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100.10 INTRODUCTION

This handbook is for use by Wilderness Rangers for training and work assignments.

The goals of the Field Guide are:

- (1) Provide a reference for use in field.
- (2) Promote accountability and safety for wilderness rangers.
- (3) Improve veteran rangers' performances and provide baseline data for new rangers.
- (4) Improve the quality of the wilderness, both socially and biologically.

100.20 AUTHORITIES

The following public laws provide the authority for wilderness management in the BWCAW.

Public Law 88-577 – The Wilderness Act (September 3, 1964).
Established National Wilderness Preservation System. Designated wilderness in Eastern and Southern Regions including the BWCAW. (See Section 200 for further information).

Public Law 95-495 – Boundary Waters Canoe Area Wilderness (October 21, 1978) – Enlarged BWCAW, altered management to be more restrictive to non-wilderness uses and created a Mining Protection Area. Entire text of this law follows.

PUBLIC LAW 95-495

FINDINGS

SECTION 1. The Congress finds that it is necessary and desirable to provide for the protection, enhancement, and preservation of the natural values of the lakes, waterways, and associated forested areas known (before the date of enactment of this Act) as the Boundary Waters Canoe Area, and for the orderly management of public use and enjoyment of that area as wilderness, and of

certain contiguous lands and waters, while at the same time protecting the special qualities of the area as a natural forest/lakeland wilderness ecosystem of major esthetic, cultural, scientific, recreational and educational value to the Nation.

PURPOSES

SECTION 2. It is the purpose of this Act to provide for such measures respecting the areas designated by this Act as the Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area as will:

- (1) provide for the protection and management of the fish and wildlife of the wilderness so as to enhance public enjoyment and appreciation of the unique biotic resources of the region.
- (2) protect and enhance the natural values and environmental quality of the lakes, streams, shorelines and associated forest areas of the wilderness.
- (3) maintain high water quality in such areas.
- (4) minimize to the maximum extent possible the environmental impacts associated with mineral development affecting such areas.
- (5) prevent further road and commercial development and restore natural conditions to existing temporary roads in the wilderness.
- (6) provide for the orderly and equitable transition from motorized recreational uses to non-motorized recreational uses on those lakes, streams and portages in the wilderness where such mechanized uses are to be phased out under the provisions of this Act.

BOUNDARY WATERS CANOE AREA WILDERNESS DESIGNATION AND MAP

SECTION 3. The areas generally depicted as wilderness on the map entitled "*Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area*", dated September 1978, comprising approximately one million and seventy-five thousand five hundred acres, are hereby designated as the Boundary Waters Canoe Area Wilderness (hereinafter referred to as the "Wilderness"). Such designation shall supersede the designation of the Boundary Waters Canoe Area under section 3(a) of the Wilderness Act (78 Stat.890) and such map shall supersede the map on file pursuant to such section. The map of the wilderness shall be on file and

(2)

available for public inspection in the offices of the Supervisor of the Superior National Forest and of the Chief, United States Forest Service. The Secretary of Agriculture, hereinafter referred to as "The Secretary" shall, as soon as practicable, but in no event later than one year after the date of the enactment of this Act, publish a detailed legal description and map showing the boundaries of the wilderness available for public inspection in the offices of the Supervisor of the Superior National Forest and of the Chief, United States Forest Service. The Secretary of in the Federal Register. Such map and description shall be filed with the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the United States Senate. Such map and description shall have the same force and effect as if included in this Act. Correction of clerical and typographical errors in such legal description and map may be made.

ADMINISTRATION

SECTION 4. (a) The Secretary shall administer the Wilderness under the provisions of this act, the Act of January 3, 1975 (88 Stat.2096; 16 U.S.C. 1132 note), the Wilderness Act of 1964 (78 Stat. 890, 16 U.S.C. 1131-1136), and in accordance with other laws, rules and regulations generally applicable to areas designated as wilderness.

(b) Paragraph (5) of Section 4(d) of the Wilderness Act of 1964 is hereby repealed and paragraphs (6), (7), and (8) of such Section 4(d) are hereby re-designated as paragraphs (5), (6), and (7).

(c) Effective January 1, 1979, the use of motorboats is prohibited within the Wilderness designed by this Act, and that portion within the Wilderness of all lakes which are partly within the Wilderness, except for the following:

- (1) On the following lakes, motorboats with motors of no greater than twenty-five (25) horsepower shall be permitted: Fall, Lake County; Newton, Lake County; Moose, Lake County; Newfound, Lake County; Sucker, Lake County; Snowbank, Lake County; East Bearskin, Cook County; South Farm, Lake County; Trout, Saint Louis County; Basswood (except that portion generally north of the narrows at the north end of Jackfish Bay and north of a point on the international boundary between Ottawa Island and Washington Island); Saganaga, Cook County (except for that portion west of American Point). Provided: That, on the following lakes, until January 1, 1984, the horsepower limitations described in this paragraph shall not apply to towboats registered with the Secretary: Moose, Lake County; Newfound, Lake County; Sucker, Lake County; Saganaga, Cook County, as limited in this paragraph.

(3)

(2) On the following lakes and river, motorboats with motors no greater than ten (10) horsepower shall be permitted: Clearwater, Cook County; North Fowl, Cook County; South Fowl, Cook County; Island River (east of Lake Isabella), Lake county; Sea Gull (that portion generally east of Threemile Island), Cook County; Alder, Cook County; Canoe, Cook County.

(3) On the following lakes, or specified portions of lakes, motorboats with motors of no greater than ten (10) horsepower shall be permitted until the dates specified: Basswood River (to and including Crooked Lake), Saint Louis and Lake Counties, until January 1, 1984; Carp Lake, the Knife River, and Knife Lake, Lake County (until January 1, 1984); Sea Gull, Cook County (that portion generally west of Threemile Island) until January 1, 1999; Brule, Cook County, until January 1, 1994, or until the termination of operation of any resort adjacent to Brule Lake in operation as of 1977, whichever occurs first.

(4) On the following lakes, or specified portions of lakes, motorboats with motors of no greater than twenty-five (25) horsepower shall be permitted until January 1, 1984; Birch, Lake County; Basswood, Lake County (that portion generally north of the narrows at the north end of Jackfish Bay and north of a point on the international boundary between Ottawa Island and Washington Island.

(d) The detailed legal description and map to be published pursuant to Section 3 of this Act shall contain a description of the various areas where the motorized uses permitted by this section are located. No provision of this section shall be construed to limit mechanical portages or the horsepower of motors used on motorboats in the following areas within the Wilderness:

Little Vermilion Lake, Saint Louis County; Loon River, Saint Louis County; Loon Lake, Saint Louis County; that portion of the Lac La Croix, Saint Louis County, south of Snow Bay and east of Wilkins Bay.

(e) For the purposes of this Act, a snowmobile is defined as any motorized vehicle that is designed to operate on snow or ice. The use of snowmobiles in the Wilderness designated by this Act is not permitted except that the Secretary may permit snowmobiles, not exceeding forty inches in width on (1) the overland portages from Crane Lake to Little Vermilion Lake in Canada, and from Sea Gull River along the eastern portion of Saganaga Lake to Canada, and (2) on the following routes until January 1, 1984:

(4)

Vermilion Lake portage to and including Trout Lake; Moose Lake to and including Saganaga Lake via Ensign, Vera, and Knife Lakes, East

Bearskin Lake to and including Pine Lake via Alder Lake and Canoe Lake.

In addition to the routes listed above, the Secretary may issue special use permits for the grooming by snowmobiles of specified cross-country ski trails for day use near existing resorts.

(f) The Secretary is directed to develop and implement as soon as practical, entry point quotas for use of motorboats within the Wilderness portions of the lakes listed in subsection ©, the quota levels to be based on such criteria as the size and configuration of each lake, and the amount of use on that lake: Provided, That the quota established for any one year shall not exceed the average actual annual motorboat use of the calendar years 1976, 1977, and 1978 for each lake, and shall take into account the fluctuation in use during different times of the year: Provided further, That on each lake homeowners and their guests and resort owners and their guests on that particular lake shall have access to that particular lake and their entry shall not be counted in determining such use.

(g) Nothing in this Act shall be deemed to require the termination of the existing operation of motor vehicles to assist in the transport of boats across the portages from Sucker Lake to Basswood Lake, from Fall Lake to Basswood Lake, and from Lake Vermilion to Trout Lake, during the period ending January 1, 1984. Following said date, unless the Secretary determines that there is no feasible non-motorized means of transporting boats across the portages to reach the lakes previously served by the portages listed above, he shall terminate all such motorized use of each portage listed above.

(h) The motorized uses authorized by this section shall be confined to those types of snowmobiles, motorboats and vehicles that have been in regular use in the Boundary Waters Canoe Area Wilderness prior to the date of enactment of this Act. The Secretary may set forth additional standards and criteria to further define the type of motorized craft that may be permitted.

(i) Except for motorboats, snowmobiles, and mechanized portaging, as authorized and defined herein, no other motorized use of the Wilderness shall be permitted. Nothing in this Act shall prohibit the use of aircraft, motorboats, snowmobiles, or other mechanized uses in emergencies, or for the administration of the Wilderness area by Federal, State, and local governmental officials or their deputies, only where the Secretary finds that such use is essential.

(5)

RESORTS

SECTION 5 (a) The owner of a resort in commercial operation during 1975, 1976 or 1977, and located on land riparian to any of the lakes listed below,

may require purchase of that resort, including land and buildings appurtenant thereto, by written notice to the Secretary prior to September 30, 1985. The value of such resort for purposes of such sale shall be based upon its fair market value as of July 1, 1978, or as of the date of said written notice, whichever is greater, without regard to restrictions imposed by this Act:

Fall, Lake County; Moose, Lake County; Snowbank, Lake County; Lake One, Lake County; Sawbill, Cook County; Brule, Cook County; East Bearskin, Cook County; Clearwater, Cook County; Saganaga, Cook County; Sea Gull, Cook County; McFarland, Cook County; North Fowl, Cook County; South Fowl, Cook County; Jasper Lake, Lake County; Ojibway, Lake County.

(b) An owner requiring purchase of a resort under this provision may elect to retain one or more appropriate buildings and lands not exceeding three acres, for personal use as a residence: Provided, That the purchase price to the Government for a resort shall be reduced by the fair market value of such buildings and lands, with the same valuation procedures outlined above.

© With respect to any privately owned lands and interests in lands riparian to the lakes listed above, and if the Federal Government has been required to purchase a resort on said lake, said lands shall not be sold without first being offered for sale to the Secretary who shall be given a period of one hundred (100) days after the date of each such offer within which to purchase such lands. No such lands shall be sold at a price below the price at which they have been offered for sale to the Secretary, and if such lands are re-offered for sale, they shall first be re-offered to the Secretary: Provided, That this right of first refusal shall not apply to a change in ownership of a property within an immediate family.

(d) There are authorized to be appropriated such sums as may be necessary for the acquisition of lands and interests therein as provided by this section.

TIMBER SALE CONTRACTS

SECTION 6. (a) The Secretary is directed to terminate within a period of one year after the date of passage of this Act, all timber sale contracts in the Boundary Waters Canoe Area Wilderness. There shall be no further logging of the virgin forest areas formerly enjoined from logging by the United States District Court on said contract areas during the termination period.

(6)

The purpose of said termination period is only to permit completion of the harvesting of timber within existing areas under contract that are not within the areas described above and permit the taking of ameliorative measures, including land and cover restoration that will, at the earliest feasible date, make the imprint

of man's work substantially unnoticeable on the lands included as Wilderness in this Act.

(b) (1) In the event that termination of timber sale contracts in subsection (a) reduces the total national forest volume which a purchaser has under contract on the Superior National Forest to less than two years cut based on the average volume of the Superior National Forest timber harvested by the purchaser in the last three years, the Secretary may, with the consent of the purchaser, substitute, to the extent practicable, timber on other national forest lands approximately equal in species and volume to the timber sale contract affected. In offering substitute timber, the Secretary shall negotiate the substitution at a price that is mutually equitable considering such factors as species, volume, logging accessibility, and other terms of the agreement.

(2) The United States will pay just compensation for any timber contracts terminated or modified by this Act, consistent with amendment V to the Constitution of the United States. Losses due to costs incurred in directly fulfilling the terms of such contracts shall be paid by the United States. Any action for the recovery from the United States of costs as provided above shall be brought in a court of competent jurisdiction. Any such judgments shall be paid from the claims and judgments fund (31 U.S.C. 724a).

© Within the limits of applicable laws and prudent forest management:

(1) The Secretary shall, in furtherance of the purposes of Subsection (a) of this section and of Section 4 of the National Forest Management Act of 1976 (90 Stat. 2949), expedite the intensification of resource management including emphasis on softwood timber production and hardwood utilization on the national forest lands in Minnesota outside the Wilderness to offset, to the extent feasible, the reduction in the programmed allowable timber harvest resulting from reclassification of the Boundary Waters Area, and the Secretary shall make a review of progress to date in 1983, and a forecast of planned achievements by 1985 and shall submit, as a part of the 1985 program under the schedule called for in the Resources Planning Act of 1974, a Plan and recommendations for 1985-1990. In administering the Superior National Forest, the Secretary is authorized and directed to engage in artificial and natural regeneration, release, site preparation, and other forms of timber production enhancement.

(7)

(2) The Secretary, in carrying out the requirements in Section © (1), is authorized and directed to cooperate with the State of Minnesota and its political subdivisions to develop and implement a system of grants, for the development of renewable resources on State, county and private lands. He may also seek the cooperation of other Federal

departments and agencies to assure a coordinated approach to renewable resources development.

(d) There is authorized to be appropriated, in addition to such sums as may otherwise be appropriated for the Superior National Forest from existing authorities established by law, the following additional sums for the fiscal years 1980 through 1990 inclusive:

(1) to carry out the purposes of Subsection 6©(1) an additional \$8,000,000 annually; and

(2) to carry out the purposes of Subsection 6©(2) an additional \$3,000,000 annually: Provided, however, That the Federal share of any grant made pursuant to Subsection 6©(2) shall not exceed 80 percent (80%) of the total cost of said grant.

(e) Funds appropriated pursuant to this section shall remain available until expended. Authorizations in excess of funds appropriated in a given fiscal year shall remain available for appropriation in subsequent fiscal years.

(f) In addition to those personnel who would otherwise be available, the Secretary is authorized to appoint and fix the compensation (not to exceed that of grade 15 on the General Schedule for Federal employees) of additional full-time personnel for the Superior National Forest to carry out the purposes of this Act.

LAWS APPLICABLE TO CERTAIN LANDS AND WATERS IN THE SUPERIOR NATIONAL FOREST

SECTION 7 (a) The provisions of the Acts listed in paragraph (b) of this section shall continue to apply to lands and waters specified in such Acts notwithstanding the inclusion of any such lands and waters in the Wilderness or mining protection area designation under this Act. For lands and waters to which such Acts listed in paragraph (b) apply which are also within the Wilderness or mining protection area designated under this Act, any withdrawal, prohibition, or restriction contained in such Acts listed in paragraph (b) shall be in addition to any withdrawal, prohibition, or restriction otherwise applicable to such wilderness or mining protection area under any other law.

