Live Sessions Week 7:
Essential Skills 13 and 14: Wildlife surveys and observation, and Stream measurements for fish habitat

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Importance of these skills

These skills very important:

Wildlife surveys and observation

- Wildlife important to people
- Abundance and diversity of these animals an indication of health of an ecosystem

Stream measurements for fish habitat

- Healthy habitat critical for fish populations
- We need standardized methods.

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Essential Skill #13: Wildlife Surveys and Observation

Will discuss here,

1. Optics for wildlife use
2. Catch per Unit effort – a critical measure
3. Wildlife trees

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Optics for use

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‘Power’ 10X42

Magnification = 10X

Objective lens aperture = 42 mm

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Compact 12X25

Large 15X70

- Lightweight
- Low light gathering ability (small aperture)
- Easy to hold steady

- Heavy
- Good light gathering ability (large aperture)
- Prone to vibration while holding

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Considerations when purchasing

When purchasing, consider:

- Your intended use (your needs)
- Light gathering ability (aperture)
- Quality of glass

Buy the best quality you can afford

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Considerations when purchasing (cont'd)

When purchasing, consider:

1. Weight
2. Magnification

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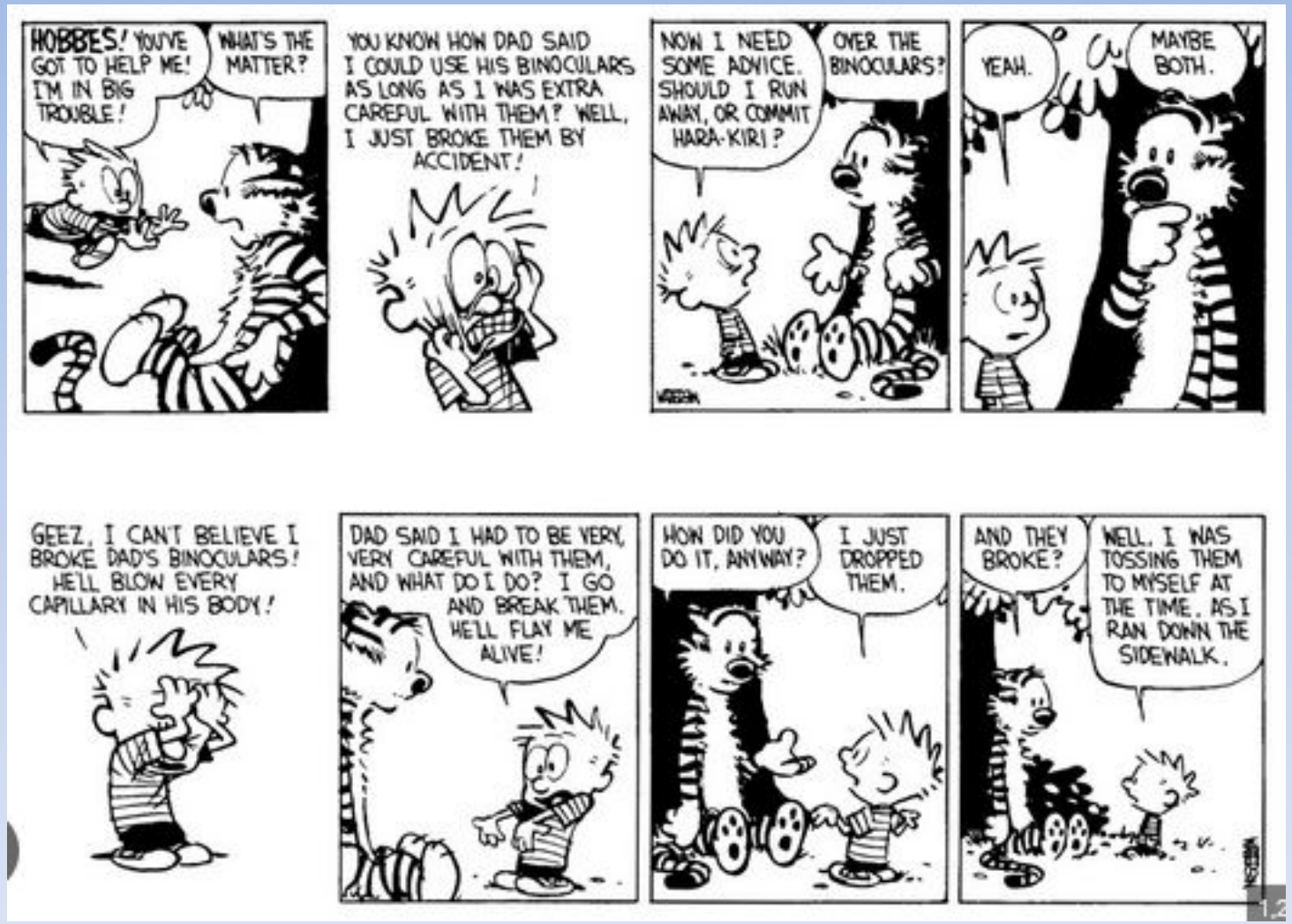
Care of binoculars



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Catch per Unit Effort (CPUE)

Lets say you and I meet for a beer one Friday after work and I tell you I have been fishing in the last couple of weeks. I tell you I went to Flapjack Lake and caught 17 trout and also Bunyan Lake and got 6 trout. You get excited and say, "Let's go to Flapjack lake tomorrow. I will pick you up at 6 AM."

Before I get up early on a Saturday, is this the right choice of lake to go to?

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	Number fish caught	Time spent fishing (effort)	Catch per unit hour (#fish/hr)
Flapjack Lake	17	12 hours	1.4 fish/hr
Bunyan lake	6	2 hours	3 fish/hr

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- Catch <u>per Unit Effort</u>

- A unit of effort can be:
  - Time: second, minute, hour, day, week…
  - Place: metre, m^2, m^3, hectare, square mile,…

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Take home message

Always record your effort when doing surveys, whether that is time or distance or area.

