Big Foot Beach State Park

Master Plan

Wisconsin Department of Natural Resources
December 1996

PUB NO-PR-253 96

PLAN APPROVAL

An Environmental Assessment was prepared with this Master Plan. The Master Plan and Environmental Assessment was developed with a local Citizen Advisory Committee and received 30 days of general public review including an "open house" public meeting in the City of Lake Geneva, September 26, 1996.

The Natural Resources Board reviewed and approved the Master Plan for Big Foot Beach State Park on December 4, 1996.

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I. EXECUTIVE SUMMARY

The Geneva Lake area, with its 5,262 acre world class lake, was a center for genteel recreation in southern Wisconsin as early as the late 1800's. Recreational pressure steadily increased, and by the middle 20th century it became clear that the last large parcels of undeveloped shoreline would quickly disappear. Big Foot Beach State Park was established in 1949 by the Wisconsin Conservation Commission to preserve a small part of the shoreline for public use.

Big Foot Beach State Park currently comprises 271.46 acres including about one-quarter mile of frontage on Geneva Lake with 900 linear feet of beach. The property has a 7.1 acre lagoon (Ceylon Lagoon), picnic areas, a 100 unit campground and 5.5 miles of trails. The park has been managed for intensive day use recreation, swimming, picnicking and camping (Figure 1.) Because of its proximity to the Chicago area, non-resident use is high, comprising about 75 percent.

This planning effort was prompted by the following issues: 1. the relocation of State Highway 120 proposed for the year 2001-- running through the western part of the park between Geneva Lake and Ceylon Lagoon (Figure 1), 2. a local proposal to develop public boat access to Geneva Lake from the park, 3. and a Lake Geneva School District request to acquire or lease land within the park. Additionally, it has been 23 years since the Department last addressed park master planning on this property. The last plan was prepared in 1973.

The plan proposes to redevelop the park to improve internal vehicle circulation by relocating the park entrance to the east of the property off of County Highway H (Figure 2). The park is presently accessed from State Highway 120 at the west end of the property near the lake.

The second major proposal is the development of a new boat launch facility on the south end of Ceylon Lagoon with 100 car/trailer parking set back from the lagoon. This plan recommends the construction of a navigable channel connecting Geneva Lake to Ceylon Lagoon with a double box culvert allowing passage of power boats up to 20 feet in length. The plan further proposes minor improvements to the existing 100 unit campground. These improvements include electrification of 25 sites, and an improved water distribution system. Swimming beach improvements to widen the beach area are also proposed and could include the addition of sand and wave barriers. A technical engineering and environmental study of the swimming beach area will be needed before improvements could be made.

Vegetation of the park will be managed to emphasize aesthetics and native plant communities. Major efforts will be made to control exotic plant species and promote water quality by management of wetlands south of the park. Some intensively used areas will be managed in non-native community landscapes to accommodate high levels of recreational use (Figure 3).

The plan proposes to add 111 acres of land or easements to the existing project goal of 324.16 acres, for a total acreage goal of 435.16 (Figure 4). The additions include 2 parcels. The first parcel is a 1 acre conservation easement area north of the park that includes the northern tip of the Ceylon Lagoon. The easement is desirable for the long-term recreational and environmental management of the lagoon. The second parcel is an area of 110 acres of wetlands to the south. The wetlands were added to provide a demonstration of wetlands management techniques and to improve water quality in Geneva Lake.

Water quality questions were raised regarding Buttons Bay Creek through the public review process. Department water programs will investigate the situation.

The total cost of the proposed development is $3.7 million. Acquisition costs associated with the additions to the project boundary are estimated at $132,000. Estimated annual tax payment to local government will be $4,060. The Department currently operates the park with a base level of funding. The proposed additional costs of operation are projected at only $8,300 per year.

This document was prepared with the assistance from the 10 member Citizen Advisory Committee, other interested parties of the public and Department staff.

II. GOAL STATEMENT AND OBJECTIVES

GOAL

Continue to manage and develop Big Foot Beach State Park as a state recreational park with an emphasis on waterfront recreation on Geneva Lake. Preserve the aesthetic and natural values of the land.

OBJECTIVES

- Continue day-use recreation, picnicking and swimming.
- Develop new public boat access to Geneva Lake from the lagoon.
- Continue to provide 100 campsites at modest fees.
- Provide trail-related recreational activities.
- Manage vegetation to encourage native plant and animal communities.
- Establish a demonstration program of nutrient management in the wetlands that drain to Geneva Lake.
- Establish interpretive program.

III. MANAGEMENT AND DEVELOPMENT PLANS

A. Project Boundary

This plan proposes an expansion of the current project boundary by 111 acres. This expansion will be accomplished through a combination of easements and fee acquisition. (Figure 4).

A conservation easement of 1 acre is proposed that would include the northern tip of Ceylon Lagoon on an adjoining youth camp. The easement is contingent upon negotiations with the property owner. The easement would be limited to protection of the shoreline and allow park rules (Code NR 45, Administrative Rules) enforcement of boating regulations that are needed to manage the lagoon from a recreational and environmental perspective.

The proposed easement would not include public access to the lagoon and the youth camp would retain its rights to utilize the easement area for its camp programs. The youth camp is currently a compatible land use buffering the park from development. Should the ownership of the youth camp change, the natural resource values of that northern part of the lagoon could be lost to development and conflicting recreational use.

The second proposed expansion includes 110 acres of wetlands along the southern edge of the park's existing project boundary. The proposed expansion will have several desirable consequences: protect water quality in Geneva Lake, buffer the park from development and disturbance, preserve views to the south, and allow some limited trail-related recreation.

Moreover, the 110 acres of wetland warrant inclusion because it represents an opportunity to demonstrate ways to control nutrient runoff and improve water quality. This wetland feeds into a small seasonal stream, Buttons Bay Creek, that discharges into Geneva Lake contributing high levels of nutrient during heavy run off periods. The wetland is dominated by reed canary grass, an exotic, nutrient rich species.

