Fort Abercrombie State Historic Park
Trails Plan

Introduction

Fort Abercrombie contains one of the Kodiak's finest developed trail systems. The predominant user group is local residents who frequent the park daily for the purposes of recreation and exercise. Island visitors also make a point of walking its quiet and scenic pathways. Over 20,000 visitors use the park trails annually and this number is increasing. Because of the island's fragile soils, park trails have suffered from use and have required extensive "hardening" to support the heavy foot traffic. Over the past 15 years, a substantial effort has been made to upgrade trails through a combination of special trail grants and community trail fundraising efforts.

Note: The Ft. Abercrombie State Historic Park Trail Plan was developed prior to an Alaska State Parks Trail Planning and Management Policy that is due in 2007. Once a statewide policy is adopted, this trail plan should be reviewed and revised accordingly.

Trail Plan Mission Statement

The purpose of this trail plan is to provide a quality system of environmentally sustainable trails, ranging from minimally to fully developed, that affords a variety of natural outdoor opportunities for visitors of varying abilities without compromising the overall purpose of the park.

Trail Management Goals

1. When feasible, trail development shall strive to subscribe to the elements of Sustainable Trails (see Trail Specifications section) for all future trail upgrades in the park. General fundamentals will include the use of:
   a. Curvilinear layout (contour trails)
   b. Integrated water control
   c. Grade control
   d. Full bench construction
2. Design and manage trails that reflect the management intent and the land use designation of the area in which the trails are located through an identified set of Trail Management Objectives (TMO) for each trail. Complete TMO forms for each managed trail by 2008.
3. Establish standards by considering public safety, aesthetics, resource protection, expected use, and user preferences.
4. Improve access to and within the park for bicycles but not necessarily by upgrading existing trails to accommodate bicycles. This would require dramatic design and construction challenges that would seriously change the atmosphere of the park. Bicycle trails would result from new construction along road corridors,

with improvements such as bike racks to promote the use of bicycles as access vehicles to the park.

5. Increase the number of accessible trails with various degrees of ADA compliancy. Develop ADA trails in keeping with the management intent and land use designation of the area where undo impact to the natural or scenic qualities of the area will not occur.
6. Provide a logical sequence of rehabilitation and new construction that will provide maximum public benefit and resource protection.
7. Consider the potential for future upgrades and ease of maintenance during design, layout, and construction. Wetlands will be avoided when possible.
8. Keep visual impacts associated with construction or maintenance to a minimum.
9. Use trail classification standards to guide the development and maintenance direction of all trails. Note that in certain unique situations these standards may be modified so as to not unduly compromise the visual and natural qualities of a location.
10. Bring current trails and associated structures up to a desired level of development. Note that in some cases due to terrain or other topographical features, it may not be possible for a particular trail to comply 100% with a trail standard assignment.
11. Institute a trail-use monitoring program to ascertain use levels and impacts through regular observations of trail integrity and by the use of trail counters to provide defensible use statistics.
12. Retain the parks natural character while providing safe hiking opportunities. The intent of this plan is not to fence and sign all hazardous locations in the park, but to provide general guidelines on how or when additional safety measures are necessary or how they can be avoided through proper design or location.
13. Develop a sign plan for the trail system that embraces uniformity, simplicity and visual aesthetics.
14. Incorporate a limited system of color-coded trail loops that would be helpful for those new to the park or for other purposes.
15. Provide high quality trail maps for the park that could minimally include trail names, difficulty, segment mileage, and park features.
16. Where feasible, locate trails and incorporate design features to highlight dramatic views and the natural beauty of the park. Where appropriate, consider resting benches at select prominent points.
17. Provide direction for issues pertaining to pets on park trails, including pet waste, leash compliancy, leash-free pet access to Lake Gertrude, and proper pet trail-etiquette through an awareness program. Consider forming an advocacy group for pet owners.
18. Consider future trail development on adjacent lands outside the park when planning for in-park trails.
19. Adopt a method of efficient trail assessments and inventory for the purpose of efficient trail maintenance and monitoring.

