NATO Cold Weather Survival Webinar

"If you can fight and survive in the extremes of the Arctic, you can fight anywhere in the world"

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Contents

- ✓ Intro Winter Survival
- ✓ Equipment and clothing
- ✓ Making fire
- ✓ Shelters
- ✓ Movement and navigation
- ✓ Evasion considerations
- ✓ Signaling
- ✓ Water and food
- ✓ LFTS

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” We learned that one cannot defy nature, but must adapt and accommodate oneself to her.

Nature will not change; it is man who must change, if he is to live in conditions where nature is dominate”

Knut Haukelid *(“Skies against the atom.” One of the heroes from Telemark.)*

History

- ✓**218 B.C: Hannibal in the Alps**
- ✓***1718: Gen Carl Gustaf Armfeldt.***
- ✓***1812 – 1813 Napoleons invasion of Russia***
- ✓***1914 – 1918 WW I***
- ✓***1939: The Russian invasion on Finland (The winter war)***
- ✓***1942 – 43: WW 2 (Stalingrad)***
- ✓***1982: Falkland war***
- ✓***1991: Iraq. SAS patrol Bravo Two Zero***
- ✓***2005 Afghanistan***
- ✓***TODAY Ukraine***









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Cold weather environment

- ✓ **Cold Weather Operations** are defined by NATO as *"The whole spectrum of the forces possible operations occur at temperatures of +8 C and below"*
- ✓ **Winter** is defined as occurring at temperature of 0 C and below

Types of climate

- ✓ Scandinavia
- ✓ Eastern European countries
- ✓ Middle East

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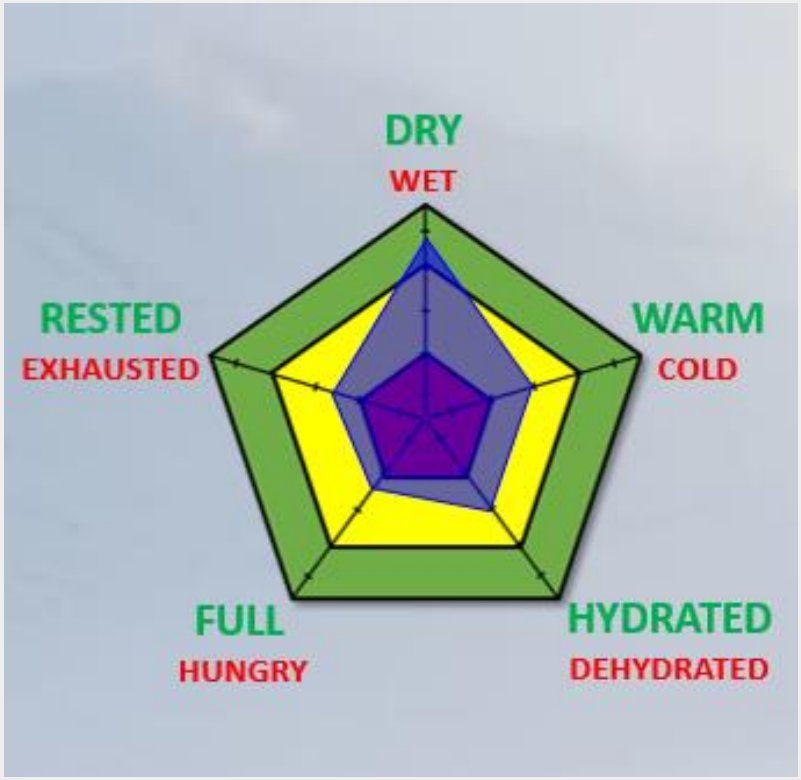
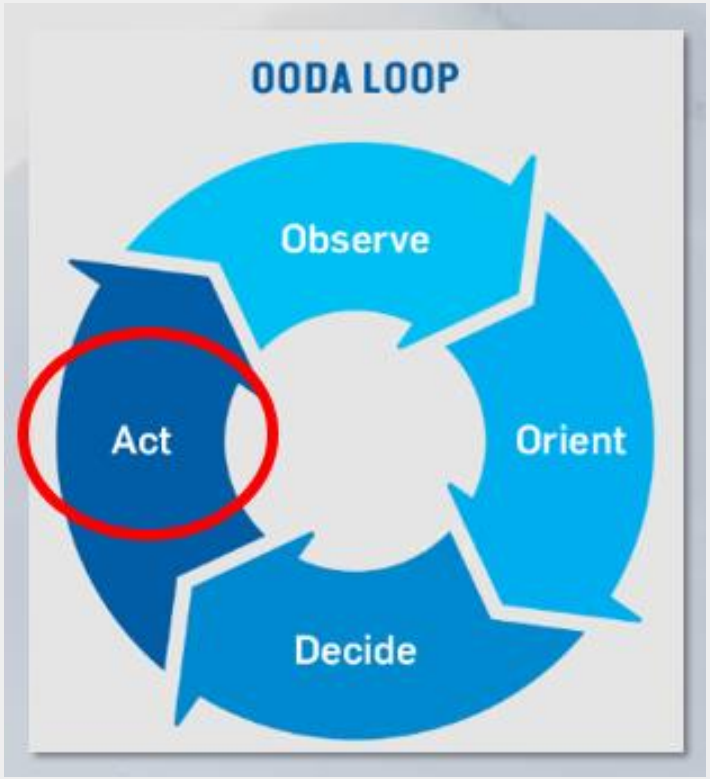
Survival depends on these factors

Monitor your status



Take action when necessary



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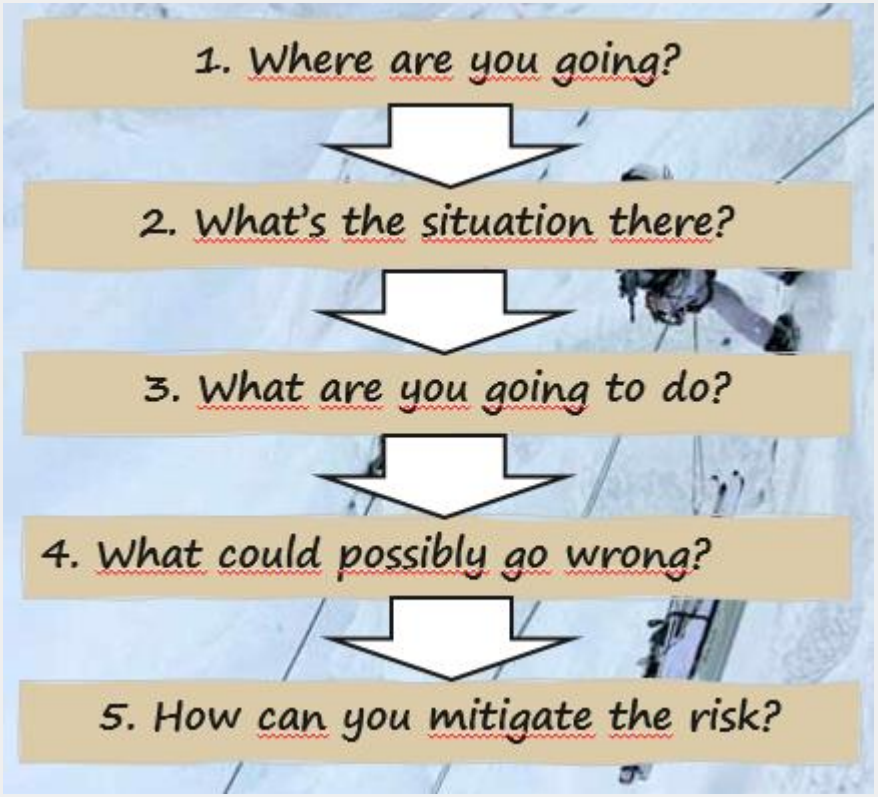

Questions?

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Equipment

✓ **Knife**

Good all-round full tang knife, blade is +- 10cm

✓ **Axe**

Good all-round axe, approx. 50cm long and 1kg heavy

✓ **Fire steel**

Good ferrocerium rod, with a good striker

✓ **Survival tarp**

Loops to hang it up, water and wind proof, whiteout insulation materiel

✓ **Sleeping bag**

Made of synthetic fiber, easy to dry, resist to sparks and fire.

