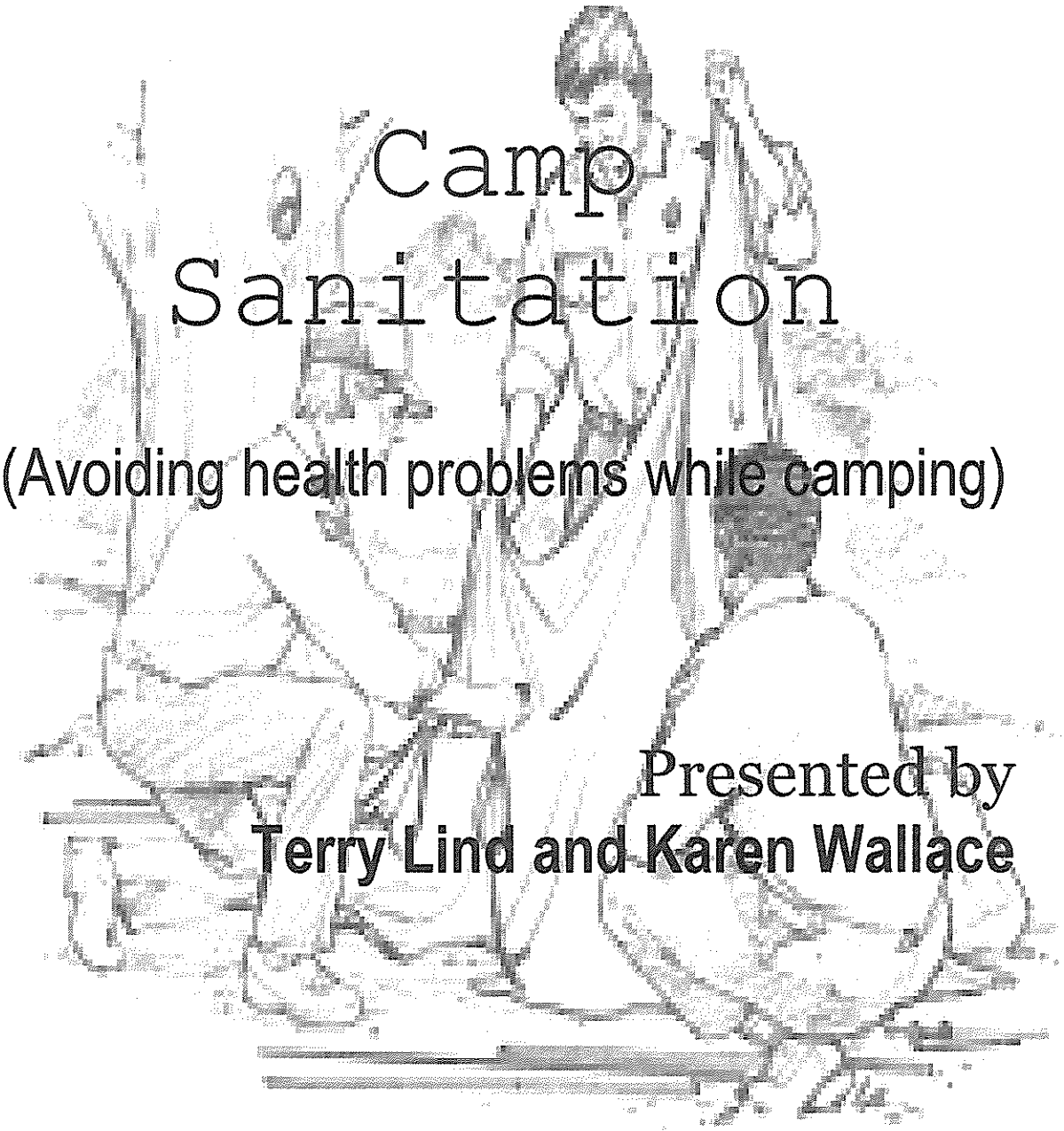
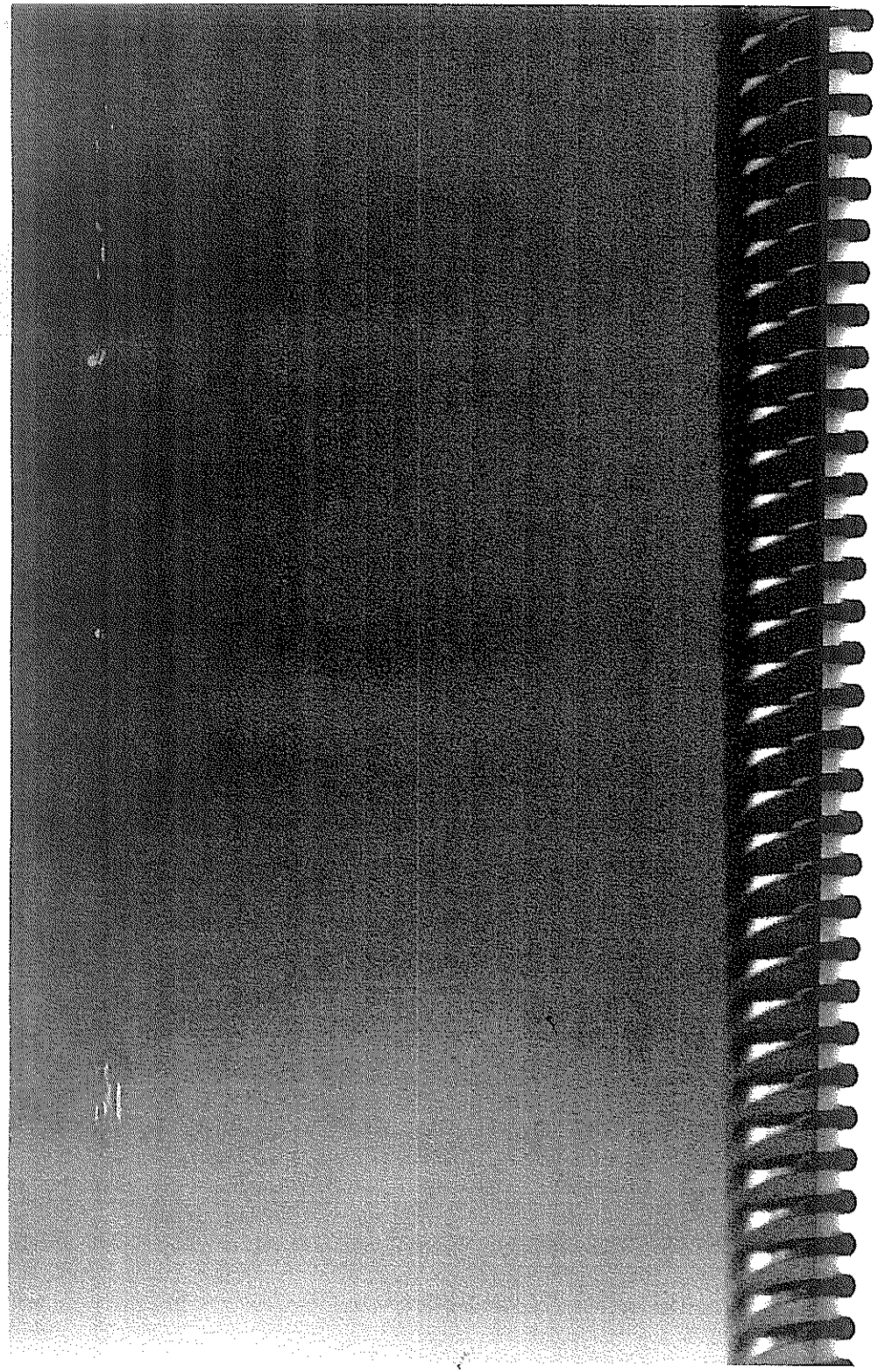
University of Scouting 11/06 2007



