

TRAINING MANUAL FOR MICHIGAN 4-H

OUTDOOR ADVENTURE CHALLENGE



Section: LOW IMPACT CAMPING



LOW IMPACT CAMPING SECTION CONTENTS

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LOW IMPACT CAMPING

One of the highest priorities when camping is campsite selection. Everyone wants the picture postcard campsite by the lake, but overuse of these sights detracts from their beauty. The best campsites should be away from the shore. These areas are often never used. Set up camp someplace where someone walking the shoreline will not have his or her view of the lake interrupted by spots of orange, blue, or whatever color your tent is sticking out in contrast to the existing area. These areas are usually 100 or more feet away, a little walk, but in nobody's way.

The actual site for pitching the tents is the next step. Check for any fragile vegetation that might be crushed by a tent, and any widow makers (dead tree limbs still attached to the tree) which might fall on the tent if high winds or a storm comes up!

All branches, twigs, or rocks should be removed to give a non-lumpy surface for sleeping and should be put in an area to be replaced to their original position upon your departure. If there is more than one tent in the group, they should be spread out so that the plant life in one area is not completely trampled.

The next items for consideration are food preparation and kitchen location. The kitchen area should be away from any of the tents, so if the smell of food attracts animals, they will not be stumbling through the tents to get at it.

Digging the fire pit is a good opportunity to get everyone involved in the process of kitchen location and set up. When the site for the kitchen has been selected, the process of digging begins. The top layer of vegetation should be cut away and removed to a place so it can be replaced on the fire pit to re-cover it later. The pit should be down to mineral soil. All the duff and other soil removed should be saved for closing the pit up after use. Mineral soil should be packed around any roots that might be destroyed by the heat of the fire and watered.

Another good place to construct a fire is on top of a flat rock or group of flat rocks. To prevent the fire from permanently charring the rock, a layer of mineral soil three to four inches deep should be placed on top of the rock and the fire should be built on the mineral soil.

The meal should now be on the fire and a few other items must be attended to before support is finished. Another task to be completed is the digging of a sump hole to be used for disposing drain water and wash water. This is done similar to the digging of the fire pit. Remember to save the top vegetation for re-covering the hole when finished. The opening of the sump should be about six inches with a depth of 10 to 12 inches deep.

Another task to be completed is the location and construction of the latrine area. Depending on the size of the group, the type of latrine can either be individual "cat-hole" or a group latrine. "Catholes" are individual holes that can be used with small groups of four or five persons or less. The group latrine is best used if the group is larger.

Depths of latrines should be at least six to eight inches deep. Group latrines should be a little deeper, but should not exceed eighteen inches in depth. A trench about eight inches wide, twenty-four inches long and about twelve inches deep. That would be a good size latrine for about ten people and should last about two days before a new one would be needed. After each use, a handful of mineral soil should be sprinkled over excrement to help in the decomposing process and to keep insects away.

Drainage toward the nearest water must also be considered. Latrines should be at least 50 yards away from any water source.

Latrines should not be in a location where people from other campsites or trails might have a clear view of those using the latrine.

CLOTHING

“The choice of clothing is largely a matter of selecting each individual garment carefully, for warmth in relation to weight, for toughness in wear, for versatility in use, and in some cases, water repellency.” Fletcher, Colin, *The Complete Walker*, Alfred A. Knopf, Inc., 1968.

The first consideration for selecting clothing is warmth, especially in this northern climate. There are three areas of warmth that need to be understood: keeping yourself warm when your heat is being robbed by wind, rain, and cold; properly ridding yourself of excess heat when you are overworking; and keeping dry from the outside with rain gear while hiking and perspiring from within.

Keeping warm when body heat is being robbed by winds, rain, and cold, is the most obvious concern. This fact is obvious when you notice that almost all beginning backpackers overdress.

If someone is unaware of what to expect due to inexperience; the only real cost will be excess weight that this neophyte will be carrying. As that person gains more experience, they will learn what is necessary and what isn't. Essentially, staying warm is dependent on three things:

- The environment
- The metabolism of the individual, and
- The insulation in the form of clothing that this person has on. Insulation is dead air space – an area in which there is little or no air movement.

Human bodies are like furnaces producing heat as a result of muscle movement and metabolism of food. This energy, produced by our bodies, would be quickly transferred or dissipated if we were to be in a cool environment without clothing. If there were a wind, the heat would be dissipated even faster. So, in order to keep warm in a cool place, we wear clothing; this clothing impedes the dissipation of heat from our bodies to the environment. Simply stated, campers need to create a dead air space around their bodies that varies with the temperature, the wind, and the activity to keep warm in cold climates.

Excess Heat

Yet another factor to be considered in body heating and cooling is how the body rids itself of excess body heat when overworked. When the body is overheated, it automatically perspires in order to cool itself. A potential problem can occur if a person perspires profusely. That can dampen your clothing, and totally wet clothing loses 90% of its insulation value.

A person needs to be very careful about perspiring and wet clothing, because when clothing becomes wet, it practically defeats its own purpose. The best technique for dealing with this phenomenon is called “layering”. Essentially, layering is wearing many thin layers of clothing instead of one thick layer. An example of this would be wearing a combination of a fishnet underwear top, a wool long-sleeve shirt, and a heavy cotton windbreaker, instead of a T-shirt and a thick parka. The advantages of the layering are two-fold: it gives the most insulation for the least amount of weight, and it is the most flexible in that it allows adjustments to the amount of clothing to be made easily. In fact, in any given day, it is not unusual to go from a situation where a camper gets cold and they need to protect their body from the heat that is being robbed, to a situation where they are over-heated, producing an excess amount of heat. If a camper has layered clothing, he or she can easily deal with the situation of either too little heat or too much by simply adding a layer of clothing or taking off a layer. A beginner is likely to spend a lot of time stopping on the trail to adjust layers, while the veteran will expand his comfort ranges so that he doesn't need to stop as often to make adjustments.