(b) The Acts referred to in paragraph (a) are as follows:

(1) The Act of July 10, 1930 (46 Stat.1020; 16 U.S.C. 577a, 577b), herein referred to as the "Shipstead-Nolan Act".

(8)

(2) The Act of June 22, 1948 (62 Stat.568, as amended 16 U.S.C. 577c-577b), herein referred to as the "Thye-Blatnik Act".

© The provisions of the Shipstead-Nolan Act are hereby extended and made applicable to all lands and waters not otherwise subject to such Act which are within the Wilderness designated under this Act.

(d) (1) The authorities contained in the Thye-Blatnik Act are hereby extended and made applicable to all lands and waters not otherwise subject to such Act which are within the Wilderness designated under this Act.

(2) In applying the second proviso of section 5 of such Thye-Blatnik Act to the areas to which such Act is extended and made applicable under this subsection, the phrase "fiscal year 1980" shall be substituted for the phrase "the first full fiscal year after the approval of this Act" in such proviso.

(3) There are authorized to be appropriated such sums as may be necessary to carry out the provisions of the Thye-Blatnik Act with respect to the lands and waters within the Wilderness designated under this act. Such sums may be used for the payment of court judgments in condemnation actions brought under the term of the Thye-Blatnik Act without regard to the date such condemnation actions were initially instituted. Funds appropriated from the Lane and Water Conservation Fund may be used for the acquisition of any lands and waters, or interests therein within such Wilderness.

EXISTING AIRSPACE RESERVATION

SECTION 8. The provisions of Executive Order 10092 as made applicable to the Boundary Waters Canoe Area established by the Wilderness Act of 1964 shall be deemed incorporated into this Act.

MINING PROTECTION AREA ESTABLISHMENT

SECTION 9. In order to protect existing natural values and high standards of environmental quality from the adverse impacts associated with mineral development, there is hereby established the Boundary Waters Canoe Area Mining Protection Area (hereinafter in this Act referred to as the "Mining Protection Area"), comprising approximately two hundred and twenty-two thousand acres.

(9)

MAPS AND BOUNDARIES

SECTION 10. The Mining Protection Area shall comprise the area generally depicted as a mining protection area on the map entitled "Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining

Protection Area” dated September 1978, which shall be on file and available for public inspection in the offices of the Supervisor of the Superior National Forest and of the Chief, United States Forest Service. As soon as practicable after this Act takes effect, the Secretary shall file a map and a legal description of the mining protection area with the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the United States Senate. Such map and description shall have the same force and effect as if included in this Act. Correction of clerical and typographical errors in such description may be made.

MINING AND MINERAL LEASING IN THE WILDERNESS AND MINING PROTECTION AREA

SECTION 11. (a) In addition to any other applicable prohibition or withdrawal from entry or appropriation under any provision of the Wilderness Act or under any other provision of law, no permit, lease, or other authorization may be issued by any agency or authority of the United States for:

(1) exploration for, or mining of, minerals owned by the United States within the Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area; or

(2) exploration for, or mining of minerals within such areas if such activities may affect navigable waters; or

(3) the use of property owned by the United States in relation to any mining of or exploration for minerals in such areas which may materially impair the wilderness qualities of the Wilderness area or which may materially impair the natural values and environmental quality of the Mining Protection Area.

The prohibitions contained in this subsection and any withdrawal from entry or appropriation for mining of or exploration for minerals applicable to the Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area shall not apply to the extent specifically provided in legislation enacted by the United States after the date of enactment of this Act pursuant to a national emergency declared by the President.

(10)

(b) (1) Consistent with the prohibitions and other requirements in subsection (a) of this section, no permit, lease, or other authorization shall be issued unless and until:

(A) the Secretary shall have approved a plan that details how mining will be conducted consistent with this Act and with other Federal, State, and local requirements, and that

details how the area will be restored to its original condition or to a substantially equivalent condition, including the estimated cost thereof;

(B) the applicant has posted a bond for performance payable to the United States in an amount determined by the Secretary to be sufficient to assure completion of the reclamation plan if the work had to be performed by the United States;

© the applicant shall have obtained all permits, licenses, certifications, and approvals required by Federal, State, or local law; and (iv) the Secretary has determined that no permanent facility will be constructed nor alteration will occur that could render the area incapable of reverting to its original condition or to a substantially equivalent condition.

(2) The provisions of paragraphs (2) and (3) of Section 4(d) of the Wilderness Act (78 Stat.890; 16 U.S.C. 1133 (d)(2) and 16 U.S.C. 1133 (d)(3) shall not apply to the area designated herein as the Boundary Waters Canoe Area Wilderness.

© The Secretary is authorized to acquire any minerals or mineral rights within the Wilderness and Mining Protection Area alleged to be owned by persons other than the Federal or State governments in the following manner:

(1) The Secretary first may seek to acquire these minerals or mineral rights by donation. In seeking a donation, the Secretary shall inform the person alleging the ownership interest of the procedures and limitations to be followed in acquisition by purchase set forth in paragraph (2) below.

(2) If the person alleging the ownership interest does not donate his minerals or mineral rights to either the Federal or State governments, the Secretary is authorized to acquire the rights by purchase within the limits of funds appropriated for property acquisition in the Superior National Forest, and in an amount appropriately discounted for the following factors if existent in relation to the particular mineral interest:

(11)

(A) The original patenting from the Federal public domain was fraudulent. The patenting of lands in the Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area is prima facie fraudulent if (1) the Act under which the patent was issued was one of the Acts intended to put settlers on the land, such as but without limitation, the Cash Purchase Act of 1820

(chapter LI, Act of April 24, 1820, 3 U.S. Stat.566, 567, as amended); the Preemption Act of 1830 (chapter CCVIII, Act of May 29, 1830, 4 U.S. Stat.420, 421, as amended); the Homestead Act of 1862 (chapter LXXV, Act of May 20, 1862, 12 U.S. Stat. 392-394, as amended); and the Timber and Stone Act (chapter 150, Act of June 3, 1878, 20 U.S. Stat.88,89, as amended, particularly by chapter 375, Act of August 4, 1892, 27 U.S. Stat. 348); and (2) the land was patented after 1875 and before the establishment of the Superior National Forest by proclamation on February 13, 1909. The Secretary also shall consider any other evidence of fraud when determining the value of the minerals such as (1) the transfer by the entryman or patentee of whole or partial interests in the property during the patenting process or soon thereafter, (2) the appearance in the chain of title of persons known to have participated in land speculation as land brokers, entryman, or in other capacities.

(B) The date of separation of the mineral or mineral rights from the surface interest, if the separation occurred after 1927, the year when the courts have determined that the roadless policy was established by the Secretary for the area.

© Any other factor such as restrictions on mining within the area imposed by State of local government, or by operation of treaty.

(d) In the event any legal action or proceeding is instituted by or against the United States in relation to minerals or mineral rights where the patenting is prima facie fraudulent as described in subsection © of this section, the Attorney General of the United States shall assert the public's equitable right to constructive of public trusts, or to recover or offset damages including but not limited to those based on the value of land fraudulently acquired plus interest at 6 per centum per annum.

(12)

(e) Notwithstanding any requirement of this section, the Secretary shall have authority to acquire within the Wilderness or Mining Protection Area designated by this Act, existing mineral interests by donation, purchase, exchange, or through exercise of the power of eminent domain.

(f) There is authorized to be appropriated to the Secretary such sums as may be required to carry out the purposes of this section, to be available until expended.

SEVERABILITY

SECTION 12. If any provision of this Act is declared to be invalid, such declaration shall not affect the validity of any other provision hereof.

EXISTING STRUCTURES

SECTION 13. Nothing in this Act or the Wilderness Act shall be construed to prohibit the maintenance of the Prairie Portage Dam (on the International Boundary chain between Birch and Basswood Lakes), and the Secretary is authorized to perform such maintenance work as may be required to keep that dam functional at its present height and width. The Secretary is authorized to maintain other existing water control structures only where such structures are necessary to protect Wilderness values or public safety.

JURISDICTION OVER FISH AND WILDLIFE

SECTION 14. Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the State with respect to fish and wildlife in the Wilderness and Mining Protection Area.

JURISDICTION OVER WATERS

SECTION 15. The Secretary is authorized to promulgate and enforce regulations that limit or prohibit the use of motorized equipment on or relating to waters located within the wilderness in accordance with the provisions of this Act: Provided, That nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the State with respect to such waters except to the extent that the exercise of such jurisdiction is less stringent than the Secretary's regulations promulgated pursuant to this section: Provided further, That any

(13)

regulations adopted pursuant to this Act shall be complementary to, and not in derogation of regulations issued by the United States Coast Guard.

The Secretary is authorized to enter into cooperative agreements with the State of Minnesota with respect to enforcement of Federal and State regulations affecting the Wilderness and the Mining Protection Area.

COOPERATION WITH STATE

SECTION 16. (a) The Secretary shall cooperate with the State of Minnesota and any political subdivision thereof in the administration of the Mining Protection Area and in the administration and protection of lands within or adjacent to the Mining Protection Area owned or controlled by the State or any political subdivision thereof. Nothing in this title shall deprive the State of Minnesota or any political subdivision thereof of its right to exercise civil and criminal jurisdiction within the Wilderness and the Mining Protection Area and impose land use controls and environmental health standards on non-Federal areas within the Wilderness and the Mining Protection Area, or of its right to tax persons, corporations, franchises, or other non-Federal property, including mineral or other interests, in or on lands or waters within the Wilderness and the Mining Protection Area.

(b) The Secretary is authorized to enter into cooperative agreements with the State of Minnesota with respect to enforcement of Federal and State regulations affecting the Wilderness and the Mining Protection and shall consult with the State of Minnesota in an effort to enhance the multiple-use benefits to be derived from both State and national forest lands.

TREATIES

SECTION 17. Nothing in this Act shall affect the provisions of any treaty now applicable to lands and waters which are included in the Mining Protection area and the Wilderness.

EXPANSION OF RECREATION PROGRAMS

SECTION 18. (a) The Secretary is authorized and directed to expedite and intensify the program of dispersed outdoor recreation development on the Superior National Forest outside the Boundary Waters Canoe Area Wilderness as designated by this Act. The Secretary shall consider in such new program development the need for the following: additional snowmobile trails, particularly those now planned or under construction; remote campsites on lightly developed lakes; and lake access sites and parking facilities to provide

(14)

motorized recreation experiences similar to those previously available in the Boundary Waters Canoe Area Wilderness.

(b) The Secretary, consistent with the Wilderness Act of 1964 and with this Act, is authorized to construct a system of new hiking, backpacking and cross-country ski trails within the Boundary Waters Canoe Area Wilderness as designated by this Act, and on appropriate adjacent Federal lands outside the Wilderness. In constructing such a trail system, consideration should be given to locating portions of the system near existing resorts on the perimeter of the

Wilderness to provide additional outdoor recreation opportunities for resort guests.

© The Secretary is authorized and directed to develop an educational program for the recreational users of the Wilderness which will assist them to understand the purpose, value, and appropriate use of wilderness lands and the functioning of natural ecosystems in the Wilderness.

(d) The Secretary, in cooperation with the State of Minnesota and other appropriate groups, consistent with the purposes of this Act, is authorized and directed to develop a program providing opportunities for a wide range of outdoor experiences for disabled persons.

(e) There are authorized to be appropriated such sums as may be necessary for the Secretary to carry out the purposes of this section.

SECTION 19. (a) The Secretary, in cooperation with other appropriate executive agencies, is authorized and directed to develop a cooperative program of technical and financial assistance to resorts in commercial operation in 1975, 1976, and 1977, and outfitters in commercial operation in 1977 which are located within the Mining Protection Area or which are located on land adjacent to any of the lakes listed in Section 5 of this Act. There are authorized to be appropriated such sums as may be necessary for the purposes of this subsection.

(b) There are authorized to be appropriated to the Secretary funds to be made available as grants to the Agricultural Extension Service, University of Minnesota, to provide over a three-year period educational and technical assistance to businesses and communities adjacent to the Boundary Waters Canoe Area Wilderness in order to improve economic opportunities for tourism and recreation-related businesses in a manner which is complementary to the management of the Wilderness.

(15)

MANAGEMENT STUDY

SECTION 20. The Secretary, acting through the Chief, United States Forest Service, shall, not later than October 1, 1981, submit to the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the Senate, a comprehensive management plan setting forth the specific management procedures to implement the objectives of this Act. An interim report setting forth public involvement procedures, management alternatives, and a timetable for the remaining study actions, shall be submitted within one year from the date of enactment of this Act.

LIMITATION OF AUTHORIZATION

SECTION 21. All authorizations for any funds to be appropriated under the terms of this Act shall not be effective until October 1, 1979. Notwithstanding any other provision of this Act, authority to enter into agreements or to make payments under this Act shall be effective only to the extent or in such amounts as are provided in advance in appropriation Acts.

A wilderness is supposed to be an area in which man's influence is absent, but management implies control of nature. Wilderness is the management of human use and influence to preserve naturalness and solitude. It includes everything done by those responsible for administering a wilderness.

Wilderness management should not be heavy-handed, should not mold nature to suit people. Rather, human use and influence should be managed so that the natural processes are not altered. Wilderness managers should do only what is necessary to meet wilderness objectives, using only the minimum tools, force, and regulations required to achieve these objectives.

Managing a wilderness is a challenge. Through laws and education we can continue to manage the area for those that follow. It is a challenge to keep the area untrammled. Like footsteps on the shoreline, used but not abused.

The wilderness movement has had leaders that have worked toward enabling wilderness legislation: Thoreau, Muir, Marshall, Leopold, Olson, and so on. All of these and countless others persevered so that the vast wilderness would not slip away into the mist of time.

There were many events that helped shape the area we now know as the BWCAW. The formation of the Superior National Forest in 1909 was a start. The Road Policy of 1926, the Shipstead-Newton-Nolan Law in 1930, the Roadless Area Policy of 1939, the Airspace Reservation in 1949, the name change in 1958, the Wilderness Act of 1964, the Secretary's Regulations of 1965, and finally the recent Boundary Waters Canoe Area Wilderness Act of 1978.

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200 – WILDERNESS MANAGEMENT AND YOU

Wilderness was described centuries ago as "a dark and dismal place, inhabited by wild beasts that roam about uncooked". Obviously, this concept has changed. It has been said that *wilderness is both a condition of physical geography and a state of mind that varies from one individual to the next.*

The Wilderness, no matter where it is – the desert, rocky crags, beaches, mountains, or the north woods – is very unique in its own way. It is wild and exhilarating and yet so very fragile.

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One of the most important pieces of legislation was the *Wilderness Act of 1964.*

An important quote from the Wilderness Act gives us our Management direction: "In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as 'Wilderness Areas', and these 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, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.”

It goes on further along to state: “A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.”

Untrammelled by man! After the arrival of the first settlers; mining, logging, resorts, and other things followed. The area was used for many pursuits. Most people took care of the area, *some did not*. Even the well-meaning users created problems just by sheer numbers. Some practices that were formerly okay are now unacceptable.

Today, Federal officials responsible for wilderness areas wrestle with all kinds of management problems: over-usage, placement of trails and signs, access roads, wilderness patrols, and fires, to name a few.

