

Prepared for:

The Memorial Park Conservancy

The Houston Parks Board, Inc.

Houston Parks and Recreation Department

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Survey

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Funding for this plan was generously provided by:

The Brown Foundation
The Cullen Foundation
The Fondren Foundation
The Houston Endowment
The Powell Foundation
Susan Vaughan Foundation
Uptown Houston
Wortham Foundation
Board Members of the Memorial Park Conservancy
Board Members of the Houston Parks Board, Inc.

Introduction

Memorial Park, encompassing over 1500 wooded acres near the southeastern intersection of IH-10 and IH-610 and bounded by Buffalo Bayou on its southern edge, is unique among urban parks in its size, location and quality of natural features. Originally the site of Camp Logan, a training camp for the soldiers of WWI, the property was purchased by the Hogg family and then conveyed to the city at cost in 1925. Under the transfer agreement, the land must be used for park purposes only. Today the park represents just over 7% of the city's park land and has a current value estimated at close to \$1 billion.

Approximately 4 millions Houstonians visit Memorial Park each year. It is widely recognized for its wooded character, highly regarded golf course and as the premier running facility in the city. In addition, it has active tennis, swimming, walking, bird watching, cycling, fitness and sports communities. The neighborhoods, both to the east and west of Memorial Park, have expanded with many more people directly impacted by park management decisions than in the past. Because the development of the park has been guided primarily by an original plan from the 1930's and the expressed wishes of the donor family, the need for a clearly documented up to date approach for managing future use and development of the facility became apparent.

Project Origin

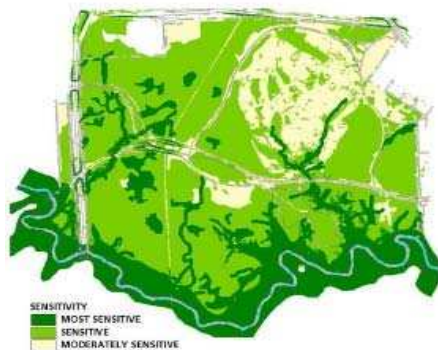
The Master Plan project began based on the collective concerns of the City of Houston, the Memorial Park Conservancy, and the Houston Parks Board, Inc. that increasing pressure to add more facilities and uses to the Park has made the lack of a master plan or guiding principles a situation unacceptable both to those whose responsibility it is to care *for* the Park and those who care *about and use* the Park.

The Conservation Master Plan was commissioned to create an objective basis for resolving the multiple concerns that face Memorial Park, ranging from concern for the natural environment to concerns about the uses that occur in it. The plan brings these concerns into focus by considering the Park's origins, the terms under which the park land was conveyed to the city, and the role the Park plays in the city and regional recreational and environmental context.

The Existing Park - Natural Resources Background



Memorial Park from above



Because Memorial Park has always, since its inception, been recognized as primarily a nature oriented park, a prominent part of this study has been to document an inventory and analysis of the park’s natural resources. This fundamental task included, among other issues, the following elements: hydrology, slopes, wetlands, vegetation, wildlife habitat, erosion, and forest conditions.

Elements were mapped and quantified, with overlays produced that provided the planning team a graphic tool for determining land uses based on environmental sensitivity to development. In this process, a clear trend resulted in the overlapping “high sensitivity” and “sensitive” ranking of many features in the southern portion of the site. This trend, when fully mapped as shown in the Composite Sensitivity Map, represents the primary finding of the ecological synthesis:

There is a clear pattern of sensitivity in the park extending from the least sensitive northern park to the most sensitive southern park, culminating in the steep, wooded slopes of the Buffalo Bayou and its headwater tributaries.

Further information is included here as Attachment A and is provided in more detail as a technical appendix to the Master Plan. As a result of this information gathering process and mapping technique, a system of prioritizing land use zones was developed as outlined below in the Land Use section of the Recommendations.

The Process

Following extensive environmental inventory and analysis, the planning team interviewed various user groups, government agencies, non-profits and neighbors. Results were reviewed at a series of public meetings and culminated with a presentation to the City Council committee responsible for such park related plans. At each stage of work, adjustments were made to best accommodate the wishes of our citizens and users without compromising the best interests of our most unique urban park.

Master Plan Recommendations

An Achievable Vision

“Memorial Park, Houston’s foremost natural wooded bayou park, is a refuge from intense urbanization and will be a living model of sustainable green space and a place for recreation both *with* and *in* nature.”

Three major themes developed during the planning process:

Stabilize: Existing erosion will be stabilized to limit further damage and the forest will be further evaluated in detail to determine the best long term strategy for forest management to reduce exotic invasive species and ensure a healthy, diverse biological community.

Connect: The Park will be more accessible and better connected by an extended comprehensive trail system and other access improvements that reach beyond the Park. In addition to physical connections, expanded and extended educational programs throughout the park will help to secure the park for future generations by creating a better informed park constituency.

Restore: Areas that are vacated, such as parts of the Maintenance facility and HPB stable areas, and other major areas of the park will be restored and enhanced by actively managing the forest, by reducing erosion, and by managing recreational use.