Activity & Clothing

Another important aspect in clothing selection is to estimate the activities the camper intends to undertake. Books on this subject recommend taking an estimate of the reasonably worst weather conditions to be encountered for that time of year, in that particular locality, and prepare accordingly. Another pertinent factor should be the length of the trip, because campers will need to be more prepared for a week-long trip than a day hike, since they are likely to encounter more varied weather in that period of time. Campers should consider the terrain and characteristics of the environment. Campers need completely different sets of clothing for climbing mountains than needed for exploring a desert. Campers and group leaders should do a little research and determine the weather characteristics for that time of year as well as any other peculiarities the group might encounter in that specific area that will effect clothing selection and direct comfort.

Cotton

Cotton is probably the work horse of clothing and although it seems as though it is being replaced by the new synthetic fabrics or combinations, it still is a significant material used in clothing.

Some of the advantages of cotton that keep it in use are:

- It has less disagreeable condensation in the sense that it does not feel clammy when damp.
- Due to the characteristics of the fiber, it will accept and hold any water repellent treatment.
- It can be woven into a very tight wind resistant article of clothing

Some disadvantages are:

- It has a low tear strength – it will tear easily
- It is subject to mildew and rot.
- Very wet cotton can lose heat nearly 240 times faster than dry cotton clothing.

One way of improving on the disadvantages of cotton is to combine it with another thread such as nylon. A good product blend is 60/40 cloth.

Wool

Probably the most popular fabric to the breakthrough in technology with the synthetics was wool. However, wool hasn't lost much ground. It is still widely used and accepted in the outdoor enthusiast environment. Wool is one of the only fabrics that will insulate when it is wet. That property makes it particularly flexible as well as very safe. In fact, as people become more oriented towards safety in the wilderness, specifically regarding hypothermia, they automatically think of wool. The only disadvantages to be considered with wool are: some people are not capable of wearing wool next to their skin because it tends to be itchy, and its tear strength is reduced when wet. Wool is used primarily in skirts, socks, mittens, and pants.

Nylon

Nylon is probably one of the most popular fabrics of the backpacking world. That is primarily because it is the strongest fabric for its weight.

Disadvantages are:

- Unless it is carefully woven and the edges are seared or heat-set, it will ravel or fray very badly.
- It is difficult to weave into a tight fabric because it is a hard, round fiber.
- It is not a good wet weather fabric because it will not hold water repellent very well.
- Condensation problems are more extreme in nylon tents than a cotton tents.

Some excerpts on materials from *The Tent* catalog best describe these materials:

- Ripstop nylon, a lightweight uncoated breathable and slightly water repellent nylon fabric with cross patterns of extra threads forming a reinforcing grid.
- Nylon taffeta, a dense strong uncoated nylon which is downproof, windproof, and slightly water repellent.
- 60/40 cloth, an uncoated breathable fabric of 60% cotton and 40% nylon, which has high abrasion resistance and tear strength and is moderately repellent; and
- Polymer-coated nylon, a light weight nylon taffeta which is water repellent and has high tear strength.

Nylon seems to be a work horse because of its advantages and although there are other synthetic materials, none have given nylon any real threat.

CHOOSING ATTIRE

Essentially, nylon, wool and cotton are the most readily used fabrics for camping clothing. There are others, but they are not as significant as the three mentioned above.

Underwear

In regards to the actual clothing itself, probably the most logical place to begin would be underwear, the foundation of a “layering approach.” Many veteran campers have a personal preference that lies in the realm of “fishnets” which look as though someone actually took open mesh net and constructed a shirt or a pair of longs. The principle of fishnet is to create a dead air space by trapping the air in the mesh itself, as well as allowing your skin to breathe easily. Fishnets have their biggest strength in cold conditions where almost excessive perspiration seems unavoidable. They allow perspiration to be picked up by your clothing without actually touching your skin. Another advantage to the fishnet is that in warm weather, it can prevent mosquitoes from biting you through your clothing due to the extra distance the outside shirt is from the skin. Some people contend that fishnets keep them cooler in the warm weather. A more recent addition to the underwear ranks are the thermal actions. They are comprised of a combination of fabrics such as REI duofolds - the outer layer is 40% wool, 50% cotton and 10% nylon and the inner layer is 100% cotton. One last item is Uncle Sam’s government-issued long johns, a bargain if they can be found – is comprised of 50% wool and 50% cotton. The more wool, the better - if your skin will tolerate it.

Socks

Socks seem to be a very personal choice, but an acceptable rule is that a 100% cotton liner and a wool outer-sock is a great combination. The cotton being comfortable when damp with perspiration and the wool still not losing so much of its insulation abilities when wet.

Pants

Pants essentially have two requirements: they should not be binding at the knees and hips; and should provide protection from things such as nettles, thorns, underbrush, and what not. Another obvious consideration is insulating qualities, both when wet and dry. If a camper is concerned with wet insulating ability, they are automatically into wool, the old reliable standby. A good place to begin looking for wool pants if you can’t quite afford the prices that most stores or catalogs want is an Army Surplus store. The Army has historically been heavy into wool and if a camper is fortunate to have access to Army wool pants, they will have a good, tough, quality. So what if it’s ugly! Other places to look for wool pants are the Salvation Army, rummage sales, or any agency comparable to St. Vincent De Paul. Good clothing can be found for very little money if campers make the effort to look for it.

Shorts

Shorts are the ultimate in freedom, but one must be cautious when it comes to bugs, underbrush, and what not.

