



Washington State Parks  
 KOPACHUCK STATE PARK  
**BEACH AREA PLAN**  
 June 27, 2014



# Trail System

Existing trails were evaluated based on their condition, visitor value, and resource protection. Based on the evaluations, this master plan makes the following recommendations: expand the trail system to better serve park users by providing more hiking opportunities with a wider range of vegetation habitats, scenic character, and views; connect trail loops to provide more options for extended walks; upgrade trails for easier walking and in order to reduce erosion and maintenance costs; and close and reintroduce vegetation to non-authorized and short sections of trails. Improved surfaces and capacity will help protect soils and vegetation. The most significant improvement will be the addition of a connecting trail between the beach loop trail and the interpretive trail. This new path will also provide a direct and safe path for students from the neighboring schools. Improved surfaces and capacity – along with the proposed improvements listed above – will help protect the soil and vegetation of the park and greatly improve walkability, ADA access, and general access to the wide variety of views and habitats within the park. Once these improvements are complete, the park will be able to better serve existing visitors and attract new visitors.

## BEACH LOOP

As the Beach Loop Trail has such wet soil and potentially the most hazardous conditions overall, it will receive the most improvements. The proposed plan is to replace the variety of stepped areas utilizing precast concrete steps that are molded to resemble stone. Wood water bars will continue to be used where appropriate. The cross section of the trail will be developed with fine crushed rock (¼” minus over a larger ¾” minus crushed rock) and a center or side perforated drain to collect sub-surface water. The existing bridge, which has deteriorated and was recently damaged, will be replaced with a fiberglass deck and pin pile foundation. Pin piles can be placed without the use of heavy equipment; nevertheless, they provide stable foundations. The fiberglass deck will allow light penetration for vegetation and will not be slippery when wet. New round rails will maintain architectural continuity with the rest of the park. Portions of the trail that are subject to movement and/or which cross drainage ways will be developed utilizing a fiberglass grating system similar to the existing grating used on the existing interpretive trail where it crosses wetlands. Two social trails will be eliminated at the southwest corner of the property and those leading up to the picnic area as they encourage access into areas that may be hazardous and contribute to erosion problems.

## NORTH LOOP

This trail is on much more stable soil and is, therefore, not subject to the same erosion issues as the beach trail. In portions that are quite steep, however, precast concrete steps will replace wood stairs where appropriate. As the soil is stable, the exposed soil will remain as the surface and will not be redeveloped using crushed rock unless problems warranting action develop in the future.

## MIDDLE LOOP

The trail is on stable soil and does not need the same drainage considerations as the beach trail. Where the few wood steps do occur, they will be replaced with the precast concrete steps. The existing site soil will remain as the trail surface unless problems warranting action develop in the future.

## UPPER LOOP

The existing asphalt will be retained as the surface. No benches will be provided since this area is at risk of falling trees. No other improvements are planned. A forest management plan should be prepared to determine if vegetation treatments should be implemented in this area.

## CONNECTION TO SCHOOLS

A 5' wide walk will be extended along the side of 56th St NW from Kopachuck Drive NW to the new park entry. This will provide safe access to the trail system for students from Kopachuck Middle School and Voyager Elementary School as well as for other visitors walking to and from the park.

## INTERPRETIVE LOOP

Fiberglass grating will be extended throughout the wetland areas and the log stepping blocks will be removed. Precast concrete steps will be used on steeper portions along the north side where steps are required. An Eagle Scout recently refurbished plant identification signs along the trail.

## WETLAND LOOP

There is considerable area to the south of the existing interpretive loop trail which will become accessible by extending the interpretive loop trail. This will provide additional opportunities closer to the schools for study and extension of outdoor classrooms. Wetland areas of the trail will be accessible using the fiberglass grating. A modification to the existing detail is to use aluminium or galvanized steel framework with small screw jacks in areas of potential settlement. The interpretive trail will include a new extension to the north and west to 56th Street NW and then cross 106th Avenue NW and parallel the entrance road into the park where it will connect to the Beach Loop Trail (and continue down to the beach) or enter the picnic, day use area and welcome center. With that connection made, all six of the loops will then be interconnected.



# Interpretation and Wayfinding

One reason that the park may be under-utilized is that it is difficult to find for new visitors. State Parks should partner with Pierce County and Gig Harbor to provide better directional signage.

