

# Live Sessions Week 6: Essential Skills 11 and 12: Forest Measurements, and Herpetofaunal Surveys and Identification



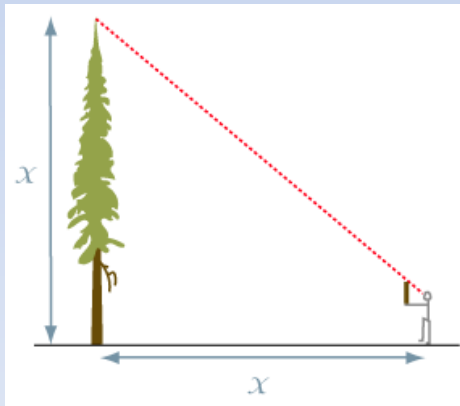
# Importance of these skills

These skills very important:

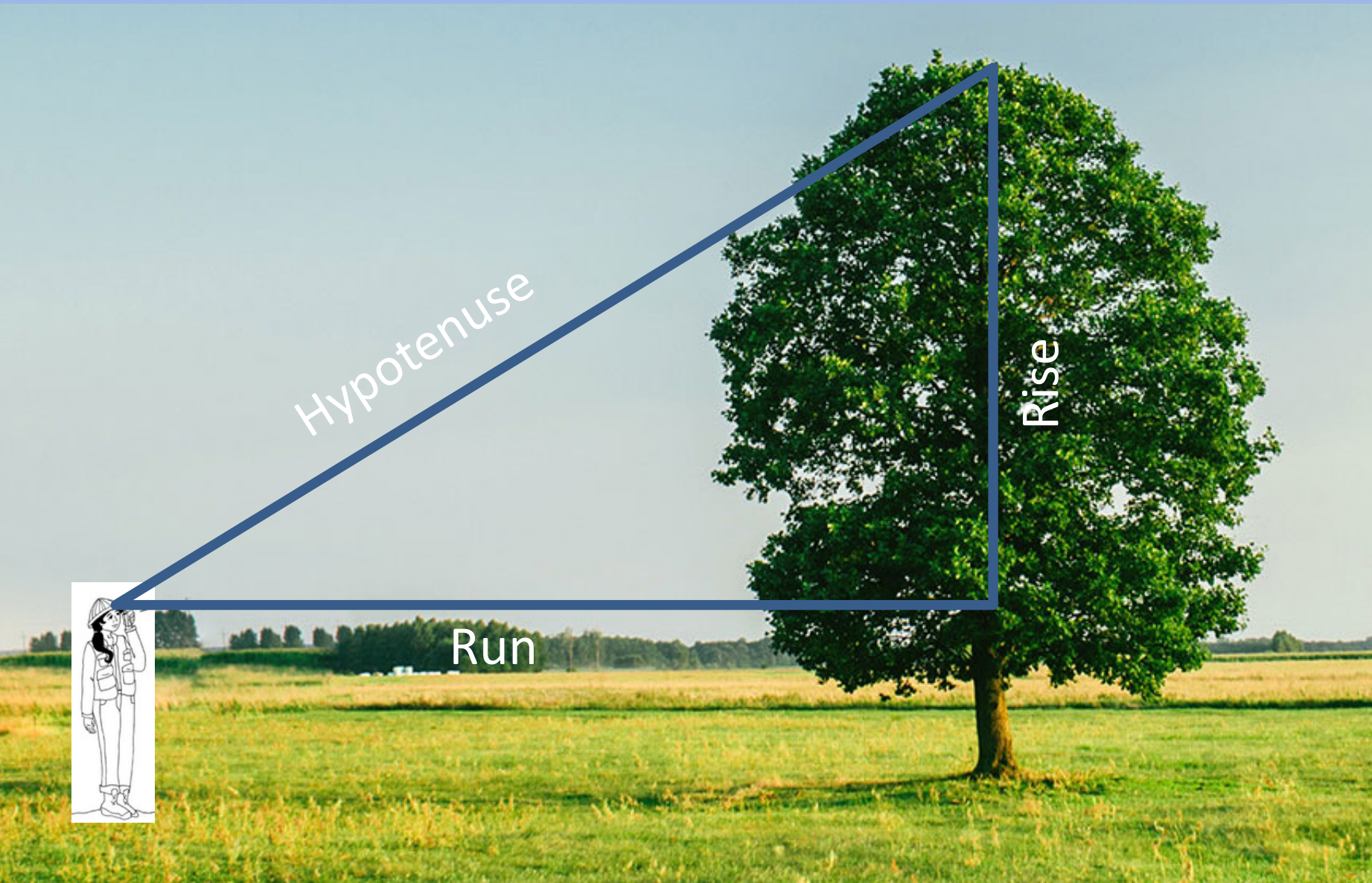
- Tree heights
  - Universal measure in forestry
  - Technique applicable anytime we are measuring height above what we can reach
- Amphibians and reptiles
  - Can inform us of ecosystem health or quality
  - Some species a concern for human health