Shirts

Shirts are a very personal selection. Requirements are that they have buttons or mechanisms to ventilate the body heat and that it has closures at the neck and sleeves for protection. Probably the most popular shirts, again, are wool. Another good shirt is the long sleeve wool cotton undershirt with the button neck. It is a cheap, comfortable outer shirt that fulfills all the requirements.

Sweaters

Sweaters seem to be a real asset to a layering approach because they are so comfortable and normally light in regards to the loft or thickness they supply. There are no real requirements for sweaters, but it would be more advantageous if they were wool. One other tidbit about the turtleneck sweater is that it is a fine garment for little or no activity, but when working and overheating, it affords no ventilation. There is a point to be made about the neck, and that is it helps considerably to cover it with something temporary like a scarf when cold. If a camper starts overheating, they can easily remove the scarf to aid in ventilation and cooling. A warm neck seems to go a long way towards helping keep the body warm.

Down Vests

In regards to jackets, the down-filled vest is the single most versatile outdoor garment for activity. It weighs virtually nothing, and allows arms to be totally unrestricted and yet still keeps the torso protected. It is a very integral part of a good “layering system” and when the vest is coupled with a good cotton windbreaker, a person can handle pretty severe winter conditions.

Parkas & Jackets

Parkas and jackets typically represent items of clothing for inactivity. Again, this is a very personal choice that is dependent on a lot of factors, with metabolism and conditioning at the forefront. Probably the most popular jackets and parkas are filled with down and as a rule, have a nylon exterior, or in some cases, a nylon-cotton combination. They run the full spectrum from a light down sweater to a very heavy expedition parka. One note of caution with down is that it totally loses its insulating qualities when wet, so a camper needs to take extra caution in keeping it dry.

Hood Covering

Hats seem to be an underrated item and yet they are extremely important because the head is a very efficient radiator. If a camper isn't careful in cold weather, their head can radiate enough heat to chill the rest of your body. So, henceforth, the old adage, “If your hands are cold, put on your hat!” In fact, he head receives 20% of the body's blood, thus the head can yield a substantial heat loss- the reverse can be true in a heat situation, since it not only protects the head but also the neck. A balaclava, for a hat, is nearly as effective as a hood since it serves the same function. Again, wool is preferable.

Hand Coverings

Mittens and gloves are essential if a camper is to have any dexterity in cold weather. There is nothing worse than trying to do a subtle movement like tying a knot with extremely cold hands. Only those actions requiring no dexterity are possible and it hurts. The most popular mitts are the down mitt because of lightness, and the wool inner mitt and leather outer mitt combo because of their durability and ability to still insulate when wet. Gloves are not that efficient in really cold weather because the fingers are isolated and can't group themselves together to pool their respective heat. A popular combination for those needing dexterity and protection, such as photographers, is to wear a silk glove inside a mitt. Then, when a subtle maneuver is required, the silk gloved hand can be used and it still has some protection. However, this silk glove hand won't give any lasting protection in extremely cold weather.

Rain Gear

Rain gear seems to be one of the greater areas of controversy because of all the different aspects such as water repellent versus waterproof or poncho versus rain suits. Plus, with any rain gear comes the dilemma of breath-ability versus waterproof-ness. Ponchos seem to be the most widely accepted piece of rain gear because of their versatility. A poncho can be a rain tarp, a ground cloth, or serve as personal body protection. Another major advantage is that the poncho, because of its design, provides for a lot of air movement, thereby increasing the dissipation of body moisture. A major disadvantage of a poncho is that it will go every which way in the wind and this does not give much protection from the rain.

In conclusion, as with all the clothing mentioned here, there is no hard, fast rule as to what clothing is acceptable and what is not. There are many factors as well as personal preferences that are going to set the guidelines for the camper's final decision. Whatever the case, don't fail to realize that clothing is merely a means to an end – it is an aid that will allow a body to be a little bit more comfortable and safer in order to explore and share the joys that only a day on the trail can possibly provide.

FIRECRAFT

Campers use all types of fires from a wood fire on the ground to charcoal in a state park grill and even gas stoves where open fires are not allowed. Whatever method is used, a certain amount of preparation precedes striking the match.

Safety

Fire safety depends on a safe spot for the fire, a safe fire, and complete extinction after use. Pick a safe spot at least 10 feet from brush, trees, or overhanging limbs. Then, clear a 10-foot circle down to the mineral soil. Remove all dry leaves and needles, dry grass, and twigs.

Duff, the partially decomposed organic matter found beneath the natural litter, is also flammable as are roots running through the fire area. Fire can travel unnoticed through either duff or roots, and spring to the surface a distance away.

Once you have cleared the fire area, take the mineral soil that you dug from the latrine and spread it 3 inches deep over a 4-foot area in the middle of the cleared circle. A more permanent fireplace can be made by using dead logs or large rocks to form a fireplace bed about 3 by 4 feet. Fill it with unburnable soil. Any sod or soil that is dug must be replaced before leaving the campsite.

Firewood

Gather fire building materials. You will need tinder, kindling, and fuel. Do not gather more than you will use. A supply can be kept conveniently near, protected to keep it dry, but any excess should be returned to its original location or otherwise scattered before departure.

Tinder must be a flammable material that will flare up when touched with a match flame. Weed tops such as goldenrod, aster, wild carrot, milkweed, cattail, and fern are good fire starters, but are only good in fall and winter when they are dry. Pine needles, tiny dead twigs from evergreens, and the tips of dead branches of many trees are usable. Cedar, birch, tulip, basswood, elm, and grape bark are good tinder, but peel it only from DEAD trees. Birchbark will burn even when wet. If everything else is wet, split small sticks from the center of a dead log. Shave them into "fuzz sticks" leaving long shavings attached.

