Visitor Use

in the

Boundary Waters Canoe Area (BWCA) Wilderness

A Policy Paper
by the

Friends of the Boundary Waters Wilderness

July 1992

The **Friends of the Boundary Waters Wilderness** is a Minnesota-based non-profit environmental organization focused on the protection and preservation of the wilderness character of the Boundary Waters Canoe Area (BWCA) Wilderness and the larger, international Quetico-Superior Ecosystem in which it lies. With members around the country and in Canada, the Friends organization works on a host of issues which affect the BWCA Wilderness and the Quetico-Superior Ecosystem. For more information, contact:

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The **Boundary Waters Wilderness Foundation** is a separate organization which functions as the tax-exempt arm of the Friends of the Boundary Waters Wilderness. The Boundary Waters Wilderness Foundation shares the same mission with the Friends, as well as sharing staff and office space. The Boundary Waters Wilderness Foundation is a 501(c)(3) charitable organization, and contributions to the organization are tax-deductible to the fullest extent of the law. For more information, contact:

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Preface

by Paul Gruchow

Author of *The Necessity of Empty Places*
and *Journal of a Prairie Year*

Wilderness is an urban value. We cherish it because it is now scarce, beyond everyday reach, far from home.

It may be far from home, but it is close, actually, to our ideal of home, for reasons historical and probably also biological. We have been -- if one counts a generation as twenty-five years -- recognizably human for only about sixteen hundred generations. For all but the last two hundred fifty of those generations, we were hunters and gatherers. On this continent we were hunters and gatherers only ten generations ago. Six generations ago, there were eyewitnesses to the hunting and gathering life; three or four generations ago there were people who knew people who remembered it. It was precisely then that the modern idea of wilderness emerged, when the memory of this way of life, but not the practice of it, was still alive.

Wilderness was an idea particularly dear to European settlers on the North American continent. We had, when it emerged, an acute sense of needing to make our own culture, to declare our own values, to distinguish ourselves from the Old World and its suffocating claims of superiority. When we took stock, we found little to claim: no literature, no language, no art, no edifices of our own invention. But we could claim -- with whatever moral compromise -- the vast, rich, and unspoiled continent. We peculiarly saw it as a cultural resource -- this was Thoreau's essential point -- beyond boast or dream of settled urbanized, industrialized Europe.

We thought we could start over here and make a new world. We anticipated both the material luxuries of industrial civilization and the cultural luxuries of the hunting and gathering life, or at least of the world it made possible, which persisted as a deep longing. This longing expressed itself in the idea of Eden -- the perfect garden before the corruptions of civilization, where the fruits grew as gifts, free for the taking. There the essential labor of our lives would be not to toil and sweat, but to manifest our libertarian reverence for all creation.

This was a very old idea given new energy by the boundless bounty of the new continent. We call it a myth, but it is really a memory, a memory of the lives we lived for so long and so recently abandoned. It seems inevitable that those who believed in it most fervently had grown up in

stifling and dogmatic households and had found, as adults, new freedom and new spirituality in wild places.

John Muir -- the founder of the American conservation movement -- classically illustrates the type. Religious fervor inspired Muir's father to abandon his shopkeeping life in Scotland and to take refuge on the Wisconsin frontier. There he ruled by the rod, spending his days in prayer and meditation while his young sons, forbidden intellectual endeavors, labored to fell the trees, and dig out the stumps, and turn land that had been unclaimed because it was so marginal to crops. It was only after Muir had been temporarily blinded in an industrial accident, had determined to see the world, had walked a thousand miles to Miami, and had made his way by stages into the pristine Sierra Nevadas, that he found peace, freedom, and spiritual wholeness. He joked late in his life that he liked to sing in the evenings to the animals gathered around his campfire. They loved Scottish ballads, he reported, but ran away in terror whenever he struck up the Old One Hundredth.

It was another Middlewesterner, L.S. Buffington of Minneapolis, who dreamed of hanging masonry walls like curtains on girders of steel to create wondrously tall buildings -- cloud-scrapers, he called them. He got a patent for the idea in 1888, but by then the first building of the kind -- ten stories high -- had already been constructed in Chicago. One attraction of the new skyscrapers, as they were soon called, was that they were relatively fireproof.

This was especially a consideration in Chicago, which had recently been devastated by a terrible fire. It was also a town on the make, "young, bold and without precedent," as Col. W.A. Starrett put it. Starrett was one of the big Chicago contractors -- he would organized materiel efforts for the Americans in World War I -- and he had a big hand in the skyline that towered above the shore of Lake Michigan by the turn of the century, the world's first. "We are waging," he said, "a war of construction against the forces of nature."

So at about the same moment two powerful ideas took shape and caught hold, both pushed into reality by Middlewesterners -- the idea of the skyscraper, still our only distinctive contribution to world architecture; and, under John Muir's leadership, the idea of a system of national parks to preserve forever the best that remained of the continent's natural splendors, which were then fast disappearing.

They were, in an odd way, complementary developments: the higher the central cities rose, the more urgently urbanites felt the need for escape routes into the past: into the pastoral -- camping vacations, suburbs, and summer houses

all became simultaneously popular among affluent urbanites -- and into the wilds. Through most of history, wilderness symbolized all that was frightening and terrible. As recently as three or four centuries ago, western Europeans found forests, mountains, and seashores not only horrid but ugly. In early twentieth century America fewer than half of us, for the first time, lived on farms, and the word wilderness finally acquired its fully modern meaning. We had learned to see it as clean (a word with which Muir was obsessed), pure, serene, and beautiful. This was a revolutionary way of seeing.

It was in this historical context that the Boundary Waters Canoe Area came to be set aside as the nation's first forest to be managed primarily for wilderness rather than commercial values. Since then, virtually all of the non-forested Middle West has been industrialized. Only about two percent of our people remain tied directly to the land, and that land has become, in a technical sense, a desert, a natural community too impoverished to be stable or sustainable. The landscapes in other regions of the country, though far more densely populated, were too rocky, or too hilly, or too swampy, to be overwhelmed in quite the same methodical way.

It is no wonder, therefore, that the BWCA is the most visited wilderness in the national system. Not only its sublime beauty makes it so, but also its proximity to that population most starved for those nourishments that can be found only in wild places.

The challenge in the long run is to find ways to reintroduce the margins of wildness into our settled lives and our developed communities. Wilderness preserves cannot forever satiate our deep and ancient longing for nature, if only because the few preserves we have are bound to be loved to death, as is now the case with the BWCA. Places like the BWCA present, in the meantime, the central test of our potential to meet the long-term challenge. If we cannot sustain wildness even in the places we have set aside expressly for this purpose, what hope can there be that we will do any better in the places of our enterprise?

Paul Gruchow

June, 1992

I. Introduction

The Boundary Waters Canoe Area (BWCA) Wilderness, a key central component of the larger, international Quetico-Superior Ecosystem, is a global treasure. The BWCA Wilderness lies in northeastern Minnesota and stretches for nearly 150 miles along the international border with Ontario. The area contains over 1,000 pristine lakes connected by hundreds of miles of streams and rivers. The BWCA features roaring rapids, plunging cliffs, the calls of loons and howls of wolves, and deep forests of pine, spruce, aspen, and birch.

At 1,087,000 acres in size, the BWCA Wilderness is one of the largest units in the National Wilderness Preservation System, and is the biggest federal wilderness east of the Rockies and north of Florida's Everglades. It is the only significant lakeland unit in the entire federal wilderness system. Though some logging did occur in the area, the BWCA still contains the largest block of virgin forest east of the Rockies, providing habitat for many rare and endangered species, a rich reservoir for native biological diversity. Part of the Superior National Forest, the BWCA Wilderness is managed by the U.S. Forest Service.

Wilderness recreation (or visitor use) by people is only one value of wilderness. Wilderness also provides immense intrinsic, biocentric values like biodiversity, old-growth forests, healthy and naturally-functioning ecosystems, high water quality, and watershed protection as well as the more anthropocentric values of natural beauty, personal and spiritual reflection, and solitude.

Sigurd F. Olson, the evocative wilderness writer and wilderness champion, often captured the essence of the wildness of the Quetico-Superior wilderness in his writings, the value of silence and solitude:

> It was before dawn, that period of hush before the birds had begun to sing. The lake was breathing softly as in sleep; rising and falling, it seemed to me to absorb like a great sponge all the sounds of the earth. It was a time of quiet -- no wind rustling the leaves, no lapping of the water, no calling of animals or birds. But I listened just the same, straining with all my faculties toward something -- I knew not what -- trying to catch the meanings that were there in that moment before the lifting of the dark.
>
> Standing there alone, I felt alive, more aware and receptive than ever before. A shout or a movement would have destroyed the spell. This was a time for silence, for being in pace with ancient rhythms and timelessness,

the breathing of the lake, the slow growth of living things. Here the cosmos could be felt and the true meaning of attunement.