While most wilderness visitors probably never think about it, much planning and modern technology go into keeping wilderness “wild”. As you can see, the very concept of wilderness management is a paradox. Seemingly you can let it take care of itself, but in reality you have to intensely manage it (in very subtle ways) in order to keep it wilderness. Your job as a Wilderness Ranger is to carry out management in the field. This handbook builds upon the Wilderness Management Plan to give you basic information needed to do your job.

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Your duties will demand a great deal of initiative. You must start and finish the tasks yourself. Your position is one of the most unsupervised in the Forest Service. A great deal of trust is involved between you and your supervisor. You must want to do the work in order to derive job satisfaction. As a wilderness ranger, you have direct responsibility for activities in the area in which you have been assigned.

Keep in mind that many of the BWCAW visitors have come here to see the peace, tranquility and wildness of the area. Our activities should minimize interference with this atmosphere. In all our work and all our actions, let’s try to maintain this area in as near a natural condition as possible.

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300.10 PREPARING FOR YOUR TRIP

A wilderness ranger’s job is far from a routine workday. You may be making overnight trips for as many as ten days at a time. If you are unprepared or forget some essential items, it is not easy to return for them. You may lose the effectiveness of your entire trip if you are not prepared. A checklist for personal items and work items is located at the end of this section.

Use a checklist to make sure you have all of your gear. Keep your gear separate from the other crews in order to minimize the chance for taking equipment by mistake. At the end of each trip, make sure your tools, etc., are ready for the next trip. Know what your assignment is and if you aren’t sure, ask your supervisor.

FOOD TIPS

Eating a good, well-rounded meal is essential for good health. A variety of lightweight, freeze-dried and dehydrated foods are available to supplement your food pack. Individual tastes and choices vary from one person to another. Generally, it is nice to pack fresh items for the first part of your trip and work into more dried foods in the latter part.

Your "area of responsibility" will greatly affect the food you carry. A crew working on a hiking trail or in a remote canoe area would be more apt to go lighter than a crew on a motorized route with easy access. Food co-ops are good sources of inexpensive dried foods. These natural foods are a good addition to any menu.

Freezing food, wrapping it well and not opening the wrapping will allow you to take a wider variety of foods. Be really careful of food spoilage in hot weather. An essential part of food preparation is your own hygiene. In most instances meals are prepared for the entire crew by one or two people. If you or your cooking utensils are not thoroughly cleaned before preparing meals, you chance contamination of the food. The consequence, at best, would be loss of work time and potential medical evacuation.

PERSONAL GEAR

During the ice-free season, you may experience temperatures from below freezing to 100 degrees, and periods of extended rain. Your needs will vary depending on the weather. Here are some ideas that may help you in packing.

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NECESSARY ITEMS

8" Leather boots or Bean boots. (8" leather boots are necessary for fire-fighting, hiking.
"Good" rain gear (jacket w/hood and pants).
Wool shirt(s), sweater or fleece.
Uniform – pants, shirts, cap (crew leaders).
2 or 3 changes of clothes (per member).
Change of clothes for around camp (1 light, 1 warmer or heavier jeans.
Sweatshirts not good when wet. Blue attracts bugs.)
Underwear (longies in spring and fall).
Sneakers (for around camp).
Toilet articles.
Towel.
Knife.

Handkerchiefs.
Belt.
Swimsuit.
Stocking cap.
Wool gloves or mittens.

Options

Layering clothes.
Long underwear.
Personal camera.
Book(s).
Fishing gear (rod should fold into pack).
Sleeping bag liner. (Nice on hot evenings when the no-see-ums are out.)
Paper and pencils.
Journal.

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CREW EQUIPMENT CHECK LIST

(Not all items are needed for every crew)

<input type="checkbox"/> Boat	<input type="checkbox"/> Insect repellent	<input type="checkbox"/> Law Enforcement kit (camera & film)
<input type="checkbox"/> Canoe (sq.stern) (dbl. end)	<input type="checkbox"/> Toilet paper	<input type="checkbox"/> Fire shirt
<input type="checkbox"/> HP motor & tool kit	<input type="checkbox"/> Disinfectant	<input type="checkbox"/> Fire pants
<input type="checkbox"/> Life vest(s)	<input type="checkbox"/> Canvas bucket	<input type="checkbox"/> Head lamp w/batteries
<input type="checkbox"/> Paddles or oars	<input type="checkbox"/> Scrub brush	<input type="checkbox"/> Sling for bear pole
<input type="checkbox"/> Gas can (5 gal. 2-1/2 gal.)	<input type="checkbox"/> Plastic bags	<input type="checkbox"/> Nails
	<input type="checkbox"/> Hard hats	<input type="checkbox"/> Hammer
	<input type="checkbox"/> Leather gloves	<input type="checkbox"/> Maps

- | | | |
|--|--|---|
| <input type="checkbox"/> Gas can spout | <input type="checkbox"/> File | <input type="checkbox"/> Compass |
| <input type="checkbox"/> Ropes | <input type="checkbox"/> Rake | <input type="checkbox"/> Packsack (lg. and sm.) |
| <input type="checkbox"/> Tent | <input type="checkbox"/> Shovel | <input type="checkbox"/> Sunscreen |
| <input type="checkbox"/> Storm fly | <input type="checkbox"/> Pulaski | <input type="checkbox"/> Sunglasses |
| <input type="checkbox"/> Sleeping bag | <input type="checkbox"/> Axe | <input type="checkbox"/> Brush clipper |
| <input type="checkbox"/> Sleeping pad | <input type="checkbox"/> Soil auger | <input type="checkbox"/> Pry bar |
| <input type="checkbox"/> Tarp | <input type="checkbox"/> Wedges | <input type="checkbox"/> Saw (bow) |
| <input type="checkbox"/> Stove | <input type="checkbox"/> Radio (w/fresh batteries) | <input type="checkbox"/> (collapsible crosscut) |
| <input type="checkbox"/> Stove fuel | <input type="checkbox"/> Cooler | <input type="checkbox"/> First Aid Kit |
| <input type="checkbox"/> Water filter | <input type="checkbox"/> Cook kit | <input type="checkbox"/> (mask and gloves) |
| | | <input type="checkbox"/> Flashlight w/batteries |

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300.20 – RADIO USE

Radios are an essential piece of equipment.

Since receiving has little effect on battery life, radios should be kept on at all times so that you may be contacted if need be. It is an expensive piece of equipment and it should be given proper care. Be sure to keep it dry! Water-proof radio pouches are commercially available. Always carry an extra battery or charge batteries before every trip to minimize problems. For radio using flashlight batteries, change them after every 10-day trip. Tag the radio and mark it as to when the batteries were fresh and initial it. Attempt to keep antenna as physically straight as possible.

Become familiar with your radio. Learn what channels to use and under what conditions. Different Forests use slightly different radio procedures. Become familiar with the procedures used in your area. Normally you will use channels 1

and 2. The others are for fire and aircraft purposes. Learn which channels to use on your District.

When speaking into the microphone, depress the button for one second so that any repeaters will be tripped and then speak very slowly and distinctly. There may be some areas in which you cannot make radio contact; learn where they are.

In areas where radio contact is difficult, get up as high as possible. Sometimes moving only a few feet will make the difference. If any crew is having trouble making contact, there is a good chance you can serve as a relay between that crew and the station that is calling.

Don't pack junk on the radios or in the carrying cases.

Forest Service radios usually provide "line of sight" transmission. That is, they transmit on a straight line but cannot "bend" over hills or mountains, or go through them. When it is necessary to talk to someone on the other side of a mountain, a repeater is often used. Your transmission goes "straight" to the repeater and then "straight" from the repeater to the person you are calling. See the diagram below.

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Radios have TWO TRANSMIT channels; Channel 1 and Channel 2. Channel 2 is used only for transmissions to a repeater. The repeater relays the message on Channel 1. These radios have only ONE RECEIVER channel. Radios receive Channel 1 whether the radio transmit channel is tuned to Channel 1 or to Channel 2. Direct messages are transmitted and received on Channel 1. See the sketch below.

Radio Failure

If you find that your radio does not work, put a tag on it describing what is wrong with it, along with your name and the date. If your radio falls in the lake or river, remove the batteries and get the radio to the repair shop as soon as possible. Make sure your supervisor is aware of any radio problems that you have. When in the woods and your radio does not function, send two messages describing the radio problems with returning tourists.

Transmission should be in clear text.

Radio Codes (NO LONGER USED ON THE SUPERIOR NATIONAL FOREST.)

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300.30 – TOOLS

Humans have used tools to assist in work for many years. Evolution of tools has been slow until recent times. Today we have a variety of tools and mechanized equipment to help us be more productive.

In the use of tools, we have again reached a compromise in wilderness management. We use manufactured hand tools in accomplishing our work. Mechanized tools, such as chain saws and bulldozers are generally not used in wilderness management.

As a wilderness manager, you may be using hand tools which are unfamiliar to you. The use and care of such tools as the crosscut saw, drawknife, and axe, require certain skills. Following a training period, you should work at developing these skills.

Tools should always be kept sharp and in good repair. There is a safety factor in the use of your tools. Develop a good job hazard analysis and use the correct procedure and safety equipment.

Use of mechanized equipment for emergencies may be approved by the Forest Supervisor. If you feel that mechanized equipment is essential in a particular case, go to your supervisor and explain your reasons and request. He/She will see that all considerations are made in the decision.

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300.40 – GENERAL CONDUCT

Remember that to the visitor you may be the only Forest Service employee they will encounter. Your impression then becomes extremely important. The following is a guide to help you understand what your role to the public is and what is expected of you by the Forest Service.

- A. You are in an area where, generally, others are seeking solitude. Keep your noise (whether it be loud voices, radios or whatever), at an acceptable level.
- B. Eat good meals. While you may all differ in your likes and dislikes, a well-balanced meal is still essential to your good health.
- C. Personal Appearance.

1. Personal cleanliness is a must. Male crew members – if you have a beard and/or long hair, keep them trimmed and neat. If you do not have a beard, shave daily.

2. A uniform in the Wilderness may not seem proper. If you are to perform your job, it is necessary that the public can identify you. Therefore, the complete Forest Service uniform should be worn when making any contacts with the public. This includes nameplate and badge.

As a representative of the Forest Service, it is important to have a neat, clean appearance. Personal cleanliness and good grooming are essential to your job performance. Start the day with a clean, neat appearance.

On extended trips, include enough changes of uniform for an acceptable appearance at all times. Wash clothes as needed. Wear good quality boots. Purchase good rain gear before starting work.

D. Attitude

1. Get away from your crew partner once in a while when you can sense tension. Talk out small differences before they become distorted and hard to handle.

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2. Keep an open line of communication between your crew, the other crews, and your supervisor. **MENTAL ATTITUDE IS EXTREMELY IMPORTANT!**

3. Your crew will be working without direct supervision most of the time. You have been hired to do a job and a great deal of trust is necessary between you and your supervisor. A good personal work ethic is important for maintaining this trust.

4. Crew leaders must lead by example. You must follow agency guidelines set for conduct, safety and wilderness management.

E. Take good care of your equipment. Repair, dry it out, wash it, or whatever else may be needed.

F. We should obey all the rules that we expect the public to abide by; i.e. cans and bottles, fishing limits, etc.

G. Use of your canoe or boat for fishing during your off-duty hours is okay. Try to be as inconspicuous as possible.

Wherever located, your camp should serve as an example for the public. Keep it neat at all times. Promote “no trace” camping by word and deed. Use biodegradable soap. Wash your dishes and yourself away from the lake(s) or stream(s). Use a cooking stove rather than an open fire. It has less impact on the site and saves time. Keep a clean camp as this helps promote other good work habits.

Bears in camp may be a problem. Here are a few tips designed to help you prevent bear trouble during your summer:

Avoid the bears, if possible. Watch for them along the shore as you paddle by. Try to not camp near where you sighted them. When picking a campsite for the night, watch for bear signs: fresh tracks, diggings, droppings, or the shredded equipment of earlier campers.

Whether or not you find bear signs, “bear proof” your chosen campsite.

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Bears and other animals (chipmunks and squirrels) are attracted by food odors. Do not leave your food where they can get to it, or you will be inviting trouble. At night (or whenever you are not in camp), hang your food supply in the trees.

If you use the single-tree method, choose a sturdy tree with the first limb about 15 feet above the ground. Suspend your pack so that it hangs four feet or so below the limb and ten feet or so about the ground. Bears have gotten packs hung too close to the limb by climbing the tree, crawling out on the limb and reaching down! Packs should also hang away from the trunk of the tree at least six feet. As a rule of thumb, remember, if an average-sized man or woman can touch the suspended pack, so can a bear.

Never store food in your tent. Bears have an excellent sense of smell and they will find any snack or candy bar you may try to hide. Also, do not wear the same clothes to bed that you wore while cooking dinner, because they pick up the food odors. Hang those clothes in the bushes outside your tent. Keep a clean campsite. Burn all food scraps and leftover grease. Do not dispose of leftovers in the wilderness latrine – bears will find them and destroy the latrine in the process. Do not let an island campsite lull you into a false sense of security either – all bears are excellent swimmers!

If a bear does wander into your campsite, don't panic. Bears are usually easily frightened by loud noises. Try banging cooking pots together and yelling. Perhaps a small stick of firewood thrown his way will encourage him to leave. Do not charge the bear – he may become defensive. If the bear refuses to leave or becomes hostile, let him have the campsite. Warning: Female bears are extremely protective of their young. If you come upon a bear cub (on a portage, for example), stop, listen and look for the mother. Never stand between a mother and her cub.

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If attacked, retreat to your canoe and paddle out in the lake. Barring that, climb the nearest suitable tree. Look for a tree that will support your weight, allowing you to escape the bear's reach, but too small to support the bear. Report any encounters with bears by you or others to your supervisor. Bears are a natural part of the Boundary Waters Canoe Area Wilderness. If you have the misfortune to have your camp raided by a hungry bear, before you get mad at the bear, look around your camp and ask, "Did I invite him?" If we find garbage, dirty pots, etc., in camp and you later have bear problems, you may be charged for the destroyed gear.

400.10 – DIARY

Keep good notes on events that are important. This could include work accomplished, notes on work that needs doing, wildlife observations, law enforcement, outfitter supplied parties vs. self-outfitted, visitor comments, and other notes that might be of interest to the other crews. A debriefing is recommended at the end of each trip. Go through your notes with your supervisor and other crews if the information is of value to everyone.

Meeting Yourself Halfway, by Dr. Sidney B. Simon

"Many of us find that self-revelation, truthfully revealing ourselves and the realness of our lives is a difficult thing. All too often we fall back on familiar reactions; what we *think* we know about ourselves. To really know, it is necessary to uncover basic things about our thoughts, habits, actions. We can do this by finding out what gives shape to our life patterns; and then by our willingness to share at least some of that intimate knowledge – to give of ourselves. Otherwise we run the risk of not being whole people, but rather 'hollow men, head pieces filled with straw'."

Journal: A reservoir of things to look back on; a reflection of what you think about; not so personal it can't be shared, but more than just reporting observations; lets you see the changes; evaluates and analyzes your reactions. Some people and situations spawn anger. Keeping a record of what and/or why may reveal patterns about yourself.

Thoughts to include: Daily, 24-hour happenings; varying levels of confidence and insecurity; how you feel about decisions you made; conflicts, reactions, alternatives; current events; "Made my day" stories; "Bad day" stories; ideas and observations about the job; wonderings and theories.