Tinder ignites kindling. Most of this can be gathered without a knife or ax. Look for dead twigs and sticks on the ground, but don't bother with damp or rotten pieces. Dead branches still on the tree are better and can usually be broken off easily. Use thin sticks for quick fire making.

The larger sticks and logs are the fuel. Use only deadwood. Sticks that bend but don't break are too green for use. For convenience, cut the fuel into pieces about 1 foot long. Large logs should be split for use as cooking fuel. In rainy weather, splitting open a log or wood from a standing dead tree may be the only source of dry fuel.

Not all deadwood makes good cooking fuel. For most cooking, hot coals are best and the best coals come from hardwoods. Use woods like ash, oak, maple, birch, or hickory. If only softwood, like pine, is available, you will need a larger supply as it burns more quickly.

Fire Lays

The secret to fire success is a good fire lay. While there are many variations, one of the simplest is made with a short log, 3 or 4 inches thick. Place it on the fire base pointing toward the wind and put your tinder beside it. Place a handful of kindling on top of the tinder, but supported by the log. Light the tinder on the windward side.

Another easy method is to push a stock into the ground at an angle or to lay it across two small rocks about a foot apart. Place tinder under the stick and lean pieces of kindling against it. The kindling should be arranged so the wind will blow the flame of the tinder toward the kindling.

The larger pieces of fire wood can be added to the basic fire lay in a variety of arrangements. One of the most basic, and a type used to start larger fires, is to set the fuel on end in the form of a tepee. Good beds of coals can be made by stacking the fuel in either a log cabin or crisscross shape.

In very windy areas, a trench or pit fire may be needed. Be careful of underground roots or peaty soil and carefully replace the sod when finished. Avoid digging fire places if possible. Holes destroy ground cover and start erosion no matter how carefully refilled.

Putting Out

To extinguish the fire, soak all embers and sticks with water. Sprinkling is more effective than pouring. Stir and soak the fire until you can put your hand right on the coals. If water is not available, stir dirt thoroughly into the ashes. Once the fire is out, bury the remains in the latrine or "garden" them into the ground. Restore the fire area to its natural state.

The matches you will need for lighting your fire should be kept in a waterproof container. A plastic match case is less likely to have its cover jam than a metal one. A tightly sealed plastic bag or film can are possible substitutes. Matches may also be waterproofed by dipping them in paraffin or fingernail polish. Solid chemical fuels, such as paraffin fire starters or even a candle stub, increase your chances of fire lighting success in difficult conditions.

Conservation Tips

Fires should be built with conservation principles in mind. This involves more than building fires in a safe place and not leaving a campsite until the fire is out. Keep the fire small but efficient and avoid methods which harm the soil and soil cover. If others have previously built fires in the area, use their fire sites instead of building a new one. In frequently used areas, more fire sites then are needed soon develop. Take the time to hide some of the excess.

Use judgment in deciding whether an area can afford the use of its wood for fires. Near timberline, for example, it would be unwise to use wood because it is so difficult for trees to grow in that environment. Even an old snag should be left as part of the scenery instead of being piled on a campfire.

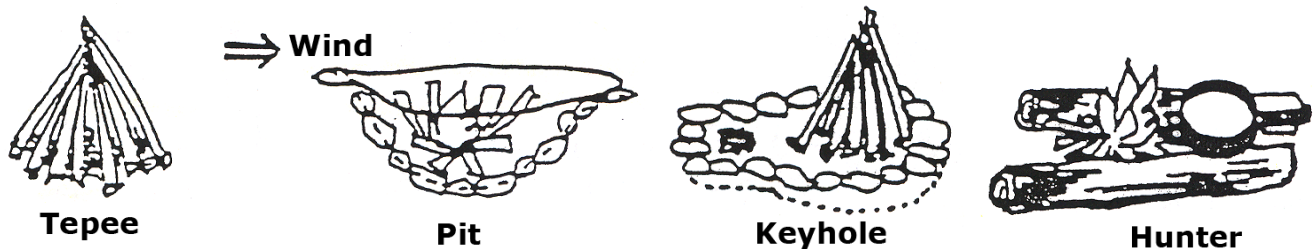
Fire places use fuel much more efficiently than unprotected fires, but build them with stones rather than logs. Tin cans make ideal "conservation stoves" which give maximum heat for minimum fuel. A paint

can may be converted to a single burner stove by cutting openings on opposite sides near the base to feed in firewood and punching nail holes in the bottom and sides. A two-burner model can be fashioned from a rectangle 1-gallon can.

FIRES FOR CAMP COOKING

Camp cookery requires some type of heat. Generally speaking, this heat will be either from the sun or from a flame. Radiant energy of the sun can be an effective source cooking heat, but is probably one of the least dependable. Heat from a flame or embers are the most common types used in camp cooking. Sources of heat flame can be either from mechanical stove or wood fires. For our purposes in this section, we'll discuss the use of wood fires and embers only. Camp stoves, while efficient, lightweight, clean and necessary during periods of high forest fire hazard or where wood fuel is not available, are inefficient and costly for typical camp cooking.

The methods for the safe and low impact construction of wood fires can be found in the preceding Firecraft section. Following is a brief description of some types of wood fires and their particular uses or special feature.



The **tepee** fire is probably the most used fire. It is simple to construct, east to start, easy to control, and effective for quick cooking. Some provision for suspending pots is required for boiling and simmering, but not for frying.

The **pit** fire is merely an inverted tepee fire with addition of vents and vole. This fire is of benefit in high winds and must be used in mineral soils.