Observations or catch without a measure of the effort you expended to get that information is valueless.

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Relevance to management

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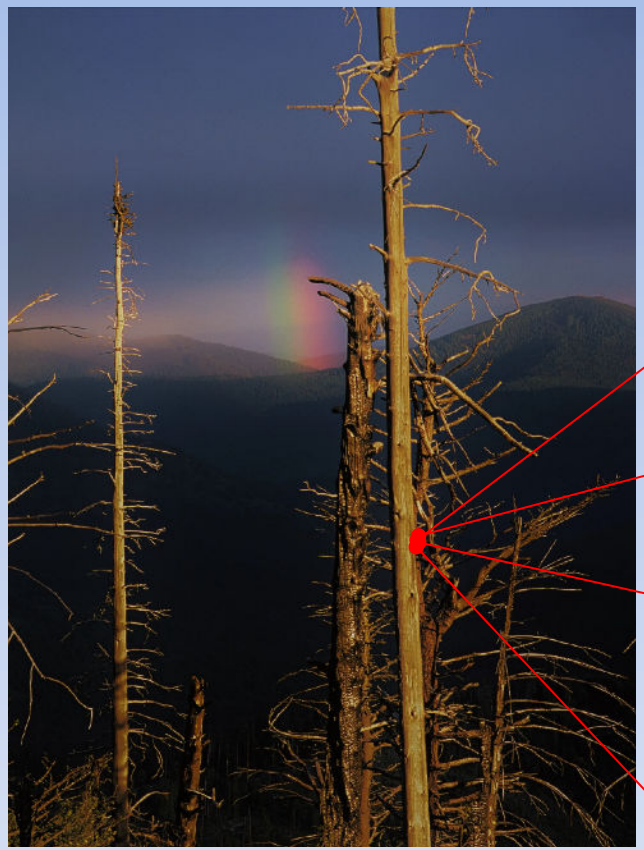
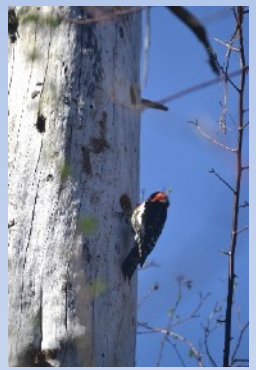
Wildlife trees



Perching location



Cavities (homes)

Birds feeding on insects

Dens at base of tree

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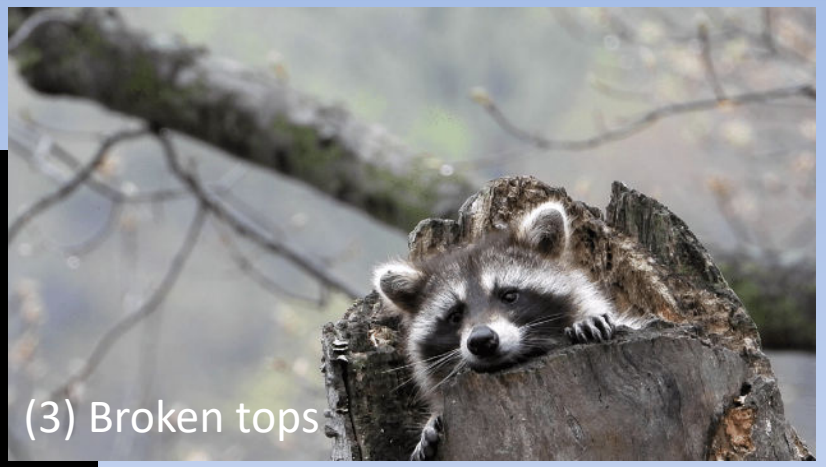
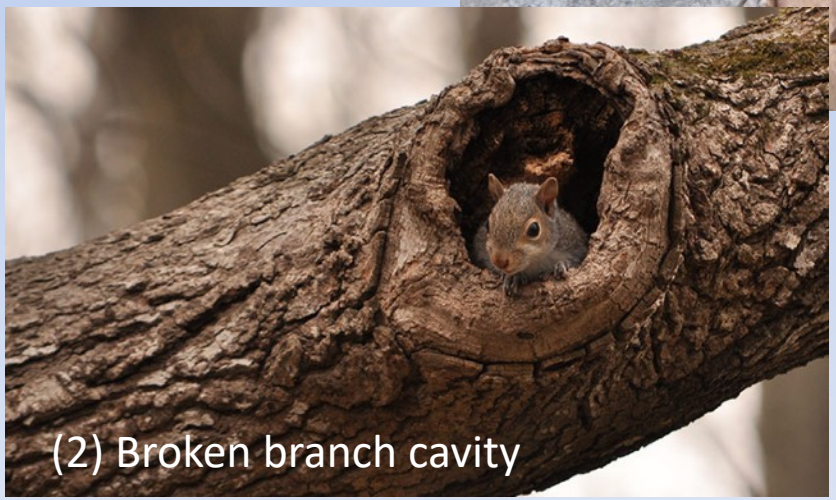
Tree cavities


(1)Excavated cavity


(5) Loose bark


(3) Broken tops


(2) Broken branch cavity


(4) Cavity in base (bear den)