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Phenology: The tracking of biological events in nature, wildlife, plants, and animals, frequently run on strict schedules. By studying phenology we can learn a lot about the workings of the forest around us.

Look for these events: The First

April-May	June	July	August
Loons	Baby Robins Flying	Tadpoles	Hazelnuts
Dandelions	Goldenrod & Daisies blooming	Baby loons	Yellowing birch leaves
Aspen leaves	Bunchberries	Blueberries	Bog Cranberries
Blackflies	Grasshoppers Flying	Fireweed	Frost (first)
Violets blooming	Lightening Bugs		
Mosquitoes	Ducklings Strawberries		

northern river, but a similar act in the heavily used Boundary Waters Canoe Area Wilderness of Minnesota would be unacceptable.

Inexperienced, but well-meaning people, are flocking to wild places in record numbers. The wilderness sports (backpacking, canoeing and ski touring), which a few years ago were a novelty, are today being enthusiastically enjoyed by more people than ever. Many hiking trails are badly eroded, sanitary facilities are over-taxed, and dead, dry wood suitable for fire-making is non-existent. The joys of camping out have been necessarily numbed by long lists of regulations designed to protect us from each other.

Wilderness abuse is seldom intentional. The person who unwittingly disposes of leftover food or fish and game entrails in a lake or stream does not usually realize that it may take months or years for the water to flush itself clean of those pollutants. And the camper who throws trash in the woods does not always understand that public land managers don't have the time or budget to gather it and pack it out.

Some "low impact" ethics that you should be promoting are:

1. Group Size: Keeping the group size small so that the visual impact on the lakes and/or portages is minimized.

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2. Noise: There are many types of noise. The type that we will normally think of is shouting or the banging of canoes on rocks. This type of noise is particularly obtrusive in the evening, but should be avoided during the daytime as well.

3. Camp Stoves: We should be encouraging the use of camp stoves. There are several advantages: a) the weather is not a limiting factor, b) the pots stay clean, c) the gathering of wood is not necessary, d) the campsites and shore line are not picked clean of branches, snags, etc.

4. Litter: Encourage everyone to pick up their own litter and perhaps some that others may have left. Emphasize that aluminum foil in the fireplace, twisties, and cigarette butts, are all litter. Burning plastic is illegal in Minnesota; it should be packed out.

5. Cutting Trees: Stress collecting dead and downed wood away from the campsite for fires. DO NOT cut trees for camp furniture.

400.11 – PUBLIC CONTACT

One of the most important parts of your job as Wilderness Rangers is public contact. You are the one who is in the eye of the public. After talking with you, the visitor will form an opinion of the management of the Wilderness, of the Forest Service in general, and of you as an individual. The visitor will look upon you as one of the ways their tax money is spent and you must make visitors feel as though it is spent wisely. Remember you are a public servant.

Wilderness management is often a controversial subject, especially in the eastern United States where new wildernesses are being designated and use patterns have been established. Know the wilderness policies and equally important, know the reasons for them when questioned about controversial subjects.

An important part of the education effort is to promote "Leave No Trace Low Impact Camping". This will be a joint effort through videotape programs and brochures, as part of the permit issuance program, and last but not least, *you*, the Wilderness Ranger. Portray a positive attitude and smile with a friendly

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greeting. People like to talk, so don't be timid. Take off your sunglasses and make eye contact. Make a point to listen.

As you approach the group and begin talking, observe the situation. Look around camp and see if it is littered or whether they are damaging the resources. Think of what message might be most appropriate for the situation. Be ready to discuss and even demonstrate low impact camping techniques, but do not get yourself into arguments or confrontations. If visitors wish to argue, it is best to back off on the preaching. Inform them of the regulations if need be, and go on with your other work. Always stay alert to potentially dangerous situations.

Wilderness Ethics: Telling someone the proper way to act in a wilderness setting is like explaining to a parent how to rear a child. Manners – either at home or on the trail – are something all people believe they have.

Expounding a philosophy of wilderness ethics is complicated by the fact that what is acceptable in one place may be unacceptable behavior in another. For example, a canoeist may cause no environmental damage by washing dishes in an isolated

6. Axes: Axes are not needed! Firewood that can be *broken* into pieces or cut with a small folding saw is abundant, if one goes away from the campsite to find it.

7. Facilities: Use the fireplaces and latrines provided. This helps to keep the area cleaner for yourselves, and for others to enjoy.

8. Garbage: Burn paper garbage in the fireplace. *Never* put it in the latrine, as this draws bears that will end up destroying the latrine to get at the food.

9. Fish Guts: Take them well away from the campsite and back from the lakeshore. Bury them in the top 6" of soil where the bacterial action is the best. State law prohibits putting the remains into the water.

10. Soaps: Use biodegradable soap and wash your dishes and bathe at least 100' from the lakeshore. Swimming without soaping up first is no problem.

11. Boots: Wear tennis shoes around camp. The smoother soles will be much easier on the campsite than lug soles.

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12. Ditching Tents: "Ditching" tents (digging trenches around them to keep out groundwater) is unnecessary now that tents come with sewn-in floors. If you can't keep surface water from getting into your tent, try sealing its vulnerable seams with one of the special water-proofing compounds available at every camp shop. For added protection, place a large plastic ground cloth underneath your tent.

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400.12 – PERMITS

Management of the BWCAW necessitates use of a permit. The mandatory permit requirement has been in effect since 1966, and has gained acceptance as a management tool. While permits may inconvenience the visitor and are costly to issue, benefits outweigh negative aspects.

The visitor permit has several advantages. It gives valuable information for wilderness administration and planning. Total use, concentrations of use, and peak seasons are samples of information that permits offer. With such information, managers can make decisions based on fact rather than assumptions. Resources and visitors benefit from this.

The permit requirement is also a critical element in implementing the visitor distribution program. Daily limits are placed on the number of visitor permits issued for each entrance point. By properly distributing use in terms of both time and location, present demand can be accommodated. If use continues to increase in the future, this system will also serve to limit the total number of people entering the area.

Issuing visitor permits also provides an important contact – a time for giving information on regulations, user distribution, fire conditions, and wilderness ethics. This user education is covered in Section 400.11.

When a wilderness visitor must be reached because of an emergency at home, information obtained from the permit may help locate the party more easily.

LAW ENFORCEMENT

Wilderness Rangers follow an expanding or progressive level of law enforcement. Start law enforcement at the lowest level necessary to accomplish the goal of resource and public protection and a recurrence of the infraction. The progression is from attempting to educate the user and verbal warning, to written warning, to citation. Different Forests have different policies regarding citing minors. Find out what your Forest policy is.

If you start a contact by telling a visitor he/she will be issued a citation for a violation, but then find out there were unavoidable circumstances that led to the violation, it is much more difficult to drop the tone to a reasonable enforcement level.

Most Forest Service employees do not like issuing citations (Form FS-5400-4). It seems to go against the grain of the idea of a wilderness

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experience. However, the Ranger must keep in mind that failing to take action may cause the wilderness quality to be degraded. Don't compromise by issuing a written warning (Form FS-5300-1) if a citation is truly in order. Check with your supervisor about the level of enforcement authority you have.

Although all areas require a permit, wilderness visitors are becoming aware of ways to circumvent the wilderness permit system. They often will enter the wilderness without a permit, knowing that one is required, but they got away with it last time, so The permit system has been in effect for over 30 years. There is little excuse for not having a permit when they are required.

Wilderness Rangers will not make arrests. If you feel that an arrest is warranted, back off and contact your dispatcher with details of the incident. This also applies if you find yourself in a potentially threatening situation (riding inadvertently into a poacher's camp). Back off and call for help.

Regulations Related to Wilderness

Refer to Title 36, Part 261, Code of Federal Regulations for a complete list of prohibitions. Also, have your local regulations with CFR's. Insert these in the front pocket of the Field Guide and refer to the Law Enforcement handbook.

Subpart B regulations apply only if a Forest Supervisor or Regional Forester has issued an order for the prohibition. Subpart A regulations are in effect

at all times for all Forests. For example, the firing of guns is restricted to emergencies and the taking of legal game in some wilderness areas, but there are no restrictions in other wilderness areas. Don't get subparts confused.

Local Regulations are Listed in Chapter 2 or with CFR's.

Refer to your law enforcement guide and bail schedule for a full account of prohibitions for your area. Bail schedules are set within a judicial district. Magistrates answer to the district judge and each one assigns specific times to hear cases. Check with your Forest law enforcement officer about when and where your magistrate hears cases.

Volunteers may not issue citations, but they may record information for a citation to be processed by a qualified employee. A warning (Form FS-5300-1) may be used for this. Tell the visitor that if the supervisor feels a citation is warranted, one will be sent to him by mail. This should not be standard practice. It is only for those instances where it is unavoidable or there is some question of applicability.

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BASIC THOUGHTS FOR GOOD HOST ENFORCEMENT

1. Our #1 role is to educate first, then regulate. Citations are a last resort.
2. When it comes to being a Good Host, some jobs in the Forest Service are tougher than others.
3. Being a Good Host is the only approach to take in Law Enforcement, otherwise you are asking for trouble from the outset.
4. The majority of visitors are thankful for enforcement action. Regulating the behavior of an individual is being a Good Host to others.
5. Do not assume the worst when approaching a situation. Appearances can be deceiving.
6. Avoid displaying an over-bearing attitude.
7. Personal risk is not asked of our employees. However, prompt response should be made to all violations that occur. This may consist of observing and recording the details of the incident and notifying law enforcement officers capable of taking direct action.
8. Be courteous, but be firm.
9. Patience should be your guiding principle.
10. Make a list of possible situations and consider what you might do when confronted with them.

11. Try to avoid backing people into a corner. Give them some room to save face, if possible.
12. Where some areas result in constant confrontation, personnel should be rotated so that they are not always being thrust into negative situations.
13. A constant stream of bad experiences can lead to a negative situation.
14. When a citation is to be written, be businesslike. Do not launch into a long lecture.
15. Be neatly dressed and in proper uniform. Call for back-up or assistance as necessary.
16. Avoid what appears to be a dangerous situation. Call for back-up as necessary, or leave.
17. Keep enforcement policy consistent. All personnel should know how they are expected to enforce the laws.
18. Be a good listener. Many people will be happy if they have a chance to explain; even if they get a citation.
19. Catching situations early often keeps them from developing into something serious.

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20. Warning people who look like they are about to commit a violation is often appreciated.
21. Be knowledgeable about the area you are operating in. Informal chatting often gives you an opportunity to point out regulations.
22. Don't feel that enforcing the law is not being a Good Host. Laws are really there for the benefit of all the people.
23. Visitors' complaints about each other need to be carefully assessed before any action is taken.
24. If a person believes that you are going to give him a hard time, he will try to avoid you, or failing that, he will be unresponsive or perhaps hostile toward you.
25. Always act courteously.
26. Be confident and professional at all times.
27. Don't get into "Well, personally, I think it's a bunch of hoey".
28. Always act courteously.
29. Let visitors have their say.
30. Don't show anger.
31. Don't threaten people. Just do what must be done.
32. Don't attempt to be clever or witty when contacting a violator.
33. Don't wait for a violation to occur with the idea of making an example of someone. You will only make a bad example of yourself.
34. Evaluate your contacts. If you have a lot of violations of one kind, chances are you need a better information program.

35. Carry fire permits and other permits when it is permissible to issue them in the field.
36. Keep in mind the Regional Policy: "When damage to resources and property cannot be prevented without risking personal injury to the employee or to the public, the risk will not be taken".
37. Carry a map of the area so you can help people find things or get oriented if they ask for your help.
38. Try to "lead up" to the problem a little bit rather than being abrupt. Give people a chance to adjust to your presence.
39. More often than not, people will be viewing you with respect and curiosity – that is, if you are in proper uniform.
40. Practically everybody recognizes the need for regulations.
41. Avoid threatening or aggressive posture.
42. Do not come "charging in" when you approach people.
43. Be friendly, but avoid being presumptuous or conducting yourself in an overly familiar manner.

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44. Always show respect to the individuals you contact.
45. Maintain your professional standing at all times.
46. Do check out complaints that people make and let them know that something is being done. Follow-up is extremely important to maintaining credibility.
47. Be accurate in the information you give. You could get someone into trouble.
48. When you do not know about a regulation that a visitor is asking about, let the visitor know that you don't know. Then find out. Make every effort to get the information to the visitor as a follow-up.
49. Don't ignore an obvious violation. Other visitors will take their cue from your reaction.
50. Set an example of behavior. Visitors who see you pick up litter will emulate your actions.
51. Establish a friendly presence as much as possible beforehand, and then when a violation occurs, the situation is more relaxed.
52. Check that signing is in good condition and keeps visitor informed of regulations and boundaries.
53. Be consistent in dealing with all people.
54. Do not vacillate once you have decided the situation warrants a citation. People like to know where they stand.
55. Do your best to be reasonable at all times. Do not be bull-headed if other information comes up that changes a situation.

56. Always keep your cool. Never respond to abusive language in anger.
57. Know the regulation you are citing for.
58. Know the real purpose of the regulation and be able to explain it to the person being cited. Often people will be much more receptive when they understand the purpose of what is happening.
59. Get all the facts before drawing your conclusions.
60. Avoid trying to judge whether or not a person is trying to con you. On short acquaintance it is practically impossible to sort this out.
61. In all cases our primary concern is for the safety of the public and our own employees.
62. All Forest Service Officers have a responsibility to observe for violations of laws and regulations.
63. Have hand-out materials on rules and regulations available for frequent use.
64. Remember, a Good Host is one who enforces laws and regulations equitably for all National Forest users.

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END-OF-HITCH-DUTIES

When you come out of the field there are a variety of tasks and reports that need to be accomplished.

Keep a journal or diary. The purpose of maintaining a daily record is so that supervisors and managers can identify problems, know how much work is being accomplished by the Wilderness Ranger, and provide statistics.

The record can take different forms. A written diary, which explains the details of trail work, public contacts, wildlife sightings, law enforcement action, search and rescue, first aid rendered, etc. can be maintained daily. Some units use management information cards, hitch reports, or other specific forms.

Turn this information in to your supervisor (see appendix for examples). Also, fill out a time sheet and per diem forms for expenses. Some districts have food supply forms that also need to be filled out.

Time and travel must be completed. Any tools or equipment that need repair or replacing should be attended to promptly.

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400.14 – HEALTH AND SAFETY

The term “wilderness” implies adventure and challenge. Associated with this are certain risks that may add to the adventure, or for some, present overwhelming obstacles. Rugged terrain, inclement weather, over-exertion, improper equipment, lack of physical conditioning, are all potential obstacles for the unprepared. Being prepared calls for stamina, mental alertness, and outdoor living skills and knowledge. Do not tackle your job if you feel you are unprepared in training, equipment or attitude. As a Wilderness Manager, you have a responsibility for visitors’ welfare as well as for your own. We need to minimize the risk to visitors and ourselves as much as possible while maintaining wilderness philosophy.