People from around the world come to the BWCA Wilderness to experience its priceless wilderness character. In fact, the BWCA Wilderness is the most heavily visited wilderness in the entire National Wilderness Preservation System, with about 1.2 million recreation visitor days of use each year. The amount of visitor use has risen dramatically -- about two and a half times -- over the past thirty years, from 72,400 total visitors and 506,800 visitor days in 1961, to 183,600 total visitors and 1,272,600 visitor days in 1991. (See table on page 4 at the end of this section.)

The usage has become so great, however, that we are in danger of forever losing the superb wilderness qualities about which Sigurd Olson wrote, the same qualities which the area's visitors still seek today. Campsites have become trampled and trammeled by the amount of use they receive, resulting in soil compaction, soil erosion, permanent loss of trees, scarification of remaining trees, and even trash and fecal waste sometimes scattered throughout. Visitors are finding it increasingly difficult to find unoccupied campsites, and must stop earlier and earlier in the day in order to be assured of finding a campsite for the evening. And the intangible qualities of a wilderness experience -- solitude, silence, remoteness, and more -- have become increasingly difficult to find in the BWCA Wilderness when racing another group for the last remaining campsite on a lake or encountering party after party throughout the day.

These problems are real, and have been documented both through day to day observations and scientific studies. The average visitor to the BWCA Wilderness has recognized these problems in the wilderness, and the members of the Friends of the Boundary Waters Wilderness are acutely aware of the problems.

The Friends are not alone in this conclusion that the wilderness resource and the wilderness experience are in jeopardy. A key researcher in the BWCA Wilderness, Dr. Robert C. Lucas, predicted as long ago as 1964 that "[a] more realistic estimate places the disappearance of full wilderness between 1965 and 1975" (Lucas 1964). Dr. Lawrence C. Merriam, another noted BWCA researcher, asked in a 1986 paper whether the wilderness had by then disappeared. He wrote that recent restrictions such as the 1978 BWCA Wilderness Act and the visitor distribution program have enhanced the wilderness, but concluded that "increased use brings more encounters with others and a loss of solitude even with restrictions" (Merriam 1986).

Though some local residents continue to complain about existing or potentially new restrictions hampering locally-based use of the BWCA Wilderness, we believe that the over-riding concerns must come from a national and even international perspective. Wilderness is an increasingly precious commodity in our world, and the BWCA Wilderness -- a federal area owned by people across the country -- provides the only significant lakeland wilderness experience in the entire nation.

Though restrictions may be unpopular locally, not all uses or levels of uses can or should be accommodated in wilderness and some restrictions must be made to protect wilderness values. The BWCA Wilderness -- all wilderness -- must provide and can provide values and experiences that transcend those provided by state parks or national recreation areas. Restrictions and changes are needed for the BWCA to protect its wild character so it can provide these special values and experiences.

The Friends of the Boundary Waters Wilderness consequently believe that the BWCA Wilderness today stands at a crossroads. Will we take steps now to reduce visitor impacts and restore the wilderness character of the Boundary Waters, or will we drift along into the future, allowing increasing visitor impacts and forfeiting forever the wilderness resource and the wilderness experience it provides?

The Friends of the Boundary Waters Wilderness believe that there can be but one choice for the BWCA Wilderness. This choice must be a course which seeks to protect and restore the priceless wilderness resource and wilderness experience of the canoe country. This policy paper sets out some of the existing problems facing the BWCA Wilderness, as well as some recommendations of the positions and principles which we feel must be followed in the hope of saving the Boundary Waters Canoe Area Wilderness from being loved to death.

Changes in Visitor Use in BWCAW 1961-1991 by Decade

Year	Total Visitor Number	Total Visitor Days
1961	72,400	506,800
1971	141,485	825,964
1981	150,057	1,164,665
1991	183,600	1,272,600

Source: 1961 data from Lucas (1964a), remainder from Superior National Forest BWCAW visitor use summaries.

II. Requirements of Law and Regulation

The U.S. Forest Service has ample authority and is, in fact, required by various laws and regulations to take the necessary steps to protect the wilderness resource from excessive visitor use. The following guidelines, particularly the 1978 BWCA Wilderness Act, all point out the importance of protecting wilderness values over other conflicting uses, and the need to take a long-range view to protect wilderness far into the future.

A. 1964 Wilderness Act - The 1964 Wilderness Act (Public Law 88-577, 16 USC 1131), the landmark law which established the National Wilderness Preservation System, provides a number of directives for wilderness visitor use management. Section 2(a) requires that wilderness areas "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas [and] the preservation of their wilderness character...."

Section 2(c) of the 1964 Act further defines wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." This section further requires that a wilderness area must have "the imprint of man's work substantially unnoticeable" and must have "outstanding opportunities for solitude or a primitive and unconfined type of recreation."

Section 4 of the Act also prohibits "commercial enterprise" within wilderness areas [section 4(c)] except those which are "proper for realizing the recreational or other wilderness purposes" of the areas [section 4(d)]. (Emphases added.)

B. 1978 Boundary Waters Canoe Area Wilderness Act - The 1978 BWCA Wilderness Act (P.L. 95-495, 92 Stat. 1649) contains additional requirements related to visitor use management. Congress found it necessary and desirable to provide for "the orderly management of public use and enjoyment of [the BWCA] as wilderness...." This Act further calls for measures to "protect and enhance the natural values and environmental quality of the lakes, streams, shorelines and associated forest areas of the wilderness", to "maintain high water quality" in the area, and to "provide for the orderly and equitable transition from motorized recreational uses to nonmotorized recreational uses...." (Emphases added.)

The Act significantly reduced, but did not entirely eliminate, motorized uses within the wilderness through a variety of provisions in Section 4.

Section 4(f) of the 1978 Act also required the development and implementation of entry point quotas for motorboats, not to exceed the actual annual average of the motorboat use during the period 1976-1978.

Section 18 further directed the Forest Service to expedite and intensify recreation outside the BWCA Wilderness, to construct new trails within and outside the wilderness, to develop a visitor education program explaining "the purpose, value, and appropriate use of wilderness lands and the functioning of natural ecosystems in wilderness", and to develop a program providing opportunities for people with disabilities.

C. Code of Federal Regulations - The Code of Federal Regulations (36 CFR 293) provides additional guidance for visitor use and wilderness management. The CFR requires that wilderness "be administered for such other purposes for which it may have been established in such a manner as to preserve and protect its wilderness character" and "to promote, perpetuate, and where necessary, restore the wilderness character of the land and its specific values of solitude...."

To that end, the CFR states that "[n]atural ecological succession will be allowed to operate freely to the extent feasible" and that "[i]n resolving conflicts in resource use, wilderness values will be dominant...." (36 CFR 293.2) (Emphases added.)

D. Forest Service Manual - The Forest Service Manual (FSM) provides even further direction on visitor management in wilderness areas. Chapter 2320 of the Forest Service Manual directs the agency to:

> Manage the wilderness resource to ensure its character and values are dominant and enduring. Its management must be consistent over time and between areas to ensure its present and future availability and enjoyment as wilderness. Manage wilderness to ensure that human influence does not impede the free play of natural forces or interfere with natural successions in the ecosystems and to ensure that each wilderness offers outstanding opportunities for solitude or a primitive and unconfined type of recreation.

The FSM further states as policy that "[w]here there are alternatives among management decisions, wilderness values

shall dominate over all other considerations...." Furthermore, in an important directive which is particularly applicable to the BWCA Wilderness, the FSM states that "[b]ecause wilderness does not exist in a vacuum, consider activities on both sides of wilderness boundaries during planning...." (FSM 2320.3)

The FSM also gives the Forest Supervisor the authority for:

> Limiting the number of visitors, parties, party size, or duration of visitor stays in a specific area when the wilderness resource is threatened or damaged because of an excessive number of people. (FSM 2323.04d)

(Emphases added.)

III. Impacts on the Wilderness - Campsites, Portages, and Wildlife

Campsites in the Boundary Waters suffer the vast majority of the physical impacts from visitor use within the wilderness. The BWCA campsites have suffered so many visitor impacts that many of them can no longer claim to be "untrammeled by man" as the 1964 Wilderness Act requires and as the FSM so defines (FSM 2320.5).

Portage trails also suffer from current visitor use levels, some of the impacts being similar to those at campsites. Widening of the trails, shoreline erosion at portage trail landings, and multiple routes around wet spots or blowdowns are some of the types of impacts to portages. Campsite impacts, however, have been studied far more than portage trail impacts.