Camp Sanitation

(Avoiding health problems while camping)

Presented by
Terry Lind and Karen Wallace



Hygiene and Waste Disposal

"Nowhere is the line between good and bad or right and wrong drawn more distinctly than in the question of the sanitary facilities of a camp."

—From *Camp Sanitation*, Boy Scouts of America, 1928

In the outdoors there seldom is much in the way of plumbing. There is no on-demand hot water for washing dishes or for bathing, and no flush toilet for getting rid of human waste. There are no garbage disposals for leftover food. Doing without those conveniences can be one of the more interesting delights of outdoor adventures. So, too, can practicing good hygiene and waste disposal as a means of protecting both the health of the outdoors and the health of you.

Maintaining good hygiene in the outdoors ensures that you are doing all you can to protect yourself, your companions, and your surroundings for the duration of every adventure. Your ability to do that increases dramatically if you have prepared yourself before a journey by getting in shape, eating well, and getting plenty of rest. Have a yearly physical checkup and keep your immunizations up-to-date.

For more on personal health and fitness, see the chapters titled "Becoming Fit" and "Outdoor Menus."

When expedition leaders and members of their groups do all they can to practice good hygiene, others in their groups are likely to follow their example.

What Can Make You Sick in the Out-of-Doors

The causes of illness during outdoor adventures include microscopic organisms and chemical residue.

Protozoa

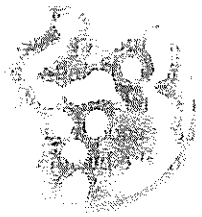
Protozoa

Protozoa are single-celled organisms found in nearly every kind of habitat, but most are found in aquatic habitats. *Giardia*, a parasitic protozoan, is commonly spread from hand to mouth. Thoroughly washing your hands after using a cathole is one of the most effective ways to avoid it. *Giardia* sets up residence in your intestines, where it can cause diarrhea, nausea, and vomiting.

Bacteria

Bacteria

Bacteria are single-celled microorganisms, some of which can be passed from one person to another. They also can be contracted from streams and lakes, and can be present in the soil. Avoid bacterial infections by keeping your tetanus immunizations current, by washing your hands frequently, and by thoroughly disinfecting any cuts or scratches you might suffer.



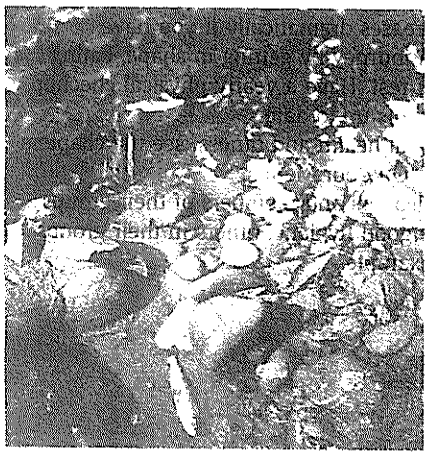
Virus

Viruses

Viruses are submicroscopic infective agents, many of which can spread easily from one person to another. Fortunately, most viruses do not survive long when exposed to the environment.

Chemicals

Residue of agricultural pesticides and fertilizers can endure a long time in the outdoors. Heavy metals can leach into streams from mines and construction sites. Avoid still water, especially if it has a sheen of unnatural color.



Most outdoor travelers do not have the means to treat water contaminated with chemicals or heavy metals

Personal Cleanliness

According to the U.S. Centers for Disease Control, the human hand is the most likely source of infectious microbes. Washing your hands is especially important after bowel movements and just before handling food.

Handwashing Stations

Encourage everyone in your Scout unit to wash regularly by setting out a pot of water and a small plastic bottle of biodegradable soap. Dispose of washwater by broadcasting it at least 200 feet away from any campsites, trails, and sources of water.

