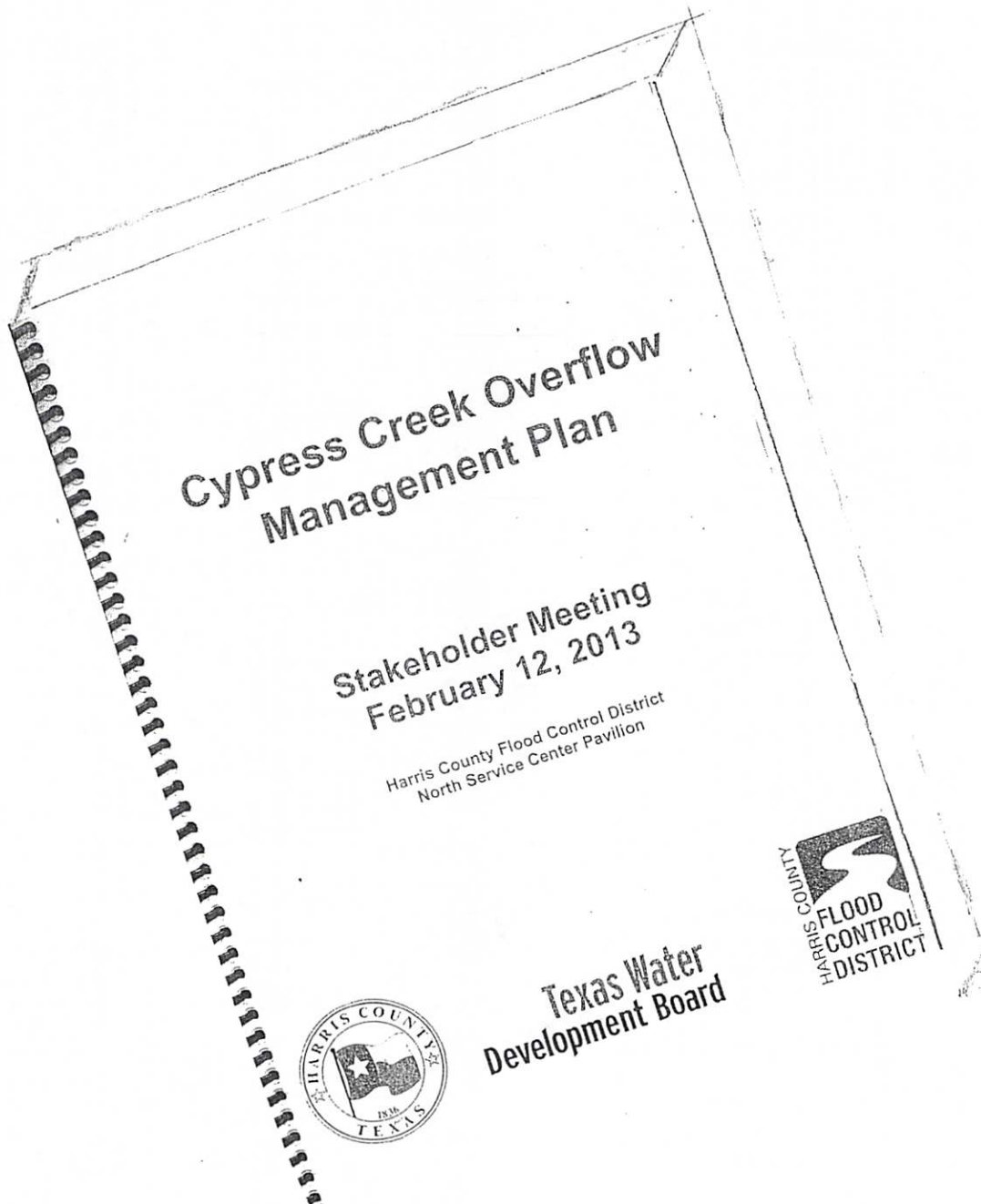




CYPRESS CREEK
FLOOD CONTROL
COALITION

2013 ANNUAL REPORT



...community organizations united for collaboration in regional government watershed management...

Spring, Texas • Houston, Texas • Cypress, Texas • Waller, Texas

CYPRESS CREEK

A WATERSHED IN TRANSITION



Cypress Creek Flood Control Coalition

...community organizations united for collaboration in regional government watershed management...

Spring • Houston • Tomball • Cypress • Waller

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President's Letter

April 15, 2014

The Cypress Creek Watershed is continuing its metamorphic transitioning from rural agriculture-based beginnings to prominence as the northwestern frontier and transportation hub of Harris County, Texas. With this change comes significant metropolitan development challenges among which one of the greatest is the need for answers on how best to deal with the stormwater drainage issues. Political, financial and private sector commitments, long overdue, are essential.

There are elements of the Cypress Creek upper watershed which for many years have significantly benefited our downstream communities but are now being lost to new land development. Primary among these which make flood-reduction engineering more difficult are:

- Thousands of acres of rice fields (have acted as reservoirs holding back the drainage).
- Native prairies and forests (have slowed runoff and soaked up much of the rain water),
- The "Cypress Creek Overflow" a topographic feature in the upper watershed where during major storm events the volume of water exceeds the creek channel capacity and flows downhill into the neighboring Addicks Reservoir Watershed thus dramatically reducing the volume flowing downstream into Cypress communities; i.e. I think of it as a pressure release valve releasing at peak flooding 13,500 cfs (HCFCD estimate for 1% storm event)

The increased flood risks in the Addicks watershed are further heightened by urban development encroachment shrinking the safety margin of the reservoir's outer border. Thus this annual report is devoted to information highlighting an immensely important project called the "**Cypress Creek Overflow Management Plan**" because it directly addresses the above challenges and consequently is where the CCFCC Board member's flood mitigation work, sweat, and tears have been devoted throughout 2013.

Cypress Creek Overflow Management Plan study This engineering study was undertaken by the Harris County Flood Control District and the Texas Water Development Board began 2 years ago. When the ongoing planning phase is completed later this year, the project team's report will be submitted to Harris County Commissioners Court seeking adoption and the "Go-Ahead" authorization for implementation. At a cost presently estimated to exceed one-third (\$1/3) billion dollars and a 20-year implementation schedule, I believe this places it at the top of the charts for the largest flood damage reduction projects ever undertaken by the HCFCD. The key project management and consultants, all highly qualified in their respective assignments are:

- Alan Potok, HCFCD, Deputy Director Engineering & Construction, Project Director
- Burton Johnson, Michael Baker Jr. Inc. Technical Management Consultant,
- Kevin Shanley, CEO, SWA Group, Environmental Consultant

In the beginning CCFCC's Board of Directors declared its full support and recommended that the Texas Water Development Board award a grant which in the end funded 50% of the engineering study. (See copy of letter to Art Storey dated Feb 21. 2012 enclosed elsewhere in this report). Although nominated, CCFCC is not one of the 8 members comprising the Steering Committee. However it is very active in its role as the prominent member of the watershed's Stakeholder team of Municipal Utility Districts, Home Owner Associations, resident families and business community interests. Details of the study area, goals and scope are provided on pages 10-15.

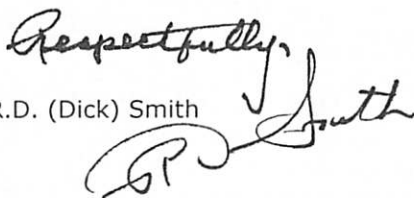
Funding. Resolution to funding of our watershed requirements in the Harris County Flood Control Districts Capital improvement Plan (CIP) has been a series of disappointments extending back nearly 15 years. At the heart of this problem are federal cost/benefit policy requirements and HCFCDD "Portfolio" policy practices - - - both of which undermine the existence of a "level playing field" for our watershed. Now Mike Talbott, Director, Harris County Flood Control District is faced with the dilemma of Commissioners Court approval of \$70 million /year versus a \$200 million/year requirement. You need to know these facts because it clearly indicates Commissioners Court approval to fund the "Overflow" project will require an "all out" showing of support by our watershed MUD, HOA and business community organizations and resident homeowners. It can be done and structured without the financial burden being carried on your backs. It won't be easy but the right things are coming to the surface to make this happen.

