Appendices

Appendix A
Glossary

AAC. Alaska Administrative Code that includes state regulations.

ADA (Americans with Disabilities Act of 1990). A federal law prohibiting discrimination against people with disabilities. Requires public entities and public accommodations to provide accessible accommodations for people with disabilities.

ADF&G. The State of Alaska, Department of Fish and Game.

Adjacent parcel. Parcels that lie near the boundary of NLSRA and NLSRS but do not share a common boundary line with the NLSRA and NLSRS.

Airboat. A shallow draft boat driven by an airplane propeller and steered by a rudder (11 AAC 20.990).

Aircraft. Any motorized device under 12,500 pounds gross weight that is used or intended for flight or movement of people or goods in the air (11 AAC 12.340 and 11 AAC 20.990).

Anadromous Stream. Those water bodies identified by the Department of Fish and Game under 5 AAC 95.011.

AS. Alaska Statutes.

Assembly. The gathering or meeting of a group of people for a common purpose (11 AAC 12.340 and 11 AAC 18.200).

Boat or Vessel. A device that is used or designed to be used for the movement of people or goods in or on the water, whether manually or mechanically propelled, but does not include personal floatation devices or other floats such as inner tubes, air mattresses, or surf boards (11 AAC 20.990).

Camp and Camping. To use a vehicle, tent, or shelter, or to arrange bedding, or both, with the intent to stay overnight in a park (11 AAC 12.340).

Campground. An area developed and maintained by the division which contains one or more campsites. (11 AAC 12.340).

Commercial Activity. The sale of, delivery of, or soliciting to provide, goods, wares, edibles, or services in exchange for valuable consideration through barter, trade, or other commercial means; a service offered in conjunction with another sale of goods, wares, edibles, or services, which service involves the use of state park land or water, is a commercial activity whether or not it is incidental to, advertised with, or specifically offered in the original sale; all guide, outfitter, and transportation services are commercial activities if any payment or valuable consideration through barter, trade, cash, or other commercial means is required, expected, or received beyond the normal and customary equally shared costs for food and fuel for any portion of the stay in the park (11 AAC 12.340).

Contiguous Parcel. Parcels that are outside of the NLSRA or NLSRS, but share a common boundary with NLSRA or NLSRS.

Developed Facility. Includes a building, boat ramp, campground, picnic area, rest area, visitor information center, swim beach, trailhead, parking area, and a developed ski area (11 AAC 12.340 and 11 AAC 20.990).

DNR or Department. The State of Alaska Department of Natural Resources.

DPOR or Division. The State of Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation.

Director. The Director of the Division of Parks and Outdoor Recreation, Department of Natural Resources, or the Director's authorized agent (11 AAC 12.340).

Easement. An interest in land owned by another, that entitles its holder to a specific limited use.

Firearm. Includes a pistol, rifle, shotgun, revolver, mechanical, gas, or air-operated gun (11 AAC 12.340); *and*, Includes a pistol, rifle, shotgun, revolver, or mechanical gas or air-operated gun (11 AAC 20.990).

Goal. A statement of basic intent or general condition. Goals are not quantifiable and do not have specific dates for achievement; they are long-term in orientation.

Guideline. A specific course of action that must be followed when a DPOR resource manager permits, leases, or otherwise authorizes use of state lands. Guidelines range from giving general guidance for decision-making or identifying factors that need to be considered, to setting detailed standards for on-the-ground decisions.

HLB. The Municipality of Anchorage's Heritage Land Bank.

ILMA. Interagency Land Management Agreement previously known as an "ILMT" or Interagency Land Management Transfer.

Inholding. Private property that is within the boundary of NLSRA.

Legislative Designation. An action by the State Legislature that sets aside a specific area of state land as a Special Purpose Site.

LWCF. Land and Water Conservation Fund. A federal program which provides monies and matching grants to federal, state, and local governments for the acquisition and/or development of land and water for public outdoor recreation use.

May. Same as "should", see Should.

Motorized Vehicle. A motorized device for carrying persons or objects over land, water, or through the air, and includes automobiles, snowmachines, bicycles, off-road vehicles, boats, and aircraft (11 AAC 21.290).

MSB. The Matanuska-Susitna Borough.

NLSRA. Nancy Lake State Recreation Area.

NLSRS. Nancy Lake State Recreation Site.

Objective. A concise statement of what we want to achieve, how much we want to achieve, when we want to achieve it, and who is responsible for the work.

Off-Road Vehicle (ORV). A) A motorized vehicle: i) designed or adapted for cross-country operation over irregular terrain, ii) consisting of more than one drive wheel or track, iii) having a gross vehicle weight less than 1,500 pounds or exerting less than eight pounds per square inch ground pressure; and, iv) that is 64 inches wide or less; B) does not include snowmobiles (11 AAC 20.990). May also be referred to as an All-Terrain Vehicle (ATV).

Permit. A written authorization to engage in uses or activities that are otherwise prohibited or restricted (11 AAC 18.200).

Personal Watercraft. A vessel that is less than 16 feet in length, propelled by a water-jet pump or other machinery as its primary source of motor propulsion, and designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than by a person sitting or standing inside it (11 AAC 20.990).

RV. Recreational Vehicle, such as a motor home or camper.

SCORP. Statewide Comprehensive Outdoor Recreation Plan.

Shall. Same as "will", see Will.

Should. States intent for a course of action or a set of conditions to be achieved. Guidelines modified by the word "should" state the plan's intent and allow the manager to use discretion in deciding the specific means for best achieving the intent or whether particular circumstances justify deviations from the intended action or set of conditions.

Snowmobile (snowmachine). A self-propelled vehicle intended for off-road travel on snow, having a maximum width of 50 inches and a curb weight of not more than 1,000 pounds, driven by one or more tracks in contact with the snow, and steered by one or more skis in contact with the snow (11 AAC 20.990).

Social trail. A trail that has been developed by repeated use by people, not sited and designed by agency staff as part of a decision process.

State. The State of Alaska.

State Park. Any land or water managed by the division (11 AAC 12.340 and 11 AAC 18.200); *and,* Any land or water managed by the division of parks and outdoor recreation (11 AAC 20.990).

State Waters. All surface waters within the Nancy Lake State Recreation Area.

Structure. Something constructed or built in, or transported to, a state park unit, including a dock, cabin, floatcamp, building, shanty, or facility used for residential or commercial purposes; it does not include a vessel with overnight berthing whose primary use is not as a domicile, but for commercial or sport fishing, general recreational boating, or transportation.

Traffic Control Device. Any physical barrier, including a boulder, ditch, berm, railing, fence, post, or gate (11 AAC 12.340).

Trailhead. The point at which a trail starts.

Vehicle. A mechanical device for carrying persons or objects over land, water, or through the air, including automobiles, motorcycles, snowmachines, bicycles, off-road vehicles, motorized boats, and aircraft. Vehicle does not include non-motorized sailboats, canoes, kayaks, rafts, sailboards, hang gliders, gliders, or parasails (11 AAC 12.340); *and,* A mechanical device for carrying persons or objects over land, water, or through the air, including automobiles, motorcycles, snowmachines, bicycles, off-road vehicles, motorized boats, and aircraft 11 AAC 20.990)

Weapon. Includes a bow and arrow, slingshot, crossbow, or firearm (11 AAC 12.340); *and,* Includes a bow and arrow, slingshot, crossbow, and firearm (11 AAC 20.990).

Will. Requires a course of action or a set of conditions to be achieved. A guideline modified by the word "will" must be followed by land managers and users. If such a guideline is not complied with, a written decision justifying the noncompliance is required.

Appendix B
Nancy Lake State Recreation Area Specific Statutes and Regulations

Alaska Statutes 41.21.450 -41.21.465

Sec. 41.21.450. Purpose of AS 41.21.450 - 41.21.465.

The purpose of AS 41.21.450 - 41.21.465 is to restrict state-owned land and water within the boundaries described in AS 41.21.455 to use as a public recreation area. Under the provisions of AS 38.05.300, state land, water, or land and water containing more than 640 acres may be closed to multiple purpose use only by act of the legislature. Inasmuch as the area described in AS 41.21.455 exceeds 640 acres, AS 41.21.450 - 41.21.465 are intended to except the area described from the provisions of AS 38.05.300.

Sec. 41.21.455. Nancy Lake State Recreation Area established.

(a) The presently state-owned land and water and all that acquired in the future by the state, lying within the following described boundary, are hereby designated as the Nancy Lake State Recreation Area, are reserved from all uses incompatible with their primary function as public recreation land, and are assigned to the department for control, development, and maintenance:

Beginning at the brass capped monument marking the one quarter corner position, common to Section 34 and Section 35, Township 19 North, Range 5 West, Seward Meridian, Alaska, which is the true point of beginning; thence easterly along the 1/4 line of Section 35 to the west shore of an unnamed lake; thence meandering said lake clockwise in a northerly and southerly direction to a point where said meanders intersect the east-west 1/4 line of Section 35; thence easterly along the 1/4 line of Section 35 to the west shore of an unnamed lake; thence meandering said lake clockwise in a northerly and easterly direction to a point where said meanders intersect the east-west 1/4 line of Section 35; thence easterly along the 1/4 line of Section 35 to the 1/4 corner position common to Section 35 and Section 36; thence southerly along the section line common to Sections 35 and 36 to the common corner between Sections 35 and 36, Township 19 North, Range 5 West, Seward Meridian and Sections 1 and 2, Township 18 North, Range 5 West, Seward Meridian; thence easterly along the common line between said Sections 1 and 36 to the common corner of Section 1, Township 18 North, Range 5 West and Section 36, Township 19 North, Range 5 West and Section 31, Township 19 North, Range 4 West and Section 6, Township 18 North, Range 4 West; thence easterly along the common line between said Sections 31 and 6 to the 1/4 corner position common to Sections 31 and 6; thence northerly along the 1/4 line of Section 31 to the C 1/4 corner positions; thence easterly along the 1/4 line of Section 31 and Section 32 to the C 1/4 corner position of Section 32, Township 19 North, Range 4 West; thence

northerly along the 1/4 line of Section 32 and Section 29 to the C-N-S 1/64th corner position of Section 29, Township 19 North, Range 4 West; thence easterly along the N-S 1/64th line of said Section 29 to the N-S 1/64th corner position common to Section 29 and Section 28; thence southerly along the east section line of Section 29 and Section 32 to the S-N-N 1/256th corner position of said Section 32; thence westerly along the S-N-N 1/256th line to the SE-NE-NE 1/256th corner positions; thence southerly along the E-E-E 1/256th line to the NE-SE-NE 1/256th corner position; thence easterly along the N-S-N 1/256th line to the N-S-N 1/256th corner position; thence southerly along the east boundary of Section 32 to the S-N 1/64th corner position of said Section 32; thence westerly along the S-N 1/64th line to the C-E-SE-NE 1/256th corner position; thence southerly along the E-E-E 1/256th line to the north shore of Nancy Lake; thence meandering said lake clockwise in an easterly, northerly, and southerly direction to a point where said meander line intersects the north line of Section Lot 41, Section 33, Township 19 North, Range 4 West; thence easterly along said north line to the NE corner of said Lot 41; thence southerly along the east line of said Lot 41 to the north shore of Nancy Lake; thence meandering said lake in an easterly, northerly, southerly, and westerly direction to a point where said meander line intersects the east line of Section Lot 54, Section 33, Township 19 North, Range 4 West; thence southerly along said east line of said Lot 54 to the east shore of Nancy Lake; thence meandering said lake in an easterly, northerly, southerly, and westerly direction to a point where said meander line intersects the N-N-N 1/256th line of Section 4, Township 18 North, Range 4 West; thence westerly along said N-N-N 1/256th line to the NE-NW-NW 1/256th corner position; thence southerly along the E-W-W 1/256th line to the SE-NW-NW 1/256th corner position; thence easterly along the S-N-N 1/256th line to the C-S-N-NW 1/256th corner position; thence along the W 1/16th line to the C-W 1/16th corner position; thence westerly along the 1/4 line to the 1/4 corner position common to Section 4 and Section 5; thence southerly along the east section line of Sections 5, 8, 17, 20, 29, 32, and 5, to the section corner common to Sections 4, 5, 8, and 9, Township 17 North, Range 4 West; thence westerly along the section line common to Section 5 and Section 8 to the E 1/16th corner position; thence southerly along the E 1/16th line to the SE 1/16th corner position of said Section 8; thence westerly along the S 1/16th line to the C-S 1/16th corner position of Section 7, Township 17 North, Range 4 West; thence northerly along the 1/4 line to the C 1/4 corner position of Section 6, Township 17 North, Range 4 West; thence westerly along the 1/4 line of said Section 6 to the east shore of Butterfly Lake; thence meandering said lake clockwise in a southerly, northerly,and westerly direction to a point on the west shore of Butterfly Lake where said meander line intersects the north section line of Section 1, Township 17 North, Range 5 West; thence westerly along the north section line of Section 1 and Section 2 to the point of intersection with line 9-10 of U.S. Survey No. 4638; thence south to Corner No. 4, Lot 3 of said U.S. Survey No. 4638; thence west along the north line of said Lot 3 to the point of intersection with the north-south section line common to Section 2 and Section 3; thence northerly along the west section line of Sections 2, 35, and 26, to the point of intersection with line 3-4 of U.S. Survey No. 3869, Township 18 North, Range 5 West; thence west along said line 3-4 of U.S. Survey No. 3869 to the point of intersection with the E 1/16th line of Section 27; thence northerly along said E 1/16th line to the point of intersection with line 1-2 of U.S. Survey No. 3869; thence west along said line 1-2 to Corner No. 1 of said U.S. Survey No. 3869; thence N 20 to 06' E along line 2-3 of Lot 31, U.S. Survey No. 3868 for a distance of 268.62 ft. to Corner No. 2 of said

Lot 31; thence N 69 54' W along line 1-2 of said Lot 31, to the east shore of Red Shirt Lake; thence meandering said lake clockwise in a southerly, westerly, easterly, and northerly direction to a point where said meander line intersects line 3-4 of Lot 3, U.S. Survey No. 3868; thence west along said line 3-4 to Corner No. 3 of Lot 3, U.S. Survey No. 3868; thence south along line 2-3 of said Lot 3 to the point of intersection with the east-west section line common to Section 21 and Section 28, Township 18 North, Range 5 West; thence westerly along said section line to the section corner position common to Sections 20, 21, 28, and 29, Township 18 North, Range 5 West; thence northerly along the section line common to Section 20 and Section 21 to the section corner position common to Sections 16, 17, 20, and 21; thence easterly along the section line common to Section 16 and Section 21 to the 1/4 corner position common to said Sections 16 and 21; thence northerly along the 1/4 line of Section 16 to the C 1/4 corner position of said Section 16; thence easterly along the 1/4 line of Section 16 to the 1/4 corner position common to Section 15 and Section 16; thence northerly along the section line common to Section 15 and Section 16 to the section corner position common to Sections 9, 10, 15, and 16; thence easterly along the section line common to Section 10 and Section 15 to the 1/4 corner position common to said Sections 10 and 15; thence northerly along the 1/4 line of Section 10 to the 1/4 corner position common to Section 3 and Section 10; thence easterly along the section line common to Sections 3 and 10 to the section corner position common to Sections 2, 3, 10, and 11; thence northerly along the section line common to Section 2 and Section 3, Township 18 North, Range 5 West, and Section 34 and Section 35, Township 19 North, Range 5 West to the brass capped monument marking the 1/4 corner position common to said Sections 34 and 35 which is the true point of beginning.