Waterless Hand Cleansers

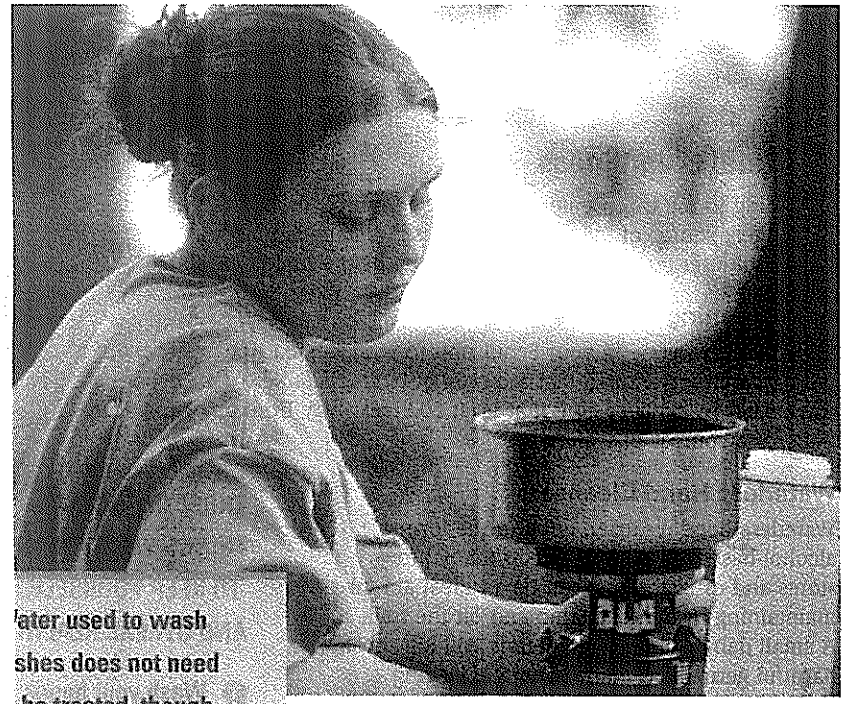
Waterless hand cleanser, often in the form of alcohol-based gel, is available at many grocery stores and drugstores. It can be an ideal aid for maintaining hygiene in camp and on the trail. A small dab rubbed on the hands will kill most harmful germs and then evaporate, leaving hands dry without the need of a towel. A small plastic pump bottle set out in camp can be used by those about to handle food or returning from having relieved themselves. Waterless cleanser is also convenient to use on the trail, during watercraft trips, and in other situations where washing with soap and water is not a convenient option.

THREE IMPORTANT THINGS YOU CAN DO TO KEEP YOURSELF AND OTHERS HEALTHY

1. Wash your hands.
2. Wash your hands.
3. Wash your hands.

Bathing

Bathing while camping usually is more important psychologically than it is from the standpoint of health. If you do want to bathe, you'll need a couple of pots of water. Carry them at least 200 feet from springs, lakes, or streams. Use biodegradable soap and the water from one pot to give yourself a thorough scrubbing. Use water from the second pot for rinsing by dipping it out with a cup. In the summer, you can let the pots of water warm in the sun before you use them, while chilly weather might call for heating the water over a stove. After your bath, broadcast the used water over a large area.



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Safe Drinking Water

The safest water to use on a Scout outing is that which you have carried from home. Always start out with one or more full water bottles and replenish your supply from tested public systems whenever you can. On adventures of longer duration, streams, lakes, springs, and snowfields are potential sources of water, but be sure to treat all water you get in the wild, no matter how clean it appears to be.

Three effective ways to treat water are *boiling, chemical treatment*, and *filtering*.

Boiling

The surest means of making your water safe is to heat it to a rolling boil—when bubbles ½ inch in diameter are rising from the bottom of the pot. (According to research conducted by the Wilderness Medical Society, simply reaching the boiling point is sufficient to kill any organisms that water might contain.) If water used for food preparation comes to a boil at least once, it requires no further treatment. Cooking pasta noodles, for example, will kill any germs that might have been in the water when you first filled the pot.

Advantages of Boiling	*Disadvantages of Boiling*
• 100 percent effective	• Requires a stove and fuel or a campfire, as well as a pot
• Simple to do	• Takes time

Chemical Treatment

Chemical treatment tablets employ iodine or chlorine to kill waterborne bacteria and viruses.

Advantages of Chemical Treatment
• Effective against viruses and bacteria
• Simple to use
• Inexpensive, lightweight, and convenient to pack
• A good backup to carry in case you can't boil or filter water

Disadvantages of Chemical Treatment
• Not always effective against all protozoa
• Requires a waiting period before water can be considered safe to drink
• Can leave a chemical taste in the water
• Can lose potency over time

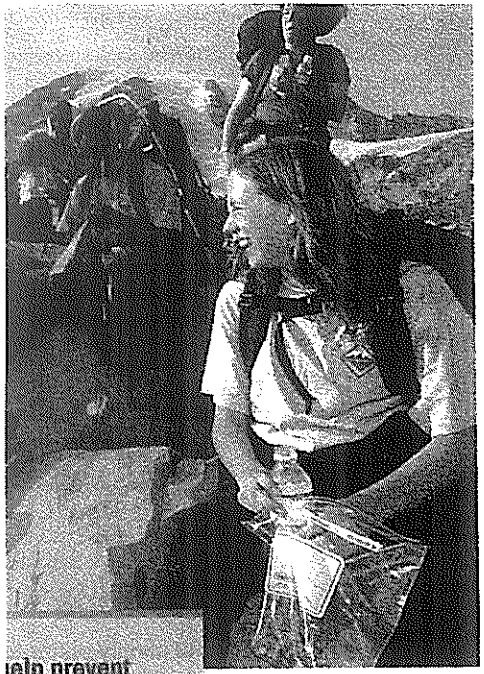
MUDDY WATERS

Allow muddy water to stand in a pot until the silt settles to the bottom. Dip the clear water off the top and remove any remaining organic debris by straining the water through a bandana into a clean container. Ensure its safety by using a filter or chemical treatment tablets, or by bringing it to a boil.

Filtering

Most portable filters are simple handheld pumps used to force water through a screen with pores so small that bacteria and protozoa cannot get through. The finer the screen, the more effective the filter. Information provided with new filters describes their use and maintenance, and the degree of filtration they can provide.

Advantages of Filtering	*Disadvantages of Filtering*
• Effective against protozoa and bacteria. Filters equipped to add chemical treatment might also kill some viruses.	• Filters can be expensive.
• Filters come in a range of capacities and designs to fit the needs of groups according to their size and the duration of their journeys	• Filtering elements must be cleaned or replaced frequently.
	• Pump mechanisms of filters might malfunction.



