UNIVERSITY OF OREGON • PE & REC • Outdoor Pursuits Program

LEAVE NO TRACE ETHICS

By Michael Strong

The LNT curriculum is based on seven principles:

1. Plan ahead and prepare
2. Camp and travel on durable surfaces
3. Dispose of waste properly
4. Leave what you find
5. Minimize campfire impacts
6. Respect wildlife; and
7. Be respectful of other visitors

"Leave nothing but footprints, take nothing but photographs, kill nothing but time".

1. Plan Ahead and Prepare

When planning a trip:

a) Research the trip ahead of time. Talk with rangers about route conditions and check online and written resources.

b) Know what you are getting into, set reasonable goals, select an outing location within the capabilities of all group members, choose qualified traveling companions, and pack adequate food, clothing and equipment for comfort, safety, and LNT practices.

c) Plan meals that minimize trash and keep pack weight to a minimum. Use a stove rather than a fire to cook meals.

d) Learn the management agency guidelines for disposing of solid waste and other special concerns related to camping and traveling in the area selected for the outing.

2. Camp and Travel on Durable Surfaces

When traveling in the backcountry:

a) Use existing trails whenever possible. Trails are constructed for a purpose - to concentrate traffic (impact) and prevent multiple travel routes, especially into and around popular areas.

b) Wear shoes or boots that are no more abusive to the soil than necessary. Lug-sole boots are often the worst possible choice and aren't necessary unless protection from rock, snow or ice is needed. For trail use, lighter weight soles are more comfortable and easier on the environment.

c) Avoid widening the trail. Don't step on the shoulder of the trail but walk in the middle of it. Don't form multiple trails by walking alongside a water-filled path.

d) Don't cut corners or switchbacks. Follow the trail around the corner even if less considerate hikers have worn a shorter path.

e) When a damaged section of trail is encountered, or if rocks, trees, or limbs block the trail, try to repair the damage or at least to clear a path through the debris. Making a path around the obstacle causes unnecessary damage that is magnified by following hikers and game.

When traveling off trail:

a) Make every attempt to minimize impact. The most sensitive areas are hillsides and meadows. Fan out to reduce impacts, and on hillsides walk in a zigzag pattern to prevent water erosion channels from forming.

b) Travel on the most durable surfaces such as rock, sand, gravel, and snow. Wet meadows and fragile vegetation are trampled fairly quickly. Be especially cautious in highly sensitive areas such as desert environments where cryptobiotic crust (tiny communities of organisms that hold soil together and reduce erosion) is highly impacted from as little as a single footstep. If cryptobiotic crust must be crossed, stay in each other's footsteps.

c) Don't mark a route with flagging or rock piles (cairns) unless there is a need to follow the exact route again, in which case remove all markings on the last passage. Remove old plastic flagging left by less considerate pathfinders. Marked routes encourage concentrated use, and plenty of marked routes exist already. In no case should trees be blazed to mark a route.

When camping in the backcountry:

a) Select campsites carefully. Perhaps the greatest impact during a backcountry outing occurs within the boundaries of a campsite. Good choices for durability include sand, glaciated rock surfaces, snow, fir or pine needle duff, and previously hardened campsites. Never camp on fragile meadow grass, right next to another group, or beside a trail. Always select a campsite at least 200 feet from water, and if possible, out of view of other people to reduce social impact. Allow enough time at the end of the day to select a safe, suitable site.

b) Generally speaking, the highest impact within the boundary of a campsite occurs in the kitchen area. Select a durable kitchen site such as a patch of snow, some sand or gravel, or a large rock surface.

c) When using a site that is already beaten down to a hard and nearly vegetation-free surface, limit activity to the existing limits of the site. Don't expand the site by placing tents outside of the impacted area or conducting activities that produce wear on the surrounding ground cover. Do not move rocks and sticks to make a bed or tent site unless it is absolutely necessary. If you must move objects, relocate them before you leave.

d) Select a safe site that provides adequate protection from the elements and is not surrounded by large, dead trees that could topple over in high winds.

