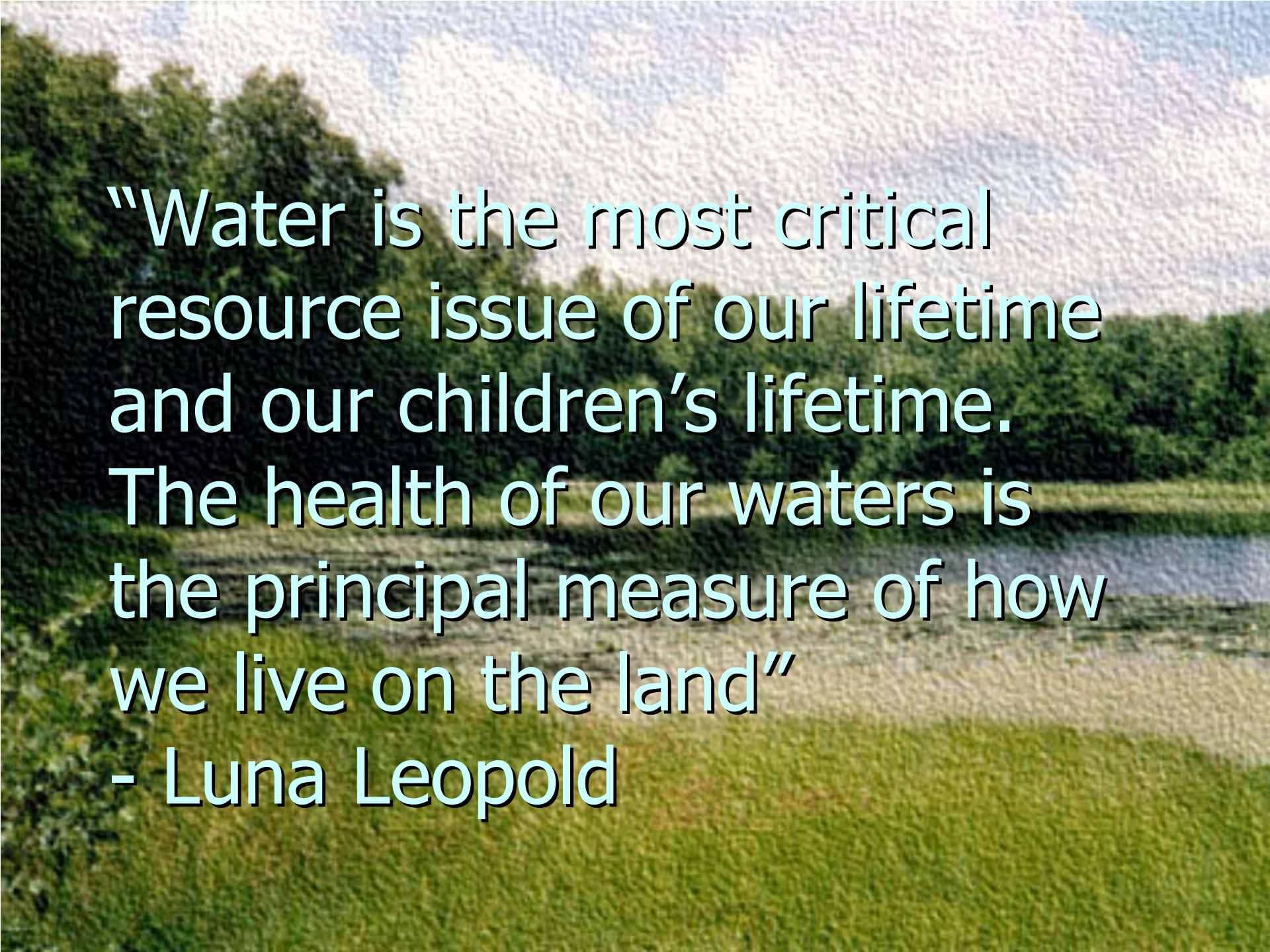
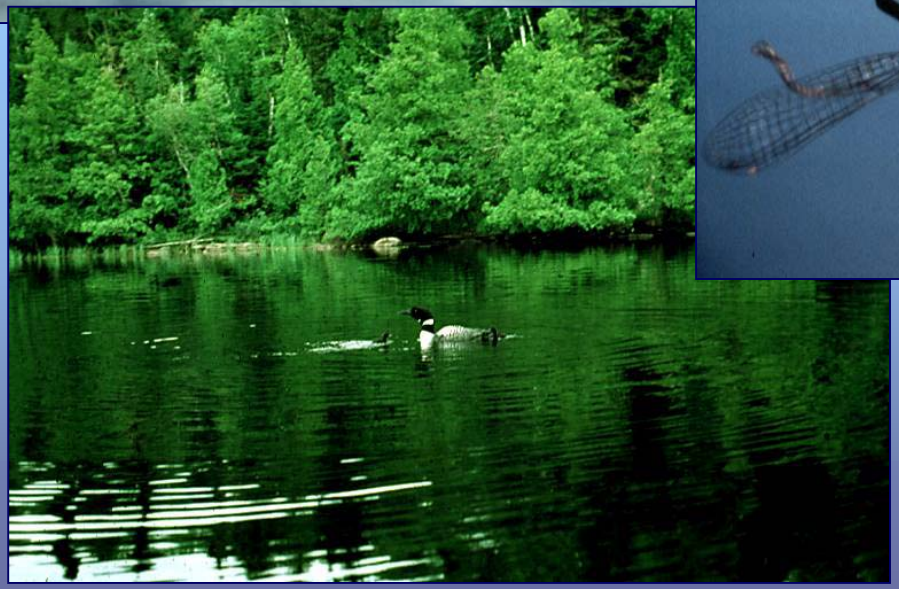
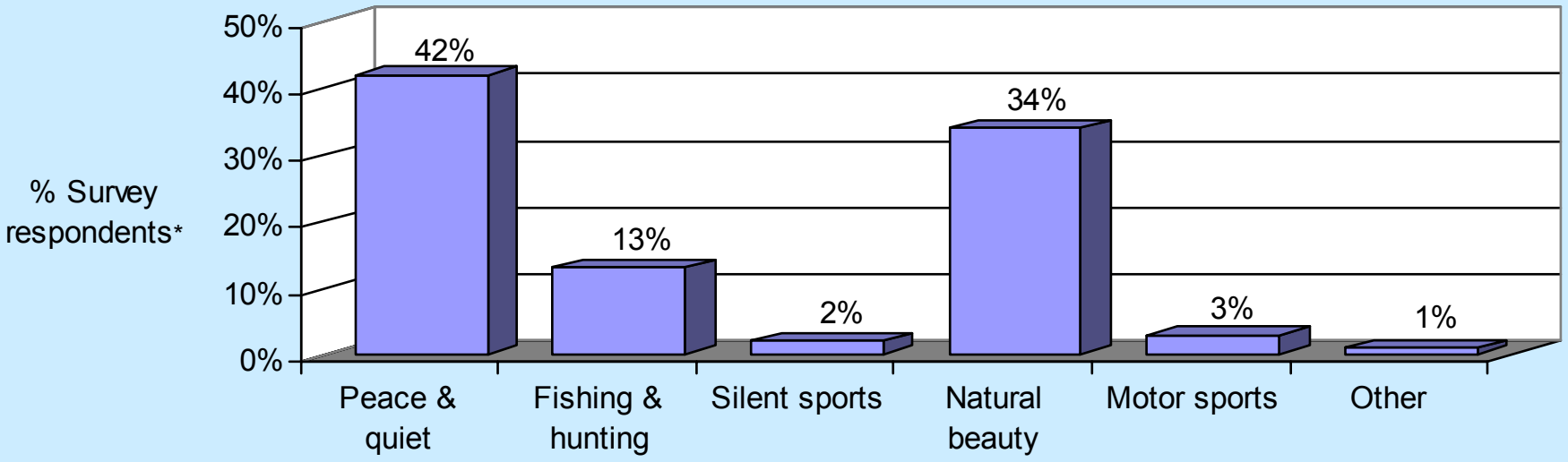
A Production of the University WI-Ext.


"Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land"
- Luna Leopold



Why People Enjoy Lakes



From a survey in Lake Tides newsletter published by University of Wisconsin Extension.

* Total is less than 100% since not all respondents answered all questions.

Take time to enjoy what is important.

The perfect shoreline?

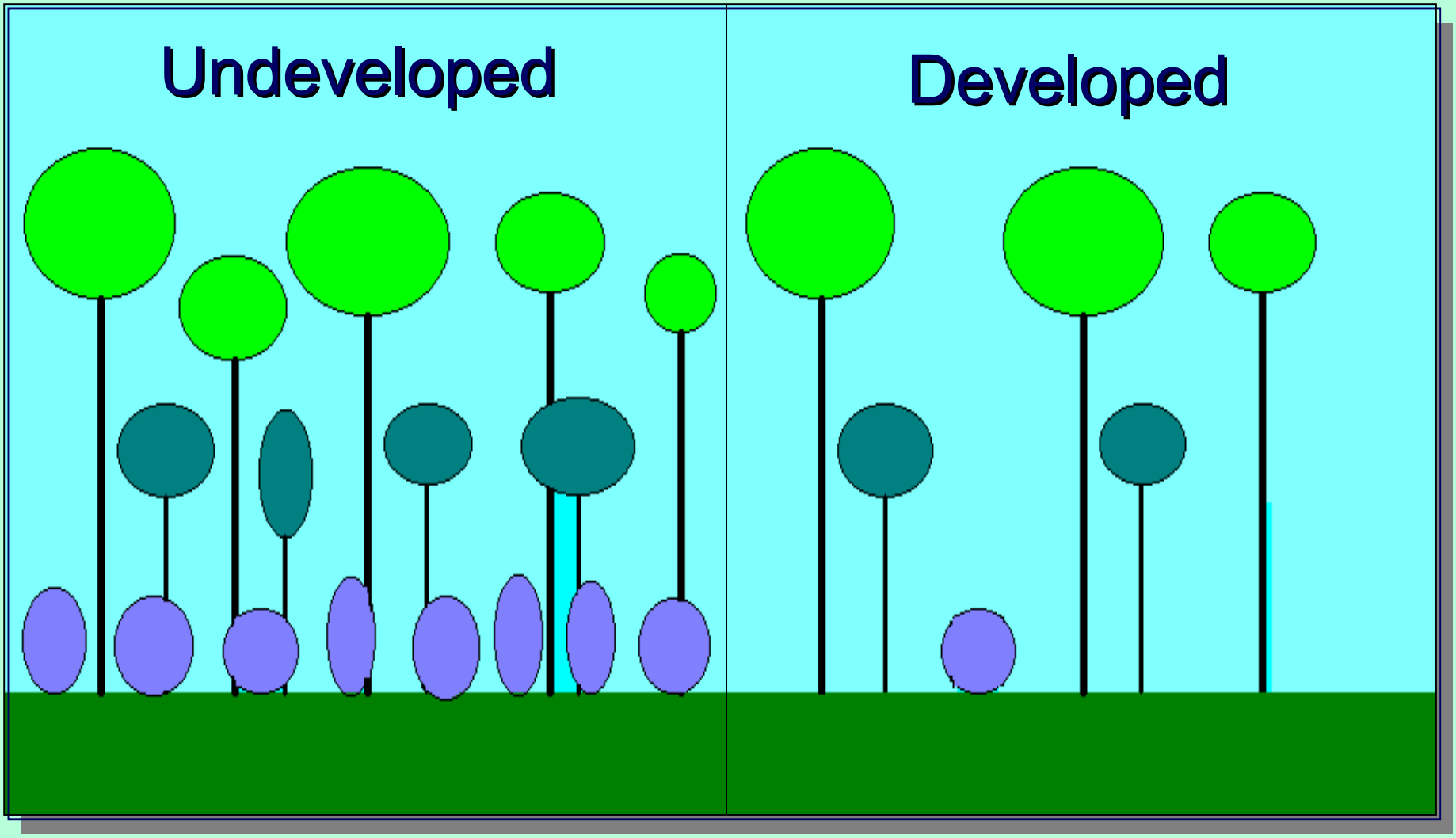
A question of maintenance.

Cumulative Impacts:

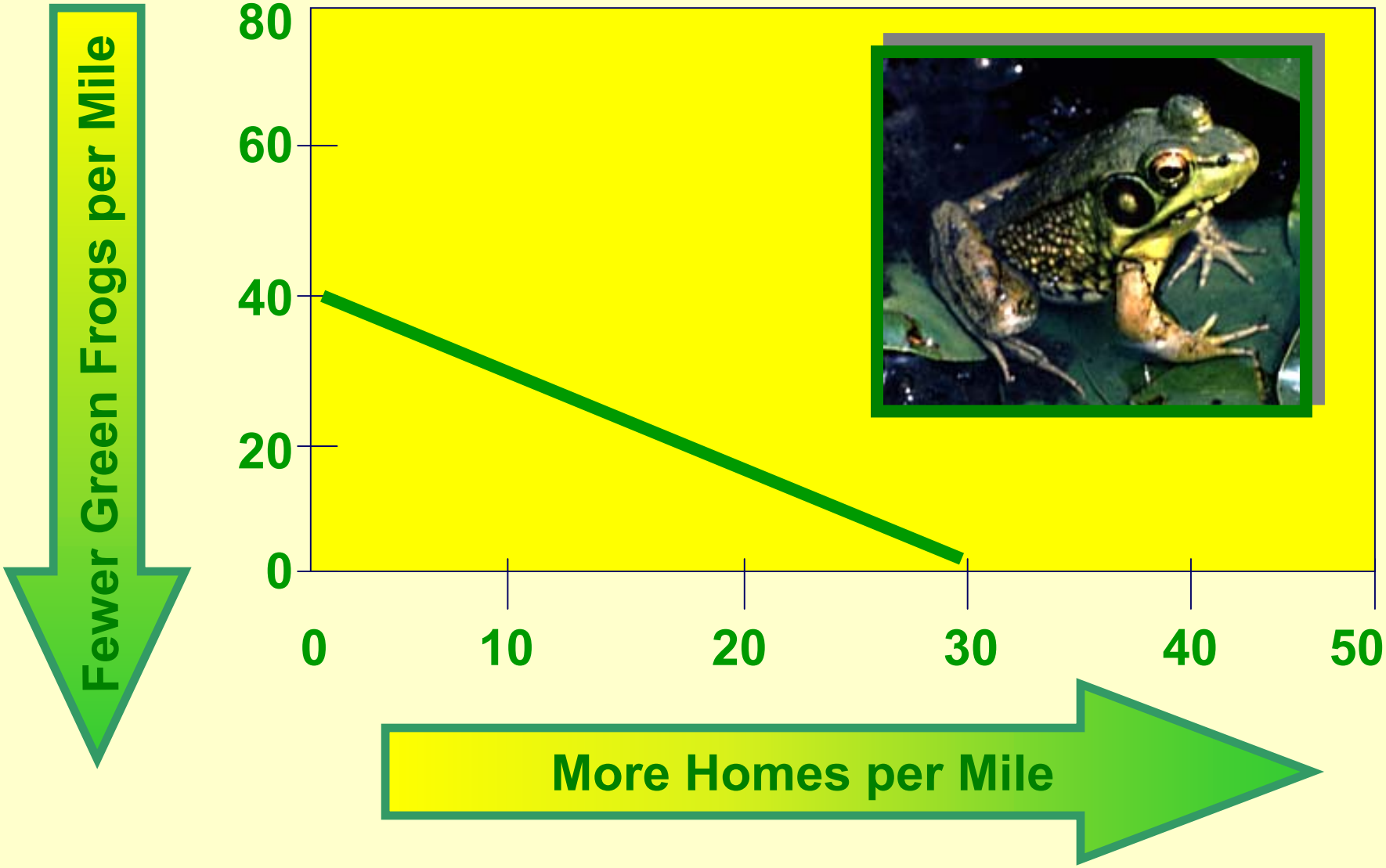
Death by a thousand cuts


Natural Shorelines - provide a rich mosaic of vegetation

What's happened to shorelines?



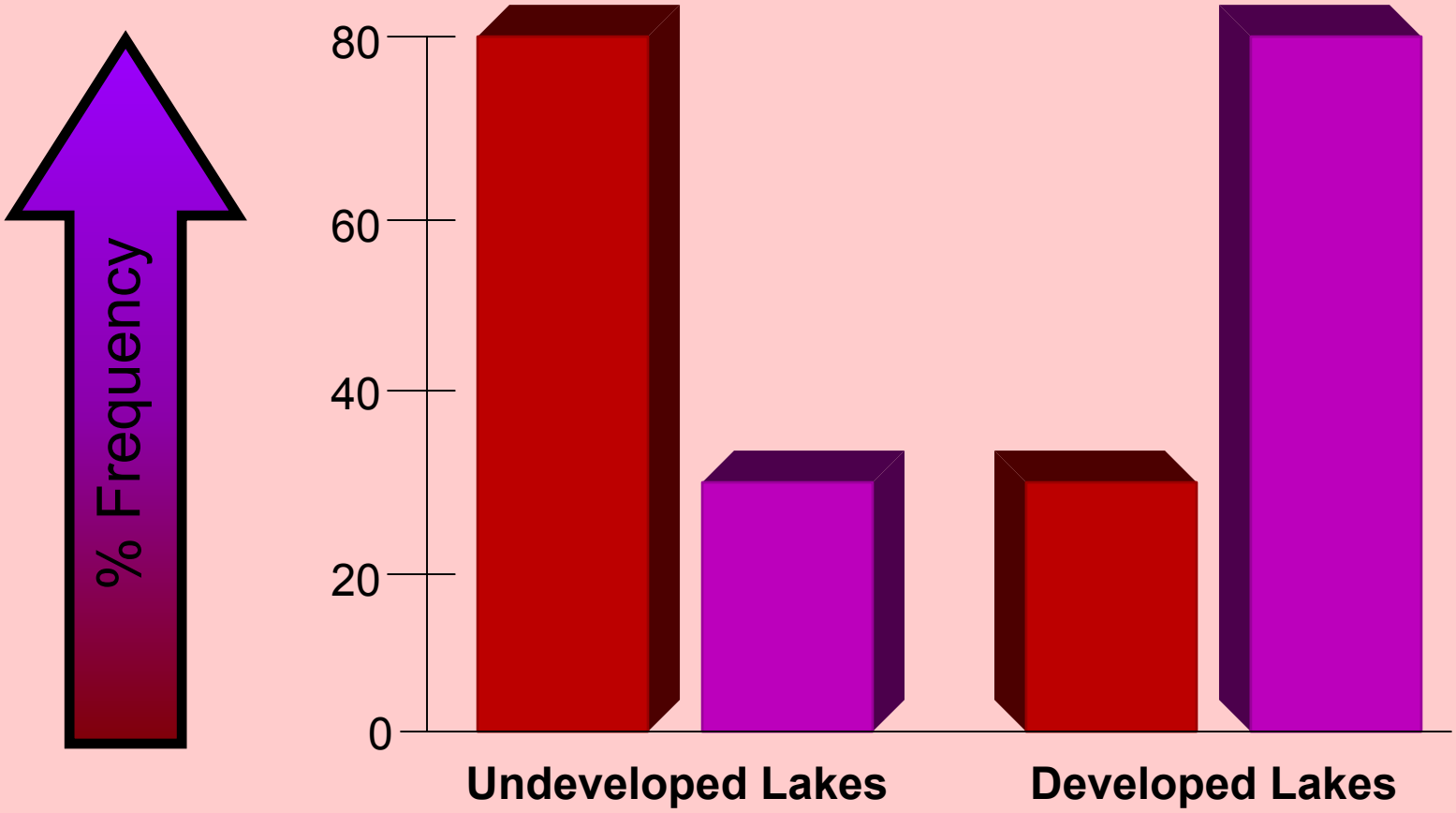
What's Happened to Frogs?



What's Happened to Songbirds?

Uncommon birds ***(Warblers, Thrushes, Vireos, Oven Bird)***

Common birds ***(Grackle, Catbird, Chickadee, Bluejay, Goldfinch)***




7 Rules for Lakeshore Living

Rule 1: Treat lake as an ecosystem
Rule 2: Lakeshores are our rainforest

Rule 3: Provide a new vision of lakeshore

Rule 4: Promote through benefits

- Less time on maintenance
- Fewer Chemicals
- Contribute to cleaner lakes
- Mitigation
- Attract more “enjoyable” wildlife

Rule 5: Importance of a buffer zone

- Help clarity by holding sediment in place
- Take up nutrients that would be used by algae
- Shelter for wildlife
- Wildlife food and nesting areas
- Reduce erosion & runoff

Rule 6: Reference Sites

Definition - a local natural area with similar site characteristics to the restoration site

Why are they so important?