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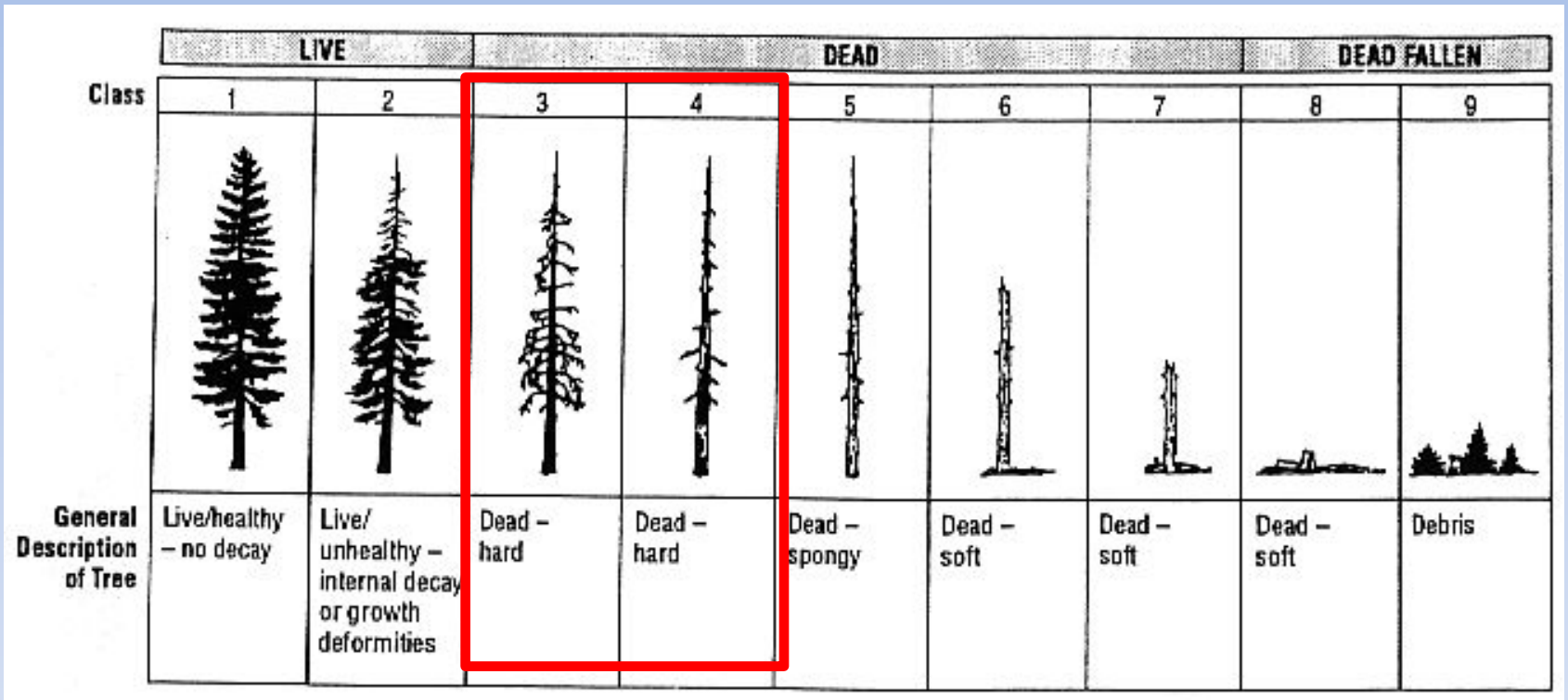
Decay trajectory (conifer)



Decades

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Typically when recording wildlife trees we record:

- Species
- Height
- Diameter at breast height
- Decay class (or some indication of quality)
- Evidence of use by birds and mammals.

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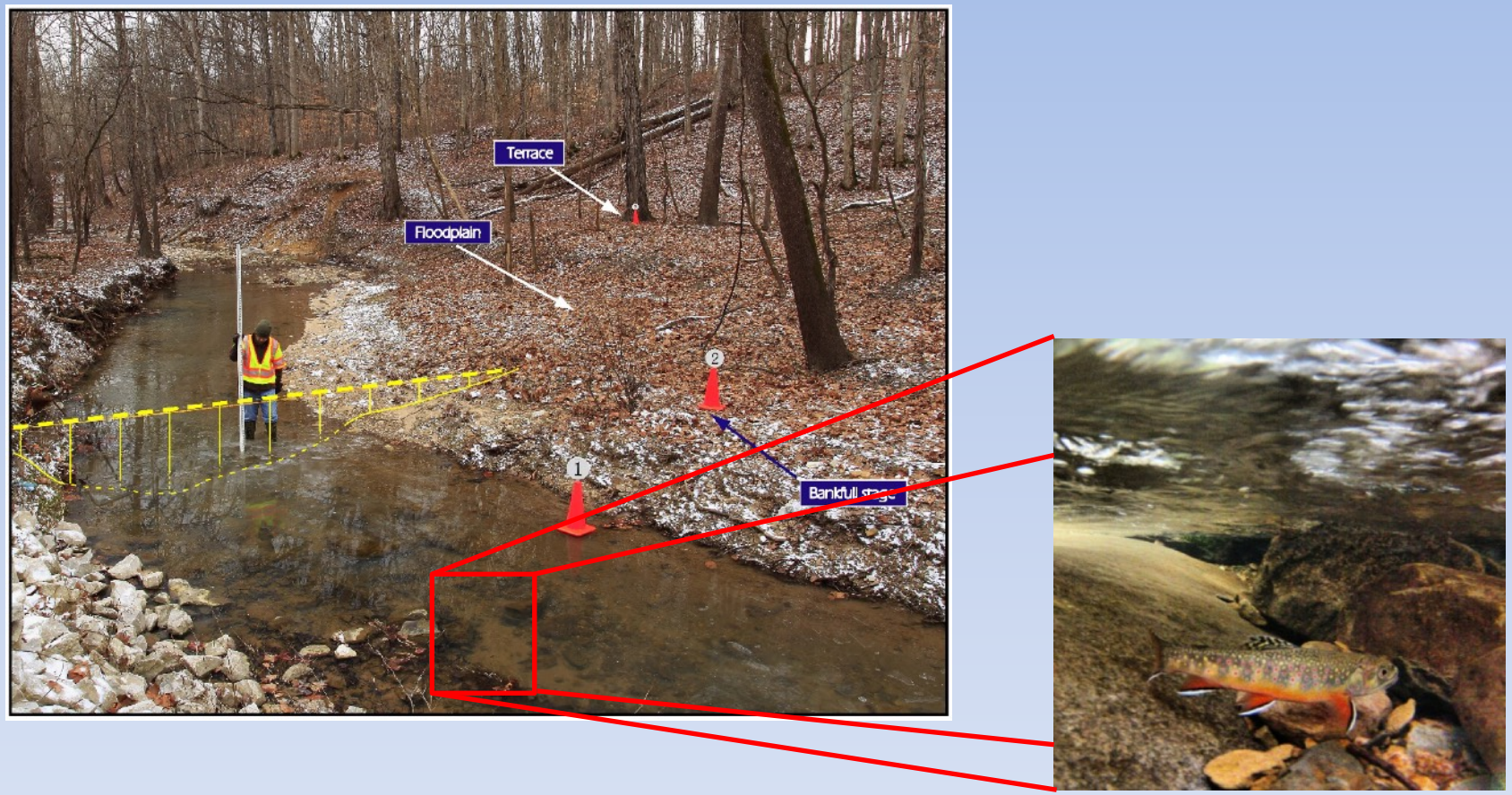
Essential Skill #14: Stream Measurements for Fish Habitat