e) Wear camp shoes with soft or smooth soles.

f) When breaking camp, naturalize it as best as possible. Erase footprints and groom the surface to eliminate signs of human presence. A dead bough from an evergreen tree works well as a broom. Prior to leaving, police the site carefully for litter and to make sure nothing is forgotten.

g) Pristine or remote sites require commitment to the highest standards of LNT ethics. If you camp in pristine areas (in addition to the above practices) move camp every day to minimize impact and camp well away from water. If you travel to pristine locations, check with land managers about special regulations for disposing of human waste and other restrictions that might be in place.

h) Along river corridors, dispersing impacts becomes challenging and it may be best to camp on sandbars or non-vegetated sites below the high water line. In many places, campsites are designated by permit.

3. Dispose of Waste Properly

Few things can change the enjoyment of a backcountry hike as quickly and profoundly as stumbling across a large pile of trash, human feces, or leftover food. And few things can test the strength of a person's environmental ethic than having to carry a weekend's worth of feces out of the backcountry for proper disposal at a dumping station. As more people venture into popular places, land managers have had to resort to measures that in past years would have been met with disdain and disbelief, such as carrying feces in a backpack, rather than going to the bathroom in the woods. Such is the price that must be paid for recreating on land and water resources stretched thin by decades of overuse.

Litter and Food Waste

While litter is unsightly and highly disturbing to all but the most insensitive observers it is an impact that can be easily reversed. Except for the growing problem of small bits of wind and animal-dispersed litter, most litter can simply be picked up and removed.

Suggestions For Managing Litter

- Repackage foods and other supplies to minimize or eliminate the possibility of littering.

- Keep animals away from food. Many critters are sensitized to human presence and associate people with food. Small animals like chipmunks and ravens are adept at getting at food that, under normal circumstances, would be considered secure (ravens can open pack zippers with their beaks to get at food). Several options exist for keeping food away from animals. Keep food in a sturdy bag that cannot be easily chewed through, or consider using plastic containers. Don't leave food carelessly strewn about in a kitchen. In winter, or when large enough snow banks or patches are available, bury food before turning in for the night, or when leaving camp during the day, making sure to mark the burial site. In bear country, it may be necessary (or required) to hang food from a bear pole, or use a bear canister. Check management agency guidelines for camping and traveling in bear country. Finally, do not feed animals. Human food is too rich, and feeding animals encourages begging.

- Never bury trash. Carry it out. Observe the slogan, "Pack it in. Pack it out."

- If you cook too much food that cannot (or will not) be eaten as leftovers, package it and carry it out. Under no circumstances should you give the food to animals. If just a small amount is left, burning it in a fire is an option so long as the fire is hot enough to burn it to ash. A mass of food thrown onto a fire will likely turn into an unsightly