This wetland could be secured through fee acquisition or management easements to meet the plan's main management objectives. Fee acquisition might be needed if recreational trails were developed on these parcels.

The Department's land acquisition policy is on a willing seller basis and is contingent on the availability of funds.

B. Developments

The park will be managed to provide the following recreational activities: tent and trailer camping, picnicking, swimming, and boat launch access to Geneva Lake. Trail-related activities include hiking/nature trail, on road biking, cross-country skiing, and limited snowmobiling.

1. Road System

The plan proposes a major redevelopment of facilities within the park to accommodate relocation of State Highway 120; improve access and circulation to campgrounds, day-use areas, and the service area; make improvements to swimming beach and campgrounds; and develop a new boat launch that would provide navigable access to Geneva Lake.

This proposal includes a new park entrance from the east to accommodate the relocation of State Highway 120. It will provide a single, controlled vehicle access site for the park. This entrance should reduce vehicle traffic conflicts near the beach/lakefront located on the west end of the park. A new two-way park road would be developed with public contact area, connector road to the service area, campgrounds, day-use area and boat launch area. Several portions of existing internal roads would be abandoned and replanted to blend with natural surroundings (Figure 2).

2. Boat Launch, Navigable Channel, Pedestrian Underpass

The new boat launch facility, which adds 4 ramps and 2 boarding piers, will be constructed on the south end of Ceylon Lagoon with 100 car/boat trailer parking set back from the lakefront. The launch area will include 4 car/boat trailer sites that will meet the requirements of the Americans with Disabilities Act.

It's important to note that because camping is offered in the park, a portion of the boat launch parking and the campgrounds may be utilized by campers for long-term boat storage. This could reduce, perhaps by 25 percent, the boat launch parking stalls available for daily users and reduce the turnover potential of the launch facility. In conjunction with local governments, the Department will develop a long-term public boat access management plan for Geneva Lake.

This proposal includes a navigable channel, 4 feet deep, and a double box culvert (12 feet X 12 feet each) to accommodate powered fishing type boats up to 20 feet in length. Eighty-nine percent of boats entering Geneva Lake are 20 feet or less in length, according to a recent study by the Geneva Lake Environmental Agency. This double box culvert would allow cars to pass overhead. The size and type of watercraft that could use the navigational channel and box culverts would be limited to car-top boats/canoes, trailered powerboats and small sailboats with retractable keels and stepped masts. The proposed navigable channel also includes the placement of an additional (8 feet X 8 feet) box culvert pedestrian underpass. The underpass will provide a safer alternative for pedestrians crossing the road.

Park rules would be established that will restrict operation, size and type of water craft. These rules will reflect the specific design limitations of the culverts and navigation channel, and help prevent environmental damage.

To protect the navigable channel/culverts from westerly storms, a combination of a breakwater/fishing pier with a few slips for small boats will be constructed at the mouth of

the channel. The boat slips would allow small boats to tie up and rigup equipment after passing through the box culvert.

The culverts should be long enough to accommodate a bike shoulder on the roadway. The current roadway, State Highway 120, will be discontinued as a state highway and designated a local road; a change in designation to take effect after 2001. Reduced traffic volume on this road will provide a safer beach and waterfront environment than presently exists.

This plan proposes no additional separate boat launch fees. Instead, persons interested in launching a boat would pay for a daily park admission or purchase the annual park entrance sticker in accordance with the park's vehicle fee structure. Under the current fee structure residents would pay $5.00 for a daily launch or $18.00 annually; non-residents would pay $7.00, or $25.00 annually. This boat launch fee policy would keep daily launch fees slightly below neighboring launch fee costs and would be adjusted periodically when statewide park entrance fees are adjusted.

It is estimated that increased park use and revenue generated by the boat launch will offset increased operational costs created by the boat launch. Some additional costs are anticipated, increased staffing for supervision of boat launch on busy weekends and long-term building maintenance associated with a fish cleaning station. With current levels of state park road aids funding, the park should be able to meet costs associated with road and parking lot maintenance.

The Department will promulgate administrative rules (NR 45) to prohibit the general beaching of water craft along the lagoon shoreline except at designated locations. This will be done to protect the lagoon's shoreline from damage by overuse.

3. Swimming Beach

The beach area could be enhanced by the addition of a sand blanket, a small breakwater and groins to retain sand and build the beach. A detailed engineering and environmental study will be prepared to evaluate other solutions balancing recreational benefits with environmental impacts. Existing fencing along the waterfront road will be maintained to concentrate pedestrian traffic providing a safer crossing from the park to the beach.

4. Camping

The existing campground will be maintained in its current location. The facility is designed to accommodate 67 trailer/campers. A separate campground loop can accommodate 33 tent campsites. Campers are allowed to stay in the park for a maximum of 21 days in a 4-week period. Only modest improvements are proposed for the campgrounds, more water outlets, 25 electric sites for the trailer campgrounds, and minor road adjustments to better separate the two types of camping. Wisconsin statutes limit electrification of the state park system. Consequently, 25 electrical service sites must be removed from other locations in the state park system, so there is no net increase.

5. Picnicking

The day use parking area would be displaced by the boat launch facilities. However, a new picnic area parking lot for 95 cars, including sites for people with disabilities, will be constructed to the east to provide access to the upland picnic area. Overall, there would be no reduction of picnic area parking. However, the boat launch parking and ramps would displace picnicking use from the south part of the lagoon to an upland site east of the boat launch parking.