A key element of the plan for Kopachuck State Park is interpretation and education. This will help the stewardship of park resources and enhance visitors’ enjoyment and understanding of why the park is developed and managed as it is. Emphasis will be on the unique geology, soils, and vegetation (ecology) of the site and illustrate how Kopachuck relates to regional and global issues. Visitors will be made aware of the interpretive elements throughout the park by “loop trail orientation maps” at the head of each loop trail. Park visitors will get an overall view of the park’s unique features and opportunities from these key interpretive story points along all trails and viewing decks and see how the various story points relate to each other. To facilitate that, all trails will be interconnected, supporting the interrelated nature of the interpretive themes.



EXISTING SIGN KIOSK TO REMAIN

## Interpretive Story Points

These will be the actual interpretive signs. Interpretive story points will include the existing three-sided marine environment kiosk at the beach. Topics will include:

### GEOLOGIC HISTORY

This topic will tell the geologic history of the site and its current condition. It will answer questions about why certain trees are leaning while others are straight, human intervention and its effects on the area, and how improvements to the park intend to reduce problems. There are numerous examples that will be used, including the most recent trees that have split or fallen due to unstable/moving ground.

### HUMAN HISTORY

This topic will focus primarily on Native Americans in the area – when they first arrived and how they lived – and examples of later visitors like Peter Puget and other explorers.

### NAMES OF THE LAND

This story point will discuss the origins of local names, including Kopachuck, Cutts Island, and Henderson Bay. It will also explain how Kopachuck came to be a state park.

### LAMINATED ROOT ROT

This will answer questions regarding what laminated root rot is, its effects on the park, other areas affected by it, and how a forest management plan is addressing the effect of laminated root rot at Kopachuck State Park.

## INFORMATION KIOSKS

Primary elements of the interpretive system will be information kiosks of which there will be three: one at the day use area adjacent to the parking lot, likely the first one that visitors will encounter; one at the beach area; and one at the head of the interpretive trail. The information kiosks will include secure, weather-resistant space for posting interpretation of and information about the site and park system.

## LOOP TRAIL ORIENTATION MAPS

These maps at the intersection of interconnecting loop trails will include an overall map of all of the trails and a “You are here” note. The sign will also include interpretive themes of the loops, the length and relative difficulty (e.g. steepness, elevation change, etc.) of the trails.

Signs will include a QR code allowing the use of tablets or smart phones for additional information. Sign planning and design will involve consultation with local tribes and the development of the signs will be done in collaboration with the school district and students.



## MATERIALS

The sign base and materials for the interpretive signs will be uniform, both graphically and structurally, thereby tying the entire system together. Frameless, high pressure laminate may be used due to its durability and minimal maintenance requirements.

### TRAILS - Six Interconnected Trail Loops

- ■ ■ ■ Beach Loop Trail
  - ■ ■ ■ Northern Loop Trail
  - ■ ■ ■ Middle Loop Trail
  - ■ ■ ■ Upper Loop Trail
  - ■ ■ ■ Interpretive Loop Trail
  - ■ ■ ■ Interpretive Loop Expansion
- 
- ● ● Beach Access Road
  - ■ ■ ■ Beach Access Trail
  - ● ● Connection to Schools

### INTERPRETIVE SIGNAGE

- ? Orientation Kiosk
  - General Information
  - Park Map
  - Trail Map
  - Trail Distance
  - Trail Difficulty
- Loop Trail Orientation Map
  - Shows All Trails
  - Lists Interpretive Themes at Each Trail
  - Distance for Each Trail
  - Difficulty of Each Trail
- Interpretive Story Point
  - Interpretive Sign

### STORY POINTS

*All story points are interconnected, telling the story of Kopachuck State Park throughout its interconnected trail system.*

- Marine Environment
- Geological History
- Human History
- Names of the Land
- Geography
- Cascade Marine Trail
- Laminated Root Rot
- Vegetation in Kopachuck State Park

## Utilities

### WATER SYSTEM

The existing well is deemed adequate for serving the park. Existing distribution lines need to be replaced with new, continuous polyethylene lines that will comply with current codes. To reduce operation costs and comply with the agency’s sustainability policy, new improvements will also include:

- water conserving fixtures and facilities in new buildings
- removal of the former well house south of the existing parking lot

### STORM DRAINAGE

New storm water improvements will meet the current Pierce County WDOE Storm Water Design requirements. This will address current down-slope runoff problems. All storm water in the parking lot will be collected by continuous curbs channeling runoff to catch basins that release the water into a bio-filtration swale or rain garden for treatment. This will eliminate all runoff over the slope. The existing roadway to the beach will be paved. Gently sloped and angled water bars will direct water to the north side of the road to a French drain and perforated pipe which will convey the water to a large control structure where runoff can overflow gently down an existing water course to the beach. This structure will control the velocity of runoff, eliminating the erosion that currently exists. Roof runoff will be collected in French drains and allowed to infiltrate.