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Stream orders (Strahler classification)

Small stream

Medium size stream

Large river (Columbia River)

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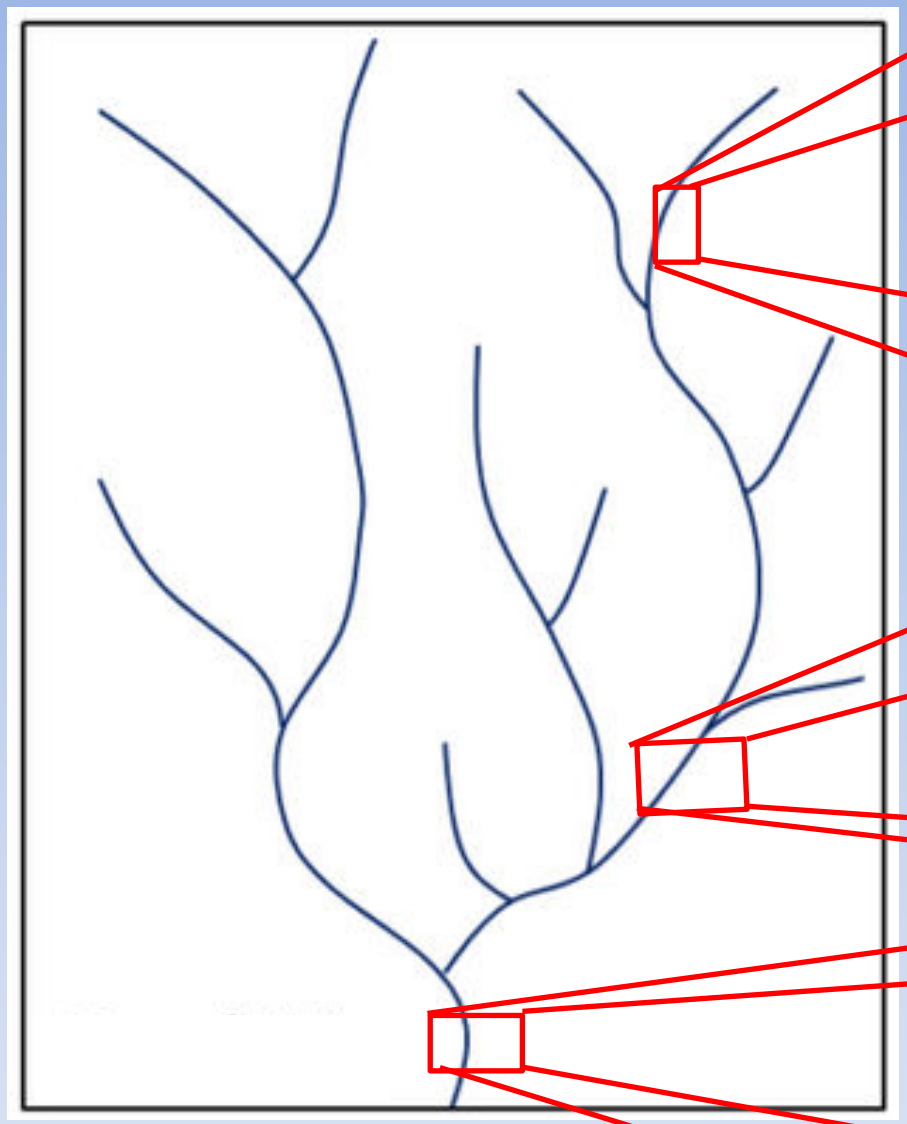

