



Production & support for printing of this
booklet provided by:
Tahosa Alumni Association-
Keepers of the flame for Camp Tahosa
Rocky Mountain Adventure Base
Ward, Colorado

All rights are reserved.
Copying & reprints are authorized to
active Boy Scouts of America units.
All others require permission.

Tahosa Alumni Association
PO Box 481633
Denver, CO 80248-1633



**ALUMNI
ASSOCIATION**
Preserving the Past...
Building for the Future!



OKPIK

Secrets of Winter Warmth

From the Okpik Winter Camping
Staff of Denver Area Council
Camp Tahosa
Ward, Colorado

Supported by the Tahosa Alumni Association

Introduction



For all who have participated in an Okpik Winter Camping training weekend, this booklet contains the essentials from the Friday night training session. For those of you who haven't experienced the pleasures of an Okpik weekend, what you find here are the areas we cover in the classroom. Either way, our intent is to provide the most information we can in a form that can be used by individual campers and units that are striving to put together a year 'round outdoor program that includes camping in cold weather conditions.

This booklet is by no means all the information out there to help you get out in cold weather conditions. We hope it is only a start in your quest for knowledge and experience.

John Tedrick, Editor
Okpik Staff & Tahosa Alumni Association
2004

Acknowledgements

Much thanks goes out to the many dedicated Okpik Staffers over the years who have contributed to the body of knowledge displayed here. The title of this booklet is *Secrets of Winter Warmth* but the information is all readily available. None of this was picked out of thin air; it has all come from many handbooks, fieldbooks, guides, papers, magazines, research studies, field institutes, training courses, the Internet and gettin' out there and doin' it. Don't take our word for it- go to the library, our Council Service Centers, search the Internet, browse the shelves in bookstores, pick the brains of the people around you who thrive in the snow. If you haven't the knowledge now, there are countless sources to glean. You're only limited by your imagination!

This booklet was compiled from the Friday Night Curriculum first put together by Loren 'Smitty' Smith, Camp Tahosa Ranger who brought Okpik to us in 1985, and Smitty's Okpik Staff and later edited into it's present form by John Tedrick and David Humphrey.

Thank you to the Tahosa Alumni Association for its support in the production of this booklet. The TAA is a group of Scouters and volunteers devoted to the support of High Adventure programs, the maintenance and preservation of Camp Tahosa and its history and traditions. We welcome any adult to become a member, whether you camped at Camp Tahosa as a youth or are a new visitor. Write to us at the address on the back page or visit us on the Internet at www.denverareacouncil.com.



Who's Your Buddy?



Use the buddy system! Buddies watch for frostnip, hypothermia; buddies should make buddies drink lots of water.

A buddy will know if his partner is acting strangely, if so, take steps:

- Get into dry clothes.
- Drink lots of fluids.
- Get them to a leader and, if necessary, out of the field.

Who's your buddy?

Getting Started



Why do we camp in the winter?

- **Fun:** The basic principle of all Scout activities is to have fun as we learn, work together and explore the outdoors.
- **Different Activities:** We get to do what we can't during the warm months such as, skiing, sledding, snowshoeing, snow shelter building, snowball fights, etc....
- **Change of Pace:** Winter camping gets you outside; changes the way you see and do things; prevents cabin fever during those long dark days.
- **During the summer,** campgrounds are crowded with noisy campers, filled with dust, bugs are out, and humidity can be high. In the winter, those same campgrounds will be deserted, oftentimes pristine white and quiet, bug & dust free.
- **Scenery:** Winter is the only time of year to see snow. Enjoy the quiet hush of the forest under a blanket of fresh snow, track animals easily through the snow, photo opportunities abound.
- **Healthy:** Breathe clean air; frigid temperatures demand exercise to stay warm; the bugs and noxious smells are gone; cleaner environment to camp in.
- **Bragging Rights:** You can tell your friends you slept in a snowbank this weekend.

In addition, during the school year you have roughly 100 days off as compared to the summer months you have only 90 days. Take advantage of your time off no matter what the weather is like year around!

Camping in the winter also helps you qualify for the Quality Unit Award. You might have a chance, too, to earn the Polar Bear Award.

Getting Physical



The secrets of winter comfort are derived from the Inuit people of the Arctic. Pay close attention to the following and you can stay warm and safe:

- Keep the **body core** warm.
- Make sure the **blood circulates** freely.
- Select the proper **amount** and **type** of clothing
- **Pay attention** to the internal signals: thirst, shivering, skin color, stinging sensation and lack of feeling.

In order to keep warm and comfortable, we need to first understand how the body reacts to cold. The physiology of how the body reacts to cold is called *homeostasis*.