Government Floodplain Management Regulations Foremost of all priorities being taken by CCFCC in 2014 is the continued drive seeking revision in the Harris County regulations governing drainage criteria for new land development in the Cypress Watershed. The storm water detention release rate as it now exists is allowing ever-greater increases in flooding as native prairie and forests become developed land. It is **failing to achieve** the county "No Adverse Impact" requirement and is therefore not acceptable.

The present criteria are absolutely unacceptable because it is the reason the Harris County 'No Adverse Impact' regulatory requirement is not being achieved in the Cypress Creek Watershed. On this final note, please read the enclosed copies of two (2) letters sent from CCFCC to Alan Potok earlier this year.

Cypress Creek Greenway project. This cornerstone of the CCFCC preservation mission goal continues to attract both government and private sector commitments to construction of an extensive trail system and additional parks along Cypress Creek and Little Cypress under the widely respected leadership of Jim Robertson, Chair. (Jim's report starts on Page 17,)

Your Board of Directors now asks for and will be grateful for your help. So please think and act accordingly when you can. It's time for the "*Decision Makers*" to hear directly from you!

Respectfully,

R.D. (Dick) Smith



CYPRESS CREEK FLOOD CONTROL COALITION

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Fax: 281-469-5468
e-mail: floodalliance@ccfcc.org
www.ccfcc.org

Arthur L. Storey, Jr., P.E., Executive Director
Harris County Public Infrastructure Department
1001 Preston, 5th Floor
Houston, Texas 77002

February 21, 2012

Subject: "Cypress Creek Overflow Management Study",

References:

- A) Art Storey letter to Harris County Commissioners Court, January 3, 2012
- B) Flood Protection Planning Grant application to Texas Water Development Board dated January 11, 2012

Dear Mr. Storey,

We are delighted Commissioners Court approved your recommendation allowing Harris County and Harris County Flood Control District (HCFCD) to submit a grant application to the Texas Water Development Board (TWDB) seeking funding assistance for the "Cypress Creek Overflow Management Study". (Reference "A" letter).

Our Board members have expressed concerns about the previous planning approach for Western Harris County flood mitigation for the reason it was done on a non-integrated basis; i.e. each watershed being done independent of the others. However, this study approach takes into account the unique hydrologic conditions in the upper watershed (prairie grasslands, abandoned rice farms, agricultural berms creating significant storage and the interaction dynamics between Cypress, Addicks and Barker and for this we are very much "on board" with how you are going about it. It's a fresh start.

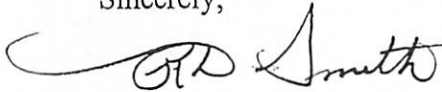
As you know, CCFCC has strong reservations that an overall stormwater management master plan for the entire Cypress Creek watershed presently does not exist. The only one adopted by Commissioners Court (TC&B 1984) was officially declared "*outdated and obsolete*" in June 2001. This announcement was made by the HCFCD/TWDB project team when it met with community representatives at the kickoff meeting for the "Major Tributaries In The Cypress Creek Watershed project (TWDB Contract No. 2000-483-356). Although a conceptual plan for the tributaries was completed in February 2003, the corresponding plan for the main channel was not.

In view of these reservations, we request and will strongly support HCFCD now beginning work with Commissioners Court to formulate the groundwork for completing and adopting a master stormwater management master plan for the entire watershed utilizing the *Cypress Creek Overflow Management Study* findings as its foundation.

COPY

In closing, we wish to assure Harris County and the Texas Water Development Board of our highest endorsement of the published study purpose and goals as set forth in the grant application which is most worthy of funding approval. Thank you personally and on behalf of the watershed residents and business community for your always appreciated leadership efforts.

Sincerely,



Richard D. (Dick) Smith
President

Encl. Cypress Creek Watershed map

cc: Melanie Callahan, Executive Director
Texas Water Development Board

Commissioner Jack Cagle
Harris County Precinct 4

Commissioner Steve Radack
Harris County Precinct 3

Judge Glenn Beckendorff
Waller County

Commissioner Sylvia Cedillo
Waller County Precinct 3

Michael D. Talbott, P.E., Director
Harris County Flood Control District

Alan Potok, Engineering & Construction
Deputy Director, Harris County Flood Control District

Jude Wiggins, President
Greater Houston Neighborhood Association

L. Susan Hill
Hawes Hill Calderon LLP

Mary Anne Piacentini
Katy Prairie Conservancy

Mary Carter, President
Houston Audubon Society

continued next page.....

COPY

Dan Patrick, District 7
Texas State Senator

Glen Hegar, District 18
Texas State Senator

Debbie Riddle, District 150
Texas House of Representatives

Patricia Harless, District 126
Texas House of Representatives

Allen Fletcher, District 130
Texas House of Representatives

Bill Callegari, District 132
Texas House of Representatives

Tommy Williams, District 15
Texas House of Representatives

Paul Hilbert, District 150
Texas House of Representatives

John Zerwas, District 28
Texas House of Representatives

Danny Marburger
Mayor, City of Waller

Jeff Taebel
Director, Community & Environmental Planning
Houston-Galveston Area Council

CCFCC Member Organizations



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www.ccfcc.org

COPY

Mr. Alan J. Potok, P.E.
Deputy Director, Engineering & Construction
Harris County Flood Control District
9900 Northwest Freeway
Houston, Texas 77092

February 10, 2014

Cypress Creek Overflow Management Plan Comments on HCFCD December 2013 Presentation

Ref: Letter, CCFCC to Alan Potok, January 3, 2014

Dear Mr. Potok,


We would like to again express our appreciation for your attendance and presentation at the December meeting of the CCFCC. In that meeting you asked for any comments that we might have on the content. The following provides our summary comments:

A. Storm Water Detention. We understand that HCFCD (1) is considering revising the detention requirements for new developments, at least for the upstream/ undeveloped parts of Cypress Creek watershed, (2) has replaced the use of detention charts with a process that requires developers to convince HCFCD of the adequacy of their detention measures and, (3) is considering regional detention. In all of these evaluations we urge HCFCD to incorporate the conclusions of the Bedient report and the Dunbar review enclosed in the above-referenced January 3rd letter, specifically that the maximum release rate of approximately 0.3 cfs per acre is necessary to avoid new development exacerbation of flooding.

B. Overflow Solutions. On the matter of overflow solutions under consideration, we understand that a draft plan of HCFCD includes diversion facilities to capture overflow run off and route to Bear Creek or possibly other conduits. We urge that in finalizing this aspect of the design, HCFCD ensures that these overflows out of Cypress Creek that have helped mitigate downstream Cypress Creek flooding in the past will not be in any way restricted.

In closing, the Board of Directors will look forward to hearing back from you regarding the Steering Committee and Project team decisions addressing these 2 concerns.

Sincerely,


R.D. (Dick) Smith
President

cc: Ty Kelly / BPA Public Policy Committee
Lawrence G. Dunbar, P.E.,
Peter R. Smullen, P.E.
Michael D. Talbott, P.E.
Board of Directors / CCFCC Members

Potok feb 2014



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Mr. Alan J. Potok, P.E.
Deputy Director, Engineering & Construction
Harris County Flood Control District
9900 Northwest Freeway
Houston, Texas 77092

January 3, 2014

Cypress Creek Overflow Management Plan Upper Cypress Creek and Addicks Reservoir Watersheds

- Ref:
1. Flood Protection Planning Grant, Application to TWDB dated 1/11/12
 2. Dr. Philip Bedient of Rice University report, *"A Distributed Hydrologic Model to Evaluate the Location of Urban Development and Flood Control Storage"*, (Slide Presentation, 3/31/09).
 3. Lawrence G. Dunbar report, *"Future Conditions Analysis for Upper Cypress Creek Watershed"* March 3, 2011.
 4. Letter, Arthur L. Storey, Jr. to Cypress Creek Flood Control Coalition, 2/09/12
 5. Letter, Cypress Creek Flood Control Coalition to Arthur L. Storey, Jr., 2/21/12

Dear Mr. Potok,

The Cypress Creek Watershed community is very encouraged by the progress you have achieved to date in developing the Cypress Creek Overflow Management Plan study project. Following in the aftermath of the disappointments addressed in Art Storey's letter, Reference 4, it has cultivated high hopes that a realistic, feasible storm water management plan benefiting the entire watershed will become a reality via Harris County Commissioners Court adoption in 2014. As requested in our letter of support for the TWDB grant funding, Reference 5, we continue to hope and believe it will become the foundation for a storm water management plan for the entire watershed as none currently exists.