The BWCA Wilderness contains about 2,200 designated campsites, each of which has a fire grate and latrine. Campsites are on average about 2,368 square feet in size (220 square meters) or 0.054 acre for the central heavy use area, according to a 1985 study (Marion and Merriam 1985). More recent Forest Service campsite inventory data indicate that overall each campsite averages 2,712 square feet (U.S. Forest Service, 1992).

A. Campsite Impact Studies - Campsite impacts in the BWCA Wilderness have been studied for many decades going back to the early 1960s (Frissell and Duncan 1965). In the 1970s, a five-year study headed by Dr. Larry Merriam examined impacts on 23 newly established campsites (Merriam et al 1973, Merriam and Smith 1974). They found that new campsites soon experienced losses in ground vegetation, increases in bare mineral soil, soil compaction, trees with exposed roots, dead trees, and expansion of the campsite area. Other studies have also shown similar impacts on other wilderness campsites (Cole 1989a, 1989b).

Though many of these campsite impacts leveled off after the first two or three years of use, campsite expansion continued to increase. Twenty-one of the 22 forested campsites in the study showed continued expansion within the five year period; 10 expanded more than 50% and four over 100%. A good deal of this campsite expansion came from parties seeking new tent sites because older ones on bare soil were muddy or dusty, or by large groups needing additional tent sites. Larger parties often established satellite sites some distance away and created paths to the original site (Merriam et al 1973).

B. The Marion Campsite Study - Another major BWCA campsite study occurred in the 1980s by Jeffrey Marion and

Larry Merriam (Marion and Merriam 1985). Their study examined the condition of 96 older, established BWCAW campsites with 96 nearby control sites which were not campsites. All campsites had been used for longer than 5 years. This study graphically documented the severe degradation of wilderness campsites by visitor use.

On the average campsite in the study, 84% of the trees had exposed roots, and over 1/5 had severe root exposure. Visitors had damaged 96% of all campsite trees to some degree, with over half of all campsite trees suffering moderate to severe damage from large branches cut or broken off, extensive trunk scars, bark stripping (especially paper birch), and tree girdling.

Campsites had 95% fewer tree seedlings than the control sites, and tree saplings had been virtually eliminated from campsites, declining from 836 per hectare on control sites to less than 1 per hectare on campsites. The number of standing dead trees and stumps on campsites had tripled over the same number on control sites (185 per hectare vs. 66 per hectare), indicating high tree mortality on campsites. The study found that this high mortality, coupled with the nearly complete lack of tree regeneration, "forecasts potentially major problems for long-term campsite management...." This finding casts doubt on whether natural ecological succession can ever occur on these heavily used campsites, as the CFR and FSM require.

Ground cover at campsites suffered similar declines. Campsites had a 76% decline in dense ground cover, from 87% ground cover on the non-campsite control sites to only 22% ground cover on campsites. Vegetative composition had also changed at campsites. The study identified 22 non-native species on BWCA campsites, and 62% of the sites had at least one non-native species.

Visitor use levels were significantly related to impact factors such as the percent of bare mineral soil in a campsite, size of the campsite, tree damage and tree mortality, tree seedling abundance, loss of and changes in vegetative cover, and other factors. Many of these impacts occur even at low visitor use levels, however. But campsite size, exposed soil, soil penetration resistance, and soil organic layer thickness are most directly related to use levels. These campsite impacts could be directly reduced by reducing BWCAW visitor use levels (Marion and Merriam 1985).

C. Visitor Awareness - Visitors to the BWCA Wilderness have noted the impacts at wilderness campsites. A study of 1988 visitors showed that canoeists rated the following indicators of campsite and portage trail degradation as problems (Lime 1990):

Problem	% Indicating Problem
Litter	54.9%
Visitor caused vegetation damage	48.2
Quality or condition of portages	45.2
Finding a high quality campsite	44.6
Soil erosion at campsites	34.4
Overall maintenance of campsites	33.1

Members of the Friends of the Boundary Waters Wilderness also have noted these same problems, and have been much more aware of the problems than the general BWCA canoeist. A 1990 study of Friends members in part replicated the same grid used in the study of 1988 overall visitors, and the same problem indicators showed up as follows (Berlin, Hackbarth and Stepaniak 1990):

Problem	% Indicating Problem
Litter	73%
Visitor caused vegetation damage	99
Quality or condition of portages	50
Finding a high quality campsite	71
Soil erosion at campsites	97
Overall maintenance of campsites	54

D. Wildlife Impacts - Visitors to the BWCA Wilderness also have ecological impacts on wildlife resources. Though this field has not been as well-studied as other impacts like campsite degradation, for example, nonetheless the impacts do occur.

One ecological impact to the wilderness occurs with fish populations. The excessive exploitation of certain fish populations is exacerbated by the high number of visitors. The fish populations of some lakes may be seriously affected by over-harvest of reproductively mature adults. This is especially a problem for such high interest species as lake trout and walleye.

Unnatural populations of some fish species also now inhabit certain lakes in the BWCA Wilderness. Walleyes and small-mouth bass were stocked in some lakes where they had never before existed, sometimes to the detriment of native species like lake trout. More exotic species like smelt, cisco, and others also now inhabit some wilderness lakes.

Black bear populations inside the BWCA Wilderness have also been affected by human recreational use of the area. Each season, some bears become habituated to the relatively easy food-gathering at well-used BWCA designated campsites. Many human parties have lost food to bears in this way.

A 1991 study of black bears in a portion of the BWCA Wilderness surveyed bear locations in connection with a potential BWCAW woodland caribou restoration project (Pitt and Jordan, 1991). This study confirmed that the "[i]ncidence of [bear] visitation [to bait stations] was strongly related to campsite presence." Human recreational use of the area has obviously affected the location or home ranges of black bears to areas near designated wilderness campsites. Other impacts on black bears regarding nutrition, feeding habits, behavior, etc., are likely but as yet unstudied in the BWCA.

A 1981 study which examined the response of loons in the BWCAW to recreational pressure documented some of the impacts of human visitors on this significant wildlife species (Titus and VanDruff, 1981). The study found a significantly greater hatch/egg laid ratio for smaller, more remote lakes than for larger more heavily visited lakes. Loons on lakes where motors were prohibited were more successful at hatching eggs and producing broods than on motor lakes, and loon pairs experiencing fewer human contacts produced significantly more surviving young than lakes enduring high human use levels.

Other indicators in this study showed little or no effect on loon productivity from heavy recreational use, such as the refusal of many loons on high recreation lakes to leave their nest when approached by humans, or the apparent increase in the total loon population in that part of the BWCAW since a previous study a quarter century earlier. Despite these factors, however, the study still points out that heavy recreational use and motor use pose serious impacts on common loon populations in the BWCA Wilderness.

Other wildlife species which may be sensitive to human disturbance from recreational visitors include bald eagle and osprey. These species can be particularly sensitive to human disturbance near nests.

Hunting, particularly for moose, and trapping may also bring about unnatural human-induced impacts to certain wildlife species. About 100-150 moose are legally killed each year in the BWCA Wilderness during the moose hunting season. While it appears that the hunting season does not seriously impact the moose population in the canoe country, it does reduce the food supply available to the eastern timber wolf. Trapping for beaver, mink, otter, bobcat, lynx, pine marten, and fisher may also bring about negative impacts which haven't yet been fully studied.

IV. Impacts on the Wilderness Experience -- The Social Effects of Crowding

High levels of visitor use in the BWCA Wilderness have caused significant impacts on the physical resources of the wilderness, such as campsites and portage trails. These same high levels of visitor use also damage the more intangible aspects of a wilderness experience. Crowding, noisy groups on nearby campsites, high numbers of encounters per day with other parties, difficulty in finding an open campsite -- such events negatively impact the wilderness experience via what is often called the social impacts.

Crowding degrades the more intangible qualities of a wilderness experience such as solitude, silence, and remoteness. Though not as easily measured as campsite degradation, these values are highly important to a wilderness experience. One of these values -- solitude -- was singled out in the 1964 Wilderness Act and other federal regulations to be protected and provided for in federal wilderness areas.

A. 1988 Visitor Study - A 1988 Visitor Use Study of BWCAW visitors documented that the average BWCA visitor was concerned with many of the factors related to crowding (Lime 1990). The 1988 canoeists ranked the following as problems:

Problem	% Indicating Problem
Meeting too many other groups	59.9%
Litter	54.9
Finding unoccupied campsite	45.2
Meeting large groups	34.2
Motorized canoes or boats	24.3

B. Friends Study - In 1990, the Friends of the Boundary Waters Wilderness also conducted a study of our membership (Berlin, Hackbarth, and Stepaniak 1990). This study in part replicated the grid used in the 1988 BWCA Visitor Use Study, and found that our members were much more aware of the crowding problems than the general BWCA visitor. Friends members ranked the following as problems:

Problem	% Indicating Problem
Meeting too many other groups	76%
Litter	73
Finding unoccupied campsite	66
Meeting large groups	50
Motorized canoes or boats	43

C. Crowding Measures - Shelby and Heberlein (1986) and Shelby et al (1989) conducted a comparative analysis of crowding in a variety of locations utilizing results from 15

years of research, including one study in the BWCA Wilderness (Adelman et al, 1982). This particular BWCA study showed that 73% of the canoers and boaters reporting crowding at Moose Lake.