The Master Plan consists of recommendations for each of nine major topics as identified during extensive investigation of the park’s historic and existing conditions. These nine topics are the basis for the goals and actions in the plan:

- | | |
|--------------------|--------------------------------------|
| Land Use | Natural Resources |
| Trail Circulation | Vehicular Circulation |
| Cultural Resources | Facilities |
| Infrastructure | Education, Coordination and Outreach |
| Stewardship | |

The proposed resolution of the major issue associated with each topic is stated as a goal, each of which is supported by specific actions.

In addition, the park would greatly benefit from a unified system of design standards for lighting, paving, seating, trash receptacles, signage, picnic facilities, etc. whose construction, design and operational requirements complement the vision of an exemplary sustainable park.

Vision and perspectives from the Community:

“Enhance the existing recreational facilities that provide the most access to the general public with the least amount of user-fee cost and scheduling. Preserve all trees and naturally undisturbed terrain.”

“Memorial Park should be the “Central Park” of Houston: a destination, a retreat, a jewel in our crown...[with] ease of access for all users.”

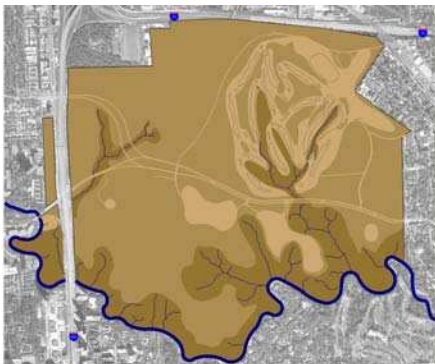
“Ensure that the vision of the Hogg family can be carried out, balanced with the pressures of progress to protect and maintain the natural beauty of the park and all it affords the environment and the people of Houston.”

Land Use

Goal: The integrity of Memorial Park’s natural systems provides the basis for land use decisions. The park accommodates recreation to the extent possible without further damage to the natural systems and character of the park.

Actions:

In order to best determine solutions to land use questions, it is necessary to develop a system of objective criteria on which to formulate the questions and to base resulting solutions. As mentioned in the Introduction, a progression of land use zones were developed based on mapping a number of environmental factors. The proposed Park Use Zone plan developed here is a land use plan intended to resolve conflict between the sensitivity gradient and the existing or proposed use pattern and to provide a constructive, objective and responsive means of managing the park. The Park Use Zone plan divides the park into use zones based on the various zones’ sensitivity to impact, defined as low, medium, or high. The type of use allowed in a given part of a park is dictated by concerns such as public health safety and welfare, preservation of natural resources, or operational economics.



Proposed Park Use Zones

The three Park Use Zones are indicated in tones of light to dark brown, with light brown as low impact, medium brown as moderate impact, and dark brown as high impact.

High Sensitivity Park Use Zone Buffer

The 75’ buffer is defined as the limit of the area likely to collapse in the case of groundwater saturation and rotational failure, given the angle of repose of soil at 3:1 slope and an approximate height of 25 feet.) Management practices are limited to natural systems management and erosion control work appropriate to the sensitivity of the area (i.e., no lawn mowing or removal of fallen tree trunks and limbs.

There are three Park Use Zones: High, Medium and Low Sensitivity to Impact:

High Sensitivity to Impact: Defined as the zones of steep slopes, woodland and riparian habitat that are mapped as the “Sensitive Area,” this area includes the core sensitive resources plus a buffer from the top of slope. Because of the sensitivity to development of these special areas, the Master Plan recommends that permitted uses be limited to include approved nature trails only and existing selected multiuse trails modified to acceptable condition. Recreational trails are recommended only under extraordinary circumstances where design and construction of such facilities is done with extraordinary care using techniques appropriate to the most sensitive areas (i.e., Texas Parks and Wildlife Department, National Park Service, Appalachian Mountain Club back country trail standards)

Moderate Sensitivity to Impact: Defined as the remaining zones that are neither Low Impact nor High Impact. Management practices are limited to natural systems management, erosion control work and trail maintenance. An ideal use consistent with the natural conditions here, as well as the “connectivity” theme, would be to take advantage of these highly scenic, but less sensitive

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areas by completing a system of multiuse trails.

Low Sensitivity to Impact: Defined as the actively used, developed and groomed zones that include park infrastructure, facilities and recreation features, such as the golf course, fitness center, active sports fields and courts. Management practices include typical institutional grounds keeping practices. These areas currently support the following: roads, parking, active sports facilities, picnicking, and construction of park specific support facilities.

Facility Development or Expansion

Because there are no possible ways to expand Memorial Park’s formal sports facilities without significant encroachments into natural areas, either of high or medium sensitivity, and because the existence of the park’s natural qualities make it unique among urban parks and central to the donor’s intent, it is recommended that no further such expansions occur in the future in Memorial Park.