There are many ingredients necessary to work safely, both on the job and away from the job. Two of these ingredients are attitude and knowledge. Attitude is something you must acquire. It is based upon your past experiences, your present experiences, and what you think of the future. It is difficult or impossible to “teach” you attitude. Things such as first aid and defensive driving training help, but by and large, you and only you can develop the proper safety attitude and gradually improve on it daily. The actions of those around you affect your attitude, and in turn, your actions affect others. Their personal development of a good safety attitude will not

only prolong your life, it will also make it more satisfying to you and those around you.

Knowledge on how to work safely can be easily acquired. How? By reading, asking questions, reading instructions, reviewing what you already know, discussing problems, training sessions, and common sense. Each of us can learn the correct and safe way to do a job. To make a step in this direction, each "crew" should *fully* review the Job Hazard Analysis (Exhibit 1) for *each and every* job task you are involved in. Travel is also considered a job. This task will take some time, but it must be done. If you later start on a new job or a job you haven't done in awhile, review and discuss this job. The Job Hazard Analysis (Exhibit 1) does not have all the answers; however, it is the result of years of experience of thousands of people. If you have questions or problems, check with your supervisor.

Be prepared with proper clothing and adequate boots. Weather can change greatly over a period of several days. Not having proper clothing can make you sick, miserable, and unproductive.

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Always wear a life jacket (provided by the Forest Service) when on the water. Safety is the primary reason for this, but remember that you are also setting an example for visitors to the area who may not be as familiar with the elements.

When using watercraft in rough weather, you have to be the judge as to when it is too rough to stay on the lake. Through experience, some are more comfortable with rough weather. If you feel uncomfortable with the rough water, you should pull off the lake. When wind-bound or while sitting out a thunderstorm, consider using the time to review first aid.

Always carry a complete first aid kit. Know what is in it and how to use it. At the end of each trip, check the kit and replace missing items. The first aid kit and its contents will be covered in Section 400.16. If you have a medical problem, make sure your crew partner and supervisor are aware of it.

Be familiar with the daily weather forecast. The Dispatch Center broadcasts a forecast for the Superior National Forest over the Forest radio net in early morning and late afternoon. Check with your supervisor for specific times.

Lightening kills several forest visitors each year. When a storm threatens, get off the water. If you are far from shelter, sit out the storm in a low-lying area that has even tree cover and little rock.

Set up your tent away from tall trees and exposed roots.

Treat or filter your drinking water. A State study has shown that some water contains protozoa called "giardia". When ingested by humans, they attach themselves to the small intestine and begin reproducing, which makes their host sick. Although this parasite has been around for several centuries, the illness, "giardiasis" is not easily diagnosed since its symptoms appear only after 12 – 15 days after ingestion. To be safe, boil your water. To improve taste, add a pinch of salt to each quart of boiled water, or pour it back and forth from one clean container to another several times. This is the same advice that we should give to the public. *NEVER* drink out of beaver ponds or streams. Always recommend boiling or treating drinking water when advising the public.

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You have a duty to warn people about dangerous situations and provide suggestions for alternatives. These contacts, like all others, should not be heavy-handed, but should be made with tact and persuasion. The visitor may decide to not accept your advice; that is his privilege.

Be alert to conditions that may prove hazardous to visitors. Correct the conditions when you can. Note in your diary the conditions requiring additional work and planning.

JOB HAZARD ANALYSIS

Project: Watercraft Travel

HAZARDS	ACTIONS TO ELIMINATE HAZARDS
High Winds	Avoid open water areas. Always wear coastguard approved personal floatation. Don't be afraid to sit out extreme winds. Know personal and equipment limitations. Do not canoe alone.
Rapids	No running whitewater.
Storms	Stay off water in electrical storms. Wear proper clothing. Be alert to hypothermic situation. Check weather before going out. Maintain radio contact.

Muscle Strain	Use proper lifting techniques. Seek help when needed.
Slippery Surfaces	Wear non-skid footwear. Pay attention to foot placement. Step aboard as close to center as possible. Never jump into a boat.
Overloading	Be sure weight is properly distributed. Be alert for obstacles. Do not exceed boat capacity. Tie all gear down.
Stranded	Boat will be complete with oars or paddles. Travel in daylight except in emergencies. Examine radio before all field trips.
Portaging: sprained ankles, muscle strains, back strains, slips/falls	Pay attention to foot placement. Wear proper boots. Do warm-up exercises. Lift properly with legs. Do not exceed your limits. Avoid fatigue. Get proper rest. Maintain good physical condition. Beware of slippery surfaces and rocks.
Boat/Canoe handling	Know how boat maneuvers. Know boat's stopping distance. Do not make tight, high speed turns.
Equipment	Have anchor and line, tool kit and spare parts, first aid kit, oars and paddles, shear pins, extra fuel, flashlight, compass, fishing pole.
Trailer handling	Working lights, use safety chains, check wheel bearings, tilt outboard when backing during launch, and put drain plug in place on boat.

2. The equipment needed to move the victim.
3. The number of people available to help in the evacuation and how many more are needed.
4. Your location.
5. Who to notify of the injury.

In cases of death, do not release the victim's name over the radio.

Evacuation of injured, sick, or dead may be necessary at times. You should know the requirements for moving helpless victims by land or air. The use of motorized equipment can be authorized by the Forest Supervisor. Use proper channels for approval, if possible. If you cannot make contact, use your best judgment. Leave the victim only if there is no better alternative.

The role of the Forest Service in search and rescue is one of supporting and developing strong local and state leadership. The County Sheriff's office is the agency with primary responsibility for the protection of life and property. Field personnel must continue to be responsible to the public needs as they involve these aspects, with emphasis toward supporting and cooperating with these local

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officials. The cooperating agencies will *not* assume the cost for an emergency. The person evacuated will be billed by the County Sheriff or Forest Service.

The Forest Service will take a temporary lead role in any search and rescue emergency in which immediate and quick response will reduce suffering or save lives. The concept of "closest forces" must be used and the lead role only maintained until the predetermined local responsible authority is available to assume its leadership. After transferring the leadership role, the Forest Service will assume a supportive role and provide assistance to the fullest extent possible.

400.15 – EMERGENCIES, SEARCH AND RESCUE

Emergencies are a part of life. They can involve anyone in any environment. Wilderness emergencies assume another dimension. Often they must be handled alone because help is not nearby.

Most emergencies are the result of injury to a wilderness visitor, your co-worker, or yourself. Remain calm and analyze the situation. If it is serious, radio for help. During off hours our radio network is tied into the Virginia, Ely and Grand Marais police station. Give information to the best of your knowledge on:

1. The victim's condition, name and age.

**400.16 – FIRST AID
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No known medical manual can prepare you for every eventuality. You need first aid classes and practical exercises to better prepare you to travel and work in a wilderness. After that it is a combination of what you have learned and practical knowledge of how to apply it to the situation you are in.

The level of instruction in this manual is aimed primarily at the Wilderness Ranger, or at least at the individual carrying the first aid kit who will be looked to for skill and knowledge in the event of illness or injury on the trail. Hopefully you will find here what you need to help you handle your potential crisis.

The Wilderness camping and work experience can readily vary from one of intense and complete enjoyment to total disaster depending on weather, adequacy of preparation, what you anticipated, and the type or work involved. If your preparations are good, the chances are your experience will be a good one.

PREVENTIVE MEDICINE

One of the key concepts in wilderness travel is realistic and accurate anticipation of stresses and needs. If this seems a bit obvious, let us look at a few examples of poor planning. Running out of food part way through the trip (it happens); having improper clothing for local weather extremes; poor knowledge of suitability and availability of water supplies; wrong gear for the type of activity (shoes, packs, special equipment); overloading your pack with unnecessary things; short cuts or omissions in equipment inspection. The list is endless.

Preventive medicine may lack the drama of the operating room or the recognition that comes from giving emergency care, but it can prevent a great many crises, and for the medically inexperienced it is the most potent tool they have. Being aware of the potential dangers in a situation and having some knowledge of symptoms to watch for can enable you to nip problems in the bud, so to speak, and keep them from escalating into serious emergencies which could threaten life or limb or at least cause you to abort your trip to return for professional medical care.

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EQUIPMENT INSPECTION

Gear should be carefully and completely inspected at the end of each trip and one should have in mind a program of regular ongoing inspections during the trip. If you are responsible for the safety of others, it is particularly important that this inspection procedure be described and documented not only for their safety, but your own.

INSTRUCTIONS ON SPECIFIC TECHNIQUES

There are a host of rather mundane techniques that can make or break a camping experience if they are neglected. The consequences are probably not life threatening, but the discomfort or distress that can occur can be enough to spoil a trip rather completely.

Cleanliness might be the furthest thing from your mind while camping. However, a few attentions are well worth your time. Dirty skin is more subject to rashes and infections. Dirty clothing loses its insulating quality. Dirty utensils predispose to diarrhea and food poisoning. If each person has his own cup and spoon, he will be more likely to insure its cleanliness and it will avoid the passing around of disease germs.

Food preparation is a common source of contamination and infection. Certain rules of cleanliness, like hand washing and food storage are not unreasonable, even while cooking over open fire.

Even the wilderness setting does not escape the influence of fashion and style. However, these factors may not be compatible with most effective function. Clothing composition is important, especially in cold weather or wet conditions. You want inner clothing that is absorptive, insulates well, and dries quickly. Wear fabrics that wick moisture and dries fast (cupiline, polypro, fleece, wool, waterproof/breathable nylons). Select outer clothing that resists wetting and wind, hold in heat, but allows moisture to escape. Several layers of relatively light clothing are better than one or more heavy layers, since they offer more alternatives for gradation, depending on temperatures and activity extremes. Being dressed so warmly as to produce heavy sweating causes wet clothing that loses insulating value. As activity slows or ceases, you need to be able to apply more layers to retain body heat.

Shoes can be critical, because blisters can be incapacitating and are very subject to infection. Break in new boots gradually. Remember, feet that are continually

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wet or that are not allowed to dry out between wettings are subject to a host of problems that will be dealt with later.

AWARENESS OF FACTORS LEADING TO INJURY

It is wise to keep in mind the factors which substantially increase your risk of injury. Adequate *nutrition* (prior to and on-going) and *hydration* are essential for every camping trip. Failure to attend to either can have disastrous results.

Since more expeditions involve strenuous and physical activity, the energy to perform it must come from somewhere. This is from the food we eat. Quick energy comes from carbohydrates and especially sweets, but such sources are also rapidly depleted.

Longer lasting sources are proteins and fats, and the most favorable diet will contain both in generous quantities. It is advisable, however, to keep the food intake frequent and in relatively small amounts, since a large feeding will divert a substantial blood supply to the gastro-intestinal tract and away from the brain and muscles; thereby decreasing alertness and endurance. Extremes of either heat or cold require substantial energy expenditures to maintain homeostasis such that total calorie needs are much greater than usual. The camping expedition is not the time to go on a reducing diet.

Fatigue is one of the most common pre-disposers to injury. It is far better to stop a bit early than to push yourself beyond the point of normal strength and reactivity.

Campers often run into problems, not because of inadequate informed advice, but *failure to heed good advice*. The feelings that “It could not happen to me”, or “I am too smart for that”, or “I will cross that bridge when I come to it”, may show a certain bravado, but they can lead to some pretty unpleasant surprises.

In a sense, all these factors can be summed up in the word “anticipation”. It means to look ahead, plan ahead, know what you are doing and apt to encounter, and be prepared.

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DEFINING FIRST AID

First Aid is defined as “the immediate and temporary care given the victim of an accident or sudden illness until the services of a physician can be obtained”. To you, as a first aid-er, this means three very important things:

1. That the first aid you perform must be IMMEDIATE. In some cases you must respond in less than one minute; in other cases you can wait several minutes before doing something. But in nearly every problem encountered, the first aid must normally be accomplished in a relatively short time even if evacuation may be delayed for hours or days.
2. The first aid performed is TEMPORARY, until the services of a physician can be obtained. A first aid-er need not concern himself with suturing, splinting with plaster casts, administration of drugs to fight infection, etc. Those actions are best left up to a physician. The first aid-er usually need only concern himself with keeping the victim alive and in reasonable comfort until help arrives or evacuation is accomplished.
3. First aid is the immediate and temporary CARE given. This includes not only the bandaging of the victim’s physical injuries, but the caring for his entire mental and physical being. A wound is more than just bleeding. It involves pain, concern, anxiety, worry, and

apprehension. All of these must be attended to by the first aid-er; mental and emotional, as well as physical needs.

Nearly all injured people want help. They want to know they will be all right; they want reassurance. This does not mean to lie to them. It does mean that they want assurance of knowing someone qualified is there to help. They want to know what their injuries are (approximately) and what the first aid-er plans to do. In short, they normally want someone to talk to. This serves the first aid-ers needs too, since it enables him to determine how he is doing (e.g., Does it hurt here?), and relieves apprehension on his part. This process, talking and attending to the victim’s emotional needs, is called “*Tender Loving Care*” (TLC). It includes keeping him warm, comfortable, fed, busy, interested, happy, and confident. *TLC is extremely important! It cannot be over-emphasized!*

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MEDICAL PROBLEMS

Minor medical problems occur on every trip, and if recognized and promptly treated will usually remain in the nuisance category. However, if neglected or improperly treated, they may escalate themselves to major problems necessitating premature return or even emergency evacuation.

Although injuries are the more likely emergency you will encounter in the field, there are a few medical problems which are worth examining.

BLISTERS: These are just about the most common problem you will encounter. They usually occur on the feet from new, unconditioned or improperly fitting boots. However, they can also occur on the hands from paddles or ropes, or minor burns. When blisters are recognized early, steps can be taken to minimize further friction and trauma with Tincture of Benzoin and moleskin, and they can regularly be inspected for signs of infection. Periodic air drying is important to aid healing and prevent growth of anerobic germs (germs that grow best when sealed off from oxygen). The wearing of new boots is a practice to be avoided on any camping expedition. When washing stockings en route, it is important that they be thoroughly rinsed so that no soap residues remain in the cloth which can act as a skin irritant.

EYE PROBLEMS: Foreign bodies in the eye and corneal scratches will be your most frequently encountered eye problems. If no foreign body is seen on the cornea, be sure to look under the upper lid, as this is a favorite place for foreign

bodies to stick. To do this, have the patient look down and then grasp the eyelashes, pulling the lid down and away from the eye. The base of the eyelid is then held down while the lid edge is pulled up, causing the plate in the eyelid to turn over, exposing the underside of the lid. If still no foreign body is seen, wash out the eye and apply a patch for 24 hours.

Most superficial eye injuries will heal well if patched for 24 hours. In the case of corneal scratches from a blow to the eye (such as from a snapping branch), always look for bleeding in the anterior chamber. It will appear as a rusty red hazy layering in the lower cornea. This is called a hyphema. The treatment is to patch both eyes and evacuate for definitive medical treatment.

RASHES AND BITES: Skin rashes due to friction from packs, clothing, or infrequent bathing are common, and usually require no special treatment other than cleansing, use of baby powder or corn starch, and extra padding or adjustment of pack straps. If the rash is hive-like (generalized and itchy), it may

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be an allergic reaction and antihistamines would be helpful. Most insect bites, if the individual is not allergic to them, will simply be a nuisance. The treatment should be aimed at control of the itching so that secondary infection does not occur. If the bites produce large red, itchy welts that remain for several hours, it may be a sign of allergy. Again, the antihistamines would be useful. In case of bee stings, the barb with the attached venom sac is often still in the skin and the sac continues to contract for a short time, pumping more venom into the skin. The barb should be looked for (use your magnifying glass) and removed as soon as possible. *DO NOT* pull it out with a tweezers – this will further compress the sac and forces even more venom into the sting. Scrape the skin with a knife or scalpel blade to remove the sting without touching the venom sac.