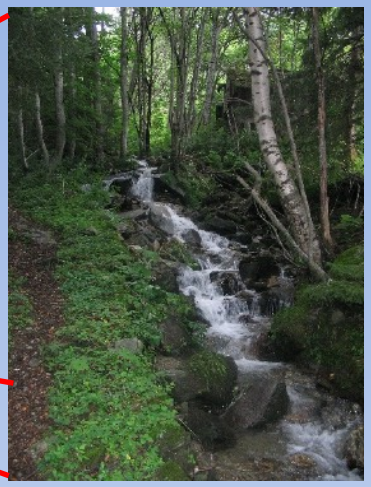

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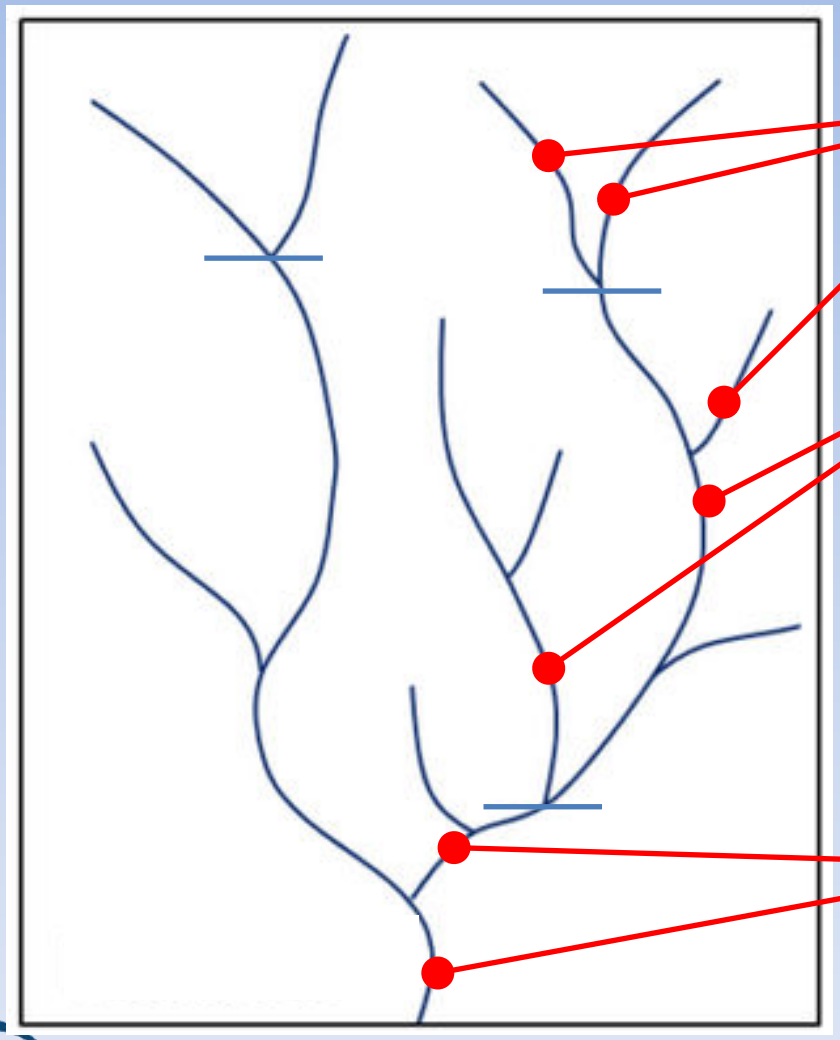

1st order: no tributaries to these streams

2nd order: downstream of where two 1st order streams come together

3rd order: downstream of where two 2nd order streams come together

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Stream order	Typical widths	Example
1st	<1 m	Headwater or very small stream
2nd	1-3 m	Small stream
3rd	3-5 m	stream
4th	5-20 m	Large stream
5th	20 -50 m	Small river
8th	100 -500 m	Ohio River
10th	500 m -1000 m	Mississippi River (at mouth)
12th	Kilometres wide	Amazon river (at mouth)

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Bustard Creek

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Importance of stream measurements

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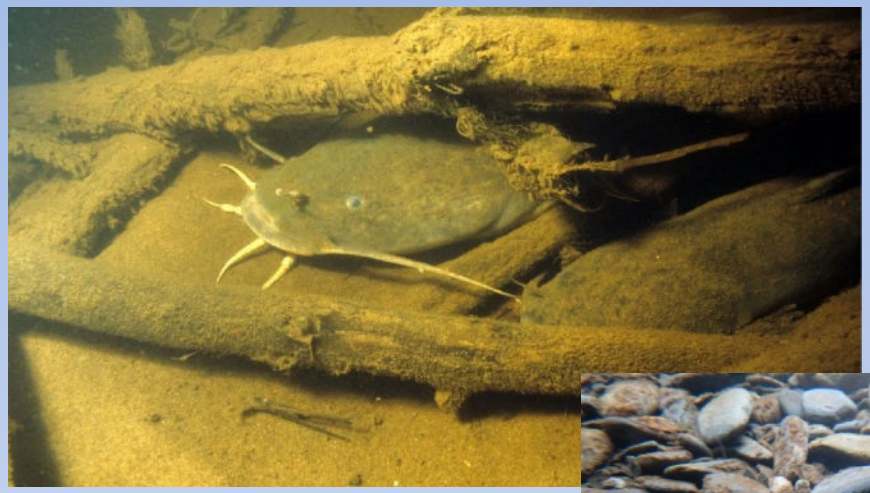
(1) Fish use



Flathead catfish

Rainbow trout

Sculpin species

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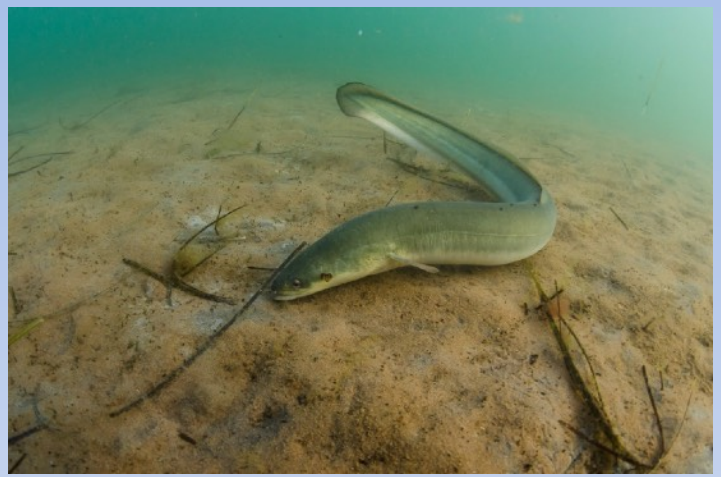
Spawning (and egg incubation)

Migration and movement



Rearing (juvenile stage)