✓ **Sleeping mat**

Not inflateble, R-value above 5

✓ **Mess-tin**

Approx 0,5 l/ 16oz, should have a lid and handle. Should have the possibility to hang it over the fire.







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Clothing
20% clothes 80% skills and knowledge

1930

2023

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Loss of body heat

Circulation:

- ✓ A specially in cold wind or in water with little clothes on.

Physical contact:

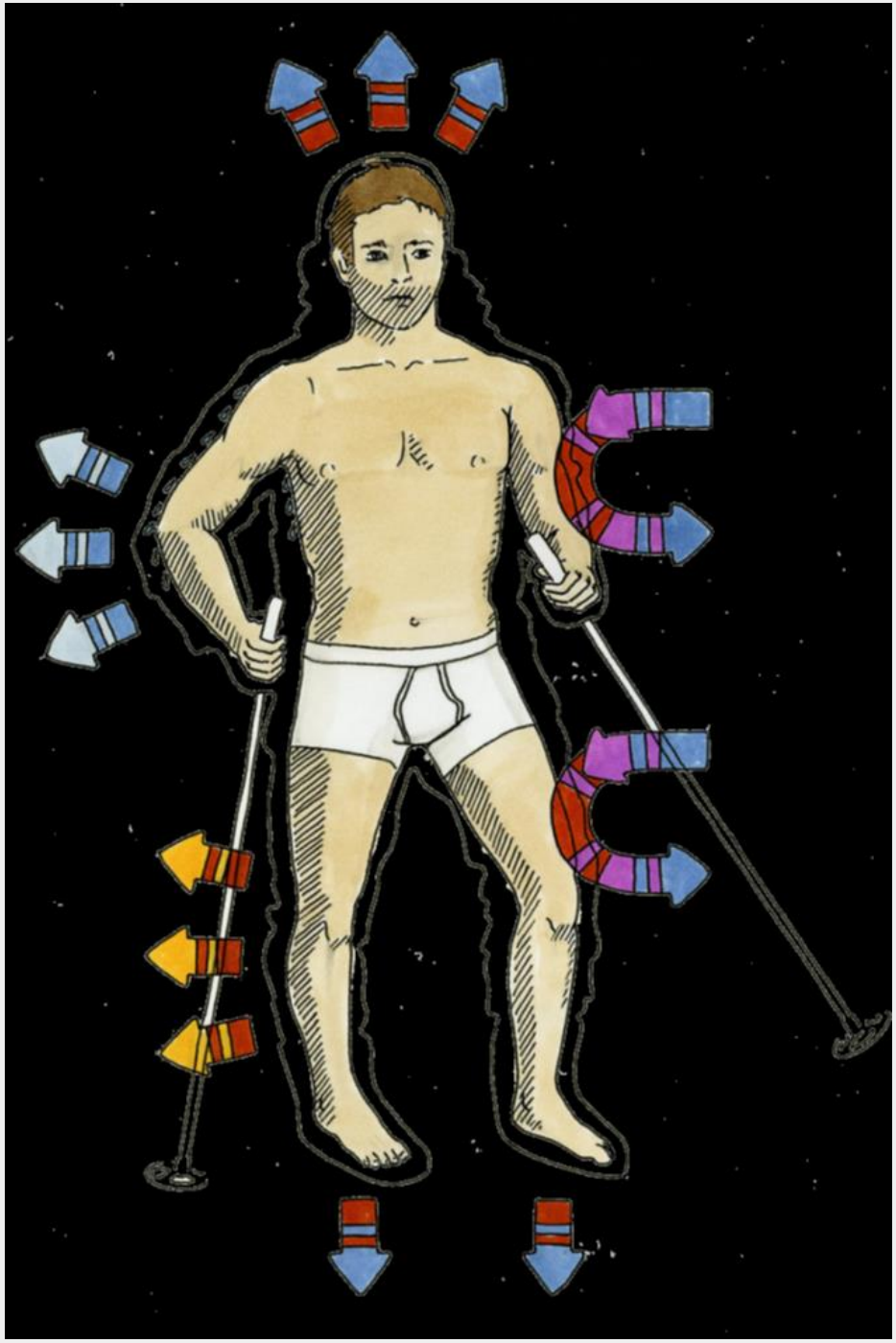
- ✓ A cold sleeping mat, cold boot soles "steals" body heat

Radiation:

- ✓ When humans "hang out" in temperate surroundings, 70% of our heat loss comes from radiation. Very little affect when people are dressed in winter time. Greatest heat loss from head and neck.
- ✓ You also lose quite a lot of warmth from your hips.

Evaporation:

- ✓ Sweat/ breath: when calm – loss of about 2,5 l pr 24 hrs, when at work you lose up to 3 l/hr.



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Temperature and wind

Wind speed		Air temp/Celsius										
Km/t	M/S	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
20	6	-5	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68
30	8	-6	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
40	11	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
50	14	-8	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76
60	17	-9	-16	-22	-30	-36	-43	-50	-57	-64	-71	-78
70	19	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80
80	22	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

	Uncomfortable, low risk of bare skin freezing.
	Very cold, a considerable risk of bare skin freezing.
	Seriously cold, bare skin could freeze in as little as 10 mins.
	Extremely cold, bare skin could freeze in as little as 2 mins.

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Principles of Clothing

- ✓ The clothing itself does not keep you warm
- ✓ The right body temperature
- ✓ Layering - multiple thin layers
- ✓ Regulate your clothing
- ✓ A soldier in combat has few possibilities to choose the level of activity, he has to act according to the situation

LOOSE FITTING

Outer layer; wind-, waterproof and ventilating

Membrane (gore-tex, triplepoint etc)

+ dries quickly
+ 100% windproof
+ 100% waterproof
+ lighter

- breathes?
- membrane gets dirty
- are colder
- not flame resistant

Cotton

+ breathes
+ windproof
+ water resistant?
+ are warmer
+ flame resistant

- absorbs moisture
- dries slowly

- ✓ Use wool sock, two layer. One thin and one thick
- ✓ Boots must be roomy to have space for isolation insoles and the necessary amount of socks, and still have room to "play piano" with your toes.
- ✓ Use some kind of over-boots / gaiters to protect the boots from moist, and give extra isolation
- ✓ Membrane boots are not recommended to be used in the wintertime for several consecutive days, without having proper drying facilities

Vapor barrier

- ✓ PURPOSE
  - – Prevent isolating layers to be wet from sweat
- ✓ PROS
  - – Only one pair of thin socks to dry
  - – Keeps your feet warm for a prolonged time during field condition with poor to none drying opportunities
  - – You can use membrane based shoes, shoes with heavy isolating and waterproof shoes like randonee boots, without hampering with the isolation
- ✓ CONS
  - – Your feet are damped close to the skin and need to dry up at least once a day

Headgear

- ✓ Always bring two sets off headgear
- ✓ One to use when you're active / sweating
- ✓ One too use while resting

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Mittens

- ✓ Shell mittens
- ✓ Wool mittens
- ✓ Wool finger gloves

- ✓ Combat gloves

- ✓ KEEP THEM DRY AND NEAR THE BODY!!

Wet is cold!

Situation	Wet form the inside	Wet form the outside
Rain and snow		X
Movement in general	X	
Movement in thick forest	X	X
Building shelter	X	X
Collecting firewood	X	X
Poor shelters		X
Siting in front of a fire with snow covered clothes		X
Digging in the snow	X	X
Sitting / laying in the snow		X

Protect critical items

- ✓Dress as cold as you dear, when in activity. Don't unnecessary sweat out your clothing
- ✓It is just as important not to be to warm as it is not to be to cold
- ✓Save the warm clothes till you take a rest
  - Pack critical items waterproof
  - The warm headgear
  - The warm mittens
  - One pair of socks
  - Spear next to skin layer
  - Reinforcement layer as JIB and thick sweaters
  - Sleeping bag
- ✓Work wet and rest dry

Drying of clothes

Priorities everything that is next too skin, headgear, mittens and socks.

