Leave No Trace, Wilderness Ethics

Wilderness is …

… a damp dreary place where all manner of wild beasts dash about uncooked
Anonymous, 19th Century

Leave No Trace: A National Education Program Designed to Teach Stewardship, Land Ethics, and Outdoor Skills on Public Lands.

Objectives:

(1) Provide an overview of resource impacts resulting from recreational use and describe their significance.

(2) Provide a rational for why a national Leave No Trace education program is needed.

(3) Provide a review of research findings as they relate to Leave No Trace practices.

Overview of Visitor Impacts

Vegetation Impacts

- Loss of vegetation cover
- Compositional change
- Spread of non-native species
- Tree damage and root exposure
- Tree cutting, loss of regeneration
- Loss of shrubs

Soil Impacts

- Loss of organic litter
- Loss of organic soils
- Soil compaction
- Decreased soil moisture
- Soil erosion

Wildlife Impacts

- Habitat alteration
- Wildlife disturbance and harassment
- Modification of wildlife behavior
- Displacement from food, water, cover
- Reduced health and reproduction
- Increased mortality

Water Resource Impacts

- Increased turbidity, sedimentation
- Oil and gas from engines
- Soaps (phosphates)
- Fecal wastes, giardia

The Biocentric View

Social Impacts

- Crowding
- Conflicts

Cultural Resource Impacts

- Theft of artifacts
- Damage to historic structures
- Damage to cultural features

Social Significance

Impacts reduce the quality of recreational experiences …

Impacts can increase the difficulty of travel

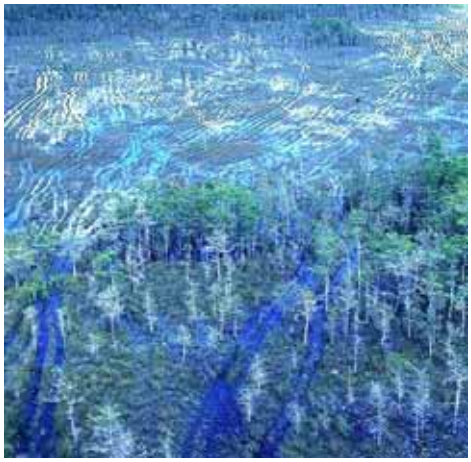
Impacts can represent depreciative behavior

Impacts can intensify conflict between use types

Ecological Significance

Impacts can threaten natural conditions and processes …

Impacts are a departure from natural conditions



Impacts can alter natural processes

Managerial Significance

Impacts can compromise legal mandates …

Impacts threaten resource protection objectives

Impacts are expensive to repair

Increased Public Land Use

- Wilderness recreation visitor days rose from
  7 million in 1970
  to
  15 million in 1985
  to
  20 million in 1999

- National Park Service visitation increased from
  33 million in 1950
  to
  172 million in 1970
  to
  287 million in 1999

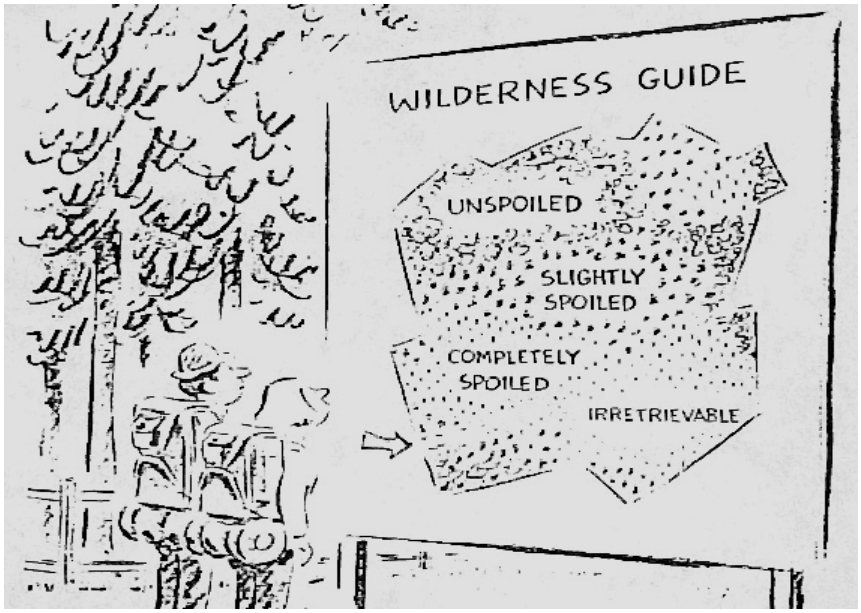
Why Leave No Trace?