6. Projected Park Development Costs

Construction Projects

New entrance road system, contact area	$ 498,700
Road abandonment of existing park roads	$ 46,900
Campground redevelopment	$ 31,900
Picnic area parking lot	$ 65,700
Boat launch and parking 100 car/trailer	$ 668,500
Beach improvement	$ 44,200*
Breakwater/fishing access	$ 280,800
Boat channel and double culverts, road	$ 557,600
Pedestrian Underpass	$ 76,000
Aquatic weed control in lagoon	$ 3,000
Total Construction Project Costs (1996)	**$2,273,200**
Unknown factors (10%)	$ 227,300
Mobilization (2%)	$ 46,500
Contingencies (10%)	$ 227,300
Engineering (10%)	$ 227,300
Subtotal (1996)	$ 2,899,300
Inflation delay est. 5 yrs. at 4% @	$ 627,500
Total Projected Development Costs (2001)	**$3,700,000****

* Beach improvements will require a technical study, estimated at an additional $20,000.

** See detailed rough cost estimate in addenda. Figures are rounded.

C. Vegetation Management

Most of the land will be managed to protect the aesthetic qualities of the park and provide a diversity of native habitats that include: oak savanna, southern hardwoods, bottomland forest, and prairie. To accommodate intensive recreation, non-native plant communities, including old field grassland type, scattered landscape trees and lawns will be maintained. (Figure 3).

1. Prairie

True prairie restoration is suggested in only a small area of the park due to the intense management that must occur before, during and after a restoration. This would involve buying seed from a local source, preparing the ground properly and managing by fire or mowing.

2. Savanna/Scattered Trees

Savanna restorations should occur in areas that already have scattered trees, picnic areas, campgrounds and lawn areas. These areas are already mowed and would only involve some planting or transplanting of native species in low-traffic areas.

3. Conifer/Hardwoods

In the area adjacent to the campgrounds and Badger High School, it is suggested that additional pines, spruces and hardwoods be planted for screening. The planting of these species would link the oak forest areas and provide cover for wildlife.

4. Grassland

The grassland area south of the proposed park road should be managed be mowing or burning. An occasional direct seeding of some prairie species would be beneficial.

5. Bottomland Forest

Bottomland forest areas will be managed to control exotic plant species. Hand cutting of exotic shrubs understory will be the main management objective.

6. Woodland Southern Hardwoods

The oak/hickory woodland area needs to be managed for invasive species through prescribed burning.

7. Exotic Vegetation Management

Some areas of the park need to be intensively managed for exotic species such as honeysuckle, garlic mustard and reed canary grass. A combination of hand labor, chemical application, burning and mowing is recommended. Often this management technique is species specific. Without this management several exotic species will invade the entire park and crowd out native communities.

8. Lagoon Aquatic Plants

It is recommended that native wetland vegetation be planted around the lagoon for demonstration purposes as well as shoreline erosion control. It is further recommended that after eradication of the exotic species Eurasian milfoil from the lagoon that management efforts encourage the revegetation of the bottom of the lagoon to inhibit suspension of soft bottom material. Mechanical harvesting, it is suggested, should be done in waters deeper than 6 feet.

D. Land Classification

By state park system standards, Big Foot Beach is a relatively small property and is surrounded by highly developed residential neighborhoods. The park's historical use has been intensive outdoor recreation, swimming, day use picnicking and camping. With the addition of a major boat launch this pattern of recreational use will increase.

It is proposed that the entire property be classified as a type 4 recreational use setting, in accordance with the Department's master planning, management and recreational use classification system. The objective of this setting is to provide and designate areas offering opportunities for intensive recreational use activities and experience. Recreational facilities provide a relatively high level of user comfort, convenience and environmental protection. The sights and sounds of human activity are common. Recreational uses are mixed and may be highly diverse with well developed road and trail systems.

E. Aesthetic Management

The Department's objective is to maintain the aesthetic quality of the park to the maximum extent possible. This objective is met here through vegetative management, and locating the new park entrance at the southeastern corner of the property consistent with minimizing impacts of roads and parking lots. Locating launch facilities on the lagoon out of the view shed of the main body of Geneva Lake is also a reflection of the policy to protect aesthetic quality.

Approximately 90 percent of the property will remain in natural condition under this plan proposal. Abandoned internal park roads will be regraded to natural contours and replanted to blend with surroundings.

F. Fisheries

The park lagoon and shoreline of the park are popular fishing spots. Additionally, the lagoon has been used in the Department's Urban Fishing Program involving frequent stocking of trout in the spring and fall, and a youth fishing instructional program. It is anticipated that the Youth Fishing Program will continue to utilize the park after the lagoon is connected to the lake. The Department will evaluate the new use patterns for the lagoon and make a determination if the Youth Fishing Program and boat launch facilities can co-exist on the south end of the lagoon.

Connecting the lagoon to the lake could have a positive effect on the quality of fishing in the lagoon. In addition, it could provide access to spawning habitat for warm water fish species naturally found in Geneva Lake. Any regulation of fishery is accomplished through statewide fishing programs.

G. Water Quality Protection

The plan will attempt to improve water quality protection by inclusion of the wetlands to the south of the existing project boundary. Wetlands will be actively managed by burning to convert to native community. This could reduce, but probably not eliminate, nutrient loading

from the wetland runoff, some of which has accumulated in low areas of the marsh through historic agricultural practices.

Location of launch facilities in the lagoon will protect the main body of Geneva Lake from small accidental oil and gas spills associated with launch use. The lagoon allows easy containment and clean-up should spills occur.

Analysis of core samples taken in May, 1996 from several sites in Ceylon Lagoon sustain the conclusion that the lagoon is comprised of aquatic sediments typically found in southeastern Wisconsin. The primary area of concern in Ceylon Lagoon is the resuspension of soft bottom material by the expected increase in boat traffic.