Homeostasis is the process of controlling the equilibrium of your body's temperature. That is, keeping your body warm or cool all over as efficiently as possible. A good example of how your body works in this equilibrium process is to think of a house and how the heating & cooling system works. By opening or closing the windows and doors or opening the flue of the chimney (taking off or putting on clothing, i.e. hat, mittens, boots...) you can control the temperature. Simply put, if you get cold, put on more layers; if you overheat, ventilate or take off layers.

The thermostat in your house controls the temperature as well as tells you how hot or cold it is. The *hypothalamus* in your brain does the same. If the hypothalamus senses loss of heat or you're overheating, it reacts and regulates the body core temperature.

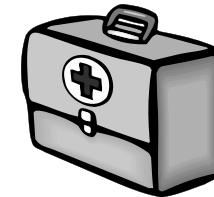
The final critical factor in staying warm is your own physical condition. While trying to survive exposure (cold), a major factor is the ability to generate heat, which is directly related to the ability to produce work. This is achieved through physical conditioning as the limiting factor, not by how much food one stuffs into one's face. The fittest stay the warmest!

Eventually your energy is drained and your central nervous system begins to shut down. At this point you'll no longer be able to care for yourself.

Field First Aid Symptoms and Treatment:

- **Frostnip:** Skin is bright red- like after a ski run. Treat frostnip by skin-to-skin warming. No fast warm-ups and no rubbing of the skin.
- **Frostbite:** Bright red turns to small white splotches. May turn gray, waxy and hard if not taken care of and the skin continues to freeze. Treat by seeking professional help immediately! Do not try to rewarm in the field, if the tissue refreezes during evacuation the damage will be greater.
- **Hypothermia:** Symptoms include stumbling, incoherence, loss of motor control and slurring of speech. Here's a field test: make the person walk a straight line. If they can't navigate a straight line, initiate first aid steps. Move the person out of the wind and cold if at all possible. Get warm (not hot) fluids and food into the body. Put on warm dry clothes. If the person is in the early stages of hypothermia keep them active. If the case is advanced, keep them quiet while treating.

When in doubt, seek professional help. Don't take chances! The mountains and trails will always be there for another adventure.



Winter First Aid



The most important piece of equipment you have is your brain, your brain helps you make the right decisions to insure your safety and survival. Sometimes you need to be prepared for problems, especially health and first aid problems.

In the summer, you often have a greater margin for error. Get wet and temperatures may be mild enough that it isn't a problem. In the winter the margin for error is greatly reduced! Get wet in subzero conditions and it could be life threatening. Your attention to safety has to be strictly focused.

The most common first aid problem you'll run into is dehydration.

Dehydration can lead to hypothermia, frostnip, frostbite, chilblains, trench foot, headaches and altitude sickness.

Water = Warmth and Health

Ways to avoid using first aid skills:

- **Drink plenty of water.** Drink before you're thirsty! We cannot stress the biggest preventative measure to maintaining health in the outdoors is to keep plenty of fluids in your system!
- The **first sign of dehydration** is the lack of moisture in the skin. Your skin becomes dry and loses its flexibility. As it becomes dry, it becomes susceptible to freezing and frostnip and frostbite can set in.
- **Dehydration also leads to the hypothermic cooling** of our body's core temperature. As you dehydrate your blood becomes thick. The heart has to work harder to force that thick blood through the narrow veins and capillaries. Your body will reach the point it can no longer circulate the warmth-carrying blood and concentrates its energy in your body core. Your hands and feet get cold, blood flow slows to the brain making you sluggish and you lose motor control.

Perspiration



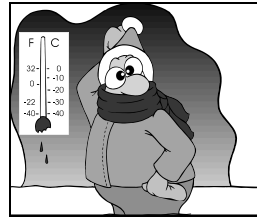
To stay warm means you must stay dry. Let's look at how perspiration can make our bodies wet and therefore cool.

There are **three types** of perspiration:

- **Insensible**- this is what keeps your skin flexible. 2 to 3 pints of water per day are lost through this type of perspiration. Your skin needs this moisture to stay healthy.
- **Non-perceptible**- you can't see it but you can feel it. Generally a cold clammy feeling. Think of it as the reaction you had when you got up in front of a group to speak and your hands got wet and clammy.
- **Perceptible**- we have all experienced this. It is brought about by exertion and overheating. You can see this- it's sweat!

Moisture can rob your body of heat very rapidly. Think of it like this: if you become chilled, you can react by putting on more layers, eating, drinking or stepping up your activity level. If you get wet you may not be able to react quickly and it may even be life threatening- in other words- **Stay Dry!**

Heat Loss



One thing we need to cover in keeping warm is how to avoid becoming cold. One way is to control your heat loss.