- *Leave No Trace* might seem unimportant until you consider the combined effects of millions of outdoor visitors.
- One poorly located campsite or campfire may have little significance, but thousands of such instances seriously degrade natural resources and recreation experiences.
- To protect our resources we must take the responsibility to educate ourselves and practice the skills and ethics necessary to *Leave No Trace*.
- "Wilderness management is 80-90 percent education and information and 10 percent regulation." Max Peterson, former Chief of the U.S. Forest Service.
- "Education…is a preemptive strike…to teach the American people how to enjoy the nature without destroying it. All other methods merely try to repair the damage after it is done. Stronger education programs would dramatically decrease the need for law enforcement and cleanup." James Bradley, former staff member, Subcommittee on National Parks and Public Lands, U.S. House of Representatives.

If recreation visitation is permitted …

… some degree of resource impact is inevitable.

What level of impact are we willing to Accept?



Management Response: Regulation or Education?

- Regulations antagonize the public … education wins their support.
- Most impacts are not due to malicious acts … education improves knowledge of consequences and low impact practices.
- Enforcement of regulation is difficult.

The *Leave No Trace* Challenge

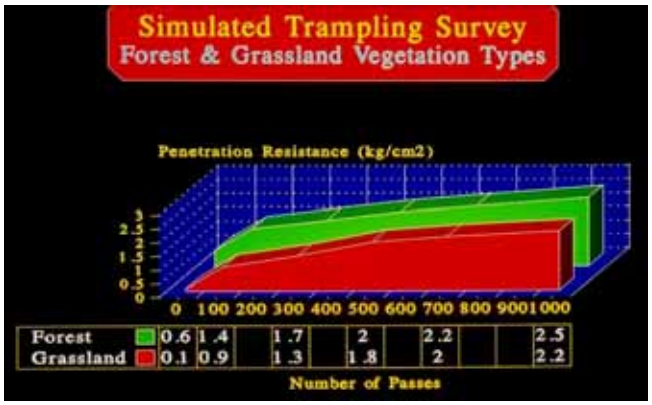
- Prevent avoidable resource and social impacts.
- Minimize unavoidable impacts.
- Preserve the quality of resources and recreation experiences.

The Appalachian Mountain Club's Role

- The AMC is an LNT Master's course provider in the northeastern U.S.
- The AMC promotes the protection, enjoyment, and wise use of the mountains, rivers, and trails of the Northeast.

Appalachian Mountain Club
Your Guide to the Northeast Outdoors

The *Leave No Trace* Message



LNT practices are science-based:

- Recreation ecology research tells us about recreation impacts and how they can be reduced by managers are visitors.
- Social science research tells us about visitor attitudes, behaviors, and social norms.

1. Plan Ahead and Prepare

- Schedule your trip to avoid times of highest use.

  New campsites are most frequently created on peak use weekends. More than a few nights camping each year prevents their recovery and results in a large inventory of campsites that aren't really needed.

  The potential for social impacts (e.g., crowding and conflict) is far greater during peak use periods.

- Schedule your trip to avoid times when resources are vulnerable.

  Vegetation and soils are far more susceptible to degradation during wet periods.

  Wildlife are more sensitive to disturbance during mating, nesting, birthing and winter seasons.

2. Travel and Camp on Durable Surfaces

- Durable surfaces include established trails and campsites, rock, gravel, dry grasses, snow, previously disturbed surfaces.
- Concentrate use in popular areas, disperse use in pristine areas.
- Protect riparian areas by camping at least 200 feet from water.
- Durable surfaces:

Previously Disturbed Surfaces

Rock/Gravel

Grass

Sand

- In popular areas:

Concentrate use on existing trails and campsites.

Walk single file in the middle of the trail, even when wet or muddy.

Keep campsites small. Focus activities in areas where vegetation is absent.

- In pristine areas:

Disperse use to prevent the creation of campsites and trails.