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Food Handling and Storage

Caring for provisions is important both for your palate and for your health. The ways in which you store food can affect the well-being of wildlife, too.

- Plan meals around ingredients that need no refrigeration.
- Estimate portion sizes to minimize leftovers.
- Keep all food items out of the reach of animals.

For more on food handling and storage, see the chapters titled "Outdoor Menus," and "Traveling and Camping in Special Environments."

Washing Dishes in Camp

Start a trip with clean utensils, pocketknives, and kitchen gear. Larger groups at base camps or on extended journeys can set up a three-step dishwashing system:

- *Wash pot*—contains hot water with a few drops of biodegradable soap
- *Cold-rinse pot*—cold water with a sanitizing tablet or a few drops of bleach to kill bacteria
- *Hot-rinse pot*—clear, hot water

If each person washes one pot, pan, or cooking utensil in addition to his or her own personal eating gear, the work will be finished in no time. Use hot-pot tongs to dip plates and spoons in the hot rinse. Some travelers also dip their plates, cups, and utensils in boiling water before a meal to ensure they are sanitary. Lay clean utensils on a plastic ground cloth to dry, or hang them in a mesh bag or lightweight net hammock.

Smaller groups in more extreme settings can devise variations on the basic dishwashing theme, starting with menu planning. Meals that require no cooking or that can be prepared by boiling just a few cups of water can minimize cleanup chores. Scour pots and pans with a small scrub pad, sand, or snow. Managed with care, a couple of pots of hot water are all you need to clean up after most meals.

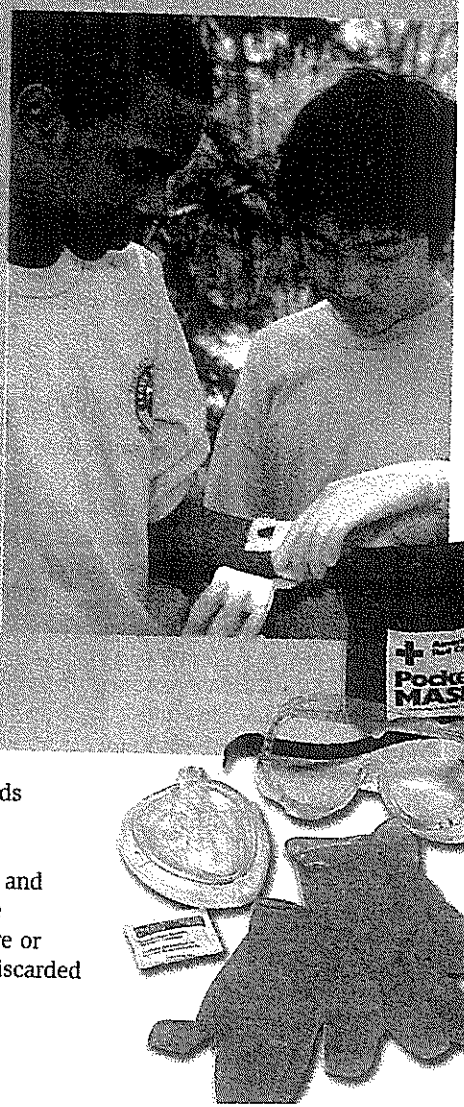
Hygienic First Aid

Modern first-aid training teaches important methods for protecting care providers from pathogens potentially carried in blood and other bodily fluids.

Boy Scouts of America Recommendation

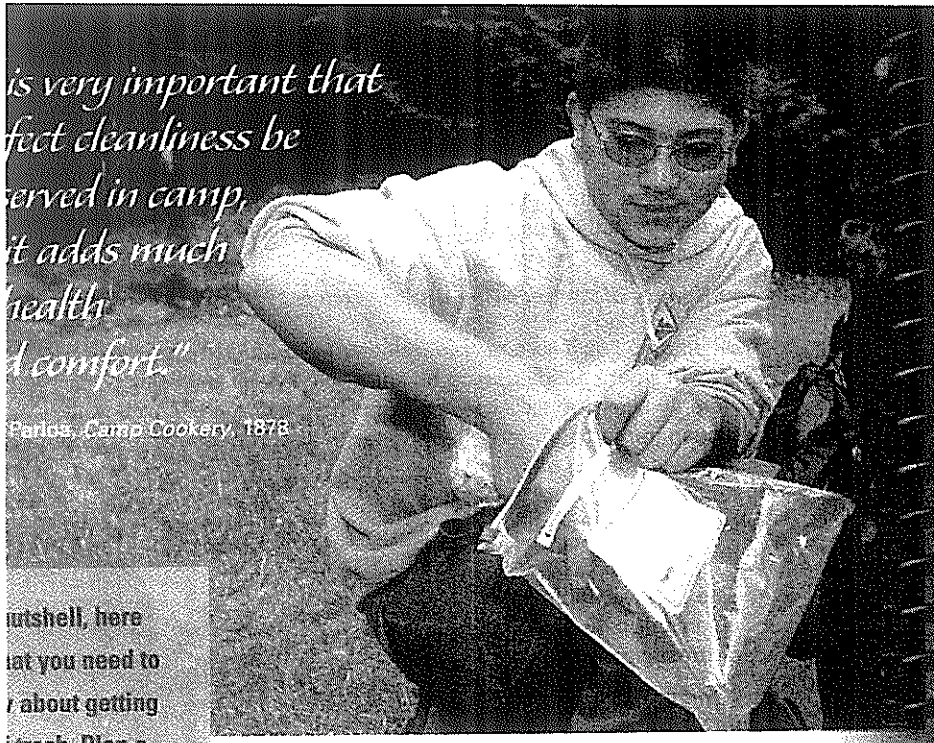
Treat all blood as if it were contaminated with blood-borne viruses. Do not use bare hands to stop bleeding; always use a protective barrier, preferably latex gloves. Always wash exposed skin areas with hot water and soap immediately after treating the victim. The following equipment is to be included in all first-aid kits and used when rendering first aid to those in need:

- Latex gloves, to be used when stopping bleeding or dressing wounds
- A mouth-barrier device for rendering rescue breathing or CPR
- Plastic goggles or other eye protection to prevent a victim's blood or other bodily fluids from getting into the rescuer's eyes in the event of serious arterial bleeding
- Antiseptic for sterilizing or cleaning exposed skin areas, especially if there is no soap or water available



Thoroughly wash your hands before and after treating a sick or injured person.