Table A-1. Types of Trail Users at Fort Abercrombie SHP

Trail User Group	Park Trail Use Patterns	Sustainability Requirements (to comply with park mission)	Special Trail Needs And/or Issues	Appropriate
Pedestrian – Walkers	Most popular and predominant use of park by cross-section of community. • Family • Recreational, relaxation • Fitness • Transportation • Education (school field trips) • Natural, cultural history	Achievable through careful trail layout, design, and maintenance; most Class 2+ trails will require aggregate hardening eventually for sustainability. Minimal cost for development.	Diverse network of trails, of many different standards to provide numerous options for a wide variety of trail uses and abilities. Loop system desired.	Yes.
Pedestrian – Pet Walkers	Very popular user group, possibly up to 50% of trail users have pets, especially in the leash-free zone. • Pet and owner exercise • Personal fitness	Achievable through careful trail layout, design, and maintenance; most Class 2+ trails will require hardening eventually for sustainability. Consideration must be made for public safety purposes – not all pets are friendly. **Encourage Proper Pet Etiquette** on trails that will address potential areas of conflict between pet walkers and non-pet walkers.	**Lack of Leash Law Compliance**: problem in leash required areas, leash-free zone purpose.	No, seek remedy through increased awareness and more vigorous enforcement.
			Pet Waste on Trails: problem especially near trailheads on trails, many animals need relief shortly after starting walk.	No, seek remedy through active education program to encourage pet owners to clean up after pets with: • Signage at trailheads • Pet waste receptacles in a few locations • Provide bags at trailheads • Public education
			Leash-free Area for Water Dogs: provide a place for pets and owners to enjoy water activity.	Not on Lake Gertrude unless a special area is identified on the south side of lake, AND pets are leashed crossing Lake Gertrude Trail for access.
			Add Leash-free Loops: create multi-looped system to improve leash compliance on Lake Gertrude Trail (south).	Yes, upgrade/reroute social trails that parallel the south side of Lake Gertrude between Pacific and Parkside Trails.

Trail User Group	Park Trail Use Patterns	Sustainability Requirements (to comply with park mission)	Special Trail Needs And/or Issues	Appropriate
Pedestrian – Runners	Popular use with individual runners, school cross-country teams, and special events. • Fitness • Race events	Achievable through careful trail layout, design, and maintenance; most Class 2+ trails will require hardening eventually for sustainability.	Prefer non-paved surfaces, minimum 12-inch tread width. Loop system desired.	Yes. Races by Special Use Permit only.
Bicyclists	As the park is connected to the bike path system, cyclists are being encouraged to travel to the park. • Family • Recreational • Fitness • Race events • Transportation (minimal)	Continuous track sustainability achievable through careful trail layout, design, and maintenance. Requires highly durable surfacing and adequate sight distance for safety of pedestrian traffic.	Paved surfaces preferred for primary bike path egress routes. Bike racks, signage on paved trails. Road crossing issues. Loop system required for all-terrain trails.	All-Terrain Trails: Not appropriate due to high cost and small area. Multi-use Bike Pathways: Appropriate as primary access routes to the park. Races by Special Use Permit only.
In-Line Skaters, Roller-Bladers, Skate-Boarders	As the park becomes connected to the bike path system, other trail users may be encouraged to travel to the park. • Family • Recreational • Fitness • Race events	Requires paved surfacing and adequate sight distance for safety of pedestrian traffic.	Minimum 5-foot wide paved surface.	Multi-use Bike Pathways: Appropriate as primary access routes to the park. Races by Special Use Permit only.
Cross Country Skiers	Occasional use on only a few trails with low grades and adequate width; most use occurs on Lake Gertrude when frozen. • Recreation • Fitness	Sustainable since use occurs when ground is frozen.	Minimum width of 24 inches (nordic) and 72 inches (skate). Loop system desired.	Poor average snow conditions negate effectiveness of trail development for this use; appropriate only as a secondary trail use on bike paths.

