by a specific river system.

It includes both the land and water drained by the river and lake systems and in many cases includes the shallow groundwater table as well.

This is the NATURAL INFRASTRUCTURE that provides us with clean water, clean air, a healthy living environment and wholesome food





Geology provides the rock and structure



Climate creates the weather, weathering and water



Vegetation modifies water flow over and through the watershed



The valley directs and concentrates surface and groundwater



The Linkages between Geology and Ecological Processes

The Role of Geology

- Conditions the potential for movement of water over and through the watershed
- Conditions the chemical make-up of the water
- Conditions the potential for soil and sediments
- Conditions the potential various aquatic communities
- Creates opportunities for various animals and plants

Regimes Driven by Geology and Climate

- The interaction of geology and climate drive several major regimes and characteristics of watersheds:
 - Flow regime (surface water and groundwater)
 - Sediment regime
 - Temperature regime
 - Chemical regime (potential productivity, water quality and assimilative capacity)
 - Channel form and habitat characteristics and supply

Need

- We need to create contextual planning and management approaches and tools linked to an understanding of:
 - Form and Function;
 - Cause:Effect, Cause:Response relationships
 - Consequences of various management outcomes (which trajectory do we want?)
 - The full breadth of what is possible through various management options
- This requires inter-disciplinary approaches in order to create an integrative system



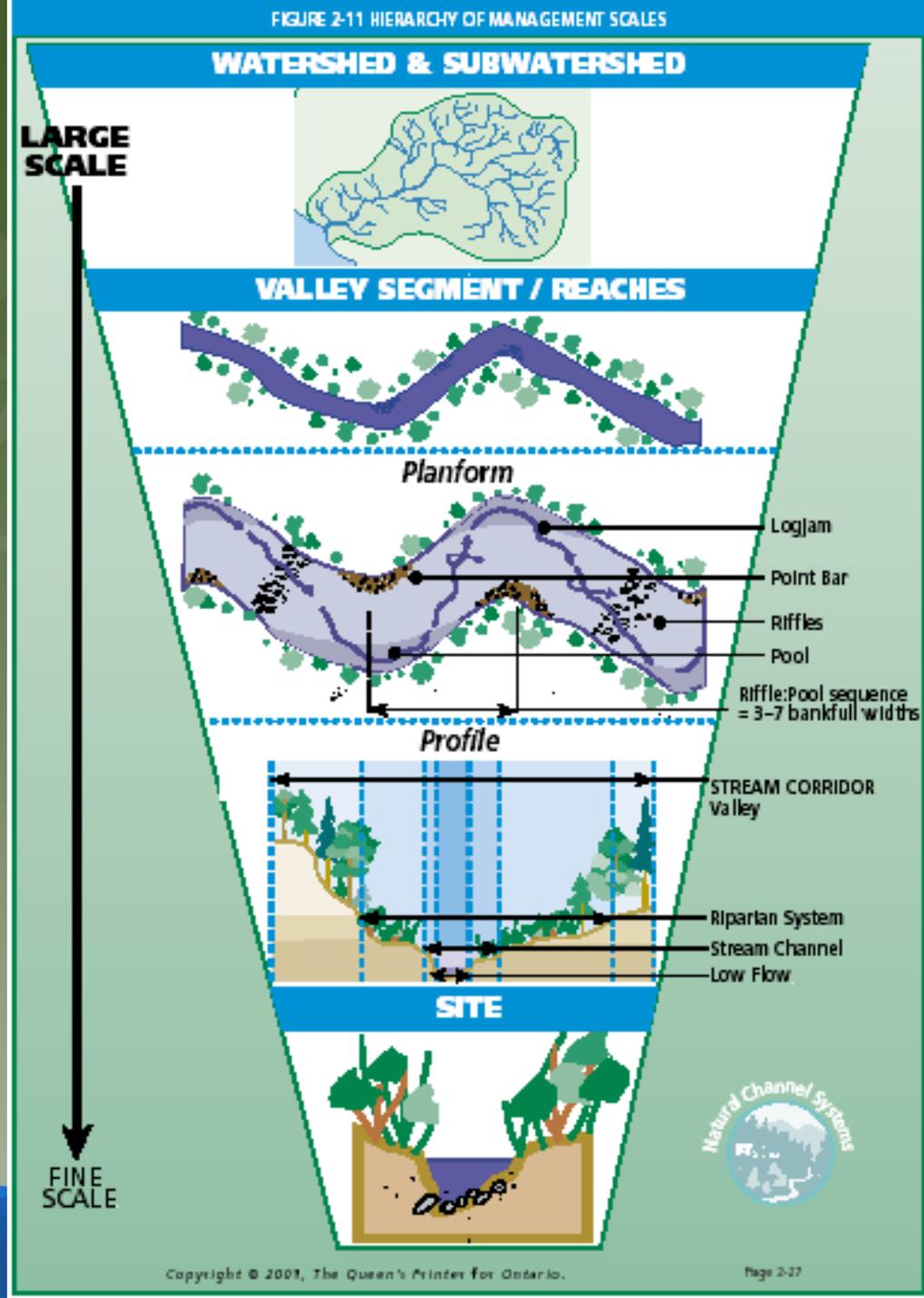
Integrating What?