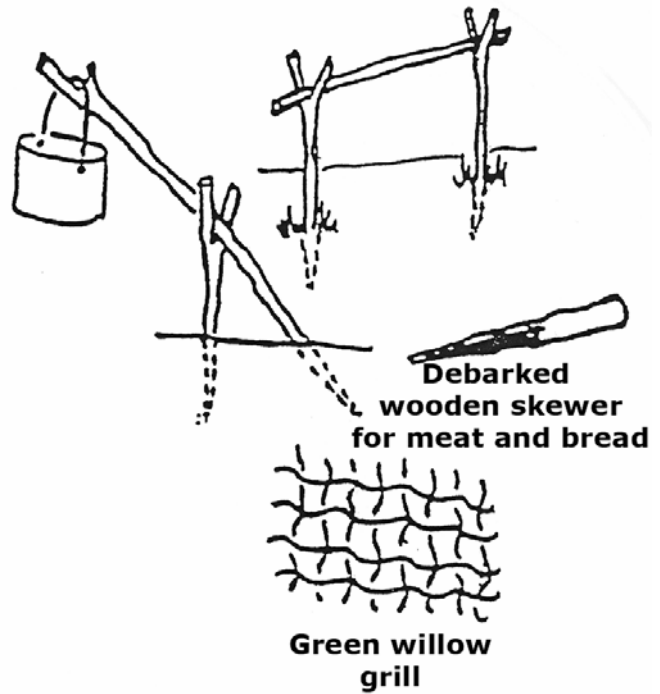
The **keyhole** fire provides a variable type fire for direct flame cooking or radiant heat cooking from coals. At one end, in a round shallow depression, a tepee fire produces flame for quick cooking while also creating burning coals. The coals are channeled down a shallow, narrow connecting trench where broiling may be done. This fire is also very effective where plenty of coals are needed and soft wood is only available, yet still keeping the fire small and controllable.

The **hunter** fire is an ideal fire for cooking over coals. Any fire lay can be used and when sufficient coals have been produced, two logs are placed upon either side. The logs provide an ideal nesting spot for a number of pans and pots.

The cooking temperature can, with a little experience, be easily regulated by shifting the concentration of the coals. The "hunter fire" can also be easily modified into a reflector fire by merely staking the outside of one log and rolling the other on top.

When cooking over wood fires, it is necessary to provide some support for pots and pans. Usually an arrangement of forked sticks and branches are used to support pots. Proper judgment should be exercised when selecting materials so as not to alter the surrounding areas. It is recommended that small grills supported on rocks or logs be used, in an effort to minimize environmental damage.

To hold your cooking pots, a simple fireplace may be build around your fire. Logs, rocks, or even tent pins can be arranged to support your pots and pans over the fire. Beware of sandstone or rocks from steam beds as moisture inside may cause them to explode when heated. The pots can also be supported by a portable grate, either the folding type or a grate placed on rocks or logs. Don't use refrigerator shelves for this purpose because of the possibility of food poisoning if the plating contains cadmium.



COOKING METHODS

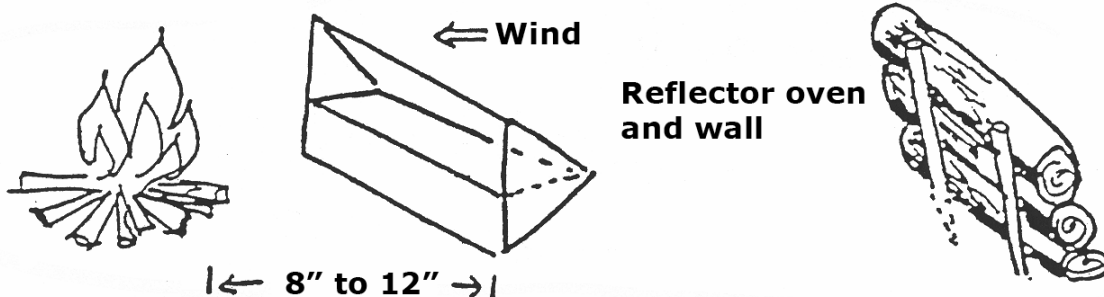
Frying, broiling, baking, roasting, and boiling are the basic methods used in outdoor cookery. With the exception of boiling, all require a good base of coals, preferably from hardwood. This will provide a long-lasting and even source of heat, which is easily controlled.

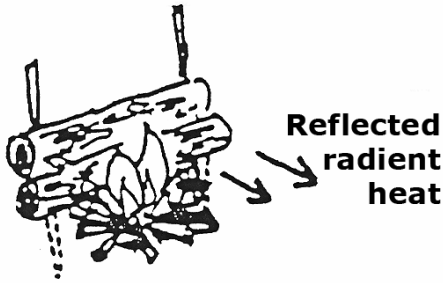
Frying - Frying is the cooking of food in hot fat, grease, oil or butter. This method is widely used in camp cookery and is not always successful. The key to frying with success is to have the food as dry as possible and the oil very hot. This will avoid excessive absorption of oil by searing the food. Pan broiling is a modification of frying, the difference being that only enough oil or fat is used to keep food from sticking and excess grease poured off as it accumulates.

Broiling - When cooking directly over radiant heat, you are broiling. Barbecuing is merely broiling over a portable fireplace and is a common form used in outdoor cooking. Food to be cooked in this manner is usually suspended directly over the coals by either a spit or grill and rotated frequently (refer to sources of heat).

Baking and Roasting - Baking and roasting require intense, indirect, dry heat. Depending on the type of food, baking and roasting can be done by reflector over dutch oven or natural casings surrounded by coals.

Reflecting ovens can be purchased from outfitting stores or one can be fashioned from aluminum using simple coals. *The Boy Scout Field Manual* has the details for making a reflector oven.