The Shelby study concluded that settings where fewer than 35% of the visitors feel crowded appear to provide relatively unique low-density experiences, and that settings with crowding ratings from 35-50% appear to be in the "no problem" range. But areas where crowding is ranked between 50-65%, the study concluded, should be carefully scrutinized since they appear to be approaching capacity, while over 65% crowding means there is a definite problem and use levels should be reduced.

The BWCA study cited 73% crowding at Moose Lake. According to Shelby's methodology, use levels should be reduced in the BWCA Wilderness, at least at Moose Lake. Even if one utilizes the 59.9% figure of 'meeting too many other groups' from the 1988 BWCA visitor study, careful scrutiny should be given to visitor use levels in the BWCA Wilderness, since the area may be approaching or already at capacity.

D. Encounters and Crowding - Stankey's ground-breaking study (Stankey 1973) sought to establish the connection between encounters per day and crowding. One of the four wilderness areas he studied was the BWCA Wilderness. He found that in the BWCA, canoeists reacted favorably to three or fewer encounters per day. This was similar to Stankey's research to user response in western wilderness areas, where most users there responded favorably to no more than zero to three encounters per day.

Shelby and Heberlein (1986) built on the research by Stankey and others to develop a social carrying capacity technique to help determine visitor capacity policies for managers of wilderness and other areas. Their technique utilizes standards to quantify such things as encounters or other indicators. This technique has been used to estimate recreation carrying capacities for such areas as the Apostle Islands National Lakeshore. Their technique can be used to estimate carrying capacity for a variety of settings, not just wilderness areas.

E. Social Conditions in BWCAW - In 1991, Dr. David Lime completed a study for the USDA Forest Service which established a set of potential indicators and standards to monitor encounters with other groups specifically in the BWCAW. Lime's work built on the earlier research of Stankey, Shelby, and many others (Lime 1991).

The Lime study sets forth ten possible indicators, and proposes potential standards for each of the recreation opportunity classes in the BWCAW (primitive, semi-primitive

nonmotorized, and semi-primitive motorized), further broken down for the two semi-primitive zones by whether an area is a peripheral lake or river, or an interior lake or river. The potential standards range, for example, from an 80% probability of 0-2 encounters per day while traveling in primitive zones, to an 80% probability of encountering no more than 6-10 groups per day while traveling on peripheral water bodies in semi-primitive motorized zones.

The indicators and standards designed by Dr. Lime hold great hope for quantifying and monitoring these types of impacts on the social conditions, or crowding factors, in the BWCA Wilderness.

F. Motor vs. Paddle Conflicts - Even after the last of the motorboat phase-outs required by the 1978 BWCA Wilderness Act (the final phase-out is most of Seagull Lake in 1999), approximately 24% of the BWCA's water surface area will remain open to motorboat use. The usage of the BWCA Wilderness is predominantly by paddlers. Paddlers accounted for 90% of the overnight groups to the area in 1991, according to Forest Service figures, with only 9% of overnight groups utilizing motors. (The remaining 1% were hikers.)

Conflicts have existed in the past between motor visitors and paddling visitors, and the same conflicts continue to exist. The conflicts still appear to be one-way or one-sided, with motor visitors negatively impacting paddlers far more than paddlers impact motor users. And motor visitors continue to add more to the sense of crowding and dissatisfaction than do the same number of paddling visitors.

Lucas (1964) noted nearly thirty years ago that eliminating motor use beyond the second lake from the boundary in the BWCA would greatly increase the carrying capacity of the area. Stankey (1973) recommended that motor craft be eliminated from the BWCA for the same reasons. A more recent 1983 study found that "the asymmetric antipathy still exists between motorcraft users and paddling canoeists in the BWCA" with 71% of the paddlers disliking meeting or seeing motorcraft users in the BWCA, while only 8% of the motorcraft users disliked meeting or seeing paddlers (Adelman, Heberlein and Bonnicksen 1983).

Dr. David Lime (1975) found that 93% of paddle canoeists had their experiences diminished by encounters with any motorboat parties, where only 10% of the same paddle groups had the same reaction to meeting other paddle parties. He concluded that though "the total amount of motor use is small, it has a disproportionate impact on the experiences of others." Permitting motor use to continue "reduces the

carrying capacity of the Area and can only result in an earlier need to restrict the number of people in the BWCA."

G. Group Size/Large Groups - Large groups in the BWCA Wilderness have a disproportionately large impact not only on campsites, but also on crowding and dissatisfaction by encounters with other groups. Dr. David Lime studied large groups twenty years ago, groups which he defined as nine or more people per party (at the time, the maximum group size was 15).

He reported that "[s]everal studies have indicated that large parties impair and degrade the wilderness experience for many visitors. Although such groups represent only a small proportion of total wilderness use, they have a disproportionate impact on the experience of other visitors." He further concluded that "the impact of large groups on the environment and on the experience of other visitors is greater than that of an equal number of people visiting the Area in small groups." (Lime 1972).

The number of large parties is fairly small, according to Lime's study of 1988 BWCA visitors. Over two-thirds of the BWCAW groups (68.2%) traveled in parties of four or less. Only 16.6% of the groups traveled in parties of seven or more, and only 7.5% traveled in groups of 9, 10, or 11 (Lime 1990). The following table shows the breakdown:

BWCA Overnight Groups by Party Size

Party Size	% of Groups	# Groups	# People	% People
1	2.1	505	505	.5
2	34.6	8,324	16,648	16.7
3	9.8	2,358	7,074	7.1
4	21.7	5,221	20,884	21.0
5	6.4	1,540	7,700	7.7
6	8.8	2,117	12,702	12.8
7	4.0	962	6,734	6.8
8	5.1	1,227	9,816	9.9
9	2.7	650	5,850	5.9
10	4.6	1,107	11,070	11.1
11	.2	48	528	.5
		24,059	99,511	

Source: Expanded from Lime (1990).

This table also shows that not only do most groups travel in parties of six or fewer (83.4%), as mentioned

above, but that a clear majority of the number of people also traveled in parties of six or fewer (65.8%).

Another recent study utilizing a much smaller sample size also examined large groups. Hollenhorst and Olson (1990) studied large groups and particularly organized groups in the Kawishiwi District of the BWCA Wilderness in a recent study utilizing unobtrusive observation methods. They found a higher percentage of large organized groups in their smaller sample than the 1988 data indicate, and concluded that "organizations pose serious problems for managers."

The average size of organized parties, according to their study, "nears and, in the case of church/religious groups, actually exceeds the limit of 10 visitors per party" at 10.89 people per party. The large number of these organized parties (between 12.6 and 19.4% of all parties, according to this study) suggests "frequent conflict with and impact upon smaller parties of private visitors sensitive to the presence of large parties." They conclude that the result may be that private individuals "seeking wilderness values like solitude may be dissatisfied or even displaced." This study, though perhaps not as statistically reliable as the 1988 visitor study, nonetheless highlights some of the problems and impacts associated with large groups.

H. Displacement - Dr. Dorothy Anderson has conducted some pioneering research on recreational displacement in the BWCA Wilderness, or how repeat visitors change their use patterns (Anderson 1980, Anderson and Brown 1984). Displacement is not necessarily just a motor-paddle conflict. "Displacement," she wrote, "which is related to the increasing number of visitors to the Boundary Waters, may make some visitors unhappy. Some may decide not to return; others may return but change their use patterns, and these changes are not always to their satisfaction." (Anderson 1980.)

Her study found that about 80% of long-time visitors (more than 4 BWCAW trips) had changed their BWCAW use patterns, or had been displaced. More than 80% of those who changed had used different entry points, three-fourths select campsites differently, and 70% enter on a different day of the week than they did earlier. The study concludes that these changes in BWCAW use patterns are related to displacement.

Much of Anderson's displacement research is related to changes in use within the BWCAW by long-time visitors. Although not as well documented as this type of change, the Friends of the Boundary Waters Wilderness also believe that another type of displacement has occurred and is occurring: many wilderness-seeking visitors no longer go to the BWCA

Wilderness, but travel instead to Quetico Provincial Park or other less-crowded areas because of the social impacts related to the large numbers of visitors in the BWCAW. We believe that the BWCA Wilderness must once again provide a quality wilderness experience -- without the excessive crowds of visitors which many wilderness enthusiasts seek to avoid.