The series of public and stakeholder meetings held to date and supplemented by your December 18th meeting with our board of directors has clearly helped clarify our understanding of (1) the alternative drainage channel-and-detention schematic designs / relationship of the components, (2) the financial implications, and, (3) the commendable progress in obtaining "buy-in" by the key Steering Committee members at this present mid-stream stage.

Based on our understanding of the project's current stage of completion, and our Stakeholder accountability / responsibility for not providing un-timely inputs, concentration of the Board of Director efforts has now shifted to the 2 following project elements:



1. Obtaining a better understanding / developing agreement on storm water runoff storage and detention release rate regulatory criteria. Specifically what these must be under full urban development conditions in order to achieve the "No Adverse Impact" land development permit requirement throughout the Cypress Creek study area (and downstream). Please see "*Regulatory Criteria*" below for details.
2. Assisting in identification and acquisition of needed implementation funding alternatives (with emphasis on the first 3-5 years requirements). See "*Capital Improvement Funding*" below.

Regulatory Storage and Release Rate Criteria: Technical analysis completed under contract to CCFCC is described in the engineering reports, References #2 and #3 above, is enclosed. It is requested the findings and conclusions therein be provided to the project's consultants and Steering Committee for consideration and taken into account in determining and arriving at the requirements in the final Task 8 report submitted to Commissioners Court.

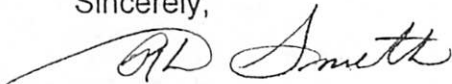
Capital Improvement Funding:

Exploratory investigation geared to assist in obtaining financial participation from qualified sources was initiated 2 months ago. This undertaking is currently work-in-progress but presently has not reached the stage where we would be comfortable in discussing it with you.

Next Step: It was decided at the conclusion of the December board meeting that a special session will be held in January to poll the board members on their thoughts and requests generated by your December 18th presentation. I anticipate we will then request a meeting the following week with you in your office with a mutually agreed agenda for identifying technical regulatory criteria issues if any remain after discussion, and agreement paving the way forward for CCFCC's continuing role and endorsement of the Task 8 Final Report.

Thank you again for your excellent briefing at last week's Board meeting.

Sincerely,



R.D. (Dick) Smith
President

Encl: Ref. #2, #3 and #5 documents

cc:

Ty Kelly, Bayou Preservation Association w/encl
Lawrence G. Dunbar, w/o encl
Board of Directors

Cypress Creek Overflow Management Plan ¹

Study Area

The study area includes the Cypress Creek watershed upstream of US 290, the watersheds draining into Addicks Reservoir, and that portion of the drainage area (including the Cypress overflow) draining into Barker Reservoir that flows through Harris County. Approximately 60 square miles of the upper Cypress Creek watershed originate in Waller County and drain into Harris County.

Addicks and Barker reservoirs were constructed in the 1940's to protect downtown Houston from severe rainfalls that occur on the Buffalo Bayou watershed. The capacity of the reservoirs anticipated an overflow from Cypress Creek. However, no defined drainage systems were planned other than the natural tributary systems. These natural tributary systems include Langham Creek, Bear Creek, and South Mayde Creek.



Note: The portion of Cypress Creek downstream of US 290 is not in the study area.

Continued on next page.....

¹ Source: Harris County Flood Control District website, January 14, 2014

Background

Western and northwestern Harris County is anticipated to experience a surge of land development activities in the near future. According to Region H Regional Water Planning studies, the population of the study area, currently about 340,000, is anticipated to nearly double in the next 50 years.

This area drains into the two major reservoirs on the west side of Harris County, Addicks and Barker, which are designed to mitigate flooding in the downtown Houston area. The trend in land development will convert many acres of prairie land and rice farms into a suburban environment. Drainage is complicated by the fact that when storm events exceeding a 10-year event occur in the upper northwest areas of the county, runoff overflows from the Cypress Creek watershed into the tributary watersheds draining into the Addicks and Barker reservoirs.

The expanse of area includes almost 400 square miles, or 1/6 of the entire Harris County. To maintain orderly development of the area, and to avoid future drainage problems caused by lack of overall planning, it is necessary to take a comprehensive look at how a drainage plan and appropriate public policy can be implemented to minimize flood risk. This planning effort must balance the competing types of land use interests: preservation, business interests, and environmental mitigation needs. The planning effort also must examine the applicability of existing drainage criteria and make appropriate changes in light of the constraints; develop a sound implementation strategy that recognizes and protects the interested parties; and is economically viable to implement.

In September of 2011, HCFCD organized a steering committee of key stakeholders to identify the array of issues associated with the competing land interests and drainage issues in the study area. The steering committee includes representatives from Bayou Preservation Association, City of Houston, Harris County, Katy Prairie Conservancy, US Army Corps of Engineers, Waller County, West Houston Association, and HCFCD.

The objective of this effort is to establish a set of policies, technical criteria and guidelines that will allow the Flood Control District and Harris County to plan for and implement programs that reduce flood risks that are reflective of the unique hydrologic conditions in upper Cypress Creek and the drainage areas upstream of Addicks and Barker reservoirs. The principal product of this effort will be a series of design guidelines and an implementation plan for moving forward.

Continued on next page.....

Study Goals

1. Gain consensus among key stakeholder groups representing business, environment, regulatory and other quality-of-life interests of the facts relating to flooding, flood volumes, flood peaks and flood risk.
2. Gain an understanding of the needs and objectives of the interested parties as it relates to land preservation, environmental mitigation, and land development.
3. Develop a consensus plan to reduce flood risks that incorporates the needs and objectives of all of the key stakeholder groups based on the collective interests involved and that is supported by all parties.
4. Establish interim criteria while adoption of the final consensus plan is ongoing.
5. Design a business plan to implement the strategies defined including the roles and responsibilities of all of the parties involved.
6. Gain adoption of the consensus and business plans by Commissioners Court.

Study Scope

It is anticipated that this effort will be a comprehensive look at the aspects of the flooding problem and its solution(s). Aspects of the study will be categorized into engineering, environmental, business/financial and communication disciplines. Scope of Work elements include the following.

- Task 1: Quantifying and Delineating Flood Risk to define the quantity, areal extent and depth of flooding associated with the Cypress Creek overflow and the locally generated runoff.
- Task 2: Identifying Mitigation Strategies
 - To estimate the size of storage/conveyance facilities necessary to respond to changing land uses from undeveloped (prairie) to suburban use.
 - To evaluate the sizing and practicality of implementing alternative strategies to manage the volume and peak rate of runoff in the study area, including runoff in Cypress Creek and the Addicks watershed, in both Waller County and Harris County.
- Task 3: Benefits of Prairie Restoration for Flood Control to determine the flood retardation benefits associated with prairie grasslands, in terms of both infiltration and time of concentration.

Continued on next page.....

- Task 4: Identifying critical conservation areas to define those tracts of land that, for reasons of unique flood management potential or environmental habitat or wetland characteristics, would be preferred to remain as open space for environmental restoration.
- Task 5: Cost/Benefit Analysis to determine the value in establishing a regional drainage plan for the watershed(s), and to quantify that value in terms of avoided costs and benefits to the community.
- Task 6: Project Financing and cost Pro Forma to develop alternative strategies for financing a regional plan and identifying what roles and responsibilities public, private, and non-profit interests would commit to work together to implement any strategy.
- Task 7: Public Outreach Program to communicate to the public the scope of activities being considered by this planning effort and to solicit suggestions that may be incorporated into the planning study.
- Task 8: Final Report to summarize the findings of all investigations into a final report for adoption by Harris County Commissioners Court and potentially Waller County Commissioners Court.