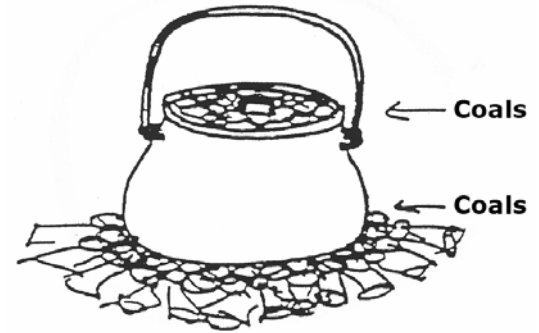




Modified

Reflector ovens should be placed on the windward side of a fire. The fire should be at least as long and as high as the oven. The efficiency of the reflector oven can be greatly increased if you build a reflector wall opposite the oven. (Refer to hunter fire modification). The oven will be ready to cook in when water sizzles on the shelf. Place food in tins or on foil to keep the oven clean.

Dutch oven cookery, while out of the question for hiking and backpacking, has a place when the mode of transportation is canoeing or packhorse. The dutch oven is made from heavy cast iron. It has a dish-type, tight-fitting lid and is supported on three legs. Hot coals are placed on the lid and below the oven. The coals at the bottom must not touch the cast iron.



Roasting in the dutch oven merely requires searing the meat in a pre-heated oven containing a slight amount of fat which is placed over a flaming fire. Then, vegetables may be added, over covered and coals placed above it. Generally, 45 minutes cooking time is required for every pound of meat. A little experimenting will provide the timing and the technique. Baking in the dutch oven is done the same as roasting except for the searing.

Roasting Fun

Many items can be baked or roasted directly in a bed of coals if some form of natural casing or foil is used. Mud, clay, husks, leaf (sweet) or orange casings can be used.

This food is encased completely in clay worked with water to form a stiff paste. It is then placed in coals. When the cases are hard, the food should be done. Merely split the case with a knife, being careful not to burn yourself. Fish and fowl may be prepared in this manner without scaling or skinning. When the case is split, skin and scales will come off with the clay.

Husks of corn or broad type leaves can be used to encase food for roasting orange off and scoop out the pulp and eat the pulp. Fill the shell with food, replace the top and secure with sliver of wood. This method imparts an orange flavor to its contents. After cooking, the charred orange casing can be used as a serving dish and later burned to ashes in the fire.

Foil cookery is done in the same manner. Take care! Use heavy gauge foil and seal food completely. Foil can be washed and used over again. Whenever cooking in coals, be sure to frequently turn food packages to avoid burning and ensure even, thorough cooking.

Backpacking Stoves

Single burner backpacking stoves are available which use white (unleaded) gas. Two general types are on the market: self-pressurizing stoves, which must be preheated, and pressure pump models. Kerosene stoves are also available or you may prefer one using butane or propane. Each kind of stove has its own characteristics which must be considered before making a selection. Butane and propane stoves are very convenient to use, but the empty fuel cylinders must be carried back to civilization for disposal. They may not work in cold weather but tend to be more reliable than self-pressurizing models at high altitudes. Kerosene models must be primed with alcohol before lighting. For winter use, self-pressurizing stoves must be insulated from the snow. All stoves operate more efficiently if shielded from the wind.

WILDERNESS KITCHEN

Those pleasant days out on the trail can create the ideal dining room. Preparing one's own meals can be a rewarding experience. You can have the pleasure of creating delectable meals from basic ingredients and be limited only by your imagination.

Great camp food can be prepared from basic ingredients. Granted, innovations in light weight camp foods are time and weight savers, but when it comes to flavor, economy and variety, you can't beat the basics. A policy of Paul Petzolt's N.O.L.S. program is that pre-packaged meals and freeze-died foods are fine for short trips if you can afford them, but do not provide as much benefit as do their meals prepared from basics.

As in any outdoor group activity, consideration and cooperation with your fellow campers is of utmost concern. Etiquette, though it may differ from what one may use at home, still has a place in the wilderness.

Camp Etiquette

Everyone should be anxious to help prepare and serve food – but a note of caution – Too many cooks spoil the pot.” One person should be responsible for the meal and those wishing to help follow his instruction. This position of delegating duties should rotate amongst all the members of the group from meal to meal.

The individual should always see that other members are served fast. A certain deep self-satisfaction will be revealed to the outdoor chef as he serves what may appear to be a simple fare to each and every ravenous hiker. He will see their eyes light up and their lips smack to the approach of a food laden plate.

If you feel that there is too much of a crowd in the kitchen area, don't just stand around. There is always need for fuel for the fire – those nice finger size twigs – or camp chores to be done. Always take the initiative!

Safety and conservation are part and parcel of outdoor meal etiquette. Caution should always be used when building fires and using them for cooking: this is not only for the camper's safety, but also for the sake of the environment. (Refer to the section dealing in Firecraft for proper safety and conservation procedures.)

Care must be taken to ensure that eating utensils are cleansed thoroughly to avoid ptomaine poisoning and animal attraction. Stay away from cleansers if possible, especially avoid high phosphate types. You will find that lots of hot water and elbow grease do a very effective job of cleansing. In any event, dish washing should be done far away from sources of drinking water, streams, and lakes. Preferably look for high areas of sand or gravel, especially when using dish soaps.

Garbage and litter is the never ending plague of the environment. Adherence to simple guidelines is all that is needed to rid the land of this ailment. Burn what you can and what you can't burn, back pack out.

Food Packaging

Proper food packaging is essential to any wilderness trip. First, avoid foods that spoil easily. Many foods can safely be carried for a few days without danger of spoiling. All foods should be removed from their original containers and repackaged in the quantity needed.

There are two basic modes of packaging foods. One is to package according to food type, and the other according to day and meal. The first method permits greater flexibility in preparing meals out in the

field, while the latter, though less flexible, is more organized. Both require property pre-planning, so it is a matter of personal preference.