Soiled bandages, dressings, and other used first-aid items should be burned completely in a hot campfire or stored in double plastic bags and discarded in the frontcountry.



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All trash that is packed in should be packed out.

Proper Waste Disposal

No matter how heavy your pack feels at the beginning of a trip, it will be lighter on your way home. You will have eaten most of your food, and that should leave plenty of space for your trash and that left by others—a few flattened cans, some food wrappers, a small plastic bag containing orange peels and leftover macaroni, perhaps a broken tent pole. Anything you leave behind is trash to the next person who sees it, so don't leave anything behind.

Disposing of Human Waste

Does a bear poop in the woods? Yes, it does, and so do we. The difference is that bear scat is compatible with the outdoors, while human waste has the potential of introducing lots of nasty bacteria and protozoa. There also are strong aesthetic differences. Finding wildlife droppings can add to our appreciation of the identities, diets, and activities of animals. Finding piles of human waste, especially flagged with shreds of soiled toilet paper, will add nothing to your outdoor experience except disgust for those who care so little for the out-of-doors and its visitors.

Here, then, are the basics of how to dispose of human waste in ways that minimize contamination of the environment and limit the risk to wildlife and people.

Urine

If toilet facilities are available, use them. Otherwise, urinate away from trails, camps, and places where people gather. Choose rocks or bare ground; animals may defoliate vegetation in their efforts to absorb the salts left by concentrations of urine.

Solid Waste

Nobody wants to come across a pile of human waste on a trail or near a campsite. It's unsightly, it's an immediate health hazard, and it can be a major contributor of pathogens seeping into springs, lakes, and streams.

Dispose of human waste in one of three ways:

- Use existing toilet facilities.
- Use a cathole.
- Pack it out.

Collect and bag toilet paper to carry it out.

Toilet Facilities

When you are traveling or camping near rest rooms, outhouses, or other toilet facilities, use them. (Most rustic facilities are designed only for human waste. Anything else will take up valuable space and may attract wild animals. Pack out all your trash and leftover food.)

Cathole

Where no toilet facilities exist, dispose of human waste in a cathole. Choose a private spot at least 200 feet from camps, trails, water, and dry gullies.

With a trowel or the heel of your boot, dig a hole 6 to 8 inches deep, but no deeper than the topsoil (humus). Take care of business, then cover the hole with soil and camouflage the site with leaves or other ground cover. Organic material in the topsoil will break down the waste over time and render it harmless.

Packing It Out

In certain pristine environments—deserts, canyons, caves, alpine tundra, snowfields and glaciers—waste might not easily decompose. The leavings of large numbers of people would negatively impact the health of the environment and the quality of everyone's experience. The best way to deal with human waste in those settings is to carry it out. That requires a few simple preparations and a supply of *pack-it-out kits*.

Land managers of areas requiring you to carry out human waste will give you guidance on how to dispose of it at the end of a trip, usually by placing it in special receptacles near trailheads. Do not toss pack-it-out kits into outhouses, trash cans, or any other trash receptacles; that can create a health hazard and in many places is prohibited by law.

Using a Pack-It-Out Kit

1. In an out-of-the-way place, put the target paper on the ground and secure the corners with small rocks or snow. Take careful aim and accomplish the task at hand.
2. Put the target paper, its contents, and any toilet paper you might have used into the paper bag. The cat litter will control odors.
3. Roll the paper bag closed and seal it inside the plastic bag.
4. Place all used pack-it-out kits in one or more trash bags that can be packed to the frontcountry for proper disposal.

Wash your hands with soap and water or disinfect them with waterless hand cleanser.

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Emvironmentally friendly human waste kits are commercially available to make carrying out your waste even easier. These kits are lightweight and can be disposed of in a trash receptacle.

Disposing of Dishwater and Washwater

The dishes are done, faces are washed, laundry is drying on a line. How best can you dispose of soapy water so that it doesn't harm the environment?

The most important step was the one you took before you began—selecting a wash site at least 200 feet from any streams, lakes, or other sources of water. Next is straining any food particles out of dishwater, using a strainer, a sieve, or a piece of fiberglass screen. Put the particles in a plastic bag along with other bits of leftover food to be packed out to the trailhead. (Water used for personal washing or for laundry does not need to be strained.) Finally, broadcast the water over a wide area.

Disposing of Leftover Food

By planning well, you should have few leftovers to manage. When you do, though, stow them in double plastic bags, along with any food particles strained from dishwater, to pack out to a trailhead.

From planning menus to carrying home leftovers, use a Leave No Trace approach to food management.

Trail and Camp Sanitation

The principal elements of camp sanitation are personal cleanliness; safe drinking water; food care and preparation; dishwashing; disposal of wastewater, garbage, and trash; and latrines.

Personal Cleanliness

- Soap and water scrubbing is important before cooking, handling of eating utensils, eating, and after using toilets.
- A lightweight plastic washbasin should be standard personal equipment.
- Streams and lakes should never be used for soap washing.
- Dry aired-out sleeping gear aids a warm night's sleep. Turn bedding inside out and air daily weather permitting.

Safe Drinking Water

- You must know the water to be safe or take necessary steps to make it safe to drink.
- All water should be considered unsafe for drinking, unless it comes from a recognized or tested water system.
- If there is any question, boil or treat it with water purification tablets to be sure.

BOILING - bring water to a rolling boil and maintain the boil for five minutes and aerate to improve taste
PURIFYING - tablets should be fresh, follow directions on container.

Food Handlers and Storage

- Cooks must always wash hands before starting meal preparation and during cooking if hands get soiled.
- Always wash hands after using the latrine.
- Prevent food contamination. Protect foods from dirt, water, tainting from soap, oils, and odoriferous foods.
- Never save leftovers, eat it up when served or throw it away.
- Avoid using foods needing refrigeration. If perishables are used; buy as late as possible and use them up quickly.
- Animal and insect foragers can be problems. Avoid feeding them intentionally or accidentally. Maintain clean camp.
- Keep all foodstuffs out of tents and packs. Even if packed in original wrappers.

