

1 **Chapter 2: GENERAL TRAIL POLICIES**

2 There is a tremendous amount of work needed to transform the Chugach State Park trail
3 system into a sustainable and functional trail system that meets the needs of user groups
4 while simultaneously providing for the protection of natural resources. Through the use of a
5 green infrastructure approach, the new interagency trail classification system, sustainable
6 trail design and proper maintenance, improvements will be made over time to create a
7 functional, high-quality trail system. The following general trail management policies and
8 management concepts apply to trails in the park in conjunction with the trail specific
9 recommendations provided later in this plan.

10 11 **Green Infrastructure Approach**

12 This plan promotes a green infrastructure approach to trail planning in order to better
13 accommodate development, reduce infrastructure costs and maintain the park's character.
14 Green Infrastructure is defined as an interconnected network of green space (hubs +
15 corridors) that conserves natural ecosystem values and functions and provides benefits to
16 human populations. It refers to an integration and interaction of different functions or
17 activities on the same piece of land. In using a green infrastructure approach, recreation
18 areas, and important environmental features and processes are identified and considered in
19 the planning of park trails and future land management actions. This approach is particularly
20 important in Chugach State Park because of its unique and intrinsic natural features and
21 proximity to Alaska's densest population centers and the State's primary international
22 transportation hub. This approach links communities to landscapes with the goal to
23 maximize the benefits to both. Green Infrastructure is the key to sustainable use of land
24 especially in the front country areas of the park that experience high use and are seeing the
25 resulting effects on facilities and resources.

26 27 **Sustainable Trail Framework**

28 In keeping with the Division of Parks and Outdoor Recreation's Trail Management Policy,
29 this plan implements a Sustainable Design Framework to create a trail system that has
30 minimum impact on natural systems and low maintenance costs. A Sustainable Trail is
31 defined as a trail that conforms to its terrain and environment, is capable of handling its
32 intended use without serious resource degradation, and requires minimal maintenance.
33 Sustainable Trails focus on initial trail design to minimize resource degradation and
34 maximize the user experience. This involves the use of integrated water control, curvilinear
35 layout, grade control and full bench construction. While initial construction costs may be
36 more, reduced future maintenance costs should compensate for those initial investments.

1 The following guidelines will be considered and integrated when building or improving trails
2 within the park. At times, certain circumstances may make the use of some of these
3 guidelines difficult or impossible to fully implement. In these cases reasonable measures
4 should be taken while maintaining the spirit of the guidelines. Some segments of the existing
5 park trails do not yet meet the sustainable standards. Where this is the case, a higher level of
6 maintenance is required to keep the trail tread in reasonably good condition while
7 minimizing impacts on park resources. The ultimate result will create a park resource that
8 provides transportation alternatives, recreational opportunities, environmental aesthetics,
9 open space preservation, and increased adjacent property values.

10 The Six Essential Elements of Sustainable Trails¹

- 13 1. *The Half Rule*: Trail grade should not exceed ½ the sideslope that the trail traverses,
14 if so, it becomes a Fall-line Trail.
- 16 2. *The 10% Average Guideline*: The average trail grade, or overall trail grade should
17 not exceed 10% along the alignment of the trail. In many cases, keeping trail grades
18 at about 10% will assure longer term sustainability, and this should be an objective
19 for all trail projects, unless specifically designed at greater grades.
- 21 3. *Maximum Sustainable Grade*: A defined maximum tread grade that can be
22 constructed along the trail. Typically restricted to runs of less than 50 feet, and no
23 more than 5% of total length of the trail. Determining the Maximum Sustainable
24 Grade for a trail involves many variables that are specific to a region or trail section.
25 For example, soils that have a very high organic content will be less stable than those
26 that are composed of weathered granite. Variables influencing the Maximum
27 Sustainable Grade include:
 - 28 - Soil type
 - 29 - Presence of surface rock or bedrock
 - 30 - Annual rainfall / intensity
 - 31 - Type and spacing of integrated water control features
 - 32 - Types of users
 - 33 - Numbers of users
 - 34 - Desired level of difficulty
- 36 4. *Grade Reversals*: A spot at which a climbing trail levels out and then changes
37 direction, dropping subtly a short distance (6-12 feet) before rising again. Ideally,
38 Grade Reversals are incorporated into a trail's initial design as part of its Curvilinear
39 Layout. Water control features such as Rolling Grade Dips and Knicks can be
40 integrated into an existing trail as a maintenance item. Water bars are not
41 recommended due to their higher maintenance requirements.