In any event, dry foods should be packaged in clear, plastic bags and sealed with a warm iron or ties. The contents should be marked on the outside along with any particular methods of preparation. Liquids, especially if in glass containers, should be repackaged in plastic containers. These are available from camp outfitters and come in various sizes with narrow and wide mouth openings. Plastic baby bottles make for fine containers.

Semi-liquid materials, such as soft cheese, peanut butter, jelly or margarine, can be packed in re-usable squeeze tubes, which are also available from outfitters.

Food storage in the out-of-doors in terms of preservation presents problems, especially during the warmer months. Generally, avoid easily perishable foods. Some foods need just to be cool to extend their freshness. This can be done by suspending food in cloth sacks out of the direct sunlight, and preferably in a breeze. This is known as an evaporation cooler. Foods can also be placed in cloth sacks and submerged in fast flowing streams. Caution! This puts food within reach of your bankside friends: raccoon, muskrat, mink, and the like.

Utensils for outdoor cooking depend upon the meals you will prepare and the size of the group. In reasonably-sized groups, the group cooking equipment can be distributed among its members. There are a variety of cooking outfits available from camp outfitters, but one should not overlook articles in the home kitchen.

Recipes for outdoor cooking are many. There are many fine books which contain tried and proven trail meals. A few are listed at the end of this chapter. Recipes should always be tested at home first under simulated wilderness conditions. Copy your recipe and include it in the meal package. A menu plan on notecards to fit in a pocket of your pack will help keep confusion at a minimum, especially with a large group. After, many meals eaten at home can be adapted to the field. With a little ingenuity and imagination, one can prepare outdoor meals that will grace the palate with titillating flavor. – Happy eating!

ACTIVITY EFFECTS

The USDA suggests that for a quick estimate of energy needs, multiply body weight in pounds by a factor determined by the type of physical activity in which the individual is engaged. These factors are: in kcal/lb/day:

Physical Activity	Women	Men
Sedentary	14	16
Moderately Active	18	21
Very Active	22	26

The difficulty lies in judgment of one's activity level. For highly physically strenuous activities such as mountaineering, backpacking, cross country skiing, etc., the judgment of very active would be appropriate for most participants. A 130 pound girl would require approximately 2860 calories using this method; a 170 lb boy would need approximately 4420 activities. Considering the possibility that both boys and girls would be taking part in the same activities, the factors for females might be low in the case of Outdoor Adventure Challenge activities. An assessment could be made after a few trips had been made.

Weather:

Weather is an important factor in meal planning. On a trip where available shelter is crude and at a minimum, if rain is to be expected, you might better include meals that can be eaten cold in case you are caught at supertime in a downpour – wood-soaked and no stove packed.

Itinerary:

There's a great difference between planning meals for a group with a base camp they return to each night and a group who are breaking camp every day. During an outing where the two are combined, traveling for a few days to reach a spot where you stay for a period and then travel on, daily changes in routine will affect planning and preparation.

Personal Tastes and Preferences:

People's taste and preferences are important. If orange drink is the only vitamin C source taken on an outing for a group and one person just *hates* it, an unnecessary discomfort will have been placed on that person which could have easily been avoided. Some people, for instance, really get a lift out of having a hot drink at lunchtime - it rejuvenates them! If the planning group knows this, it can attempt to include soups at noon in the schedule and meal plan.

SIX STEPS FOR FOOD SELECTION

1. **Nutritional values** - Consider energy, stick to basic needs
2. **Weight** - is it important to keep gear weight low?
If Yes:
 - Choose dehydrated foods, high nutrition and energy for low bulk and weight; no cans or high water content foods, few fresh foods
 - Freeze-dried foods are expensive but great for weight conservationIf No:
 - Cans and fresh foods are possibilities. Almost any food could be included in menu (coolers could be carried when travel is by vehicle).
3. **Ease of preparation** - Cooking can be a headache - make the job as easy as possible; good planning encourages efficient, trouble-free meal preparation.
4. **Palatability** - Who wants to eat if the food isn't tasty? Again, planning and careful preparation will help. Practice makes perfect, most of the time.
5. **Packaging** - No Littering!!
 - What you pack in, pack out!
 - Food must be securely packaged - moisture proof, animal proof, spill proof, fool proof!
 - Package to make food preparation easy - meal-by-meal with recipes and menu included, day-by-day, group-by-group.
 - Do as much pre-packaging and advance preparation as possible.
 - Pre-packaged meals cost fantastic amounts - beware!
 - Many dehydrated foods can be purchased at the focal food store - use ingenuity to create dishes from common foods.
6. **Cost** - Shop wisely to cut corners so you can splurge on special foods if your money allows it

Meals are Social Events!

- A time to share experiences of the day like when your canoe hurdled between two rocks in the rapids like a bullet, not touching either one...
- A time to evaluate the trip up to that point and offer suggestions for changes in the itinerary for the days ahead
- A time to joke and have fun, to relax, and to get to know one another better.

Many parties plan to eat their meals together and to cook as a group. A common carefully planned menu will require the least weight and economy in packaging. Experience both in cooking as a group and cooking individually are both valuable in training. The situation may arise where it is easier to eat breakfast and lunch separately and dinner together. Be sensitive to the needs and preferences of your group.

Effective groups for cooking should rarely exceed six. Beyond that number, usually, the efficiency of group preparation is outweighed by complications of large fires, large pots, and hungry mobs almost strangling the cook as they grab for the pot. The intensity of the schedule and fuel available may also affect group eating patterns (small pack stoves are not real efficient for cooking for a mob). Socially, a group cohesiveness is extremely important to the success of a Outdoor Adventure Challenge outing. Foster togetherness within your group whenever possible. Challenge them as a group as well as individually.