- Integrating the processes
 - *Defining the technical and analytical approaches to linking the science*
 - *Creating Enabling Policies and Legislation*
- Integrating the disciplines and mandates
 - *Creating a common scientific and policy view*
 - *Creating institutional arrangements and a common vision*
- Integrating our view of the watershed
 - *Social learning*
 - *Community engagement and leadership*
 - *Integrating jurisdictional responsibilities*
 - *Integrated and complementary policies and programs*



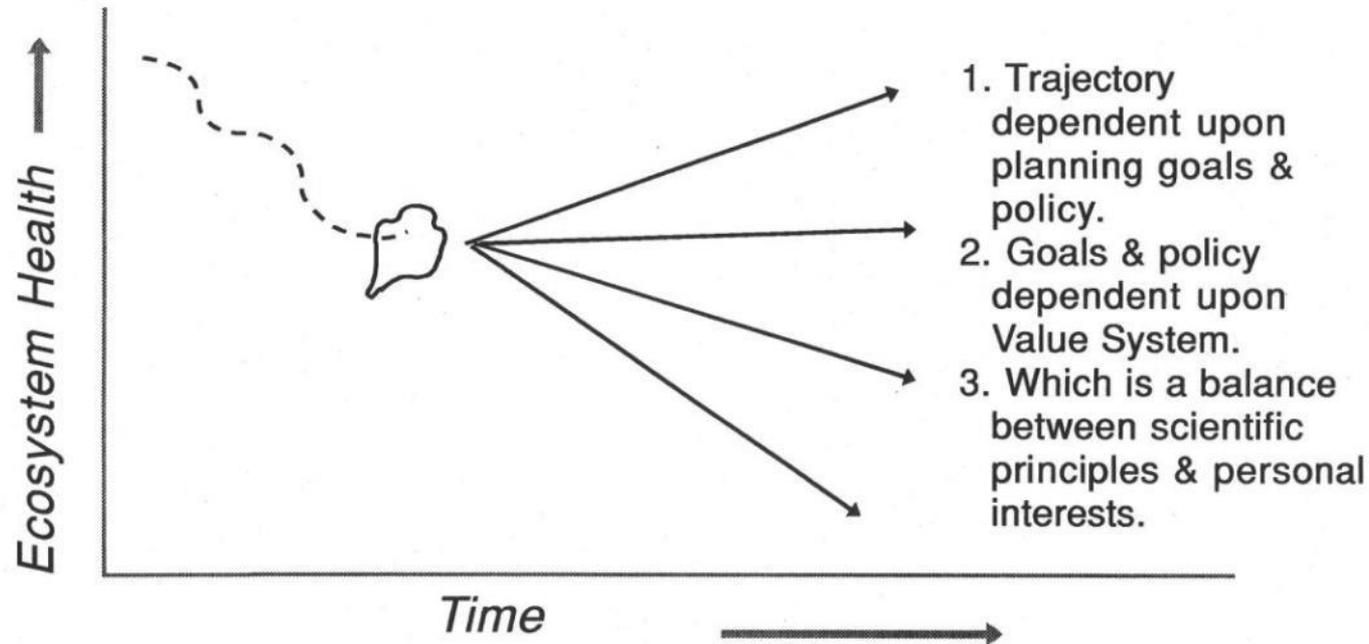
Building Context

- Which end of the telescope should you be using?
- If we only fix what we perceive to be the problem at the site, we may NOT really fix ANYTHING
- What is the cause of the problem?



Where Do We Want To Go?