(b) Nothing in this section affects the right of an organized borough to extract gravel from land that is located within the recreation area and that has been selected by the borough before April 22, 1970 under former AS 07.10.150 - 07.10.160.

Sec. 41.21.460. Incompatible uses.

The commissioner shall designate by regulation incompatible uses within the boundaries of the Nancy Lake State Recreation Area in accordance with the requirements of AS 41.21.450, and those incompatible uses designated shall be prohibited or restricted, as provided by regulation.

Sec. 41.21.465. Purchase authorized.

The commissioner may acquire, by purchase in the name of the state, title to or interest in real property lying within the boundaries of the Nancy Lake State Recreation Area.

Alaska Administrative Code 11 AAC 20.540 – 11 AAC 20.555

11 AAC 20.540. Use of weapons.

The use and discharge of a bow and arrow or trap for the purpose of lawful hunting or trapping is allowed in the Nancy Lake State Recreation Area, except within one-quarter mile of a developed facility.

11 AAC 20.545. Aircraft.

(a) Except as provided in (b) and (c) of this section, the use of aircraft is allowed in the Nancy Lake State Recreation Area.

(b) The use of float-equipped aircraft in the Nancy Lake State Recreation Area is prohibited on

(1) South Rolly Lake;
(2) Bald Lake;
(3) Tanaina Lake;
(4) Milo Lake;
(5) Ardaw Lake;
(6) Jacknife Pond;
(7) Frazer Lake;
(8) Little Frazer Lake;
(9) Charr Lake;
(10) Owl Lake;
(11) James Lake;
(12) Chicken Lake;
(13) Big Noluck Lake;
(14) Little Noluck Lake;
(15) Milo Pond;
(16) the Echo Ponds;
(17) Candlestick Lake;
(18) Buckley Lake; and
(19) Skeetna Lake.

(c) The use of aircraft for the purpose of practice landing is prohibited in the Nancy Lake State Recreation Area.

11 AAC 20.550. Motorized boats.

(a) The use of motorized boats is allowed in the Nancy Lake State Recreation Area on

(1) Nancy Lake;
(2) Lynx Lake;
(3) Butterfly Lake;
(4) Red Shirt Lake; and
(5) the Little Susitna River.

(b) A person may not use a personal watercraft on Red Shirt Lake.

(c) A person may use an electric trolling motor on South Rolly Lake.

11 AAC 20.555. Snowmobiles.

If the director finds that the snow depth is adequate to protect underlying vegetation, the director shall open Nancy Lake State Recreation Area to the use of snowmobiles south of the Nancy Lake Parkway.

Appendix C
Trail Plan: Nancy Lake State Recreation Area and Nancy Lake State Recreation Site

Introduction

Background

The 1983 Plan for NLSRA and NLSRS indicated that hiking trails were the most requested facility and that trail development was a high priority of that plan. As a result, a number of new trails were proposed; however, few of these trails were developed between 1983 and today. Similar to the 1983 Plan, this plan continues to place an emphasis on trail development as a cost effective means to diversify, expand, and enhance recreation opportunities. This plan conceives a looped system of trails that will accommodate a diversity of uses and provide access to areas that have previously seen little public use due to lack of access or developed facilities. These new trails will be developed to minimize impact on the natural environment and minimize maintenance costs consistent with a recently adopted trail policy.

In March 2009 the Division of Parks and Outdoor Recreation (DPOR) finalized a Trail Management Policy[1] that provides direction on how the Division will manage, develop, maintain, and assess the condition of state park trails. The policy provides goals and trail management concepts for sustainable and responsible trail development and management. This trail plan was developed consistent with the concepts in the Trail Management Policy and will serve as the framework for management and trail development within NLSRA and NLSRS. The use of sustainable trail design will result in a number of long-term benefits including a reduction of long-term maintenance costs and reduced impacts to the adjacent natural habitats. The DPOR Trail Management Policy includes terminology and concepts that are similar to those commonly found in other trail plans and guidance documents. This consistency enhances agency, organization, and public understanding of trail recommendations in this plan and should result in enhanced coordination with partners interested in trail development within NLSRA and NLSRS.

Comprehensive mapping of existing trails at NLSRA took place in the summer of 2011. The result was the mapping of approximately 36.3 miles of trail that are used during snow free periods. These trails included the three primary hiking trails, the two canoe trail loops, and a number of short access trails. Only existing and proposed trails that are, or will be, actively managed by DPOR are identified in this trail plan.

[1] See Appendix E

This trail plan addresses the three types of trails – Terra (land), Water (includes waterbodies and portages), and Snow. NLSRA currently has three terra trails that receive some level of active management from DPOR – Red Shirt Lake Summer Trail, East Red Shirt Lake Summer Trail, and the Chicken Lake Cross-Park Trail. Portages associated with the water trails (canoe trails) receive periodic maintenance. Only minimal maintenance of snow trails has occurred, and includes grooming of cross-country ski trails and some clearing of vegetation.

Why Develop A Trail Plan?

Development of trails recommended included in this plan will help DPOR fulfill the dominant management objective of recreation areas: "to provide a maximum level of outdoor recreational opportunities based on the natural values of the unit and its ability to sustain use without significant adverse effects on natural systems." This objective will be met by allowing multiple-use of trails and by incorporating sustainable design standards to new and redeveloped trails. This trail plan provides a road map for DPOR to follow when redeveloping existing trails to sustainable standards and when developing new trails. It provides the desired future condition for trails, not an inventory of the current state of a trail. Because this plan uses terms and concepts that are adapted from national and statewide trail processes DPOR will be able to partner with local and federal agencies and non-agency groups to develop trails that are consistent with the purposes and intent of NLSRA and NLSRS. This relationship will encourage stewardship of the area by the public and foster positive relationships with supporters of outdoor recreation. Finally, including specific trail recommendations in this plan allows DPOR to pursue funding for development of trails.

Trail Sustainability

The 2009 DPOR Trail Management Policy defines a sustainable trail as: a trail that conforms to its terrain and environment, is capable of handling its intended use without serious degradation, and requires minimal maintenance. These trails are sited properly within the natural environment and are designed to accommodate uses with minimal degradation of the trail tread or impacts to the adjacent natural resources. While the initial development costs may be higher, a sustainable trail will cost less to maintain long term. Fundamental sustainable trail design incorporates integrated water control, curvilinear layout, grade control, and full bench construction.

The following guidelines will be considered and integrated when building or improving trails within NLSRA and NLSRS. At times, certain circumstances may make the use of some of these guidelines difficult or impossible to fully implement. In these cases reasonable measures should be taken while maintaining the spirit of the guidelines. Some segments of

the existing trails do not yet meet the sustainable standards. Where this is the case, a higher level of maintenance is required to keep the trail tread in reasonably good condition while minimizing impacts on natural resources.

Trail Sustainability Guidelines:

The Six Essential Elements of Sustainable Trails[2]

1. *The Half Rule*: Trail grade should not exceed ½ the sideslope that the trail traverses, if so, it becomes a Fall-line Trail.
2. *The 10% Average Guideline*: The average trail grade, or overall trail grade should not exceed 10% along the alignment of the trail. In many cases, keeping trail grades at about 10% will assure longer term sustainability, and this should be an objective for all trail projects, unless specifically designed at greater grades.
3. *Maximum Sustainable Grade*: A defined maximum tread grade that can be constructed along the trail. Typically restricted to runs of less than 50 feet, and no more than 5% of total length of the trail. Determining the Maximum Sustainable Grade for a trail involves many variables that are specific to a region or trail section. For example, soils that have a very high organic content will be less stable than those that are composed of weathered granite. Variables influencing the Maximum Sustainable Grade include:
   - Soil type
   - Presence of surface rock or bedrock
   - Annual rainfall / intensity
   - Type and spacing of integrated water control features
   - Types of users
   - Numbers of users
   - Desired level of difficulty
4. *Grade Reversals*: A spot at which a climbing trail levels out and then changes direction, dropping subtly a short distance (6-12 feet) before rising again. Ideally, Grade Reversals are incorporated into a trail's initial design as part of its Curvilinear Layout. Water control features such as Rolling Grade Dips and Knicks can be integrated into an existing trail as a maintenance item. Water bars are not recommended due to their higher maintenance requirements.
5. *Outslope*: As the trail contours across a hillside, the downhill or outer edge of the tread should tilt slightly downhill and away from the uphill trail edge. Under typical circumstances, this "Outslope" should be less than 5%. Anything greater will usually lead to tread creep and user discomfort. Outslope is influenced by the forces of compaction, displacement, and erosion, which collectively reduce the effectiveness of

[2] Derived from Alaska Trails Curriculum

the design element. Even on trails that are constructed with proper outslope, it will often deform through time and routine maintenance is needed to restore a trail tread to its designed outslope with these forces in mind. The integration of Grade Reversals and Rolling Grade Dips insure that water is managed along the trail if outslope is compromised.

6. *Durable Tread Surface*: Surfacing should take into consideration special characteristics of the soils such as the presence of permafrost, organic/muskeg soils, volcanic ash, saturated soils, or some other environmental challenge. Many trails in Alaska are not sustainable due to flat terrain or the soil characteristics noted above. In these cases tread surfaces require trail hardening to ensure sustainability. Trail hardening includes techniques such as gravel capping, boardwalk and planking decking, the use of geotextile surfaces and other means to provide a sustainable tread.

Avoid Flat Terrain Trails when Possible

The premise of Trail Sustainability is built around integrated water control. Flat terrain (<3% surface slope) represents a great challenge since often when trails are constructed in these situations, there is no provision for drainage – the trail tread becomes the lowest point and thus collects water. These situations include: valley floors, glacial plains, deltas, and wetlands. This is especially problematic in Alaska where many historic trails which were originally intended for winter use were built across wetlands, but are now being used in the summer.

Common Trail Practices or Structures to Avoid when Possible

- Fall-Line Trails (exceeding the half rule)
- Waterbars (difficult to properly construct, high-maintenance)
- Culverts – installing too small of diameter (difficult to maintain, fish passage issues)
- Grades too steep for sustainability (exceeding 10% average grade)
- Improper bridge location
- Lack of Grade Control along alignment (highly variable grades)
- Improper trail location (or non-curvilinear layout)
- Improper outslope (entrenched tread, <3% or >7%, poorly maintained)
- Failure to identify critical control points during layout
- Improper or failure to acquire proper permits (poor planning)
- Construction in a flood zone (poor planning)
- Construction in a sensitive habitat (poor planning)
- Construction on flat terrain (valley bottoms, ridgelines, etc.)

Visitor Experience

Many elements contribute to a visitor's experience while traveling on a trail. Every effort shall be made throughout the trail planning and construction process to consider the visitor's experience. It is important to keep trails interesting, appreciated, and respected to engender stewardship among users. Understanding core values is the key to being able to provide a good visitor experience. There are basic values associated with safety and convenience and recreational values associated with fitness and various transportation methods. Human values are important to recognize, understand and consider. These values include how trails and their surroundings are perceived, and how their shape affects people. An individual perception of how safe and appropriate the trail is to use must be balanced with the reality that a certain amount of risk is also a trail attractor in the context of the trail's designed and managed uses.

Trail Design and Development

There are a number of different philosophies and thought processes that need to be considered during the development and design phase for any functional trail. This plan puts forth new direction in the way trails will be designed and managed. Below you will find trail direction by different categories.

Trail Design Process

Achieving a sustainable trail begins with establishing an integrated design process, which relies on a multidisciplinary team working collaboratively from the pre-design phase through construction to ensure that a site is developed in keeping with the spirit of the trail design. A typical design process entails finding the really interesting features that currently exist along a proposed trail alignment. These features become positive control points that are incorporated into the trail design, effectively connecting all the interesting features in a linear fashion.

Trail Layout

While destination trails will be incorporated into NLSRA and NLSRA this plan will focus on a looped trail system. Where appropriate, construction of trails that connect other loops should be incorporated in future trail design to create more loop options within the existing trail infrastructure. Connectivity of looped trails diversifies recreation opportunities within NLSRA and NLSRS; however, destination opportunities will also be considered and incorporated into the design.

Re-Vegetation

Native and/or self-sustaining plant materials should be used for re-vegetation of disturbed areas. Re-vegetation can be used to provide screening and help to stabilize slopes. Construction techniques to preserve vegetation and trail routing techniques should be used to minimize visual intrusion. Where possible, plants that are removed from the trail corridor for clearance should be transplanted to other locations where re-vegetation is necessary.

Clearing

Clearing widths and heights shall conform to the trail class and design parameter specifications assigned to a particular trail or trail segment. Deviations to the design parameters may occur only when the deviation is documented in the trail management objective form for a particular trail or trail segment. Additional clearing may be done to remove fire or falling hazard trees adjacent to developed areas or to improve views particularly when associated with a destination incorporated into the trail.

Natural Considerations

Trails should have a natural flow and rhythm that avoids long, straight alignments. Where natural hazards are present, special trail construction techniques or locations should be used to mitigate the hazard to trail users.

Historic and Cultural Resource Considerations

Like natural resources, cultural resources must be considered when planning and constructing trails. Cultural resource identification and evaluation should occur early in any trail project and possible impacts assessed. As needed and in consultation with the Office of History and Archaeology, special trail routing and construction techniques should be used to avoid or reduce adverse impacts to cultural resources.

Environmentally Sensitive Sites

Special location or construction methods may be necessary to reduce impacts and minimize disturbance in environmentally sensitive areas. Examples of environmentally sensitive sites include: wetlands, highly visible hillsides, significant vegetation areas, threatened and endangered species habitat, highly erodible soils, unstable slopes, and ridgelines. Techniques, such as site specific trail routing, erosion control measures, site specific adjustment of construction standards, and site specific construction practices should be implemented to minimize environmental, visual or construction impacts. Construction methods that should reduce impacts include installing retaining walls to reduce cut and fill slopes on a visually prominent hillside, hand construction of the trail, or stabilizing a hazard that is located within or adjacent to a trail corridor.

Special care should be taken in areas close to streams or wetlands. Trails that cross or are located adjacent to wetlands should be designed for minimal impact. Boardwalks or other techniques may be necessary to impose minimal construction impacts. Wildlife needs should also be considered when setting trails near wetlands. Consider decommissioning underutilized trails in sensitive areas to minimize erosion of sediment into streams. Connectivity between drainage ditches and streams should be minimized to reduce sediment delivery potential.