¹ Derived from Alaska Trails Curriculum

- 1 5. *Outslope*: As the trail contours across a hillside, the downhill or outer edge of the
2 tread should tilt slightly downhill and away from the uphill trail edge. Under typical
3 circumstances, this “Outslope” should be less than 5%. Anything greater will usually
4 lead to tread creep and user discomfort. Outslope is influenced by the forces of
5 compaction, displacement, and erosion, which collectively reduce the effectiveness of
6 the design element. Even on trails that are constructed with proper outslope, it will
7 often deform through time and routine maintenance is needed to restore a trail tread to
8 its designed Outslope with these forces in mind. The integration of Grade Reversals
9 and Rolling Grade Dips insure that water is managed along the trail if Outslope is
10 compromised.
- 11
- 12 6. *Durable Tread Surface*: Surfacing should take into consideration special
13 characteristics of the soils such as the presence of permafrost, organic/muskeg soils,
14 volcanic ash, saturated soils, or some other environmental challenge. Many trails in
15 Alaska are not sustainable due to flat terrain or the soil characteristics noted above.
16 In these cases tread surfaces require trail hardening to ensure sustainability. Trail
17 hardening includes techniques such as gravel capping, boardwalk and planking
18 decking, the use of geotextile surfaces and other means to provide a sustainable tread.
19

20 Avoid Flat Terrain Trails when Possible

21 The premise of Trail Sustainability is built around integrated water control. Flat terrain
22 (<3% surface slope) represents a great challenge since often when trails are constructed in
23 these situations, there is no provision for drainage – the trail tread becomes the lowest
24 point and thus collects water. These situations include: valley floors, glacial plains,
25 deltas, and wetlands. This is especially problematic in Alaska where many historic trails
26 which were originally intended for winter use were built across wetlands, but are now
27 being used in the summer.
28

29 Common Trail Practices or Structures to Avoid when Possible

- 30 • Fall-Line Trails (exceeding the half rule)
- 31 • Waterbars (difficult to properly construct, high-maintenance)
- 32 • Culverts – installing too small of diameter (difficult to maintain, fish passage
33 issues)
- 34 • Grades too steep for sustainability (exceeding 10% average grade)
- 35 • Improper bridge location
- 36 • Lack of Grade Control along alignment (highly variable grades)
- 37 • Improper trail location (or non-curvilinear layout)
- 38 • Improper outslope (entrenched tread, <3% or >7%, poorly maintained)
- 39 • Failure to identify critical control points during layout
- 40 • Improper or failure to acquire proper permits (poor planning)
- 41 • Construction in a flood zone (poor planning)
- 42 • Construction in a sensitive habitat (poor planning)
- 43 • Construction on flat terrain (valley bottoms, ridgelines, etc.)
44
45

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. Humans have a desire for efficiency that translates to making sure a trail is easier to use than to bypass, shortcut, or avoid. The notion that nature's randomness has a playful quality should be represented in the trail experience while considering the concept of harmony that is felt when all the core values work together to support a desired trail experience.

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 always be a major trail type in Chugach State Park, users have indicated a desire to see more loop trails incorporated within the trail system. Loop trails provide a more diverse experience for park users and can be an important trail management tool when different elevations and terrain configurations are incorporated to take advantage of superior park features. Additionally, greater use can be accommodated using loops in the park's development zones without placing greater impact in backcountry areas or wilderness zones. Where appropriate, construction of connecting links with existing trails or connecting other loops should be incorporated in future trail design to create more loop options within the existing trail infrastructure.

1 Re-Vegetation

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

7
8 Clearing

9 Clearing widths and heights shall conform to the trail class and design parameter
10 specifications assigned to a particular trail or trail segment. Deviations to the design
11 parameters may occur only when the deviation is documented in the trail management
12 objective form for a particular trail or trail segment. Additional clearing may be done to
13 remove fire or falling hazard trees adjacent to developed areas or to improve views as guided
14 by park zoning and a trail's classification.

15
16 Natural Considerations

17 Where significant wildlife or other natural features exist, special trail routing, construction
18 methods and trail use should be used. Trails should have a natural flow and rhythm that
19 avoids long, straight alignments. Where hazards are present, special trail construction
20 techniques or locations should be used to mitigate the hazard. Hazardous areas, such as steep
21 slopes, avalanche prone areas and rockslide areas should either be avoided or be closed
22 seasonally when hazardous conditions are a problem.