The presence of rooted aquatic weeds (macrophytes) and the fairly high proportion of clay on the lagoon floor will function as a stabilizing force to sediment suspension. It is suggested that boating traffic be managed to lessen suspension of soft sediment. To minimize suspension of lagoon sediment the following is recommended:

1. Boats not be allowed to "power load", using the thrust of the motor in loading a boat onto a trailer.

2. Boats be kept away from the shoreline to the extent practical. This will result in boats using areas that comprise deeper waters.

3. Implementing and enforcing a no wake speed.

4. Following the proposed eradication of Eurasian milfoil from the lagoon, management efforts should encourage the revegetation of the bottom of the lagoon with native aquatic vegetation. No chemical treatment of rooted aquatic vegetation should be allowed except to control exotic species. Mechanical harvesting of aquatic vegetation should be done in deeper water (greater than 6 feet).

To manage the lagoon from both a recreational and environmental standpoint the Department will promulgate rules (NR 45) regarding limits on watercraft size and their operation within the entire lagoon and navigation channel.

Additionally, questions have been raised during the public review process about the water quality of Buttons Bay Creek. Department water programs will investigate the matter.

H. Interpretive Program

Currently, the park interpretation program consists of self-guided nature trails. The majority of park users are from the metropolitan Chicago area. This is a highly urbanized population and the need for interpretation is significant. There is an opportunity here to reach an audience who might not otherwise learn about the environment.

This plan proposes to use Limited Term Employees, a naturalist, or local volunteers to develop evening programs, children's programs and guided hikes for park peak use times.

Roving naturalist contacts with live animals and specimens would be the best way to pique curiosity and develop interest in the naturalist programs.

Some additional non-personal interpretive devices which could be developed include a butterfly garden, bird feeding station, composting station, recycling station, tree identification and interpretation of the prairie restoration.

I. Anticipated Increases in Capital Supplies and Operation Costs

Boat launch weekend supervision (LTE 14-week season)	$ 2,000
Management of breakwater slips management	$ 500
Environmental supplies	$ 1,000
Hand held radio	$ 800
Interpretive program	$ 2,000
Vegetation management per year	$ 2,000
Total new operational costs.	**$ 8,300**

IV. BACKGROUND INFORMATION

A. Regional History of the Area

The Geneva Lake area is located in the southeastern corner of Wisconsin in Walworth County. The 6th largest natural lake in Wisconsin, Geneva Lake with its high, sloping banks and clear waters was the magnet that attracted economic development of the area in the 19th century. Frontage towns Fontana, Williams Bay, and the former Town of Lake Geneva were all settled in 1836. As is typical of the wider Middle Western region, Native Americans were forced to resettle to make room for white settlement and economic expansion. As is also typical of the region the mere prospect of building a railroad line stimulated growth in the area. A permanent railroad line was created in 1871 leading to the Village of Lake Geneva. Lake Geneva subsequently became a city in 1886.

During the late 19th century the area became a fashionable resort and summering location, a trend that was accelerated by the great Chicago fire of 1871. Many of the enormous summer cottages and estates on Geneva Lake date from this period when wealthy Chicago families who had lost their homes and businesses to the fire simply moved to the area while the city was being restored.

Although the area is not the exclusive vacationing destination it once was, the area resources that attracted past settlement remain intact due to dedicated, local preservation efforts.

B. Recreational Analysis of Geneva Lake Area

Big Foot Beach is a recreational facility located in an area that has long been a major attraction as an exclusive summer retreat, and more recently as a tourist destination open to public use. Many of the formerly large estates built on the shores have been subdivided into smaller residential lots. Several youth camps and resorts are found in the lake region, and numerous small towns in the vicinity of the park serve as local trading centers and recreational bases.

Public boating access to Geneva Lake is presently available at the City of Lake Geneva (19 spaces), the Village of Williams Bay (39 spaces), the Village of Fontana (52 spaces), and the Town of Linn (26 spaces). At this time non-reserved car/trailer units number 139 spaces. The City of Lake Geneva is expected to discontinue its boat launch facilities (19 spaces) in the near future. In addition, the Village of Fontana could withdraw an additional 52 spaces without notice. Other boat accesses at town and county sites are subject to Department review.

Area recreational facilities include Bong Recreation Area 12 miles to the east, and Kettle Moraine State Forest 25 miles to the north.

C. History of Big Foot Beach State Park

The earliest known human presence in the vicinity of Big Foot Beach State Park is evidenced by a prehistoric Indian village site recorded in 1928. The large archeological site is located southwest of the park. Not much is known about the site, but local knowledge refers to the Potawatomi presence and a chief named Big Foot who lived on the shores of Geneva Lake.

Local legend claims "Big Foot" was a nickname applied by a brother-in-law of the chief after seeing the size of the chief's tracks made on snow-covered ice on the lake. Today Big Foot's legend lives on in the name of the state park.

Even before the arrival of the railroad in 1871, Lake Geneva became a popular resort area as its deep, clear waters attracted economically prominent families from Chicago who established estates along the lake's shores. Property that once belonged to the famous Maytag family subsequently underwent several ownerships and attempts at residential subdivision before being purchased in 1949 from Martin Fox for state park purposes. Much of the 116 acres was used for farming. The property included Ceylon Lagoon, which reportedly was enlarged to its present size by one of Maytag's sons. Heavy park usage prompted a second major acquisition of 182 acres of adjacent farmland in 1953 from Marion Isbell of Chicago.

Creation of Big Foot Beach State Park returned a portion of Geneva Lake's shores to general public enjoyment. Today the park continues to serve the recreational needs of southern Wisconsin and northern Illinois swimmers, boaters, picnickers and campers.

D. Current Park Operation

The park itself features the lake as its primary user attraction; therefore, much of the function of the park is day-use picnicking, sunning, swimming, boating and fishing. Numerous game fish are found in Geneva Lake, which holds a reputation for its fishing, both in summer and winter. There is a 100 unit campground in the park. The park received about 161,500 day users and 16,500 campers in 1995.