V. Current Visitor Use Management in BWCA - Background

The BWCA Wilderness has set many national precedents in visitor use management for the National Wilderness Preservation System. Various visitor management tools or techniques now in use across the country were pioneered in and for the Boundary Waters. Many positive accomplishments have been achieved to protect the wilderness and manage its visitors, although some improvements and changes are still needed.

A. Visitor Distribution Program - The Forest Service developed the Visitor Distribution Program in the mid-1970s, and implemented it for the first time in 1976. The program is based on a computer travel model which predicts the travel patterns of wilderness visitors, and attempts to better distribute visitor use by setting daily party quotas for each of the 87 BWCAW entry points. Each overnight party entering the BWCAW is required to have a wilderness travel permit from the U.S. Forest Service, thus providing the means to control entry. The listing of current entry point quotas is found on page 27 at the end of this section.

The Visitor Distribution Program was designed to operate at a campsite occupancy rate of 67%. In other words, a maximum of only two-thirds of the campsites would be occupied at any one time, leaving the remaining one-third open to allow for visitor selection preferences, some physical recovery for campsites between visitor use periods, unexpected travel patterns due to unusual weather, etc. (Hulbert and Higgins 1977, Higgins 1977, Peterson 1977).

But the Visitor Distribution Program apparently has never operated at the 67% level for all travel zones. To phase-in the program in 1976, the Forest Service allowed a relaxation of the capacity level to 85% if all entry points within a geographic zone had reached the 67% capacity level, and then a further relaxation to 100% campsite occupancy level. Though the announced goal was "to reach and maintain the 67% maximum capacity level by the 1978 or 1979 season," this never occurred (U.S. Forest Service 1975).

"Control zones" (generally subdivisions of the travel zones which lie closest to entry points) have been allowed to operate at an 85% campsite occupancy rate. In 1981, the Forest Service's Environmental Assessment for the 1981 BWCA Implementation Plan stated that more study was needed before determining the appropriate campsite occupancy level, but the Forest Supervisor apparently made the decision without more study or public notice to operate the Visitor Distribution Program at the 85% rate for control zones. Far interior zones (more remote) have operated at the 67% campsite

occupancy level, but a third, mid-level set of zones has operated between the 67% and 85% rate (Marion and Sober 1987, Proescholdt 1987).

In 1986, the Friends of the Boundary Waters Wilderness filed a formal administrative appeal of the Land and Resource Management Plan for Superior National Forest. One of twelve major issues in this appeal was BWCA visitor use, and included the request by the Friends to operate the Visitor Distribution Program at the 67% campsite occupancy level as the program had been designed for. This appeal issue was settled in 1988 with a formal signed settlement agreement in which the Forest Service agreed to re-evaluate the whole issue of visitor use in the BWCA Wilderness.

B. Entry Points - The BWCA Wilderness currently has 87 entry points along its periphery. Some of these entry points are exclusively used by hikers, some are not used or publicized by the Forest Service, and some have no quota assigned to them. At least a quarter of all the entry points originated as accidental or unintended entry points to the wilderness over the years through the construction of logging roads. The number of entry points has grown in recent years. Even as recently as 1976, only 70 entry points existed for the BWCA (U.S. Forest Service, 1975).

Too many entry points currently exist. The continuing increase in entry points has resulted in a shrinkage of truly remote areas within the Boundary Waters, particularly in light of the high amount of "edge" which the BWCA has compared to more compact areas like Quetico. Though more entry points may help in better initial distribution of visitors, it has also resulted in a dramatic loss of remoteness and solitude as well, and a shrinkage of the remote interior area. Virtually every place in the BWCA Wilderness can now be reached within a day's travel by canoe, given a choice of entry point.

C. The Wilderness Visitor Permit System - The Forest Service operates a computerized visitor permit system for issuing visitor permits for travel in the BWCAW. Visitor permits have been required since 1966, the first wilderness in the nation to do so.

Through use of the Visitor Distribution Program, the Forest Service has set daily entry point quotas for each of the 87 BWCAW entry points. These quotas range from 1 party per day to 37 per day at Moose Lake. (Some barely-used entry points have no permits available.) A listing of the current entry point quotas is found on page 27.

Because demand for certain entry points during much of the summer is quite high, the Forest Service also developed a reservation system. With this system, an individual or an

outfitter working on behalf of a customer can make an advance reservation for a permit for a specific entry point on a specific day. The Forest Service currently takes applications for reservations by mail beginning in mid-January, and by telephone beginning February 1st. The agency charges a $5 fee for the reservation service. A central computer system in Duluth handles the permit system, with local Forest Service offices or cooperators (those who issue travel permits with authorization from the Forest Service) calling in to inquire about the availability of permits for certain days and entry points.

The Forest Service also "overbooks" the daily entry points quotas, much the same as motels or airlines overbook. By assuming that the no-show rate averages 7% for all entry points, the agency issues roughly 7% more permits than the quotas would otherwise allow. Some entry points are overbooked by much more than 7%, others at less than 7%. While on average, this overbooking may work out, there are occasions when fewer than 7% fail to show up, exacerbating crowding in the wilderness even further.

In addition to quotas for overnight paddling groups, two additional sets of quotas exist for day motor use and overnight motor use. Section 4(f) of the 1978 BWCA Wilderness Act requires these motor quotas, and further specifies that the quotas not exceed the actual annual average motorboat use during the period 1976-1978. These quotas were set with extensive public involvement during the period 1979-1981. The Friends participated in the process which established these quotas; we feel that these quotas, particularly the day use quotas, incorporated estimates of non-recorded motor use which were far too high and produced quotas which ranged from 50% to 200% higher than the 1976-78 average derived from published travel permit data (Proescholdt 1984).

The day-use motor quotas were monitored by the Forest Service, though not strictly enforced, throughout most of the 1980s since the use levels appeared well below the quotas. In 1988, however, the quota was exceeded for Moose Lake (interior); further monitoring in 1989 revealed that quotas were exceeded that year for Trout, Fall (interior), and Moose (interior). Beginning in 1990, the Forest Service began to more strictly enforce the day use motor quotas, including the use of towboats by outfitters.

The Trout Lake entry point is the one motor entry point which is operated differently than all others. Trout Lake does not have separate day-use and overnight motor quotas, but a single motor quota. Because of this anomaly, this entry point is also not managed through the Forest Service's computer system, but rather is tracked manually.

D. Campsites - The BWCAW has approximately 2200 designated campsites throughout its million acres, all located on lakes or streams. Each designated campsite has a steel firegrate, a wilderness pit latrine, two or three tent locations ("tent pads"), and a canoe landing area at water's edge. All visitors during the ice-free season have been required to camp at a designated campsite since 1975. Winter visitors may camp anywhere they wish (Anderson and Lime 1984).

The location and number of campsites in the BWCA resulted from several different factors, some of which had little to do with physical and social carrying capacity. Many campsites on heavily visited routes or good fishing lakes were older user-established sites which the Forest Service subsequently made official with grates and latrines during the needed move towards requiring all camping at designated sites. Although old sites on small islands or other sensitive locations were closed by the Forest Service, many other new sites were developed on the same heavily used routes during the late 1960s and 1970s. Some newer campsites were also established on smaller interior lakes during this time as well.

Campsite numbers and locations on given lakes have therefore been determined primarily by previous visitor use, and to some extent by the individual Ranger Districts involved.

Campsite management in the BWCA Wilderness has developed primarily into rehabilitation work and, just recently, a new program to monitor campsite impacts called the Limits of Acceptable Change (LAC) process.

As described in previous sections, the impacts to designated campsites in the BWCA can be staggering. Rather than continue to close damaged campsites and open new sites (and thus impacting more and more shoreline of wilderness lakes), the Forest Service has adopted a policy of allowing campsites to "harden" or focusing impacts primarily on existing sites. This policy prevents the degradation of additional shoreline areas from opening new campsites, which helps protect the wilderness resource, but it does pose problems for maintaining existing campsites.

Forest Service field staff members have developed a number of ways to rehabilitate heavily damaged campsites, at least to some degree, in an attempt to restore their natural character. Campsite rehabilitation work often includes rock work and rock placement to lessen erosion problems or to restrict unnecessary visitor traffic, moving firegrates to more suitable bedrock locations within the campsite, planting tree seedlings and other vegetative cover, adding soil, and other such activities (Marion and Sober 1987).