Trail User Group	Park Trail Use Patterns	Sustainability Requirements (to comply with park mission)	Special Trail Needs And/or Issues	Appropriate
Equestrian	Equestrian use of the park has been minimal. Currently only permitted on park roadways. • Recreation • Animal exercise • Transportation	Because of high weight to surface area ratio, sustainable only on trails hardened with a minimum 8-inch base aggregate or paving.	Special height requirements for rider; tethers and watering areas needed; concerns with waste management; potential conflict with vehicles on narrow park roads. Loop system desired.	Small size of park and lack of suitable soils would make sustainable trail development cost prohibitive; allow equestrian use only on multi-use bike paths and roadways.
Fully Accessible Trails (ADA)	Expand opportunities for individuals of various abilities to use the park. • Recreation, relaxation • Fitness • Pet exercise • Transportation	Achievable through careful trail layout, design, and maintenance; Class 4+ trails will require aggregate, pavement, or boardwalk hardening for sustainability.	Diverse network of trails, of many different standards to provide numerous options for a wide variety of trail uses and abilities. Issues with attaining slope requirements.	Yes, where financially feasible, and will not adversely impact the park's natural and cultural resources.

Trail Specifications

The following general specifications apply to all trails developed in the park. The specifications are intended to be guidelines for a more detailed operational plan to be developed once this plan is approved.

1. **Aesthetics** – Visual indicators of trail construction or maintenance will be kept minimal, or eliminated when possible. Trail design and materials will attempt to blend when possible with the character of the park.
2. **Sustainable Trails** – When feasible, trail development shall subscribe to the concept of Sustainable Trails for all future trail upgrades in the park. The following list is a few select recommendations:
   a. The Half Rule – Trail grades should not exceed half the grade of the hillside or sideslope that the trail traverses.
   b. Ten Percent Target Grade – When feasible and as a general rule, future trail design and maintenance will construct grades at or less than 10%. The overall trail grade averaged over the entire trail from one end to the other should not be greater than 10%.
   c. Maximum Sustainable Grades – Grade of the steepest section of trail that is more than about 10 feet in length, dependent on soils, rainfall, types and numbers of users, and other factors. See Table A-2, *Trail Classification Matrix*.
   d. Grade Reversals – A location at which a climbing trail levels out and the changes elevation direction, dropping subtly for 10-50 linear feet before climbing again.
   e. Outslope – On sidehill traverses, the downhill or outer edge of the tread should tilt slightly down and away from the uphill side to shed water.
   f. Durable Tread Material – Use of mineral (NOT organic) soils, aggregates, treated lumber, or other suitable materials for trail treads.
   g. Fall Line Trails – Shall generally be avoided.
3. **Obstructions** – The trail corridor will be kept clear of fallen trees, brush, and other obstructions.
4. **Brushing/Logging Out** – Branch stubs will be cut flush with the tree trunk. Tree stumps will be cut flush with the ground. Bucking cuts should be angled away from the trail whenever possible. Brush will be placed on the downslope side of the trail, cut into three to four foot lengths, and scattered out of view of the trail.
5. **Lumber** – All bridge and boardwalk lumber will be pressure treated according to specifications intended for their appropriate grade applications. For example, boardwalk support sills in direct contact with the ground shall be of a suitable retention value for that purpose. Unless specifically approved by the district manager, native log materials will not be used in trail construction. An exception to this requirement is the use of native logs for trail lining or cribbing. Use of local beach logs, preferably cedar, may be used in this application.
6. **Staking** – The use of reinforcement rod (re-rod) for wood cribbing or liner log retention will be discouraged unless the rod is completely out of sight or encased in wood. Wood stakes will be a preferred retainer when possible, and will be cut flush for visual and safety purposes.