Avoid places where impacts are just beginning.

Resistance and Resilience: Forbs

Forest forbs generally have low resistance and resilience.

0 passes

250 passes

1,000 passes

1 month later

Resistance and Resilience: Grasses

Grasses generally have high resistance and resilience.

0 passes

250 passes

1,000 passes

1 month later

Use-Impact Relationships: A Campsite Example

The majority of most types of impact occur at low use levels.

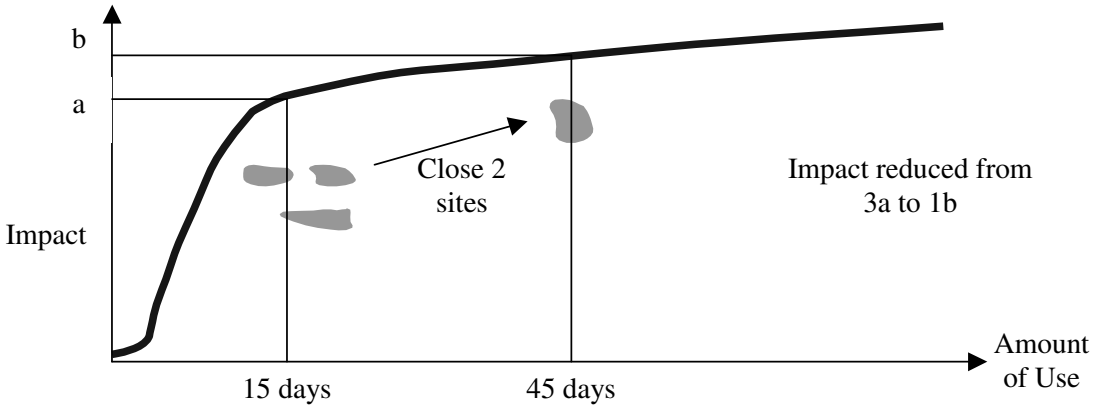
Rationale for Dispersal and Containment Strategies:

Consider an area where camping is unregulated with 3 sites that receive 15 nights/year.

All permanent impact could be avoided if use from the 3 sites was dispersed to 45 sites, each with 1 night of camping/year.

Management experience has shown this level of dispersal to be exceedingly difficult to achieve.

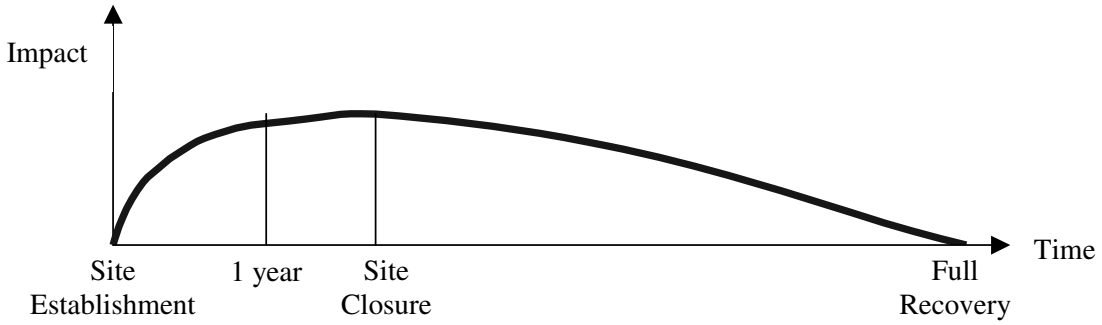
A containment policy is more effective: Close 2 of the 3 campsites and the cumulative impact is reduced from to that at just 1 site.



Temporal Trends: A Campsite Life History

Impacts occur quickly; recovery can take up to 30 years.

Implication: Rest-rotation schemes will be ineffective.



3. Dispose of Waste Properly

Human Waste

- Problems: human health and aesthetic impacts to other visitors.
  Bacteria (salmonella, shigella, campylobacter, waterborne gastroenteritis)
  Protozoans (giardia, cryptosporidium)
  Viruses (hepatitis A, rotavirus)
- Options: toilets, shallow burial, surface disposal, pack it out

A paper by Cilimburg et al, 2000 showed:

- Studies have shown bacteria to be present one year after cat-hole waste burial. Decomposition is aided by stirring the waste together with soil and water – organic soils are not required.
- Desiccation, high temperatures, and UV radiation are lethal to pathogens but are highly effective only for smeared surface-deposited waste.
- Soils are effective pathogen filters (only 5 feet) provided they are not coarse-textured.