Geographic Identity

A lack of identity falsely suggests that certain areas of the park are underutilized and lacking in purpose, and are therefore candidates for development of facilities. Therefore, an identity for park areas that are not currently developed and programmed should be established, by referring to the individual area’s intrinsic landscape, cultural heritage, or educational potential.

Special Events

The Houston Parks and Recreation Department will be providing guidelines for special events on a citywide basis. All special event requests to the Houston Parks and Recreation Department for Memorial Park must be accompanied by a parking plan that adequately addresses parking and emergency vehicle access on public streets adjoining the park, and any potential impact, such as noise, litter, etc. on adjoining property owners.

Natural Resources

Goal: Memorial Park’s natural resources are protected, conserved, and enhanced as necessary to achieve the highest biological potential of the Park’s ecosystems while meeting recreational needs appropriate to the Houston Park and Recreation Department’s mission.



Camp Logan

Although little remains of the military training camp for which the park was named, there is an opportunity to reveal some of the tangible features and make the camp heritage more visible.

From the Community:

“Don’t close the park to public access for any private [or] public groups.”



A Diverse Woodland

Stands of red maple, plane tree, green ash and black willow occupy patches of wetland among the predominately pine and hardwood forest of the park’s plateau. The flared base of the tree trunks indicate the natural adaptation to stabilized shallow rooted trees seeking oxygen in upper layers of wet soils.

Actions:

Erosion Control and Restoration



An example of a trail incised into the ground surface by erosion.

Erosion that has taken place due to the high volume of runoff and the high erodibility of the soils is the most threatening and visible problem currently facing the park. Erosion is gradually encroaching upon some of the roadways and facilities in the park and will eventually cause failures of the paving along Memorial Drive and the Picnic Loop. The majority of the erosion problems in Memorial Park can be attributed to four basic erosion mechanisms: sheet flow concentrated by a manmade structure, ditch, or a natural drainage swale; inadequate erosion protection at storm sewer outfalls and culverts; inundation by high floodwater in Buffalo Bayou; and pedestrian, bicycle, and equestrian traffic on the trails that form swales alongside that eventually lead to concentrated flow and erosion.

As a high priority, create a master erosion control plan that address the key areas of erosion at the Picnic Loop, Memorial Drive, Woodway at the former Archery Range, and within the sensitive area. This plan should initiate action on the part of public agencies such as TxDOT and DPWE, and should address all conditions of extreme erosion as an imperative.

Parkwide Trail Erosion: This plan recommends management of erosion with proper trail design, construction and regular maintenance.

Picnic Loop Erosion: The plan recommends possible solutions to the Picnic Loop erosion problem. These may include:

Short Term: Reduce impervious surface by redesigning the lots to provide enhanced dispersal and better percolation into the soil below. Provide velocity control and energy dispersal for runoff at pipe exits.

Long Term: Redesign the drainage systems on the six parking areas in the picnic loop, to minimize the current condition where they empty concentrated stormwater directly into the sensitive area buffer at the edge of the slopes. Relocate / reconstruct the road at the four points of obvious proximity to rapidly eroding slopes.

Consider a new storm drainage solution to eliminate point concentration discharge. Possible solutions include reverse flow to several central collection points, or regrading the road to eliminate the damming effect and permitting sheet flow across the pavement, or regrading the interior to drain as sheet flow across the road surface.

Roadside ditch erosion along the picnic loop could be corrected by realigning the ditch away from the roadway to allow room for a



For a variety of reasons, the steeply sloped southern portion of the park along the Bayou is severely eroded in many areas. A major action of the plan is to stabilize and restore these areas.

shoulder. The new shoulders could be used as a parallel parking lane similar to configuration of Memorial Loop, enabling the park to retain the quantity of parking spaces subtracted by removing the exterior and interior parking lots.

Bayou Woodland (former Archery Range)

The Bayou Woodland is affected by three erosion problems: extreme mass wasting of soil at the exit of a storm sewer pipe draining North Post Oak Lane, an extensive unauthorized trail network, and a tributary that was channelized as a result of IH-610 construction.

Post Oak Outfall: Massive erosion from a stormwater pipe has caused “a small canyon” on the east bank of the Bayou just downstream of the Woodway Bridge. Stormwater exits a pipe from a point halfway up the embankment from the Bayou, in the vicinity of North Post Oak Lane and Woodway Drive, without effective energy dissipation devices or slope protection. This is an outfall of a storm sewer system (owned and maintained by the City of Houston Department of Public Works and Engineering) that drains North Post Oak Road and is discharging drainage from a pipe outfall immediately south of Woodway Drive in the Bayou Woodland tract. The condition continues to cause erosion and must be addressed.

The plan recommends the construction of a solution to the pipe outfall problem and restoration of the highly eroded ravine.

Unauthorized Trails: An extensive system of unauthorized trails extends throughout the site and in some areas in the south has resulted in severe erosion along the Bayou bank.

It is recommended that the unauthorized trails be reclaimed and the ground surface restored, except for a pedestrian only loop around the high ground knoll that extends north-south generally parallel to IH-610.