TRAJECTORY OF ECOSYSTEM HEALTH VS TIME



Ecosystem Unit –



Historical trajectory based upon previous goals and policies –



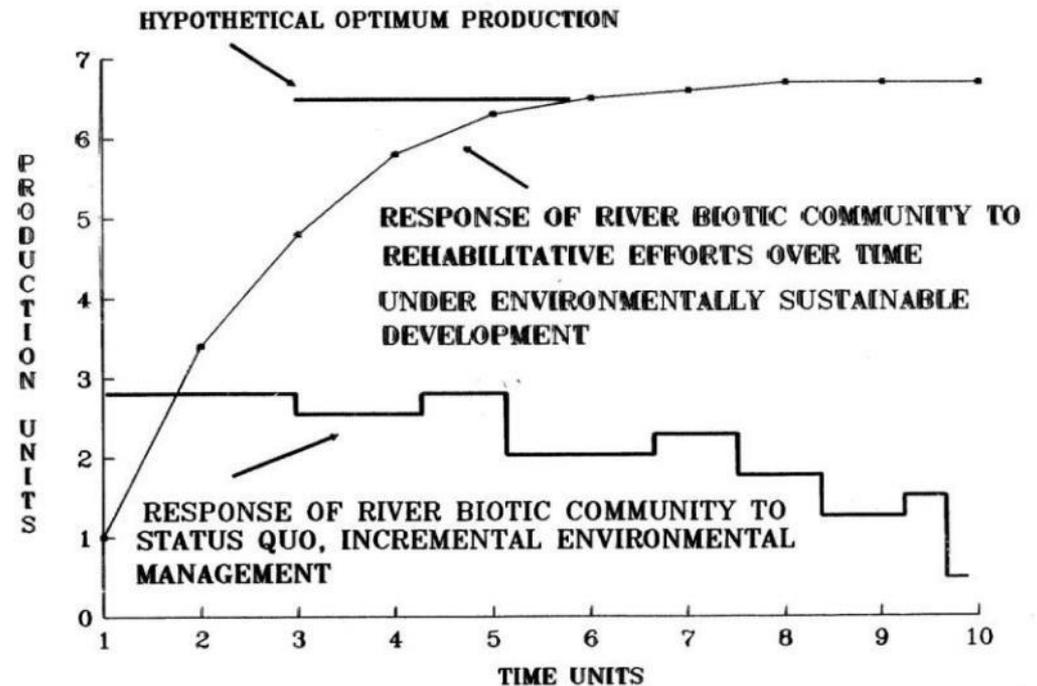
Possible future trajectories –



Managing through regulation whatever baseline you sit on will NOT protect you in the long-run. Regulation in planning and management is considered the last tool, not the only tool.

Conservation Authorities are in a unique position to create management context and work with Municipalities to rebuild resilience in the local watershed

HYPOTHETICAL PRODUCTION RESPONSE CURVE AS VARIOUS DEVELOPMENT PROJECTS OCCUR



How do we affect our Water?

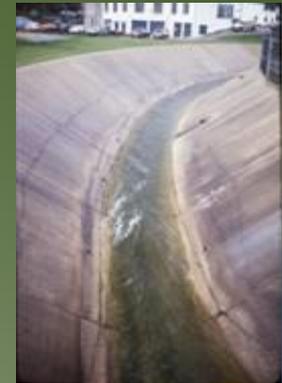
Poor landuse practices can lead to abuse of the watershed and damage to the quality of land, water and our local environment.