But campsite rehabilitation is not restoration, and re-vegetation is not rehabilitation or restoration. Rehabilitation is an artificial restructuring of the context within which use takes place; it can repair some types of resource damage -- but not all damage -- and perhaps prevent some damage or slow down the rate of damage. Within the artificial restructured context of campsite rehabilitation, this work can attempt to re-establish components of natural vegetation such as trees or ground cover, but the outcome is far from certain. Rehabilitation of some sites will need to be repeated again and again.

The Forest Service has also begun a Limits of Acceptable Change (LAC) process for Boundary Waters campsites. All existing 2200 campsites have been inventoried against a series of nine objective measures, so that currently existing conditions are quantified. In theory, future re-inventories of these campsites which show that limits have been exceeded and have resulted in unacceptable changes can result in management actions to address the problems.

The Forest Service developed preliminary standards for acceptable levels of these campsite indicators in 1991. But, according to Forest Service data released in the spring of 1992, 80% of the existing campsites exceed these preliminary standards and more work, including field visits to actual campsites, is needed to develop final standards (U.S. Forest Service, 1992). Even though more work is needed, however, this 80% exceedence shows that many campsites have already been seriously damaged.

This problem demonstrates one of the difficulties in the LAC process, in that the base-line data gathered from the campsite inventories in many instances have come from campsites that are already severely impacted.

We believe that campsites must be managed from a long-range perspective. What will these campsites look like in 100 years or more? Will they be part of the natural wilderness ecosystem around them? Can trees and natural vegetation survive or re-establish themselves at campsites given current tree loss, soil erosion and soil compaction? Or will campsites eventually degrade into mostly open treeless, eroded bedrock or grassy areas?

E. Party Size - A maximum group size for the BWCA was first imposed in 1968 when the limit was set at 15. In 1975, the maximum group size was lowered to 10 (Anderson and Lime, 1984).

F. Can and Bottle Ban - The Forest Service has required a metal can and glass bottle ban for the BWCA Wilderness since 1971. Nonburnable containers --

particularly cans and bottles -- are not allowed under this policy. Before the adoption of this policy, it was common for many campsites to have piles of rusting cans and broken bottles back at the edge of the woods. The can and bottle ban has very successfully reduced the amount of this type of litter in the wilderness.

G. Primitive Management Areas (PMAs) - PMAs were established under the 1986 Superior National Forest Land and Resource Management Plan. These are the 5.1 Management Areas within the wilderness, which are classified under the Recreation Opportunity Spectrum (ROS) as primitive.

There are 10 PMAs within the BWCA Wilderness under the 1986 Forest Plan, nine of them in the large, central unit of the BWCAW, one located in the Little Sioux unit of the BWCAW, and none in the Caribou unit east of the Gunflint Trail. They include a total of approximately 87,000 acres. Management activities are generally limited to activities associated with prescribed fire and restoration.

PMAs generally include the really remote areas, usually of very small lakes. Here one can camp anywhere - there are no designated campsites - but parties must register with the Forest Service and have the notation on permits to do so. Parties must practice no-trace camping in PMAs, but more visitor education work must be done with PMA campers and the Forest Service has generally not had the resources to check conditions in PMAs after groups have camped there.

H. One-Night Camping Zones - At one time, the Forest Service utilized one-night camping zones for crowded areas to help alleviate congestion, requiring groups to disperse away from crowded areas after their first night in them. These one-night camping zones included at one time such areas as the Moose Lake Chain and Ogishkemuncie Lake. This management tool was difficult to enforce on the ground, and the Forest Service has largely eliminated it. Instead the agency has subdivided some entry point quotas into sub-categories such as "Seagull-Restricted", "Seagull Lake", and "Seagull Lake Only".

I. Tent Camps - Some outfitters offer tent camp services for their customers, particularly on Basswood Lake. Outfitters must abide by all the rules and regulations that the general visitor to the BWCAW must, including the maximum campsite stay of no more than 14 consecutive days. Outfitters generally send a staff member to set up the camp for the customer (sometimes ahead of the customer's arrival), often with several, larger tents (a cooking/eating tent, a sleeping tent, etc.), and then service the tent camp daily or every other day to provide gas, ice, food, etc.

The Forest Service has required outfitters who provide tent camp services to apply and pay for an outfitter/guide permit for the use of National Forest land.

Tent camps, however, tend to monopolize some of the finest campsites so that they are unavailable to the general public for much of the summer season. Tent camps also add to the motor traffic within the wilderness, and are examples of commercial activity within the wilderness which should not be allowed under Section 4(c) of the 1964 Wilderness Act.

J. Towboats - Towboats are motorboats, usually with overhead racks attached, which transport canoes and boats from one point to another. Despite the implication of their name, towboats rarely tow other watercraft behind them, but rather carry them piggyback on the overhead racks.

Prior to passage of the 1978 BWCA Wilderness Act, towboats of unlimited horsepower operated on the Moose Lake Chain and on Saganaga Lake, even though these lakes had a maximum limit of 25 horsepower. Towboat operators had claimed to the Forest Service, and later to the Congress, that towboats could not operate with only 25 horsepower motors.

Congress intended to phase-out towboat use entirely within the BWCA Wilderness through the 1978 law. Taking the towboat operators at their word that 25 hp motors could not be used for towing, the provision of the law regarding towboats called for terminating unlimited horsepower towboats as of January 1, 1984. The intent was, however, that all towboat use would end by that date. Senator Wendell Anderson, chief Senate sponsor of the Act, told the Senate that towboats would be "[p]ermitted for 5 years on Moose Lake, Newfound, Sucker, and Saganaga," with no mention of horsepower limits or continued use past those first five years. This interpretation was also the general understanding of the provision by the public as evidenced by newspaper accounts which stated the towboat phase-out as "Towboats, which pull canoes into the BWCA, would have been allowed on the Moose Lake Chain and Saganaga until 1984" (Proescholdt 1984).

But towboat operators discovered that towboats could operate with 25 horsepower motors, and they continue to do so on the Moose Lake Chain and on Saganaga. The towboat use, particularly on the Moose Lake Chain, makes these areas motorized sacrifice zones within the wilderness with literally dozens and dozens of towboat trips every day during the summer.

K. Visitor Education - Over the years, a number of visitor education efforts have occurred to reach BWCAW visitors and to impart information about wilderness ethics

and minimum impact camping techniques. Many of these efforts have utilized printed materials sent out by the Forest Service with permits or permit reservations, posters, displays, and personal contact with Forest Service rangers or with permit issuers.

From 1984-1985, the Forest Service developed a new user education program in conjunction with a variety of other organizations (including the Friends) aimed at off-site education. The program was successful, and nearly 500 people attended the User Education Programs in Minnesota and Wisconsin between 1985 and 1988. One independent evaluation of the program deemed it an effective educational method. Unfortunately the Forest Service discontinued the program due to budget restraints (Schomaker 1990).

In 1991-1992, another new user education effort occurred through the BWCA Wilderness Education Consortium, which included support from environmental organizations like the Friends and Sierra Club, the Forest Service, and local outfitters. The Consortium produced two wilderness ethics videotapes which are being used for the first time in the summer of 1992. This highly successful effort should help reach all BWCAW visitors and education them about wilderness ethics.

Much more remains to be done on visitor education, however, and even with dramatic improvements in the total wilderness education efforts many problems will remain. User education is not a quick-fix or panacea for some of the continuing overuse problems, nor can we educate visitors to be invisible in the wilderness.

L. Quetico Provincial Park - Quetico Provincial Park, immediately adjacent to the BWCA Wilderness along the international border, provides a useful example for the BWCA Wilderness on various issues related to visitor use.

Quetico Park is essentially the same total size as the BWCA Wilderness, with about 1,176,000 acres compared to the BWCA's 1,087,000 acres. Quetico is very similar to the BWCA in terrain, ecology, resources, etc., although its shape is more compact than the BWCA's. Like the Boundary Waters, Quetico is prized for its wilderness recreation, primarily canoeing. Like the BWCA, Quetico has required visitor permits (beginning in 1956), begun a Visitor Distribution Program (1977), and instituted a can and bottle ban (1977).

Quetico's Visitor Distribution Program was designed by the same people who designed the BWCA's. Like the BWCA's, Quetico's program was designed for a maximum of 67% campsite occupancy (Wilson, 1977). Unlike the BWCA, however, Quetico has operated its Visitor Distribution Program at a 70% level, very close to the original design level (Bourque, 1992).

Though essentially the same size, Quetico also has far fewer entry points than the BWCA Wilderness. Instead of the 87 BWCA entry points, Quetico has 21 entry points through 6 major entry stations (Bourque, 1992).

Quetico Park also has a maximum group size, instituted in 1977, of no more than 9 persons per party. Quetico has had as part of its policy the eventual goal of reducing its maximum group size to 6 persons per party, but has maintained its limit of 9 to date, one person less than the BWCAW.