Dishwashing

- Dishwashing is a four-part operation.

SCRAPING - scrape dishes thoroughly. Use napkin from meal to wipe plate and utensils after scraping.
WASH - wash with good detergent in clean hot water (112° F). Hot water is needed to break down the grease.
RINSE - in clean warm water. Main purpose is to remove the soap or detergent.
SANITIZE - Immerse utensils for several seconds in boiling water or for 30 seconds in hot water (180° F)

- Allow dishes and utensils to air-dry. If sanitized at prescribed temperature they will dry in about a minute.
- Dishwashing sanitizing tablets may be used, follow package directions.
- If cooking on open fire, soap outside of pots prior to use; it makes the clean up easier.
- Store all cooking and eating gear in a fly proof place; bag, box or plastic bags after each use.
- Clean up fireplaces, stoves, and police the area.
- Clean and put away all dishwashing equipment in a place where it will dry out thoroughly.

Garbage and Trash Disposal

- In developed camps use disposal systems provided after every meal.
- In back woods camps you have to haul it out. DO NOT BURY any trash.
- You can burn everything that will burn to reduce the hauling.

Waste Water Disposal

- Carefully screen out all food particles before disposing of the dishwater.
- Use trash disposal system provided or in the backwoods burn or haul out these particles.
- After the screening, wash water should be scattered evenly across the ground.
- Never pour wash water in streams or lakes

Latrines

- In developed camps use the facilities provided
- Latrines should be the only hole you make at a campsite. They should be limited to long-term camps.
- Should be at least 100 feet from campsite away from streams, springs, or lakes to avoid drainage pollution.
- When breaking camp, close with subsoil from fireplace hearth and also ashes and charred wood to fill trench.
- Replace original topsoil and leave trench slightly mounded.

SANITATION AND FOOD HANDLING IN THE FIELD

This is a discussion of the proper methods of food handling and preparation from its acquisition to the disposal of its waste products in an outdoor camping environment. We should ensure a good, safe environment for the preparation and consumption of food. We should ensure that waste products be handled and disposed of in a safe manner. We, of course, don't expect to be working in an all stainless steel commercial kitchen environment, but we should expect that our camping area, which is our outdoor kitchen be kept as neat and clean as possible. We also expect that food be stored and handled in a reasonably safe manner in order to prevent Food Borne Illness. At this point there are a few concepts we have to deal with. First, what is FOOD BORN ILLNESS, Second, What is POTENTIALLY HAZARDOUS FOOD, and last, what is the TIME TEMPERATURE EQUATION.

A) FOOD BORNE ILLNESS is an illness or a disease that is carried or transmitted to humans by food.

1) BACTERIA are single cell living organisms that grow on food at an amazingly fast rate. There are two ways in which BACTERIA cause illness.

a. It can be a pathogen or a direct infecting agent.

b. Bacteria can produce poisons or toxins as waste products.

2) VIRUSES can be transmitted to food by infected animals or people. Viruses can only live outside of living cells for a short period of time. It should be noted that under the right conditions viruses could survive for up to 4 hours on a work surface. (Hepatitis B can survive up to 8 days)

3) PARASITES are also potentially dangerous to humans. A common parasite is cyclospora. This is found on fruits with more than 1,300 cases reported in 1997. This parasite is not seen, is not removed by normal washing and is linked to imported berries.

4) MOLD and YEAST not only spoil the look and taste of food, but can also contribute to disease.

5) There are certain INGREDIENTS in prepared or processed foods that seem to be appearing with much greater frequency and are undigestible to a significant percentage of the population. It is estimated that up to 15% of the population is lactose intolerant, especially Asian and Native Americans. The heavy use of whey as a milk substitute in foods such as coco mix, cheap cake mixes, bread and even margarine has amplified this problem for many people.

B) POTENTIALLY HAZARDOUS FOOD is food that because of its moisture content, nutrient content, and pH will easily become a vehicle or host for Micro-organisms under normal household

Temperatures.

1) Moisture--In food industry there is a moisture index called Water Activity. The magic number 0.85 is the minimum moisture level required for bacteria to grow. Below this level are things such as jellies, candy, flour and dry noodles. Above this every thing is in the Potentially Hazardous Food category, including meat, soft cheese and eggs.

2) Acidity (pH) ---Bacteria grow best when food is neutral or slightly acidic. The magic number here is a pH of 4.6.

Below pH 4.6 foods is too acid to grow bacteria.

.6 there is potentially Hazardous Food.

C) THE TIME-TEMPERATURE EQUATION-- The basic concept in time-temp

is that the longer you expose food to the temperatures that encourage bacteria growth which is between 40° and 140°F the faster that food is going to spoil.

1) Below 40°F--All Potentially Hazardous food must always be stored at this temp range

2) Above 140°F-- Food that has been cooked and being held to be eaten later must be kept at a minimum temp. of 140°F.

Acquisition of Food

A little planning when acquiring food for camp can make an enormous difference in the cost, the amount of handling and safety of our food. The cost of food must be considered or some scouts will be priced out of the camping experience. In camp, most of us have seen, decent meals for as little as $2 per scout and occasionally some really lousy ones for $10. When the scouts do their menu planning we need to help them plan to use foods that can be safely stored and easily prepared.

A) Refrigeration--Potentially Hazardous Food must always be stored below 45°F at all times. If you are not going to eat meat or other perishable items use the three-day rule -- that is if not consumed in three days after purchase freeze and keep frozen.

B) Food Source-Be careful about the Source of your food. Use only fresh food. Food that has been sitting in someone's refrigerator for some time may not be safe under field conditions where there is not good temperature control. Don't use out of date food. Under conditions of prolonged refrigeration, microorganisms will have a jump-start when they are inadvertently exposed to temperatures above 45° degrees F.

C) Water - We all need water for drinking, food preparation and washing. In the field there are only two possible ways to acquire potable water, through filtration or boiling.

1. Filtering water -- There are a number of filtering systems. The most important thing to look for when purchasing a filter is that it will filter Giardia. A 3 micron filter is required to filter Giardia.