- ✓ By the fire / tent. Mind the temperature.
- ✓ During warm hours in the day
- ✓ Freeze dry moist and brush it off as ice
- ✓ True slow movement
- ✓ On your body
- ✓ Between the body and the isomat / isolation when you sleep
- ✓ Put boots under you knees when you sleep
- ✓ In you survival sheet
- ✓ The snowbrush is your number one weapon against moist from snow on your clothing – use it

Questions?

15 min break

Fire making

- ✓Challenges
  - Cold air suppresses air flow
  - Snow on the ground makes a cold and wet base
  - Snow on the ground makes the fire melt down in a pit with less to non air (O2) suffocating the fire
  - Everything from tinder to logs is apparently covered with snow and ice.

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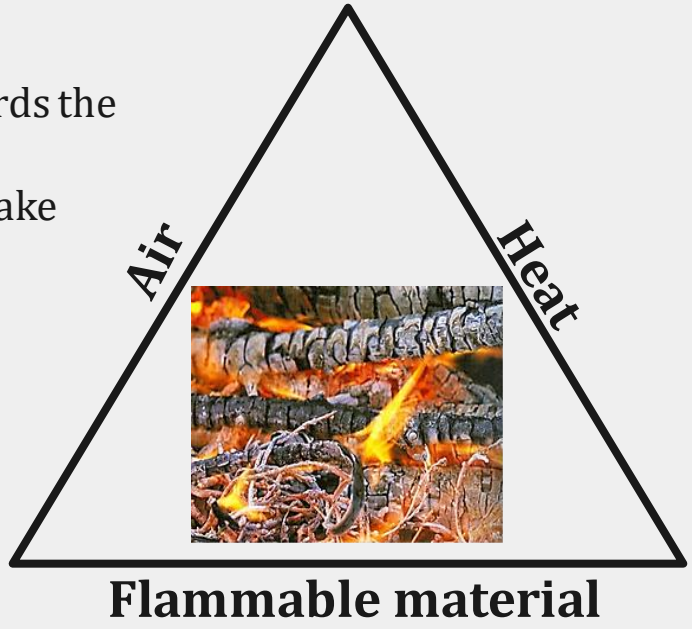
Take care of the fire when it's small, and it will take care of you when it's big

- Base of logs towards the ground
- Digg down and make ventilation shafts
- Air funnels
- Blow



- Enough heat in the beginning to heat up and dry firewood, this means;
  - More tinder
  - More kindling
- Have ready backup tinder and kindling in case you need more energy
- "Fuel" is dry pine and spruce branches, grey and no bark
- Don't put on next step before the flame has eaten through current step and is strong and rising

- Natural tinder need to be DRY, THIN, AIRY and have LARGE SURFACE
- Birch bark flakes, so even when icy and wet on the outside, it's dry on the inside.
- Dry thin spruce branches could be harvested under the tree, low and close to the stem where it's protected by the trees snow-covered canapé.
- If you cant find anything dry you have to use core wood. Underarm sized logs need to be processed into your fire steps from tinder to "fuel"

Base

Tinder

Kindling

«Fuel»

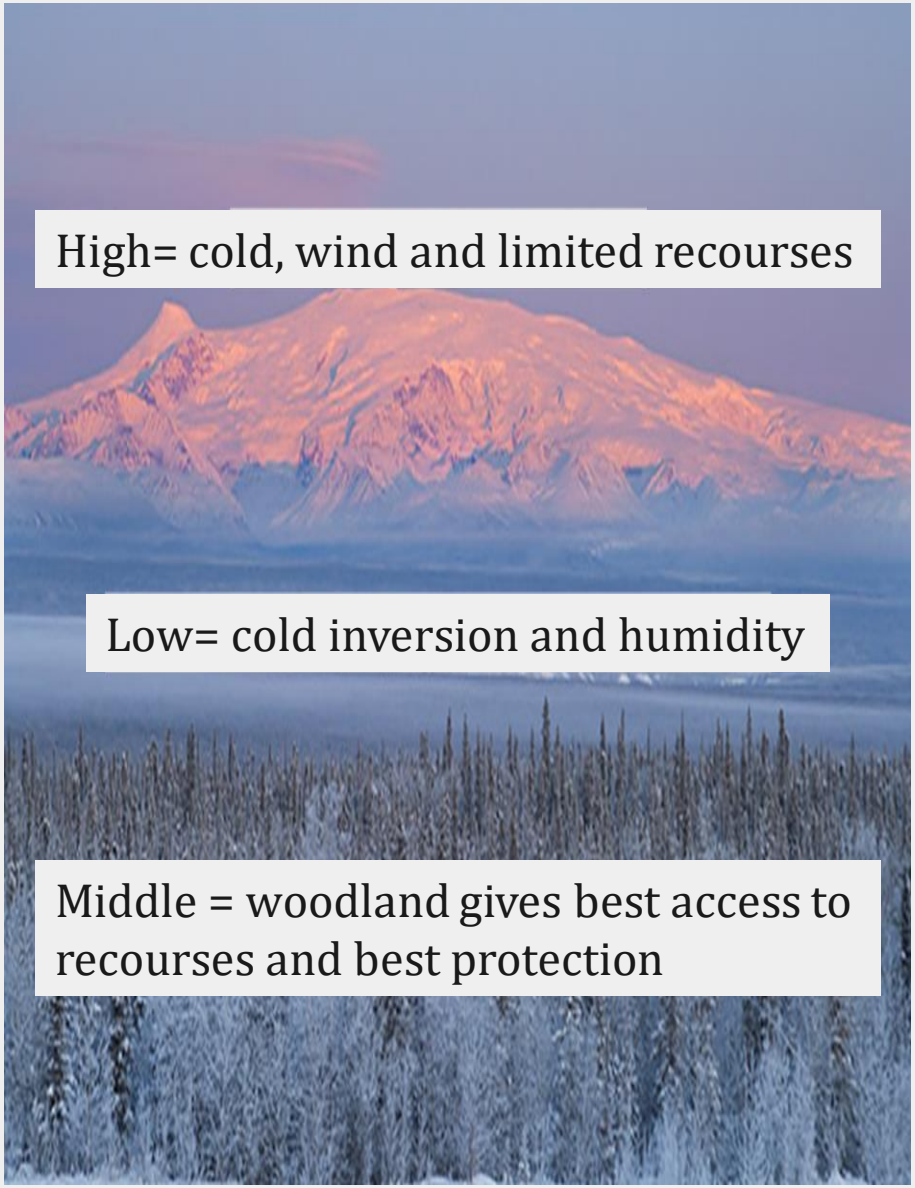
Processed core wood

Top lit fire

Questions?

Shelter

- ✓ High, but low. (picture)
- ✓ Trap and hold warm air
  - Not to big
  - Protection from 3 sides
  - Insulation towards ground (min 30 cm compressed bow bed)
  - Aligned or higher than the fire
  - Fire with reflector
- ✓ Close to recourses PLWF
- ✓ BLISS
- ✓ Shelter types
  - Tarps / survival sheets
  - Woodland
  - Snow shelters



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Tarps / survival sheets (short term shelter)

A- frame construction

A- frame in use

Diamond construction

Diamond in use

Woodland (long term term shelter)

Closed lean too

Buddy lean too

Spruce hut

Tipi / lavou

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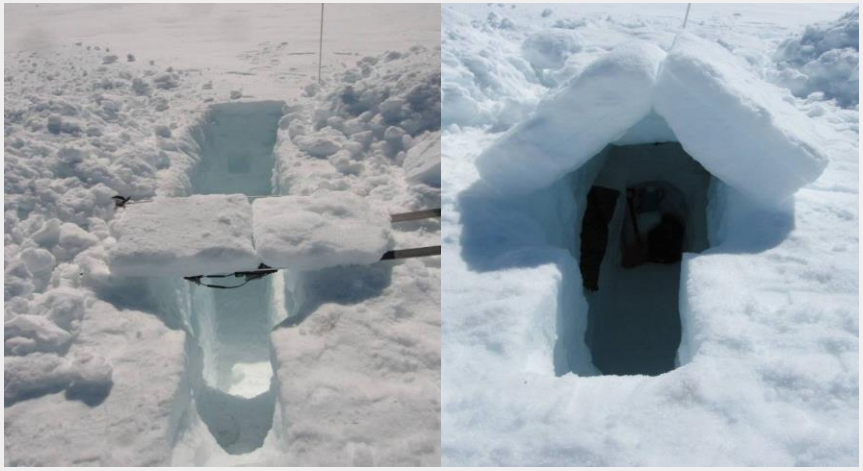
Snow shelter

Woodland Snow trench (short term)

Woodland Quinzhee (long term)



High mountain Flat pit (short / long term)

High mountain Edge pit (Short term)

Questions?