7. **Drainage Design** – All trail work will promote the rapid and direct shedding of water laterally off the tread. Outsloping, reverse grades and crowning techniques to shed water will be applied at all times. Waterbars or checks will be generally avoided.
8. **Trail Equipment** – All trails will be built to be accessible by trail construction equipment to keep construction costs down. Trail width standards will be followed closely to permit the use of all-terrain-vehicles (ATVs) with trailers on Class 4+ Trails, and powered track-barrows on Class 2-3 Trails. Trail bridges and boardwalks should be constructed to accommodate such equipment (fully loaded) where feasible.
9. **Bridges** will be constructed to the following standards:
    a. Set flush to the ground to eliminate step-ups when feasible.
    b. Constructed preferably with <5% grades.
    c. Designed to support trail equipment.
    d. Should optimally be 20% wider than the trail tread.
    e. Have handrails on at least one side when decking surfaces are greater than 36 inches above grade or water.
10. **Boardwalk** will be constructed to the following standards:
    a. Minimum width corresponding with trail class.
    b. Constructed with application-appropriate pressure-treated wood (or composite material).
    c. Sill supports no greater than 40 inches apart.
    d. Minimal bounce, flex or sag upon average loading.
    e. Sill footprint large enough to prevent flexing or sinkage.
    f. Surface will have some type of added traction aid, such as 1-2 inch web (net, preferably black), ½" mesh galvanized hardware cloth, permanently affixed grip tape, or other similar functioning material that will not require regular maintenance.
    g. Constructed with <5% grades to reduce slipping hazards.
    h. Butt-run planks will be mitered for tight fits, and have uniform gaps (typically ¼ inch) between planks for drainage.
11. **Tread Hardening Material** will be preferably compactable crushed rock, such as D-1 aggregate. Mineral soils may be used in areas with low erosion potential. Organic soils will not be used, and will typically be removed prior to new tread construction and hardening. The use of a Typar or similar sub-grade support fabric is encouraged for use in areas that contain high levels of organic or waterlogged soils where removal is not feasible or that may not warrant boardwalk or bridging. Unconsolidated rounded gravels (such as beach gravel) will not be used unless a fine binder is added.
12. **Native Rock "Flagstones"** will be encouraged when feasible for steps, cribs, waterbars, or as a hardening material when set in crushed rock aggregate. Flagstones should be large enough to span the tread width and must be set solidly to not move when weight is applied.
13. **Braided Trails** will be consolidated to keep tread impacts to a minimum. Braiding usually is a result of steep or wet trail conditions that force hikers to seek an alternative place to walk.
14. **Trail Remediation** techniques will be employed when trails are abandoned due to consolidation, rerouting, or to prevent unwanted use. Remediation should be built

into project costs and include practices such as scarification and revegetation (with native plants), or physical closure with appropriate barricades (logs, brush, etc.).

15. **Culverts** will preferably be 6-8 inch diameter (depending on trail type), be black or neutral in color, with exposed ends visually screened along trails. Flexible culvert material is preferred (must be set straight for ease of cleaning).
16. **Switchbacks** – Due to problems associated with "shortcutting" and subsequent erosional concerns, switchbacks will be avoided when possible through the use of wider climbing turns or longer traverses on sidehills. If switchbacks are unavoidable, barriers (physical or visual) should be incorporated inside the turns to deter shortcutting.
17. **Safety Fencing** along hazardous bluffs will be constructed of simple post and rail, and should be consistent throughout the park. In locations where a full fence is not appropriate and a simple visual barrier is sufficient, native logs on the ground may be employed or a low fence with posts and draped heavy anchor chain (minimum 5/8-inch links) may be used.
18. **Tree Roots** will be covered with soil or aggregate vs. removing whenever feasible.
19. **Trail Information** – For the purpose of this section, a trailhead is defined as a trail interface with a roadway or other significant change in modal type (highway vehicle to pedestrian or bicycle). The following standards apply to trail information:
    a. **Primary Trailhead**: Main park entry points (such as Parkside Trailhead and Abercrombie Bike Path Trailhead):
        i) Full size bulletin board.
        ii) "You are Here" trail maps.
        iii) Park Regulations.
        iv) Trail use and regulatory sign symbols.
        v) Possible interpretive signs.
        vi) Pet Waste Station.
        vii) Bicycle rack.
    b. **Secondary Trailhead**: Smaller roadside trailheads located within the park, such as Lake Gertrude access trailheads, Miller Point, and the Group Recreation Area:
        i) Small bulletin board.
        ii) "You are Here" trail maps at key points.
        iii) Park Regulations.
        iv) Trail use and regulatory sign symbols.
    c. **Strategic Trail Junctions**: A few selected junctions that will provide general directional information to walkers unfamiliar with the park:
        i) Small bulletin board.
        ii) "You are Here" trail maps.
        iii) Directional signage.