Study Schedule

Perspective

Project Area and Overflow Water Volume

Cypress Creek Overflow Management Plan

		Land Area (Acres)
• Project area in Cypress Watershed	(157 sq. miles)	100,480 ¹
• Project area in Waller County	(60 sq. miles)	38,400
• Total area in Overflow project	270 square miles)	172,800

Master Planned Communities

	Land Area (Acres)
• The Woodlands	28,000
• Bridgeland	11,000
• Fairfield	3,200
• Towne Lake	2,400
• Canyon Lakes	1,800
• Cypress Creek Lakes	1,600
• Coles Crossing	1,500

City

	Land Area (Acres)
• City of Houston (4 th largest city in U.S.)	383,000
• Galveston City	133,000

Volume of Overflow Water: 13,500 cubic feet per second (cfs) ²

Perspective Overflow Project

¹ Approximate area based on H-GAC map of watershed sections provided to CCFCC

² Volume of overflow water per second at the watershed divide (1 cfs equals 748 gallons). Source: HCFCD public meeting in November 2013. Ref: VG #48

*P*erspective ¹

How much water falls during a rainstorm?

Have you ever wondered how much water falls onto your yard during a rainstorm? Using a 1-inch rainstorm as an example, the table below gives example of how much water falls during a storm for various land areas.

Amount of water received when an inch of rain occurs				
Area	Area (square miles)	Area (square kilometers)	Amount of water (gallons)	Amount of water (liters)
My roof 40x70 feet	.0001	.000257	1,743 gallons	6,601 liters
1 acre (1 mile = 640 acres)	.00156	.004	27,154 gallons	102,789 liters
1 square mile	1	2.6	17.38 million gallons	65.78 million liters
Atlanta, Georgia	132.4	342.9	2.293 billion gallons	8.68 billion liters
United States	3,537,438	9,161,922	61,474 billion gallons	232,700 billion liters

Consider for a moment how much rainwater some cities may receive during a year. For example, Atlanta, Ga. averages about 45 inches of precipitation per year; multiplying this by the 2.293 billion gallons shown in the table as the number of gallons in 1 inch reveals that some 103.2 billion gallons of water fall on Atlanta in an average year. In a city the size of Atlanta, the per capita water use is about 110 gallons per day or 40,150 gallons per year. Thus, the water from a year's precipitation, if it could be collected and stored without evaporation loss, would supply the needs of about 2,574,000 people.

How much water falls during a rainstorm

¹ Source: United States Geologic Survey (USGS). <https://water.usgs.gov/earthrain/tml>

Year 2013
Stormwater Flood Mitigation – Cypress Creek Watershed
Chronology Highlights

<u>Date</u>	<u>Milestone Event</u>
February 12	Stakeholders Meeting #1, Cypress Creek Overflow Management Plan
March 8	Resolution passed by Harris County Flood Control Task Force for submittal to Judge Ed Emmett recommending Commissioners Court approval of \$200 M/year funding of HCFCD Capital Improvement Program.
June	HCFCD submits CIP budget seeking CIP funding of \$200/M per year. Commissioners Court approves it at \$60 /M per year.
October 1	CCFCC Technical Management Committee meeting with HCFCD Engineering representatives. This is 2 nd of meeting protocol established by Commissioner Jack Cagle as resolution for providing technical data to CCFCC for analysis and comment.
October 16	Effective date for revised Cypress Creek Watershed FEMA flood maps thereby resolving issues of FEMA computer modeling challenges first initiated by CCFCC in 2005. FEMA acceptance of changes advocated by CCFCC was based on conclusions and recommendations of a Scientific Resolution Panel (SRP) of 6 national engineering and scientific experts.
November 7	Cypress Creek Overflow Management Plan project, Public Meeting #2. Next (last) public meeting is expected to be in June 2014.
December 11	Alan Potok, Deputy Director, HCFCD Engineering & Construction meets with CCFCC Board of Directors to brief board on Cypress Creek Overflow Management Plan (a progress status report).

Cypress Creek Greenway Project – CCFCC Year 2013 Annual Report

During 2013 the Cypress Creek Greenway Project (CCGP) continued its efforts toward the creation of a linear greenway along Cypress Creek from west of US 290 to the east where Cypress Creek joins Spring Creek. The greenway will connect existing and future anchor parks along Cypress Creek with a multi-use trail. In addition to our efforts many partners in the Greenway are doing things to make the vision for the Greenway a reality. Below are some highlights from 2013.

- **REI Grant & Cypress Creek Paddling Trail** - The Bayou Preservation Association (BPA) in coordination with the Cypress Creek Greenway Project applied for and received a \$10,000 grant from REI. Most of the funds will go toward the development of the Cypress Creek Paddling Trail. The Paddling Trail will extend 35 miles from Telge Park on the west to US 59 on the east. This follows a similarly focused grant which was received last year. An application was submitted by BPA to TPWD for designation as a state recognized paddling trail.
- **Park Dedication** - Timber Lane UD completed and dedicated Cypress Creek Park. The park is adjacent to Cypress Creek near the Hardy Toll Road. The 104 acre park includes a 16 acre lake, two smaller ponds of 5 and 2 acres each, one mile of paved and 2 miles of natural surface hike and bike trails, a canoe storage building, two wildlife observation decks, two pavilions, a beach, a skateboard park, a playground and two fishing piers. The next two phases of park development planned for 2014 will include two soccer fields, restrooms, paved parking, additional trails, and a bridge connecting across Cypress Creek to Mercer Arboretum. This is the third park opened by Timber Lane UD along Cypress Creek where it has also developed several miles of hiking trails as part of the Cypress Creek Greenway Project on its almost 5 miles of frontage on Cypress Creek.
- **Trail Master Plan** - Lake Forest UD working with the Cypress Creek Greenway Project has secured funding from several partners for the development of a trail master plan for the Cypress Creek/SH 249 area. The 4 x 5 mile planning area is bisected by Cypress Creek and contains two future anchor parks, a preserved natural corridor along the creek, and a large residential area with a central core including offices, retail, educational facilities and mixed use development. Following review of RFQ's from several landscape architect firms the coordinating board will select a company to complete the plan in 2014.
- **Trash Bash at Collins Park** – The Bayou Preservation Association and the Cypress Creek Greenway Project organized a Trash Bash event at Collins Park on Cypress Creek as one of 17 Regional Trash bash locations. Approximately 410 volunteers participated and picked up a significant amount of trash along Cypress Creek and its tributaries. This was the 20th annual Trash Bash event, and was the fourth year the event was held at Collins Park.
- **Houston Parks Board Sustainability Grant** – The Houston Parks Board was awarded a \$100,000 grant from the H-GAC to conduct a case study focused on the Cypress Creek Greenway as part of H-GAC's Our Great Region 2040 sustainability plan. The study, begun in November 2012, was completed in early 2013. The grant included a public engagement program, an economic benefits

- Cypress Forest Park (Cypress Forest PUD)
- Two (2) Terranova West Parks (Terranova West UD) *Not open to public*
- Lents Family Park West (CNP UD)
- Lents Family Park East (CNP UD)
- Lakes of Cypress Forest (WCID 110) *Not open to public*
- Cypress Forest Lakes (WCID 110) *Not open to public*
- Herman Little Park and Trails (Timber Lane UD)
- Sandpiper Park and Trails (Timber Lane UD)
- Cypress Creek Park and Trails (Timber Lane UD)
- 100 Acre Wood Preserve (Bayou Land Conservancy and Precinct 4)
- Ponderosa Forest UD Park

Trail Development Projects (trails extending significantly beyond core park area)

- Cypress Creek Trail – Phase 1 (Bridgeland) *Not open to public*
- Cypress Creek Trail – Phase 2 (Bridgeland) *Not open to public*
- Faulkey Gully Trail Extension (Faulkey Gully Greenbelt Association and Precinct 4)
- Charterwood Trail on Pilot Gully (Charterwood UD)
- Gourley Nature Trail and expansion of Collins Park and Meyer Park trails (Precinct 4)
- Cypresswood Proper Trails at Lower Collins Park (Precinct 4 and GHORBA)
- Cypress Creek Greenway Trails on HCFCD Acreage (Timber Lane UD)
- Cypresswood Equestrian Trails Project – Equestrian and pedestrian trails (Precinct 4)
- MUD 286 Trail System along Anderson Ditch, Cypress Creek, and Faulkey Gully
- Malcomson Road UD Trail on K142-05-00
- Anderson Ditch (K143-00-00) Trail (Precinct 4) – under development
- 100 Acre Wood Trail extension (Precinct 4) – under development
- Bridge across Cypress Creek and trails connecting Timber Lane UD trails with Mercer Arboretum (Timber Lane UD, Precinct 4, TxDOT) – under development
- Lower Cypress Creek trails and bridge over Cypress Creek connecting along Spring Creek Greenway (Precinct 4)
- Equestrian trails along Turkey Creek connecting to 100+ miles of equestrian trails at IAH (Precinct 4)

Continued on next page.....