# Essential Skill #11: Forest Measurements

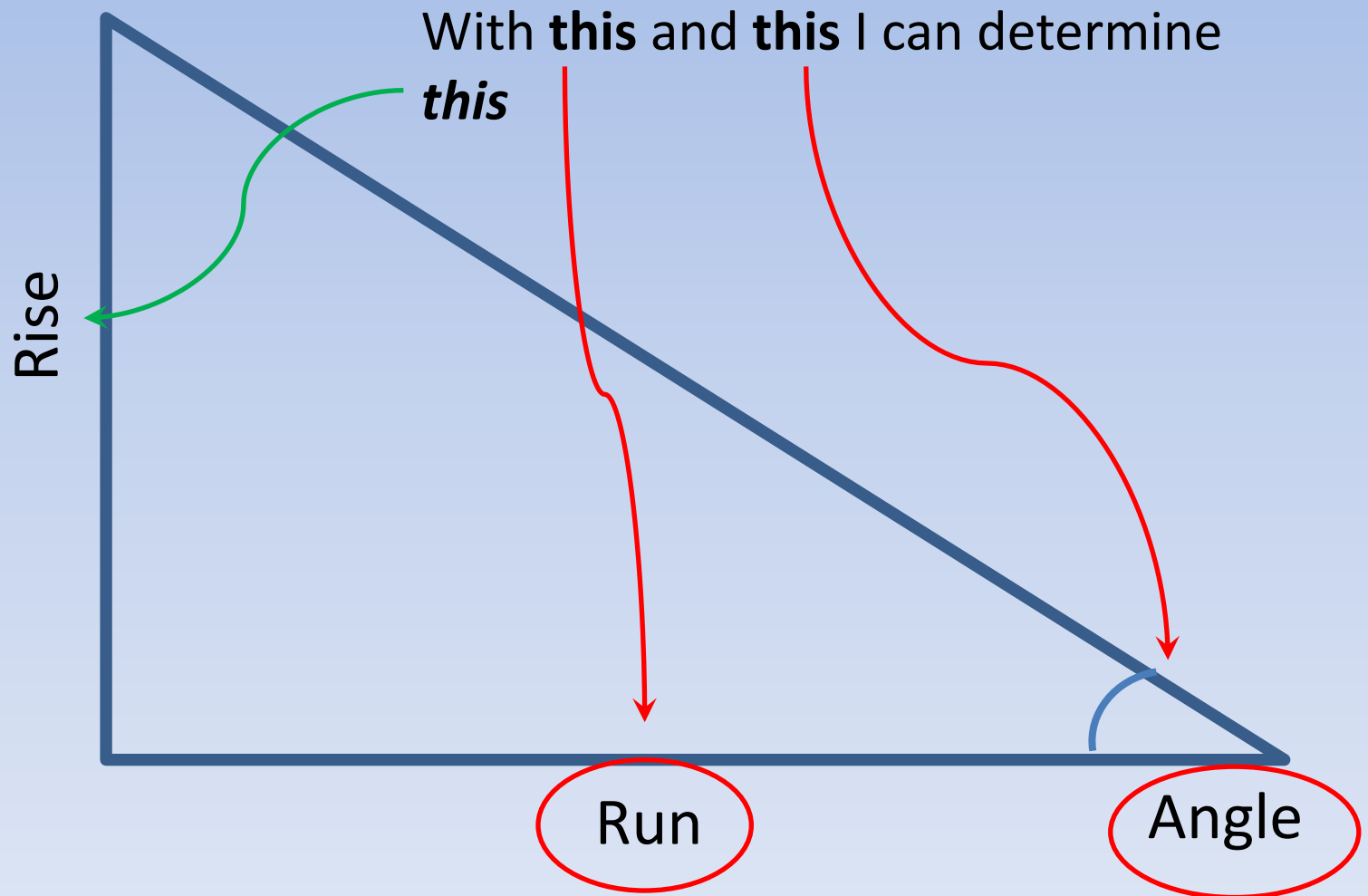








# Magic of Trigonometry



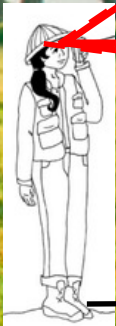
Level Ground

### 3 measurements

1. Angle to top of tree
2. Angle to base of tree
3. Distance observer to tree

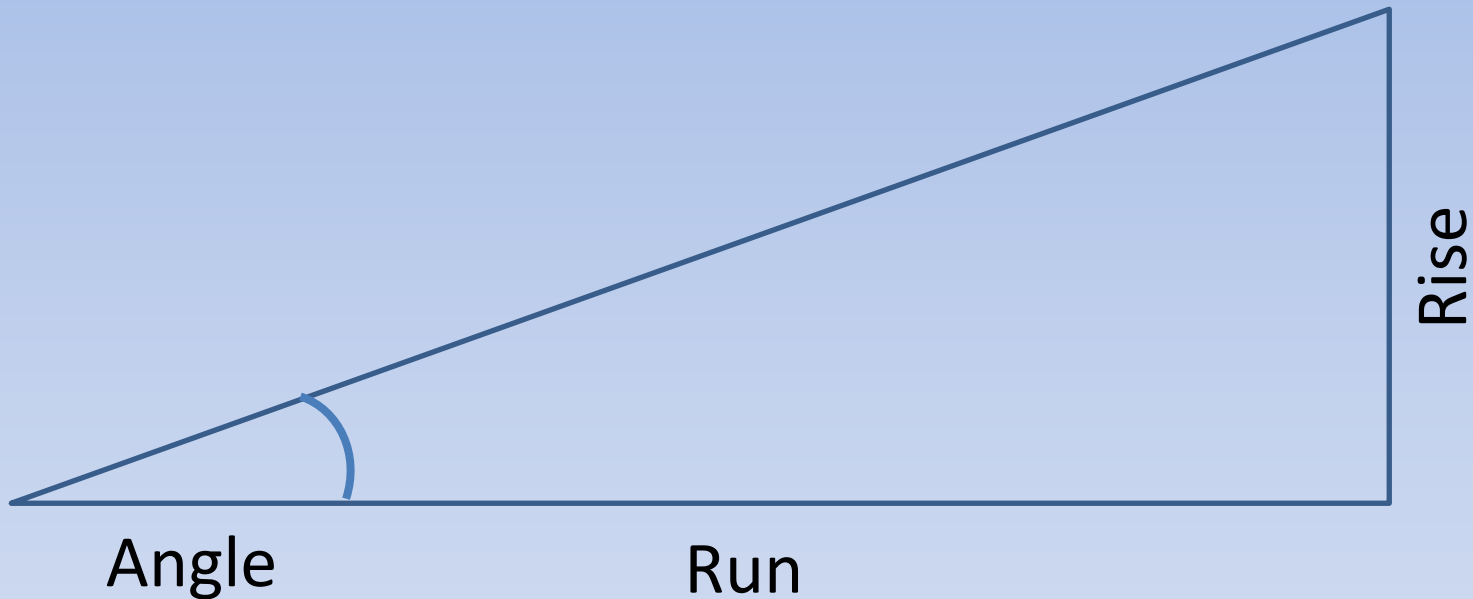
*Right Triangle 1*

*Right Triangle 2*





# Tree height calculations – the triangle



$$\text{Rise} = \text{Angle } (\%) \div 100 \times \text{Run}$$

Assume:

Angle (triangle 1) = 60%; Angle (triangle 2) = 15%

Total angle = 75%

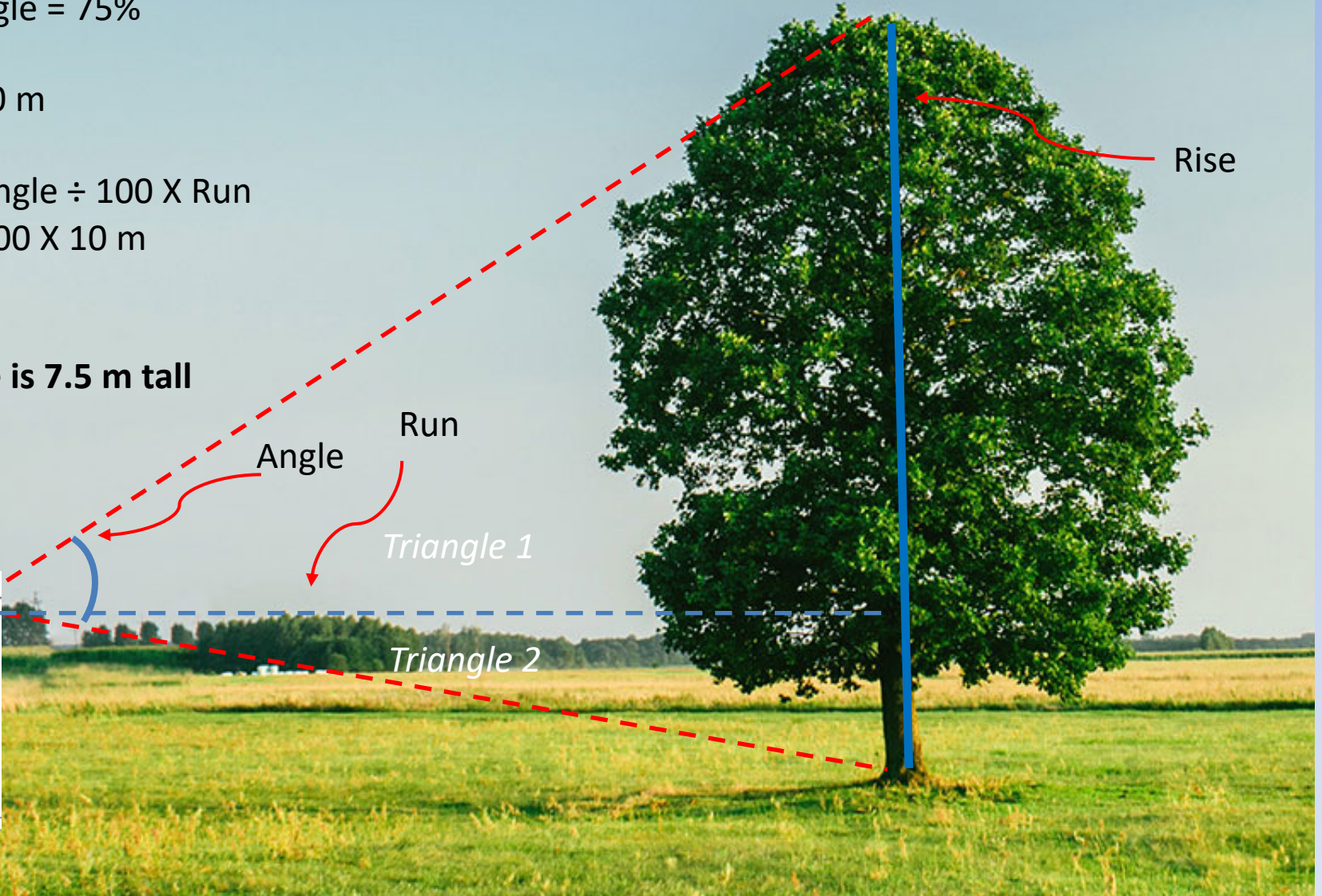
Run = 10 m

Rise = Angle  $\div$  100 X Run

75%  $\div$  100 X 10 m

7.5 m

**The tree is 7.5 m tall**





# Looking downslope

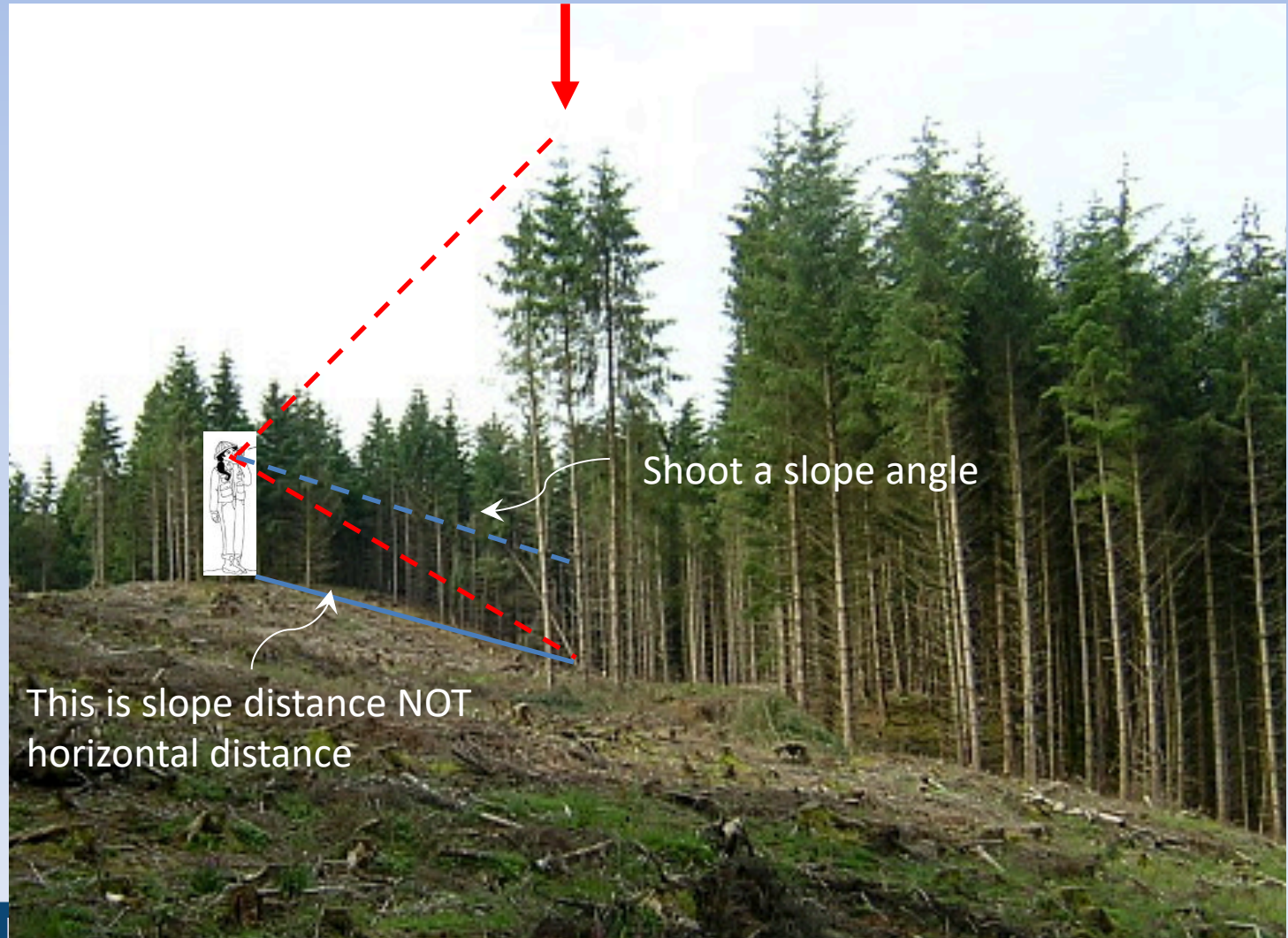


Assume slope distance = 15.2 m and slope angle 15%

Horizontal distance = slope distance X slope correction factor

Slope correction factor for 15% = 0.9889

**Horizontal distance = 15.2 m X 0.9889 = 15.0 m**





Assume:

Angle (triangle 1) = 85%;