Quetico also sees far fewer visitors than does the BWCA Wilderness, between one-fifth and one-sixth the amount of the BWCA Wilderness. The BWCA, for example, had 25,626 overnight camping groups in 1989, while Quetico recorded only 4,515 overnight camper groups according to the official statistics for both areas. Because of such relatively light visitor use, Quetico has no designated campsites and visitors may camp wherever they wish. (Heavily used campsites in Quetico, however, bear many of the same problems as BWCAW campsites, compounded by numerous fire rings and poorly-dug or nonexistent latrines.)

As a result of these policies and differences between the two areas on either side of the international border, Quetico Provincial Park provides a far greater wilderness resource than does the BWCAW. Quetico has fewer visitors, fewer entry points, slightly smaller average group size, operates its visitor distribution program at a significantly lower campsite occupancy rate, and has more remote areas to offer outstanding opportunities for solitude.

BWCAW Overnight Entry Point Quotas (with Overbook)

Entry Point	Quota
01-Trout Lake	15
02-Beyond Trout Lake	3
03-Pine Lake Trail	NA
04-Crab Lake	6
06-Slim Lake	2
07-From Big Lake	2
08-Moose River-South	2
09-Indian Sioux-South	1
10-Norway Trail	NA
11-Blandin Trail	NA
12-Little Vermilion Lake	17
13-Herriman Lake Trails	NA
14-Indian Sioux-North	8
15-Devils Cascade Trail	NA
16-Moose/Portage River	11
19-Stuart River	2
20-Angleworm Lake(paddle)	2
21-Angleworm Lake(hike)	2
22-Mudro Lake(restricted)	6
23-Mudro Lake	3
24-Fall Lake	26
25-Moose Lake	37
26-Wood Lake	3
27-Snowbank Lake	5
28-Snowbank Lake Only	3
29-From Ojibway Lake	2
30-Lake One	24
31-From Farm Lake	3
32-South Kawishiwi River	3
33-Little Gabbro Lake	3
34-Island River	5
35-Isabella Lake	5
36-Hog Creek	5
37-Kawishiwi Lake	10
38-Sawbill Lake	20
39-Baker Lake	3
40-Homer Lake	2
41-Brule Lake	16
43-Bower Trout Lake	1
44-Ram Lake	2
45-Morgan Lake	1
47-Lizz Lake	4
48-Meeds Lake	4
49-Skipper Lake	4
50-Cross Bay Lake-Ham	3
51-Missing Link Lake	10
52-Brant Lake	5
53-Seagull-Restricted	6
54-Seagull Lake	6
54A-Seagull Lake Only	7
55-Saganaga Lake	27
55A-Saganaga Lake Only	7
56-Kekekabic Trail East	2
57-Magnetic Lake	6
58-South Lake	3
59-Partridge Lake	1
60-Duncan Lake	5
61-Daniels Lake	1
62-Clearwater Lake	5
63-Four Mile Portage	9
64-East Bearskin Lake	10
65-Portage Lake	1
66-Crocodile River	1
67-Bog Lake	2
68-Pine Lake	2
69-John Lake	2
70-North Fowl-To Moose	2
71-From Canada	4
74-Snowbank/Kekekabic Tr.	4
75-Little Isabella River	2
76-Big Moose Lake Trail	NA
77-South Hegman Lake	1
78-So. Hegman Restricted	1
79-Eagle Mountain Trail	2
80-Larch Creek	1
81-Border Route Tr. West	1
82-Border Route Tr. Center	2
83-Border Route Tr. East	3
84-Snake River	1
86-Pow Wow Trail	NA

Source: USDA Forest Service, Superior National Forest

VI. Recommendations from the Friends of the Boundary Waters Wilderness

A. Visitor Distribution Program - The Visitor Distribution Program has been an innovative tool to better distribute visitors to the BWCA Wilderness, but crowding still occurs and must be addressed. Special attention should be given to solving the crowding and high encounter rate problems that occur on certain key routes and lakes. Visitors from crowded routes should not be simply diverted to lighter use areas. To do so would mean no areas will offer solitude.

A1. The Forest Service should continue and complete its work on revising the Visitor Distribution Program to reflect current travel patterns.

A2. The Visitor Distribution Program should be operated at the 67% campsite occupancy rate in all zones as it was originally designed.

B. Entry Point Quotas

B1. Entry point quotas should be reduced to reach, at a minimum, the levels needed to achieve the proposed standards outlined in the 1991 report on Procedures to Monitor Social Conditions. Additional ongoing research may show that even the levels proposed in the 1991 report are too high, and that further reductions are needed.

B2. Monitoring of social conditions must continue into the future in order to determine whether the standards are being met.

C. Overbooking - Overbooking of permits for entry points can result in overcrowding within the wilderness if the estimated no-show rate is not reached. The permit system should err on the side of wilderness values, rather than on maximizing the quotas.

C1. Overbooking should be eliminated.

D. Group Size - Some youth camp programs have argued that a group size of ten is needed for proper group dynamics, safety, or lower cost per youth. However, group dynamics or the economics of youth trips must not predominate over wilderness values. Currently 83% of the BWCAW overnight groups and two-thirds of the individual overnight campers already travel in groups of six or less.

D1. The maximum group size for parties in the BWCA Wilderness should be reduced from 10 to 6.

D2. Organized camps which provide Forest Service-approved minimum impact training and wilderness ethics for their guides and other trail staff may continue with a maximum group size of 10 until December 31, 1997.

E. Entry Points - The BWCA Wilderness has too many entry points currently, intruding into formerly remote areas or routes and shrinking the area of remote wilderness interior.

E1. No new entry points to the BWCA Wilderness should be built, authorized, or designated by the Forest Service.

E2. The Forest Service should re-evaluate all existing entry points and close some of them to restore solitude and remoteness to certain areas of the BWCA Wilderness. The Snake River entry point, for example, should be closed.

F. Campsite and Portage Trail Management - The BWCA's designated campsites suffer the greatest physical impact from human visitation of any of the area's resources. Impacts to the campsites must be reduced. Campsite rehabilitation by itself should not be viewed as the sole answer to campsite degradation.

F1. The number of visitors and the maximum party size must both be reduced to lessen the campsite degradation which now occurs.

F2. New campsites should be built only under rare circumstances. New campsites should not be built just to avoid exceeding the current campsite occupancy rate.

F3. Some existing campsites should be closed, particularly on lakes with high campsite density like Agnes, Cherokee, Ensign, Polly, and others.

F4. The initial campsite standards developed for the Limits of Acceptable Change (LAC) should be accepted for use under the LAC process.

F5. Building new portages and creating new alternative routes should not be done. This kind of action would generally make the relatively tiny truly remote areas or lakes much more accessible and heavily used, leading to a loss of solitude and remoteness.

F6. Signs and canoe rests at or along portage trails should be kept to a minimum or eliminated. In the past, they have been used primarily for the convenience of the visitor and not to protect the wilderness resource.

Brushing of portage trails should be kept to a minimum, and the wide brushing on either side of the trail which was done in the past on some trails should be eliminated.

G. Outfitter/Guide Permit - The Forest Service currently requires an outfitter/guide permit for guides who stay overnight with parties on National Forest land as well as other commercial operations on National Forest land like operators of tent camps on Basswood Lake. The agency requires such outfitter/guide permits nation-wide for the commercial use of National Forest land. Some outfitters and guides complain about being required to obtain such a permit, or the liability insurance requirement it requires, or that some organizations or businesses which should be required to obtain a permit have not done so.

G1. The Forest Service should continue to require outfitter/guide permits as in the past.

G2. Better enforcement is needed to identify and require those organizations or businesses which should have an outfitter/guide permit to acquire one.

H. Management Areas - The BWCA Wilderness is currently divided into three Management Areas: 5.1 (the Primitive Management Areas [PMAs], 5.2 (semi-primitive non-motorized areas), and 5.3 (semi-primitive motorized areas). These areas are delineated on the map accompanying the Superior National Forest Land and Resource Management Plan (LRMP).

H1. 5.3 Management Areas should be reduced to include precisely only those lakes which are open to motors under the 1978 BWCA Wilderness Act, rather than the wide swaths currently on the LRMP map. The 5.3 M.A. in the Caribou unit east of the Gunflint Trail, for example, contains a number of lakes and a good deal of land which would appear from the map to be open to motor use. All 5.3 areas should be reduced to precisely only those lakes open to motor use. Brule Lake should also now be re-designated from a 5.3 to a 5.2 M.A.

H2. The Forest Service should re-evaluate all its policies related to PMAs. The agency should strive to provide the experiences currently provided in PMAs to all portions of the BWCA Wilderness. Amounts of PMA use, impacts at PMA lakes, and sizes of PMAs should all be examined with an eye to whether PMAs should be expanded, eliminated, or kept the same.