- Cole's Crossing Nature Preserve Tract (HCFCD) – 12 acres
- Anderson Woods (HCFCD) – 53 acres
- 100 Acre Woods (Bayou Land Conservancy) - ~100 acres
- Little Cypress Creek Tract (NWHC MUD 10) – 118 acres
- Kickerillo Mischer Preserve - 85 acres
- Cypress Park (agreement between HCFCD and Sprint Sand and Clay) – ~40 acres
- Raveneaux/Cypress Forest Park (Cypress Forest PUD) – 257 acres
- HCFCD buyout areas at Grantwood, Norchester, and Lake Cypress Estates
- Timber Lane UD acquisition of UPRR property for Cypress Creek Park – 80 acres
- Creek Course Park (Precinct 4, formerly west side of Cypresswood Golf Course) – 244 acres

Other

- Cypress Creek Paddling Trail (Bayou Preservation Association and Cypress Creek Greenway Project) – 35 miles, under development
- Over \$20 million in bonds approved for park and trail projects by utility districts
- Cypress Creek Greenway Case Study completed by The Houston Parks Board with funding from H-GAC Our Great Region 2040
- Trail Master Plan under development for Cypress Creek/SH 249 Area
- HCFCD Bank Stabilization Projects (Meyer Park-2 phases, Kickerillo Mischer Preserve-2 phases, Little Cypress Creek Preserve)

Jim Robertson, Cypress Creek Greenway Project (CCFCC)

*These parks, trails, and acquisitions listed were developed and/or acquired by MUDs, Precinct 3 and Precinct 4, developers, Bayou Land Conservancy and HCFCD.

Grand Parkway

Year 2013

- Summer Construction began on Segments F-1, F-2, and G traversing from Highway US 290 through the Little Cypress Watershed and onward to US 59 North. Construction completio = Year 2015.
- Dec. 21 Segment E traversing through the Katy Prairie from the I-10 Katy Freeway to U.S 290 in the Upper Cypress Watershed was completed.

According to the Grand Parkway Association, government documents have shown the Grand Parkway since the early 1960s. At that time, the western boundary of the Houston suburbs was only beginning to cross what is now the 610 Loop. The Grand Parkway, or SH99, is over 20 miles from downtown and, if completed, will traverse seven counties making it the longest circumferential road in the world at 180+ miles.



Detail of excavation of human remains burial site near Cypress Creek that could be 14,000 years old. Grand Parkway Segment E ¹

¹ Cite Magazine, Rice Design Alliance, Issue Cite 93, "A Heartbreaking Loss Grand Parkway Segment E Ruins, Site of International Significance, Raj Mankaid, Dec. 18, 2012

Burial ground site in the path of Grand Parkway Segment E. All photographs by Brett Sillers.

Raj Mankad Dec. 18, 2012 2:12 PM

A Heartbreaking Loss: Grand Parkway Segment E Ruins Site of International Significance

I visited the most sublime site in Houston. In the vast expanse of the Katy Prairie, the pure column and beam form of an elevated highway stretches into the distance, not yet topped by roadway or stained with leaking oil. Deer, coyotes, and raccoons have left tracks next to those of horses, heavy machinery, and booted workers. Then, the highway construction abruptly ends, and in the center of the gap is an excavation of human remains that could be 14,000 years old, potentially making it the oldest multiple burial ground in the Western Hemisphere.

The story of how the Texas Department of Transportation (TxDOT) knew of the site in 1996 and failed to preserve it exposes more than a loss of heritage for this city, region, and continent. The treatment of the burial ground highlights a pattern of disregard at TxDOT and other governing bodies for the objections that citizens and experts raise about flooding, water quality, recreation, noise, traffic, and the loss of farms, hunting grounds, and wildlife habitat. To that list, we can now add contempt for history and scientific knowledge.

A detention basin near the intersection of 290 and Segment E.

The Hike

On the Sunday of Thanksgiving weekend, I accompanied six others in an eight-mile hike through the Katy Prairie in search of the burial site with only a bend in Cypress Creek on the map as a reference point. The night before, we assessed possible routes. At one site, in a new neighborhood of single family homes, the moment we stepped into the prairie, a band of coyotes announced their presence by yipping and howling, but we could not make them out in the moon-lit night.

The next day, we parked off a Highway 290 feeder road and walked for about two miles through an enormous detention basin. The grass was freshly mowed and the sound of the highway not far off, but I was immediately awed by the epic western expanse of earth and sky. For a brief stretch, we walked along a path punctuated by shell casings, along with deer feeders and blinds in the trees. There, the stewardship of hunters was apparent. The flora and fauna seemed more intact to me. The crisp morning air was filled with a chorus of grasshoppers never heard in town. I caught one and held it delicately between my thumb and forefinger. The thrum of its brown and black-striped body was startling and I let it go. The final leg of the trip was along a dirt road. Cows and calves rested under some scrubby trees. What seemed to be big ant piles were everywhere. I thrust my hand in one to the horror of my fellow hikers. The earth was buttery, soft, and ant free; they were pocket gopher burrows.

Crossing prairie in search of the burial ground.

Finally, the new Grand Parkway loomed on the horizon. We crossed a field of dry grass that poked through our pants and socks. Physically exhausted, I had forgotten to emotionally gird myself, and I was surprised by how I felt. The concrete was fresh and gleaming white under what was now a noon-time sun. The only marks on the girders were the dates they were dropped into place, written by hand, just one or two weeks past. The prairie and the highway were both astonishingly beautiful in their own right, and their juxtaposition was suck-the-breath-out-of-you...something. "Terrible" isn't quite the word because at first I felt giddy and inspired. The huge cranes and earthmovers stood silent, casting their shadows in the stark light. The keys were left in the ignition. I let wild thoughts about the massive structure play in my mind. Maybe it isn't a highway. Maybe it is a giant Richard Serra sculpture!

A car and a port-a-potty frame the burial site with the lone tree at the center.

Then the highway construction ended and picked up again about 100 yards later. Between the two stretches of Grand Parkway Segment E, at the center of the gap, was the excavation of human remains. Though designated an "area of interest" and eligible for inclusion in the National Register of Historic Places since 1996 because spear points had been found there, it appeared as if TxDOT had aimed the 15-mile-long highway segment directly at the burial ground. The highway was suspended, figuratively and physically, like an unintentional monument honoring the burial grounds, like Texas was trying to tell anyone in an airplane or spaceship to LOOK HERE.

I was again startled by how I felt. Anger and shame surged through me. A man was in a car parked near the site, presumably to protect the remains from looters. We walked past the car. The man seemed to be asleep. Our group dispersed somewhat and some murmured private prayers. One woman, who is of native ancestry and background, burned sage at the edge of the excavation. I scrambled down the banks of the creek, a few feet away, and splashed my face with water. I crawled through a concrete passage under the new roadway, found more paw prints, and scrambled back up.

The site itself was both unremarkable and shocking. A blue port-o-potty squatted at one corner. A single tree remained, towering, somehow intact, in the center. Several stumps kneeled around it. I tried to picture what the site had looked like before the construction. I imagined the cool shade from the riparian edge of Cypress Creek extending to this spot. I imagined a breeze and a rustling of leaves. What I saw were several pieces of plywood, propped up on five-gallon paint buckets, covering what I presume to be the human remains and the tools, buffalo teeth, and other objects found with them. The plywood was weighted down with rocks. I have no experience in archaeology. To my amateur eyes, the excavation looked makeshift and tenuous, not systematic or professional.

At that moment, a lawsuit by the Harris County Historical Commission had halted construction and negotiations were underway with six federally recognized Native American tribes. Since then, the *Houston Chronicle* has reported that construction has resumed, though the reporter did not seem to have visited the site and witnessed its condition.