Identifies what native plants are most suitable and the densities they are found in.

Rule 7: Restoration vs. Gardening

Why Native Plants

- Conservation of local genetic diversity
- Ability to provide food & shelter for native wildlife
- Improved health & vigor
- Increased survival rates
- Reduced maintenance costs

Water Garden Exotics

long for many years. All four varieties are winter hardy to -30° and can remain in ponds during the winter where the water does not freeze to the level of the plant. They are easily stored for winter in colder climates. All bloom from June to September. Water depth for all varieties is 18-24".

Pink Water Lily

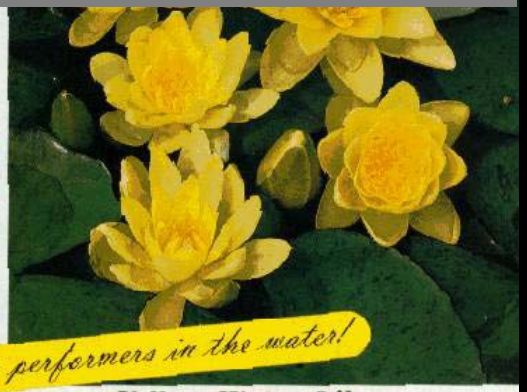
Nymphaea 'Fabiola'

Once this pink beauty starts to bloom, it doesn't stop. Selected because it usually blooms with several flowers at one time. Slightly fragrant.

Red Water Lily

Nymphaea 'Attraction'

A regal beauty with large, cup-shaped deep red flowers with white outer petals. Flowers begin blooming light red and get darker each day.



Top performers in the water!

Yellow Water Lily

Nymphaea 'Sulphurea'

Summer splash of creamy yellow flowers that stay open much later in the afternoon than other varieties. Cup shaped flowers measure 2-6" across. Very free flowering.

White Water Lily

Nymphaea 'Mariacea Albida'

favorite because of its reliable blooming quality. Has large white, mildly fragrant flowers that are cup-shaped with narrow delicate petals.

Types of Restoration

- Protection
- Natural Recovery
- Accelerated Recovery

Protection

- No serious erosion problem
- Native vegetation present
- Diversity of structure
- Shoreland buffer requirement met

Natural Recovery

- Wet margins of lake drawdown zone
- Native elements present
- Turf grasses not well established
- Areas screened from view
- Discourage trampling
- Look for opportunities to see results and promote

Accelerated Recovery

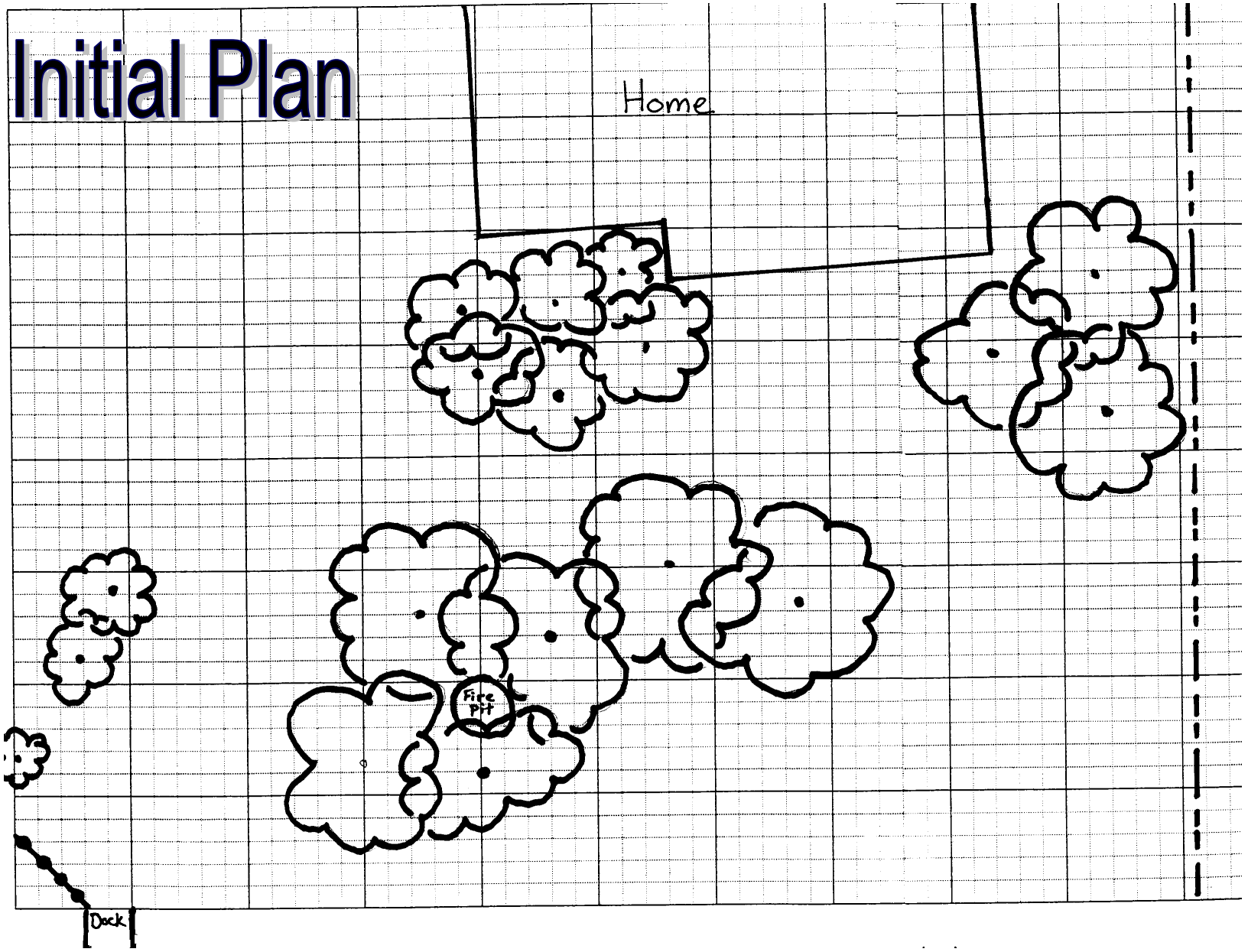
- Turf grass well established
- No natives present
- Exposed soil
- Lots of traffic
- Sand beach maintained
- Quick results wanted

Site Plan Design

The first step in designing a site plan is to inventory and map existing:

- Trees and Shrubs
- Areas of native forbs and grasses
- Structures
- Relevant landscape features

Initial Plan



Homeowner questions

- What end product does each family member envision for the shoreline
- What is the property's drainage pattern
- Where are the areas of heaviest use
  - Recreation (What types, # of people)
  - Pets and children
- Where is the viewing corridor
- Structures near the water

Work to Address Homeowner Concerns

- View of the Lake
- What will the neighbors think
- Beach Areas
- Play Areas
- Storage

Find a Reference Site with similar conditions.