Movement

Terrain features that may disappear

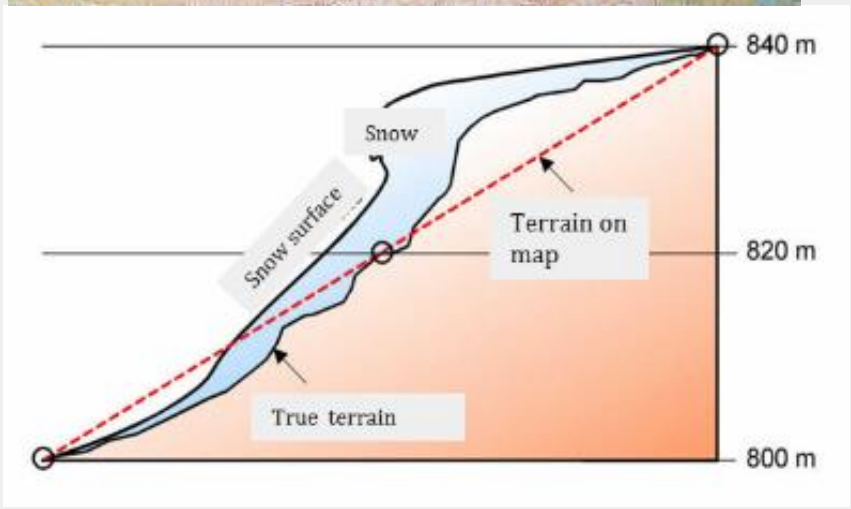
- Marshes
- Creeks
- Roads
- Paths
- Small lakes

Terrain that stands out and becomes more visible

- Ravines and gully's.
- Dominating formations.
- Open areas in terrain or in vicinity of powerlines, roads, harvested forest etc..

Snow doesn't only wipe out

Hidden terrain



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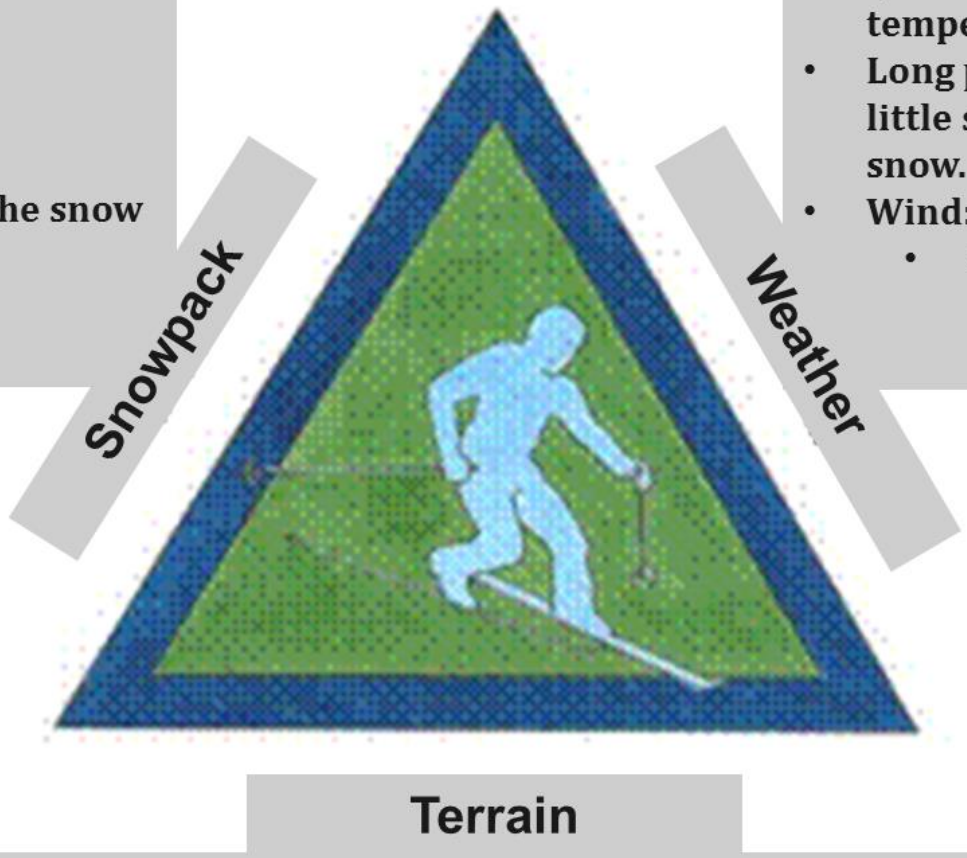
4 factor avalanche hazard assessment

- Tension in the snow cover.
- Self triggered avalanches.
- Weak layers:
  - ✓ Whoomps
  - ✓ Cracks in the snow

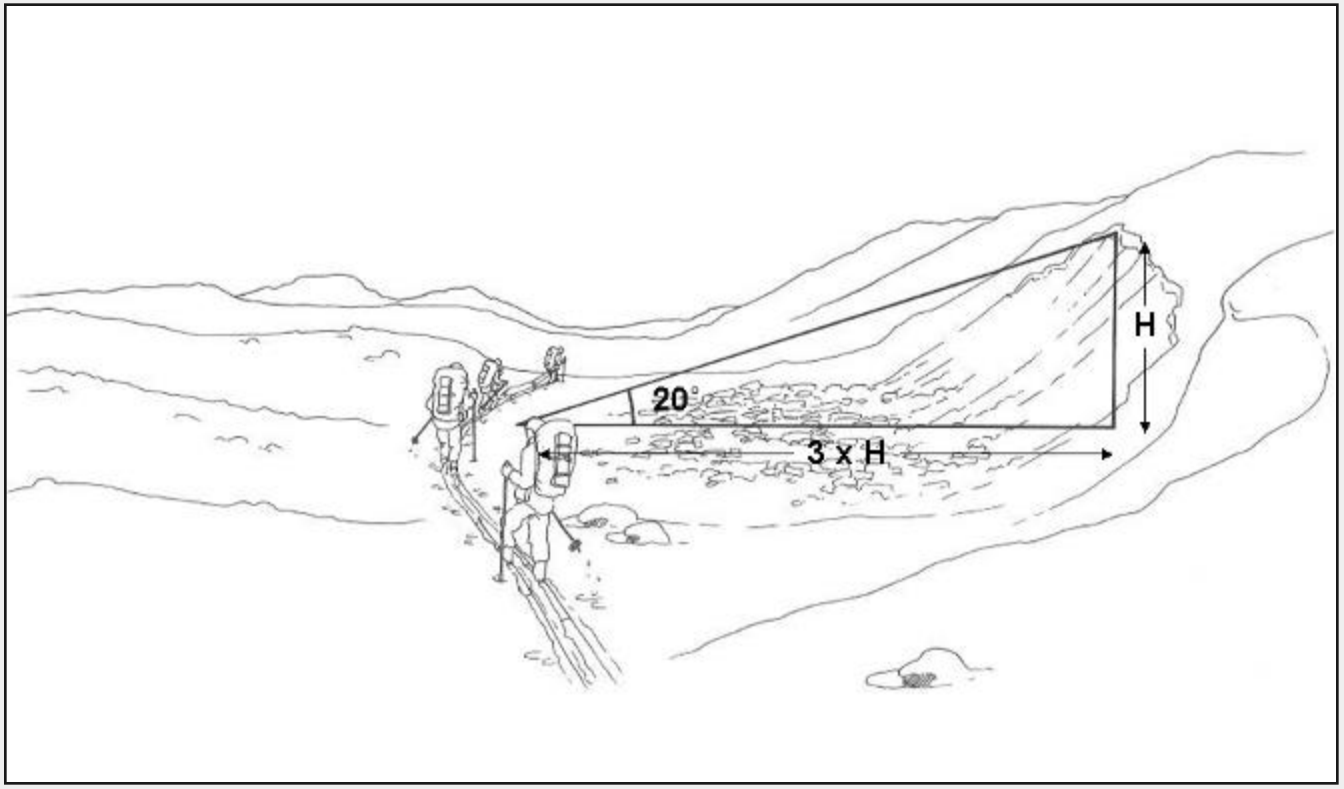
- Precipitation, snow or rain.
- Quick changes in temperature.
- Long period of cold and little snow, with sudden snow.
- Wind:
  - 5m/s or more