TxDOT takes precautions to protect some wetlands while fragmenting the landscape.

CONT.

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Harris County Flood Control District Creates and Restores Wetlands on the Katy Prairie

February 13, 2014

The Harris County Flood Control District has completed a project to create and restore approximately 95 acres of wetland habitat on the Katy Prairie, near Cypress Creek in northwest Harris County.

The wetlands construction project is in support of conditions set out in U.S. Army Corps of Engineers' Clean Water Act (Section 404) permits in connection with two Flood Control District stormwater detention basin projects in northwest Harris County. Formally identified as K700-01-00-E001, the wetlands construction project will serve as environmental mitigation for unavoidable wetlands impacts related to those basins.

Construction of the wetlands project took place on Flood Control District property near the intersection of Katy-Hockley and House Hahl roads. With guidance from environmental specialists, workers shaped mounds of soils, or *berms*, around low areas at the site, to form what will become new depressional wetlands. Wetlands are defined as saturated low areas which provide habitat for a variety of water-loving vegetation and wildlife.

In one particular location, the Flood Control District used old aerial photos and soil survey maps from the 1940s to locate and uncover a previously functioning depressional wetland – also known as a *"prairie pothole"* – that had been buried over many years of agricultural use. Prairie potholes naturally fill with rainwater and support wetlands plants, but many are filled in with soil from higher areas when the land is leveled for rice farming or grazing cattle. The Flood Control District used a method pioneered by a Texas Parks and Wildlife Department biologist at east Houston's Sheldon Lake State Park to identify old potholes and more effectively target the restoration.

In the Katy Prairie pothole area, some wetland vegetation is expected to reestablish itself naturally, from dormant seeds. The Flood Control District also is planting wetland species, such as bog rush, swamp smartweed, duck potato, powdered thalia and maidencane.

In the Katy Prairie pothole area, some wetland vegetation is expected to reestablish itself naturally, from dormant seeds. The Flood Control District also is planting wetland species, such as bog rush, swamp smartweed, duck potato, powdered thalia and maidencane.



Harris County Flood Control District consultant Austin Richards examines the soil of a previously functioning shallow wetland known as a "prairie pothole." The prairie pothole was uncovered as part of a project to create and restore approximately 95 acres of wetland habitat on the Katy Prairie.

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Cypress Creek Watershed

Home Buy-out / Land Acquisition By Harris County Flood Control District

	<u>Master Plan Requirement¹</u>	<u>Actual²</u>
• Land acquisition		
○ Channelization	5,229 acres	-0-
○ Detention	11,112 acres	?
○ Flood plains	3,663 acres	1,955 acres
○ Other (Home buyouts)	Not in report	<u>213</u> acres
— Total	20,004 acres	2,168 acres
• Home Buy-out	442	241 homes ³
• Flooding Easements	N/A	2,658 acres ⁴

Home Buyouts in the Cypress Creek Watershed have been a major focus of the Harris County Flood Control District in their program beginning in 1989 acting alone and in various partnerships with FEMA and the US Army Corps of Engineers.

Annual Report 2013 Home Buyout

¹ Data shown under the "Requirement" column is per the Turner, Collie & Braden Cypress Creek Master Stormwater Management Plan adopted by Harris County Commissioners Court in 1986.

² Information shown is as of March 25, 2014. Source: Harris County Flood Control District. The reader should note this does not include detention acreage provided by the private sector / developers

³ The historical record of home buy-out according to CCFCC past annual reports is:

	<u>Homes Purchased To Date</u>
2004	210
2005	216
2009	258
2010	262
2013	241

⁴ These 2,658 acres are property for which HCFCD has acquired a right to flood easement with an underlying fee owner. These are mostly on the Katy Prairie.

Cypress Creek Flood Control Coalition Profit and Loss Standard

January through December 2013

	<u>Jan - Dec '13</u>
Ordinary Income/Expense	
Income	
I - 2 — Resident Voluntary Contribution	20,415.69
I - 3 — Grant Applications	
3b. — Other Sources	250.00
I - 3 — Grant Applications - Other	<u>14,250.00</u>
Total I - 3 — Grant Applications	14,500.00
I - 4 — Interest Earnings	<u>5.13</u>
Total Income	34,920.82
Expense	
10 — Office Supplies, Print, Postage	534.68
13 — Contributions & Membership Du...	580.00
18 — Engineering/Technical Consultin	17,500.00
23 — Cypress Creek Greenway Proj...	4,820.04
1 — Membership Business&Comm.O...	702.00
7 — Administration Expense	2,429.04
11 — Computer ops and maintenance	1,425.00
12 — D&O L Liability Insurance	849.00
9 — Earthlink, SBC,DSL,Symantec	<u>1,644.05</u>
Total Expense	<u>30,483.81</u>
Net Ordinary Income	<u>4,437.01</u>
Net Income	<u><u>4,437.01</u></u>