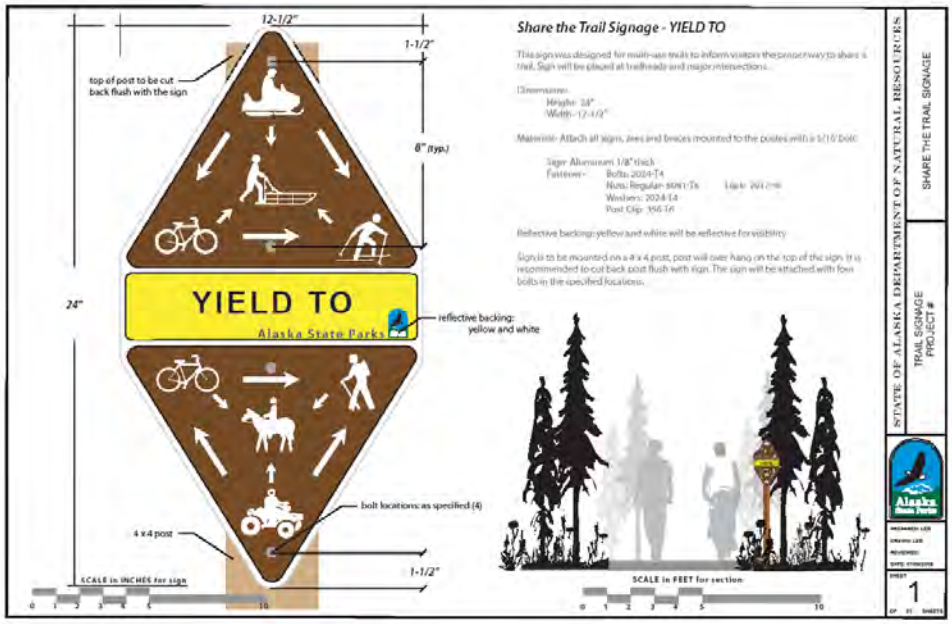
Climatic Trail Use Opportunities

Locate the trails for both summer and winter activities, where possible, given the terrain and climatic considerations. Identify snow retention areas for possible cross-country ski trails. In open areas, place trail alignment to take advantage of wind protection and shaded canyon areas.

Signage

Generally, all trail signage should be kept to a minimum and include only that needed to convey necessary information consistent with the intent for each trail or segment of trail. Highly developed trails will typically include more directional signage and interpretive information while minimally developed trails will typically have the minimal signage needed to provide safety or directional information. Yield hierarchy signs (see sample figure C - 1) should be placed at all major access points of multiple use trails where it is clearly visible and where it does not impede trail use or present a hazard to trail users.

Figure C - 1: Yield Hierarchy Sign Example



Trail Closures

Closing trails to use is an important management tool that will be utilized as needed. Trails may be temporarily closed throughout the year due to construction or trail restoration projects, because of increased wildlife activity, to protect trail tread from damage during wet or spring break up conditions, or for other hazardous conditions that may threaten visitor safety and natural resources. Trail conditions will be closely monitored by staff and when appropriate, closures will be lifted. Trail closures and openings will be public noticed and well signed.

Concepts of Sustainable Trail Development

Trail Type

The type of trail is identified by the predominant surface the trail will be developed on. There are three types of trails – Terra (ground), Water (waterbody and portages), and Snow. A trail or trail segment can only be assigned as a single trail type. This is not to say that two types of trails, or segments, cannot exist on the same route. Where this occurs, each trail type will be identified as a separate route and will be given a separate name. An example of this is where a multi-use snow trail is developed on the same route as a water trail portage.

Trail Classifications

The trail classification system provides uniform principles for trail classification, maintenance, marking, design, and construction. DPOR's Trail Management Policy is adapted from, and closely resembles, the National Trail Classification System. The trail classification is the expression of the intended design and management standards for an entire trail or specific segment of a trail. The following table (Table C - 1) illustrates the similarities and differences between trail classes in general terms. Specific design parameters are provided for each type of trail and under the Trail Design Parameters section below.

Table C - 1: General Trail Criteria

General Trail Criteria					
Trail Attributes	**Trail Class 1** Minimal/ Undeveloped	**Trail Class 2** Simple/Minor Development	**Trail Class 3** Developed/Improved	**Trail Class 4** Highly Developed	**Trail Class 5** Fully Developed
Tread & Traffic Flow	-Tread intermittent & often indistinct -May require route finding -Native materials only	-Tread discernible & continuous, but narrow and rough -Few or no allowances constructed for passing -Native materials	-Tread obvious & continuous -Width accommodates unhindered one-lane travel, occasional allowances constructed for passing -Typically native materials	-Tread wide & relatively smooth with few irregularities -Width may consistently accommodate two-lane travel -Native or imported materials -May be hardened	-Width generally accommodates two-lane and two-directional travel, or provides frequent passing turnarounds -Commonly hardened with asphalt or other imported material
Obstacles	-Obstacles common -Narrow passages; brush, steep grades, rocks and logs present	-Obstacles occasionally present -Blockages cleared to define route and protect resources -Vegetation may encroach into trailway	-Obstacles infrequent -Vegetation cleared outside of trailway	-Few or no obstacles exist -Grades typically <12% -Vegetation cleared outside of trailway	-No obstacles -Grades typically <8%
Constructed Features & Trail Elements	-Minimal to non-existent -Drainage is functional -No constructed bridges or foot crossings	-Structures are of limited size, scale and number -Drainage is functional -Structures adequate to protect trail infrastructure and resources -Primitive foot crossings and fords	-Trail structures (walls, steps, drainage, raised trail) may be common & substantial -Trail bridges as needed for resources protection and appropriate access -Generally native materials	-Structures frequent and substantial -Substantial trail bridges are appropriate at water crossings -Trailside amenities may be present	-Structures frequent or continuous; may include curbs, handrails, trailside amenities and boardwalks -Drainage structures frequent; may include culverts and road-like designs
Signs	-Minimum required -Generally limited to regulation and resource protection -No destination signs present	-Minimum required for basic direction -Generally limited to regulation and resource protection -Typically very few or no destination signs present	-Regulation, resource protection, user reassurance -Directional signs at junctions, or when confusion is likely -Informational and interpretative signs may be present	-Wide variety of signs likely and present -Informational signs likely -Interpretive signs possible	Wide variety of signage is present -Information and interpretive signs likely
Typical Recreation Environs & Experience	-Natural, unmodified -Primitive setting	-Natural, essentially unmodified -Primitive to Semi-primitive	-Natural, primarily unmodified -Semi-primitive to roaded natural setting -Transition	-May be modified -Typically roaded natural to rural setting -Transition, rarely present in wilderness	-Can be highly modified -Typically rural to urban setting -Commonly associated with visitor centers or high-use recreation sites -Not present in wilderness

General Trail Criteria					
Trail Attributes	**Trail Class 1** Minimal/ Undeveloped	**Trail Class 2** Simple/Minor Development	**Trail Class 3** Developed/Improved	**Trail Class 4** Highly Developed	**Trail Class 5** Fully Developed
Trail Management Typically managed to accommodate:	-Low level use -Highly skilled users, comfortable off trail -Users with high degree of orienteering skill -Some travel modes & ability levels may be impractical or impossible -Water trail users require high level of navigation/orientation and paddling skills	-Low-to-moderate use levels -Mid-to-highly skilled users, capable of traveling over awkward conditions/ obstacles -Users with moderate orienteering skill -Trail suitable for many user types but challenging and involves advanced skills -Water trails: moderate to high level of navigation/orientation and paddling/piloting skills required	-Moderate to heavy use -Users with intermediate skill level and experience -Users with minimal orienteering skills -Moderately easy travel by managed use types -Random potential for accessible use -Water trails: Basic to moderate navigation and paddling/piloting skills required	-Very heavy use -Users with minimal skills and experience -Users with minimal to no orienteering skills -Easy/ comfortable travel by managed use types -Maybe or has the potential to be made accessible -Water trails: Basic navigation and paddling/piloting skills required	-Intensive use -Users with limited trail skills and experience -Trail typically meets agency requirements for accessibility
Maintenance Indicators & Intensity	-Resource protection or safety commensurate with targeted recreational experience -Infrequent or no scheduled maintenance, usually in response to reports of unusual resource problems requiring repair	-Resource protection or safety commensurate with targeted recreational experience -Maintenance scheduled to preserve trail facility & route location or in response to reports of unusual resource problems	-User convenience -Resource protection or safety commensurate with targeted recreational experience -Trail cleared to make available for use early in use season and to preserve trail integrity -Maintenance typically in response to trail or resource damage or significant obstacles to managed use type and experience level	-User comfort and ease -Resource protection or safety commensurate with targeted recreational experience -Trail cleared to make available for use at earliest opportunity in use season -Maintenance typically performed at least annually	-User comfort and ease -Targeted high level of accessibility to key recreational opportunities -Safety commensurate with targeted recreational experience -Maintenance performed at least annually or as needed to meet posted conditions, major damage or safety concerns typically corrected or posted within 24 hours of notice
Additional Criteria	-Typically not managed for Pack and Saddle and Motorized Trails				-Not managed for Pack and Saddle stock, Watercraft or Motorized use.

1

Trail Design Parameters

The following text describes the major concepts used in sustainable trail design. Within a sustainable trail system the designed use controls the design and maintenance parameters of the trail. That is, it is what the use trail is designed to accommodate. Managed uses are those uses that are allowed by the agency and actively managed for on a trail, but they do not drive the design of a trail or segment of trail. Under this system, a trail or segment of trail may be designed to accommodate a particular use, but other uses may be allowed to occur on the same trail or segment of trail. Similarly, a trail may be designed to accommodate a particular use, even though that use is only allowed by authorization, while allowing other types of use without authorization to occur at the same time.

Designed Use

Designed Use is the intended use that controls the desired design of the trail and determines the subsequent maintenance parameters for a trail. There can only be one Designed Use per trail or trail segment. Seven different designed uses are applied in this plan. They are:

1. Bicycle
2. Off-Road Vehicle
3. Hiker/Pedestrian
4. Equestrian (Pack and Saddle)
5. Non-Motorized Watercraft
6. Dog Sledding
7. Skijoring

Managed Use

Managed Use is a term that is used to describe the modes of travel that are actively managed and appropriate on a trail considering the design of the trail. There can be many managed uses per trail or trail segment. Managed Use is applied to indicate a management decision or intent to accommodate or encourage a specific type of use but it does not necessarily mean that other uses are prohibited.

Design Parameters

Design parameters provide guidance for the assessment, survey, design, construction, repair and maintenance of trails. While the five trail classes apply, the specific design parameters vary under each trail class depending on the designed use. Site-specific circumstances may demand some exceptions or variances to the Design Parameters based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable trail class. Trail design parameters used in this plan are provided in Tables C - 2 through C - 12.

Trail Management Objectives

Trail Management Objectives (TMOs) are the mechanisms that link the Trail Classification System and direction given in this plan to on-the-ground trail management. TMOs synthesize and document in one form the management intention for the trail while providing basic reference information for any subsequent trail planning, management, condition surveys, and reporting. A TMO is required for each trail or trail segment as a pre-requisite for completing trail condition assessment surveys and subsequent prescriptions for work needed to meet standard. Each TMO is approved by management staff to ensure that the objectives for the trail are consistent with this plan and anticipated future land management actions. After approval, the TMOs provide the mechanism for trail maintenance staff and volunteers to know how to maintain and bring a particular trail or trail segment up to standard as needed.

Segmentation of Trails

Segmentation refers to applying different use or design standards to portions of a trail. There are a couple of ways a single trail may be designed to accommodate different uses on different segments of the same trail. For instance, the first segment of a trail may be designed to accommodate bicycle uses and managed for both biking and hiking uses. Beyond that first segment of trail the use of bicycles may be prohibited, and thus, the trail will be designed and managed for hiking. Trails that have been segmented by designed use are indicated in the Trail Recommendation tables under the *Design Considerations* heading.

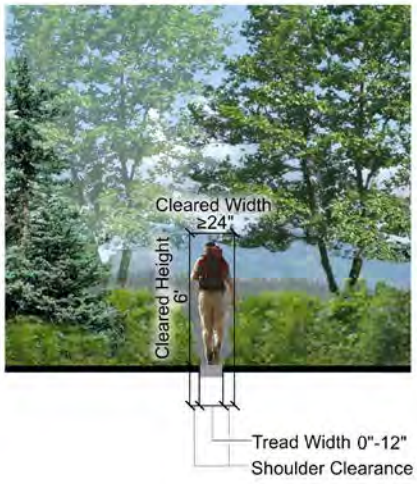
Trail Design Parameters

Terra Trails

Table C - 2: Hiker/Pedestrian Design Parameters

Designed Use HIKER/PEDESTRIAN		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	**Single Lane**	0" – 12"	6" – 18"	18" – 36"	24" – 60"	36" – 72"
	Double Lane	36"	36"	36" – 60"	48" – 72"	72" – 120"
	Structures (Minimum Width)	18"	18"	18"	36"	36"
Design Surface	**Type**	Native, ungraded May be continuously rough	Native, limited grading May be continuously rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native with improved sections of borrow or imported material, and routine grading Minor roughness	Likely imported material, and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	No protrusions
	Obstacles (Maximum Height)	24"	14"	10"	8"	No obstacles
Design Grade	**Target Grade**	5% – 25%	5% – 18%	3% – 12%	2% – 10%	2% – 5%
	Short Pitch Maximum	40%	35%	25%	15%	5% – 12%
	Maximum Pitch Density	20% – 40% of trail	20% – 30% of trail	10% – 20% of trail	5% – 20% of trail	0% – 5% of trail
Design Cross Slope	**Target Cross Slope**	Natural side slope	5% – 20%	5% – 10%	3% – 7%	2% – 3% (or crowned)
	Maximum Cross Slope	Natural side slope	25%	15%	10%	3%
Design Clearing	**Height**	6'	6' – 7'	7' – 8'	8' – 10'	8' – 10'
	Width	≥ 24" Some vegetation may encroach into clearing area	24" – 48" Some light vegetation may encroach into clearing area	36" – 60"	48" – 72"	60" – 72"
	Shoulder Clearance	3" – 6"	6" – 12"	12" – 18"	12" – 18"	12" – 24"
Design Turn	**Radius**	No minimum	2' – 3'	3' – 6'	4' – 8'	6' – 8'

Class 1



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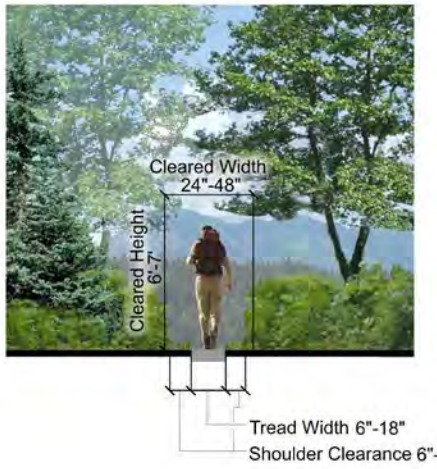