Angle (triangle 2) = 25%

Total angle = 110%

Run = 15 m

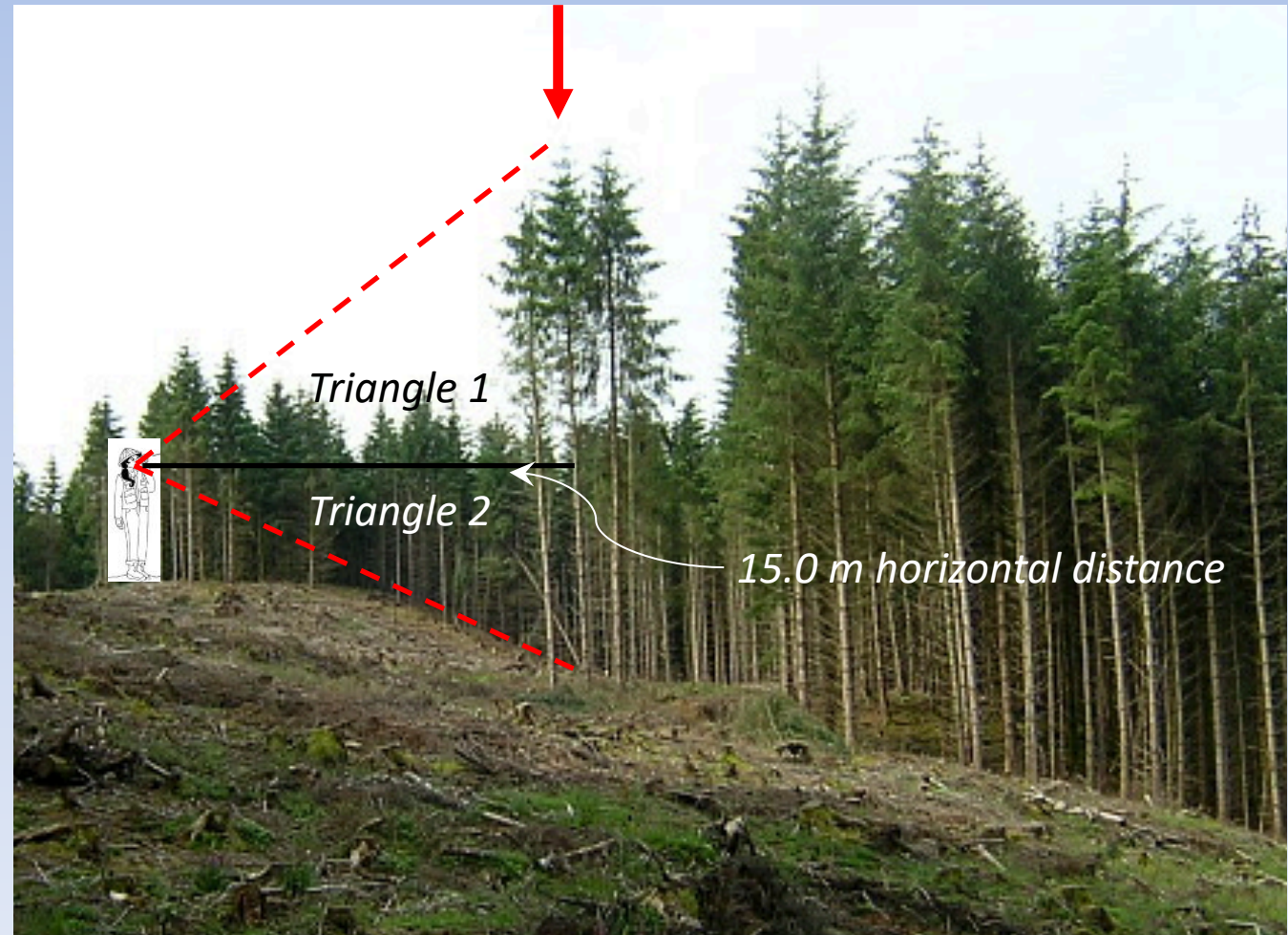
Rise = Angle  $\div$  100  $\times$  Run

110%  $\div$  100  $\times$  15 m

16.5 m

**The tree is 16.5 m tall**

# Looking downslope



# Looking upslope





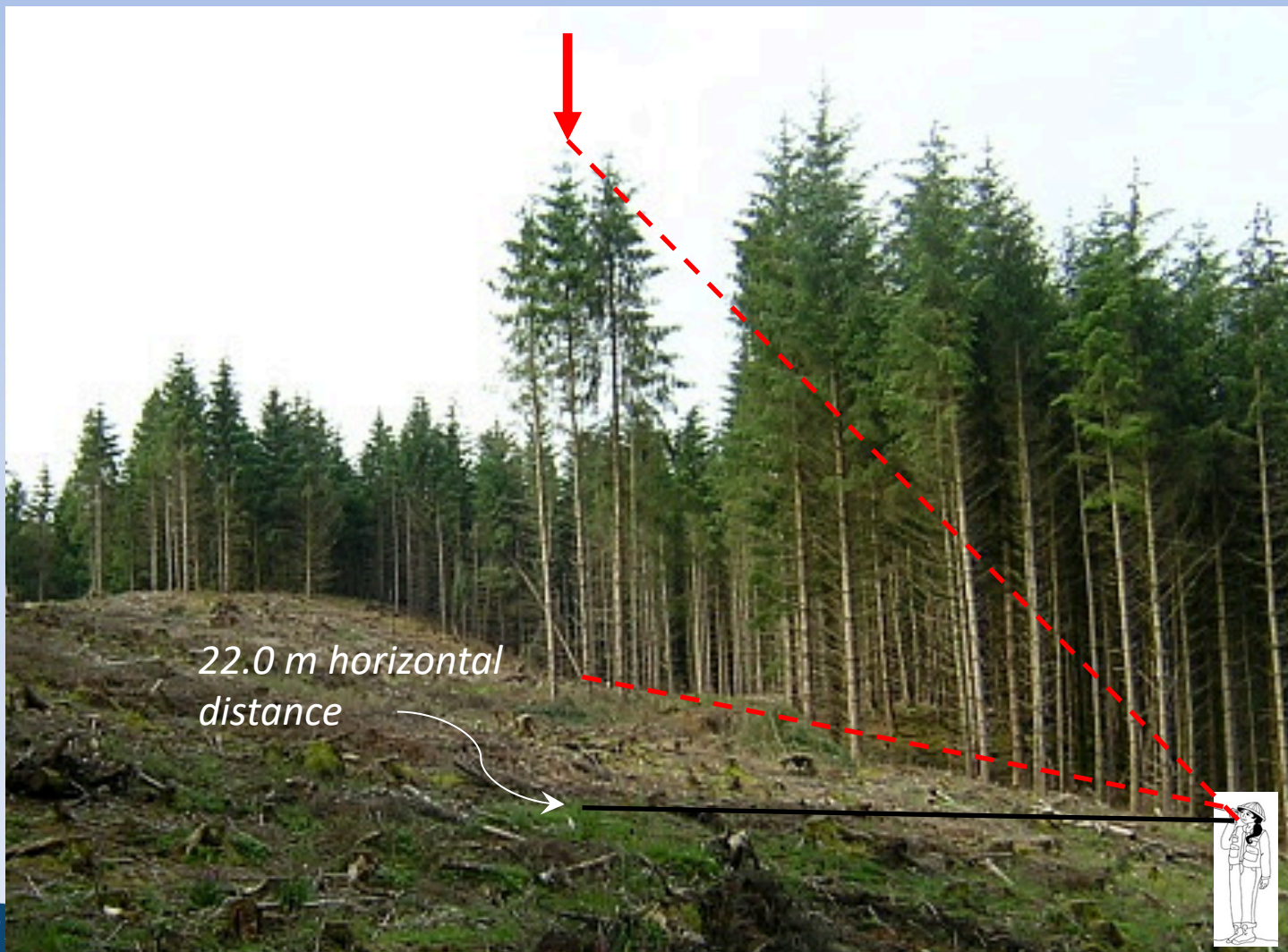
Assume slope distance = 22.7 m and slope angle 25%