Cypress Creek Flood Control Coalition Balance Sheet Standard

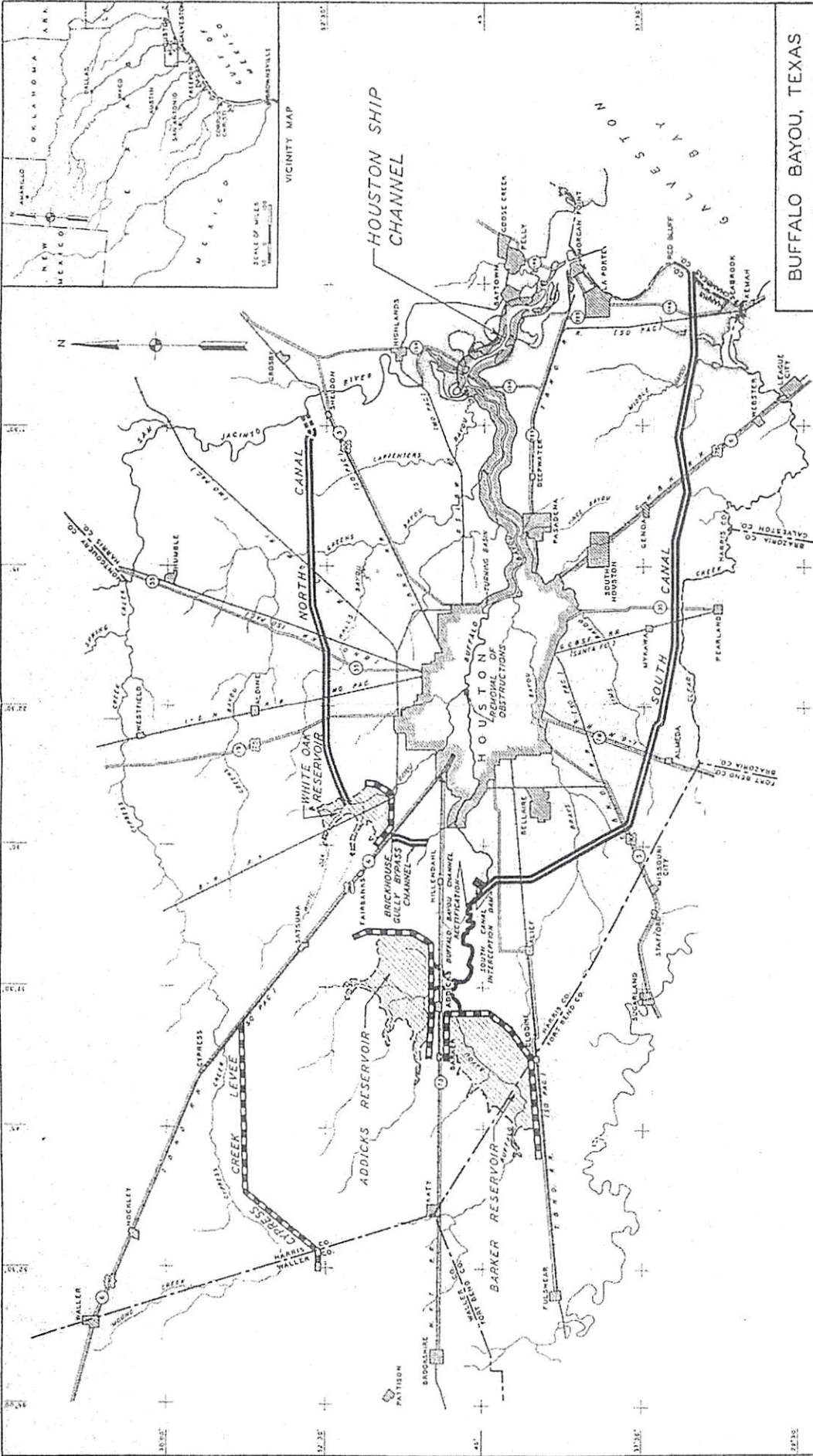
As of December 31, 2013

	<u>Dec 31, '13</u>
ASSETS	
Current Assets	
Checking/Savings	
1.1110 — Checking - Amegy Bank 365...	29,977.83
1.1130 — Investments - Amegy	<u>16,090.73</u>
Total Checking/Savings	<u>46,068.56</u>
Total Current Assets	46,068.56
Fixed Assets	
1.1300 — Computer & Office Equipment	<u>2,334.30</u>
Total Fixed Assets	<u>2,334.30</u>
TOTAL ASSETS	<u><u>48,402.86</u></u>
LIABILITIES & EQUITY	
Equity	
3000 — Opening Bal Equity	24,870.64
3900 — Retained Earnings	19,095.21
Net Income	<u>4,437.01</u>
Total Equity	<u>48,402.86</u>
TOTAL LIABILITIES & EQUITY	<u><u>48,402.86</u></u>

Cypress Creek Flood Control Coalition

2013 Budget

Funds/Expense		2013 BUDGET	Total 2013	2014 Budget	Current Mo.	
					1/15/14	Total 2014
Funds						
1-1	MUD/HOA Contributions					
1-2	Resident Vountary Contribution	20,000	\$20,666	\$20,000	1417.97	1,417.97
1-3	Grant Applications					
	3a.- Houston Endowment					
	3b. - Other Sources (See Treasurer's Report)		\$14,250			
Total	1-3 Grant Applications					
	Misc		\$250			
1-4	Interest Earnings (Includes cking & savings)	16	\$5	\$5	0.40	0.40
Total		20,000	\$35,171	\$20,005	1,418.37	1,418.37
Expense						
1	Membership Bus. & Community Outreach	150	\$752	\$700		
2	Annual Meeting					
3	Preservation Committee					
4	IT Mgt-Evaluation Comm.					
5	AWBD Committee					
6	Legal & Accounting Fees & Banking fees					
7	Administration Expense RD Smith	700	\$1,699	\$1,500	231.29	231.29
8	Fed Income Tax Preparation	160				
9	Earthlink, SBC,DSL,Symantec	1,500	\$1,698	\$1,500		
10	Office Supplies,Print Postage	1,000	\$997	\$1,000	128.20	128.20
11	Computer ops & maint.	2,000	\$1,375	\$1,500		
12	D&O Liability Insurance	1,400	\$849	\$1,000		
13	Contributions & membership Dues	1,325	\$980	\$1,300	50.00	50.00
14	Houston-Galveston Area Council					
15	Publications					
16	Environmental Affairs Committee					
17	Seminar/Conference Expense		\$199	\$100		
	Total 1->17	8,235	\$8,549	\$8,600.00	409.49	409.49
18	Engr / Tech Consultation					
	18-1 PY Work to be Paid in '2013		\$12,500			
	Rice Univ. NAI Project		\$5,000			
	LG Dunbar-FEMA Comp/LOMAR (Encumbered)					
	Total 18-1 PY Work to be Paid in '13	15,000	\$17,500	\$15,000		
	18-ii CY 2010 Work					
	Rice Univ. NAI Project					
	Future Conditions-begin 4/1/10 (L Dunbar)					
	Houston Endowment for Future Conditions)(Encumbered Grant)					
	Aerial Photo's					
	Total 18-ii-CY 2010 Work					
Total 18	Engr / Tech Consultation	15,000	\$17,500	\$15,000		
19	Reserve for Future Requirements					
20	Grant Proposal Expense					
21	Operator Fee - Customer Billing					
22	Bookkeeping					
23	Cypress Creek Greenway Project-J Robertson	2,500	\$4,571	\$4,000		
	23a Meyer Park / RE1 (Encumbered Grant)					
	23b Memorial Lady Bug (Encumbered Grant)					
	23d Cypress Creek Greenway Project-other					
Total 23	Cypress Creek Greenway project	2,500	\$4,571	\$4,000	0.00	
24	Detention Pond Committee					
25	Contingencies					
26	Misc. office Equipment		\$108	\$250		
	Total 18>26		\$108			
Total expense		25,735	\$30,728	\$27,850.00	409.49	409.49
Total Income		20,000	\$35,171	\$20,005.00	1,418.37	1,418.37

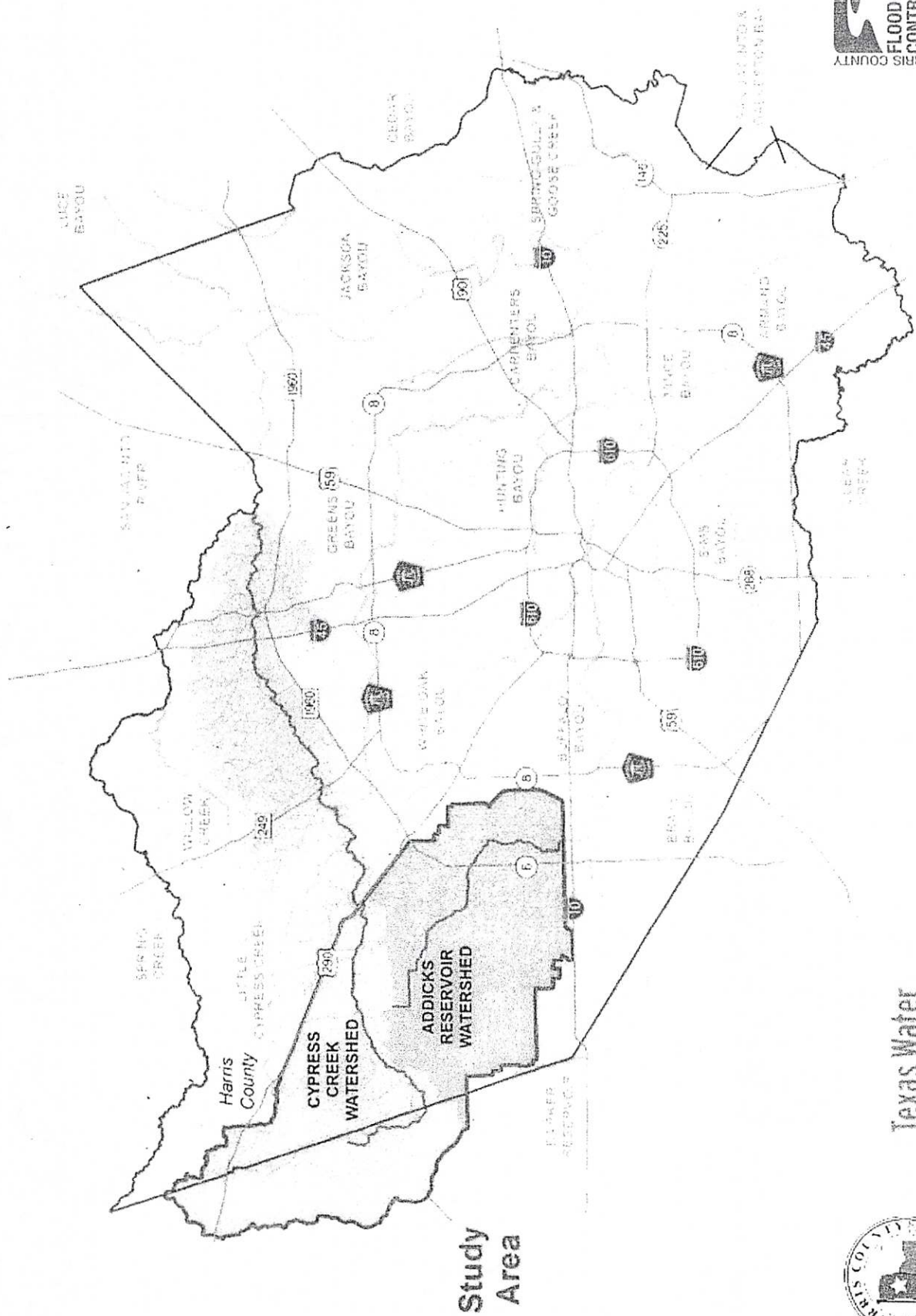


BUFFALO BAYOU, TEXAS PROJECT PLAN

SCALE OF MILES

U.S. ENGINEER OFFICE, GALVESTON, TEXAS JUNE 1940
 SUBMITTED: RECOMMENDED: APPROVED:
 H. P. [Signature]
 CHIEF OF ENGINEERS CO., CORPS OF ENGINEERS
 DISTRICT ENGINEER