30 degrees or more **5 m or higher** **Leeside**

-0.7 mm between hight lines

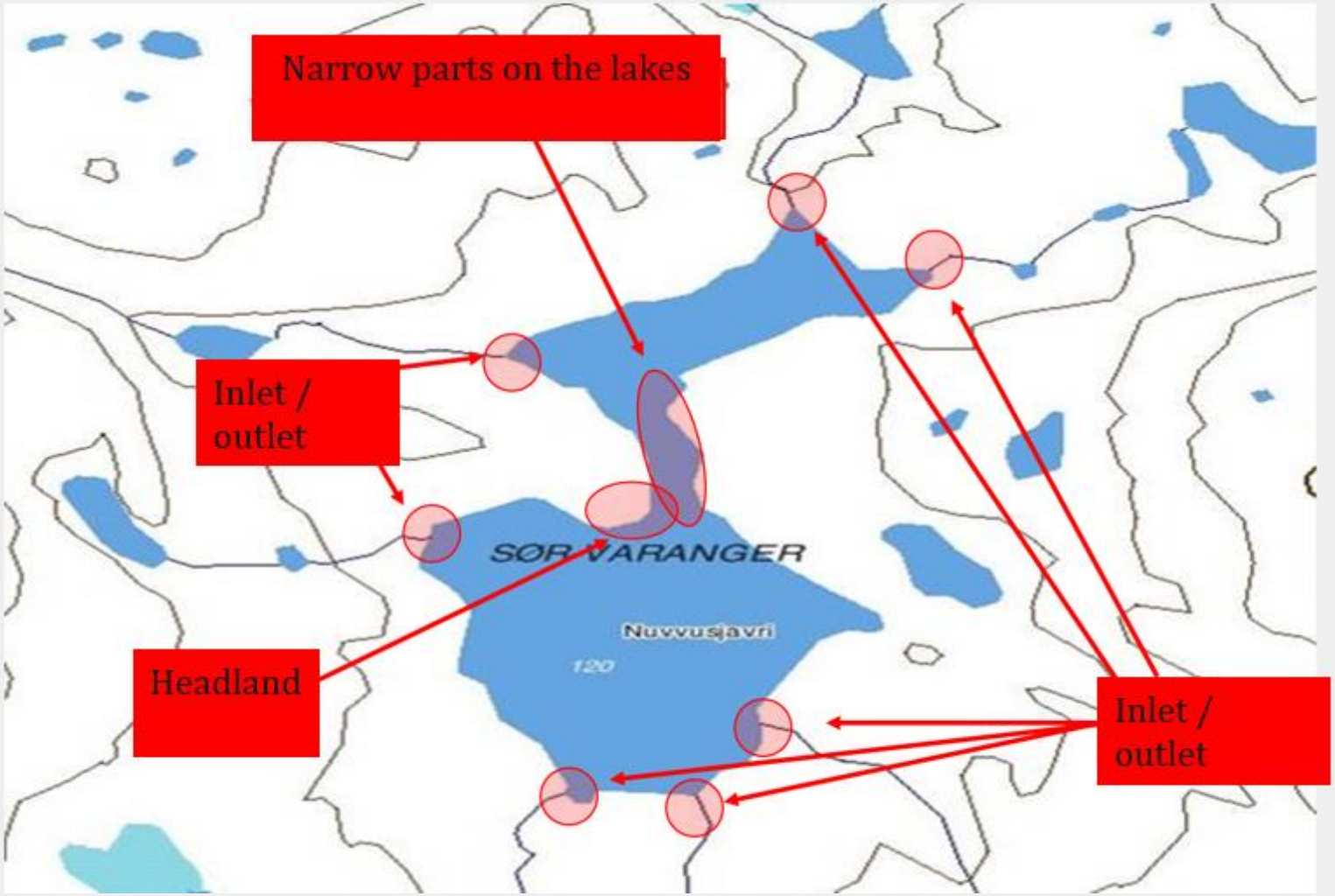
Release zone, Run-out zone small scale terrain 3 x H (height) and the 20˚ RULE



3 x H
The height from the bottom of the valley to the crown of the potential avalanche multiplied by 3 gives an estimation of the horisontal distance the avalanche will travel.

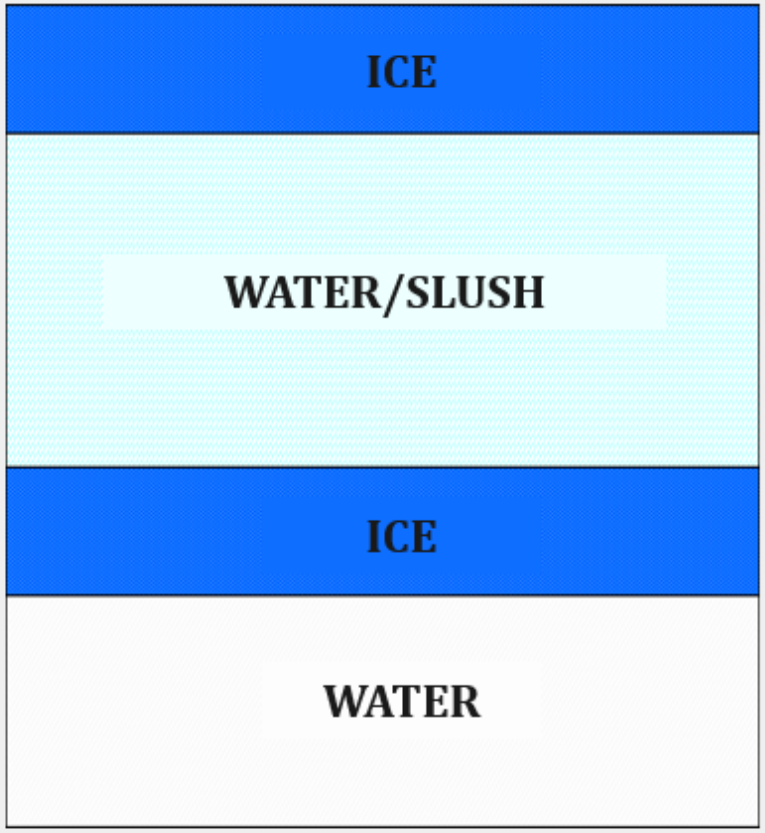
20˚ - rule
When aiming at the crown with a 20˚ angle of the line of sight, you are outside the run-out zone