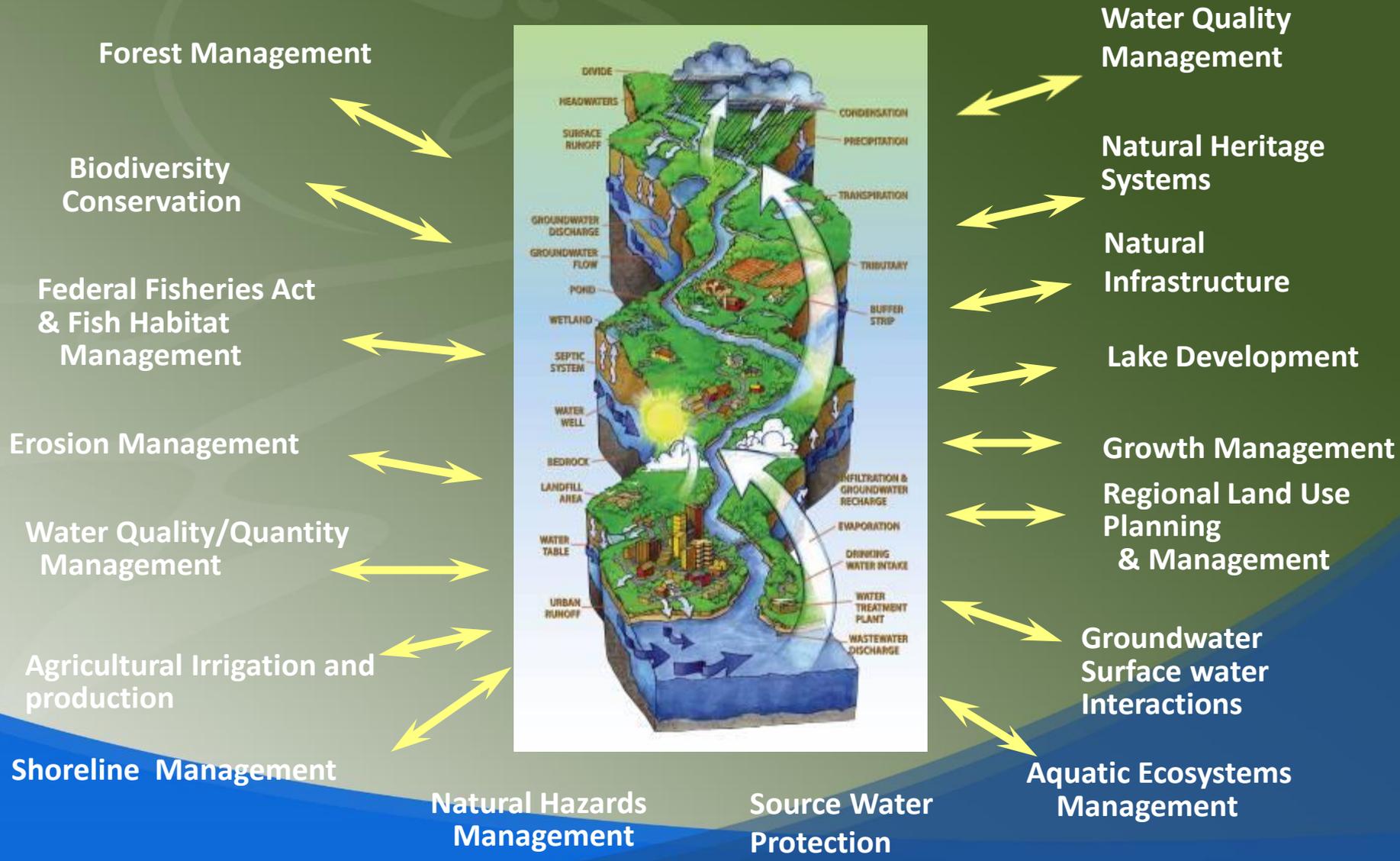
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Integrated Watershed Management informs Everything



Landuse Impacts and Climate Change

- There is a need for many strategies
- Regulation is ONLY ONE TOOL it is often considered the LAST recourse, not the only recourse in environmental management.
- Flood management and mitigation are only two tools and NOT ENOUGH
- Climate change will exacerbate extremes, frequency and intensity of major issues such as drought and flooding
- The key is to rebuild RESILIENCY within a watershed to be able to cope with greater variability and to heal some of our impacts.
- We need to protect what is working and work to restore as much function as possible

Restoration vs. Rehabilitation

Restoration

- Returning an ecosystem to its original (pre-settlement) condition and function

Rehabilitation

- Modification of an existing ecosystem to restore healthy function and dynamic stability



Protect the Best and Restore and Rehabilitate the Rest

- We are not saving the planet...we are trying to save ourselves!
- We need to restore or rehabilitate our natural infra-structure
- We all need clean water, clean air and wholesome food
- Clean water and wholesome food come from a healthy functioning landscape!



We can and Should Repair our Natural Infrastructure

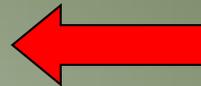
Rehabilitation is a tool

- Modification of an existing, degraded ecosystem to restore healthy function and dynamic stability
- CAs are the only remaining organization with the context to do this. If they don't who will?