20. **Signage** – Sign standards will vary according to park zoning and trail classification. A uniform appearance is desired. All signage should be kept to the degree minimal to convey the necessary information. Sign materials should be durable, minimal maintenance, and easy to replace. International symbols will be used whenever possible.
    a. Sign Material: Most signage will be six-inch wide standard DOT-approved aluminum, park brown, with white reflective lettering. An exception to this will be regulatory signage on bike paths, such as approved smaller version stop signs.
    b. Sign Mounting: Mounted center of post, with top sign edge ½ inch below top of post cut.
    c. Sign Fasteners: All signs will be fastened with tamper-resistant and rust-resistant (stainless steel) fasteners, preferably on four sides.
    d. Sign Posts/Supports:
        i) Class 2-4 Trails - Signposts will be constructed of either a treated or a rot-resistant wood, with a flat fastening face at least as wide as the sign (to prevent clam-like folding of sign). Eight-inch by eight-inch pressure treated wood set with cross-brace anchor and concrete will be the norm. Post tops will be beveled and sealed. All Class 2+ trail junctions will be signed with trail name and direction arrow. If two trail junctions are within 30 feet, one post may suffice for both.
        ii) Class 5 Trails – Same as Class 2-4 Trails, plus the use of ADOT/PF approved metal telspar posts and fasteners.
    e. Sign Post Height:
        i) Trail Junctions: "Low Profile" posts will have the bottom of lowest sign will be set no less than 24 inches above grade. Post height will be kept low as possible, generally less than 42 inches above grade.
        ii) Primary and Secondary Trailheads: "High Profile" posts will be set no less than 60 inches above grade.
    f. Color-Coded Routes: In lieu of mileage signs, several (4-5) routes will be identified to provide distances for personal fitness and purposes and for those unfamiliar with the park. The routes will be identified by one-inch round reflective colored dots applied to directional arrow signs at applicable trail junctions. The routes will be displayed on maps posted at all primary and selected secondary trailheads.

Table A-2. Ft. Abercrombie SHP Trail Classifications (based on USFS National Trail Classification System)

Designed Use		Trail Class 1 Undeveloped	Trail Class 2 Simple/Minor Developed	Trail Class 3 Developed/Improved	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Purpose		Natural game-type or "social" trails maintained only by use.	Primitive paths maintained for low-level use. Provides private, natural experience.	Semi-primitive paths maintained for moderate use. Provides a more primitive experience.	Moderately developed trails maintained for a high level of use. May be fully or partially ADA compliant.	Highly developed trails maintained for a high level of shared uses. Will be fully ADA compliant.
Design Tread	**Width**	0" – 12"	12" minimum	2 ft minimum	4 ft minimum	8 ft minimum
	Height	6 ft	8 ft	8 ft	8 ft	>8 ft
	Clearing	Sufficient to define trail corridor, if any.	24" – 36" corridor	12" – 18" outside of tread edge	12" – 18" outside of tread edge	12" – 24" outside tread edge
Design Surface	**Type**	Native, ungraded, intermittent, rough.	Native with limited grading, continuous, rough, hardened only where waterlogged organic soils cannot be avoided.	Native with some on-site borrow if available, or imported compactable materials.	Improved with compactable gravels is common, such as D-1 aggregate	Uniform, firm, and stable; such as asphalt, pavement or compacted D-1 aggregate
	Obstacles	Roots, rocks, logs, steps to 24"	Roots, rocks and log protrusions to 6"; steps to 14".	Generally clear, protrusions to 3"; steps to 10".	Smooth, few obstacles, protrusions 2-3"; steps to 8".	Smooth, no obstacles. Protrusions <2"
Design Grade 1% = 1ft rise/100ft 100%=45°	**Target Range** (>90% of Trail)	< 25%	< 12%	< 10%	< 10% (<5% typical, <8% max ADA)	< 5% (<5% for FULL ADA)
	Short Pitch Max (Up to 20' lengths)	50%	40%	20%	15%	8% at 200 ft max 10% at 100 ft max
	Max Pitch Density* **	< 10% of trail	< 5% of trail	< 5% of trail	< 3% of trail	< 3% of trail
Design Outslope	**Target Range**	Not applicable.	5 – 20%	5 – 10%	3 – 7% (<2% max. ADA)	2 – 3% (or crowned) (<2% max for FULL ADA)
	Maximum	Up to natural side-slope.	Up to natural side-slope.	15%	10%	3%
Structures	**Boardwalk**	None	Minimal, 12" single-plank (butt-run).	24" minimum double-plank (butt-run).	4 ft minimum higher standard (cross-plank).	Highest standard (cross-plank).
	Bridges	None	Minimal to none (ford or rock steps); boardwalk.	30" preferred, <3 foot spans may be boardwalk width.	5 ft minimum.	8-10 ft minimum, engineered.
	Waterbars	None	Only if unavoidable.	Only if unavoidable.	Highly discouraged, only if unavoidable.	No
	Culverts	None	None	Yes	Yes	Yes
	Benches**	None	Yes, only if a bona-fide need, designed and situated to fit location.	Yes, only if a bona-fide need, designed and situated to fit location.	Yes, only if a bona-fide need, designed and situated to fit location.	Yes
	Safety Fence (along coast bluffs)	None	None, tread set back from bluffs min 3 ft.	Yes, if tread is <3 ft from bluff.	Yes, if tread is <4 ft from bluff.	Yes, if tread is <5 ft from bluff.