Horizontal distance = slope distance X slope correction factor

Slope correction factor for 25% = 0.9701

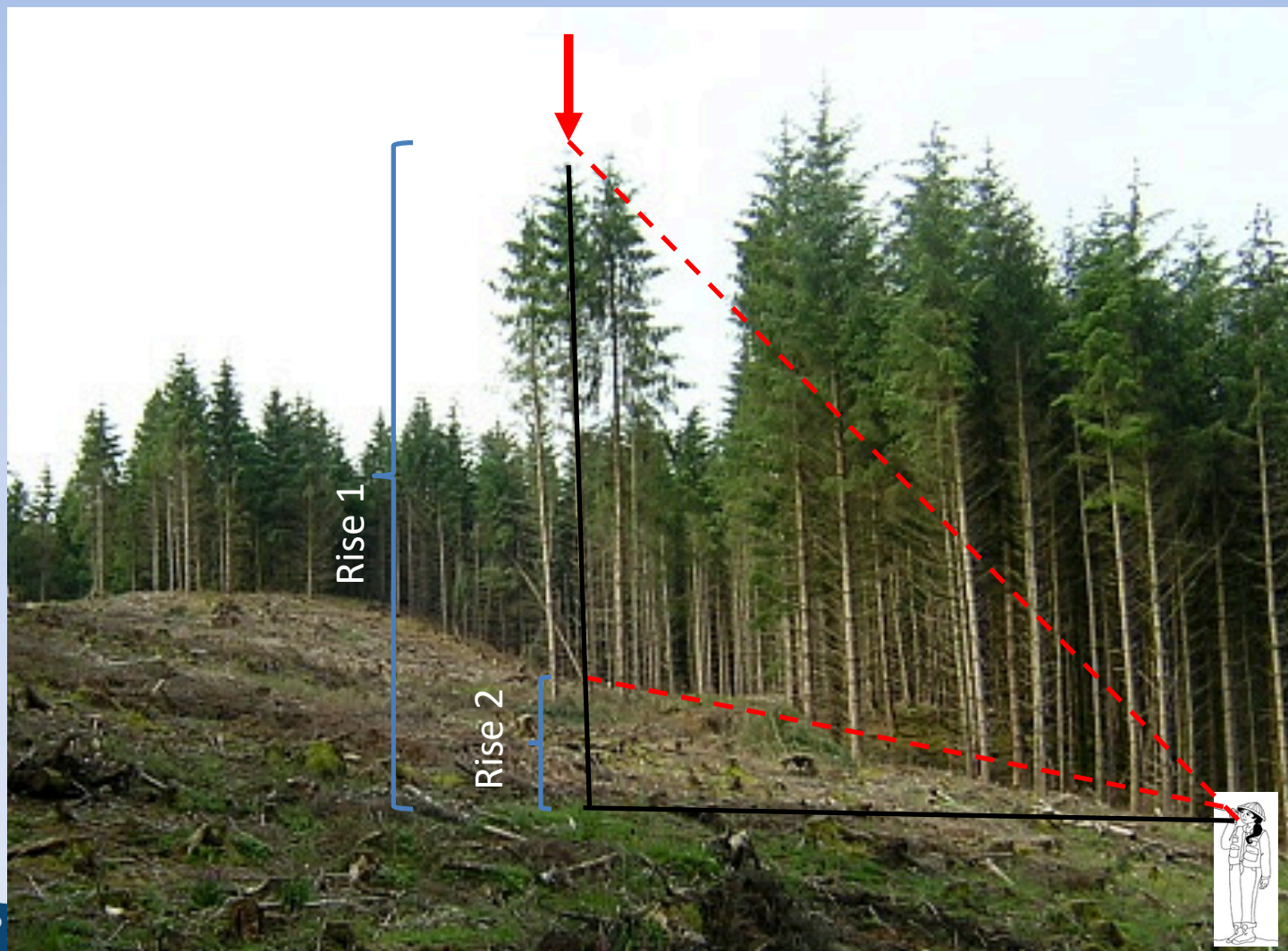
**Horizontal distance = 22.7 m X 0.9701 = 22.0 m**







Tree height = Rise 1 – Rise 2



Assume:

Angle (triangle 1) = 105%; Angle (triangle 2) = 30%

Run = 22 m (from previous calculation)