Protection during challenging seasons

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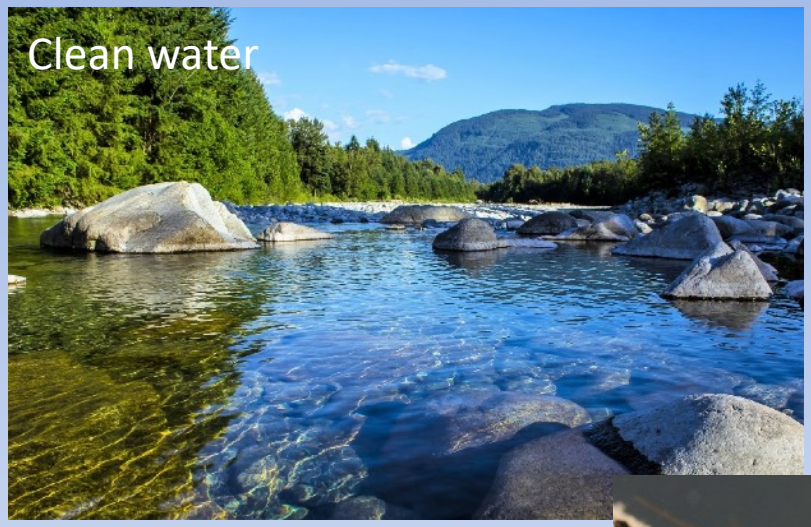
Spawning and egg incubation

Lamprey constructed nest (eggs buried in gravel)

Incubating eggs and newly hatched fish

Broadcast spawning (eggs)

Rearing



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Movement and migration

Some barriers to movement

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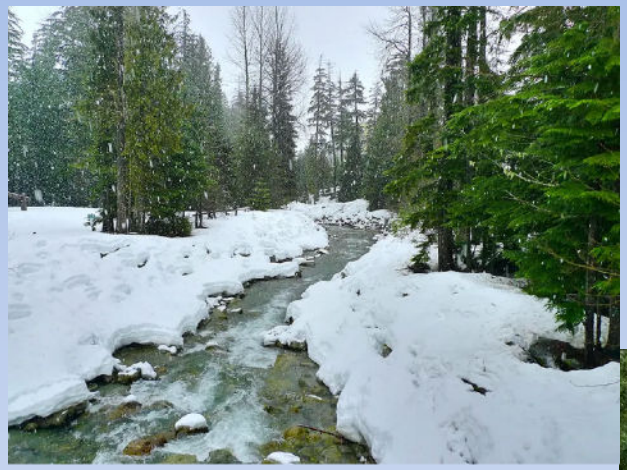
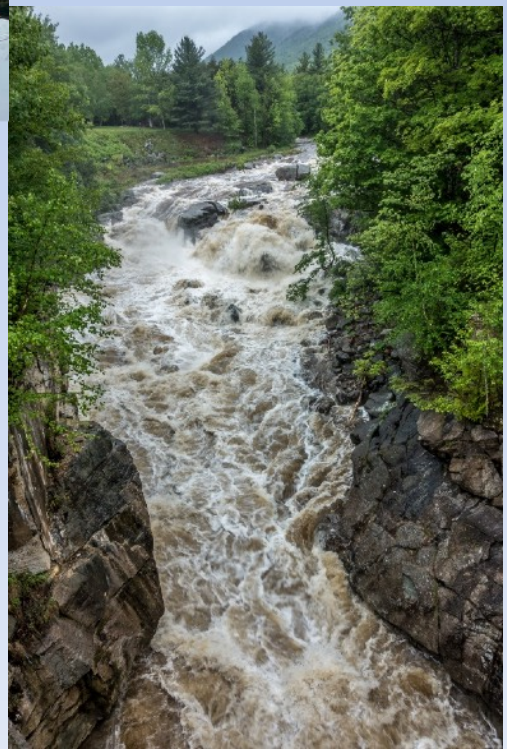
Protection during challenging seasons



Seeking deep pools, calm water, and cover from predators

Seeking calm waters out of flood flow



Aggregating in cool water refugia during extreme temperature events

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(2) Habitat Restoration

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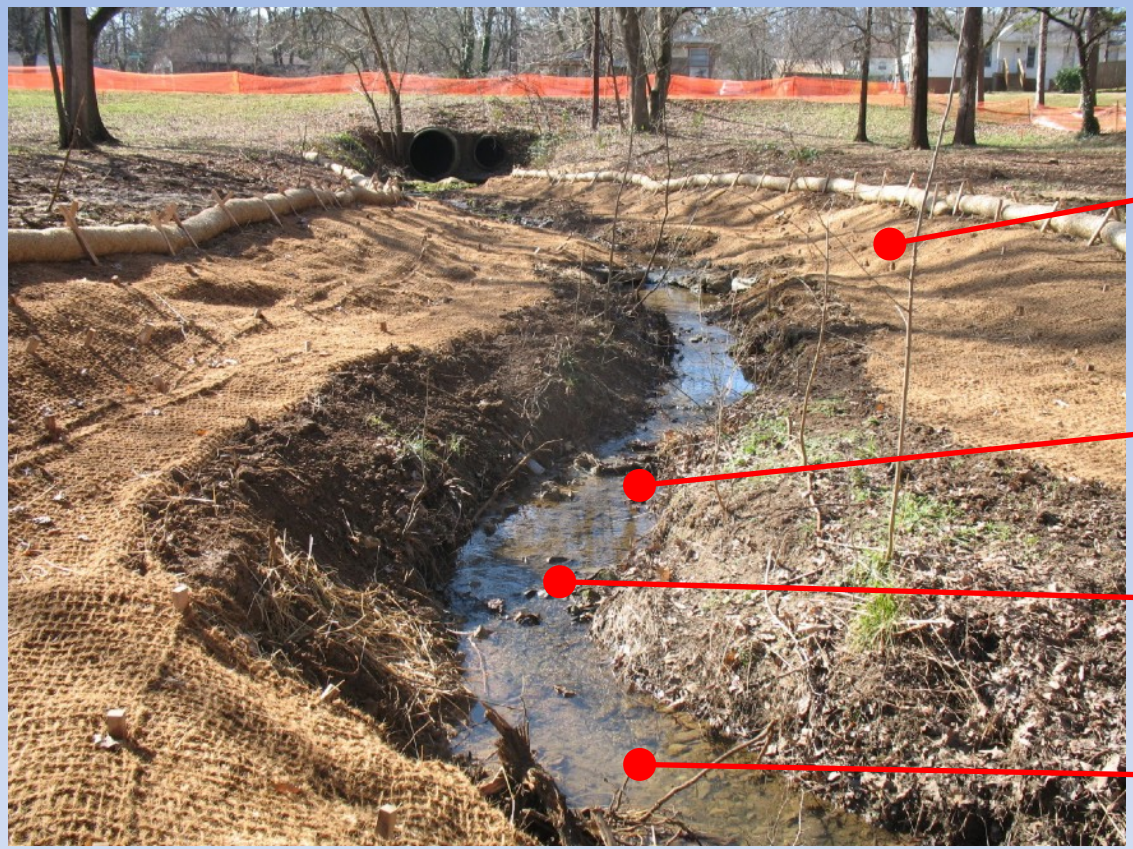
Law of Limiting Factors