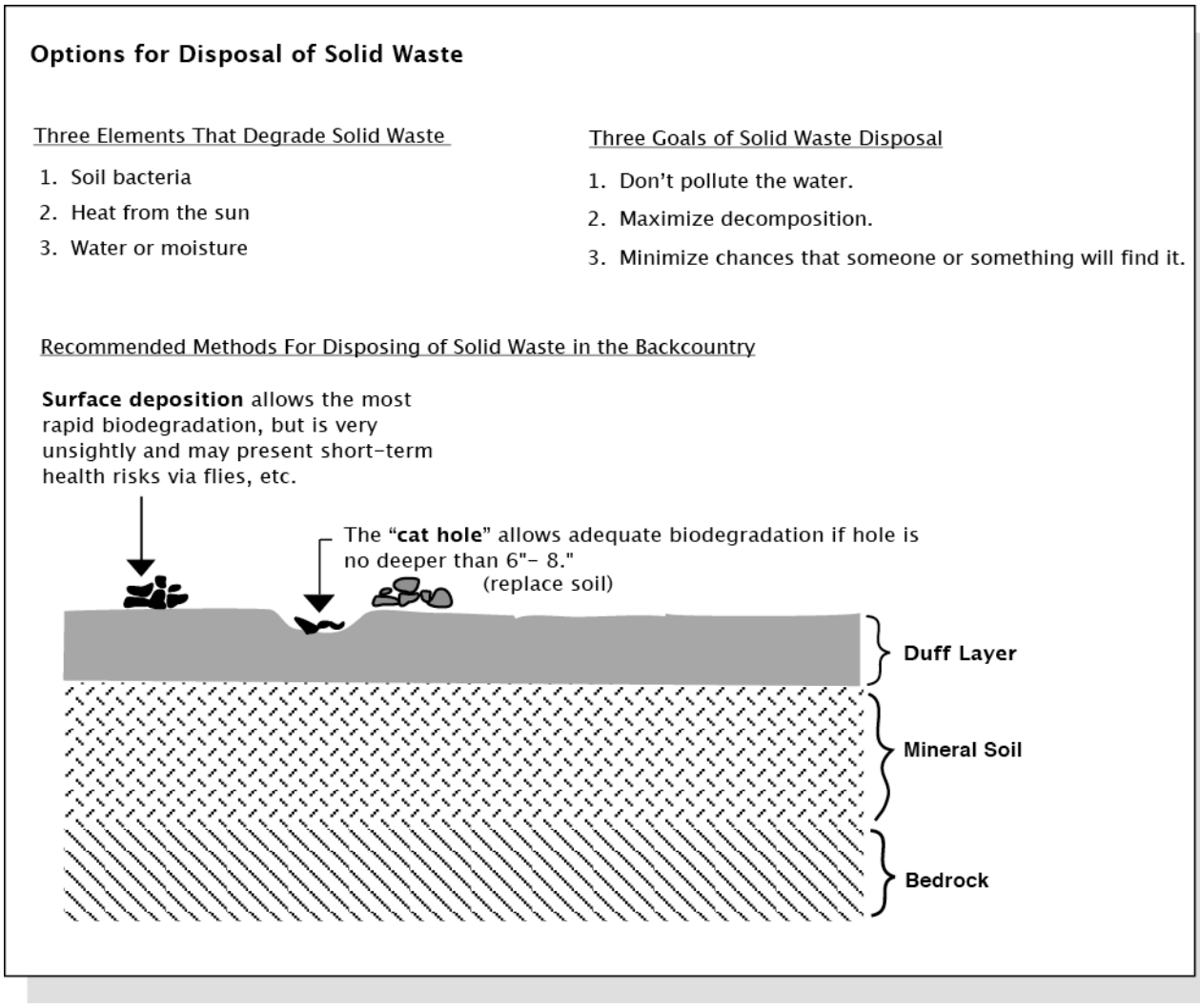
lump of ash unless the fire is extremely hot - an unlikely possibility for the LNT practitioner (as explained under fires below).

- Don't try to burn plastics or metal in a fire, especially aluminum cans or foil. It is far easier to put empty plastic, aluminum, and foil wrappers and containers into a trash bag and carry them out.

- If you fish backcountry lake, scatter fish parts when in secluded locations rather than throwing them in the stream where they will remain visible, preserved by cold water for a relatively long period of time. In bear country, it's best to dispose of fish parts in lakes and streams, rather than risk attracting bears to the area.

Human Waste

Disposing of human wastes is an ecological *and* a social concern. The ecological impacts of human waste disposal can be significant in fragile or overused sites where water supplies may be sensitive to excessive input of nutrients. Many diseases are carried in fecal matter and many backcountry water sources have become polluted.



Disposing of solid waste responsibly requires an understanding of the environmental forces that work to degrade it. The actions of soil bacteria, heat (from the sun), and water are instrumental in breaking down solid waste. The abundance or lack of each of these elements depends on the physical environment (desert vs. alpine vs. coast) and the season (summer vs. winter). Ask, "What will be at work *here* and *now* to decompose feces". It's also important to keep

in mind the three main goals of disposing of solid waste in the backcountry: avoiding water contamination, maximizing decomposition, and minimizing the chances that someone or something will find it.