Areas of possible weaker ice

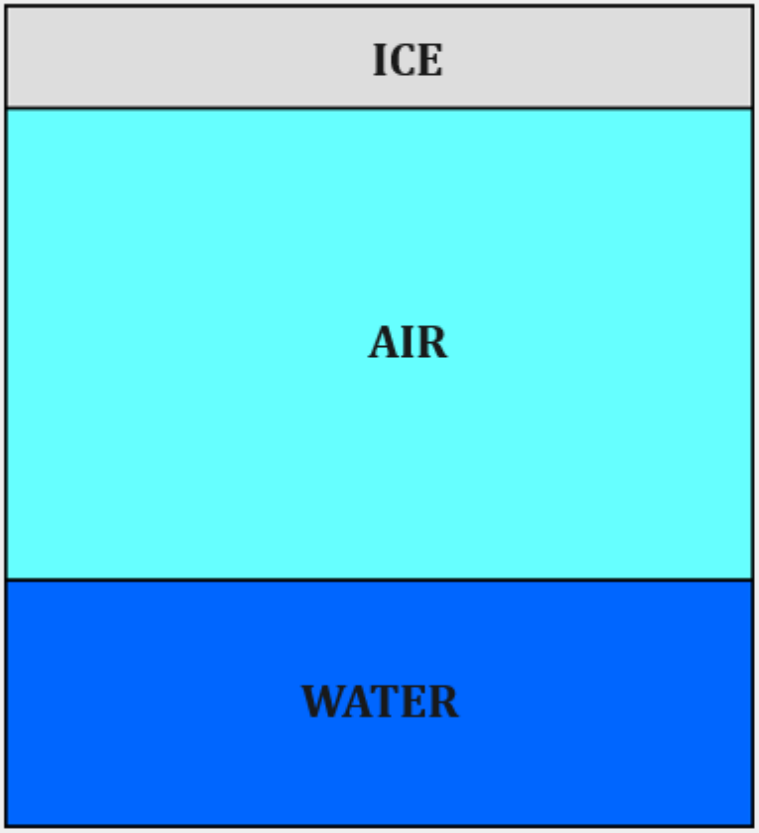


Examples

Double ice



Regulated water



Navigation by reading natural signs

Snow melting

South

South

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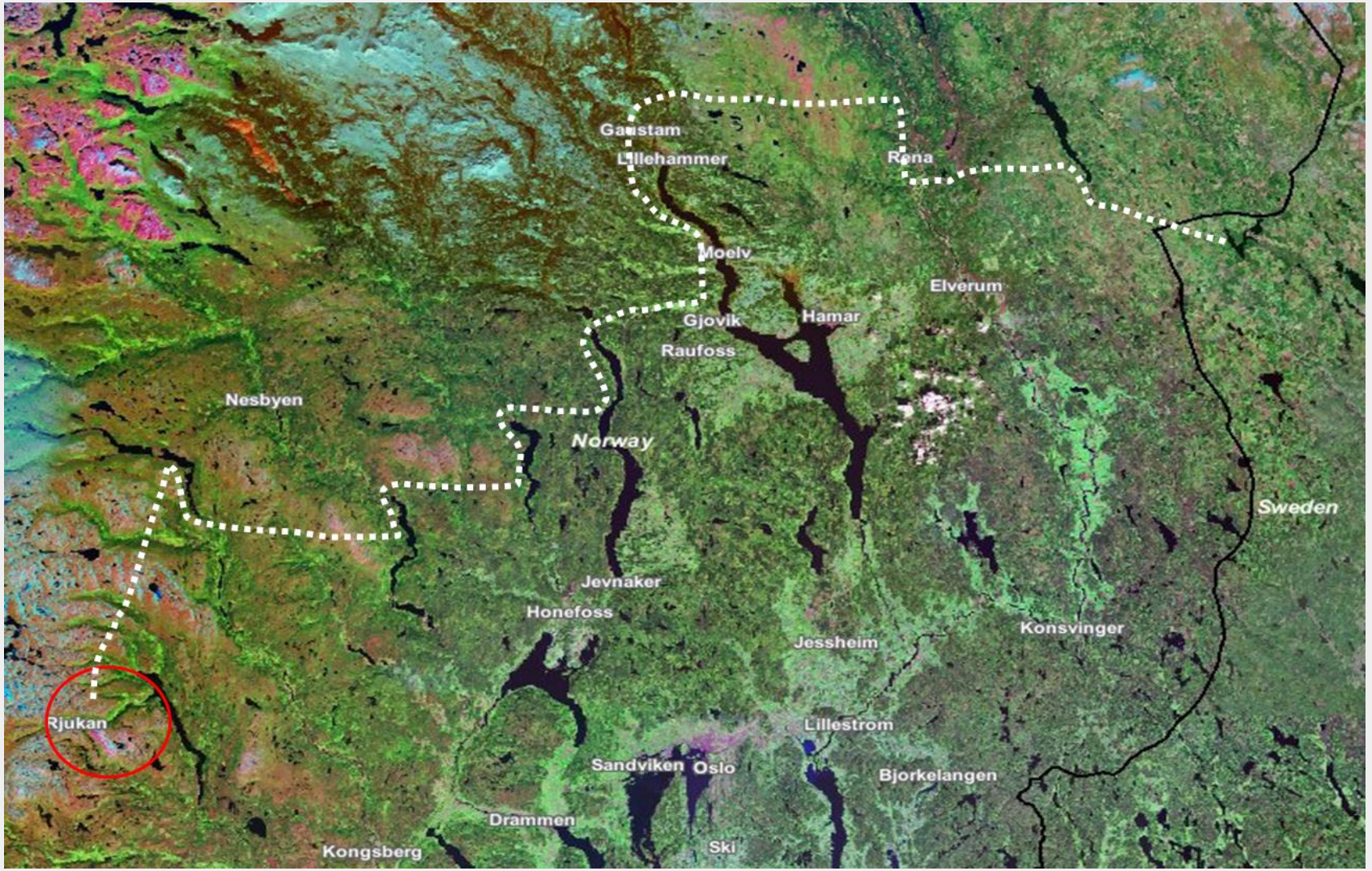
Exfiltration operation Gunnerside WW2
Vemork - Sweden



Questions?

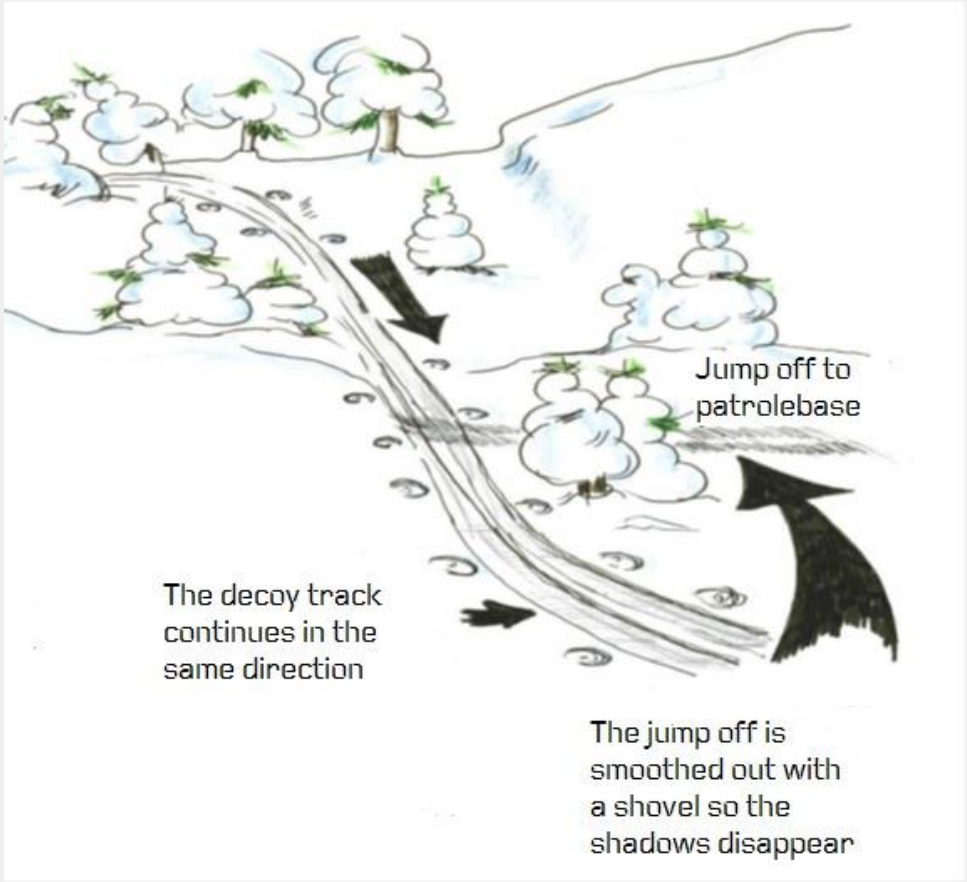
15 min break

Evasion winter

- ✓Challenges
  - Speed and big directional changes to create distance gap and mislead direction of movement towards pursuers is the way to go. This might be very difficult, even impossible in the winter if you don't have any means to carry you over the snow, such as skis or snowshoes
  - Everywhere you step you leave a very visible track.
  - Your tools to mitigate this is track discipline, track concealment and track deception.