** Installation of benches in Natural Use Zones will require review by the State Park Citizens Advisory Board

*** See TRAIL DEFINITIONS for terminology

Designed Use		Trail Class 1 Undeveloped	Trail Class 2 Simple/Minor Developed	Trail Class 3 Developed/Improved	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Signs	**Directional**	None	Low profile directional signs at junctions with Class 2+ trails. High profile posts to be set at both primary and secondary trailheads. Minimum signage needed for basic direction.	Low profile directional signs at junctions with Class 2+ trails. High profile posts to be set at both primary and secondary trailheads.	Low profile directional signs at junctions with Class 2+ trails. High profile posts to be set at both primary and secondary trailheads.	High profile posts to be set at both primary and secondary trailheads.
	Informational/ Regulatory	None	Leash zone signage if crossing in/out. Appropriate or prohibited trail use symbols at trailheads.	Leash zone signage, may have interpretive or informational signs. Appropriate or prohibited trail use symbols at trailheads.	Leash zone signage, may have interpretive or informational signs. Appropriate or prohibited trail use symbols at trailheads.	Regulatory, interpretive or informational signs. Appropriate or prohibited trail use symbols at trailheads.
Trail Assignments *ADA – indicates trail will be developed to be American with Disabilities Act compliant		Un-named trails	-Mill Bay Trail -Leashless Zone loop trails (proposed) -Monashka Trail -Quarry Trail (proposed)	-Lake Gertrude Trail (South Side) -Parkside Trail -Connector Trail -Wildflower Meadow Trail -Ranger Station Trail -Lake Gertrude TH 4 (water pump) -Lake Gertrude Beach TH (parking lot) -Water Pump Trail -Miller Point Interpretive Trail (proposed) -Moss Trail -Forest Trail	-Lake Gertrude Trail (North) *ADA -Piedmont Point Trail -Miller Point Bluffs Access Trail -Miller Point Interpretive Trail (proposed, portions will be ADA compliant) -Lake Gertrude Trail Extension (proposed connect with bike path) -Lake Gertrude TH 1 (Aber Dr) -Lake Gertrude TH 2 (big tree) -Lake Gertrude TH 3 *ADA -Lake Gertrude TH 5 (fee stn)	-Abercrombie Drive Bike Path -Proposed Miller Point Road Bike Path -Proposed Ram Site Bike Path

TH = Trailhead/access trail to Lake Gertrude Trail, as numbered along Miller Point Road, starting at the intersection of Miller Point Road and Abercrombie Drive

Trail Development

While there is not a need to greatly expand park trails, most new development will either be coordinated with bike path extensions in the park, or upgrading existing social trails. For example, the Quarry Trail is a reconstruction/reopening of an old trail.