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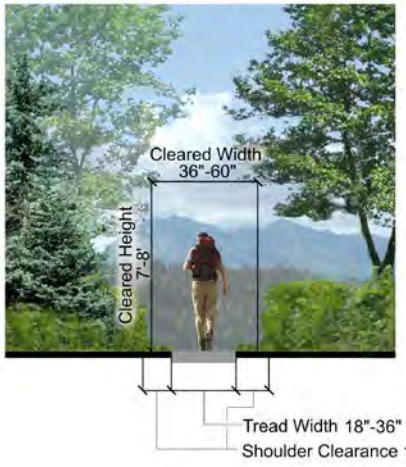
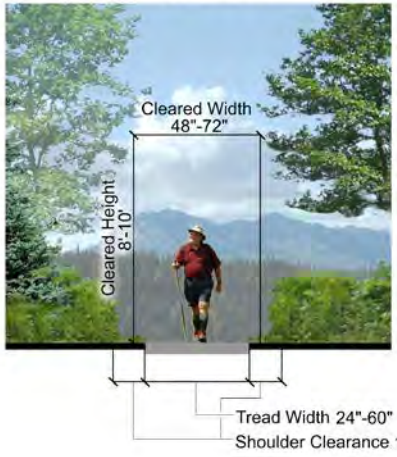


Class 4



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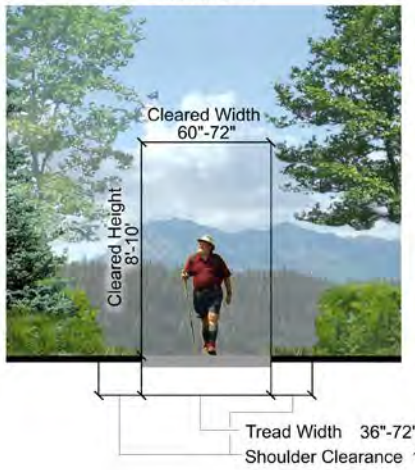
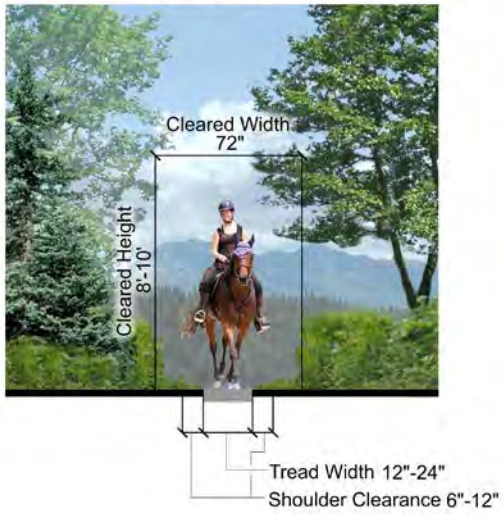


Table C - 3: Pack and Saddle Design Parameters

Designed Use PACK AND SADDLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	**Single Lane**	Typically not designed or actively managed for equestrians, although use may be allowed	12" – 24" May be up to 48" along steep side slopes 48" – 60" or greater along precipices	18" – 48" 48" – 60" or greater along precipices	24" – 96" 48" – 60" or greater along precipices	Typically not designed or actively managed for equestrians, although use may be allowed
	Double Lane		60"	60" – 84"	84" – 120"	
	Structures (Minimum Width)		Other than bridges: 36" Bridges without handrails: 60" Bridges with handrails: 84" clear width	Other than bridges: 36" Bridges without handrails: 60" Bridges with handrails: 84" clear width	Other than bridges: 36" Bridges without handrails: 60" Bridges with handrails: 84" clear width	
Design Surface	**Type**		Native, with limited grading May be frequently rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native, with improved sections of borrow or imported material and routine grading Minor roughness	
	Protrusions		≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	
	Obstacles (Maximum Height)		12"	6"	3"	
Design Grade	**Target Grade**		5% – 20%	3% – 12%	2% – 10%	
	Short Pitch Maximum		30%	20%	15%	
	Maximum Pitch Density		15% – 20% of trail	5% – 15% of trail	5% – 10% of trail	
Design Clearing	**Height**		8' – 10'	10'	10' – 12'	
	Width		72" Some light vegetation may encroach into clearing area	72" – 96"	96"	
	Shoulder Clearance		6" – 12" Pack clearance: 36" x 36"	12" – 18" Pack clearance: 36" x 36"	12" – 18" Pack clearance: 36" x 36"	
Design Turn	**Radius**		4' – 5'	5' – 8'	6' – 10'	

Class 2



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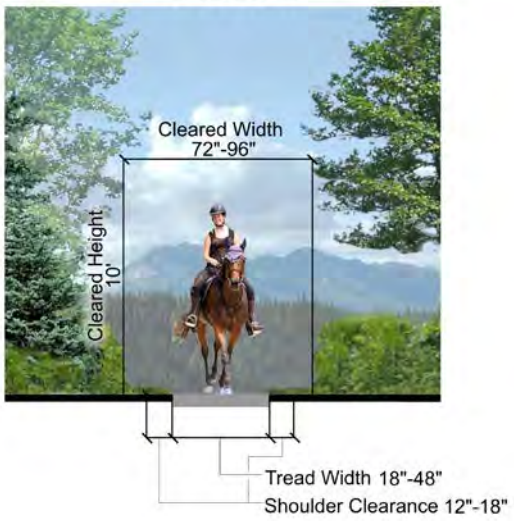

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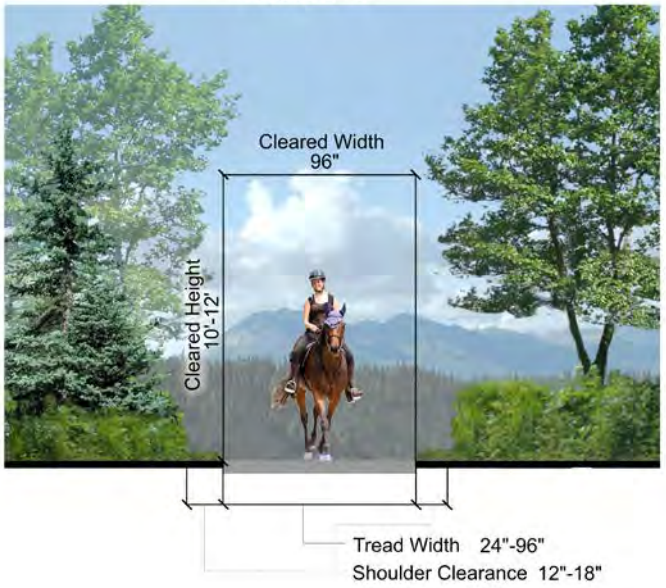
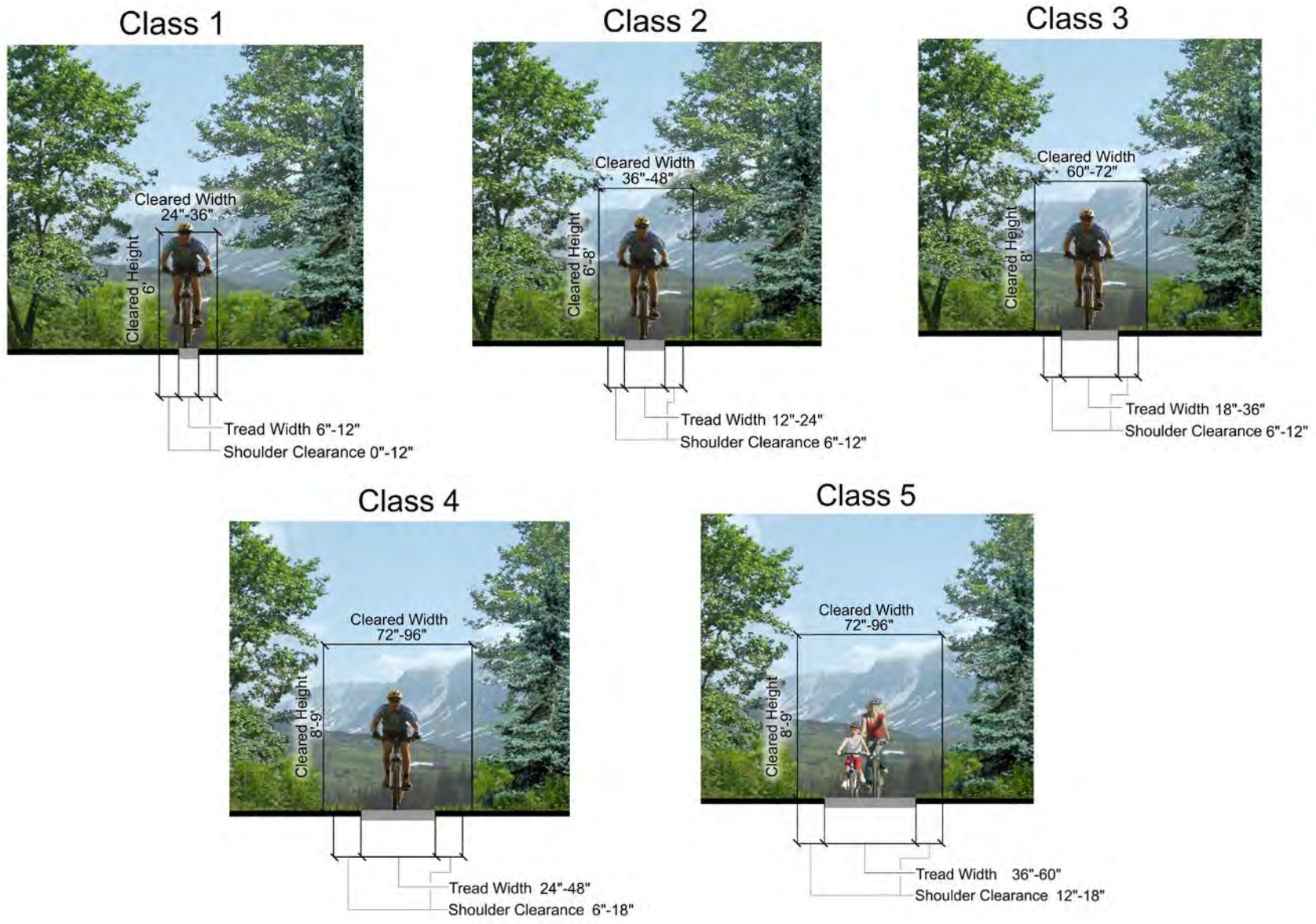


Table C - 4: Bicycle Design Parameters

Designed Use BICYCLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	**Single Lane**	6" – 12"	12" – 24"	18" – 36"	24" – 48"	36" – 60"
	Double Lane	36" – 48"	36" – 48"	36" – 48"	48" – 84"	72" – 120"
	Structures (Minimum Width)	18"	18"	36"	48"	60"
Design Surface	**Type**	Native, ungraded May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native, with limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present, but not common	Native, with improved sections of borrow or imported materials and routine grading Stable, with minor roughness	Likely imported material and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, but not continuous	≤ 3" Uncommon and not continuous	No protrusions
	Obstacles (Maximum Height)	24"	12"	10"	8"	No obstacles
Design Grade	**Target Grade**	5% – 20%	5% – 12%	3% – 10%	2% – 8%	2% – 5%
	Short Pitch Maximum	30% 50% on downhill segments only	25% 35% on downhill segments only	15%	10%	8%
	Maximum Pitch Density	20% – 30% of trail	10% – 30% of trail	10% – 20% of trail	5% – 10% of trail	0% – 5% of trail
Design Cross Slope	**Target Cross Slope**	5% – 10%	5% – 8%	3% – 8%	3% – 5%	2% – 3%
	Maximum Cross Slope	10%	10%	8%	5%	5%
Design Clearing	**Height**	6'	6' – 8'	8'	8' - 9'	8' - 9'
	Width	24" – 36" Some vegetation may encroach into clearing area	36" – 48" Some light vegetation may encroach into clearing area	60" – 72"	72" – 96"	72" – 96"
	Shoulder Clearance	0" – 12"	6" – 12"	6" – 12"	6" – 18"	12" – 18"
Design Turn	**Radius**	2' – 3'	3' – 6'	4' – 8'	8' – 10'	8' - 12'

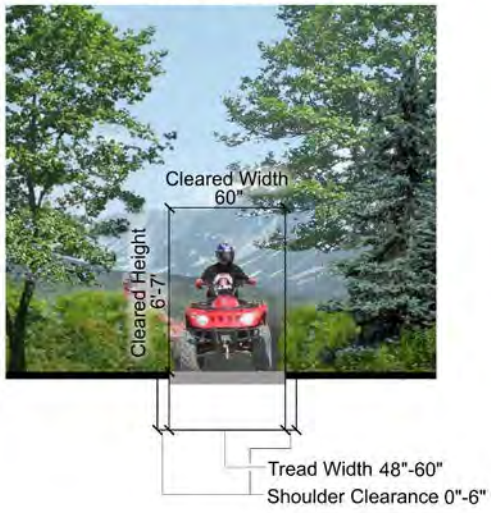

Class 1
Cleared Width
24"-36"
Cleared Height
6'
Tread Width 6"-12"
Shoulder Clearance 0"-12"
Class 2
Cleared Width
36"-48"
Cleared Height
6'-8'
Tread Width 12"-24"
Shoulder Clearance 6"-12"
Class 3
Cleared Width
60"-72"
Cleared Height
8'
Tread Width 18"-36"
Shoulder Clearance 6"-12"
Class 4
Cleared Width
72"-96"
Cleared Height
8'-9'
Tread Width 24"-48"
Shoulder Clearance 6"-18"
Class 5
Cleared Width
72"-96"
Cleared Height
8'-9'
Tread Width 36"-60"
Shoulder Clearance 12"-18"