- Site should be within 75 miles
- Note vegetation types
- Note vegetation densities and growth characteristics

To save time ask your local agencies if a list for your area exists.

Burnett County Native Shrub List

DRAFT

Moist Open Areas

Ironwood (blue beech) - *Carpinus carolinianus* (10 - 15 feet) - interesting bark texture
Red Osier Dogwood - *Comus stolonifera* (4-8 feet) - red twigs in winter
Winterberry Holly - *Ilex verticillata* (4-9 feet) - great fall color and red berries for birds in winter
Northern Bayberry - *Myrica gale* (3-4 feet) - attractive foliage
Choke Cherry - *Prunus virginiana* (10-25 feet) - nice in flower and purple berry clusters are attractive and edible
Elderberry - *Sambucus canadensis* (3-12 feet) - nice flower clusters in summer and very attractive purple fruit
American Mountain Ash - *Sorbus americanus* (10-25 feet) - persistent clusters of orange fruit
Meadowsweet - *Spiraea alba* - (3-4 feet) - tall white flower spikes, long flower season
Steeplebush - *Spiraea tomentosa* (3 feet) - tall pink flower spikes, long flower season
Arrowleaf Viburnum - *Viburnum dentatum* (10-12 feet) - very nice toothed, glossy leaves and deep purple fruits
Highbush Cranberry - *Viburnum trilobum* (4-12 feet) broad heads of white flower clusters followed by persistent red fruits that cling through winter

Shady Upland

Bush honeysuckle - (2 feet) *Diervilla lonicera*
Hazelnut - *Corylus americana* (most commonly available) or *C cormuta* (nice foliage and great fall color)
Grey Dogwood - (to 6 feet) *Cornus racemosa* - great fall color
Witchhazel

Semi-shady to Open Upland

Hazelnut - (8 to 10 *feet) Corylus americana* (most commonly available) or *C cormuta* (nice foliage and great fall color)
Pin Cherry - (10 to 25 feet) *Prunus pennsylvanica* (nice in flower in spring, edible red fruits)
Serviceberry - (8 to 10 *feet) Amelanchier canadensis* is most often available (early flowering shrub w/ white flowers followed by edible blue fruits)
Snowberry - (8 to 10 *feet) Symphoricarpos albus* (nice white berries)
New Jersey Tea - (to 3 feet) *Ceanothus americanus* (glossy evergreen foliage and showy white flower clusters)
Red Root - (to 3 feet) *Ceanothus ovatus* (similar to New Jersey Tea)
Gray Dogwood - (to 6 feet) *Cornus racemosa* - great fall color

Trees

Red Maple - *Acer rubrum*
Silver Maple - *Acer saccharinum*
Yellow Birch - *Betula allegheniensis*
River Birch - *Betula nigra*
Green Ash - *Fraxinus pennsylvanicus*
Tamarack - *Larix laricina*
Eastern White Cedar - Thuja *occidentalis*
Hemlock - *Tsuga canadensis*

Grey Dogwood

Serviceberry /Juneberry

High bush Cranberry

New Jersey Tea

Hazelnut

Red Osier Dogwood

White Cedar

Snowberry

Paper Birch

Tamarack

Purple Loosestrife

Eurasian Milfoil

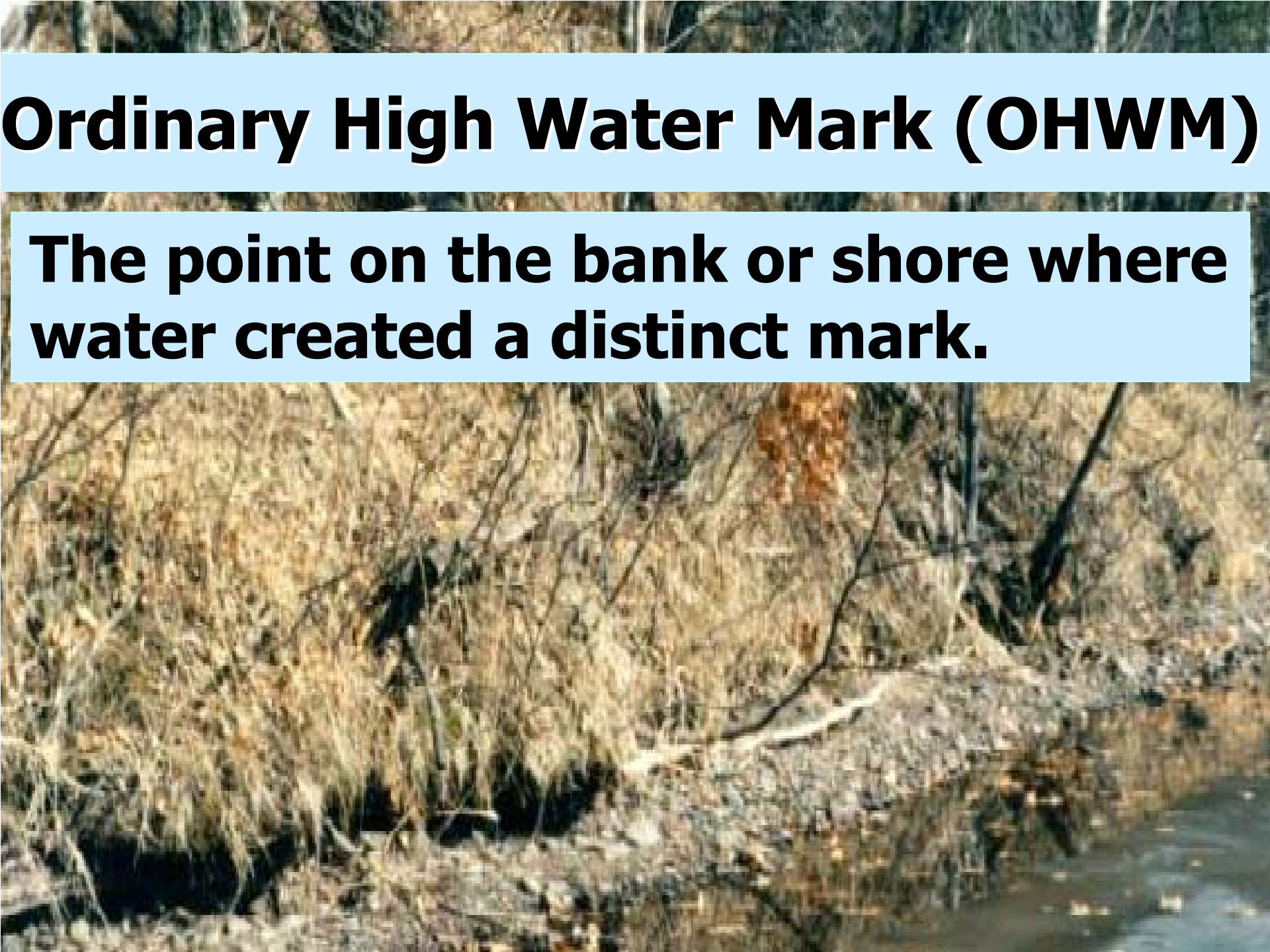
Poison Ivy

Will permits be needed?