### ON-SITE SEWAGE DISPOSAL (Septic Systems)

The existing sewage disposal facility serving the parking lot and beach restrooms should be adequate, provided that there is no significant increase in park use or water demand. A new force main from the beach area restroom (following the existing gravel road) will intersect a new force main from a new day use area restroom facility and extend to the existing drain field. The drain field at the former campground restroom will be abandoned.

### POWER

Existing service appears to be adequate for the proposed improvements and will serve replacement buildings. Parking lots will be illuminated to current Illuminating Engineering Society (IES) standards using state-of-the-art LED lights controlled by a photocell and time clock. They will also be remotely operable by staff from their computer or cell phone. This will improve security of capital investments and public safety and aid park staff responsible for enforcement.



## Sustainable Design

Sustainable design is design that seeks to minimize through efficient and specific use of materials and energy the negative environmental impacts of development. Sustainable design uses a conscientious approach to energy and ecological conservation throughout the design of the entire project. In accordance with Washington State Parks' sustainable design policy, the goal is to ensure that the designs and actions today do not inhibit the opportunities of future generations. There are a number of ways in which sustainable design will be implemented at Kopachuck State Park.

### WASTE MANAGEMENT

Requiring recycling of waste materials during demolition and construction is one form of waste management. Another form could be using collected rainwater for flushing toilets or the use of low-flow toilets. Existing recycle bins at the picnic area and beach will be replaced. Existing asphalt in the parking lot could be ground and left in place as base material or it could be recycled elsewhere. During design, an evaluation of the most cost-effective and best practices for sustainability will be evaluated. Decisions regarding specific material use will be made at that time. The state park's policy on sustainability will be the guiding principle for final design implementation and as maintenance evolves.

### SUSTAINABLE BUILDING MATERIALS

Some examples of sustainable building materials which may be used at Kopachuck State Park include: recycled denim or blown-in fiberglass insulation; sustainably harvested wood; high and ultra high performance concrete; panels made from paper flakes; baked earth; rammed earth; clay; vermiculite; flax linen; scissel; sea grass; expanded clay grains; coconut; wood fiber plates; calcium sandstone; bamboo, one of the strongest, fastest growing woody plants; and non-toxic, low VOC glues and paints.

### HEATING, VENTILATION, AND COOLING SYSTEM EFFICIENCY

The most important and cost-effective element of an efficient heating system is the quality of insulation in the building. A well-insulated building is more efficient and requires less heat generating or dissipating power. Buildings at Kopachuck State Park will be oriented to take advantage of northwest prevailing winds. Windows on the kitchen/shelter are placed to maximize the effects of heat-creating light while minimizing the loss of heat through glass: south-facing windows will allow sunlight in and north-facing windows will be minimized. Double or triple-glass insulating windows with gas-filled spaced and low-E coatings will provide better insulation than single glass windows and vital natural lighting. The existing deciduous trees in front of the west facing windows will provide shade over the building in the summer when their branches are full with leaves and will allow sunlight through the windows in the winter when their leaves have fallen off. An integrated energy system will increase efficiency when well-insulated and properly sited to work with the forces of nature.



## RECYCLED MATERIALS

Final design may also incorporate the use of recycled or second-hand materials such as reclaimed lumber and recycled copper. The reduction in use of new materials creates a corresponding reduction of energy used in the production of materials. All four existing wood shelters will be relocated and reused. When possible, building materials may be gleaned from the site itself. An example of this includes using wood from the trees that were cut to make room for the building in the construction of the building itself or for benches along the trails.

## SUSTAINABLE ENERGY USE

Energy efficiency throughout the entire life cycle of the buildings is the most important goal of sustainable design. The final design will incorporate many different techniques to reduce the energy needs of the buildings and increase their ability to capture or generate their own energy.

## NATIVE PLANTINGS

Areas disturbed by construction and new planting areas within the parking lot and roadways will be planted with native plants that require less maintenance and help to sustain habitat and scenic values. Volunteers will be encouraged to remove English ivy and other non-native plants.

## OPERATIONS AND MAINTENANCE

Economic sustainability is important. Modifying staff demands can help in this goal. Maintenance costs will be kept lower by the design of efficient maintenance access and use of durable materials. The proposed centralized facilities will reduce maintenance costs. Improved trails will reduce the need for frequent trail maintenance and will reduce soil erosion.