H3. LAC inventory work should be conducted on PMAs so that baseline data are available for determining human impacts there, and the Forest Service should regularly monitor PMAs.

H4. The Forest Service and outfitters should not encourage the use of PMAs, and PMA visitors should have a rigorous no-trace camping indoctrination before being allowed to camp in PMAs.

I. Permit and Reservation System - The current system for reserving and issuing travel permits for the BWCA Wilderness needs some adjustments.

I1. Day use by paddling canoeists currently contributes to crowding at least in certain areas like the Hegman Lakes. Travel permits for paddle day use are not currently required. The Forest Service needs to better understand the levels and areas of high day paddle use and how it contributes to crowding conditions. Travel permits for day paddlers in the BWCA should again be required, without limits or quotas, at least at this time. Such a requirement will provide accurate data on day paddle use, be consistent with all other user types, and would provide needed opportunities for user education for this user type.

I2. "Split" parties -- where some of the members of a single group enter the wilderness at different times but camp together, or where some members leave the wilderness earlier than the rest -- need to be addressed. Split parties which enter the wilderness at different times should each have travel permits.

I3. Reservation Fee - Currently the $5 reservation fee funds the reservation system on essentially a break-even basis. Alternatives should be investigated further to increase the reservation fee if that money could be retained on the Superior National Forest (rather than go to the general treasury) to help fund user education and wilderness management.

J. Motor Permit System - Currently both the day-use motor permits and overnight motor permits are rationed on a weekly basis by entry point, rather than a daily entry point basis as is the overnight paddle permit system. In addition, both the day use and overnight motor systems allow for any unused quotas from a week to be added to the following week's quota, and for borrowing ahead from some of the quota for the upcoming week. This results in jamming more motor parties into the wilderness during heavy use periods than would otherwise be allowed with a daily entry point quota, or creating excessive motor use after certain circumstances, like when a week's worth of rain has left permits unused.

J1. Day-use and overnight motor permits should be issued on a daily entry point basis in the same manner as overnight paddle permits are available. The existing annual motor quotas should be divided into a daily quota.

J2. The new daily entry point motor quotas must not exceed the actual annual average motor use of the period 1976-78, in accordance with the 1978 law.

J3. Day-use motor quotas must continue to be enforced, including all of the motor use which occurs, whether by commercial towboats or the general public.

J4. For as long as towboat use is allowed to continue within the area, towboat operators must reserve towboat motor permits in the name of their client, and not in their own name. This change would bring uniformity to the policies guiding the reservation of all permits.

J5. Multiple motorboats traveling under the same motor permit should have some written confirmation that they are traveling under that permit (carbon copy of travel permit, a signed permit stub with permit number, or some such device). This will aid Forest Service enforcement and reduce cheating.

J6. The motor quota for the Trout Lake entry point should be divided into day-use and overnight motor use, as are all other motor entry points, and the issuing of permits for this entry point should be added to the Forest Service's computer system.

K. Motor Use - Motor use within the BWCA Wilderness, even if allowed under the 1978 law, diminishes the wilderness character of the BWCA. The conflict between motorboat use and paddle use continues to be largely one-way, with paddlers much more bothered by motorboat use than motorboaters are by paddle use. Motorboat use also adds proportionately more to the sense of crowding than does an equal amount of canoe use. Furthermore, commercial towboat services violate the sections of the 1964 Wilderness Act which prohibit all commercial enterprise within wilderness except those which aid in realizing the "recreational or other wilderness purposes" of the areas.

K1. The Forest Service has the authority to, and should administratively reduce, motor use in the BWCA Wilderness to enhance the wilderness resource and to decrease crowding and its attendant social impacts, by lowering motor quotas, closing some areas to motors, or both.

K2. The Forest Service should eliminate all towboats within the BWCA Wilderness, since they are incompatible with wilderness, violate the 1964 Wilderness Act, and conflict with the intent of Congress in the 1978 BWCA Wilderness Act.

K3. The Forest Service should close the three BWCA truck portages since they are incompatible with wilderness values, encourage excessive motor use within the wilderness, contribute to problems with tent camps and towboats, and violate the 1964 Wilderness Act.

L. Tent Camps - Tent camps, particularly on Basswood Lake, are commercial activities within the wilderness which violate the 1964 Wilderness Act. In addition, they tend to increase motorboat use in the wilderness, not only by the camping party itself but also by the outfitter who sets up camp and services the camp during the party's stay.

L1. Tent camps should be eliminated from the wilderness, and the Forest Service should no longer issue permits for them.

M. Burning Plastics - The burning of plastics is against state regulations for open burning. Plastic containers, especially those of rigid plastic, often don't burn completely, can release dioxins and other pollutants into the atmosphere, and make a mess at fire grates. Recently, plastic liquor and pop containers have added to litter problems in the wilderness since they are legal under current regulations. Plastic packaging intended for a one-time use often ends up partially burned in BWCA fire grates.

M1. The Forest Service should conform to state law and ban the burning of rigid plastics in the BWCA Wilderness.

M2. The Forest Service should evaluate the need for a ban on all pre-packaged beverage containers.

N. Winter Use - Winter use of the BWCA Wilderness has grown significantly in recent years. Precise information on the number and types of winter visitors does not exist since permits are not currently required, and no opportunities for user education exist for the general winter visitor. The increasing popularity of winter dog sled trips has raised questions of water quality and visitor impact. Some winter visitors have brought in straw at campsites which has been left behind.

N1. The Forest Service should once again require wilderness permits for winter use in order to better determine current winter use levels and patterns and to provide user education opportunities. Quotas for winter use, however, should not be developed at this time.

N2. The Forest Service should study the problem of dog feces in the lakes from winter teams, identify how significant a problem it is, and seek appropriate measures to address the problem.

N3. The maximum party size for winter groups should be the same as for summer groups.

N4. Packing in of straw for winter insulation should be prohibited to avoid the subsequent mess as well as the introduction of exotic seed sources in the wilderness.

N5. Mechanized equipment must not be allowed for construction and maintenance of winter trails, since mechanized equipment conflicts with wilderness values.

O. Visitor Education - While the new user education videotapes are very good, much more can and should be done. Education alone cannot solve the crowding and encounters problems, but can certainly help immensely. A mandatory leader certification program would reach all parties which enter the BWCA Wilderness.

O1. A comprehensive education program should focus on the following three audiences, in order of priority: wilderness visitors (emphasizing pre-trip contacts and education), wilderness partners (including Forest Service staff, cooperators, environmental organizations, outing programs, etc.), and the general public.

O2. The Forest Service should continue to seek more, new and innovative visitor education methods, working with a variety of outside groups.

O3. The Forest Service should institute a leader certification program and require each party leader to be certified before receiving BWCAW travel permits.

O4. The Forest Service should re-examine the User Education Program from 1985 and modify it as needed for the leader certification program.

O5. The education program should include a component on the functioning of the wilderness ecosystem, as required by the 1978 law.

O6. Many people who currently visit the Boundary Waters are either ill-prepared for a wilderness trip or don't need to visit a wilderness area to meet their group's goals and expectations. The education program should include a component which encourages potential BWCAW visitors to seek destinations other than the BWCAW.

O7. User education materials should encourage the use of camping stoves, and discourage the use of axes and fires.

O8. Special user education materials should be developed for anglers, including such aspects as catch and

release practices, proper disposal of fish remains (burial away from campsites), and promoting good fishing lakes outside the BWCAW.

P. Natural Fires - Under the prescribed natural fire policy for the BWCA Wilderness, which we support, some campsites will burn and an increase in the recently burned acreage of the BWCA will occur. Fire is a natural part of the wilderness ecosystem. Concerning only the aspects of visitor use and visitor management, we have the following recommendations about natural fires:

P1. The Forest Service should allow prescribed natural fires (PNFs) to burn independently of campsite locations.

P2. Burned campsites should not be automatically closed after a fire, but closed only if a site is too dangerous. Follow up evaluation should occur over time, with the intent to re-open the campsite.

P3. The "clean-up" of naturally-damaged sites, like the Red Tank Island campsite on Saganaga Lake (where many trees were cut down after its recent burn due to safety concerns or fears of unfavorable public comments) should not be a process repeated at other sites.

P4. Informational materials about the role of fire in the Quetico-Superior Ecosystem and the fire policies for the BWCAW should be developed and used to educate wilderness visitors, nearby residents, and the general public.

Q. Funding - Some of these recommendations, particularly those involved with visitor education, will require additional funds beyond those currently available.

Q1. The Forest Service should seek funds or funding sources to fully implement these recommendations, and seek support for the funds from various interest groups and the public at large.

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