IH-610 Culvert / Channelization: The existing tributary that drains the part of the park occupied by the Houston Arboretum Triangle, and Northwest Quadrant has been radically altered by highway construction. The Tributary begins as an open swale east of IH-610, passes under IH-610 via a pair of seven foot square culverts, and opens out into a narrow manmade channel parallel to the highway and extending to a pair of culverts that exit out into the Bayou at the IH-610 bridge over the Bayou. The tributary is thus rendered null as a habitat corridor into the Park, and appears as a waste channel.

It is recommended that, although the tributary has been altered beyond



A chain link fence and locked gate block access to the Woodland, however this has not prevented the unsanctioned development of an extensive network of off road biking trails.



Through Memorial Park, Buffalo Bayou is a tree lined corridor. Under this tree canopy are many areas of severe erosion and bank failure due to floodwaters.

recognition, the Memorial Park Conservancy pursue with TX DOT a broad restoration strategy including daylighting, stream restoration and other improvement measures that could improve the tributary as an ecological, recreational and visual asset instead of the liability it is in its current state.

Buffalo Bayou

It is recommended that, based on hydrologic and hydraulic analysis of Buffalo Bayou, and the Park Vision, the recommended course of action for the Bayou is simply to leave it alone and consider it a symbol of dynamic natural process. The Bayou can serve as a valuable environmental education tool that depicts the change inherent in nature. Possible solutions such as concrete surfacing and decreasing the bank slope would only destroy the habitat value and visual amenity of the bayou and conflict with the ability to observe natural process.



Ongoing Efforts of Restoration

Reforestation project signs are already a familiar sight in the Park, such as this one in the western park south of Memorial Drive.



Much of the forest of Memorial Park consists largely of a solid mass of canopy and understory vegetation. The understory is primarily made up of exotic, invasive plant species such as chinese privet.

Overall Park Forest and Landscape Management

Memorial Park's forest is fairly uniform in age, species composition, health, and current needs. The over story consists of mature to over mature pine trees. The mid-story consists primarily of oaks and elms with a few small stands of middle aged pines and a few small stands of hardwoods. The under story contains native and invasive species and consists primarily of yaupon, privet, ligustrum, camphor, and cherry laurel. Chinese tallow is present along forest edges and within a few small stands.

The assessment concluded that the under story does not allow adequate sunlight to penetrate to the forest floor, which hinders seed germination and seedling growth of tree species. As the site's mature pine and oak trees further decline due to age, insects, disease, and natural causes, the under story will likely become the predominant component of forest. If left untreated, the site could become a very dense thicket stand of 15 to 20 feet tall yaupon and privet with randomly scattered over mature trees. If the under story is controlled via management techniques, seedlings can become established, develop into an over story and create a regenerating forest.

The plan recognizes that, while the Park's forest canopy is gradually growing in surface area, its condition is in gradual, long term decline. It recommends the creation of a strategy for the long term stewardship and restoration of the natural landscapes within the park, and the sustainable management of the designed and improved landscapes. A detailed forest assessment study should be performed to better identify problem target areas, methods and management scopes for prescription activities. Management actions can be budgeted to occur

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over several years, which minimize the amount of acreage treated at any one time. A long-term strategy should be selected so that Memorial Park's intended forest goal can be achieved before implementation of management prescription actions. The Preliminary Forest Assessment includes seven (7) management prescriptions: Fungus and Insect Control, Invasive Species and Under Story Control, Park Buffer Treatment, Forest Regeneration, Species Diversification, Stand Thinning, and Fertilization.

Golf Course

It is recommended that as a part of the overall Park Landscape Management Plan (described above), a plan should be created specifically for the Golf Course. The Golf Course Plan should recommend reforesting the areas between the fairways to enhance the visual experience and increase desired species habitat, and managing the other environments on the course to their highest reasonable ecological potential. The Memorial Park Conservancy should support the course manager in pursuing Audubon certification as described below.



Golf Course

The areas between the fairways are currently mown, allowing for an attractive groomed appearance but preventing the regrowth of understory and new canopy trees.

Trails

Goal: A comprehensive multiuse and specialized trail system connects Memorial Park's various subareas and accommodates appropriate usage, consistent with natural and cultural features.

Trails are a vital part of the use and enjoyment of Memorial Park. The trail system includes a variety of types of trails, ranging from the popular, crowded Seymour Lieberman Exer-Trail to narrow paths winding through the woods near Buffalo Bayou.

General Recommended Actions for Trails

Comprehensive System: The plan recommends the establishment of a comprehensive trail system, extending throughout Memorial Park, with trails of a variety of types, lengths and difficulty. All general areas of the park and all facilities should be accessible by trails.

Inter-Connected System: It is recommended as a major feature of the plan



The Seymour Lieberman Trail is well used by runners and walkers. It will remain restricted from off road bikers and horses.

From the Community:

"Be able to bicycle through the Park to get to other parts of the park."

"Trails generally should be shared use."