Recommendations: Use toilets, carry out, or cat-hole wastes.

- Surface deposition is problematic: aesthetics, animal and insect transmission of diseases, surface runoff, and water contamination. Appropriate only in remote areas that lack adequate soils for burial.
- Burial (6-8 feet) in fine textured soil at least 200 feet from water.
- Temporary group latrines are not recommended – would slow decomposition time.
- On snow and glaciers, carry out is the best option.

4. Leave What You Find

- Avoid introducing or transporting non-native species

  Seeds stuck to boots, hooves, and tents often germinate along trails and at campsites.

  Most non-native plants are “disturbance-associated” species that remain in the vicinity of trails and campsites, such as dandelions and plantain. However, a few species are able to out-compete native vegetation in undisturbed environments.

  Research has also documented the germination of non-native seeds that have passed through the intestines of pack stock.

- Leave flowers for other to see. Picking them prevents formation of seeds vital to their reproduction and survival. A Great Smoky Mountain NP study documented significantly fewer orchids along trail in comparison to more distant areas.

5. Minimize Campfire Impacts

Campfires can cause lasting impacts to the backcountry. Research shows that campfire-related impacts are both socially and ecologically significant.

- Campfire sites remind others that the area is not pristine, large mounds of charcoal with trash are an eyesore, firewood depletion can leave a human "browse line" and tree damage and stumps represent acts of depreciative behavior.
- Fire wood depletion diminishes nutrient cycling and soil macro fauna; campfires produce long-term changes in soil physical and chemical properties.

Avoid campfire-related impacts by using a stove

6. Respect Wildlife

- Observe wildlife from a distance. You are too close if your presence or actions elicit a response from wildlife.

- Control pets at all times, or leave them at home.

- Never feed animals. Protect wildlife and your food by storing rations and trash securely.

- Displacement

  Animals are forced away from preferred habitats e.g., food/water sources or cover, either during certain times (temporal displacement) or in certain places (spatial displacement).

  New habitats are unfamiliar, often have lower quality food and cover, or increased competition and predation.

- Keep wildlife wild

  Never feed wildlife or allow them to obtain human food or trash.

  Wildlife attracted to human food often suffer nutritionally, alter their natural behavior and expose themselves to predators and other dangers.

  Fed deer in Grand Canyon had 3-5 pounds of plastic clogging their digestive system. A fed deer in Yosemite killed a small child.

7. Be Considerate of Other Visitors

Respect other visitors and protect the quality of their experience.

Crowding and conflict can be avoided or minimized by traveling and camping in small groups, taking breaks and camping away from the trail and other visitors, by exercising considerate behavior, and by maintaining the natural quiet.

Social Research on Group Size (based on a paper by Monz et al, 2000)

- Numerous visitor surveys have addressed this issue.
- Most studies reveal that more than 2/3rds of wilderness visitors report that seeing large groups reduces their feelings of being in wilderness.
- However, about 20-50% report that seeing large groups is a problem and group size is generally among the lowest ranked problems in comparison studies.
- About 75% of wilderness visitors support group size limits (though most travel in small groups so they don't bear the costs of group size regulations.

Ecological Research on Group Size (based on a paper by Monz et al, 2000)

- Only one empirical study and several suggestive studies …
- Large groups burned more firewood, but less wood per person, than smaller groups.
- Wildlife would likely be less disturbed by a smaller number of larger groups than by a larger number of smaller groups.
- Ecological impacts of large groups are greater at lower use levels – more difficult to disperse activities.
- Large groups can cause excessive impact at higher use levels if they cannot locate a sufficiently large site – in this instance they should split up and camp separately.
- Large groups with horses have more potential to cause greater impact than hikers so limits should include horses or be lower for horse groups.
- Large groups can reduce their impact by:
    (i) Breaking into smaller groups to hike and camp,
    (ii) Confining their activities to already impacted areas away from other groups,
    (iii) Meeting infrequently as a large group and only on durable surfaces, and
    (iv) Practicing quiet and courteous behavior.

Table of Contents