2. Boiling water -- When boiling water it is important to bring it to a full rolling boil for at least 5 minutes to kill all bacteria.

Proper Storage of Foods

We must remember that all food is perishable. The perishability of potentially hazardous food is rather obvious sometimes, while other less obvious foods may be over looked (dried or sealed foods). We must think of the storage of foods as we bring them into camp and those meals that have already been cooked. For example, if we fix a Dutch oven full of our favorite camp chef's delight and several hours later decide eat to some more it may not be safe especially under field conditions.

A) Refrigeration - As stated before, all potentially hazardous foods must be stored below 45°F. Any time food is above 45°F there will be rapid bacteria growth. If food is stored for more than 3 hours above 45°F it should not be used. Usually the only field refrigeration available is either a cooler with ice or the outside air on cold days. Coolers are only as reliable as the ice that's in them. With large quantities of food in a cooler that may not be good enough. Even under commercial restaurant conditions a food manager will check the temp. of stored food. A pocket thermometer is a requirement for commercial food managers and every Scoutmaster should also consider using one. It is the only way that you will truly know what your food temperature is and, therefore, how safe the food is. Relying on the outside air can be a risky business. If the temp gets above 45°F you're out of luck. You also have to be careful about exposing the food you are trying to keep cool to direct sunlight. One other hazard of relying on outside cool air is danger of airborne contaminants. You should also be careful when relying on outside air not to insulate food in the middle of your pack.

B) Dry Food - Dry food is considerably easier to store, as long as it is kept dry. Plastic bags are the obvious way to deal with that. If dry food picks up moisture it may very well become potentially hazardous. Dried or

packaged foods stored for prolong periods of time are excellent breeding grounds for bugs or insects. Don't store things like cake mixes or packaged of instant oatmeal in your patrol boxes over the summer. Store dry foods in a cool, dry place. They will last a lot longer.

FOOD PREPARATION

This is the time when food contamination most often occurs. In the field it becomes much more difficult to prevent and control contamination. So far, we have talked mostly about biological contamination, but in the field physical contamination such as particles of dirt, glass, metal, tree bark, etc. are much more difficult to control. During food preparation, we must consider what kind of surface we have to work on. Is an old chunk of plywood, the ground, or a log a safe place to lay out food during preparation? Do the Scouts who are handling food have clean hands? Is the food getting cross-contaminated? Is some of our food sitting at temperatures above 45?F too long? Are our utensils clean or were they just simply wiped off from the last meal because it is difficult to wash them in the field? These are questions that we must deal w it h every t ime we prepare food especially with young Scouts who just don't think about sanitation when mom is not there.

A) Hand Washing - The lack of hand washing may very well be the most dangerous problem and the biggest cause of food contamination, not only in camp, but also in commercial food operations. It is essential that a Scout or anyone who handles food wash their hands before handling any food. Do the scouts always wash their hands after using the latrine? Hand washing is sometimes difficult in the field but it is so important clean hands must and cannot be stressed enough for the health of our scouts.

B) Cross Contamination--Cross contamination is the movement of bacteria from one food item to another usually by way of utensils or the work surface on which the food is being prepared. In the field when dealing with raw meat cross contamination can be a very difficult problem to deal with. Most often there is very limited surface to work on.

It is not unusual for Scouts to handle meat and then fruit or vegetables with out rewashing their hands or work surface. This can be a very dangerous practice especially when handling poultry. The contamination of poultry with salmonella is well known.

C) Clean Utensils--In the field with limited water it is difficult to wash utensils but this is one of the skills that all Scouts need to learn from the beginning. There are several methods of washing and rinsing in which we conserve water but it is also important to sanitize on your last rinse. Cleaning utensils in the field is never as good as at home, therefore we really need this extra measure. When using chlorine bleach as a sanitizer in commercial kitchens, the requirement is that you have a solution of between 50 and 200 parts per billion of chlorine. Using an eyedropper bottle can easily do this. It takes about 6 drops of household laundry bleach to a ½ gallon of water to get the proper solution.

Cooking of Foods

The proper cooking of foods is, of course, very important. Cooking of food is our last line of defense against microorganisms. This is the only way that we have of eliminating any bacteria that may be on your food. Although we try, it is impossible, especially in the field, to completely prevent the contamination of food. Although many of us like rare meat, camp is not the place for such things. We are unable to take our steak out of the freezer on to the grill as at home. There are just too many chances for contamination and bacterial growth in the field. We need to be sure that all food is well done. We need to check the temperature. This is where our pocket thermometer comes in handy again. You would not want your

scouts eating a Dutch oven full of chicken that was not thoroughly cooked. How do you tell when it is ready? Do you shake the chicken leg too see how lose it is? Do you assume that after one hour in a Dutch oven there was enough heat to thoroughly cook your food? No, we can't assume anything. The only real way to tell is to check the temperature. Lift the lid of a Dutch oven and put your thermometer in. Make sure that your food has reached 170°F.

A) Safe Temperatures for food (internal temp for 15 sec)--

Pork	+170° F

Poultry	+170° F
Beef	+170° F
All potentially hazardous food that has been previously served and cooled that are reheated	+170° F

B) Precooking Foods - Never partially precook foods for camp. This could greatly accelerate bacterial growth.

Proper Disposal and Storage of Garbage

It is very important to properly store and eliminate trash and garbage in camp. Keep your trash and garbage at least 90 feet from the food storage and cooking areas. It is desirable to keep your campsite clean. This is only common sense. It eliminates pests such as insects, rodents and other larger wild animals from your camp. It is at times possible to burn some trash (check with local regulations). It is very dangerous to burn plastic bags. All plastics give off toxic fumes when burned. It's just not appropriate to allow Scouts to be exposed to these very toxic and poisonous gasses. All trash and garbage should be stored in heavy-duty plastic bags in a place where animals won't get into it. Any trash that can't be burned must be carried out.

Always consider the placement of your latrine. Latrines should be located at least 300 feet or more from the food storage and cooking areas. Latrines should be located on level ground. Never uphill from the campsite or water supplies. You don't want the latrine in a place where a heavy rainfall could cause it to contaminate either your water source or your campsite.