Who regulates what?

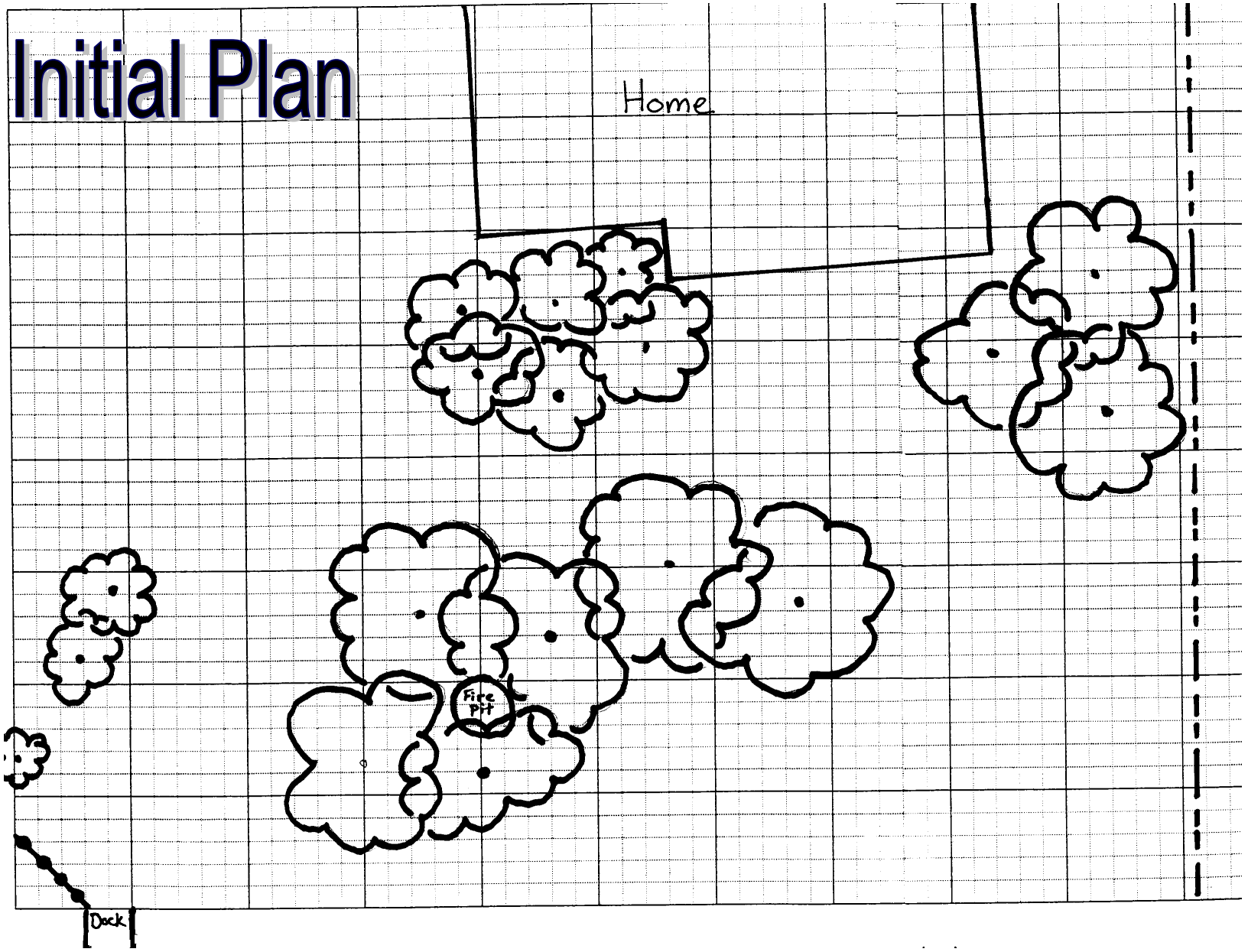
Ordinary High Water Mark (OHWM)

The point on the bank or shore where water created a distinct mark.