The state park system is required by law to collect reasonable fees to defray usually half the operational costs. The Department currently collects fees for vehicle entrance; for residents $18.00 annually, $5.00 daily; and for non-residents $25.00 annually, $7.00 daily. Wisconsin residents pay camping fees of $9.00/day on weekends, $7.00/weekdays; non- resident $11.00/day on weekends and $9.00/weekdays.

It currently costs about $152,600 annually to operate Big Foot Beach State Park. The property is staffed by 2 full-time and 8 limited-term employees for a 14-week season.

V. RESOURCE INVENTORIES

A. Land Forms, Geology and Hydrology

Big Foot Beach lies in the geographic area of Wisconsin called the "Eastern Ridges and Lowlands". The primary bedrock near the surface is Niagara Limestone. In most places it is overlain by a mantle of sand, gravel and clay glacial drift. The area is an extension of the Kettle Moraine, a hilly terrain region, but its topographic features are less pronounced.

Ceylon Lagoon, a small artificial, warmwater pond, has an area of 7.1 acres with a maximum depth of 12 feet on its south end. It is located on the west end of the park separated from Geneva Lake by State Highway 120 and 50 feet of filled land. The shape of the lagoon is said to resemble Geneva Lake although a close examination reveals only a slight resemblance.

Geneva Lake was also formed by glacial activity. The lake lies in a pre-glacial valley filled with 220 feet of glacial drift, material deposited by glaciers 10,000 years ago. Lake Como, Lake Delavan and several other large lakes are located in the area.

Geneva Lake is approximately 7.75 miles long and averages a little over 1 mile in width. A dam established in 1836 maintains a 10 foot head and forms an outlet that becomes the White River flowing through the City of Lake Geneva. The lake has a volume of 320,984 acre feet with a maximum depth of 135 feet. It is a deep, cold water (oligotrophic) lake with both a cold and warmwater fishery. The lake has 20.2 miles of shoreline. Several municipalities are located on the lakeshore. Only small surface streams drain into Geneva Lake. Most of the water comes from groundwater sources.

B. Wetlands, Wildlife, Fisheries and Endangered Species

Wetlands are found in two general locations in the park. The area surrounding the lagoon was historically wetland, much of it filled with materials from the lagoon. The land south of the park is part of an extensive wetland complex in the region. A portion of the wetland drains into a small intermittent creek flowing into Geneva Lake near the park beach.

Wildlife species found in the park are typical of the surrounding farm land and suburbs. (See species list in addenda).

The fisheries of Ceylon Lagoon consist of warmwater species, such as bluegill, bass, and bullhead. The lagoon is used as part of the Department urban fishing and fishing skills youth program and is stocked with trout in the early season. This program provides some of the earliest fishing opportunities in this part of the state.

Geneva Lake is the sixth largest lake in the state. It is managed for smallmouth and largemouth bass, panfish, walleye, northern pike and cisco. Lake trout and brown trout are present in low numbers. The lake receives heavy fishing pressure in the spring and winter, moderate pressure in the summer and fall. The intermittent creek that passes through the southwest corner of the park has several minnow species seasonally.

A check of the Department's Threatened or Endangered Species List indicates there are no known threatened or endangered species in the park area. However, the longear sunfish, a state threatened species, is found in Geneva Lake.

C. Vegetation Resources

The park's vegetation has been highly manipulated by past farming practices. The western third of the park has old growth southern hardwood such as oak, hickory, and cherry. Much of the forest understory is comprised of non-native plants i.e., buckthorn, honeysuckle, etc. Areas near the lagoon contain bottomland forest, European alder, silver maple, green ash, and a few old field plants. The upland areas have been used for row crops and have reverted to heavy grassland cover of non-native grasses. It will be possible to restore a diversity of native habitats that include oak savanna, southern hardwoods, bottomland forest, prairie, some non-native old field grasslands and limited landscape trees and lawn.