## Security and Control Systems

Security and control of the park will be upgraded using current technology. The ability for staff to remotely monitor each activity area and operate gates and locks will greatly enhance safety and security for park visitors. It will also reduce staff work time, granting them more time to interact with park visitors.

The closed-circuit camera system will allow the ranger to monitor the following areas:

- ranger residence and shop
- small parking lot by the interpretive trail
- entrance and exit on 56th Street NW
- main parking lot
- beach road gate
- beach area restroom, parking, and viewing area
- beach/picnic area
- day use/picnic area and kitchen/shelter building

The staff will be able to monitor all cameras and operate all gates and building door locks by cell phone. They will also be able to control building lights and thermostats.

Wi-Fi service may be made available as a convenience to park visitors.

## Structures

A key consideration voiced by the ad hoc committee, general public, and Parks' staff was that all structures and site furnishing be rustic – or, as it is also known, Cascadian Northwest – in character. In general, this type of design expresses respect for the location, climate, topography, and vegetation of the Northwest. Similar character can be seen in the buildings at Millersylvania State Park. Buildings will be simple with dominant roofs. Windows will be paired and divided paned windows to maximize sunlight and view. Structures will be sound and substantial with exposed wood trusses. Post and beam construction may be used both externally and internally on all buildings. Exterior and interior materials will be predominantly wood with a metal, dark-colored standing seam roof. The roof will be simple in shape with gabled openings toward the sunlight and views.

New materials, while utilizing wood, will also include state-of-the-art materials and recycled materials that are durable and long-lasting, minimizing maintenance as much as practical.



PROPOSED CHARACTER OF SHELTER / KITCHEN STRUCTURE

# Site Furnishings

Scout and other volunteer projects as well as emergency remedial measures over the years have resulted in an eclectic collection of materials and small structures in the park. This is particularly true for steps on the trails, fencing, bridges, and signs. The purpose of establishing set design standards for the park is to not preclude future volunteer efforts but rather to standardize the materials and design character of the park as a whole. Like the buildings, site furnishings such as benches, guardrails, and bridges should also be Cascadian Northwest in character. This will improve park aesthetics, provide efficient direction to volunteers, and simplify maintenance.

## BRIDGES

Instead of using dimensioned lumber, the rail system will be round three rail design with fiberglass grated decking that complies with ADA requirements. On ADA-accessible bridges and ramps, handrails will be installed.

## FENCING

The intent is to provide uniform and rustic character throughout the site. Existing fencing and guardrails utilize dimensioned lumber, primarily two-by-fours. All fencing is proposed to be round three rail and round posts. Where needed, galvanized or powder-coated 2" square mesh can be added to the rails to prevent small children from getting through the rails. These rails are readily available and, although manufactured, have a rustic character.

## PICNIC TABLES AND BENCHES

The park has an eclectic collection of tables in variations of wood, metal, and recycled plastic. As tables and benches are replaced, one interior table, one exterior table, and one bench model should be selected and used. These may vary in length but should be consistent in design, materials, and colors.

## SIGNS

The information kiosks should be wood structures in character with the buildings and other site furnishings. Sign posts should be round and appropriate scale, see discussion on interpretive signs for more detail.

## DRINKING FOUNTAINS & SPIGOTS

Stone bases are the most durable, though round timber may be employed in certain settings and locations. Existing fountains and spigots should be replaced with ADA-compliant designs and sites.

## STEPS

As discussed in the section on trails, steps will now be precast concrete made to resemble stone. They are essentially indestructible and, once in place, will be permanent. They will provide safe and secure continuity throughout the trails.





## Permits, Checklists, Titles & Compliance Requirements

At the preliminary master plan stage, a pre-application meeting was held with Pierce County to ascertain required permits. The plan was presented to Pierce County staff, including representatives from the Health Department, Building Department, Fire Prevention, Resource Management, Development Engineering, and Planning. The following approvals will be required for construction:

### COUNTY COMPLIANCE REQUIREMENTS

- Demolition Permit
- Building Permit
- “Rural Residential Conservancy Zone” Conditional Use Permit
- “Shoreline Management Area” Conditional Use Permit
- Conditional Use Permit for Park Land Use Portion
- Shoreline Substantial Development Permit (SSDP)
- Shoreline Conditional Use Permit (SCUP)
- SEPA Checklist
- Title 18J Compliance