Trails should be aligned to avoid drainage ways, but where unavoidable, must be constructed to minimize impacts and maintain drainage flow without increasing erosion potential by side-trailing. This solution in the Park channels bike traffic properly while minimizing the construction footprint.

that a system be expanded so that trails are connected to one another as much as possible. Trails should include safe, convenient road crossings to allow users to move easily throughout the park. Other recommendations include the following:

- a. Pursue improving the design standards of existing on-grade crossings at all intersections to make a more accommodating and dignified passage for park users.
- b. Restore and improve existing box culvert underpasses beneath Memorial and Woodway Drives.
- c. Construct a multiuse bridge across Memorial Drive east of the railroad bridge to carry people, bicycles and horses.
- d. Support the provision of pedestrian access along and across IH-10 and IH-610 to provide access from the adjacent streets, sidewalks, neighborhoods, and the Galleria area.
- e. Construct a trail connection on the north side of Memorial Drive under the railroad bridge, to connect the established runners' path that leads northwest out of the park.
- f. Pursue trail easements below the existing railroad bridge on IH-10 right of way.

Trail Use System: It is recommended that the trail system be primarily shared-use trails, open for use by pedestrians, cyclists and equestrians. Certain trails may have use restrictions to accommodate physical conditions such as soil or steep slope or to accommodate crowded conditions or special uses such as the Houston Arboretum and the running loop.

Trails Advisory Committee: The plan recommends that the Memorial Park Conservancy and Parks and Recreation Department create a committee to coordinate all trail design, construction and operations/maintenance activities.

Design Standards: It is recommended that standards be established for each type of trail to provide for user safety, protection of the park environment, attractive appearance and appropriate recreation use. Utilize recognized standards where available, such as the International Mountain Bicycling Association trail guidelines. HPARD will retain oversight of all trail design and management decisions and activities.

Trail Management: It is recommended that the appropriate parties manage and maintain trails over time to ensure ongoing compliance with recreation, environmental and other objectives.

Trail Rangers: The plan recommends that a volunteer trail patrol group be



Trail use management will require direct participation of the trail user stakeholders who make good use of the park's trails already.

established, composed of various trail user groups, that would provide a visible, positive presence on the trails to provide information and assistance to trail users.

Vehicular Circulation

Goal: Vehicular access to Memorial Park is provided in such a way as to limit impact on the natural features and enhance the experience of park users.

Road Crossings

The recreational experience in the park is fragmented by the need to cross Memorial Drive to pass north-south through the park, and the park is separated from adjacent neighborhoods by daunting expanses of highway ramps and bridges.

The following recommendations are made in this regard:

- a. **Pursue improving the design standards of existing on-grade crossings at all intersections** to make a more accommodating and dignified passage for park users.
- b. **Construct a new pedestrian/cyclist connection** across Memorial Drive east of the existing railroad bridge.

Parking

Adequate parking is essential to the use and enjoyment of a metro park in a vehicle-oriented city. However, parking lots are undesirable intrusions on the natural landscape. Memorial Park requires a wide array of management strategies to accommodate “peak load” daily recreational use and events such as the Bayou Arts Festival and the Rodeo encampment.

This plan recommends there be no net change to the quantity of daily use parking spaces in the Park. To balance the demand and supply of the park’s current parking spaces, HPARD should continue to manage peak demand with shuttles and the **construction of an “overflow only” parking using environmentally sensitive construction techniques along the rail and power line right of way.**

Mass Transit

As a part of a regional effort to encourage transit use, this plan recommends



Woodway and Memorial Drives are depressed beneath ground level to pass beneath the railroad to avoid a grade crossing. This provides visual variety, and makes it possible for multipurpose trails to pass under as well.

The grade change offers the potential for a multipurpose overpass bridge to connect north and south.



Improved Crosswalk Potential

The lack of a curb ramp and sidewalk at this striped crosswalk on Memorial Drive indicates the potential improvement in connectivity that can be made by building sidewalk to link the park walkways to the surrounding sidewalk system.

From the Community:

"Memorial Park should be a refuge - removed from fast traffic and traffic noise..."

"Sanctuary, Recreation, Nature Preserve, Balance, Family-Friendly, For the People-for the Community not for Corporate interests-not for Automobile Transportation through..."

"A refuge for everyone from the concrete, noise, rush-rush traffic that we must live with."

creation of very clear and attractive bus stops.

Memorial Drive Traffic Calming

While the installation of traffic signals should help to keep speeds down, the plan recommends that the Memorial Park Conservancy work with the Department of Public Works and Engineering to study the use of traffic calming measures to ensure that the speed limit is maintained. Consideration should be given to reducing the speed limit by five to ten miles per hour to further reduce the impact of speeding cars and the north-south open space fragmentation that the Drive currently imposes on the park.

Cultural Resources

Goal: Memorial Park's prehistoric cultural heritage is preserved and remnants of Camp Logan serve to interpret the origins of the Park as a memorial to those who trained at the Camp.



The historic plan for Camp Logan has strongly influenced the way the park looks today.