HEADACE, EARACHE, TOOTHACHE: Most headaches are self-limited and require only symptomatic treatment. Persons with headaches of a persistent or disabling character should probably avoid being any distance from expert medical care. A brief description of the common types will help you to recognize them.

Migraines are usually one-sided in location, throbbing in character and often accompanied by sensitivity to light and nausea. It is rare for one to last overnight.

Tension headaches usually involve the back of the head and neck or feel like a tight vise around the head. They are usually dull in character and infrequently produce nausea. They are one of the few headaches that can last for a number of days.

Sinus headaches are usually frontal and accompanied by nasal congestion. The person may be tender over their cheekbones or complain of aching behind the eyes.

Earaches may be due to middle ear infections, inflammation of the ear canal, or plugging of the Eustachian tube, which prevents the normal aeration of the middle ear. The type most commonly encountered, where there has been considerable swelling, is *otitis externa* (inflammation of the ear canal). The only accurate way to distinguish these is to look in the ear with an otoscope. Since you probably will not have access to such a tool, or familiarity with the varying appearances of the ear canal in these conditions, you will have to rely on other clues. If the symptoms can be temporarily relieved by “popping” the ears, it is probably a partially plugged Eustachian tube. If the pain is made worse by moving the external ear or pressing on the tragus (the small pointed cartilage just

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in front of the opening to the ear), it is probably an inflammation of the external ear. Such persons should avoid anything which might get water in their ears, and may get symptomatic relief from a small cotton in the ear along with the application of external heat. If the earache is accompanied by fever or a thin, pussy drainage, it is probably a middle ear infection, and such persons should be started on Erythromycin.

Toothaches, if accompanied by swelling of the jaw, or a fever, should be treated with analgesics and Erythromycin. Otherwise, only symptomatic treatment is indicated until they can get professional dental attention.

BURNS: Sunburn will be your most common type of burn. It is usually first degree, although second degree, with blistering, occurs at times. Prevention and gradually increasing exposure are the most reasonable approaches. Zinc oxide effectively blocks all the burning rays, and there are commercially available preparations for varying degrees of ultra-violet screening. If burns do occur, the simple measure of applying first aid cream and giving three Aspirin or Tylenol every four hours will greatly reduce the discomfort.

Thermal burns from fire or hot cooking utensils are also common. Immediate immersion in ice cold water for ½ hour will often greatly reduce the reaction. Afterwards it should either be left open or a loose protective dressing applied. Inspect frequently for signs of secondary infection. Certain types of burns by virtue of size, depth, or special areas, are considered major burns, and because of their serious potential will almost always require evacuation.

WOUND CARE: Any break in the skin is a potential source of infection, whether it be a broken blister, a sliver, an abrasion, a burn, a puncture, or a laceration. There are certain fundamentals which are applicable to all of these. First of all you must clean the wound as thoroughly as you can and remove all foreign materials. Soap, water, and scrubbing may be briefly uncomfortable, but far less so than a severely infected wound 24 to 48 hours later. Once the wound is clean it should be rinsed with clear water to remove all traces of soap. At this point a mild antiseptic may be applied, but do not panic if you do not have any. The cleansing is far more important. If the wound is in a location where it is not apt to get grossly dirty, it is better not to bandage it at all, but just leave it open to the air. If a bandage is necessary, make it loose and porous so that the air is not sealed off from the wound. If bleeding from the wound has been a problem, it can almost always be controlled by direct pressure on the wound for at least 10 minutes with a sterile pad (or at least a sterile layer over the wound) covered by a bulky pressure dressing such as a clean sock or folded up T-shirt. The most

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important thing about bandaging is not to just apply them and then forget them. Who knows what is happening under that bandage? They should be changed at least once a day, and if possible, left off for several hours (such as overnight) each day. If there are signs of developing infection, warm soaks or warm moist packs may be applied with considerable benefit.

You may have noticed that nothing was said about ointments. Most ointment, even those containing antibiotics, do relatively little good, and often do harm by keeping air away from the wound, thereby promoting growth of anaerobic bacteria (germs that grow best when oxygen is in short supply).

Puncture wounds can be dangerous because anaerobic infections can develop. It is important that one has had a tetanus shot within five years (although 10 years is probably effective). Warm soaks of the affected area several times a day will help to prevent infection. Inspect regularly for increasing pain, redness, or heat.

A laceration, even a large one, is not really an emergency unless there is uncontrolled bleeding (and direct pressure will control even vigorous arterial bleeding). Lacerations can be safely stitched up to eight hours later. If you can not get to a medical facility by then, the wound should just be left open, bandaged, and the bandage changed at least once daily.

A handy trick to keep in mind with scalp lacerations is to take small clumps of hair from each side of the wound and tie them together over the wound, thereby closing it. If the hair is very slippery and does not want to stay tied, apply some Tincture of Benzoin to the strands before tying them together.

Stress the importance of frequent (at least once a day) inspection of all wounds for signs of infection (redness, heat, swelling, and pain). Warm soaks or packs, elevation, and putting the area at rest are all helpful. If infection progresses, in spite of these measures, it would be reason for return to professional medical care.

SPLINTING

The purpose of splinting suspected or actual fractures is two-fold: (1) to reduce pain and (2) to prevent further damage to blood vessels, nerves and soft tissues around the fracture site from the movement of sharp bone ends. One can usually improvise splints fairly well from materials at hand (branches, tent stakes or poles, paddles, life preservers, etc.). For fingers or toes, it works well when the adjacent finger or toe are taped together with a little padding in between. It is

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important in any splinting operation that you avoid prolonged pressure on a bony prominence. Pad the splints well with anything soft such as sweatshirts, socks, etc., or apply a soft bulky wrapping around the limb before the rigid splint is applied. A very common mistake, even among some professional health care people, is to splint fingers in a straight-out position (like with a popsicle stick or tongue blade). If a finger is to be splinted, it should always be splinted in the position of function (as if the hand is grasping a small ball). This can often be accomplished by placing a small roll or ball in the hand, then wrapping the fingers around it. This will effectively immobilize the suspected break or sprain and still not contribute to a painfully stiff finger that is long in rehabilitating.

SPRAINS AND STRAINS

The twisted ankle will be a common problem on rocky or uneven trails. The usual mechanism will be an inward twisting of the foot and/or ankle, producing pain on the side of the foot/ankle. The lateral malleolus is the prominent bone on the outside of the ankle, and it is connected to the rest of the foot by a system of ligaments. If these ligaments are stretched but not broken, it is called a strain. It is not easy to tell the difference right away, unless you are able to stress the joint and note that compared to the other ankle, it can be turned in much further. Pain and swelling will usually prevent you from attempting this type of examination. If there is no pain when pressing directly on the malleolus, but there is tenderness around it, it is most likely not a fracture. With sprains there is usually considerable swelling and discoloration within a few hours.

The treatment is to soak in cool water immediately to reduce swelling; later wrapping or taping, as well as weight-bearing (as tolerated) can be added. If there is much pain with weight-bearing, it should be discontinued. Heat can be applied after swelling has ceased.

The foot twisting injury that results in a pain at the small knob on the side of the foot will often be an avulsion fracture of the base of the fifth metatarsal when a small piece of bone is broken loose. Treatment (again) is wrapping and limited weight-bearing as tolerated. The same type of twist may produce a sudden egg-like swelling over the dorso-lateral aspect of the foot. There is a small extensor muscle located there and the source of the swelling and discoloration is often torn muscle fibers. Treatment is wrapping.

Twisting injuries to the knee are much harder to evaluate, and unless the symptoms are mild, are best treated as probable cartilage or ligament tears. Treat with wrapping and no weight-bearing.

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Fingers are often strained in the PIP joint (Proximal Inter Phalanx), which is the first joint away from the knuckles. Taping the injured finger to the next finger serves as a good functional splint. Never splint a finger straight, as this leads to a great deal of stiffness and disability. Anytime you need to splint a finger, hold it in the position of function (as if the hand were holding a small ball).

The immediate treatment for all sprains or strains is to apply cold for the first 24 hours, wrap and elevate. Warm soaks and activity as tolerated can be started after 24 hours. Let pain be your guide as far as activity is concerned.

SLIVERS

Slivers, if the ends are not broken off, are usually relatively easy to remove. Treat afterwards like any other puncture wound. If the sliver is imbedded, a small incision might be required to expose it. With slivers under the fingernail, the overlying nail can be pared away with a sharp knife or scalpel blade until the end of the sliver has been exposed enough to grasp and remove.

Every effort should be made to remove slivers promptly, because otherwise they are a sure source of infection. Once they are removed, frequent warm soaks and observation for infection are the treatment.

SKIN INFECTIONS

Local skin infections, in the form of furuncles, boils, infected wounds, etc., will usually respond to local treatment consisting of hot packs or soaks, incision, and drainage, if there is localized pus. Use of antibiotics should be limited to those cases where there appears to be systemic spread as evidenced by red streaking up

the arm or leg; swollen, tender glands in the groin or armpit, or fever. An infected arm or leg should be put at rest and not exercised.

SYSTEMIC INFECTIONS: In contrast to local infections, such as boils, abscesses, etc., systemic infections involve much larger parts or even all of the body. They usually are accompanied by fever and malaise (falling sick). Some systemic or general infections start out locally, such as an infected blister which progresses to red streaking, swollen, tender glands, and fever. Other infections show no early local signs and seem to begin as general infections, such as influenza, pneumonia, etc. There will frequently be one organ or system that shows most of the symptoms, such as the lungs in pneumonia, stomach and intestinal gastroenteritis, the throat in tonsillitis, and the brain in encephalitis.

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One basic fact that is essential to keep in mind is the difference between viral and bacterial infections. Viral infections include such conditions as "flu", colds, most gastroenteritis, and the common childhood illnesses such as chicken pox, measles, mumps, etc. Common bacterial infections are pneumonia (although it can also be viral), systemic spread of local infections, bladder and kidney infections, tonsillitis (can also be viral). Viral infections in general are not helped at all by the administration of any kind of antibiotic, so do not give them. Bacterial infections usually do respond to antibiotic treatment and Erythromycin will be effective for most of the bacterial infections you will encounter on the trail.

INDIGESTION: Changes in dietary patterns are the usual cause for indigestion, characterized by heartburn, belching and upper abdominal discomfort. More frequent smaller meals, plenty of fluids and antacids 45 minutes after eating will usually relieve the symptoms.

DIARRHEA: A few diarrhea stools for any camper are not unusual and generally is self-limited, requiring no special treatment. It may be due to a variety of causes: dietary changes, water, residual soap on eating and cooking utensils, bacterial, viral or parasitic infections. The infectious diarrheas are less common in this setting. If cramping is severe, Lomotil can be given: 2 tablets every 4 hours. Make sure that hydration remains adequate by giving extra fluids. If evidence of dehydration appears, along with fever, dry skin, infrequent urination, weakness, the patient will probably need to be evacuated.

CONSTIPATION: Constipation is defined in terms of stool consistency rather than frequency. A stool that is hard and dry and passed only with hard straining, is a constipated stool. A bowel movement of normal consistency, even if passed once every 2 – 3 days, is normal. Most constipation is due to inadequate fluid intake, or insufficient bulk in the diet. Dietary inclusion of dried fruits, raisins, bran muffins or whole wheat bread, and lots of fluids will usually prevent the

problem or help to resolve it if it occurs. Laxatives may be used if necessary, and even a mild soap-suds enema can be administered with the bulb syringe.

APPENDICITIS: Tends to be a seasonal disease (for unknown reasons), and is more common in the spring and fall. The symptoms can be extremely variable, but the classical sequence of symptoms is as follows: usually begins with a rather diffuse abdominal pain that after a few hours becomes localized to the right lower quadrant of the abdomen. There is frequently nausea, or at least loss of appetite, and jarring or sudden movements tend to make the pain worse. The key to the diagnosis is persistent localized tenderness (increased pain on

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pressure) for six hours or more. If you think of the mnemonic SOS, meaning SPASM (for guarding or tensing of the abdominal muscles over the right lower quadrant), OUCH for tenderness on palpitation or pressure, SILENT for absence of bowel sounds, you will have a rather complete picture of the acute abdomen which accompanies appendicitis. There is no field treatment which is of value, except for not giving anything by mouth and arranging for immediate evacuation.

GASTROENTERITIS, GI BLEEDING AND ULCER DISEASE: The abdominal contents are subject to a host of problems, a few of which we will consider in a bit more detail. Gastroenteritis is an infection or inflammation of the lining of the stomach and/or intestinal tract. The usual symptoms are nausea and vomiting, cramping abdominal pains, and diarrhea. The key to this diagnosis is that the pains are usually cramping in nature (come and go, and not always in the same place), and there is no persistent localized tenderness when you press on the abdomen. This is usually a self-limited illness and treatment is aimed at fluid replacement and watching for dehydration (rising fever, infrequent urination, warm, dry skin).

Gastrointestinal bleeding is most commonly from a bleeding ulcer or bleeding hemorrhoids. Bleeding from a peptic ulcer may cause nausea and vomiting of coffee-ground-appearing material and/or tarry black stools. It is usually accompanied by weakness and palor and an elevated pulse rate. This is a genuine emergency and prompts immediate evacuation. Bleeding and hemorrhoids will usually be painless and bright red in color, and rarely of large enough amount to be serious. No treatment is indicated except observation for unusual amount or duration.

Peptic ulcer disease is characterized by gnawing, burning pain in epigastrium (pit of stomach) that is relieved by eating and tends to return when the stomach is empty. Treatment is frequent, small feeding, antacids about 45 minutes after meals and avoiding coffee on an empty stomach. If the individual has been having typical ulcer pain that abruptly disappears, look out, because this can be a sign of bleeding (blood is an effective neutralizer of gastric acid).

GENITO-URINARY: This duo of organ systems will probably be an infrequent source of problems with the three exceptions being menstrual cramps, excessive menstrual flow, and dysuria (urinary burning).

There is no good explanation for dysmenorrhea (painful menstruation), except that it is usually conditioned and often comes under the heading of

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psychosomatic illnesses. Treatment is entirely symptomatic, and Aspirin (one or two tablets every 4 hours), is usually effective.

Dysuria, or burning urination, is a common symptom of excessive urinary concentration that may accompany inadequate fluid intake. Forcing fluid for a day or two will usually relieve the symptoms. If it does not, you will have to assume that the burning is from bladder infection, in which case the patient should be returned to a source of definitive medical treatment.

URI: Upper respiratory infections with nasal congestion, raw throat and cough, along with low-grade fever and aching, are the usual cold syndrome and require only symptomatic treatment. Antibiotics are of no value for this group of illnesses.

BRONCHITIS, PNEUMONIA: Are infrequent complications of the cold syndrome and are characterized by more severe cough, raising of colored phlegm and varying degrees of fever. The individual with pneumonia will often feel and look quite ill.

ALLERGIC REACTIONS: Most allergic reactions you might encounter will be local and of minor significance. Less frequently they might be systemic and rarely will they be anaphylactic. Let's look at them in a little more detail.