Potential limiting factors

Lack of shading to keep water temperatures low

Lack of cover for fish

Lack of pools

Lack of food?

Which limiting factor is most important to work on?

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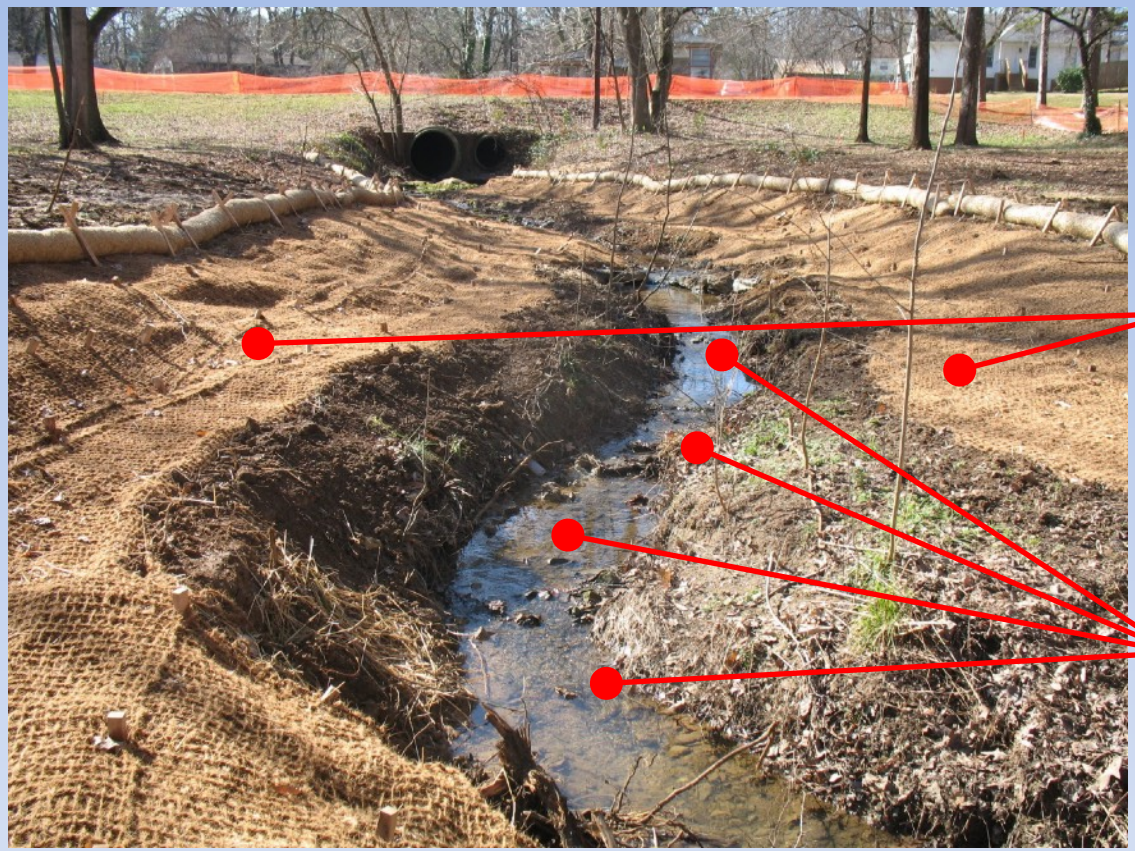