Types of Heat Loss:

- **Radiation-** This is the normal flow of hot to cold. Heat source (your body) to the outside cold, for example.
- **Conduction-** Contact with something where there is a heat differential, i.e. sitting on a cold rock or cold chair.
- **Convection-** This is the thin layer of warm air surrounding our body. If this thin layer of convective heat is disturbed, either from wind or water, for example, you lose heat.
- **Evaporation-** Normal migration of bodily fluids.
- **Respiration-** Every time you exhale you exhale warm moist air from your lungs. When you inhale, you bring in cold air. This cold air must be prewarmed through your sinuses and if it is really cold, a Jr. birdman. Your airway must preheat the air you breathe in to 98.6 degrees before it reaches your lungs.
- **Wind & Water Chill-** Wind and water rob the body of warmth. You must exercise every control you can to minimize heat loss through this means.

Here's a tip: when outdoors, try to stay *comfortably cool*, not toasty warm. If you're too warm, you can begin perspiring easily, get wet and lose heat rapidly. Instead, adjust your layers of clothes, monitor your activity level and stay as cool as possible without chilling.

Determine the location of the entrance and start dig-out, making the entrance as small as possible. Go straight in but start upward quickly so that you can begin work on your knees. Go upward until you begin to hit sticks, then angle inward and upward until you locate more sticks.

Try not to have too much snow above you- cave-ins often occur when someone digs straight in and doesn't realize there is a ton of snow above their head. Go for the "roof" and dig out around you later.

Rotate team members frequently. You'll get very wet inside digging out.

Digging out may take two to three hours.

Important: If your team partner has to leave the area at any time, for any reason, get out and wait until your partner returns. No one should be inside working unless the partner is immediately outside. Should a cave-in occur, there must be someone to assist you out of the snow!

If you are lucky, the snow was deep enough to allow for sleeping benches and shelves. Level out spots for beds and move in!



Overnight, a quinzee is strong enough to support the weight of people!

Building a Quinzee



A properly constructed quinzee will provide warm shelter; the inside temperature will stay right around the freezing point (32 degrees). Even a modest 2-person quinzee can take most of a day to construct so plan accordingly!

Determine the location site for construction. It's almost the same as picking a site for a tent- as level as possible, no obvious rocks or bushes, no dead trees or limbs nearby and as much snow as possible. A site where snow is drifted in is great.

Stand in the center of the site with a ski pole in an extended hand, mark the outside circle. This will be approximately 12 feet in diameter.

With shovels, break up the snow within the circle. Break through all layers down to the ground. *It is not necessary to shovel out the snow in the circle.* Just make sure it is well broken up.

Go outside the circle and begin to pile the snow into the circle, breaking up any large clumps. *Do not pack the snow- this isn't necessary!* The snowflakes will cling together naturally. Packing can break up the snow too much and the clumps can be too hard to dig out. Continue to pile the snow until a dome is formed approximately 6 feet high and 12 feet in diameter.

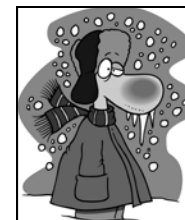
Using thin sticks approximately 18 inches long. The sticks will be used to gauge the thickness of the walls when digging out. Starting low, insert the sticks into the dome leaving just a couple of inches exposed, insert sticks every couple of feet. Make rows of sticks until you can't reach any higher

If snow conditions are good, stacking the snow may take one to two hours.

Now stop and let the snow settle for 1 ½ to 2 hours. This is a good time to eat lunch, rehydrate, relax or play in the snow. During this break, the snowflakes begin the process of clinging together.

Now we're ready for digging out! Put on dry outer clothes to protect you from the snow while digging out.

The C.O.L.D. Equation



The standard and easy to remember formula for staying warm is the "COLD" equation:

- Keep your body and clothes **Clean**. If your clothes are clean, they will "breathe" better, wicking excess moisture away.
- Don't **Overheat**- If you begin to overheat you will perspire. This moisture will wick heat away from your body and you'll chill. Slow down, ventilate (open your collar, unzip your jacket, take off layers).
- Practice using lots of **Loose Layers**- Practice using many layers of clothes instead of one or two bulky layers. Each layer of clothes is dead air space creating an insulated layer. Take off or put on layers as you need them. This keeps you from overheating and is also a less expensive way to dress.
- Stay **Dry**- If you are dry, water chill can't occur. The body cools 240 times quicker if it is wet than when it is dry. Your biggest danger in the winter isn't simply getting cold it is getting wet. Moisture from whatever its source will make you colder more quickly than anything else will. *Always, stay dry!*

Getting Layered Up!