Rise = Angle  $\div$  100 X Run

Rise 1 = 105%  $\div$  100 X 22 m = 23.1 m

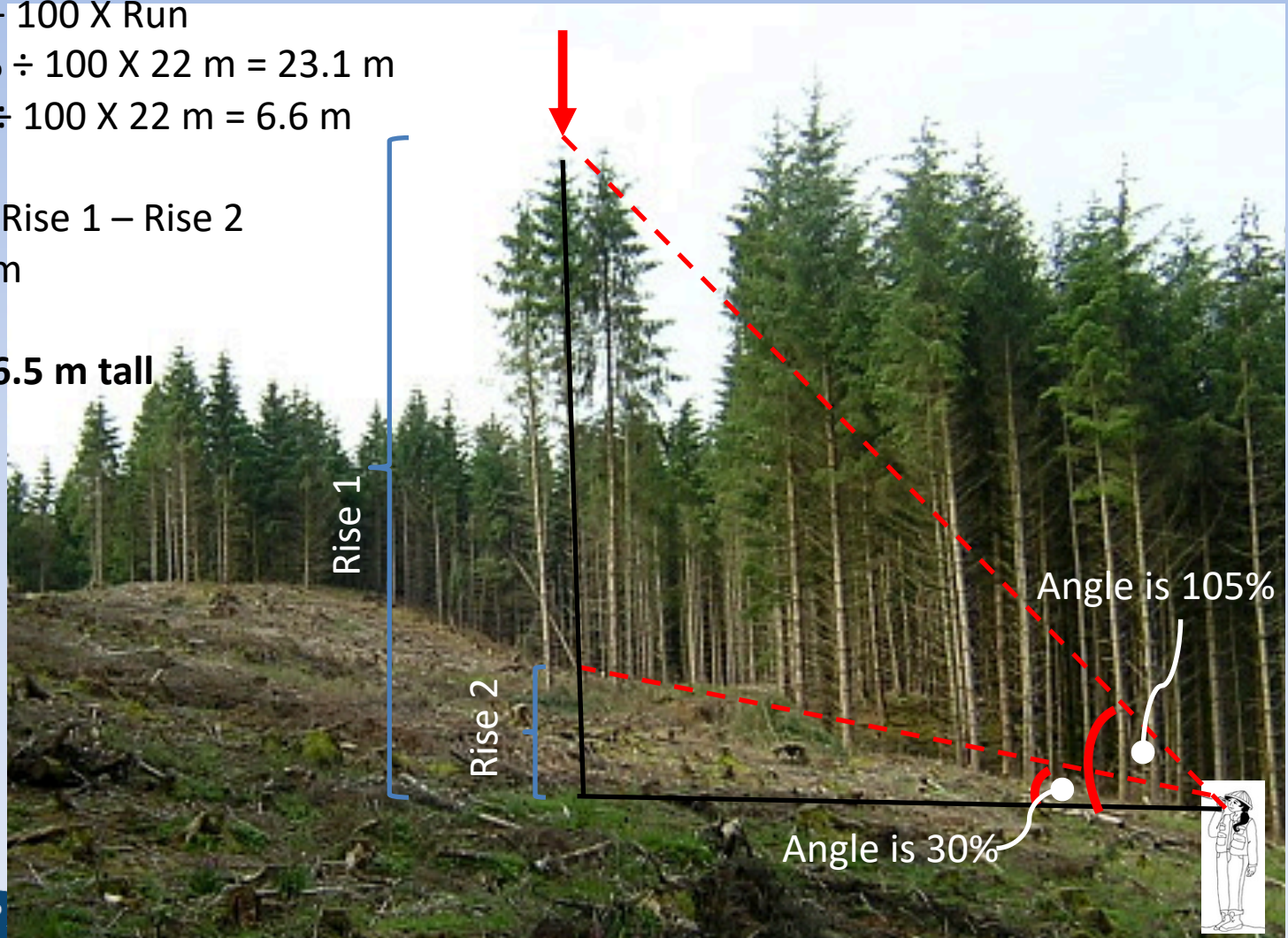
Rise 2 = 30%  $\div$  100 X 22 m = 6.6 m

Tree height = Rise 1 – Rise 2

23.1 m – 6.6 m

16.5 m

**The tree is 16.5 m tall**





# Take Home Message

- On level ground we use our measured distance as the run – there is no need to correct slope to horizontal distance
- Shoot angles to top of tree and base of tree
- Calculate height

# Take Home Message

**When upslope of tree:**

- 1. Have to correct slope distance to horizontal distance**
- 2. Shoot angles to top of tree and base of tree**
- 3. Calculate height**



# Take Home Message

**When downslope of tree:**

- 1. Have to correct slope distance to horizontal distance**
- 2. Shoot angles to top of tree and base of tree**
- 3. Calculate heights**
  - Total rise from run to top of tree (Rise 1)**
  - Rise from run to base of tree (Rise 2)**
- 4. Subtract Rise 2 from Rise 1**

# Essential Skill #12: Herpetofaunal Surveys and Identification





# Amphibians

Frogs

Wood frog



Western toad



Toads

Tiger salamander



Caecilian (legless lizard)