### ADDITIONAL STATE AND FEDERAL COMPLIANCE REQUIREMENTS AS APPLICABLE

# IMPLEMENTATION STRATEGIES

The ad hoc committee recommended developing all proposed improvements at one time; however, due to the magnitude of the project, it is unlikely that the entire list of improvements would be constructed at one time. If the project is phased, the phasing needs to consider logical construction sequence, priority of needs, and probable funding. The following scenarios should be considered:

## BEACH AREA

Improvements to the beach area will provide safer and easier access to the beach, allowing people with disabilities to reach areas currently inaccessible to them. If the proposed restroom is served by a force main and not a vault system, the force main will have to be constructed up the beach road and across the main parking lot to the drain field. The beach road improvements should also be included. If the beach area is not constructed initially, then the existing beach restroom could be replaced with ADA-accessible temporary units in the interim.

## BEACH TRAIL

The beach trail improvements provide a needed path between the day use area and beach area. People with disabilities would still access the beach by vehicle. The beach loop trail, therefore, could be included with either the day use area, beach area, or even as a separate stand alone phase.

## ALL OTHER TRAILS

All other trails could be improved as either individual projects or as a single large project.

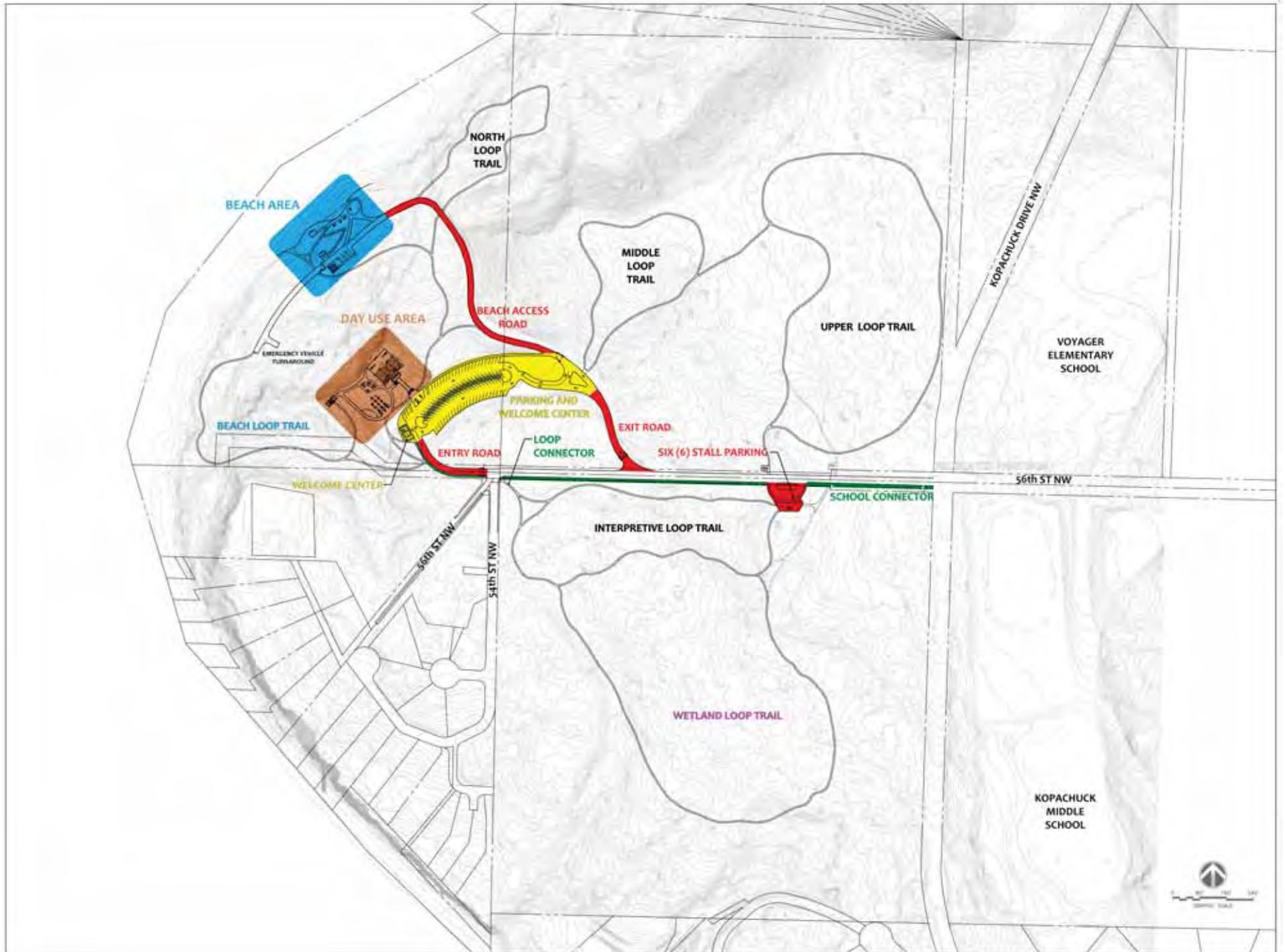
## INTERPRETIVE SIGNS

Interpretive signs could be included with each phase or as a single stand-alone phase.