Archaeological Significance

The plan recommends acknowledgement of the significance of the park's prehistoric, colonial / settlement and Camp eras by conducting a thorough archaeological study of the park to aid in site planning and the formation of a parkwide interpretive plan. Consider applying for state historic register status.

Camp Logan

It is recommended efforts be made to use the camp plan and physical remnants of Camp Logan to identify certain parts of the park, and to provide the basis for layout of selected features, such as trail location, interpretive exhibit design, and other means of commemoration.

Facilities

Goal: Memorial Park’s facilities are consistent with the conservation of the natural and cultural resources and the forested character of the park. The list of actions below is arranged in order of immediacy, priority and ease of implementation.

Maintenance Complex

It is recommended that the Parks and recreation Department relocate the existing northwest maintenance complex out of the Park. Environmental tests will be conducted to determine the extent, if any, of reclamation requirements. Restore and reforest the disturbed area and allow for reuse of the remaining area for park-related service/support facilities. Consolidate maintenance at the golf course support facility.



Maintenance buildings and the storage areas for vehicles and materials are too close to the highest designated sensitive area near the Bayou.

Bayou Woodlands (Former Archery Range)

The plan recommends that the area be reclaimed and designated as a natural area, with a park/refuge-compatible use, such as nature trails and a canoe launch with associated parking and pavilion. Restore severe erosion from the Post Oak outfall and miscellaneous erosion from the illegal trail system.



After relocation of the HPD Police Equestrian facility from Wiess Park, this open area would be reforested.

Wiess Park

Consistent with the wishes of the donor, it is recommended that Wiess Park be managed as an integral part of Memorial Park. It is further recommended that the importance of Wiess Park, in relation to Memorial Park, be recognized by creating a plan for passive use of the park linked to Memorial Park and the adjacent neighborhood. It is also recommended that the Police facilities be relocated from the park after replacing in kind elsewhere.

Picnic Loop

It is recommended that this area remain for both picnic use and a roller blade/road cycling loop. Picnic facilities, restroom facilities and landscaping should be improved to provide a more positive experience.



Road cyclists use the Picnic Loop as a training course when the Loop is closed to picnicking.

Park Equestrian Facility

It is recommended to permit the polo practice field to remain on park property, and negotiate a formal, short-term concessionaire agreement that provides for promoting and accommodating public access and increasing public use. Seek

ways to allow public access to the facility in concert with the adjacent landowner.



South Locker/Changing Center

The plan recommends that a changing and restroom facility be constructed to replace a current restroom building south of Memorial Drive to provide a southern focus for running (for the Lieberman Loop, trail and other running routes) as well as for cyclists and rollerbladers.

Golf Course

It is recommended that the golf course management continue to build on and expand ongoing efforts to enhance the golf course landscape by more aggressively reforesting the areas between the fairways. Pursue Audubon Society certification.

Infrastructure

Goal: Low impact infrastructure provides adequate service to Memorial Park to demonstrate cost effective sustainable park development that limits environmental impact and is affordable in terms of municipal lifecycle.

Construction Impact

Construction activities in the park create primary and secondary damage to the natural resources. Primary damage from the construction activity includes the contract work necessary, and secondary damage includes the damage from stockpiling, access roads, temporary parking and lay-down areas, all of which can be destructive.

The plan recommends the reduction of impact of all construction activities (including utilities) on the park by developing low impact solutions and reviewing design / construction plans to ensure follow-through.

Education, Coordination and Outreach

Goal: Memorial Park itself educates visitors about natural and cultural resources, and the benefits of conserving nature as a part of sustainable development in the Houston region.

Education

It is recommended that all parties consider the entire park an education opportunity for park visitors. Create a parkwide interpretive program that emphasizes the natural environment and history of the park, with interpretive exhibits in selected areas parkwide.

Stewardship

Goal: Strengthen Memorial Park's management through public-private partnership.

The City of Houston Parks and Recreation Department will continue to work with the Houston Parks Board in its current capacity. The City will formalize its relationship with the Memorial Park Conservancy which will provide advice to the Parks and Recreation Department regarding future park preservation and development, provide funding for future projects, convene user groups and neighborhood representatives, facilitate volunteer activities in the park, and execute certain construction, restoration, renovation and/or improvement projects as determined by the Director.

Memorandum of Agreement

There is already in place a legislated relationship between the City of Houston and the Houston Parks Board regarding its role in the parks of the City of Houston. The City of Houston Parks and Recreation Department will work to develop a memorandum of agreement between the City and the Memorial Park Conservancy to provide the Conservancy with a right of entry to execute capital improvement projects, programs and operations within Memorial Park, as approved by existing City authority. The three groups will seek to ensure that the Master Plan, when approved by the City, will be implemented and that recom-



Environmental Education

Interpretive panels in the Arboretum help to make the natural features of the park more intelligible to visitors, engendering a respect for the Park, and by extension, nature in general.



The Houston Arboretum and Nature Center provides educational programs for adults and children.



The Arboretum is a separate place in the Park, but the educational potential of Memorial Park extends beyond the boundaries of the Arboretum to the remainder of the park.

recommendations made within the report will be followed.