Catholes

Catholes are the recommended choice in environments that have a well-developed layer of organic soil, due to the decomposing action of soil bacteria. Catholes disperse solid waste, are private, can be easily disguised, and in most cases they are relatively easy to dig. Use a plastic trowel to dig the cathole deep enough to prevent animals from getting at the deposit (6" to 8 " is recommended), then cover it over and disguise it as best as possible. Select a location that is at least 200 feet from water, out of a drainage basin, and where organic soil is deep enough. Tree wells are excellent sites, as are south facing slopes where heat from the sun warms the soil and increases decomposition. When camped in one place for more than a couple days, choose sites in different locations well away from camp. Catholes cannot be dug in winter when the ground is either frozen or covered by several feet of snow. It's best to take care of business in a shallow snow hole in a tree well. Come spring, the microclimate around the base of the tree will start the process of decomposition and the waste will be less likely to flow with the snow melt into a water source.

Other Possibilities

Catholes may not always be the best choice. Soils in extreme environments are generally poor at breaking down solid waste due to a lack of soil bacteria and/or extremely cold temperatures (e.g. alpine and desert soils). What's the best way to dispose of solid waste when traveling in these environments? If the main and only goal is promoting rapid decomposition, then smearing the solid waste (like peanut butter) onto a rock exposed to the sun and wind would be the best choice. This method is suited to very remote places where human visits are very rare. In desert environments, it's best to deposit solid waste several inches below the surface, in exposures facing the sun and out of watercourses. The sun's heat will bake the top several inches of soil, killing pathogens. The feces will be petrified beneath the soil, but at least it will be sterile and out of sight.

Latrines, a once popular method for disposing of solid waste, are marginally acceptable and should be considered only when camping with children in the same place for awhile. It's our belief that any group that needs to use a latrine should not travel into the backcountry, but camp at an established campsite with developed facilities.

In many alpine environments, especially highly popular places, management agencies require mountaineers and others who camp above treeline to pack out their feces - a response to decades of unsightly waste accumulation and irresponsible behavior by uninformed or inconsiderate users. Those planning to climb the Grand Teton in Wyoming, Mt. Adams or Rainier in Washington, and other popular mountains must follow agency guidelines and carry the disposal system with them at all times when hiking or climbing above treeline. Going to the bathroom on the surface is not an option when nature calls, despite how embarrassing it might be.

Boaters and others who travel remote watercourses should check with land managers about the required method for disposing of solid waste. Agency guidelines differ from place to place.

Other Issues and Concerns

To use toilet paper or not, that is the question. Many people are comfortable using what nature provides for toilet paper, whether it is a soft thimbleberry leaf, a spruce cone, or snow. There is certainly no need for toilet paper in most

circumstances, and people who choose to use it should use the biodegradable variety (which even comes in camouflage colors), or double bag it and carry it out of the backcountry. Feminine hygiene products should also be double bagged and carried out.

Despite the fact that the urine of a healthy individual is sterile, it's not acceptable to urinate in or near the water. The best choice is rock or gravel, as some animals are attracted to the salt and may destroy vegetation that has been urinated on.

4. Leave What You Find

The sense of discovery felt when a historical artifact is uncovered, a rack of antlers is found, or a rare plant or interesting rock is discovered can add a great deal of enjoyment and excitement to a backcountry experience. The natural tendency might be to put a small object in a pocket as a memento; responsible behavior dictates putting the object back in place, or looking instead of collecting, so that others may have the same opportunity for discovery.

In addition to leaving cultural artifacts in place, alter the natural world as little as possible. Digging runoff trenches around a tent fly may keep water at bay, but it's irresponsible. Constructing rudimentary improvements like lean-to's tables, etc. out of the forest's wood is unacceptable. At high use sights, do not take apart a fire ring; another one will likely be assembled in its place, probably resulting in more damage than would have occurred if the original fire ring was left intact.