Stream Rehabilitation takes time and perseverance.
Belgrave Creek 1979, 80, 81, 01



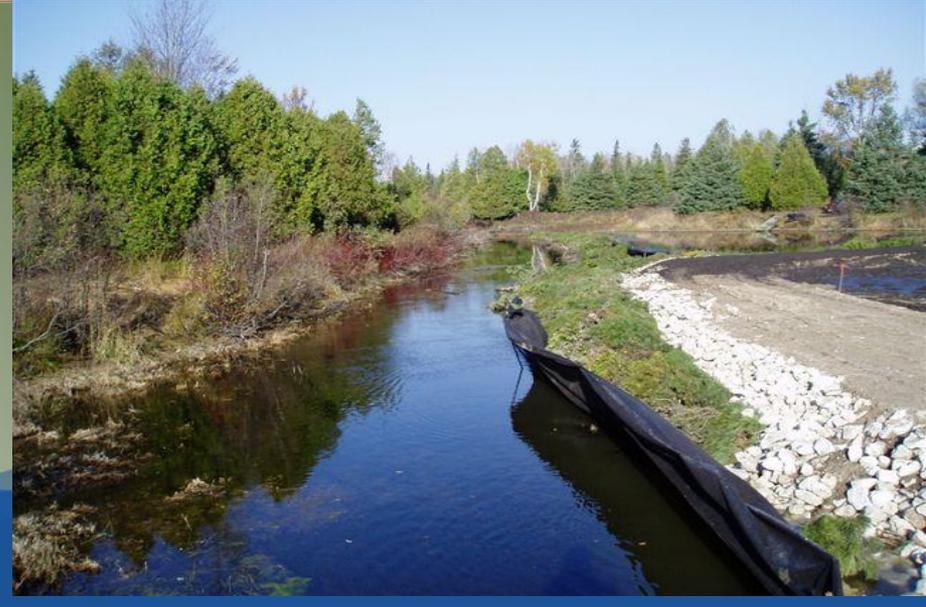
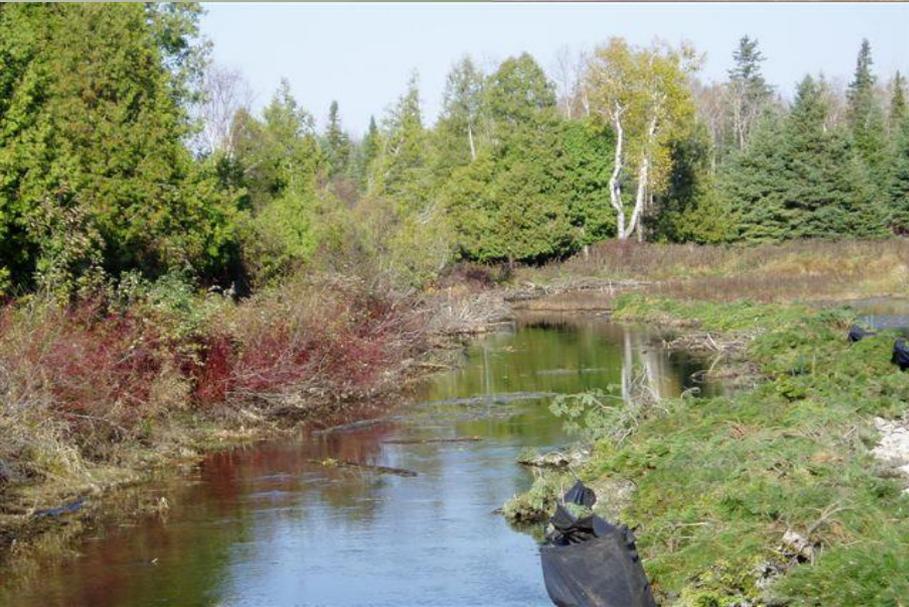








Mervart Pond Mitigation 2007 NVCA/TUC



Beeton Creek 2019





Summary

- The watershed focus is the most effective context for the management of land and water.
- We MUST work to increase the functioning and resiliency of our watersheds.
- Protection and Regulation are only two small tools.
- Rehabilitation to increase functions and health is essential.
- CAs as partners with the Province and member municipalities are in the best position to coordinate and implement watershed rehabilitation.

MOVING FORWARD



“WE CANNOT SOLVE TODAY’S
PROBLEMS WITH THE SAME LEVEL
OF THINKING THAT CREATED
THEM.”

Albert Einstein