1 **Table C - 5: All-Terrain Vehicle Design Parameters**

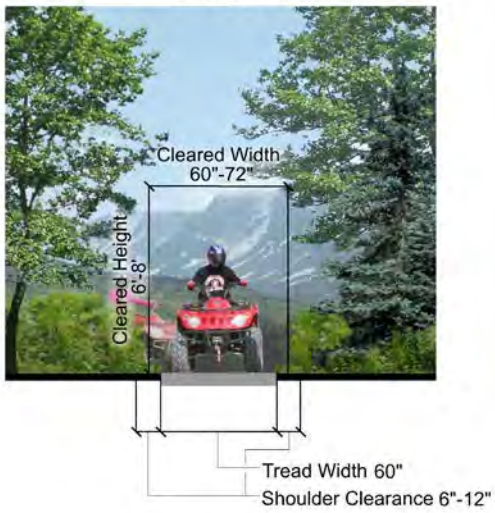
Designed Use ALL-TERRAIN VEHICLE		**Trail Class 1**	**Trail Class 2**	**Trail Class 3**	**Trail Class 4**	**Trail Class 5**
Design Tread Width	**Single Lane**	Typically not designed or actively managed for ATVs, although use may be allowed	48" – 60"	60"	60" – 72"	Typically not designed or actively managed for ATVs, although use may be allowed
	Double Lane		96"	96" – 108"	96" – 120"	
	Structures (Minimum Width)		60"	60"	60"	
Design Surface	**Type**		Native, with limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present	Native, with imported materials for tread stabilization likely and routine grading Minor roughness Sections of soft tread uncommon	
	Protrusions		≤ 6" May be common and continuous	≤ 3" May be common, but not continuous	≤ 3" Uncommon and not continuous	
	Obstacles (Maximum Height)		12" May be common or placed for increased challenge	6" May be common and left for increased challenge	3" Uncommon	
Design Grade	**Target Grade**		10% – 25%	5% – 15%	3% – 10%	
	Short Pitch Maximum		35%	25%	15%	
	Maximum Pitch Density		20% – 40% of trail	15% – 30% of trail	10% – 20% of trail	
Design Cross Slope	**Target Cross Slope**		5% – 10%	3% – 8%	3% – 5%	
	Maximum Cross Slope		15%	10%	8%	
Design Clearing	**Height**		6' – 7'	6' – 8'	8' – 10'	
	Width (On steep side hills, increase clearing on uphill side by 6" – 12")		60" Some light vegetation may encroach into clearing area	60" – 72"	72" - 96"	
	Shoulder Clearance		0" – 6"	6" – 12"	12" – 18"	
Design Turn	**Radius**		6' – 8'	8' – 10'	8' – 12'	

2
3

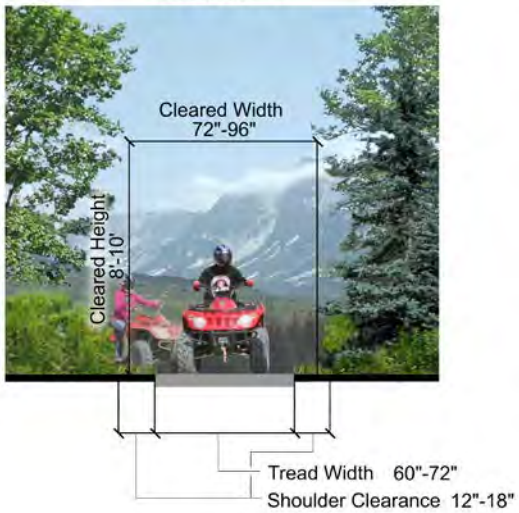
Class 2



Class 3



Class 4



Water Trails

Table C - 6: Non-Motorized Watercraft Design Parameters – Water Segments

Designed Use NON-MOTORIZED WATERCRAFT*		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	**Structures**	Water route shown on maps and used to access other trails or portages, but with no trail structures, facilities, signs, or recurring maintenance needs along route. Signs and/or parking facilities at initial access points only, and likely associated with other trails or sites.	Few markers or route designators. Low profile structures or facilities occasionally present; primarily to reduce beach and bank impacts. Structures typically consist of native material hardening of portage/water entry points. Signs and/or parking facilities at initial access points only, and likely associated with other trails or sites.	Buoys or markers possible to identify route Typically, facilities provide for improved access and to reduce beach and bank impacts. Well-developed parking and launch facilities at primary access points, but facilities and structures rare along the trail. Interpretive and informational displays typically present at primary access points	Buoys or markers are high profile and may be inter-visible and or route is readily followed. Highly developed launch facilities, docks, and amenities typically proved for user convenience. Well-marked approaches to facilities and portages. Interpretative displays, maps, information kiosks and signs typically present at access points and along route	Typically not designed or actively managed for watercraft, although use may be allowed
Design Surface	**Protrusions**	May be common and continuous	May be common and continuous	May be common, but not continuous	Uncommon and not continuous	
	Obstacles	May be common or placed for increased challenge	May be common or placed for increased challenge	May be common and left for increased challenge	Uncommon	
Design Clearing		In densely vegetated areas, users will commonly need to lift vessels over logs, shoals, or matted vegetation.	Path is typically narrow, shallow, and may occasionally require user to lift over obstacles or break path through some vegetation and duck under overhanging branches	Path is typically cleared wide enough for ready passage and maneuvering of at least one vessel, and usually two-way vessel passage, with only occasional low overhanging vegetation	Path is consistently cleared wide enough for unhindered, easy passage of two or more vessels.	

Class 1

Class 2

Class 3

Class 4

Table C - 7: Non-Motorized Watercraft Design Parameters – Terra Segments (Portages)

Designed Use Water Trail Portage		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	**Single Lane**	0" – 12"	6" – 18"	18" – 36"	24" – 60"	36" – 72"
	Structures (Minimum Width)	18"	18"	18"	36"	36"
Design Surface	**Type**	Native, ungraded May be continuously rough	Native, limited grading May be continuously rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native with improved sections of borrow or imported material, and routine grading Minor roughness	Likely imported material, and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	No protrusions
	Obstacles (Maximum Height)	24"	14"	10"	8"	No obstacles
Design Grade	**Target Grade**	5% – 25%	5% – 18%	3% – 12%	2% – 10%	2% – 5%
	Short Pitch Maximum	40%	35%	25%	15%	5% – 12%
	Maximum Pitch Density	20% – 40% of trail	20% – 30% of trail	10% – 20% of trail	5% – 20% of trail	0% – 5% of trail
Design Cross Slope	**Target Cross Slope**	Natural side slope	5% – 20%	5% – 10%	3% – 7%	2% – 3% (or crowned)
	Maximum Cross Slope	Natural side slope	25%	15%	10%	3%
Design Clearing	**Height**	8' – 10'	8' – 10'	8' – 10'	8' – 10'	8' – 10'
	Width	48" Some vegetation may encroach into clearing area	48" – 60" Some light vegetation may encroach into clearing area	60" – 72"	72" – 96"	84" – 120"
	Shoulder Clearance	6" – 12"	6" – 12"	12" – 18"	12" – 18"	12" – 24"
Design Turn	**Radius**	8' – 10'	8' – 10'	10' – 12'	12' – 14'	12' – 16'


Class 1
Cleared Width 48"
Cleared Height 8'-10'
Tread Width 0"-12"
Shoulder Clearance 6"-12"
Class 2
Cleared Width 48"-60"
Cleared Height 8'-10'
Tread Width 6"-18"
Shoulder Clearance 6"-12"
Class 3
Cleared Width 60"-72"
Cleared Height 8'-10'
Tread Width 18"-36"
Shoulder Clearance 12"-18"
Class 4
Cleared Width 72"-96"
Cleared Height 8'-10'
Tread Width 24"-60"
Shoulder Clearance 12"-18"
Class 5
Cleared Width 84"-120"
Cleared Height 8'-10'
Tread Width 36"-72"
Shoulder Clearance 12"-24"

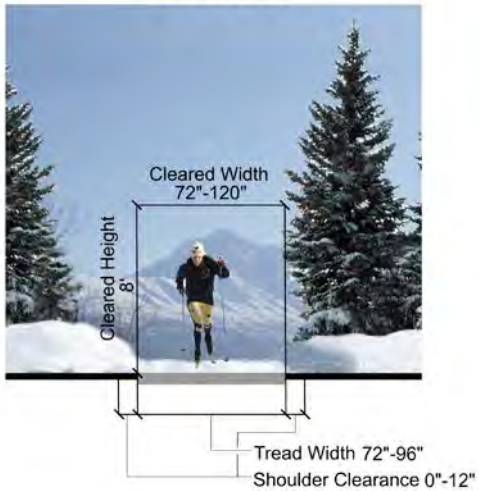
Snow Trails

Table C - 8: Cross-Country Ski (Diagonal/Classical) Design Parameters

Designed Use CROSS-COUNTRY SKI (Diagonal/Classic ski)		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Groomed Width	**Single Lane**	Typically not designed or actively managed for cross-country skiing, although use may be allowed	24" – 48" Typically not groomed	72" – 96" Or width of grooming equipment	96" – 120" Or width of grooming equipment	Typically not designed or actively managed for cross-country skiing, although use may be allowed
	Double Lane		72" – 96"	96" – 144"	144" – 192"	
	Structures (Minimum Width)		36"	36"	36"	
Design Grooming and Surface	**Type**		Generally no machine grooming	May receive occasional machine grooming for snow compaction and track setting	Regular machine grooming for snow compaction and track setting	
	Protrusions		No protrusions	No protrusions	No protrusions	
	Obstacles (Maximum Height)		12" Uncommon	8" Uncommon (no obstacles if machine groomed)	No obstacles	
Design Grade	**Target Grade**		5% – 15%	2% – 10%	0% – 8%	
	Short Pitch Maximum		25%	20%	12%	
	Maximum Pitch Density		10% – 20% of trail	5% – 15% of trail	0% – 10% of trail	
Design Cross Slope	**Target Cross Slope**		0% – 10%	0% – 5%	0% – 5%	
	Maximum Cross Slope (For up to 50')		20%	15%	10%	
Design Clearing	**Height** (Above normal maximum snow level)		6' – 8'	8' Or height of grooming equipment	8' – 10'	
	Width		24" – 60" Light vegetation may encroach into clearing area	72" – 120" Light vegetation may encroach into clearing area	96" – 168" Widen clearing at turns or if increased sight distance needed	
	Shoulder Clearance		0" – 6"	0" - 12"	0" – 24"	
Design Turn	**Radius**		8' – 10'	15' – 20' Or to accommodate grooming equipment	≥ 25'	

Class 2

Class 3



Class 4

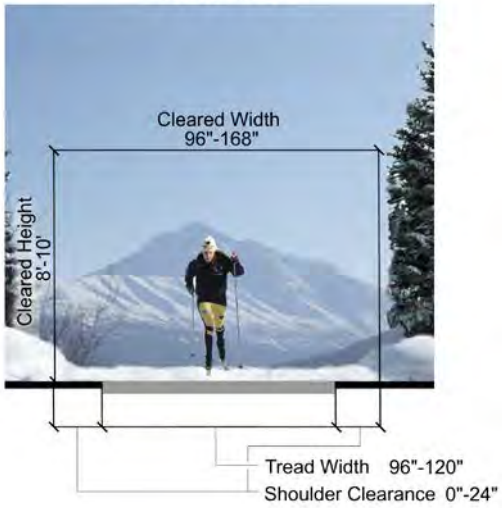


Table C - 9: Nordic Ski (Skate) Design Parameters

Designed Use NORDIC SKI (Skate Ski)		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Groomed Width	**Single Lane**	Typically not designed or actively managed for skate skiing, although use may be allowed	Typically not designed or actively managed for skate skiing, although use may be allowed	72" – 96" Or width of grooming equipment	96" – 144" Or width of grooming equipment	144" - 192" Or width of grooming equipment
	Double Lane[3]			96" – 144"	144" – 192"	168" - 288"
	Structures (Minimum Width)			36"	36"	36"
Design Grooming and Surface	**Type**			May receive occasional machine grooming for snow compaction and track setting	Smooth compaction using implements designed for creating skate lanes.	Smooth compaction using implements designed for creating skate lanes.
	Protrusions			No protrusions	No protrusions	No protrusions
	Obstacles (Maximum Height)			8" Uncommon (no obstacles if machine groomed)	No obstacles	No obstacles
Design Grade	**Target Grade**			2% – 10%	0% – 8%	0% – 6%
	Short Pitch Maximum			20%	20%	20%
	Maximum Pitch Density			5% – 15% of trail	5% - 10% of trail	5 - 8% of trail
Design Cross Slope	**Target Cross Slope**			0% – 5%	0% – 5%	0% – 5%
	Maximum Cross Slope (For up to 50')			15%	12% Minimum cross-slope (crowned or one side) should be 2% to promote drainage	10% Minimum cross-slope (crowned or one side) should be 2% to promote drainage
Design Clearing	**Height** (Above normal maximum snow level)			8' Or height of grooming equipment	8' – 10' Or height of grooming equipment	At least 10' Or height of grooming equipment
	Width			72" – 168" Light vegetation may encroach into clearing area	96" – 216" Widen clearing at turns or if increased sight distance needed	96" – 312" Widen clearing at turns or if increased sight distance needed
	Shoulder Clearance			0" - 12"	0" – 24"	0" – 24"
Design Turn	**Radius**			15' – 20' Or to accommodate grooming equipment	≥ 25' Or to accommodate grooming equipment	25' - 30' Or to accommodate grooming equipment

[3] Double lane may accommodate a combination of diagonal and skate ski lanes with room to pass.