LOCAL – An example of this type of reaction would be a large, red welt following a bee, fly, or mosquito bite which persists for several hours and may be surrounded by varying degrees of swelling. Treatment is local cold packs and administration of antihistamines, such as Benadryl 50 mg. Every 4 hours.

SYSTEMIC – If the local reaction is accompanied by hives in other locations, swelling around the eyes, swelling of the tongue, or wheezing, it can be considered a systemic reaction. This is a more intense allergic reaction, and if the symptoms are quite severe (especially tongue-swelling and wheezing), you should first administer oral antihistamines and check by radio for instructions from a doctor.

ANAPHYLACTIC—This is the most severe form of allergic reaction. If not promptly recognized and treated, it can be rapidly fatal. It tends to occur within minutes of the precipitating event (usually bee sting) and may skip all the usual allergic symptoms and go directly to collapse. There are usually three aspects to Anaphylaxis:

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they are laryngeal edema, bronchial muscle spasm, and vasomotor collapse (sudden fall in blood pressure).

SHOCK: Physiological shock, in contrast to emotional shock, is a situation in which the individual is pale, the skin is cool and clammy, the pulse rapid and weak, and the blood pressure is abnormally low. The level of consciousness may be decreased (lethargic, confused, disoriented). This can be caused by a multitude of factors, but the general picture is the same for all and the first aid treatment is the same regardless of the cause. Keep the patient lying down and warm (cover with blankets or jackets, if necessary). Elevate the legs and do not give anything by mouth.

Look for obvious causes, such as heavy bleeding from a wound (control with direct pressure), or severe pain (such as a severely deformed fracture).

If the skin color and pulse strength do not improve with these simple measures, preparations should be made for immediate evacuation. Do not attempt to get the victim up, as this will make the condition worse.

SEIZURES – A seizure or convulsion is a frightening experience to observe and prompts people to try to do all sorts of things which are not only unnecessary but might be actually harmful. With rare exceptions they are self-limited and all that one need do is restrain them only enough to prevent them from hurting themselves. Do not be alarmed by the brief period of not breathing or the intense cyanosis as this will correct itself. There is normally a period of depressed consciousness after the seizure is over. (Protect the head from injury.)

DIABETES – The two contrasting problems that you might see with diabetes are brought on by too much or too little insulin. With too much insulin (and exercise can greatly decrease the need), the patient becomes shaky, pale, sweaty and complains of headache. Give something sweet by mouth as long as they are alert enough to swallow without choking. Diabetic acidosis (too little insulin) comes on more slowly and is characterized by sleepiness, warm, dry skin, thirst, puffing respiration, and a fruity odor to the breath. This can be brought on by infection which greatly increases insulin requirements. Giving sugar will not hurt the patient.

ENVIRONMENTAL PROBLEMS – The world around us is only rarely indifferent to our well-being. Most of the time the weather conditions require us to adapt in terms of body cooling or heating. When you lie in the shade with an air temperature of 88 degrees F., and no wind, your body is in equilibrium with

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the environment. Any change in terms of higher or lower temperature, wind and physical activity mean that physical work has to be performed by our bodies in the form of heating or cooling. In order to do this our bodies need fuel, and this comes from the food we eat. The greater the difference between ideal conditions and the environment you find yourself in, the greater amount of work your body must perform and the greater the fuel requirements. I will illustrate this in more detail for more specific situations.

COLD: The lowering of body temperature is called *hypothermia*, and occurs when your metabolic furnace is unable to keep up with heat loss. Factors which speed up heat loss are extreme cold, wind, lack of insulation, getting wet, and inadequate heat production. Imagine a group of hikers who start out in a warm valley on a sunny summer day. Their goal is an 8,000 foot peak. They start out dressed in shorts and their short-sleeved shirts because the air is warm, the sun is bright, and they are sheltered from any wind. By early afternoon they are at 5,000 feet, it has clouded over and started to drizzle. A strong wind has come up and the air temperature has sharply dropped. They stop for lunch and everyone puts on warmer clothing and rain parkas. Everyone except Jack. He is a strong young athlete and insisted he was not cold. He also skipped lunch because he said it would make him feel loggy, and he did not want to give up the lead position on the hike. As they climbed higher it got rapidly colder and windier and the drizzle changed to a fine driving rain. It soon became apparent that something was wrong with Jack. He seemed vague, unsure about his direction and footing, and finally just sagged down next to a large rock and was unable to get up. He was shivering uncontrollably, his facial expression was dull and his speech was slow and confused. Jack was suffering from hypothermia. Fortunately, others in the group recognized the symptoms and took immediate steps to correct it. Emergency camp was set up, a fire was started, Jack was stripped of his wet clothes and placed in a sleeping bag with another camper. Hot chocolate and soup were prepared and these were given to Jack as rapidly as he could swallow them. In about 20 minutes he stopped shivering (one of the body's methods of producing more heat", and his level of consciousness had returned to normal. The group wisely did not push on any further that day, but rested, ate heartily, and dried their wet clothes. Carbohydrates (sweets and starches) and fats produce quick, readily available energy. These may include hot drinks sweetened with honey or sugar, soups, liberal amounts of butter, margarine, cheese, chocolate, nuts and raisins. Proteins produce long-lasting energy reserves and include meats, cheese, eggs and milk. Water is essential to avoid dehydration.

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In sub-freezing temperatures, local hypothermia in the form of frost nip or frostbite can occur. The most common areas involved are the face (cheeks, nose or ears), and the hands and feet. Frost nip is usually painless and the area looks white and feels waxy. Immediate re-warming will usually correct the problem. Frostbite is a deeper, more serious injury and the affected part will be numb and board-like. Do not attempt re-warming until you have arrived at a point where no further danger of re-freezing will occur. A frozen foot can be walked on for a long distance without pain, or danger of further injury. If a painfully cold hand or foot suddenly stops hurting, stop immediately and inspect the involved part, because it may be a sign of more serious cold injury. Placing cold feet or hands against the bare skin of an understanding fellow-camper can be an effective means of re-warming. Rely on the buddy system to detect frost nip of the face since the affected individual will not be aware of any symptoms.

Clothing should consist of multiple, relatively thin layers, so you can have more options than just hot or cold. Inner clothing should be absorptive without matting (wool is best). Pay particular attention to covering the head, neck, wrists and groin, as these are all areas of potentially large heat loss. Have a waterproof outer covering available, since wet clothes lose all their insulation value and produce rapid chilling.

OVERHEATING: Strenuous activity in hot, humid, sunny conditions can cause *hyperthermia* (abnormally high body temperature), heat exhaustion or heat cramps. Heat cramps are the mildest form, producing painful spasms of the muscles and usually respond to rest and fluids. In heat exhaustion, the body temperature stays normal, the skin is cool and moist, and the victim is weak, often confused and feels faint. Treatment is rest in the shade, fanning or sponging with cool water and administering large amounts of lightly salted fluids. One teaspoon of salt per gallon of fruit drink supplies a favorable and still palatable ratio. Salt tablets can be a bit dangerous, because they are often nauseating and they do not force you to take an adequate amount of fluid.

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SKULL FRACTURE SYMPTOM:

Minor Injury
or *Immediate Symptoms:*

Headache.
Throbbing head.
Facial color reddish.
Pulse full and slow.
Minor scalp bleeding.
Bump on head where struck.
Consciousness.

Major Injury
Later Symptoms

Prolonged unconsciousness.
Blood or cerebrospinal fluid
from the ear, nose, or mouth.
Pulse weak and rapid.
Face color ashen.
Breathing labored and heavy.
Changes in eye pupils (unequal size,
dilated and not responsive to light.
Paralysis.
Skull indented or soft where struck.

The first aid administered to the victim of a head injury depends upon the severity of the injury. For minor injuries, for example, in which there is relatively little bleeding from the scalp, the first aid is the same as for any minor wound.

If the victim lost consciousness briefly, however, before being allowed to get up, he should be examined thoroughly to determine what injury has taken place. He should be asked, for example, to add some one-digit numbers, or who is the president, etc., to determine if his reasoning and memory are normal. He should be tested for balance, coordination, and vision during a "trial" walk. If no abnormalities appear and if he complains *only* of minor injury symptoms at most, he may be allowed to walk out *WITH ASSISTANCE AND CONSTANT OBSERVATION*. It should be noted that even though no signs and symptoms of major injury were observed at the time of the accident, a blood clot may form within the skull or internal bleeding or swelling can occur, which could prove fatal some time later.

If the victim exhibits signs of major head injury or worsening condition, he should be *EVACUATED IMMEDIATELY*. The need for prompt medical attention is urgent. Possible additional injury occurring during the evacuation is of less importance than immediate medical attention *WHEN THE VICTIM'S CONDITION IS PROGRESSIVELY DETERIORATING*. *CAUTION:* *Always* suspect a neck injury. Approximately 15% of all severe head injuries are associated with a broken neck.

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FRACTURE OF THE SPINE: Whenever a person has a pain in the neck or back following an accident, always consider the possibility of spinal fracture, even though local swelling and tenderness are absent.

Fractures of the neck (cervical) are most frequently caused by a blow on the head during a fall or by a falling rock. Examination for neck injury should always be conducted simultaneously with examination for a head injury.

1. Determine if the victim's neck hurts. If pain is severe, even if there are no local bruises, suspect a neck fracture or hemorrhage in the membranes covering the spinal cord.
2. Do not ask the victim to move his head. With a broken neck he is apt to have a great deal of muscular spasm and will not want to do so.
3. If other injuries permit, test for:
 - (a) Loss of muscular power in the arms or legs by asking the victim to move them carefully.
 - (b) Loss of sensation. Stroke various parts of the victim's body with a finger, asking if sensation is felt. Always check both right and left sides.
4. If doubt remains concerning the presence of a neck fracture, treat the victim as though he had one.

Before performing first aid, it must be realized that any forward flexion may sever the spinal cord, causing permanent paralysis or death. Therefore, extreme caution must be exercised when splinting or moving the victim. If turning or moving of the victim is absolutely required prior to splinting, he must be turned as a unit with the body and head in perfect alignment. One first aid-er should hold the head, exerting slight traction and rotating the head while others slowly rotate the trunk and legs.

It is essential that splinting be accomplished prior to moving the victim. There are two splinting methods that can be used. The first, and probably the most common, is the use of a neck collar. A wire splint approximately 3 to 4 inches wide and 12 inches long serves this function well. It is placed under the chin and around the neck, with the two ends joining in the back. This keeps the head supported and prevents forward movement. **CAUTION:** Use well-padded still or rigid materials such as wire splints or Ensolite. If the material is loose or unpacked, such as clothing, the head may not be supported rigidly enough to prevent forward flexion.

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The second method is to place a pad (stuff sack full of clothing, parka, ensolite, etc.) at the small of the neck. A sling, cravat, or tape is then placed around the forehead, running down the back, crossing and under the armpits, around the chest. This will keep the head, neck, and chest in a straight line and even slightly arched backwards.

For evacuation, the victim must be transported by rigid stretcher. Use of an improvised stretcher is **NOT RECOMMENDED**. The head must be secured to prevent any movement. This can be done by placing pads on all sides of the head and tying it down with webbing. It should be emphasized that it is just as important to prevent the rest of the body from moving as it is the head. Use of adequate padding keeps the victim from moving and reduces the risk of circulatory impediment from tight webbing or straps.

Fractures of the back (thoracic or lumbar) are extremely serious in that displacement or fracturing of the vertebrae can cause puncturing or severing of the spinal cord. If this occurs, it will result in partial or complete paralysis to all areas below the injury. If a person falls and lands on his feet or buttocks, the last two thoracic or any of the lumbar vertebrae are particularly susceptible to being injured in such an accident.

1. Check for loss of motor power and sensation by asking the injured to move his legs, feet and toes, and by testing his sensitivity to touch.
2. Determine the location of pain. If it is 2 or 3 inches to one side of the midline, there is probably a fracture of a transverse process (bony projection on either side of a vertebra). Pain that is deeper and in the midline of the spine indicates fractures of the vertebral body (main weight-bearing structure of vertebra).

There is little that can be done from a first aid standpoint. If the ground is cold, slowly and gently turn the patient onto his back, with one man keeping the victim's legs constantly in line with his body and another exerting tension on the head. Place insulative materials underneath him, including a small pad under the back to hyperextend it. With hyperextension, there is less likelihood of injury to the spinal cord. If there is any doubt regarding a possible back injury, send for help so that evacuation can be accomplished by rigid stretcher.

HEART ATTACK: A dreaded and fortunately uncommon crisis on the trail is heart attack (also called coronary thrombosis or myocardial infraction). Although you may think of this as a disease of old age, it occurs often enough in the 30's and 40's so that the diagnosis must not be excluded on the basis of age.

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The classic symptoms are a heavy, crushing pain under the sternum which may or may not radiate to the left arm or both arms, neck or jaws. It is frequently accompanied by profuse sweating and nausea or vomiting. The color will frequently be pale or ashen, and the victim looks anxious. Sharp stabbing pains to either side of the sternum or under the left breast are rarely heart pain.

If the patient has the above signs or symptoms, you must consider it a heart attack until proven otherwise (and that proof sometimes involves 24 – 48 hours of repeated testing).

The major cause of immediate or early death in heart attack is the development of an abnormal heart rhythm called ventricular fibrillation in which the heart muscle simply quivers and does not beat in a coordinated way. The blood pressure falls to zero and the patient quickly becomes deeply unresponsive even to severe pain. The only effective treatment in the field is doing immediate and accurate CPR, and taking immediate steps toward rapid evacuation.

Just a few words about CPR (Cardio-Pulmonary-Resuscitation). Since the level of this instruction is aimed at individuals who have considerable training and experience, I am assuming that you already are trained and effective in your CPR technique; it is not something that you can learn out of a book anyway. However, it is very important to remember that there is no room for sloppiness in doing CPR, that when done at its best you are just barely meeting physiological requirements for blood pressure, perfusion and respiratory exchange. Any deviation will probably reduce its effectiveness below critical levels and may superimpose such injuries as broken ribs and potential pneumo or hemothorax. I cannot urge you strongly enough to frequently review and reassess your technique.

Even when no serious dysrhythmias occur, the patient should be placed at immediate and complete rest, keep warm and comfortable, and continuously watched until he can be evacuated.

ANALYSIS OF THE PROBLEM WHEN FIRST ENCOUNTERED

CIRCULATION: If there is a heartbeat, what is its rate? Is it regular? Is it full or thready? What is the blood pressure? Is the circulation effective in terms of skin color and temperature? If there is no effective pulse or spontaneous respiration, this is a CPR and immediate resuscitation must be started.

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SHOCK: What is the skin color? Is it dry or moist? Is the pulse strong or weak? Does its rate increase when the victim is brought to a sitting position? Is the expression glazed or vacant? Is the level of consciousness depressed? Be thinking of the various causes of shock which can involve many different organs and systems.