Potential restoration activities

Intensive planting along stream edges to shade stream and control temperature

Create and build instream cover for fish

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Limited fish habitat

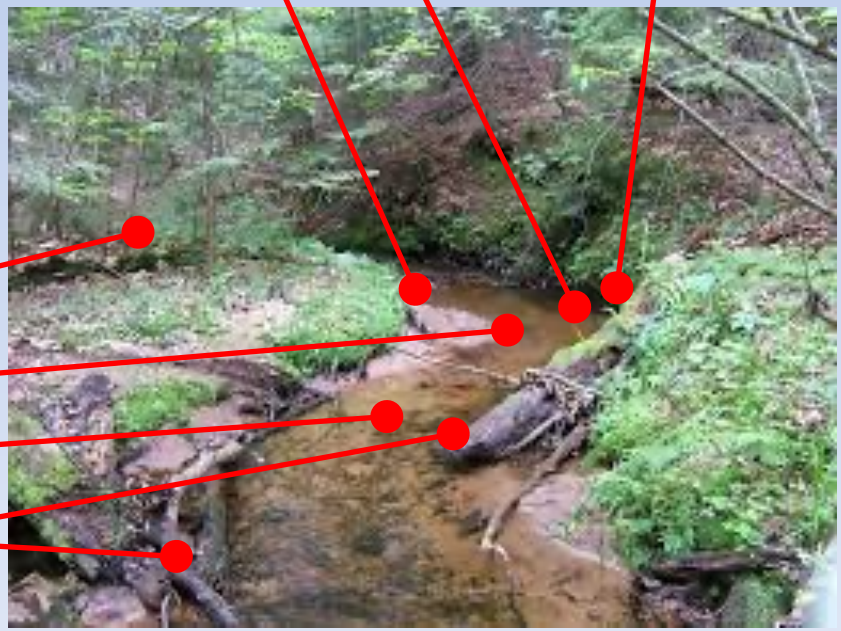
All the same, no diversity at all

Potentially rich fish habitat

Point bar

Deep water

Undercut bank



Complex streamside vegetation

Low velocity current

Higher velocity current

Cover

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Logs installed to control water and encourage stream to change as we want it to.

Number of logs and spacing depends upon channel measurements

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Common stream measurements to determine size and placement of restoration structures

- Bankfull width
- Wetted width
- Depths
- Velocity
- Substrate
- Gradient

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Fish sampling as well

- Species present
- Sizes and ages and weights of fish in area
- Relative abundance (Catch per Unit Effort)
- Use through the year (seasonal sampling)

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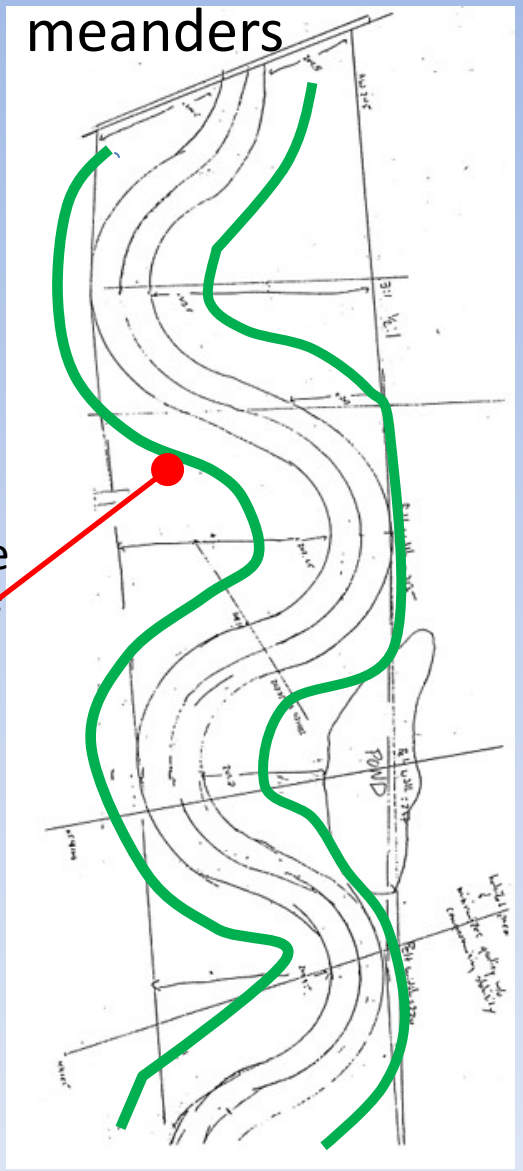
Primary: restore meanders

Streamside planting of trees and shrubs

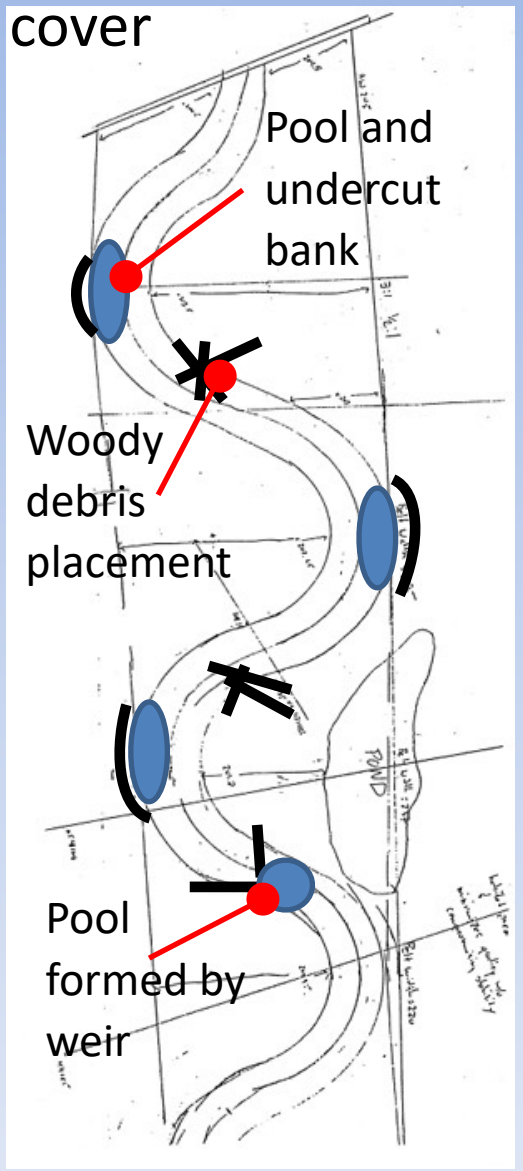


Secondary: restore cover

Pool and undercut bank

Woody debris placement

Pool formed by weir



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Essential Skills 13 and 14: summary

This week we focused on:

- Wildlife surveys and observation
  - Selection of optics
  - Catch per Unit Effort
  - Wildlife trees
- Stream measurements and fish habitat
  - Stream orders
  - Importance of stream measurements
    - Fish use
    - Restoration

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