Do not cut or pull limbs off of trees for a fire or bough bed, sink a nail into a tree for a coat hanger or guy line anchor, or harm a tree in any fashion. Consider the impacts that picking edible plants will have on an area. If plants are abundant, selective picking is probably fine, but when plants are scant or rare, picking them for a dinner salad or to include in a meal is unacceptable.

5. Minimize Campfire Impacts

For many people, camping is synonymous with campfires. Fires provide ambiance and warmth to a cool evening, can be fun to cook on, and are necessary in some survival situations. While campfires are considered irresponsible in some situations, everybody should know how to build one. Skilled backcountry travelers can start one in a downpour with wet wood, a valuable skill in an emergency situation.

People who travel into the backcountry should know whether the forest is capable of absorbing the impacts of a fire before deciding on whether or not to have one. Too many sites have been severely impacted by fires. Fire rings, compacted earth, and limbs ripped or cut from trees in a radius of 50 feet from popular sites are evidence of the impacts fires have had on the land, not to mention the severe destruction caused by forest fires that have been started by careless campers.

Over time, the backpacking stove has replaced the fire as a means of cooking and in the process has greatly reduced impacts, especially to the fragile environment near treeline. Still, a fire adds something to an experience that a stove cannot. Not too many people can be found enjoying each other's company around a stove, unless a meal is being prepared.

There are several things to consider when deciding on whether or not to build a fire. *First and foremost* is the region's fire hazard. At the height of fire season (late summer for most places), campfire bans are likely to be in effect and all cooking will have to be done on a stove. Even if fires are allowed, it's imperative to use judgment about whether the conditions are appropriate for a fire. It may be extremely dry and windy, combinations that will preclude building a fire. If the campsite does not have a large enough opening to the sky, especially in dry conditions, do not start a fire.

Second, determine if an adequate supply of dead and down wood is available - enough so that its removal will not be noticeable by others who follow. If conditions are not hazardous, you will be doing the forest a favor by having a fire in a place where "fuel loading" (accumulation of dead and down wood) has occurred out of proportion to its natural amount. Extensive fuel loading is a serious problem in many western forests that have been managed under a philosophy of fire suppression for many decades. In sparse forests near treeline, or other environments where dead and down wood does not keep pace with the demand for firewood, fires are out of the question. Never take wood from a live tree. Follow the axiom "If it's on the tree, leave it be".

Finally, someone in the group must know how to build a fire that leaves no trace of its existence.

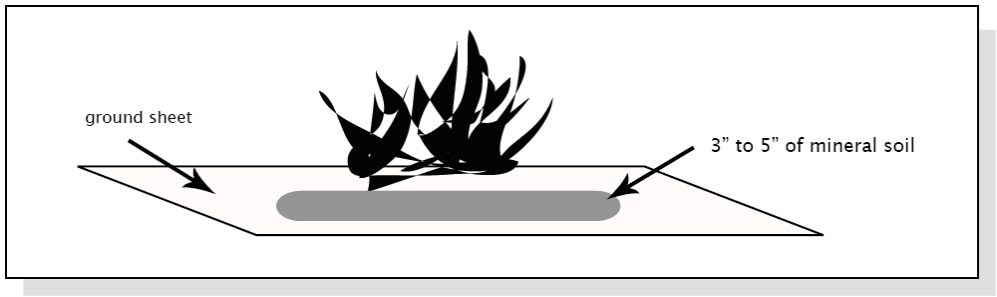
Leave No Trace Fires

Fires built according to LNT ethics are generally small and used primarily for cooking. Wood should be no larger than the diameter of an adult wrist, and be readily broken by hand. Large fires that burn thick pieces of wood have no place in the backcountry, and should be reserved for developed sites.

Collect firewood from a variety of places near camp, rather than taking it all from one place, and if there is excess after the fire has been put out, also distribute it randomly in the woods around camp. Never leave a fire unattended and keep a water container onhand to douse any sparks that fly onto the ground or nearby vegetation.