How you dress outdoors can make the difference between staying warm & dry and having fun or getting cold & wet and being miserable. Consider the following:

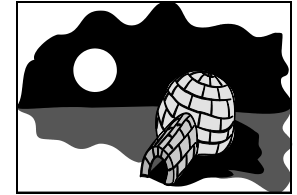
Outdoor fabrics to choose from:

Cotton	Worst	Natural fiber
Wool	Good	Natural fiber
Poplin	Very good	Poly/Cotton blend
Polypro	Best	Synthetic
Polar fleece	Best	Synthetic
Supplex, nylon	Best	Synthetic

Let's see what the properly dressed person wears into the wilderness:

- **Long johns first-** Wool or polypro- No cotton! Synthetics wick the best and keep you dry! Option B: panty hose. Panty hose is a dense layer of tiny cells that trap and hold heat.
- **Socks-** Wool or wool blend- never cotton in any form. Use polypro sock liners for added moisture control.
- **Pants-** Very good: wool pants worn loose with suspenders, no belt. Belts constrict the flow of blood and the transfer of heat. Best: Polar fleece- lightweight, warm and wicks great. Option B: ski pants. OK but heavy, insulates too well- danger of overheating too great.
- **Shirts-** Wool shirts are very good- versatile, relatively inexpensive. Polar fleece tops, like the pants, are light and ounce for ounce the warmest.
- **Hat-** A wool or fleece balaclava style (like a knit watch cap but can be pulled down over the face and neck) is the best choice.
- **Boots-** Choose Pak boots whenever possible. Pak boots have

Sack Time



Sleeping in the cold takes some special considerations. Planned properly, you can sleep as well as at home in your own bed.

- **Don't have a winter-weight sleeping bag** (one that is rated at around zero degrees) but you have a good 3-season bag? Make or buy a polar-fleece liner, insert it your 3-season bag and you've lowered the temperature rating 10 to 20 degrees!
- **It's more important what you have under you** than on top of you. Put as much as you can under you, between your sleeping bag and the snow or cold ground. One or two foam ground pads or a good Thermo-Rest pad placed on a plastic/waterproof ground sheet work well. Going car camping? Fill large garbage bags with wadded up newspaper for a thick layer between you and the ground. Don't use an air mattress- it provides no insulation.
- **The fewer clothes you wear** to bed the better. The more layers you wear inside the sleeping bag the more body moisture will be trapped inside the layers of clothing & bedding. **Remember-** moisture robs your body of heat, the more moisture that can migrate out of the sleeping bag the drier you'll stay and the warmer you'll be through the night.
- Winter camping can mean some very long nights in bed. Take a **mid-night snack and a bottle of water** to bed with you. If you wake up in the middle of the night feeling chilled, a snack of nuts, chocolate, sausage and cheese, washed down with a little water can help re-light the furnace and warm you back up.
- **Save** some of your dinner cooking or wash water and fill a water bottle with that warm (not hot!) water and put it at your feet in the sleeping bag. If it is too hot you'll sweat (see above), warm and it will help you stay comfortable.
- **Hunker down** in your sleeping bag but breathe outside the bag. If you breathe inside the sleeping bag your breath will condense and you'll get wet- not a good thing! (See the notes above.)
- **Wear a light stocking cap** to bed. A body loses a big percentage of its heat through your head and neck, a cap helps preserve that warmth.
- If you've been **drinking enough water** it will be inevitable that you'll have to get up at some time during the night to go to the bathroom. When you do, just get up & go, take care of business and get back into bed. If you try to wait it out until morning you'll just be miserable, so just get up & go- get it over with!

Water, Water, Water



In addition to the food you need to stay warm and healthy, you also need water and more than you probably think you need!

Water serves as the catalyst to turn food into useable energy. Without enough water, your body stops producing energy and you become cold.

If you wait until you're thirsty to drink, you've passed the danger point and may be getting dangerously dehydrated. Drink before you're thirsty. Drink from the time you get up in the morning, throughout the day (not letting more than 15 to 30 minutes pass without a drink) right up to the time you go to bed. (If you don't have to get up at least once during the night to go to the bathroom, you're not drinking enough!)

During heavy exercise you may lose up to two quarts of water per hour but your stomach can only absorb one quart per hour! Drink continuously!

A person knows if they are properly hydrated by the color of their urine. If the urine is copious and clear- you're doing fine. If it is dark yellow or orange and little in quantity- it is concentrated and you are dehydrated. Start drinking!