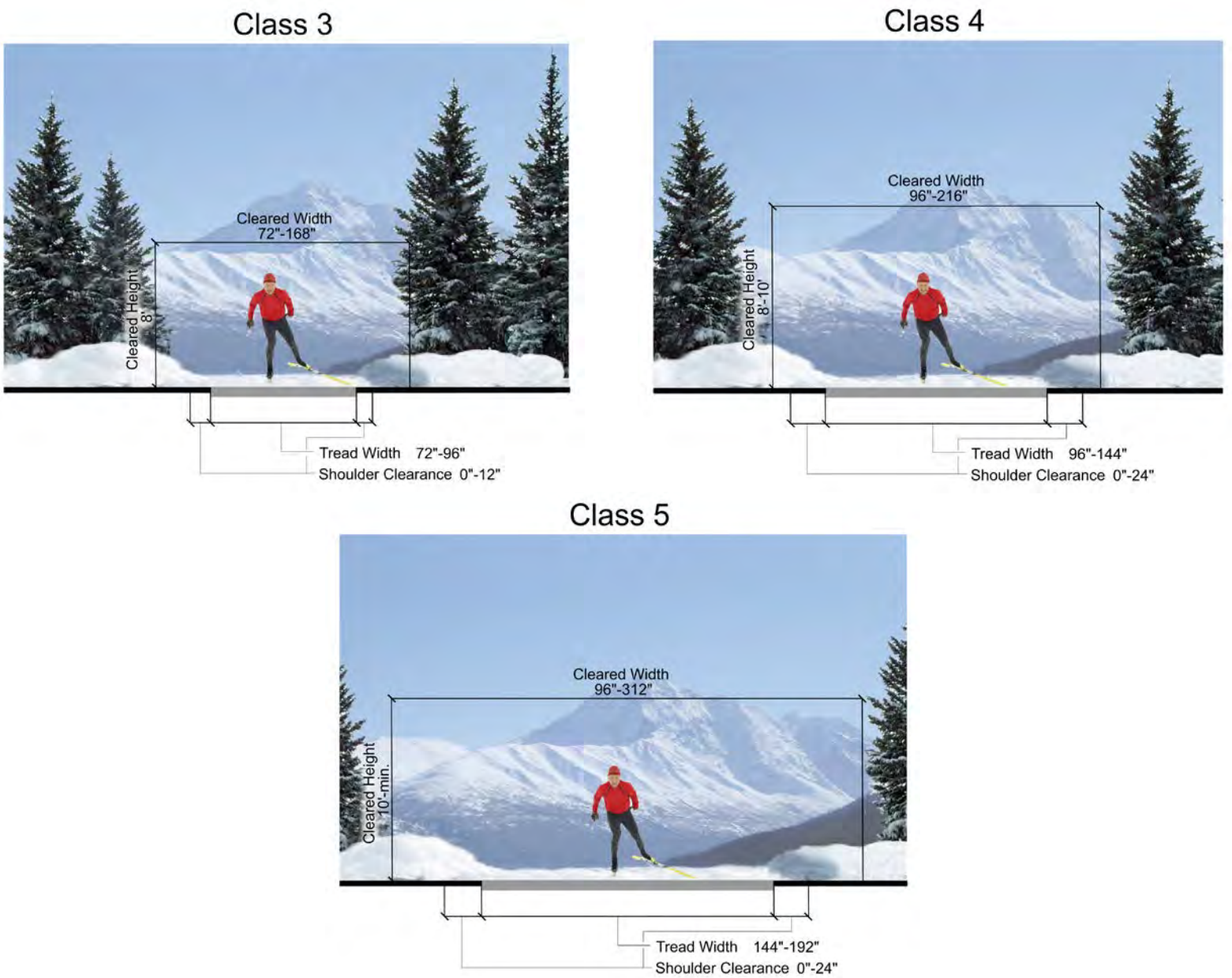
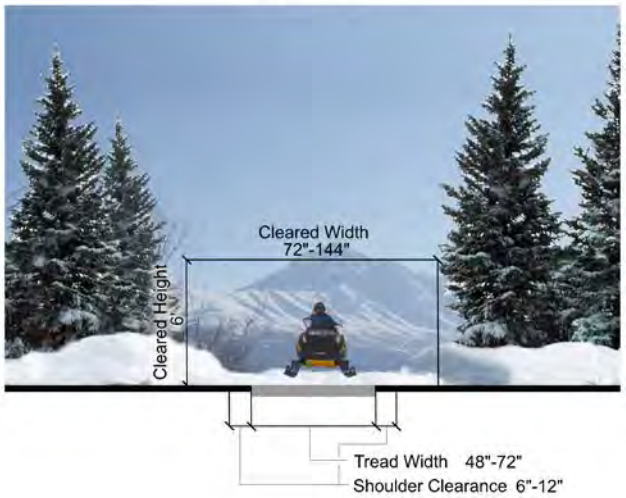

Class 3
Cleared Width
72"-168"
Cleared Height
8'
Tread Width 72"-96"
Shoulder Clearance 0"-12"
Class 4
Cleared Width
96"-216"
Cleared Height
8'-10'
Tread Width 96"-144"
Shoulder Clearance 0"-24"
Class 5
Cleared Width
96"-312"
Cleared Height
10'-min.
Tread Width 144"-192"
Shoulder Clearance 0"-24"

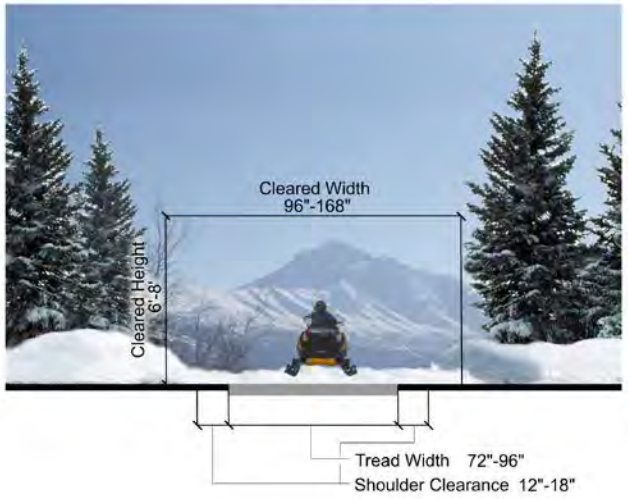
Table C - 10: Snowmobile Design Parameters

Designed Use SNOWMOBILE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	**Single Lane**	Typically not designed or actively managed for snowmobiles, although use may be allowed	48" – 72" Typically not groomed	72" – 96" Or width of grooming equipment. On turns with tight radius, increase groomed width to ≥ 10'	96" – 120" Or width of grooming equipment. On turns with tight radius, increase groomed width to ≥ 12'	Typically not designed or actively managed for snowmobiles, although use may be allowed
	Double Lane		120" Typically not groomed	120" – 144"	144" – 240"	
	Structures (Minimum Width)		72"	144"	216"	
Design Surface	**Type**		Generally no machine grooming Commonly rough and bumpy	May receive occasional machine grooming for snow compaction and conditioning Frequently rough and bumpy	Regular machine grooming for snow compaction and conditioning Commonly smooth	
	Protrusions		No protrusions	No protrusions	No protrusions	
	Obstacles (Maximum Height)		12" Uncommon	6" Uncommon (no obstacles if machine groomed)	No obstacles	
Design Grade	**Target Grade**		0% – 12%	0% – 10%	0% – 8%	
	Short Pitch Maximum		35%	25%	20%	
	Maximum Pitch Density		15% – 30% of trail	10% – 20% of trail	5% – 10% of trail	
Design Cross Slope	**Target Cross Slope**		0% – 10%	0% – 5%	0%	
	Maximum Cross Slope		15%	10%	5%	
Design Clearing	**Height** (Above normal maximum snow level)		6'	6' – 8' Provide sufficient clearance for grooming equipment	8' – 12' Provide sufficient clearance for grooming equipment	
	Width		72" – 144" Some light vegetation may encroach into clearing area	96" – 168" Light vegetation may encroach into clearing area	120" – 264" Widen clearing at turns or if increased sight distance needed	
	Shoulder Clearance		6" – 12"	12" – 18"	12" – 24"	
Design Turn	**Radius**		8' – 10'	15' – 20' Or to accommodate grooming equipment	25' – 50'	

Class 2



Class 3



Class 4

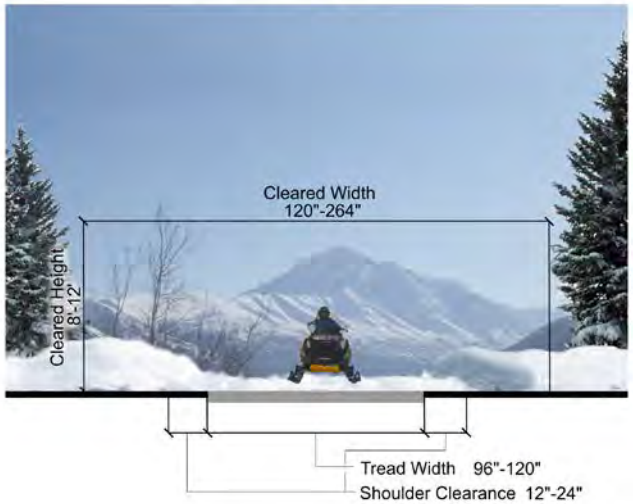
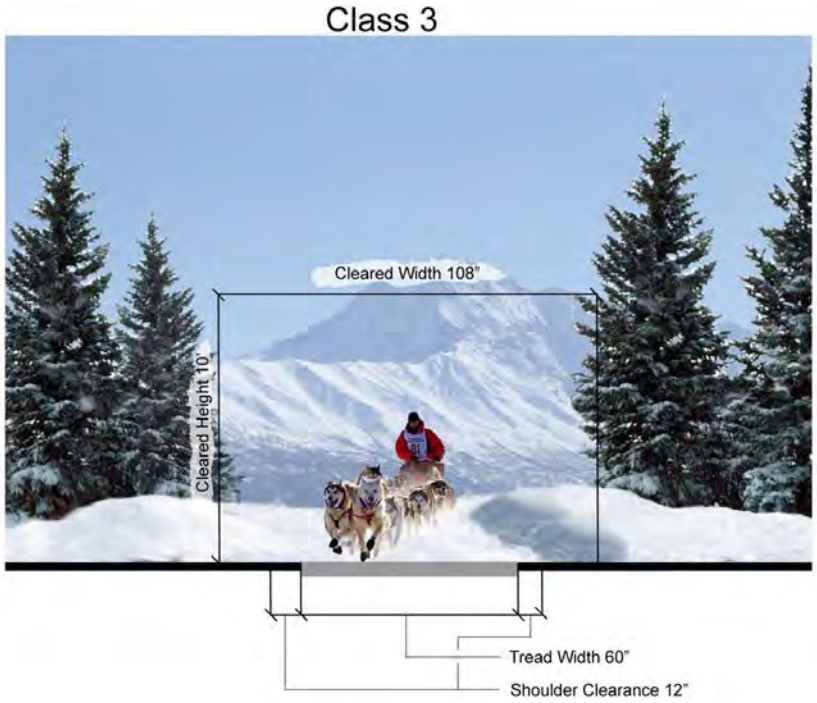


Table C - 11: Dog Sledding Design Parameters

Designed Use Dog Sledding		**Trail Class 1**	**Trail Class 2**	**Trail Class 3**	**Trail Class 4**	**Trail Class 5**
Design Tread Width		Typically not designed or actively managed for snowmobiles, although use may be allowed	Typically not designed or actively managed for snowmobiles, although use may be allowed	5' minimum (or width of grooming equipment).	8' – 10', but typically managed to accommodate two-way passage.	Typically not designed or actively managed for snowmobiles, although use may be allowed
Design Surface	**Type**			Groomed or compacted using implements and/or tracklayer/grooming equipment. May include wider pull-off sections.	Regular machine grooming for snow compaction and conditioning. Wider trail may allow teams to pass.	
	Obstacles (Max. Height) Caused by use, lack of grooming, melt, or surface/subsurface protrusions)			Generally smooth, dips, bumps, or ruts to 12" uncommon and widely spaced. Surface obstructions not present.	Consistently smooth. Small rolling bumps, dips, and rises. Surface obstructions not present.	
Design Grade	**Target Grade** (>90% of trail)			Up to 15%	Up to 10%	
	Short Pitch Maximum (up to 200' length)			20%	15%	
	Maximum Pitch Density			<5% of trail	<5% of trail	
Design Cross Slope	**Target Cross Slope**			<5%	<5%	
	Maximum Cross Slope			15%	10%	
Design Clearing	**Height** (Above normal maximum snow level)			>10' minimum or height of grooming machinery	10' minimum or height of grooming machinery	
	Width			9' minimum. <1' outside of groomed edge. Light vegetation may encroach into clearing area Understory vegetation and lower tree limbs will be cleared to a height of 6' at trail intersections or perpendicular corners to enhance sight distances at these locations.	15'-20' minimum. >2' outside of groomed edges. Understory vegetation and lower tree limbs will be cleared to a height of 6' at trail intersections or perpendicular corners to enhance provide 250' minimum sight distances at these locations.	
Design Turn	**Radius** (Use climbing turn versus switchbacks)			50' – 100'	100' minimum	


Class 3
Cleared Width 108"
Cleared Height 10'
Tread Width 60"
Shoulder Clearance 12"

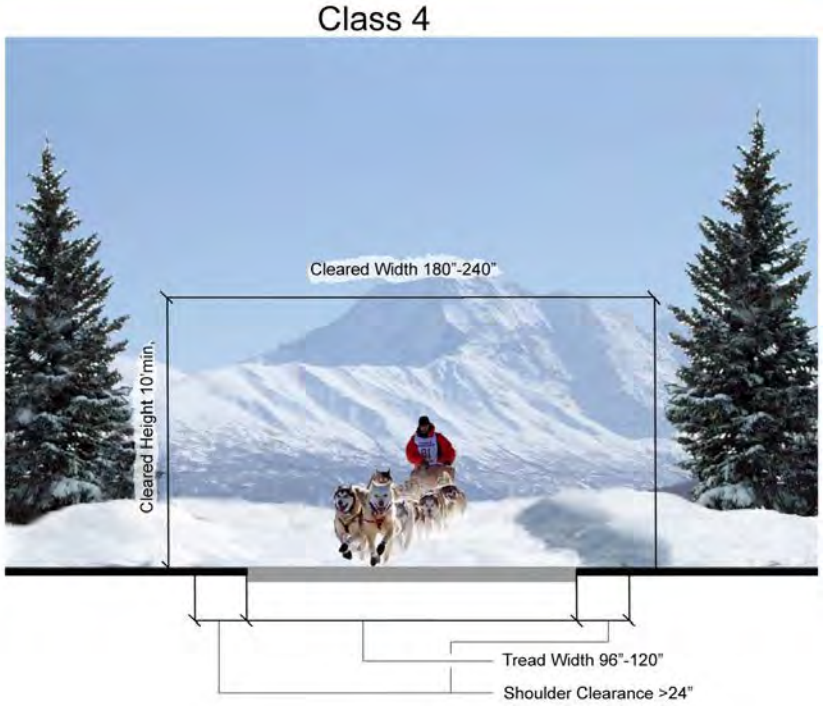
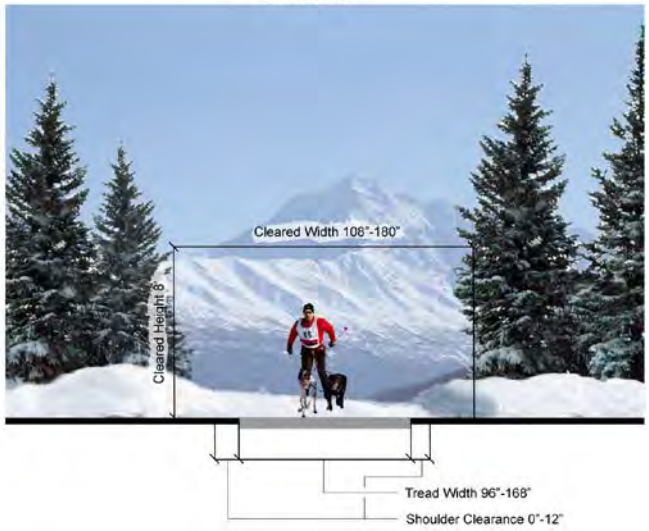

Class 4
Cleared Width 180"-240"
Cleared Height 10'min.
Tread Width 96"-120"
Shoulder Clearance >24"

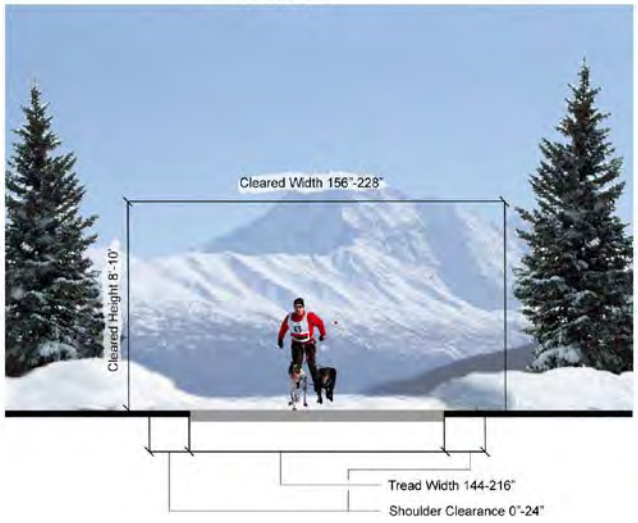
Table C - 12: Skijoring Design Parameters

Designed Use Skijoring		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Groomed Width		Typically not designed or actively managed for skate skiing, although use may be allowed	Typically not designed or actively managed for skate skiing, although use may be allowed	8' – 14' May be wider to accommodate width of grooming equipment.	12' -18' May be wider to accommodate width of grooming equipment.	16' -24'
Design Grooming and Surface	**Type**			May receive occasional machine grooming for snow compaction and track setting.	Smooth compaction using implements designed for creating skate lanes.	Smooth compaction using implements designed for creating skate lanes.
	Protrusions			No protrusions	No protrusions	No protrusions
	Obstacles (Maximum Height)			8" Uncommon (no obstacles if machine groomed)	No obstacles	No obstacles
Design Grade	**Target Grade**			<10%	<8%	6-8%
	Short Pitch Maximum			<20%	15%	12%
	Maximum Pitch Density			<10% of trail	<5% of trail	<5% of trail overall; up to 8% for short stretches (50' max.)
Design Cross Slope	**Target Cross Slope**			<5%	<5%	<5%
	Maximum Cross Slope (For up to 50')			15%	12% Minimum cross-slope (crowned or one side) should be 2% to promote drainage.	8% Minimum cross-slope (crowned or one side) should be 2% to promote drainage.
Design Clearing	**Height** (Above normal maximum snow level)			8' Or height of grooming equipment.	8' – 10' from top of anticipated snowpack or height of grooming equipment.	At least 10' from top of anticipated snowpack or height of grooming equipment.
	Width			>1' outside groomed edge.	Minimum of 1' outside groomed edge.	Minimum 2' outside groomed edge.
	Shoulder Clearance			0" - 12"	0" – 24"	0" – 24"
Design Turn	**Radius**			50' or the minimum needed to accommodate grooming equipment.	75' or the minimum needed to accommodate grooming equipment.	75' or the minimum needed to accommodate grooming equipment.