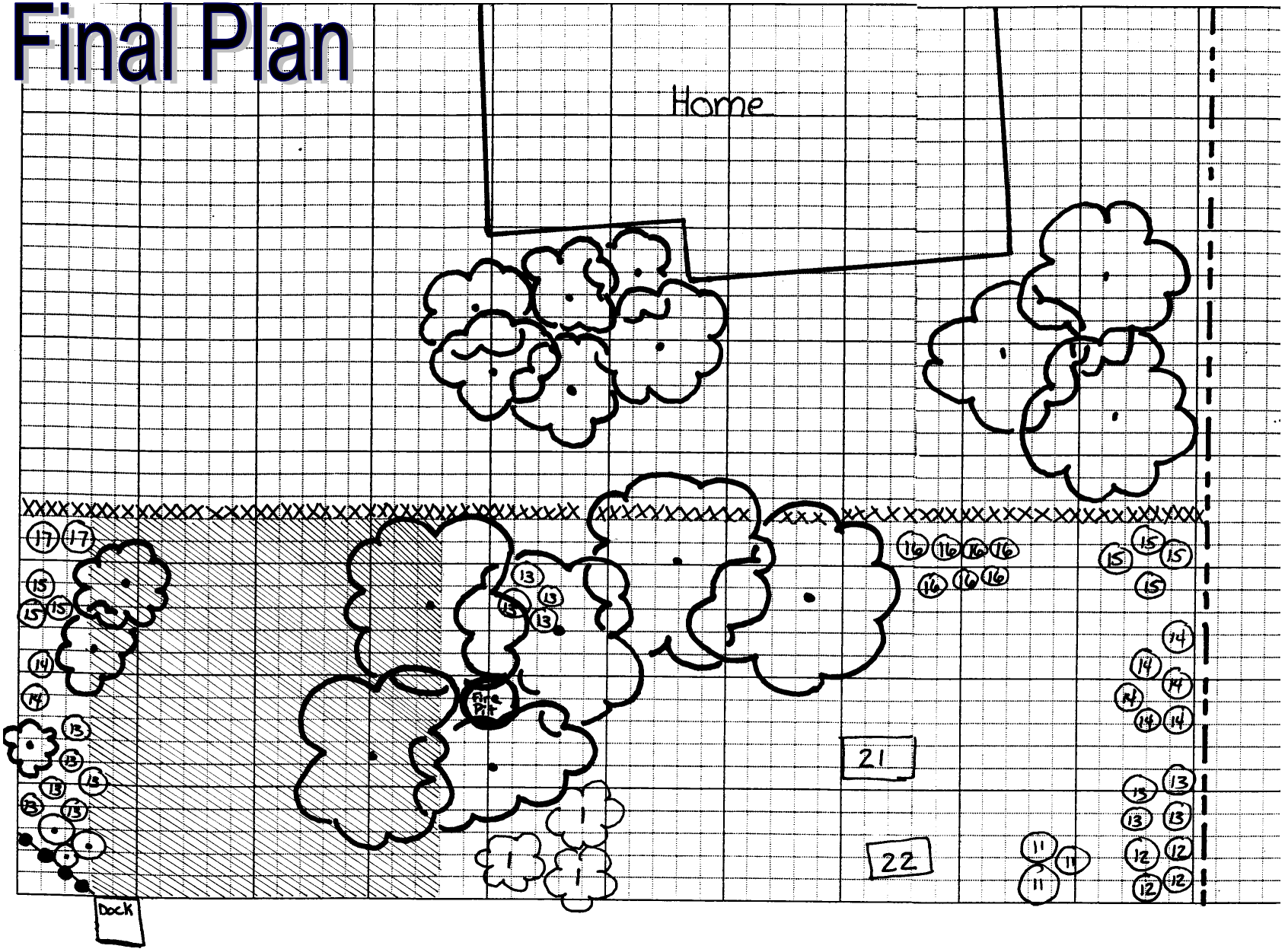


Create a final site plan that combines a vegetation list & veg. densities from your reference site and answers to the land use questions. End product should be beneficial to the shoreline and agreeable to the homeowner.

Initial Plan



Final Plan



Monitoring Plan

- Who will maintain
- What level of management will be utilized

  Once a plan is agreed upon provide written care and maintenance guidelines.

For the Greatest success involve the homeowner in all project steps.

This will help create ownership in their eyes. Thus increasing the level of pride in the project

- Continue maintenance
- Willingness to invest time and finances

Challenges

- Unrealistic homeowner expectations
- Patience
- Site variability
- Technical Skills
- Lack of good reference sites/ lists
- Undesirable species
- Herbivory
- Monitoring

Planting

- Seeds
- Live plants
  - plants
  - rootstock
- Live stakes

Seeds

- Remove competing vegetation
- Mix seed with moist sand & broadcast
- Tamp
- Mulch
- Water
- WEED

Vegetation Removal

- Black Plastic
- Soil tilling
- Herbicides

Plants/Rootstock

- Spring planting
- Spacing
- Plant carefully
- Water
- Plant in cool hours
- Mulch
- Water
- WEED

Live Stakes

- Willow, dogwoods, tag alder
- 18-24” X 3/8” stakes
- Angle bottom and dip top in latex
- Drive in with rubber mallet
- Plant within 24 hours

Plants from a nursery

- Special orders - plan well in advance
- Determine origin/propagation method
- DO NOT use imported plants

Taking from the wild

- Wild plant laws
- Ethics
  - Collect only common / abundant
  - Transplant when in danger of destruction
  - Don’t endanger health of plant community
  - Cuttings - remove less than 5% of plant
  - Seeds - be sloppy, leave majority
  - Ask permission
  - CHECK FOR EXOTICS

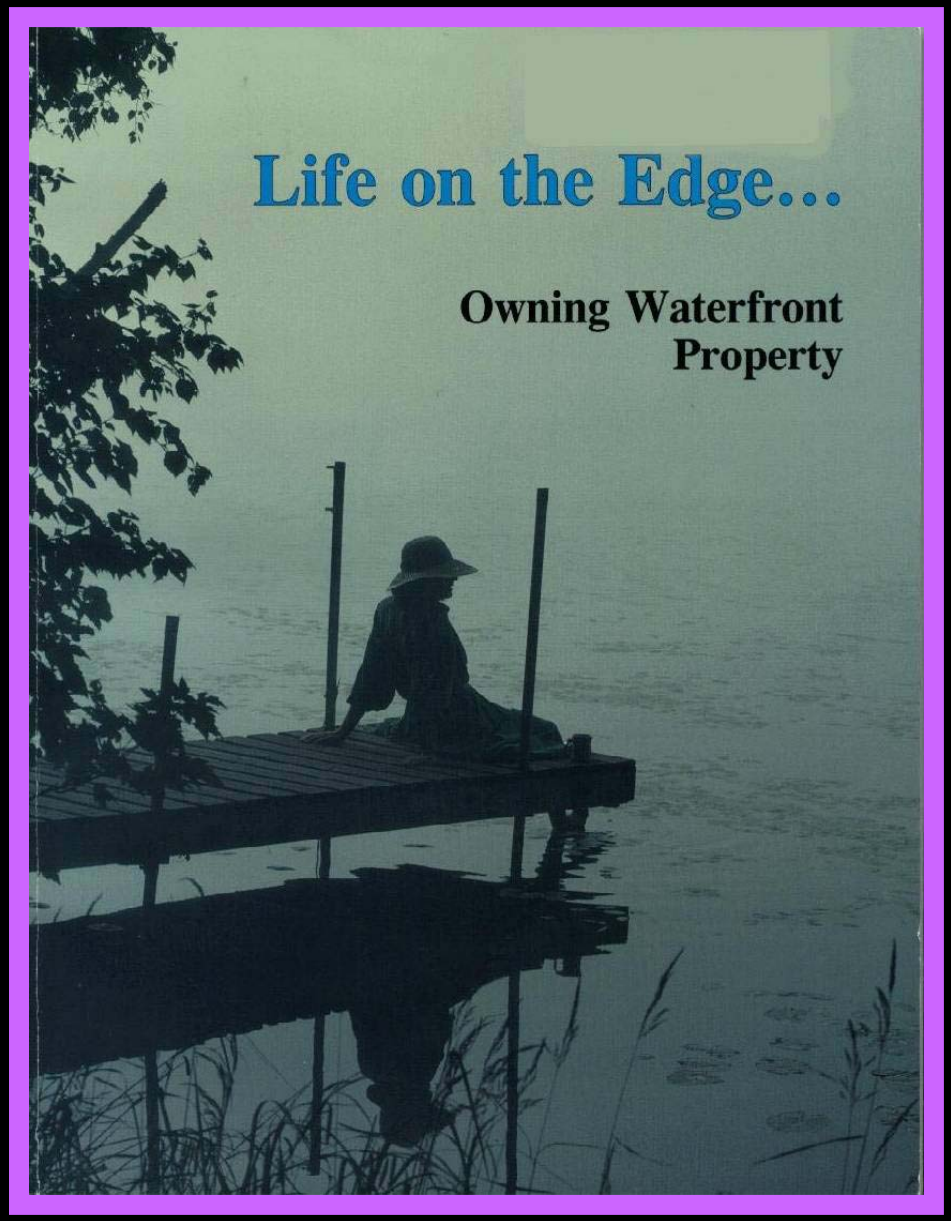
Littoral Zone Restoration

- Change use patterns
- Plantings
  - Seed bank
  - Plants need to be weighted down
  - Protection - wave reduction structures
- Alternatives - Fish habitat structures