It is the responsibility of the Scoutmaster and Senior Patrol Leader to inspect their camp for proper cleanliness. It is the policy of the BSA to always leave your site neater and cleaner than before (leave no trace).

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Teaching Leave No Trace

Dispose of Waste Properly (Pack It In, Pack It Out)

- How Long Does it Last?

This common saying is a simple yet effective way to get backcountry visitors to take their trash home with them. There is no reason why people cannot carry out of the backcountry the extra food and packaging materials that they carried in with them in the first place. Trash and litter in the backcountry ranks high as a problem in the minds of many backcountry visitors. Trash and litter are human impacts that can greatly detract from the naturalness of an area.

Reduce litter at the source. Much backcountry trash and litter originates from food items. Perhaps the easiest way to practice the principle of *pack it in, pack it out,* is to follow principle number one*óplan ahead and prepare.* It is possible to leave most potential trash at home if you take the time to properly repackage food supplies. Reduce the volume of trash you have to pack out. Save weight by repackaging solid foods into plastic bags and liquids into reusable containers.

Another good idea is to keep your menu simple. For short trips, consider not taking a stove and taking only food that requires no cooking. This significantly reduces backpack weight and excess food packaging taken into the backcountry.

Your first preference for dealing with trash should be to pack it out. Most trash will not be entirely consumed by fire and conditions frequently make fires unacceptable. Areas are often closed to fires because of high fire hazards or excessive campsite damage. Some areas, such as desert settings, are impractical for fires because of the scarcity of firewood.

Under no circumstances should food scraps be buried! Discarded or buried food scraps attract animal life. It is common to see chipmunks, ground squirrels, and various species of birds gathering around camp kitchens. These "camp robbers" have become attracted to campers as a food source. Human food is not natural to wild animals, and their natural feeding cycles and habits become disrupted when they are fed by humans.

A conscientious no-trace camper always keeps and leaves a clean camp.

Sanitation

Dishwater

Strain dishwater through a small strainer or bandana. Put the food particles in a sealable plastic bag and pack them out. Broadcast the strained dishwater over a wide area at least 200 feet from the nearest water source, campsite, or trail. Scattering dishwater in a sunny area will cause the water to evaporate quickly, causing minimal impact.

Human Waste

Proper disposal of human waste is important to avoid pollution of water sources, avoid the negative implications of someone else finding it, minimize the possibility of spreading disease, and maximize the rate of decomposition.

If an outhouse or bathroom is available, use it. In most backcountry locations, burying human feces in the correct manner is the most effective method to meet these criteria. Solid human waste must be packed out from some places, such as narrow river canyons. Land management agencies can advise you of specific rules for the area you plan to visit.

Contrary to popular opinion, research indicates that burial of feces in mineral soil actually slows decomposition. Pathogens have been discovered to survive for a year or more when buried. However, in light of the other problems associated with feces, it is still generally best to bury it in humus (decomposing plant or animal matter that forms organic soil). The slow decomposition rate emphasizes the need to choose the correct location, far from water, campsites, and other frequently used places.

Catholes

Catholes are the most widely accepted method of waste disposal. Locate catholes at least 200 feet (about 80 adult steps) from water, trails, and camp. Select an inconspicuous site where other people will be unlikely to walk or camp. With a small garden trowel, dig a hole in humus that is 6 to 8 inches deep and 4 to 6 inches in diameter. Cover and disguise the cathole with natural materials when finished. If camping in the area for more than one night, or if camping with a large group, widely disperse cathole sites.

Catholes in Arid Lands

A cathole is also the most widely accepted means of waste disposal in arid lands. Locate catholes at least 200 feet (about 80 adult steps) from water, trails, and camp. Avoid areas where water visibly flows, such as sandy washes, even if they are dry at the moment. Aid decomposition by selecting a site that will maximize exposure to the sun. Because the sun's heat will penetrate desert soils several inches, it can eventually kill pathogens if the feces are buried properly. South-

facing slopes and ridgetops will have more exposure to sun and heat than will other areas.

Trench Latrines

Though catholes are recommended for most situations, there are times when a trench latrine may be more applicable, such as when camping with young children or if staying in one camp for longer than a few nights. Use similar criteria for selecting a latrine location as those used to locate a cathole. Since this higher concentration of feces will decompose very slowly, location is especially important. Deposit feces in one end of the trench and lengthen the other end as needed. A good way to speed decomposition and diminish odors is to toss in a handful of humus after each use. Ask your land manager about latrine-building techniques. Carry a urine bottle when caving to avoid impacting an extremely fragile environment.

Toilet Paper

Use toilet paper sparingly and use only plain, white, nonperfumed brands. Toilet paper must be disposed of properly! It should be either thoroughly buried in a cathole or placed in plastic bags and packed out, which is the best way to practice Leave No Trace. Never burn toilet paper because of the danger of starting a wildfire.

Urine

Urine has little direct effect on vegetation or soil. In some instances urine may draw wildlife that are attracted to the salts; wildlife may defoliate plants and dig up soil. Because urine has an objectionable odor, be sure to urinate at least 200 feet from a campsite or trail. Urinating on rocks, pine needles, and gravel is less likely to attract wildlife. Diluting urine with water from a water bottle also can help minimize negative effects.

Special Considerations for River Canyons

Western river canyons often present unique Leave No Trace problems. In large western rivers the most common practice is to urinate directly in the river (because urine is sterile) and to pack out feces in sealed boxes for later disposal. Check with your land manager for details about specific areas.

How Long Does It Last?

Packing out trash is increasingly important as greater numbers of people visit the backcountry.

Here are some estimated life expectancies for different kinds of litter:

Paper: two to four weeks

Banana peel: three to five weeks

Wool cap: one year

Cigarette butt: two to five years

Disposable diaper: 10 to 20 years

Hard plastic container: 20 to 30 years

Rubber boot sole: 50 to 80 years

Tin can: 80 to 100 years

Aluminum can: 200 to 400 years

Plastic six-pack holder: 450 years

Glass bottles: Thousands or millions of years

Teaching Leave No Trace