<u>Building a Mound Fire</u>

a) Collect mineral soil (light in color and devoid of organic matter) from a root hole of a toppled tree, a sandbar, or other source. A small, plastic trowel is handy for this purpose.



b) Lay down a ground sheet (to make clean up easier), and build the mound on the sheet to a depth of at least 3" to 5". A shorter mound will not be thick enough to effectively insulate the ground. Make the mound large enough in diameter so that coals and embers do not fall or roll off the mound and onto the sheet.

c) Build a small cooking fire on top of the mound and after you are finished, and when all wood has burned to coals, and coals to ashes, douse the fire with water. Collect the cooled ashes and distribute them into the forest well

away from camp, or below the high water line if near a watercourse, return the mineral soil to its original location, and groom the area to disguise the impacts that have occurred.

If an existing fire ring is available, consider using it, unless someone has just assembled it. If it's very recent and the ground around the fire ring uncompacted, dismantle the ring and build a mound fire (or use a stove). When using an existing fire ring, make sure that the fire is completely out before moving on. Most people make some effort to extinguish their fires, yet many fail to do so completely. Unless properly doused, roots and other underground vegetable matter may smolder far away from the confines of the fire ring. Wilderness rangers tell tales of amazingly long escapes, up to 100 yards or so, and of extensive areas of underground smoldering fires lasting through entire winter seasons under a healthy snow pack. Underground fires can be extremely hard to control, require tedious digging to contain, and result in a lot of damage to the soil surface. There are records of these fires requiring several seasons of hard work to extinguish. It is far easier to spend a few extra minutes to select and prepare the site properly.

6. Respect Wildlife

Opportunities to view wildlife are increased when people travel quietly, move deliberately, and carry binoculars. View wildlife from a distance and do not attempt to lure animals closer to get pictures. The backcountry is an animal's home. Behave respectfully by keeping food inaccessible, not camping right next to game trails that access water sources, keeping dogs and other animals in control, not feeding wildlife, giving wildlife wide berth and keeping pollutants out of water sources.

7. Respect Other Users

While people head into the backcountry for a variety of different reasons and to pursue different goals, most everyone hopes for an enjoyable experience. Contribute to other people's enjoyment by being courteous and respecting people encountered in the parking lot and along the trail, and remembering that not all impacts are physical. Your behavior, demeanor, and presence socially impact others as well.

<u>Suggestions for Respecting Other Users</u>

Be quiet. The backcountry is no place for loud noises or boisterous behavior that might negatively impact someone's search for peace and quiet (e.g. such as singing, yelling, screaming, even talking loudly at night when sounds carry).

Keep your group small. The maximum group size permitted in Oregon (and most other) wilderness areas is 12 people, although many people are negatively impacted by groups barely half this size. Split large groups into smaller ones groups if possible.

Adhere to the norms of trail etiquette by moving off the trail onto durable surfaces when taking breaks, and to yield the right of way when approached by other hikers or horses. If approached by a horse and rider, step off the trail on the downward side of a slope. People hiking uphill have the right of way over downhill hikers. The reverse is true in cross-country skiing where the downhill skier usually has less control.

While easy to spot in an emergency, a day-glow orange tent makes a visual statement that can be offensive to people who abide by the philosophy that it's best to blend in by wearing and using earth-tone colors. Bright colors contribute to a crowded feeling, even if a bright tent is relatively far away.

Use trees and terrain to screen your campsite from the view of people who may pass nearby, or camp in the same general area. Respect others by setting up camp well away from an existing tent site.

Dogs as Traveling Companions

There are a number of serious ecological and sociological impacts related to the presence of dogs and other pets in natural areas. Dogs can harass wildlife, pollute water supplies (dogs can carry Giardia), and disturb human users by barking and in some cases, by their very presence. Dogs can also be a nuisance and a hazard on ski trails.