VI. ADDENDA

A. Rough Cost Estimate

WORK ITEM:	UNIT COST	ALT. A QUANTITY	ALT. A COST $	%
DEMOLITION:				
STH 120	2.93 /SY	2267 SY	6,600	0%
PARK ENTRANCE	2.93 /SY	1015 SY	3,000	0%
PARKING LOT	2.93 /SY	4167 SY	12,200	1%
OTHER PARK ROADS	2.93 /SY	10619 SY	31,100	1%
GRUB TREES	14275.00 /AC	2 AC	24,300	1%
REMOVE FENCING	0.55 /LF	600 LF	300	0%
EXCAVATION	4.74 /CY	5152 CY	24,400	1%
EXISTING BRIDGE STH 120	44000.00 EA	1 EA	44,000	2%
CONTACT STATION	0.20 /CF	3000.00 CF	600	0%
PIT TOILETS	0.25 /CF	0.00 CF	0	0%
NEW WORK:				
STH 120	28000.00 /ST/	7 ST	191,800	8%
OTH RD FACT DTCH/TILE/ETC	0.50 X		95,900	4%
BIKE LANES (1 EA. DIR.)	473.00 /ST/	31 ST	14,900	1%
NEW PARK ROADS	15.46 /SY	17315 SY	267,700	12%
OTHER NEW RDS/TURNS,ETC	15.46 /SY	0 SY	0	0%
DOUBLE BOX CULV (BOATS)	95400.00 /EA	1 EA	95,400	4%
BOX CULV (PEDESTRIAN)	40000.00 /EA	1 EA	40,000	2%
RELOCATE UTILITIES	5000.00 /EA	1 EA	5,000	0%
ADD LIFT STATION	100000.00 /EA	1 EA	100,000	4%
BEACH GROINS	28.00 /CY	243 CY	6,800	0%
BEACH SAND	8.50 /CY	4400 CY	37,400	2%
LAUNCH RAMPS	50.00 /SF	3200 SF	160,000	7%
PIERS	30.00 /SF	960 SF	28,800	1%
LAUNCH AREA	15.46 /SY	2978 SY	46,000	2%
STAGING AREA	15.46 /SY	0 SY	0	0%
DREDGING	8.28 /CY	590 CY	3,700	0%
BREAKWATER	1000.00 /LF	270 LF	270,000	12%
RIPRAP	30.00 /CY	400 CY	12,000	1%
CURB/GUTTER	8.00 /LF	330 LF	2,600	0%
CONTACT STATION	50.00 /SF	1200 SF	60,000	3%
FISH CLEAN STATION	150000 EA	1 EA	150,000	7%
ADA PARKING (4 STALLS)	15.46 /SY	317 SY	4,900	0%
PARKING LOT (100 STALLS)	15.46 /SY	9240 SY	142,900	6%
OTHER PARKING	15.46 /SY	4250 SY	65,700	3%
ATTENDANT BOOTH	50.00 /SF	0 SF	0	0%
LIGHTING	2000.00 /EA	15 EA	30,000	1%
PATHS	8.71 /SY	590 SY	5,100	0%
ELEC. @ CAMPSITES	1000.00 /EA	25 EA	25,000	1%
WATER SPIGOTS @ CAMPSIT	2300.00 EA	3 EA	6,900	0%
TOPSOIL (4")	2.67 /SY	37000 SY	98,800	4%
FENCING	12.00 /LF	600 LF	7,200	0%
DRAINAGE	25.00 /LF	40 LF	1,000	0%
TREES	227.00 /EA	50 EA	11,400	1%
SHRUBS	50.00 /EA	150 EA	7,500	0%
EROSION CONTROL	1.20 /LF	1000 LF	1,200	0%
ENTR. SIGN	1000.00 /EA	1 EA	1,000	0%
AUX. SIGNS	100.00 /EA	12 EA	1,200	0%
SEED/MULCH/FERT.	0.75 /SY	37000 SY	27,800	1%
FINE GRADING	2.65 /SY	37000 SY	98,100	4%
WETLAND MITIGATION	3500.00 /AC	0 AC	0	0%
WEED CONTROL POND	3000.00 EA	1 EA	3,000	0%
SUB-TOTAL			$2,273,200	
FACTOR FOR UNKNOWNS (10%)			227,300	10%
MOBILIZATION (2%)			45,500	2%
ENGINEERING (10%)			227,300	10%
CONTINGENCY (10%)			227,300	10%
SUB-TOTAL			$3,000,600	
YRS DELAY @4%	5.00 YR		650,100	
TOTAL			$3,700,000	

B. Species List of the Big Foot Beach State Park Area

The species lists below were compiled in the following manner. A species list from the master plan (completed in 1967 by George Knudsen) was used as a base. After a follow-up investigation and consultation with Citizen Advisory Committee member Mary Koutsky, the species were either confirmed or listed as probable. A probable listing means a species was not confirmed but was probably present as site conditions and habitats likely supported these species. The park needs to be surveyed during the growing season to confirm the probable listings and to expand the list.

CODE KEY: C--Confirmed P--Probable E--Exotic

VASCULAR PLANTS

Genus & Species	Common Name & Code
TREES	
Acer negundo	Box Elder (C)
Ulmus rubra	Slippery Elm (P)
Ulmus americana	American Elm (C)
Prunus serotina	Black Cherry (C)
Alnus glutinosa	European Alder (C,E)
Quercus macrocarpa	Bur Oak (C)
Quercus rubra	Red Oak (C)
Quercus alba	White Oak (C)
Quercus velutina	Black Oak (C)
Populus tremuloides	Quaking Aspen (C)
Populus deltoides	Cottonwood (C)
Polulus alba	Silver Poplar (P,E)
Populus grandidentata	Bigtooth Aspen (P)
Betula papyrifera	Paper Birch (C)
Salix nigra	Black Willow (C)
Morus rubra	Mulberry(P)
Carya ovata	Shagbark Hickory (C)
Acer saccharinum	Silver Maple (C)
Acer saccharum	Sugar Maple (C)
Robinia pseudo-acacia	Black Locust (C,E)
Gleditsia triacanthos	Thornless Honey Locust(P)
Tilia americana	Basswood (C)
Pinus resinosa	Red Pine (C)
Pinus strobus	White Pine (C)
Fraxinus americana	White Ash (C)
Fraxinus pennsylvanica	Green Ash (C)
Sycamore occidentalis	American Sycamore (P)

SHRUBS & VINES

Crataegus spp.	Hawthorn (C)
Rhamnus cathartica	Common Buckthorn (C,E)
Viburnum acerifolium	Mapleleaf Viburnum (P)
Lonicera tatarica	Tatarian Honeysuckle(C,E)
Salix interior	Sandbar Willow (P)
Rhus glabra	Smooth Sumac (C)
Rhus radicans	Poison Sumac (P)
Sambucus canadensis	Elderberry (P)
Ostrya virginiana	American Hornbeam (C)
Rosa multiflora	Multiflora Rose (C,E)
Rubus spp.	Raspberry& Blackberry(C)
Berberis vulgaris	Barberry(P,E)
Cornus stolonifera	Red-osier Dogwood (C)
Parthenocissus quinquefolia	Virginia Creeper (C)
Vitis spp.	Wild Grape (C)
Rhus toxicans	Poison Ivy (C)