Don't force someone to drink large quantities of water! A large volume of water with not enough food to balance the electrolytes in the system could cause a condition known as water intoxication. It is rare for this to occur and it isn't a risk if you eat some food with your water.

Feeling headachy, listless, tired or nauseous? These are signs of possible dehydration. Stop your activity, sit and sip up to a quart of liquids over an hour period to start the rehydration process.

You may need at least four quarts of water a day! That's a gallon of liquid that can be in the form of water from a canteen, juices, soups, warm Jell-O water or hot chocolate.

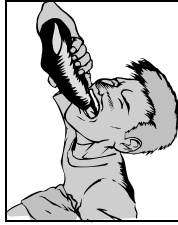
Stay away from coffee and especially alcohol! Coffee and alcohol are diuretics- they actually dehydrate the body and are energy drains! A diuretic (coffee) can actually cause your body to lose more water than you took in from the cup of coffee.

removable felt liners, rubber bottoms to keep feet dry and leather tops to wick moisture away. Leather hunting boots, either insulated or not, are never a good choice. The leather will always get wet and stay wet.

- **Wristlets-** Keeps the capillaries in the back of the hands warm while keeping the fingers free to work. (Form a fist and the skin to skin contact will rewarm hands fast.)
- **Mittens-** Choose mittens for the next layer- fingers remain in contact and warm. Gloves separate the fingers and it is harder to keep your hands warm.
- **Outer Mitts-** Supplex (another form of nylon, wicks, is breathable and wind resistant), and Cordura (like pack cloth- very tough and abrasion resistant) both serve to keep wind and water away from your hands.
- **Wind Layer-** this would include a hooded anorak and wind pants. Poplin is a good choice for material- it wicks and sheds moisture. Supplex may be better- more wind resistant and it hates moisture.
- **Nose and cheek protector-** Jr. Birdman for short. Wear in cold and windy conditions. It prewarms and premoistens the air you breathe and protects your nose from freezing.
- **Sunglasses-** Always a must in winter travel. It is one of the ten essentials for year around use, too! Option B but a very good option: snow goggles for windy, ground blizzard conditions.
- **Water Bottle-** May be the most important item you go into the outdoors with! Empty it, refill, empty, refill, etc.



Stoking the Furnace



You will change your diet extensively as cold weather may require as much as 4 to 5,000 calories per day. Understanding that the average person may only need about 2,500 calories per day while living and working in heated buildings, this is a drastic step up! You use 5% more energy for every 1,000 feet over 5,000 feet elevation. Or, put another way, you'll need 20% more calories just by coming to Camp Tahosa!

That energy can come from:

Quick energy sources- Sugars, either from simple or complex carbohydrates. Don't overdo the simple carbohydrates; such as, candy. These can give you a quick lift in energy but the danger is that it can bring you down quickly, too. The preferable source for carbohydrates is from the complex carbohydrate category. This includes breads, potatoes, pastas, rice, energy bars, crackers, bagels & oatmeal.

Long term energy sources- These include fats and proteins. Fats burn slowly. Think of carbohydrates as the kindling for a fire and fat as the log that burn slowly. Select high quality sources for the fats, this would include, meats (beef, chicken & fish), butter & margarine, nuts (peanut butter is an excellent standby) and cheeses.

There is usually little need to put a lot of emphasis on proteins. A well-planned menu will have an adequate amount of protein in it from meats, eggs and nuts and your daily requirements should be satisfied. Do know that too much protein can put a strain on your system. Protein requires more water and energy to digest than carbohydrates or fats.

Menu planning for winter camping:

Carbohydrates- pastas, breads, oatmeal, starches, etc.	40%
Fats- peanut butter, meats, whale blubber, etc.	40%
Protein- meats, eggs, more peanut butter, etc.	20%

Cooking Tips



Some tips for cold weather cooking:

- Use **stainless steel** pots- it cooks faster and more efficiently. Stainless is sturdier than aluminum, too.
- Use **plastic ware** for utensils- they won't freeze to your tongue and food in plastic bowls won't cool down as quickly as in a metal mess kit, for instance.
- Use a small **backpacking stove** with a high BTU output. Much more efficient and reliable than a wood fire.
- Prepare a **midnight snack** for everyone. Take to bed with you, snack on if you wake in the night and feel a bit chilled- a snack helps relight the furnace.
- **Plan meals** that can be cooked ahead of time and packaged in seal-a-meals. In camp you only have to drop food bags into hot water, heat, cut open and eat right from the bag. No messy prep work, easy eating, no wet hands in cold weather for clean up!



Avoid caffeinated drinks like coffee- they can serve to dehydrate you.



Good ole PB&J- a good menu choice in the cold. Peanut butter is concentrated energy.