If you travel in the backcountry with a dog, keep it under your control at all times, either by a leash, hand signals or quiet voice commands - *not* periodic yells or whistles. Be sensitive to the effects of barking or howling. Such sounds carry for long distances and can be highly disturbing to wildlife as well as to human users. Under no circumstances, do not leave your dog tied up in camp and leave for a hike or climb.

Take special care when traveling in bear country, especially grizzly country. It's best to leave your dog at home. Serious injuries have resulted when dogs being chased by grizzlies have sought refuge between the legs of their owners.

Sanitation and Personal Hygiene

Sanitation and personal hygiene can directly impact the enjoyment and duration of a trip into the backcountry. Many trips have been cut short because people have gotten sick as a result of poor hygiene and bad sanitation practices. While it's possible to avoid illness on shorter trips, longer excursions require consistent attention to cleanliness when cooking, cleaning dishes, going to the bathroom, and grooming.

Personal Hygiene

Human hands account for 25 to 40 percent of foodborne illnesses. (Tilton, n.d.) Keeping clean hands is critical to minimizing the spread of disease. Develop the habit of cleaning your hands before cooking, after eating, and after going to the bathroom, especially after disposing solid waste.

Washing you hands with warm soap and water is not always possible, nor feasible. Consider using hand sanitizer. A relatively small bottle can go a long way (over 100 applications) if reserved for bathroom breaks away from camp, or when washing your hands with soap and water is inconvenient. Hand sanitizers are very effective at killing germs, bacteria, and viruses. Some report killing 99.9 percent of germs upon contact.

Consider packing biodegradable soap for washing your hands, hair, and body. Keep in mind that biodegradable soaps are degraded by biological agents in the soil and must be kept out of the water. Biodegradable soaps also take longer to degrade than people think (years in inhospitable environs). Soap up well away from water sources and rinse soap residue into a cathole where it can be degraded by soil bacteria. Some people prefer to use biodegradable soap for brushing the teeth as well. Whatever toothpaste you use, rinse your mouth with water and spray the residue into a fine mist, or dump it into the cathole used for soap residue.

Never wash your hands, hair, or the body with soap directly in a stream, lake or other backcountry water source. Soaps and detergents in amazingly small quantities can add enough nutrients to lakes and streams to cause major

shifts in both plant and animal populations. Rinse repellents and lotions off of your body well away from lakes and streams prior to swimming in a lake, especially in subalpine or alpine regions. Even dyes and soap residues can harm these fragile waters, so clothing, if it must be worn in the water, should be carefully rinsed as well. Respect others by wearing a bathing suit when other people, especially strangers who might take offense, are nearby.

Refrain from sharing a water bottle, snacks unless they have been poured from the container (i.e. not touched by other hands), personal eating utensils, lip balm and toothbrush with others.

Food and Water Waste

For health reasons, it's best to avoid eating leftovers, unless they can be kept chilled. Leftover food that is stored at temperatures between approximately 45° to well over 100° F will be almost immediately attacked by bacteria. While bacteria are killed when leftovers are adequately heated, the toxins produced by bacteria are not, possibly producing gastrointestinal illness. Cook food in conservative portions to avoid leftovers.

Clean your dishes as soon as possible after cooking to prevent food from turning into a hard to clean layer of crust. Soap is not needed to effectively clean dishes, and unless dishes cleaned with soap can be thoroughly rinsed, any soap left on dishes can cause diarrhea. Hot water and a natural scrubbing pad (pinecone, sand, gravel), even snow will usually do the job well. Strain solid remains through a mesh screen, coffee filter, bandana, or your hands before dispersing the gray water into the woods (at least 200 feet from water). If camping in the same place for a few nights, consider digging a sump hole for water disposal.

Keep dishes, pots and other kitchen items packed away when in camp. Recently, hanta virus has become a serious health concern, especially in environments where mice and small rodents are likely to visit a kitchen at night in search of food morsels. Hanta virus can be fatal; efforts should be made to keep all eating utensils clean, and protect the face from dust (e.g. by using a ground sheet a night).

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