23
24 Historic and Cultural Resource Considerations

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

30
31 Environmentally Sensitive Sites

32 Special location or construction methods may be necessary to reduce impacts and minimize
33 disturbance in environmentally sensitive areas. Examples of environmentally sensitive sites
34 include: wetlands, highly visible hillsides, significant vegetation areas, threatened and
35 endangered species habitat, highly erodible soils, unstable slopes, and ridgelines.

36 Techniques, such as site specific trail routing, erosion control measures, site specific
37 adjustment of construction standards, and site specific construction practices should be
38 implemented to minimize environmental, visual or construction impacts. Construction
39 methods that should reduce impacts include installing retaining walls to reduce cut and fill
40 slopes on a visually prominent hillside, hand construction of the trail, or stabilizing a hazard
41 that is located within or adjacent to a trail corridor.

42
43 Special care should be taken in areas close to streams or wetlands. Trails that cross or are
44 located adjacent to wetlands should be designed for minimal impact. Boardwalks or other
45 techniques may be necessary to impose minimal construction impacts. Wildlife needs should

1 also be considered when setting trails near wetlands. Consider decommissioning
 2 underutilized trails in sensitive areas to minimize erosion of sediment into streams.
 3 Connectivity between drainage ditches and streams should be minimized to reduce sediment
 4 delivery potential.

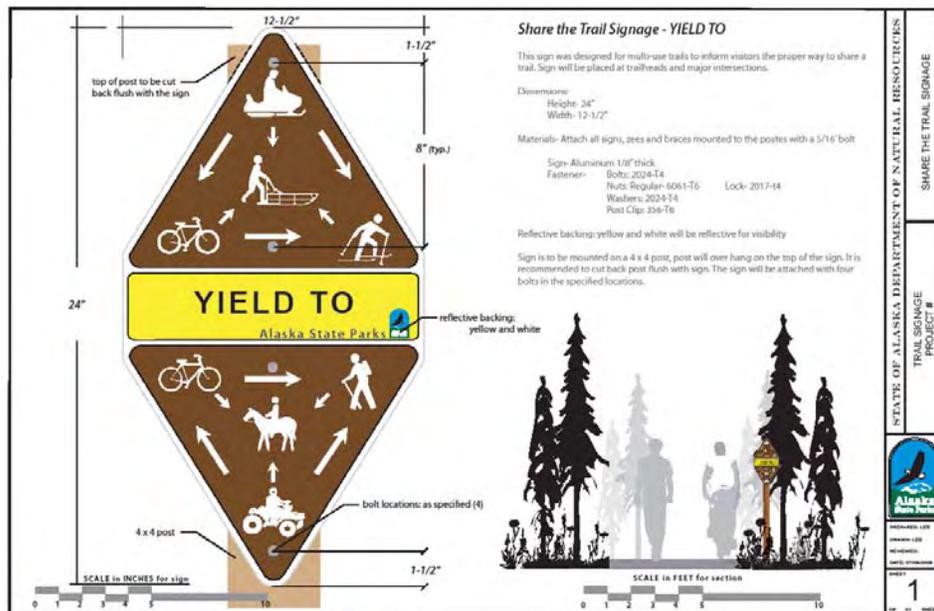
5
 6 Climatic Trail Use Opportunities

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

11
 12 Signage

13 Sign standards will vary according to park zoning and trail classification. Generally, all trail
 14 signage should be kept to a minimum and include only that needed to convey necessary
 15 information. Highly developed trails will typically include more directional signage and
 16 interpretive information. Locations of signs need to be evaluated on a case-by-case basis and
 17 signs should only be posted where necessary to avoid visual pollution. Yield hierarchy signs
 18 (see sample figure 2.1) should be placed at all major access points of multiple use trails
 19 where it is clearly visible and where it does not impede trail use or present a hazard to trail
 20 users.

21 **Figure 2.1: Yield Hierarchy Sign Example**



23
 24
 25 Trail Closures

26 Closing trails to use is an important management tool that will be utilized as needed within
 27 the park. Trails may be temporarily closed throughout the year due to construction or trail
 28 restoration projects, because of increased wildlife activity, to protect trail tread from

1 damage during wet or spring break up conditions, or for other hazardous conditions that
2 may threaten visitor safety and park resources. Trail conditions will be closely monitored
3 by staff and when appropriate, closures will be lifted. Trail closures and openings will be
4 public noticed and well signed.