Track plan

- ✓ Have a plan before entering the designated area
- ✓ Make sure everyone knows the plan and follows it
- ✓ Do a map recce beforehand
- ✓ Make sure every patrole member knows their role



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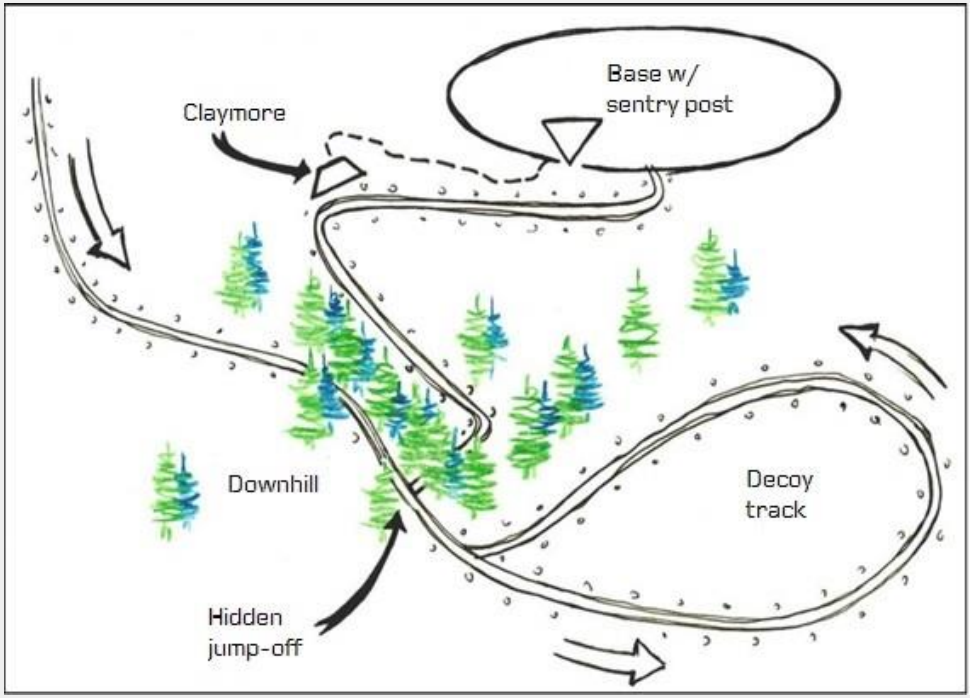
Track discipline

- ✓ Thermal image of vehicle and ski tracks
- ✓ The layers in the snow have different temperatures
- ✓ The difference in depth will keep a temperature difference (thermal) and make shadows in the track (Visual)
- ✓ Do a map recce if there is time. Where do we want to go?
- ✓ Deception plan and false trails
- ✓ Jump-off with concealment
- ✓ Fishhook
- ✓ The ideal spot for a jump off is where the pursuer need to focus on other things than the trail. I.e. a slope, in addition to where it is easy to camouflage.



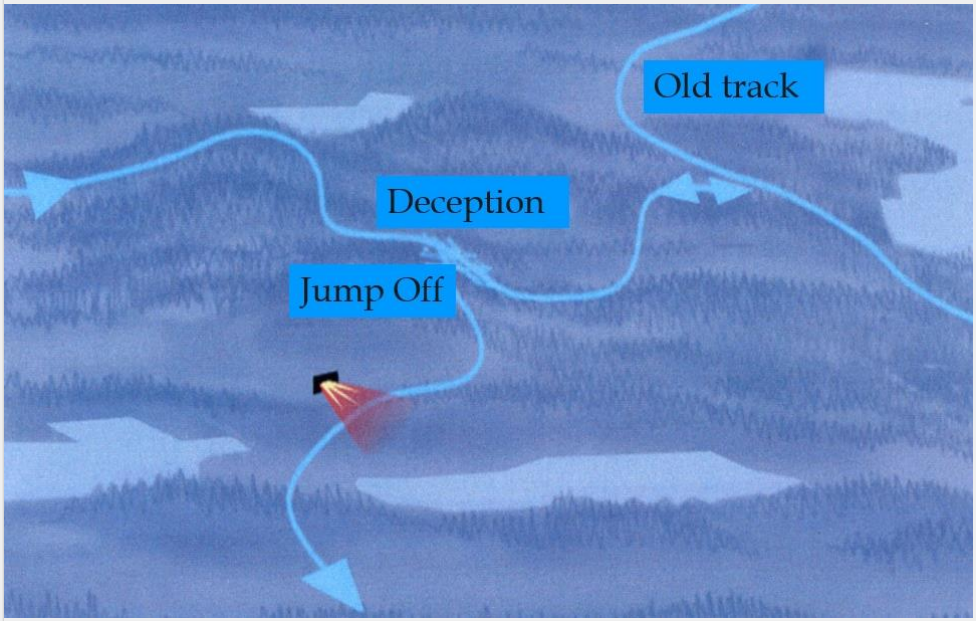
Track Concealment

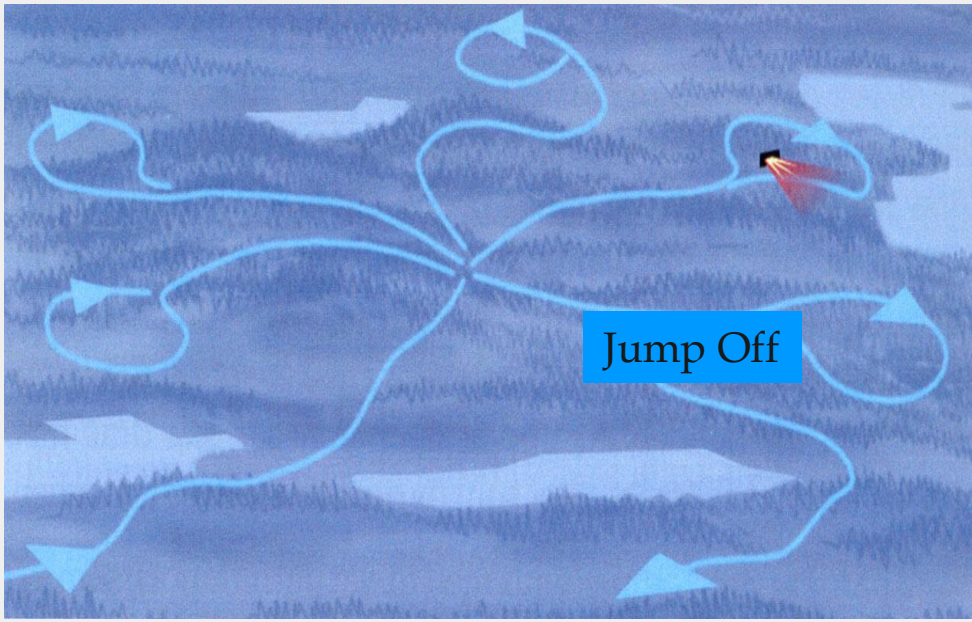
- ✓ Methods:
  - Erasure
  - Blocking
  - Use of hard, solid ground

Track Deception

The evader will normally use one or several of the following techniques:

- ✓ Roundabout
- ✓ Swastika
- ✓ Tangle
- ✓ Old track

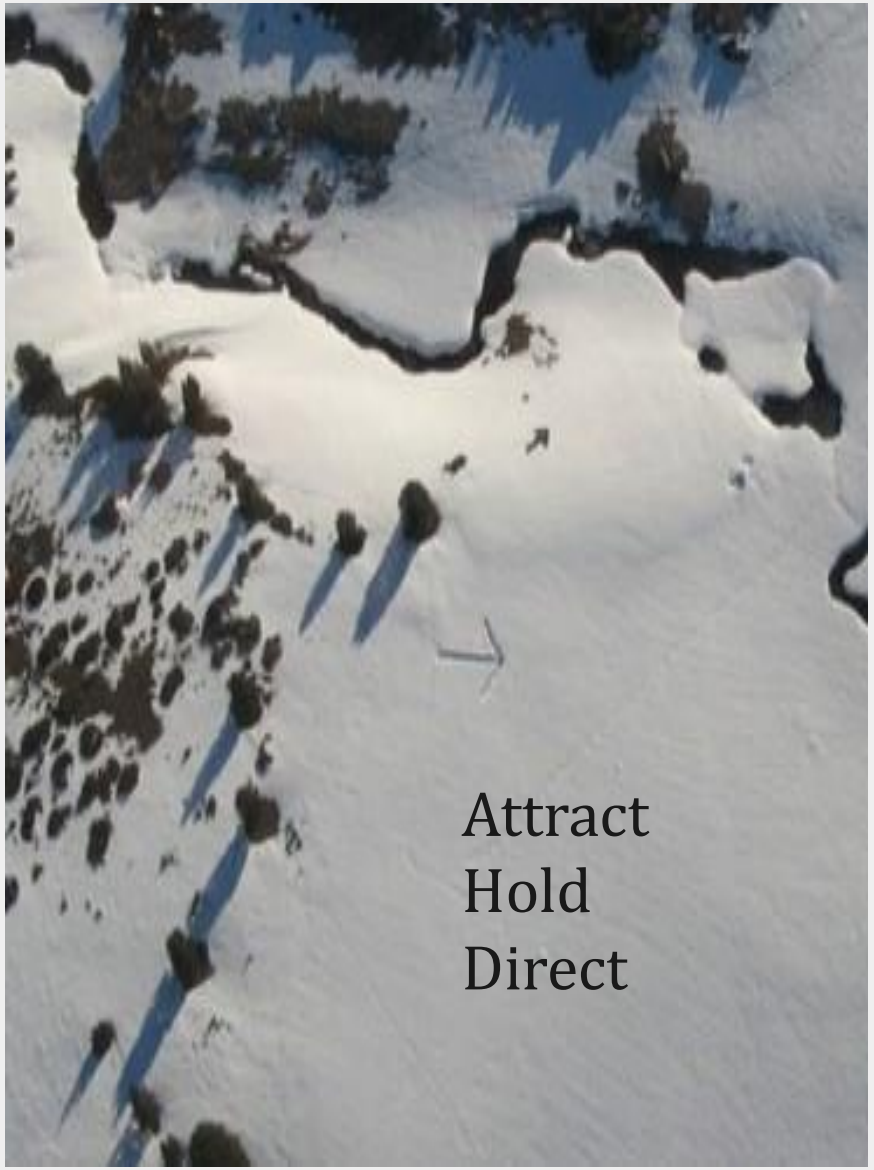




Questions?

Signaling

- ✓Consideration
  - Cold air suppresses smoke
  - Dark favorites light flashes/buzzsaw, mirror is not a good option
- ✓Types of signaling
  - Pyro smoke
  - Light flashes / buzzsaw
  - Mirror
  - Natural smoke generator
  - GTAS



Smoke

- ✓Need terminal punch
  - Cold air suppresses smoke
- ✓Pyro smoke combined with natural smoke generator creates punch and contrast color
- ✓Smoke generator
  - Tripod. The fire is made on a platform gives good airflow from under need.
  - Lots of tinder and kindling to create a lot of heat
  - Evergreens (spruce, pine, juniper) makes the smoke

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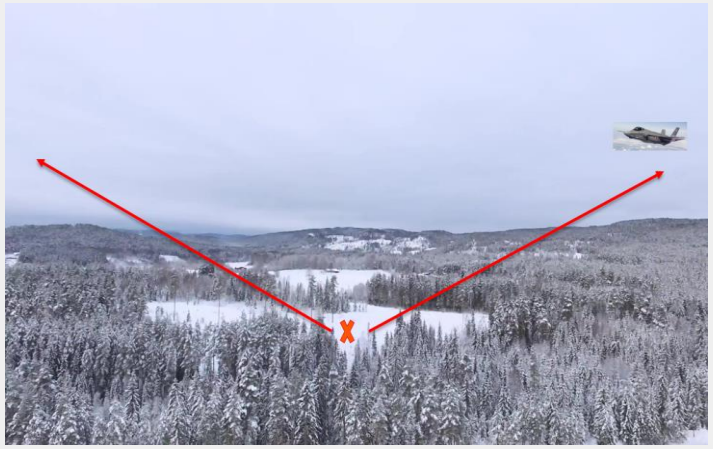
GTAS

- ✓Minimum 5x5 meters
- ✓Contrast color, evergreens on top of snow (top pic)
- ✓Tracks on snow breaks the light and creates shadows. GTAS can quickly be made by simply step down the snow (middle pic)
- ✓Needs to be seen from a distance, mind the angel and keep clear from high trees (bottom pic)
- ✓Very little wind (5m/s) creates snowdrift. GTAS needs to be maintained.



Questions?

Water & food

- ✓Water
  - 2-4 l per day iaw activity level
  - You don't feel the thirst in the same way as you do when its warm.
  - Finding water is easy, snow = water, but it takes time to prepare.
  - Metal mess tin makes melting and boiling easier.
  - Learn to find running water, and never pas a open water source
  - Melting snow into water is relative safe, but big bubbles no troubles still applies
  - Dark urine is a sign of dehydration, easy to see in the snow

Melting snow

- White snow consist of mainly air and very little water.
- Digg down to the ground to find ice crystals (facets) with higher water content.
- Top layer has also more debris

- Melting snow with no metal mess tin.
- Make a big snowball and place it by the fire, collect the dripping water
- Melt snow inside a plastic bag of a t-shirt by the fire

Finding open water in the winter

Streaming rivers

Small streams under thick snowpack

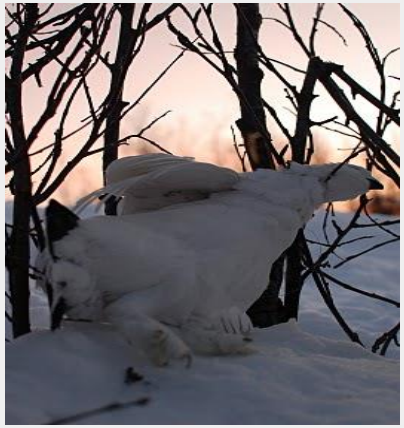
Outlets on lakes

Surface / headwater on lakes with heavy snowpack

Water & food

✓Food

- Food = heat production
- Eat warm food if possible
- Fat and protein gives double the amount of energy than carbs. More energy = more heat production.
- Eat before rest / sleep to turn up heat production when inactive.
- Hunting and trapping requires skills
- Fishing is easier
- Plants requires knowledge. Lichen is a good source to carbs.
- Needles from pine, spruce and juniper is a vital vitamin –c source.



Food – priorities iaw PLWF

- In a short – term survival situation food is not your major priority. You have recently eaten and you should have some basic emergency food in your pack. Ration your food.
- In a long – term survival situation , your survival priorities changes, and the need for food in order to simply survive will become more important.
- There is a thin line between food not being your priority and the subsequently finding that you're in no condition to do anything about it when it does become a priority – regularly reassess your situation and alter your plan accordingly
- It takes effort, skill and a certain amount of luck to obtain food in the wild, especially if you're not in your natural environment.
- When gathering food in the wild always ensure that the energy gained from the food is more than the energy you expended in procuring it, otherwise it's a wasteful exercise

Questions?

15 min break

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LFTS

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End of Brief