## DAY-USE AREA, PARKING LOT, & ROADS

The day use area with the kitchen/shelter/restroom will provide a source of revenue to replace lost revenue from the campground closure. There is a demand for small and large gathering spaces and the proposed building design offers flexibility for small and large events alike. Moreover, with roll-up glass doors leading to the patio, the building would be an attractive venue in any season. The restrooms in the kitchen/shelter and the direct access to the building, picnic area, amphitheatre, play area, and view point will make that portion of the site fully accessible for people of all abilities.

It makes sense to construct the main parking lot with the day use area. The exit road could remain as is if the beach access road and beach improvements are constructed later. New utilities for the beach area should be constructed across the parking lot to the beach road gate, ready for extension down to the beach at a later phase. The welcome center, with utility stubs to it, could be a stand alone project at a later date.



## Estimated Probable Construction Costs

Estimated costs for the entire master plan are based on 2014-2015 construction prices and will need to be adjusted annually for the current rate of inflation if the project is constructed after 2015. Estimated costs include 35% for construction contingency, architectural and engineering design fees, inspection, and testing. Precise quantities of the various construction items cannot be determined until final design (for construction) is complete; therefore, the design contingency covers the unknowns inherent at the master plan stage. Washington State Parks and Recreation Commission administration costs must be added to this estimate.

Day Use Area	\$ 2,202,611.00
Beach Area	\$ 824,777.00
Entry Road	\$ 117,656.00
Exit Road	\$ 150,932.00
Main Parking Lot & Welcome Center	\$ 1,400,480.00
Beach Road	\$ 251,798.00
Beach Trail	\$ 780,053.00
North Loop Trail	\$ 41,128.00
Middle Loop Trail	\$ 32,117.00
Former Camp Loop Trail	\$ 46,391.00
Interpretative Loop Trail	\$ 171,113.00
Wetland Loop Trail	\$ 476,974.00
School Connector	\$ 14,324.00
<b>GRAND TOTAL</b>	<b>\$ 6,510,354.00</b>

## Grants

In addition to the Washington Wildlife and Recreation Program (WWRP) grants which help fund State Parks' capital improvements, other grants such as the Aquatic Lands Enhancement Account (ALEA) and WSDOT's Safe Routes to Schools may be used.

## Partnerships, Volunteers, & Donations

Projects may be implemented using partnerships and donations. For example, interpretive research could be conducted in cooperation with the local tribes and students. The closing and re-vegetation of to-be-abandoned trails could be done by Scouts or other volunteers. Protect Our Parks (POP), Harbor WildWatch, Rotary Clubs, or other park-friendly advocacy groups may want to propose Community-Based Park Improvements. or raise Park Foundation donations to be used for park improvements.

# Acknowledgements

## **Washington State**

### **Parks and Recreation Commission**

Brian Yearout, Project Manager

Julie McQuary, Parks Planner

Janet Shonk, Area Manager

Dennis Mills, Kopachuck State Park Ranger

Lisa Lantz, Stewardship Program Manager

Jessica Logan, Environment Specialist

### **Ad Hoc Committee**

Bruce Brown, Scoutmaster and firefighter

Linda Gough, Preserve Our Parks

Lt. Jerry Lawrence, Pierce County Sherriff

Joyce Murray, Harbor WildWatch

Sherryl Peterson, Kopachuck Middle School

Morgan Scherer, Washington Water Trails Association

Steve Severin, park neighbor

### **Consultant**

#### **Bruce Dees & Associates**

Bruce Dees, FASLA

Derrick Eberle, Associate ASLA

Bethany Marsh

Josh Hail

#### **Sub-Consultants:**

##### **JKA Civil Engineering**

John Knowles, P.E., Civil Engineer

##### **Sparling**

Chris Fote, P.E., Electrical Engineer

##### **AustinCina Architects, P.S.**

Bill Parretta, Architect