Caecilians





# Reptiles

*Snakes*



*Lizards*

*Turtles*



*Crocodiles*



# Safety

Coral snake



Snapping turtle



Gila monster



American alligator





# Why we survey

- Protection of species
- Protection of environment
- Public safety

Louisiana pine snake – one of rarest snakes in US



Timber rattlesnake – potential human hazard



Red-backed salamander – an indicator of forest condition

# Survey methods for amphibians

1. Visual surveys
2. Acoustic surveys
3. Egg mass searches
4. Trapping larval stages
5. Trapping adults

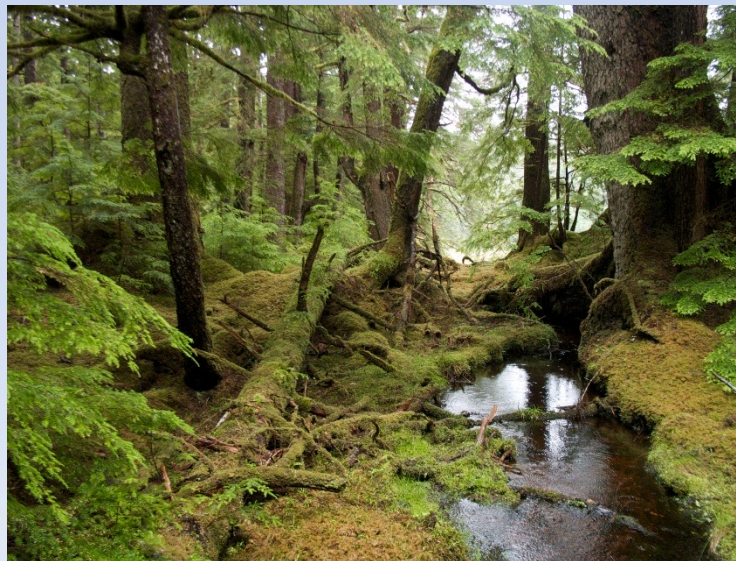


# (1) Visual searches (frogs, toads, salamanders)

Shoreline survey



Looking under objects



Salamander  
habitat – moist,  
wet, abundance of  
cover





## (2) Acoustic surveys (frogs)



### (3) Egg mass surveys

Salamanders



Sorin Damian 1995

Toads



Frogs





## (4) Trapping larval amphibians

Minnow trap

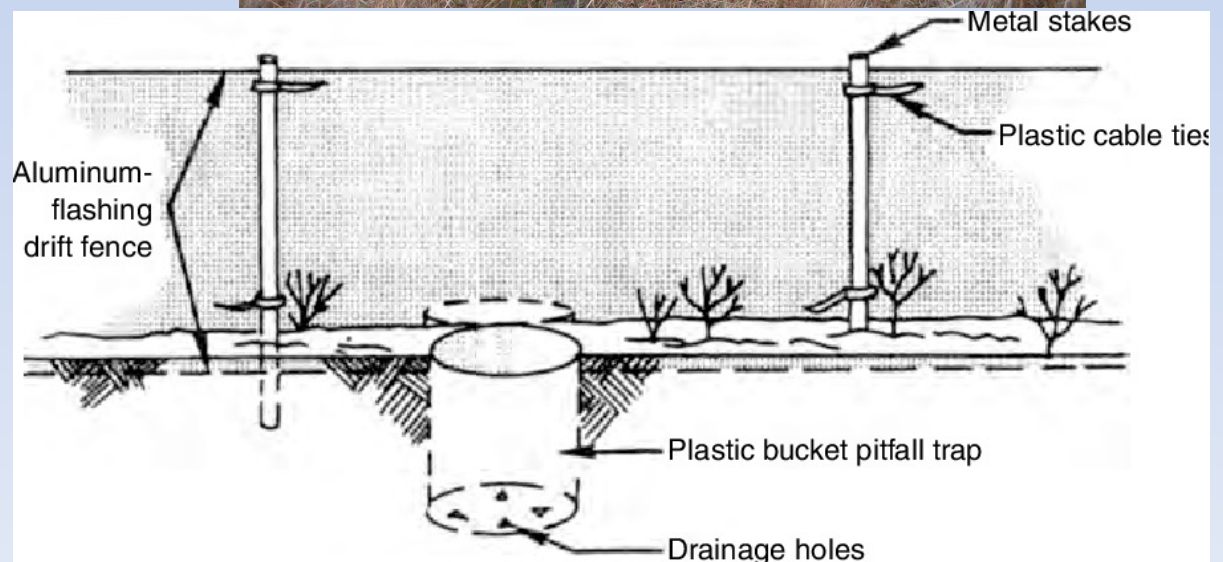


Homemade minnow trap



## (5) Trapping adult amphibians

Drift fences and  
pitfall traps





# Survey methods for reptiles

1. Visual surveys
2. Cover boards
3. Drift fence and funnel trap
4. Hibernacula

# (1) Visual surveys

Basking collared lizard



Use binoculars



# Visual survey – road survey

Snake basking on road



Biking gravel road shoulders  
looking for reptiles



# Visual survey – night surveys



Snapping turtle female  
digging a nest

Alligator eyes at night



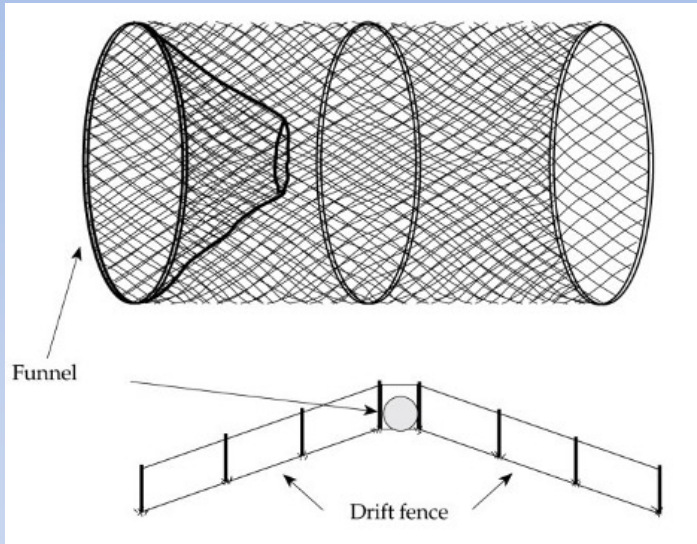


## (2) Cover boards





### (3) Drift fence and funnel trap





## (4) Hibernacula

Garter snakes emerging from  
hibernacula – southern Saskatchewan



# Essential Skills 11 and 12: summary

This week we focused on:

- A universal and critical skill to measure anything higher than we can reach.
- Importance of, and some ways to survey for, reptiles and amphibians.