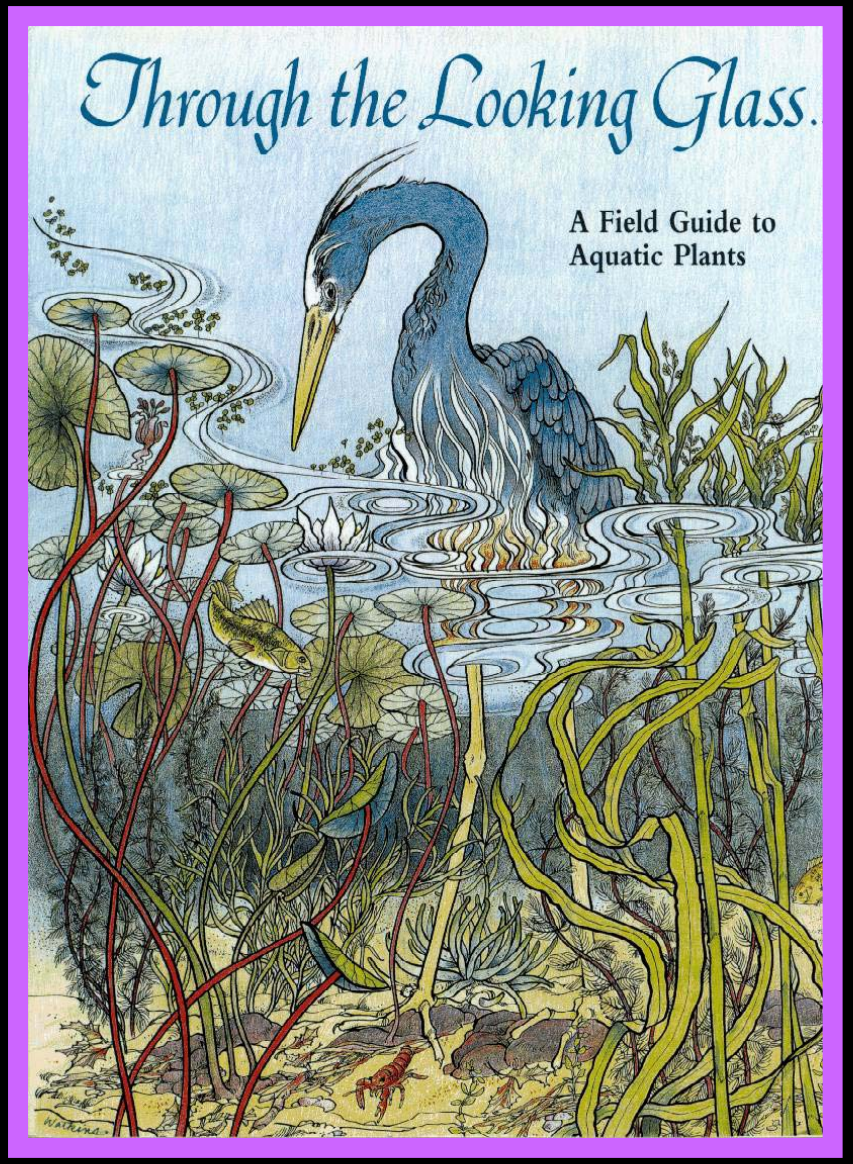
Littoral Zone Hazards

- Boat Motors
- Ice
- Drawdowns
- Exotics
  - Carp
  - Rusty crayfish
  - Eurasion watermilfoil
  - Purple Loostrife

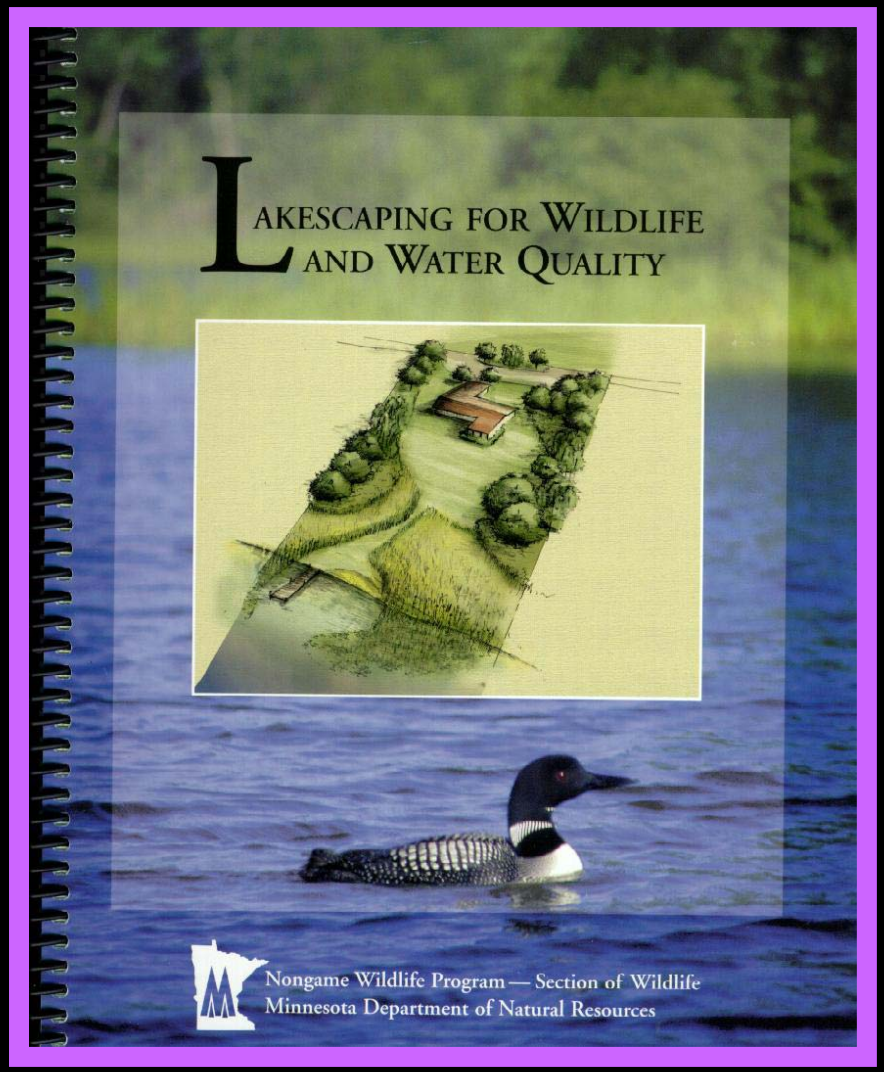
Life on the Edge



Through the Looking Glass



Landscaping for Wildlife and Water Quality



Yard Care and the Environment

The Living Shore