CONSCIOUSNESS: Is the patient alert and oriented as to person, place and time? Is the emotional effect appropriate to the situation and the degree of injury? If the level of consciousness is altered, be specific and qualitative as to its nature. Do not use such terms as “semi-conscious”, “stuporous”, “comatose”, as they can mean different things to different people. Your objective is to describe the level of consciousness so that you or whomever you are delegating responsibility for this patient can tell if the state of consciousness is stable, getting better or worse. Think in terms of *STIMULUS AND RESPONSE*. The stimuli will be first. *VERBAL AND THEN PAINFUL* responses might be as follows, in order of increasing severity.

Responses to speech – Is it appropriate, intelligible? Are they able to be aroused with speech, or shaking – with ease, with difficulty, or not at all?

Response to pain – Is it purposeful (attempting to remove painful stimulus) or withdrawing? Or is it non-purposeful (just moaning or writhing), or no response at all.

Any spontaneous movement?

This is also a good time to examine the rest of the head for obvious injuries, bleeding, or draining from nose or ears, papillary equality, size and response. Check the occlusion of the teeth. Look for contact lenses in the eyes.

SPINE: The cervical and lumbar spine are the most vulnerable to injury. Is there movement, equal strength and sensation in all the limbs? Is there localized pain or tenderness to pressure over any vertebrae? If spinal injury is suspected, avoid all flexion and especially rotation. Slow, careful straightening or extension accompanied by traction is usually safe. At that point, measures should be taken to keep the body straight and stiff.

ABDOMEN: Look for objective signs of injury such as bruising, abrasions, lacerations. Blunt, non-penetrating wounds may show no external signs, but can produce severe internal injuries. Think of the SOS of the acute abdomen *Spasm* (guarding or tensing of abdominal muscles over an internal injury). *Ouch* (pain

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and tenderness to pressure). *Silent* (absence of bowel sounds). With injuries to lower ribs, there may be accompanying injury to the spleen or liver (keep checking the vital signs for indications of shock). Are respirations shallow or splinted? Does movement make the pain worse? Do not give anything by mouth to the patient suspected of having internal injuries.

LIMBS: Look for obvious deformities, asymmetries, or disturbances of function. Feel of the limbs from top to bottom for tenderness, deformity, or crepitus (a grating or crackling sensation under the fingers). Compress the pelvis from both sides and front to back, looking for pain as an indication of possible fracture. In shoulder injuries, if the patient can touch his hand to the good shoulder, there is no dislocation. If he can squeeze your hand between his knees, it is unlikely that there is any bony injury to the hips or femurs. Whenever possible, if a fracture is suspected, feel for pulses and temperature distal to the injury. If they are good, splint where they lie. If the pulses and temperature are diminished compared to the other side, some reduction may be needed before splinting is done. In open fractures with protruding bone ends, if evacuation to a hospital cannot be achieved in 2 – 3 hours, cleanse the wound as best you can, reduce the deformity with straight traction in the direction of the limb, apply pressure dressing and splint. In suspected fractures or dislocations, immobilize the injured limb and call for evacuation assistance.

Dislocated fingers can usually be reduced by a straight pull, after which they can be taped to a neighboring finger for support.

A fractured femur is extremely painful and can be the source of major blood loss. If a traction splint is not available or readily constructed, use the other leg as a splint. Put a block of anything rigid and about 3 – 4 “ thick under the good foot. Put a wrap of cloth around the foot of the injured leg, pull it down and under the block on the other foot and secure to the good ankle. Then bind both legs together with a little padding between the knees and ankles and begin evacuation.

SKIN: Look for obvious injuries such as laceration, abrasions, bruising and burns. Also note skin color and temperature, whether moist or dry. Most bleeding can be controlled by direct pressure to the wound. Do not rely on pressure points, as they are often hard to find, difficult to maintain, and are actually less effective than direct pressure, and also reducing blood flow to a much larger area than is needed.

If there are penetrating wounds of the skull, chest or abdomen, *DO NOT* remove the foreign object as you will not be able to control the possible internal bleeding. Evacuate immediately.

MEDICO – LEGAL PROBLEMS

In this day of “sue your son, sue your mother, sue your father, and your brother”, it is important to have some concept of legal liabilities in the performance of emergency care. The Good Samaritan Law is in effect in all of the United States and protects from liability the individual rendering usual and ordinary emergency first aid. This is comforting except for the fact that the type of care you might need to perform in field emergencies might be substantially beyond the definition of usual and ordinary. In such cases the performer is technically at risk. However, you are also enjoined by the law to do what you can to save life, save limb, save limb function, and save limb appearance – in that order. So it appears that you are caught somewhere between the frying pan and the fire. Again, it is necessary to consider the alternatives; and if a bold act is required to prevent what would be fairly certain death, loss of limb, or disfigurement, you must do what you can.

You should probably also know that even if you are protected from liability by the law, you can still be sued. Anyone can sue anyone for anything. The suit will probably not stand up in court, but it can be an unpleasant experience anyway. It is also a factor that the greater your training, the more is expected of you and the greater your responsibility in the eyes of the medical and legal community.

SUMMARY: The key phrase is *INTELLIGENT ANTICIPATION* in knowing your area, preparing yourself for the most likely needs and contingencies, acquiring the necessary skills and knowledge prior to setting out, being willing and able to improvise, exhibiting flexibility in your agenda and matching as best as you can your goals with your strength and resources.

Be informed, know what you are doing, know your limits, and be prepared.

HAVE A GOOD TRIP!

- 1 – First Aid Book
 - 2 – Triangular Bandages
 - 2 -- 4” Compress
 - 1 – 2” Compress
 - 1 – 24” x 72” Compress
 - 1 – Box of Band Aids
 - 2 – Elastic gauze wrap
 - 1 -- Roll of tape
 - 1 – Donband elastic porous bandage
 - 1 – Wire splint (use as splint or cervical collar)
 - 1 – Plastic bag containing:
 - a. large Band Aids.
 - b. moleskin (use before blisters develop).
 - c. butterfly closures.
 - d. paper clip (use for blood blisters under fingernails (heat it and poke hole through top of fingernail).
 - 1 – Box of Stingfoe
 - 2 – Neosporin antibacterial
 - 1 – Thermometer
 - 2 – Towelettes
 - 1 – Scissors
 - 1 – Tweezers
 - 1 – Safety pin
 - 1 – Clove oil (for toothaches)
 - 1 – Eye drops
 - 1 – Small soap
 - 1 – CA-1 Accident form
- 1 – small plastic kit containing common items so you do not need to open the large kit. It should contain Tylenol or Aspirin), band aids, Neosporin, and 1 Medihaler.

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400.17 FIRE

Fire is a part of the Wilderness environment. Along with other aspects of wilderness, it needs to be managed. Some wildernesses now have a natural fire management policy. Others will develop fire management plans in the future. The use of fire is essential if we are to maintain wilderness areas as we know them. The challenge is to make fire work for us, not against us.

Fire prevention should be part of all visitor contacts during the fire season. Most man-caused wildfires begin as campfires. Smoking is the second major cause. Review the prescribed Natural Fire Policy for BWCAW.

If you receive a call from the dispatcher directing you to a fire, make sure you get all pertinent information. Leave your radio on. Use your experience and training in fire suppression. If you feel you cannot handle a situation, call for help.

Fire fighting in a wilderness may require special tactics. Care is needed to insure that suppression efforts do not permanently damage the environment. Pumps and chain saws can be used in fire suppression; anything that leaves wheel marks or “tracks” requires the Regional Forester’s approval! If you need any such equipment, request approval of use through the dispatcher.

A wilderness visitor may notify you of a fire or you may detect one. If so, call the dispatcher immediately if you have radio contact. Relay all information and await instructions. Record in detail all people, dogs, vehicles, etc. seen around area (may provide clues to cause of fire). If you cannot contact the dispatcher, take action on your own.

If you receive information on a fire that was extinguished by a member of the public, record the name and address of those that helped. At the very least, a letter of thank you would be sent, and possibly they could be paid for their efforts. In that they are generally not qualified fire-fighters, or have proper equipment, you should relieve them as soon as practical. Make sure you thank them for their efforts.

Relay pertinent information to the dispatcher. Usually this type of fire needs to be checked. Those inexperienced in fire suppression often do not realize the need for mop-up. These fires can flare up again in a day or two if no further work is done on them.

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Certain information is kept on all wildfires in the National Forests. You should make a record of the following items on all fires you have suppressed:

Location: Pinpoint on a map or use a legal description.

Size: Estimate in acres. You can pace the perimeter and get an estimate later from a chart.

Cause: If man-caused, investigate using your law enforcement training.

Date and time of control:

Type of fuels fire burned:

Number of persons assisting in suppression:

Make sure you have all of your required fire gear before you start your trip.

400.18 CULTURAL RESOURCES

Cultural resource sites are present throughout the BWCAW. As managers of the wilderness, *you* are responsible for their protection.

During the course of your travel and work, you will probably observe cultural resource sites in the form of stone chips and/or arrowheads, pieces of pottery, old dumps, earthen embankments, or old building foundations, remnant of old logging dams, treaties, and the like. You have been provided plastic bags and site forms (2300-53 – 4/81). When stone chips, arrowheads or pottery are observed, collect the materials from the surface and bag them. *DO NOT DIG!* In addition, fill out a site form (see Exhibit #1) and place it in the bag with the cultural materials. In the case of historic dumps, foundations, etc., simply fill out a site form. Do not attempt to collect any cultural materials from these types of sites. When you return to the District at the end of your trip, turn the completed bags and site forms over to your District's Cultural Resource Paraprofessional, or the District's BWCAW Supervisory Technician.

There are various laws and regulations which provide penalties of up to 10 years in prison and \$100,000 fine for collecting, excavating, removing, damaging, altering, defacing, or transporting cultural resources located on Federal lands. Should you observe any individual in the process of collecting or removing cultural resources, courteously inform them of the legality of their actions. While the use of a metal detector is not illegal, the collection of any located material is. If the individual continues to collect or remove materials, the artifacts should be confiscated and the individual cited. In the case of excavation, destruction, or malicious intent, the cultural materials excavated and tools used in the excavation or destruction should be confiscated, and the District contacted for further instructions.

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BWCAW CULTURAL RESOURCES SITE FORM

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400.19 CAMPSITE CONSTRUCTION

The new campsites on your route will be planned by the District staff. Your job will be to do the actual construction.

Several considerations must be made when constructing a campsite.

1. *THE LANDING*: Preferably one of ledgerrock to minimize erosion and site deterioration.

If there are any rocks or logs that interfere with the landing, they should be removed.

2. *THE FIREGRATE AREA*: A base of ledge where the grate can be drilled in or mineral soil where the grate can be dug in. Diagrams at the end of this section illustrate firegrate installation.

3. *THE TENT PADS*: usually new tent pads will have to be cleared of brush and roots, rocks removed and leveled. The tent pads should be located away from tall trees and *their root systems – LIGHTENING IS A PROBLEM!*

Don't construct tent pads where water will be a problem during rainy weather. Generally clear enough area for an 8' x 10' tent.

4. *THE LATRINE*: Latrines are a special problem in our terrain. A soil auger is used to test for soil depth. We look for locations where we have at least three feet of soil. The latrine must be at least 100 feet away from water. It should never be visible from the campsite or waterway. See Exhibit #2 for a diagram of the new fiberglass latrine. (Include latrine installation instructions.)

5. *THE LATRINE TRAIL*: Care should be taken to insure that the latrine is not visible from the site. This can be achieved with a curved "J" or hook-shaped trail.

6. *HAZARD TREES*: remove all hazard trees, cutting the stumps as low to the ground as possible. Take the tops of the trees off the site. Stack the rest for firewood.

7. *BRUSHING AND PRUNING*: Cut all brush low and take it off from the campsite to dispose of it. Prune trees close to the trunk of the tree, which aids the tree in healing the scar.

PROPER INSTALLATION OF THE F. S. FIRE GRATE

The grate should be assembled with proper size bolts. The assembled grate should then be set or dead-headed in a trench 5' x 1' x 16". The grate should be *leveled* before setting the logs in. You will need 2 or 3 logs (not rotten) not less than 3" diameter. Make sure the logs are set firmly on the cross bars of the grate as well as the bottom of the trench otherwise you may dislodge the leveled grate when you fill the trench. After logs are placed on the bottom, large rocks are used to further anchor the grate.

The trench should now be refilled. Be careful not to mix duff with the soil used for fill. The area of the fireplace should be clear of duff and roots. There should be no duff within 3' of the fireplace. Small 6 – 12" rocks should be piled on 3 sides of the fireplace.

The natural fire area should be high enough so that it will not collect water.

400.20 *CAMPSITE MAINTENANCE*

1. Latrine
 - a. Wash latrine top, including under and behind lid. Be sure to wash off dead bugs, spider webs, leaves and needles.
 - b. The bottom of the inside boards is the "full" mark. Re-dig before you have a bigger problem.
 - c. Shore up any holes around latrine base with sound, peeled logs or rocks and cover with dirt.
 - d. Brush latrine trail by making a "J"-shaped trail so that the latrine can be adequately screened out of view of the campsite.
 - e. Brush and prune small area around latrine for air circulation and to let sunlight in.
2. Fire Grate
 - a. Reset fire grate if necessary, making sure it is level and firmly anchored according to diagram. Put the size rocks around it that users can move so as to take advantage of the wind.
 - b. Clean out all litter.
 - c. Shovel out ashes periodically and scatter away from site.
 - d. Level the fire area with dirt (not duff) so it does not collect water.
 - e. Wash fire grate if there is grease, food, etc., on it.
 - f. Break up any rock rings. Scatter rocks and ashes. Cover fire area with leaves and needles.
 - g. Prune any branches above fire grate.
 - h. Fire grate should be 10" above the ground.
3. General Campsite
 - a. Pull nails, using something to pry against so you don't injure the tree.
 - b. Cut down any rope.
 - c. Break up homemade tables, etc.
 - d. Prune the landing, tent site and cooking area, leaving screening in the direction of other near-by campsites.
 - e. Pick up any litter.
 - f. Level tent pads. Use 10' x 12' as a guide.
 - g. Check landing for erosion. Correct with rocks and, if serious, make a note so your supervisor can check.
 - h. Cut any new sprouts coming in.

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- i. Rake and remove any heavy concentrations of wood chips.
- j. Cut stumps low to the ground and remove hazard trees.
- k. Bury any open latrines.
- l. Remove any trash in the water.

UNDEVELOPED CAMPSITES

- a. Break up any rock rings, scatter ashes and cover burn area with leaves and needles (be sure burn area is dead out).
- b. Drag deadfalls and branches in on "used" portion of site and on landing to discourage future use.
- c. If necessary, transplant small trees or brush to fill in site.

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400.23 **STANDARDS & SPECIFICATIONS
FOR TRAIL & PORTAGE WORK**

The guidelines and standards are written to be used by supervisors and trail and portage crews. They reflect local and unique conditions of the BWCAW. The methods and principles used for their development are based upon worth proven by past experience and use.

1. *Objectives of Trail and Portage Construction*
 - a. To provide a safe and unobstructed passage for foot travelers carrying canoes and other heavy loads.
 - b. To design and construct trails and portages durable enough to meet expected use and minimize maintenance costs.
 - c. To fit the type of construction and maintenance to the appropriate recreation opportunity class (ROC).

2. *Selection of Appropriate Guidelines*
 - a. The selection of appropriate guidelines will depend on which management area the trail is in. You must refer to the maps and text in the BWCAW Management Plan and Implementation Schedule.