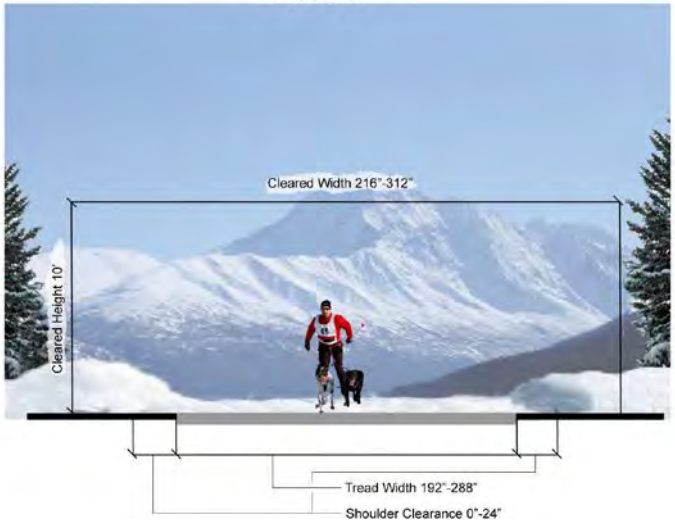
Class 3



Class 4



Class 5



Trail Recommendations

The following trail recommendations provide greater detail on the trails discussed in Chapter 7 of this plan. Trail recommendations are provided in a tabular format and are grouped by the type of trail – terra, water, and snow. The tables identify the *reference number;* the plan *map reference*; the *trail* name (if existing); the *designed use*, the *managed uses*; the *trail class*; and, any *design considerations* known at the time of development of this plan. The reference number corresponds to the number used in the unit specific recommendations in Chapter 7 and similarly, the map references the appropriate map in that same chapter.

Terra Trails

Ref. No.	Map Ref.	Trail	Designed Use	Managed Use	Trail Class	Design Considerations
13	Map 8, Page 7-13	New unnamed looped multi-use trails in southern area of NLSRA	Bicycle	Biking/Hiking	Class 3	Trail design should accommodate a broad range of biking and hiking abilities.
14	Map 8, Page 7-13	New unnamed access trails that access public use cabins and camping facilities	Bicycle	Biking/Hiking	Class 2 or Class 3	Because use of the access trails will be less than that of the main trails, these trails may be developed as a lower class trail.
15	Map 8, Page 7-13	Red Shirt Lake Summer Trail	Bicycle	Biking/Hiking	Class 3 and Class 4	The portion of this trail from the South Rolly Lake Campground to the area north and west of Arc Lake should be developed as a Class 4 trail. It is anticipated this portion of the trail will receive elevated levels of use as part of the new looped biking and hiking trails to the east. The remaining portion of this trail should be developed as a Class 3 trail. All segments of this trail should be designed to have good sight distances while reducing speeds of bicycles.

Ref. No.	Map Ref.	Trail	Designed Use	Managed Use	Trail Class	Design Considerations
16	Map 8, Page 7-13	Butterfly Lake Trail	ORV	ORV/Biking/ Hiking	Class 2	Only portions of this trail on state owned land will be upgraded by DPOR. No state funds will be expended on upgrading this trail if the public recreational easement is removed from the Anchorage Church of Christ property. If the easement is removed, the trail may be closed to pubic use or removed and the tread restored to a natural state. The width of this trail should be the minimum necessary to accommodate use of Off-Road Vehicles.
17	Map 8, Page 7-13	Chicken Lake Cross-Park Trail	Bicycle	Biking/Hiking	Class 4	Because this trail is anticipated to have moderate to high levels of biking and hiking, all segments of this trail should be designed to have good sight distances while reducing speeds of bicycles.
18	Map 8, Page 7-13	East Red Shirt Lake Trail	Bicycle	Biking/Hiking	Class 3 and Class 4	The segment of this trail that originates from the Parkway to the intersection of the new trail east of Chicken Lake should be developed a s Class 4 trail in anticipation of moderate to high levels of biking and hiking use. The remaining segment should be developed as a Class 3 trail. All segments of this trail should be designed to have good sight distances while reducing speeds of bicycles.
24	Map 9, Page 7-23	New unnamed looped trails in the area south of South Rolly Lake	Bicycle	ADA Accessibility/ Biking/Hiking	Class 1, 2, 3, 4, and 5	These trails should be developed to provide a wide range of recreation opportunities. At least one of these trails should be developed as a Class 4 or 5 ADA accessible multi-use interpretive trail that connects to the East Red Shirt Lake Trail. The majority of new looped trails should accommodate bicycle and hiking use and shod be developed as Class 3 trails. Some trails, may be designed and managed as Class 1 or 2 single track bicycle trails, but these should not be the main trail type. Beginner to advanced riding abilities should be accommodated.
26	Map 9, Page 7-23	New unnamed ADA accessible interpretive trail at the proposed interpretive and education center	Hiker/ Pedestrian	ADA Accessibility/ Hiking	Class 4 and Class 5	The main trail developed on the top of the bluff should be developed as a Class 5 trail. The Nancy Lake connection trail should be developed as a Class 4 trail. All segments of these trails should be developed as ADA accessible trails.

Ref. No.	Map Ref.	Trail	Designed Use	Managed Use	Trail Class	Design Considerations
27	Map 9, Page 7-23	New unnamed ADA accessible interpretive and portage trail at the proposed group camp facility	Biking	ADA Accessibility/ Biking/Hiking	Class 5	This trail should accommodate wheelchair, bicycle, hiking, and canoe portage use.
29	Map 9, Page 7-23	New unnamed ADA accessible trail on the south side of the Nancy Lake Parkway	Biking	ADA Accessibility/ Biking/Hiking	Class 4 or Class 5	This trail should accommodate wheelchair, bicycle, and hiking use.
37	Map 10, Page 7-29	New unnamed ADA accessible terra trails that connect the campground and picnic area to the Nancy lake shoreline facilities	Biking	ADA Accessibility/ Hiking	Class 4 or Class 5	This trail should accommodate and hiking use in addition to wheelchair use.
41	Map 11, Page 7-35	New unnamed looped trails North of the winter parking area on the Nancy Lake Parkway	Equestrian	Equestrian/ Biking/Hiking	Class 2 and Class 3	These trails should only be developed in the upland area across the road (north) from the winter parking area in the eastern portion of the Northern Unit.

Water Trails

Ref. No.	Map Ref.	Trail	Designed Use	Managed Use	Trail Class	Design Considerations
11	Map 8, Page 7-13	Lynx Lake Loop Canoe Trail	Non-motorized Watercraft	Non-motorized Watercraft/ Kayak	Class 3	Should consider turn radius and slope for snowmobiles where snow trails overlie portage segments. Boat access sites on portages should be designed to minimize impacts to waterbody while not interfering with wintertime uses.
42	Map 11, Page 7-35	Pioneer Loop Canoe Trail	Non-motorized Watercraft	Non-motorized Watercraft/ Kayak	Class 3	To maintain the more rustic and natural character of this water trail should be maintained tread width and clearing width should be minimal.

Snow Trails

Ref. No.	Map Ref.	Trail	Designed Use	Managed Use	Trail Class	Design Considerations
12	Map 8, Page 7-13	Existing unnamed trails on segments of the existing water trails.	Snowmobile	Snowmobile/ Dog Sledding	Class 2	Trail design should accommodate a broad range of motorized and non-motorized winter uses. To enhance safety of wintertime users, particular attention should be paid to sight distances at trail intersections or perpendicular corners.
25	Map 9, Page 7-23	New unnamed connection trail between the winter parking area and the Nancy Lake Parkway.	Dog Sledding	Dog Sledding	Class 4	Turn radius should accommodate use of large dog teams when designing this trail. To enhance safety of wintertime users, particular attention should be paid to sight distances at trail intersections or perpendicular corners.
28	Map 9, Page 7-23	New unnamed connection trail between the Nancy Lake Parkway and the North Rolly Lake motorized snow trail.	Dog Sledding	Dog Sledding	Class 4	Turn radius should accommodate use of large dog teams when designing this trail. To enhance safety of wintertime users, particular attention should be paid to sight distances at trail intersections or perpendicular corners.
40	Map 11, Page 7-35	Portions of the existing	Skijoring	Skijoring/ Nordic Skiing/ Classic cross-country Skiing/ Fat Tire Bike	Class 3	Outer loop should be designed as a Class 3 Skijoring trail. Inner, or connecting, trails should be developed as Class 3 Skijoring trails, but the width of these trails should be kept to a minimum.

Appendix D
Nancy Lake State Recreation Area Questionnaire Summary

- Questionnaire was available for public comment from July 7, 2010 through September 13, 2010.
- Notice of the availability of the questionnaire was distributed to over 900 individuals via email or postcard, and a link to the questionnaire was added to the NLSRA planning website
- Questions 1-10 percentages are based on the total number of questionnaires received (151)
- Questions 11-24 percentages are based on total number of respondents for each question (number indicated in parenthesis)
- 46% (72) of respondents did not indicate ownership w/in NLSRA
- 52% (79) of respondents indicated property ownership w/in NLSRA
- Part B percentages are based on the 79 people that indicated they were land owners
- Results for 151 completed questionnaires are tabulated below

Part A: Recreation & Facilities

1. Q: Do you recreate in the NLSRA or have you recreated in here in the past?
   A: 99% of respondents recreate in the NLSRA

2. Why do you choose to recreate at the NLSRA? (check most applicable answer)
   a) Opportunity to escape urban environments (67%)
   b) Own property in area (48%)
   c) Quiet natural setting (40%)
   d) Like the area (36%)
   e) Nearby & convenient (30%)
   f) Groomed Trails (26%)
   g) Water access (25%)
   h) Public Use Cabin System (19%)
   i) Campgrounds & amenities (9%)
   j) Trying new area (5%)

3. When do you typically recreate at NLSRA? (check all that apply)
   a) 88% summer
   b) 87% winter
   c) 62% fall
   d) 52% Spring

4. In what area(s) have you recreated?
   a) Canoe trail (59%)
   b) Nancy Lake Camp (58%)
   c) Nancy Lake Parkway (56%)
   d) Redshirt Lake (56%)
   e) Lynx/Butterfly Lakes (53%)

5. What recreational activities do you engage in? (check all that apply)

   a) Snowmobiling (68%)
   b) Canoeing (66%)
   c) Boating (61%)
   d) Fishing (54%)
   e) Hiking (51%)
   f) Wildlife Viewing (44%)
   g) Skiing (43%)
   h) Photography (34%)
   i) Public Use Cabins (31%)
   j) Snowshoeing (26%)
   k) Remote Camping (25%)
   l) Picnicking (19%)
   m) Hunting (18%)
   n) Biking (18%)
   o) Camping at S. Rolly (14%)
   p) Camping at Nancy Lk. (13%)
   q) Dog Mushing (11%)
   r) Orienteering (3%)
   s) Other (15%) Swimming (3), Skijoring, walking, Ice skating, Jet Skiing, ATV Riding, Geocaching, Dog Activities, Bird Watching, Star Gazing, Cabin Owner (3)

6. What recreational uses or facilities that may or may not be currently available do you feel <u>are appropriate</u> for the NLSRA? (check all that apply)

   a) Hiking (72%)
   b) Cross country skiing (69%)
   c) Camping (69%)
   d) Public Use Cabins (65%)
   e) Snowmobile Riding (64%)
   f) Boating (64%)
   g) Swimming (62%)
   h) Picnic Areas (61%)
   i) Biking (56%)
   j) Group Camping (48%)
   k) Park Organized Activities (44%)
   l) Dog Mushing (44%)
   m) Float Plane Use (42%)
   n) Education & Interpretation Center (38%)
   o) Dog Training (25%)
   p) Horse Riding (25%)
   q) Other (25%) - ATV Access (10), Fishing (2), Non – Motorized Boating (2), Marina, Boat Launch on L. Susitna, Hunting, Skijoring (2), Nude Beach, Boat Storage for Cabin Owners, Geo-caching, Canoeing, Dedicated access to Butterfly Lk from Lynx Lk Rd, Vehicular Access to W bank of Nancy Lake, Ice-skating (2), Shooting, Jet Skiing, Quiet Areas, Birding, Golf Course

7. What recreational uses or facilities that may or may not be currently available do you feel are not appropriate for the NLSRA? (check all that apply)

a) Horse riding (33%)
b) Dog training (31%)
c) Float plane use (29%)
d) Education & Interpretation center (16%)
e) Snowmobile Riding (15%)
f) Dog Mushing (14%)
g) Park Organized Activities (12%)
h) Biking (9%)
i) Group Camping (8%)
j) Boating (7%)
k) Swimming (3%)
l) Picnic Areas (2%)
m) Public use Cabins (1%)
n) Camping (1%)
o) Cross Country Skiing (1%)
p) Hiking (0%)
q) Other (22%) – ATV's (15), Jet Skis (5), Motorized Boating (4), RV's, Commercial Beer & Liquor Sales, Boat Traffic/Storage, Vehicular Access, Fireworks, Street Lights, Docks beyond 25' into Lake, Shooting