New Trail Development

1. **Abercrombie Drive Bike Path – Proposed for construction fall/winter 2006/2007. Composed of 3 components:**
   a. Main path to park: A ¼-mile trail, mainly within the roadway right-of-way, Class 5 with 8-foot wide surface, 6 feet asphalt paved, and 2 feet compacted gravel. Fully compliant with ADA guidelines. Open to most traditional non-motorized uses.
   b. Extension through Ram Site: Continuation of the bike path through the Ram Site back toward Monashka Bay Road. Same standards as above.
   c. Connecting links to Lake Gertrude Trail and Parkside Trail: Links to trails will be of the same class as the trails being connected.
2. **Quarry Trail**: Re-open old service road into beach-side quarry, replace portion lost during 1964 tsunami, to connect back to the Group Recreation Site.
3. **Miller Point Interpretive Loop** – A self-guided interpretive trail in the main Miller Point installation. To include interpretive panels on the various structures of the area. Most of the route will follow existing trails, some new trail will be required to reduce steep grades. Two trail class standards may apply since there will be various loops of trail. One section will be Class 4 and will be partially ADA compliant, the other section will be Class 3.
4. **Secondary loop trails in the Leash-Free Zon**e – Upgrade social trails that have developed as a result of leash zoning in the park. Will allow the leash-less walking of pets with several loop options. Will connect the coastal portion of the Piedmont Point Trail to Parkside Trail, along a route that will preferably be out of sight of Lake Gertrude Trail. Upgrade to Class 2.
5. **Miller Point Pathway** – Extension of the Abercrombie Drive Bike Path to Miller Point. Provide pedestrian and bicycle off-roadway access through the park. This will be especially critical if park roads are paved. May be independent trail, expanded shoulder, or combination. Paving would be optional, no more than 3/4 of trail width would be paved, the other 1/4 left compacted gravel for runners or walkers.
6. **Mill Bay Overlook** – Short approximate 200-foot spur off Piedmont Point Trail to a scenic overlook, constructed to appropriate ADA compliancy.

Existing Trail Upgrade Priorities

For the most part, all trails will be upgraded over time to meet the Trail Assignments in Table A-2, since most do not current meet the standards defined. The following list is prioritized, but may change with park use, trail funding, and other issues and may not be strictly followed. [Note: certain trails may be categorized in dual classes since they may not fit nicely into one class.]

1. Upgrade all boardwalks and bridge surfaces with traction aids.
2. Lake Gertrude Trail (North) – Complete minor gravel base upgrades to eliminate pooling water and areas of exposed tree roots.
3. Piedmont Point Trail – Upgrade to Class 4. Include ADA provisions as feasible (due to grades, full compliance may not be practical). Re-route very steep hill at Piedmont Point, harden, consolidate braided trail areas, re-route away from hazardous bluffs, new boardwalk, safety fencing, improve safety access to 2 bunkers, upgrade to Class 4.
4. Wildflower Meadow Trail – Complete gravel hardening, upgrade to Class 3.
5. Mill Bay Trail – Harden soft areas, reduce steep grade and protect tree roots (one especially bad area), increase trail setback at one particularly hazardous bluff area, upgrade to Class 2. Consider possible new re-route to eliminate steep, rocky section at most westerly point.
6. Monashka Bay Trail – Re-route north end, reduce grades, improve views, upgrade to Class 2.
7. Water Pump Trail – Harden, and upgrade to Class 3.
8. Moss Trail – Replace old wooden bridges, harden, upgrade to Class 3-4.
9. Old Miller Point Road South Trail – Harden, erosion control, upgrade to Class 3-4.
10. Miller Point Bluffs Trail – Replace steps below north gun mount. Improve ADA access along old roadway to bluffs area. To eliminate the need for fencing along bluffs, trails will NOT be routed to or along bluffs.
11. Lake Gertrude Trail (North) – Upgrade to Class 4. Include ADA provisions from at least Trailhead 3 to Lake Gertrude Beach.

Trail Definitions

Backslope – The angle of cut just above the tread, on the uphill side.

Braided Trail – Problem areas along a trail where multiple parallel paths exist, usually around steep or wet areas.

Checks – A device similar to a waterbar, except the purpose will be to serve as a small in-tread crib or gravel retainer on steep slopes that exceed most sustainability standards. Set perpendicular to the tread. Often used in tandem with waterbars.

Climbing Turn – A wide, ascending curve that gradually reverses the direction of the trail when trying to change elevation.

Contour Trail (also tranverse trail) – To cross a slope horizontally by going gradually up and across rather than a more direct "straight up" (fall-line) approach.

Crib – A retaining device used to hold the trail in place along side slopes, may be layered on steep slopes.

Fall-Line – The direction water flows down a slope under most circumstances.

Grade – Relative steepness of the trail as compared to a flat horizontal plane. Grade is commonly measured in slope, usually as a percentage.

Grade Reversals, Rolling Grade Dip (or **Grade Dip**) – A short change in grade (such as a dip) designed into the trail to allow or force water away from the tread.

Integrated Water Control – A means of instituting water management into the trail design, usually during construction. Includes the judicious use of grade reversals and outslope.

Logging Out – Clearing a trail of fallen trees.