Houston Parks and Recreation Department (HPARD)

It is recommended that:

- a. HPARD will continue ownership and jurisdiction over all activities. Final decisions will be made by HPARD, the Mayor and City Council.
- b. HPARD will continue to review and comment on public works or other outside construction projects within park boundaries to ensure that construction does not jeopardize environmental and programmatic integrity and to make certain that such projects are consistent with the goals of the master plan.

Houston Parks Board (HPB)

The plan recommends that:

- a. HPB will continue to work with HPARD and Memorial Park Conservancy to provide a conduit for funding for major implementation projects of the master plan.
- b. HPB will continue to advocate for the long-term integrity of Memorial Park and seek to ensure that the goals and recommendations of the master plan are implemented and followed.

Memorial Park Conservancy (MPC)

Because of the organization's long term and unique focus on this particular park, it is recommended that MPC will:

- a. Regularly convene user and neighborhood constituencies to provide a forum for discussion of park issues. MPC may establish committees to work more closely on specific projects and issues in the park, such as trails, erosion, programs, boat access, etc.
- b. Raise funds, with the approval of HPARD, and have a right of entry to implement capital improvements for approved projects.
- c. Act as a coordinator for volunteer efforts within the park.
- d. Assist HPARD in reviewing public projects within park boundaries to ensure that construction is consistent with the goals and recommendations of the master plan.
- e. Work with HPARD to create a park-wide natural systems management plan.

From the Community:

"My vision is to maximize both recreational and conservation values by involving the users on as many issues as possible, both in making and implementing the decisions..."

Implementation

The Memorial Park Conservation Master Plan is structured to provide the Memorial Park Conservancy, Houston Parks and Recreation Department and Houston Parks Board with a strategy or guide for action.

Strategy

The costs of implementing the Conservation Master Plan will be spread over a very long period with funds originating from a broad variety of public and private sources through a combination of city state and federal funds, grants and donations.

The Plan's recommendations will have to be prioritized according to several general criteria:

- Need (e.g., erosion undermining the Picnic Loop)
- Ease / Difficulty of Implementation (projects that do not require complex or expensive efforts)
- Operations (projects that can be taken care of as a part of existing operations efforts)

Implementation Roles

In an era of ongoing municipal budget concerns, responsibility for the actions in the plan will of necessity be shared among a wide number of public and private entities including the City, the Houston Parks Board, Memorial Park Conservancy, Houston Arboretum and Nature Center, federal state and local funding programs, and other private and non-profit organizations.

Conclusion

Through many months of technical research, user input, analysis and public review, the planning team and client group worked hard to accomplish a balance of user needs and wishes with the fundamental characteristics of Memorial Park. Chief among all considerations was the uniqueness of the natural areas of the park. Indeed, these natural areas are what make Memorial Park so attractive to so many. If error was to be made in the process, there was an unspoken consensus to err on the side of preserving this jewel for future generations. With the protection and conservation of this great legacy as the foremost issue, we trust that the citizens of Houston will accept and support this plan as their own.

The Houston Advanced Research Center has studied the Houston eco-region to determine its condition, and has made recommendations that are supported by the Memorial Park Conservation Master Plan:

Goals for Habitat, Parks and Water Issues

- Goal 1: Acquire, preserve, enhance and create more habitat, greenspace and storm water retention areas.
- Goal 2: Ensure adequate number, size, and distribution of parks and natural areas to accommodate a growing and diverse population.
- Goal 3: Coordinate planning, acquisition and management of habitat, parks and greenspace on a regional basis.
- Goal 4: Increase vegetated wildlife habitat that supports biodiversity in all regional ecosystems.
- Goal 5: Reduce human impact on flooding level and flood frequency.
- Goal 6: Preserve and enhance urban forest while encouraging preservation of trees in rural and suburban areas.
- Goal 7: Promote natural landscaping and biological diversity in public parks and private land.
- Goal 8: Employ best management practices for land use in the region.
- Goal 9: Use geographical information systems (GIS) to develop a visual database.

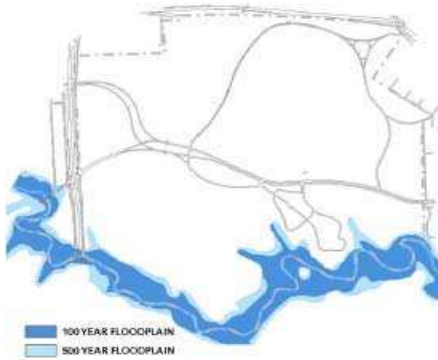
Houston Environmental Foresight
Habitat, Parks, and Water Issues Work Group
December 2000

Attachment A

Hydrology

Buffalo Bayou and its seven headwater tributary streams are the major surface hydrologic features of the park. The Bayou floodplain is a largely confined within the steeply sloping banks that define the Bayou channel.