8. What do you like most about the NLSRA? (check all that apply)

a) Quiet Natural Setting of the area (62%)
b) Remote canoeing and camping (57%)
c) Diversity of recreational opportunities (55%)
d) Marked trails (37%)
e) Family Oriented (26%)
f) Escape urban environments (2%)
g) Other (11%) – Snowmachine Trails (4), Wildlife Viewing (2), Boating (2), Fishing (3), Jet Skiing, Hunting, No HWY Vehicular Access, Access to Cabin

9. What do you like least about the NLSRA? (check all that apply)

a) Motorized use in the recreation area* (33%)
b) Crowding in area of Nancy Lake Parkway (21%)
c) Lack of developed access (19%)
d) Lack of development (14%)
e) Facilities at or above capacity (13%)
f) Cleanliness of public sanitary facilities (9%)
g) Other(33%) – ATV Damaged trails (4), Non-enforcement of noise ban after 10PM (4), Lack of ATV Summer Access (2), Lack of plan for boat owner storage at Red Shirt Lk, Unpermitted development of small lakes, Snow cover limitations for snowmachine use, Litter on trails & in Lakes, bureaucratic interference in landowner access, Jet Skis & Waterskiing, Hunting & Trapping, Floatplanes practice landings & takeoffs, Lack of park staff at gate for assistance, Unmaintained canoe trails, Inadequate signage, Boat docks beyond 25' into Lakes, Parking at Nancy Lake Parkway Boat Launch

10. There are currently approximately 42 miles of trails (includes cross country ski trails, canoe trails, summer hiking trails, and access trails), two developed campgrounds, 23 maintained portages and approximately 6 miles of maintained roads in NLSRA. Based on

this information and your experience, how much development is appropriate? (check the one that applies most)

- Keep it near current levels (46%)
- Increase it slightly (26%)
- Increase 50% (9%)
- Reduced (9%)
- Double (7%)
- Triple (7%)

Questions 11-24 (Yes/No) (Many respondents chose not to answer some questions)

11) Would you support a higher level of development in the Nancy Lake Parkway corridor to provide a greater diversity of recreational opportunities? This would focus increased development in an area that has paved access and currently receives high use levels while preserving the interior portion of the recreation area for non-motorized boating and camping opportunities 45% Yes / 55% No (146)

12) Would you support a higher level of development in the areas of Lynx Lake Road and Butterfly Lake Trail to provide a greater diversity of recreational opportunities? This would focus increased development in areas with existing access routes and lakes that allow motorized use, while preserving the interior portion of the recreation area for non-motorized boating and camping opportunities. 41% Yes / 59% No (147)

13) Would you support expanding the cross country skiing trails north of the Nancy Lake Parkway? This would increase non-motorized recreation opportunities during the winter season. 69% Yes / 31% No (143)

14) Would you support development of skate skiing trails? This would be done by locating a new skate ski trail alongside the existing Nordic trails or by the development of new combined trails. 61% Yes / 39% No (143)

15) Would you support the development of new looped snowmobile trails? All of these new trails would be developed south of the Nancy Lake Parkway. 63% Yes / 37% No (148)

16) Would you support developing the canoe trail system (trail tread, boardwalk, and portage sites) to a higher trail standard? This would include improving and widening the tread of the trail, increasing the clearing width, addressing impacts to resources, and increasing trail sustainability. 69% Yes / 31% No (146)

17) Would you support constructing new public use cabins, Adirondack type shelters, or additional remote camping sites in back-country areas (areas accessed by canoe or other trails)? This would allow expansion of the public use cabin system, expand camping opportunities, and introduce new opportunities for overnight accommodation at Adirondack type shelters. 61% Yes / 39% No (145)

18) Would you support constructing new public use cabins, Adirondack type shelters, or additional camping sites in front-country areas such as Nancy Lake Parkway or Lynx Lake Road/Butterfly Lake Trail)? This would allow expansion of the public use cabin system, expand camping opportunities, and introduce new opportunities for overnight accommodation at shelters. At least one of the cabins would be developed as barrier free and will have summertime access that meets ADA Accessibility Guidelines for Buildings and Facilities. 51% Yes / 49% No (144)

19) Would you support development of a looped mountain bike trail system in the area south and west of South Rolly Lake Campground? This would provide an opportunity that does not currently exist in the recreation area and would enhance opportunities for recreation associated with the developed campground at South Rolly Lake and for day use visitors to the recreation area. 68% Yes / 32% No (146)

20) Would you support development of a group camp facility at Shem Pete Lake? This would provide an opportunity for group oriented recreation that does not currently exist in the recreation area. 57% Yes / 43% No (139)

21) Would you support a multi use trail (non-motorized), on the East Red Shirt Lake Trail and Chicken Lake Cross-park Trail? This would provide new recreational opportunities that do not currently exist (bicycle use) and expand use of the primitive and unmaintained Cross-park Trail. 59% Yes / 41% No (140)

22) Would you support the development of equestrian trails in the area of the Nancy Lake Parkway? This would provide new recreational opportunities that do not currently exist. 31% Yes / 69% No (144)

23) Would you support the development of interpretive and nature trails in the area of the South Rolly Lake Campground? This would provide increased opportunities for guests at the campground and for day use visitors to the area. 73% Yes / 27% No (142)

24) Would you support the development of a new multipurpose facility within the Nancy Lake Parkway corridor? This facility could serve as a new park headquarters site and regional training and meeting center for both the park and the public (similar to the Campbell Creek Science Center in Anchorage). When not being used in support of park programs, this facility would be available for use by the public for a fee. 57% Yes / 43% No (148)

Part B: Landowner

A. Ownership and Access

1. Do you own property within[1], contiguous[2], or adjacent[3] to the Recreation Area?
 52% Yes / 48% No *If yes please complete the following questions*

2. Where is your property located?
 Top three areas of land ownership – Nancy Lake, Butterfly Lake & Redshirt Lake Subdivisions. *(Subdivision and/or lake name)*

3. How long have you owned this property? *(17)** Years

4. Do you utilize trails, launches, or boat storage areas in the Recreation Area to access your property? 62% Yes / 38% No

5. Do you utilize the boat launch and parking area of the Recreation Site to access your property? 34% Yes / 66% No

6. How do you access your property in the summer and winter? (check all that apply)
 (79 Landowners)

a) Hiking	33 Summer / 0 Winter
b) Power boating	30 Summer
c) Canoe	35 Summer
d) Plane	17 Summer / 9 Winter
e) Skiing	0 Winter
f) Off Highway Vehicle	22 Summer / 17 Winter
g) Highway Vehicle	36 Summer / 34 Winter
h) Snowmobile	51 Winter
i) Bicycle	9 Summer / 2 Winter

7. How long have you been using those access methods? (19)* Years

[1] Property is entirely or mostly within NLSRA.
[2] Property shares a common boundary with NLSRA.
[3] Property is in close proximity to NLSRA.
* Average

Appendix E
Division of Parks and Outdoor Recreation Trail Management Policy – Effective 3/10/2009

Introduction:

The Alaska Division of Parks and Outdoor Recreation is responsible for approximately 67 trails, comprising more than 650 miles (not including water trails) within 128 units of the State system. These trails are very important to Alaskans. According to a public recreation survey, seven of the top ten favorite activities of Alaskans involve trail usage (SCORP, 2004). This same survey found that the majority of respondents indicated that trail rehabilitation, upgrades, and expansion should be a high priority for the State.

The *Division of Parks and Outdoor Recreation Ten-Year Strategic Plan 2007-2017* reports that the deferred maintenance backlog for park facilities (which includes trail operations) is over $67 million. Funding tends to focus on the high-use front-country areas, where most management and public safety problems occur. For this reason, trail programs tend to receive little attention other than "basic" maintenance, such as removing fallen trees or other minor repairs, and almost no preventive maintenance. Often, trail operations have been viewed as a non-technical element of overall park operations and little emphasis has been placed on formal training for staff involved in trail programs. In most cases, staff has been provided with limited direction and guidelines and few training opportunities. This has proved detrimental as improperly built and maintained trails are in some cases inadequate for their current uses, and can lead to park resource damage.

Purpose:

This Trail Management Policy will provide direction on how the Division will manage, develop, maintain and assess the condition of its trails. It is designed to provide the overarching framework guiding sustainable and responsible trail development and management. To complement this policy the Alaska State Parks Trail Management Handbook has been created to provide greater detail on how to design, construct and maintain trails using standards, guidelines and best management practices.

The five primary goals of this policy and the Alaska State Parks Trail Management Handbook include:

1. Standardize ***sustainable*** trail construction and maintenance techniques.
2. Organize a process to assess, prescribe and prioritize State trail system needs.
3. Promote wise management of Alaska State Park trail resources through proper planning, design and training.
4. Achieve long-term savings in maintenance costs.
5. Provide reference resources to the public, other organizations and park staff to establish, promote and enhance sustainable trail systems throughout the State.

These goals will be carried out through the creation, use and in some cases adoption of the following trail management concepts:

1. Trail Management Objectives (TMO's)
2. Trail Classification System
3. Best Trail Management Practices (BMP's) through use of the adopted "Sustainable Trail Framework"
4. Trail Inventory and Assessment (through GIS / GPS application)
5. Standardized Trail Dictionary

1. Trail Management Objectives

Trail Management Objectives (TMO's) are defined as the documentation of the intended purpose and management strategies of a trail based on the trail vision. TMO's document the Trail Class, Designed Use, Design Parameters, and other trail-specific considerations for both planned and existing trails. TMO's also provide information for subsequent trail planning, management and reporting purposes.

All Alaska State Park's *managed trails*[4] will have TMO's developed based on management plan direction and a trail's specified Designed Use. Absent of a management or trail plan, TMO's will be developed with consideration given to how individual TMO's accommodate the public needs, protect resources and are sustained into the future.

See Section 1 of the **Alaska State Parks Trail Management Handbook** for the Trail Management Objective form and instructions.

[4] *See the Alaska State Parks Trail Management Handbook for a formal definition (Trail Use Strategies and Managed use)*

2. Trail Classification System

A Trail Classification System provides uniform standards for trail nomenclature, maintenance, marking, design, and construction. The Trail Classification System adopted by this policy is a close adaptation of the National Trail Classification System that has been formally adopted by most federal land management agencies, and therefore will be a major step forward in applying consistent terminology and management guidance on trails across Alaska. This system is based on identifying the standardized category (Type and Class) of an existing or planned trail.

Two general types of trails will be referenced in the Alaska State Parks Trail Management Handbook: Standard Terra Trails and Snow Trails. Each trail, regardless of type, is further broken-down into one of five Trail Classes, ranging from least developed (Trail Class 1) to most developed (Trail Class 5). General criteria are supplied to define Trail Classes applicable to all system trails. Trail Classes are further refined through Trail Design Parameters that offer construction specifications by the type of trail use, such as hiking, biking, all-terrain vehicle, and snowmobile trails. Trail Design Parameters provide guidance for the assessment, survey and design, construction, repair and maintenance of trails, based on the Trail Class and Designed Use of the trail.

See Sections 2 and 3 of the **Alaska State Parks Trail Management Handbook** for Trail Classification Criteria and Design Parameter Matrices.

3. Best Management Practices (BMP's) for Trails through use of a "Sustainable Trail Design Framework"

A Sustainable Trail is most simply defined as a trail that conforms to its terrain and environment, is capable of handling its intended use without serious degradation, and requires minimal maintenance.

Trail sustainability is designed around the following four design fundamentals:

- Integrated Water Control
- Curvilinear Layout
- Grade Control
- Full Bench Construction

The foundation of sustainable trail construction focuses on initial trail design to prevent future resource degradation and human impacts. While initial construction costs are typically higher, overall life-cycle costs will be reduced with lower maintenance costs as well as minimizing resource degradation in the future. Integral to sustainability is proper trail

planning – a sound plan is the core for any successful trail project. Additionally, a Sustainable Trail integrates well into its environment; it does not destroy the feel, aesthetics or ecological integrity of the environment.

The Division adopts these core fundamental sustainable trail design concepts and will integrate them into its trails program. While some elements may be difficult or impossible to fully implement without major expense, all reasonable measures shall be implemented whenever feasible. This policy mandates that the "Sustainable Trail Design Framework" be incorporated as follows:

- **New Trails** – All new Division trails will be built using the "Sustainable Trail Design Framework" as part of their design standard. No new trails will be constructed without adherence to this standard.
- **Existing Trails** – As trails are repaired, re-routed or otherwise upgraded, they will be built to sustainable levels when feasible.

See Section 4 of the **Alaska State Parks Trail Management Handbook** for reference to the adopted "Sustainable Trail Design Framework".

4. Trail Inventory and Assessment System

Before trail maintenance and repair strategies can be fully developed, an assessment of trails and their condition will be made based on the TMO's developed for each trail. While TMO's provide a vision for *future* trail conditions, Trail Assessments will offer an accurate snapshot of *existing* conditions and what is needed to meet sustainable standards. Differences identified between a TMO and Trail Assessment will expose those areas where shortfalls and gaps exist. Corrective measures and rehabilitation efforts to address identified shortfalls shall utilize sustainable trail concepts and best practices. Information derived from assessments and evaluated against sustainable standards and guidelines will also aid in the determination of how a trail may be best managed given its current state.

It will be Division policy to collect an inventory and assessment of all managed trails to determine the condition and immediate need of park trail systems. Alaska's Minimum State Mapping Standards will be applied for the creation of mapping documents, as listed in the Alaska State Parks Trail Management Handbook. It is also mandated that all data collected will conform to the newly developed Interagency Trail Data Standards. Universal trail data standards will enable national, regional, state, and trail-level managers and the public to use mutually understood terminology for recording, retrieving and applying spatial and tabular information. Data standards will make it easier for trail information to be accessed, exchanged and used by more than one individual, agency or group. Any data collected for the Division shall be exchangeable and functional for other partner agencies and public use.

See Section 5 of the **Alaska State Parks Trail Management Handbook** for the Trail Assessment Procedures and Guidelines, Alaska's Minimum State Mapping Standards and the (soon to be adopted) Interagency Trail Data Standards.

5. Trail Terminology

A major goal of this policy is to clarify and implement consistent terminology to provide for effective communication and common understanding. Terminology referenced in this policy has been obtained from many sources including the US Forest Service (in collaboration with the National Park Service, the US Fish and Wildlife Service, and the Bureau of Land Management) and non-profit organizations such as Alaska Trails. It is the policy of the Division to utilize a standardized trail dictionary. Use of a standardized trail dictionary will allow management to become more uniform in the implementation of sustainable trail design practices and carry a common, consistent voice in the trails community.