6 **Health and Fitness**

7 The health benefits of exercise derived from recreational activities, such as bicycling and
8 walking lessen health-related problems and reduce health care costs. Regular, moderate
9 exercise has been proven to reduce the risks of many health problems, such as coronary
10 heart disease, diabetes, certain kinds of cancers, and obesity. Regular exercise can also
11 protect against injury and disability because it builds muscular strength and flexibility. In
12 addition to the health benefits that bicycling and walking offer, the improvement of
13 physical health reduces health care costs. Trails and greenbelt connecting trails offer
14 adults and children alternative transportation networks that provide an opportunity to
15 integrate moderate, individualized exercise with daily trips to work or school. Health and
16 fitness shall be encouraged throughout the park by looking for opportunities to connect
17 with other trail networks that may offer alternatives to vehicular transportation for day-to-
18 day activities and through the consideration of trail design and trail-related facilities that
19 enhance health and fitness.

21 **Americans with Disabilities Act**

22 In 1990, Congress passed the Americans with Disabilities Act. Among other provisions, the
23 act prohibits state and local governments from discriminating on the basis of disability and
24 requires government services, programs, and activities to be accessible to people with
25 disabilities. This act attempts to remove the physical and social barriers facing over 43
26 million Americans with disabilities. The Access Board is developing new guidelines
27 covering access to trails, beaches, and picnic and camping areas. The guidelines will
28 supplement those the Board has issued for the built environment and will address unique
29 constraints specific to outdoor developed areas. Until that time every effort will be made to
30 maximize the accessibility of trails while at the same time recognizing and protecting the
31 unique characteristics of the park. While it is clearly not practical for all types of trails in a
32 mountainous environment to be fully accessible, where appropriate, the trail system should
33 comply with the standards set forth in this law. In addition, not all ADA accessible trails will
34 be of the same difficulty. Information on trail grade, cross-slope, width, and surface will
35 allow individuals with disabilities to decide if they have the ability and interest to use that
36 segment of the trail. Appendix B provides additional information and technical provisions
37 for accessible trails and outdoor access routes.

39 **National Trails**

40 The National Trails System Act of 1968 made it Federal policy to recognize and promote
41 trails by providing financial assistance, support of volunteers, coordination with States, and
42 other authorities. Under this Act, trails that meet certain criteria can be nominated for
43 inclusion in the National Trails System. The system is made up of National Scenic Trails,
44 National Historic Trails, and National Recreation Trails. These trails provide for outdoor
45 recreation needs; promote the enjoyment, appreciation, and preservation of open-air, outdoor

1 areas and historic resources; and encourage public access and citizen involvement. Only
2 Congress can authorize National Historic or Scenic Trails and to date, 11 national scenic
3 trails and 19 national historic trails have been established by law. National Recreation Trails
4 can be designated by the Secretary of Interior or Agriculture and over 1000 national
5 recreation trails have been recognized. Chugach State Park has two National Trails within its
6 system: the Iditarod National Historic Trail and Indian to Girdwood National Recreation
7 Trail. Management of these areas shall be consistent with the provisions of the National
8 Trails Program.

9 10 **Trail Access**

11 Access to Chugach State Park has long been challenging with established trailheads being the
12 principal access points into the park. As the park's popularity grows and residential
13 development adjacent to the park boundary continues, trailheads are being used beyond
14 capacity and park facilities are suffering from overuse. For example, the Glen Alps trailhead
15 provides access to the network of Anchorage Hillside trails and the parking lot capacity there
16 is 165 cars. On an average day regardless of the season, that lot is easily half to mostly full
17 while on nice sunny summer days, the lot is completely full and over a 130 cars have been
18 observed parking along the road adjacent to the lot. While Glen Alps is probably the most
19 popular access point, this kind of public demand is still being experienced in many areas
20 along the park boundary and the impacts on park resources and neighboring communities are
21 problematic. Access has become enough of an issue that an entire plan is being developed to
22 address these concerns. As a result this plan defers to the Chugach Access Plan for guidance
23 with these access-related issues. This plan also defers to the Chugach State Park
24 Management Plan for guidance related to trailhead facility development.

25 26 **Land Acquisitions and Park Additions**

27 Occasionally lands are purchased or donated for addition to the park. These additions are
28 typically important to provide access or protect areas with special features. Many trails begin
29 outside of the park boundary and link to trails within the park or provide access to the park
30 boundary. Should these trails or the land they cross be acquired, the trail classification and
31 design parameter of the adjoining trail within the park should be applied. Trail development
32 in newly acquired areas may need to go through a site-specific planning process if these areas
33 are not addressed in this plan. Trail development in newly acquired areas shall also consider
34 management recommendations provided in the Chugach State Park Management Plan.