FORBS

Circaea quadrisulcata	Enchanter's Nightshade(C)
Geum alleppicum	Yellow Avens (C)
Geum canadense	White Avens(C)
Prunella vulgaris	Heal-all (P,E)
Euphorbia corollata	Flowering Spurge (P)
Polygonum spp.	Knotweeds (P)
Taraxacum officinalis	Dandelion (C,E)
Hieracium spp.	Hawkweeds (P)
Monarda fistulosa	Wild Bergamot (C)
Lespedeza capitata	Round-headed Bush Clover (P)
Rudbeckia hirta	Black-eyed Susan (P)
Arctium minus	Common Burdock (C,E)
Leonurus cardiaca	Motherwort (C,E)
Nepeta cataria	Catnip (P,E)
Chenopodium album	Lamb's Quarters (P,E)
Solanum dulcamara	Bittersweet Nightshade (C,E)
Echinocystis lobata	Wild Cucumber (P)
Physalis spp.	Ground Cherries (P)
Solidago altissima	Tall Goldenrod (C)
Solidago spp.	Goldenrods (C)
Asclepias verticillata	Whorled Milkweed (P)
Asclepias incarnata	Swamp Milkweed (P)
Asclepias syriaca	Common Milkweed (C)
Potentilla spp.	Cinquefoils (P)
Plantago major	Plantain (C,E)
Achillea millefolium	Yarrow (C,E)
Melilotus alba	White Sweet Clover (C,E)
Melilotus officinalis	Yellow Sweet Clover (C,E)

Trifolium repens	White Clover (C,E)
Trifolium pratense	Red Clover (C,E)
Medicago sativa	Alfalfa (P,E)
Ambrosia artemisiifolia	Common Ragweed (C)
Ambrosia trifida	Giant Ragweed (C)
Lepidium spp.	Peppergrass (P)
Capsella bursa-pastoris	Shepherd's Purse (P,E)
Amphicarpa bracteata	Hog Peanut (P)
Prenanthes alba	White Lettuce (P)
Geranium maculatum	Wild Geranium (C)
Oxalis stricta	Yellow Wood-sorrel (P)
Podophyllum peltatum	Mayapple (C)
Erigeron annuus	Daisy Fleabane (P)
Carduus nutans	Nodding Thistle (P,E)
Cirsium vulgare	Bull Thistle (P,E)
Cirsium arvense	Canada Thistle (P,E)
Verbena hastata	Blue Vervain (P)
Urtica dioica	Stinging Nettle (P)
Polygonatum biflorum	Solomon's Seal (P)
Smilacina racemosa	False Solomon's Seal (P)
Smilacina stellata	Starry False Solomon's Seal (P)
Oenothera biennis	Common Evening-primrose (P)
Helianthus spp.	Sunflowers (P)
Impatiens biflora	Spotted Jewelweed (C)
Verbascum thapsus	Common Mullein (C,E)
Aster novae-angliae	New England Aster (C)
Aster pilosos	Frost Aster (C)
Aster spp.	Asters (P)
Pilea pumila	Clearweed (P)
Asparagus officinalis	Asparagus (C,E)
Apocynum androsaemifolium	Spreading Dogbane (P)
Anemone virginiana	Tumbleweed (P)
Heracleum maximum	Cow Parsnip (P)
Rumex crispus	Curled Dock (C,E)
Antennaria spp.	Pussytoes (C)
Daucus carota	Wild Carrot (C,E)
Convolvulus sepium	Hedge Bindweed (P)
Convolvulus arvensis	Field Bindweed (P,E)
Tanacetum vulgare	Common Tansy (C,E)
Fragaria virginiana	Wild Strawberry (C)
Viola spp.	Violets (C)
Coronilla varia	Crown-vetch (C,E)
Veronicastrum virginicum	Culver's Root (P)
Cichorium intybus	Chicory (P,E)
Hepatica acutiloba	Sharp-lobed Hepatica (C)
Claytonia virginica	Spring Beauty (C)
Symplocarpus foetidus	Skunk Cabbage (C)

Caltha palustris	Marsh Marigold (C)
Alliaria officinalis	Garlic Mustard (C,E)
Ratibida pinnata	Gray-headed Coneflower (C)
Saponaria officinalis	Bouncing Bet (P,E)
Typha latifolia	Cattail (C)
Dodecatheon meadia	Shooting Star (C)
Anemone canadensis	Canada Anemone (C)
Anemone quinquefolia	Wood Anemone (C)
Uvularia sessilifolia	Wild Oats (C)
Trillium recurvatum	Prairie Trillium (C)
Chrysanthemum leucanthemum	Ox-eye Daisy (C,E)
Ajuga reptans	Bugle (C,E)
Allium canadense	Wild Garlic (C)
Iris versicolor	Larger Blue Flag (C)
Thalictrum dioicum	Early Meadow Rue (C)
Arisaema spp.	Jack-in-the-Pulpit (C)

GRASSES

Setaria spp.	Bristly Foxtails (P)
Agropyron repens	Quackgrass (C,E)
Phleum pratense	Timothy (C,E)
Calamagrostis canadensis	Bluejoint (P)
Bromus spp.	Brome Grass (C,E)
Phalaris arundinacea	Reed Canary Grass (C,P)
Equisetum arvense	Horsetail (P)
Andropogon gerardi	Big Bluestem (C)
Andropogon scoparius	Little Bluestem (C)
Sorghastrum nutans	Indian Grass (C)
Poa pratensis	Kentucky Bluegrass (C,E)
Carex spp.	Sedges

MAMMALS

Oedocoileus virginianus	Whitetail Deer (C)
Ondatra zibethica	Muskrat (C)
Sciurus niger	Eastern Fox Squirrel (P)
Sciurus carolinensis	Eastern Gray Squirrel (C)
Citellus tridecemlineatus	13-lined Ground Squirrel (C)
Tamias striatus	Eastern Chipmunk (C)
Marmota monax	Woodchuck (P)
Sylvilagus floridanus	Eastern Cottontail (C)
Microtus pennsylvanicus	Meadow Vole (C)
Peromyscus maniculatus	Deer Mouse (P)
Peromyscus leucopus	White-footed Mouse (P)
Blarina brevicauda	Shorttail Shrew (P)
Myotis lucifugus	Little Brown Bat (P)
Eptesicus fuscus	Big Brown Bat (P)