Menu Planning

So you know what to eat and what foods are available to take along, what do you do next? Throw it all in a pack and create masterpieces of delight, magnificent wonders and gourmet smashes (no fair to use a recipe) on a campfire site with a wave of your carved wooden spoon over your famed black pot, with “a little bit o’luck” thrown in for good measure? Ah, let’s be realistic... it takes time and practice to be a gourmet wilderness cook.

Whether you’re planning a one-day, one-week, or longer excursion, you should plan a written menu for every meal that you expect to eat, especially when working with groups of less experienced outers. Now, no one is saying you have to eat every meal as planned or that you have to consume them in some specific order. But, if you do plan, you will know the foods you have along, the amounts, and a way in which they can be combined to fulfill nutritive requirements. Extra amounts can then easily be included for emergency rations and for additional energy requirements, if necessary (or you might meet a friend?).

Before menu planning can begin, examine the purpose of your trip, what you want to learn and experience:

- Are you learning outdoor skills not related to nutrition and foods? You might want to keep the menu simple so most of your available time can be available for fulfilling your outing’s purpose.
- Are you learning about nutrition – extra emphasis should be put on planning and preparation to make cooking a real learning experience – and fun, too!

Planning Makes Sense!!

Where you are going and what you will be doing are super important to your menu planning.

Types of trips to consider:

- Backpacking across Isle Royal National Park in Lake Superior - 50 mile, week-long, hike - this trip would call for minimum weight, high energy, low bulk foods; preparation morning and noon must be fast and easy; evening could allow more creativity and time for preparation.
- Spelunking in an Indiana cave - daily trips into the cave - food might be transported by car, refrigeration (coolers) and weight would be little problem so fresh foods could be included in the diet.
- Winter weekend for constructing shelters and practicing camp skills - emphasis might be placed on cooking techniques and fires; teaching how to plan, shop, etc., might be an integral part of program. Cooking in shelters could be implemented.

A point to remember - hot foods are desirable in winter! Caloric needs might be lower, depending on activity level.

- Canoe trip with foraging - food must be packed with added moisture protection, weight would be important if forages were long.

HOW TO MEAL PLAN

Meals can be planned by a committee, by one designated individual or by the whole group if it is small. Whatever is more desirable for your group which will make the trip more enjoyable and a better learning experience is A-OK.

- Set goals for menu planning:
 - Evaluate six considerations for food choices
 - Nutritional value
 - Weight
 - Ease of preparation
 - Palatability - tastes & preferences
 - Packaging
 - Cost
- Make decisions as to what the needs of the group are:
 - Three meals a day or more
 - Youth or adults or more (in terms of calories, tastes, milk, habits)
 - Expenses must be kept low?
- Write menus - Follow the Food Pyramid! *Variety is Sanity!* Consider:
 - Where the group will be for each meal?
 - What equipment is available
 - Time to be spent in preparing, eating, and cleanup
 - Activities that will follow meal - strenuous? Watch for fat intake
 - When next meal will be served
 - Be creative - try new foods, new cooking techniques, new forms of foods

Note: Try all new dishes out at home *before* including them in your menu. Nothing is worse than having a whole meal ruined because a recipe failed, or the cook failed.

- Gather recipes for all menus
Compile lists of ingredients with estimated quantities - make sure you have made plans for doubling a recipe or preparing it more than once, if necessary.
- Make a shopping list
- Make a duty list: Who will
 - Shop
 - Package
 - Build fires
 - Cook
 - Cleanup
 - Repack

To be on the safe side:

- Include in your menus only foods that you have practiced preparing. Choose less complicated dishes that are quick to prepare. Who wants to spend an entire vacation in the kitchen?
- Keep meal equipment at minimum, and take only what you'll need. Who wants to carry a reflector

oven on a trip and never use it? Be creative and initiative in using equipment for more than one purpose, 2, 3, 4, or 5!

- Plan for proteins and fats to be taken frequently in small amounts rather than at one sitting to aid easy digestion.
- Repeat foods that are liked by all and refreshing in the menu.
- Keep in mind that snacks are usually welcome for a break - good for an energy pickup. Flavored drinks refresh and add to caloric intake. They can supply vitamin C, too. Snacks should be an integral part of the daily nutritional diet picture.

Happy Eating!

PACKABLE FOODS

- Allow 1 ½ to 2 pounds of food per day per person.
- Plan a hot meal for morning and evening; a cold lunch can be eaten at noon.
- Bring trail snacks to nibble between meals for energy.
- Plan to drink a lot of liquids to avoid dehydration.
- Pack all food for one meal in a small bag and label it.

Good nutrition is important! You will be using a lot of energy and you don't want to get tired or sick out in the woods. Each day you should eat foods from all the basic food groups-fruits and vegetables, carbohydrates and fats, proteins (meats, dairy products, eggs, beans, etc).

There are commercially prepared freeze-dried foods for camping, but they are fairly expensive. There are enough foods available these days in the grocery store to make up a good backpack diet.

Protein

Squeeze cheese
Hard Cheese
Hard Salami
Dry Milk
Bac-O's
Jerky
Dried chipped Meats
Beans, Legumes
Peanut Butter
Trail Mix
Nuts
Hot Chocolate
Small cans of meat
..spam/tuna/chicken

Carbs/Fat

Corn Meal
Hard Crackers
Instant Cereal
Instant Rice
Pasta
Hard Cookies
Bisquick
Breads
Wheat Germ
Gravy Mix
Jam/Honey
Granola
Instant pudding
Dried Potatoes
Salad Oil
Ramen Noodles
Mug-a-Lunch
Dried Cream sauces

Fruits/Veggies

Dried Vegetables
Tang
Instant soups
Dried Fruit
Zucchini Bread
Gorp
Fruit Leather
Fruit Bars

Other

Sugar free Kool-aid
Tea
Coffee
Bouillon
Postum