Glacier National Park
Winter Ecology Field Notes

A. Introduction

Humans and all living things in northwest Montana have adaptations that help them cope with winter. Today you will get a chance to look more closely at the different strategies organisms use to survive winter here. You will also make some calculations and observations to determine what role snow plays in survival.

Each group will have a winter pack with:

___ Clipboard & Pencil
___ Shovel
___ 2 Foam Sitting Pads
___ Wind Chill Chart
___ Snow Crystal Chart
___ Magnifying Glass(es)
___ Mammal Track ID Card
___ Map & Aerial Photo
___ Winter Tree Key
___ Compass
___ Calculator
___ Wind Speed Meter
___ Ruler
___ Tin Can
___ 2 Thermometers
___ Spring Scale

Name(s): _____ Pack #_____

School: _____ Teacher: _____

Date: _____Start Time: _____ End Time: _____

Location: _____

Weather Conditions:
Air Temperature=_____ Wind Speed = _____

Wind Chill (use chart)=_____ % Cloud Cover = _____

Other Observations (snowing, raining, etc...) = _____

B. Animal Signs

#	Sign	Location	Description
1	Scat	on trail	dry, full of gray fur, 3 small clumps, fox?
2	Track	across trail	deer - (3), heading west fr. creek
3	Animal Sighting	trailhead	Pileated Woodpecker drilling on lodgepole snag.
4			
5			
6			
7			

C. Snow Pit Profile

Example:

Surface - icy crust
Soft, and fluffy
Icy
Medium hardness
Loose, like sugar

Your Snow Pit Profile:

D. Snow Pit Observations

1. Location of snow pit _____

2. Snow crystals (use classification chart to describe falling snowflakes or most dominant type in surface layer of snow).

_____.

(Ask your ranger if you should also fill in the snow pit profile, part C.)

3. Measure **snow depth** from top to bottom of pit = _____cm

4. Surface Snow Temperature _____ Middle of pit Temperature _____ Temperature at ground_____

5. Compare the temperatures from the top of the pit with the middle and bottom. How could the different temperatures influence organisms in winter? The different snow layers?

Calculating Snow Water Equivalent: The amount of water in the snowpack or the depth of water resulting if you melted all the snow.

6. Find the mass of empty can + bag = _____ grams (g)
7. Find the **snow mass** from different sections of the pit.

a. **Top** = _____g - _____= _____g
(mass of can with snow) (can & bag mass) (snow mass)

b. **Middle** = _____g - _____= _____g
(mass of can with snow) (can & bag mass) (snow mass)

c. **Bottom** = _____g - _____= _____g
(mass of can with snow) (can & bag mass) (snow mass)

8. Now, calculate the **snow density** of the different sections.

Snow mass (#7) / volume of can = **snow density**
[Volume of tin can = (pi)r^2h = (3.14)(2.5 cm)^2(8 cm) =157 cm^3]

a. _____ / 157 cm^3 = _____ g/cm^3 [X 100=_____%]
(snow mass **top** #7a) (snow density **top**)

b. _____ / 157 cm^3 = _____ g/cm^3 [X 100=_____%]
(snow mass **middle** #7b) (snow density **middle**)

c. _____ / 157 cm^3 = _____ g/cm^3 [X 100=_____%]
(snow mass **bottom** #7c) (snow density **bottom**)

9. Compare the **snow density** at the top of the pit with the density in the middle and at the bottom. How did your sections compare?

10. Now calculate the **average snow density** (use decimals not %)

(#8a + #8b + #8c) ÷ 3 = _____g/ cm^3

11. Finally, calculate **SWE**, **snow water equivalent**

_____g/ cm^3 X _____= _____cm
(average snow density #10) (snow depth #3) (SWE)

12. Scientists are noticing that more of our precipitation is falling as rain each year, rather than snow. How could that affect people and organisms living in mountain ecosystems? Living in other areas?

13. Ask the rangers (or research when you get back to school) things that are being done and that we can all help to do, to continue to be good stewards of our water resources as conditions change.