Outslope – The amount the tread slopes from side-to-side to promote drainage off the trail instead of down the trail.

Right-of-Way – The total cleared area on both sides of the trail. Also known as trail corridor.

Short Pitch Maximum – The steepest grade expected along the trail, at a specified maximum distance and density for the entire trail.

Sill – The timber that a boardwalk plank or bridge end rests upon.

Slope – Refers to the relative steepness of the terrain. Slope is the number of feet of vertical rise per one hundred feet of horizontal distance. It can be calculated in degrees, but more commonly expressed as a percentage. For example, a 10% slope has 10 feet of rise per 100 feet of horizontal distance. (100% = 45°)

Sustainable Trails – Low maintenance trails that have minimum impact on natural systems.

Switchback – A sharp turn, often 180 degrees, along a slope to keep a trail's grade from being too steep.

Tread – The walking surface of the trail upon which a hiker walks. The tread, or treadway, is the most important component of a trail.

Waterbar – A device (typically wood or rocks) that is set at an angle across tread to force any water off the treadway. Generally discouraged in favor of grade reversals or outsloping.

Technical Provisions for Accessible Trails and Outdoor Access Routes

The following provides technical provisions for accessible trails as recommended by the National Center on Accessibility, Indiana University Department of Recreation and Park Administration. The guidelines are a summary of various findings and rules established by the U.S. Access Board, which is the Federal agency responsible for creating guidelines and standards for accessible environments. While the following table is provided as a reference and is advisory in nature, every effort will be made to comply with its standards and provisions as feasible, or if further restricted by future Division policy.

	Outdoor Recreation Access Route	Accessible Trail
Purpose	Relates to facilities in the outdoor environment where reasonable access is required, such as between a parking lot and a picnic area or campground.	Relates to a natural trail that is designated as being suitable for all levels of ability and consistent with the guidelines defined here.
Surface	Firm and stable.	Firm and stable (Exception: *).
Maximum Running Slope	5% or 1: 20 (for any distance). 8% or 1: 12 (for max 200 ft). 10% or 1: 10 (for max 30 ft).	5% or 1: 20 (for any distance). 8% or 1: 12 (for max 200 ft). 10% or 1: 10 (for max 30 ft). 12.5% or 1: 8 (for max 10 ft). *(Exception: 14% or 1: 7 for 5 ft maximum for open drainage structures or when * applies).*
Maximum Cross Slope	3% or 1: 33. *(Exception: 1:20 for drainage purposes.)*	5% or 1: 20. *(Exception: 1:10 at the bottom of an open drain where clear tread width is a minimum of 42 inches.)*
Maximum Clear Tread Width	36 inches. *(Exception: 32 inches when * applies.)*	36 inches for any distance. *(Exception: 32 inches when * applies.)*
Tread Obstacles	1 inch high maximum. *(Exception: 2 inches high maximum where beveled with a slope no greater than 50% or 1: 2 and where * applies.)*	2 inches high maximum. Exception: 3 inches maximum where running and cross slopes are less than 5% or 1:20. *(Exception: *.)*
Passing Space	Every 200 feet where clear tread width is less than 60 inches, a minimum 60 x 60 inch space, or a T-shaped intersection of two walking surfaces with arms and stem extending minimum of 48 inches. *(Exception: Every 300 feet where * applies.)*	Every 1000 feet where clear tread width is less than 60 inches, a 60 x 60 inch minimum passing space or a T-shaped intersection of two walking surfaces with arms and stem extending minimum of 48 inches. *(Exception: *.)*
Resting Intervals	60 inches minimum length, width at least as wide as the widest portion of the trail segment leading to the resting interval and a max slope of 3% or 1: 33. *(Exception: A max slope of 5% or 1: 20 is allowed for drainage purposes.)*	60 inches minimum length, width at least as wide as the widest portion of the trail segment leading to the resting interval and a maximum slope of 5% or 1: 20. *(Exception: *.)*

* The provision may not apply if it cannot be provided because compliance would cause substantial harm to cultural, historic, religious or significant natural features or characteristics; substantially alter the nature of the setting or purpose of the facility; require construction methods or materials that are prohibited by Federal, state or local regulations or statutes; or would not be feasible due to terrain or the prevailing construction practices.

Figure A-1: Trail Map