Lasiurus borealis	Red Bat (P)
Didelphis marsupialis	Opossum (C)
Procyon lotor	Raccoon (C)
Mephitis mephitis	Striped Skunk (C)
Mustela vison	Mink (P)
Lutra canadensis	River Otter (C)
Vulpes fulva	Red Fox (P)
Sylvilagus floridanus	Eastern Cottontail (C)

REPTILES & AMPHIBIANS

Thamnophis sirtalis sirtalis	Eastern Garter Snake (P)
Storeria occipitomaculata	Redbelly Snake (P)
Storeria dekayi dekayi	Northern Brown Snake (P)
Chytsemys picta picta	Eastern Painted Turtle (P)
Ambystoma maculatum	Spotted Salamander (P)
Bufo americanus	American Toad (P)
Pseudacris triseriata triseriata	Western Chorus Frog (P)
Rana pipiens	Northern Leopard Frog (P)

BIRDS

The following list contains the species confirmed as of May, 1996. The existing species list is not complete nor confirmed accurate. A further survey would be necessary to compile a complete and accurate list.

Gavia immer	Common Loon
Branta canadensis	Canada Goose
Anas platyrhynchos	Mallard
Fulica americana	American Coot
Grus canadensis	Sandhill Crane
Chlidonias niger	Black Tern
Charadrius vociferus	Killdeer
Zenaida macroura	Mourning Dove
Megaceryle alcyon	Belted Kingfisher
Picoides pubescens	Downy Woodpecker
Colaptes auratus	Northern Flicker
Tyrannus tyrannus	Eastern Kingbird
Myiarchus crinitus	Great Crested Flycatcher
Sayornis phoebe	Eastern Phoebe
Contopus virens	Eastern Pewee
Hirundo rustica	Barn Swallow
Iridoprocne bicolor	Tree Swallow
Chaetura pelagica	Chimney Swift
Cyanocitta cristata	Blue Jay
Corvus brachrhynchos	American Crow

Parus atricapillus	Black-capped Chickadee
Sitta carolinensis	White-breasted Nuthatch
Troglodytes aedon	House Wren
Polioptila caerulea	Blue-gray Gnatcatcher
Toxostoma rufum	Brown Thrasher
Dumetella carolinensis	Gray Catbird
Mimus polyglottos	Northern Mockingbird
Sialia sialis	Eastern Bluebird
Turdus migratorius	American Robin
Hylocichla mustelina	Wood Thrush
Vireo olivaceus	Red-eyed Vireo
Dendroica striata	Blackpoll Warbler
Dendroica coronata	Yellow-rumped Warbler
Dendroica fusca	Blackburnian Warbler
Setophaga ruticilla	American Redstart
Dendroica palmarum	Palm Warbler
Dendroica petechia	Yellow Warbler
Vermivora pinus	Blue-winged Warbler
Geothlypis trichas	Common Yellowthroat
Agelaius phoeniceus	Red-winged Blackbird
Molothrus ater	Brown-headed Cowbird
Quiscalus quiscula	Common Grackle
Dolichonyx oryzivorus	Bobolink
Sturnella magna	Eastern Meadowlark
Sturnella neglecta	Western Meadowlark
Sturnus vulgaris	European Starling
Piranga olivacea	Scarlet Tanager
Passer domesticus	House Sparrow
Junco hyemalis	Dark-eyed Junco
Cardinalis cardinalis	Northern Cardinal
Carduelis tristis	American Goldfinch
Zonotrichia albicollis	White-throated Sparrow
Spizella passerina	Chipping Sparrow
Spizella pusilla	Field Sparrow
Spizella arborea	American Tree Sparrow
Melospiza georgiana	Swamp Sparrow
Melospiza melodia	Song Sparrow
Passerculus sandwichensis	Savannah Sparrow

FISH

Lepisosteus osseus	Longnose Gar
Amia calva	Bowfin
Coregonus artedi	Lake Herring (Rare Fish List)
Salmo trutta	Brown Trout
Salvelinus namaycush	Lake Trout
Salvelinus namaycush x fontinalis	Splake
Esox americanus	Grass Pickerel

Esox lucius	Northern Pike
Campostoma anomalum	Central Stoneroller
Cyprinus carpio	Common Carp
Notemigonus chrysoleucas	Golden Shiner
Notropis atherinoides	Emerald Shiner
Notropis cornutus	Common Shiner
Notropis hudsonius	Spottail Shiner
Notropis spilopterus	Spotfin Shiner
Notropis volucellus	Mimic Shiner
Pimephales notatus	Bluntnose Minnow
Pimephales promelas	Fathead Minnow
Semotilus atromaculatus	Creek Chub
Catostomus commersoni	White Sucker
Ictalurus melas	Black Bullhead
Ictalurus nebulosus	Brown Bullhead
Ictalurus natalis	Yellow Bullhead
Fundulus diaphanus	Banded Killifish
Labidesthes sicculus	Brook Silverside
Culaea inconstans	Brook Stickleback
Morone chrysops	White Bass
Ambloplites rupestris	Rock Bass
Lepomis cyanellus	Green Sunfish
Lepomis gibbosus	Pumpkinseed
Lepomis gulosus	Warmouth
Lepomis macrochirus	Bluegill
Lepomis megalotis	Longear Sunfish (Threatened)
Micropterus dolomieui	Smallmouth Bass
Micropterus salmoides	Largemouth Bass
Pomoxis annularis	White Crappie
Pomoxis nigromaculatus	Black Crappie
Etheostoma caeruleum	Rainbow Darter
Etheostoma exile	Iowa Darter
Etheostoma microperca	Least Darter
Etheostoma nigrum	Johnny Darter
Perca flavescens	Yellow Perch
Stizostedion vitreum	Walleye

INVERTEBRATES

There is no invertebrate species list available.