A study of the Bayou's dynamics and stability concluded that, after adjusting to increased urban runoff and water management structures upstream, the Bayou is vertically and horizontally stable, i.e., it is not deepening its channel nor is it dramatically widening its path. The tributaries however have been destabilized by the down cutting of the main channel and are themselves down cutting to reach a point of stability, and are therefore prone to bank collapse and problems resulting from the encroachment into upland area and infrastructure.



Hydrology

Slopes

The park is mostly level with slopes of 0-5%, with areas of extreme slope occurring along the Bayou and tributaries in the south. Thus the park is characterized by extremes - land so level that it forms localized pockets of poor drainage (much of which has been altered by ditching to enable surface water to flow to the tributaries) and land so steep that it cannot support itself when saturated with water, unless it is covered with protective rooted vegetation.



Slopes

Wetlands

There are 26 acres of wetland scattered throughout the upland portion of the Park, of which only slightly over a half acre is defined as having the legal protection afforded by designation as *Jurisdictional Waters of the United States*. This condition does not diminish the importance of these other non-jurisdictional isolated upland wetlands to the overall ecological mosaic of the park. Additionally, the headwater streams are considered jurisdictional headwaters.

Vegetation

The Park was assessed for vegetation complexes currently found within the site's boundaries. The complexes observed consist of Pine and Hardwood Mix Forest, Hardwood Motts, Disturbed Areas, Wetlands, and Prairie Grasses.



Vegetation

Wildlife Habitat

Memorial Park plays an important role as a habitat "patch" in the North American Central Flyway. As such, the Park has been designated as a place on the Texas Birding Trail. Habitat types identified in the park include a substantial forest interior

Memorial Park Conservation Master Plan

habitat, extensive forest edge habitat, and numerous wetland and riparian habitats. No federally or state listed rare, threatened or endangered species were found.

Erosion Problems

Stormwater runoff and the high erodibility of the soils are the most threatening and visible problems currently facing the park. Erosion is gradually encroaching upon the roadways and facilities in the park and will eventually cause failures of the paving along Memorial Drive and the Picnic Loop.

Forest Condition

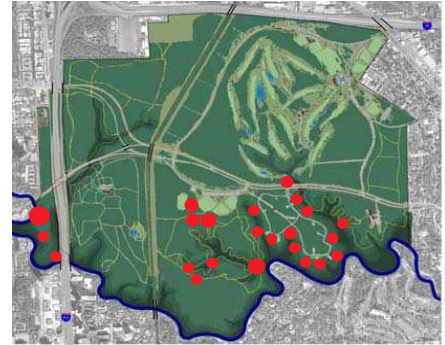
The native forest in Memorial Park as a whole is threatened by the increasing presence of invasive exotic plant species, by disease and insects, by the presence of monocultures in certain areas, and by the relatively uniform age of the canopy.

Ecological Synthesis

The natural resource inventory maps were analyzed and the relative environmental sensitivity evaluated for each mapping factor. Sensitivity was chosen as the most useful criterion because the analysis maps would then correspond to the park land use plan and would therefore be an aid to deciding which parts of the park are best suited to recreational development and which to preservation.

In this process, a clear trend resulted in the overlapping “high sensitivity” and “sensitive” ranking of many features in the southern portion of the site. This trend represents the primary finding of the ecological synthesis:

There is a clear pattern of sensitivity in the park extending from the least sensitive northern park to the most sensitive southern park, culminating in the steep, wooded slopes of the Buffalo Bayou and its headwater tributaries.



Erosion Coincides with Steep Slopes and Concentrated Water

Some of the areas of erosion are indicated in red. Note that the locations of these areas are exclusively in the south park, along the steep banks of the Bayou and tributaries, where infrastructure or recreational use intersects the flow of water across steep topography.



Attachment B

Summary of Recommended Projects

All capital projects are subject to the Mayor's and City Council approval.

- Development of a comprehensive multi-use trail system, including reactivation of the Memorial and Woodway underpasses.
- Post Oak Stormwater outfall modification and erosion repair in the Bayou Woodlands.
- Creation of a canoe/kayak access site to Buffalo Bayou.
- Construction of a pedestrian bridge over Memorial Drive and a trail under the railroad tracks north of Memorial.
- Restoration and enhancement of the Picnic Loop, including installation of appropriate erosion control treatments.
- Development of a long-term forest management strategy.
- Relocation and redevelopment of the regional maintenance facility, followed by reactivation of the area for multiple park uses.
- Opening of the Bayou Woodlands (formerly the archery range) site with nature trails.
- Relocation of the HPD Mounted Police facility.
- Activation of Wiess Park with a multi-use trail and park amenities.
- Development of permeable-surfaced overflow parking along the power easement.
- Development of "gateway" treatments at all four entrances to the park.
- Development of a comprehensive signage, geographic identity and way finding system.
- Construction of new vehicular and pedestrian bridges on Memorial Drive at the central tributary outfall from the golf course.
- Construction, a new locker/changing facility and visitor center south of Memorial Drive.
- Development of a public equestrian center along IH-10.
- Relocation and reconfiguring the Timing track.