Upper Cypress Creek and Addicks Watersheds



Texas Water
Development Board



v.g # 4

CREEK & TRIBUTARY | Watershed's Veins & Arteries

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CYPRESS CREEK WATERSHED BASIN

SURFACE WATER
PIPELINE TO MUDS

LAKE HOUSTON

OVERFLOW AREA

BUFFALO /
BAYOU /
DOWNTOWN
HOUSTON

Reservoir

→ STORM WATER AND TREATED WASTE WATER

ADDICKS WATERSHED BASIN



By Shawn Arraji

Officials with the Harris County Flood Control District revealed several methods to deal with flooding in the Cypress Creek and Addicks Reservoir watersheds at a Nov. 7 public meeting based on studies that have taken place over the past year.

Although floods in these watersheds do not occur often under current conditions, HCFCD is looking for ways to prepare for future development in west Harris County, which is expected to make flooding more of an issue. Census data for this segment of west Harris County projects the population in the area to increase from 300,000 to 540,000 throughout the next 50 years.

"Right now, Cypress Creek overflow is occurring in areas that are predominately undeveloped or partially developed," said Dena Green, study manager in HCFCD's engineering and construction division. "However, we've seen a lot of information that indicates west Harris County will undergo a rapid increase in population. If that occurs, we think there are going to be some pretty dramatic land use changes."

Cypress Creek overflow—when water

flows southward out of Cypress Creek Watershed into the Addicks Reservoir Watershed—happens approximately every eight to 10 years, Green said. During especially heavy rains, overflow will continue into the tributary system and ultimately drain into the Addicks reservoir.

"Although the Addicks Reservoir has a large storage capacity, we need to be cognizant of its limit and rate of discharge," Green said. "If too much [water] is released, you have flooding downstream on Buffalo Bayou. If you don't release enough, you're going to impact the property upstream."

The ongoing study involves measuring the ability of three different land types to absorb rainwater and analyzing how future development could affect water infiltration into the soil. Two monitors measuring runoff and absorption were placed in areas identified as "highly developed," "open space" and "prairie." The study area encompasses 400 square miles, from east Waller County down to and including the Addicks Reservoir.

"There are some theories that the native prairie grass helps increase the infiltration

capacity of the soil," Green said. "They help absorb water as runoff goes across the land. That reduces the overall volume of water draining into the tributaries."

HCFCD has been monitoring the six sites for about a year and expects to have a report in December. Green said HCFCD will monitor the sites for another five years as development continues.

In the meantime, HCFCD officials have proposed several projects that would help mitigate overflow and protect populations from increased flooding. Alan Potok, director of HCFCD's engineering and construction division, said the objective was to come up with something that was both financially feasible and could be implemented in a timely fashion.

A steering committee with members representing the city of Houston, Waller County, Harris County precincts 3 and 4 and the U.S. Army Corps of Engineers, among other entities, are helping guide the process. The most appealing concept so far involves three steps.

First, a berm—or raised barrier—would be created between the Cypress Creek and Addicks watersheds to collect water

and provide relief for the overflow area. Second, overflow conveyance mechanisms would be developed to help convey water downstream to existing channels such as Bear Creek. Third, a 4,000- to 8,000-acre upstream storage facility would be created in Waller County to store between 11,000 and 26,000 acre-feet of water.

"If we combine the holding basin upstream in Waller County and collect and convey the rest of [the overflow] down Bear Creek, we reduce the overflow actually occurring and control the flow rate into the reservoir," Potok said.

The proposed projects would cost around \$325 million. It would be completed in phases to avoid having to pay the entire cost at once.

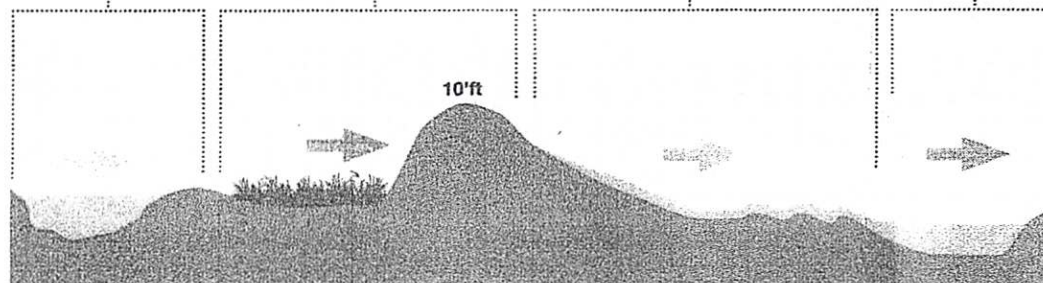
The next step for HCFCD is to continue to develop these concepts into a draft that can be presented to the Texas Water Development Board and Harris County Commissioners Court for approval.

The draft is expected to be ready by early spring 2014. A third public meeting will take place after the draft is composed but before it is finalized and submitted to TWDB.

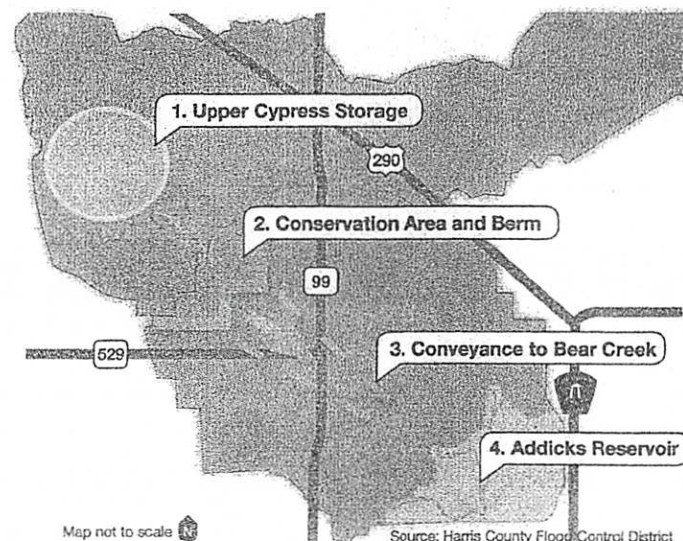
Flood mitigation proposal

Officials with the Harris County Flood Control District offered several possible solutions to mitigate future flooding from Cypress Creek into Addicks Reservoir. One proposal involves building a collection berm, creating conveyance methods to guide water to Addicks Reservoir and building a water storage basin in upper Cypress.

1. Upper Cypress Storage
2. Conservation Area and Overflow Collection Berm
3. Conveyance to Bear Creek
4. Addicks Reservoir



The 10-foot collection berm is essentially an earth barrier meant to hold water, which can be absorbed into an established conservation area. Conveyance channels would also be dug out to guide runoff to Bear Creek.



Map not to scale

Source: Harris County Flood Control District

Preliminary Plan Costs¹

Cypress Creek Overflow Management Plan

Reservoir		\$246,000,000
Land	\$193,000,000	
Construction	40,000,000	
Professional	13,000,000	
Bear Cree Enlargements		\$82,000,000
Land	\$11,000,000	
Construction	54,000,000	
Professional	17,000,000	
John Paul's Landing		\$42,000,000
Land	\$ 2,000,000	
Construction	30,000,000	
Professional	10,000,000	
TOTAL		\$370,000,000

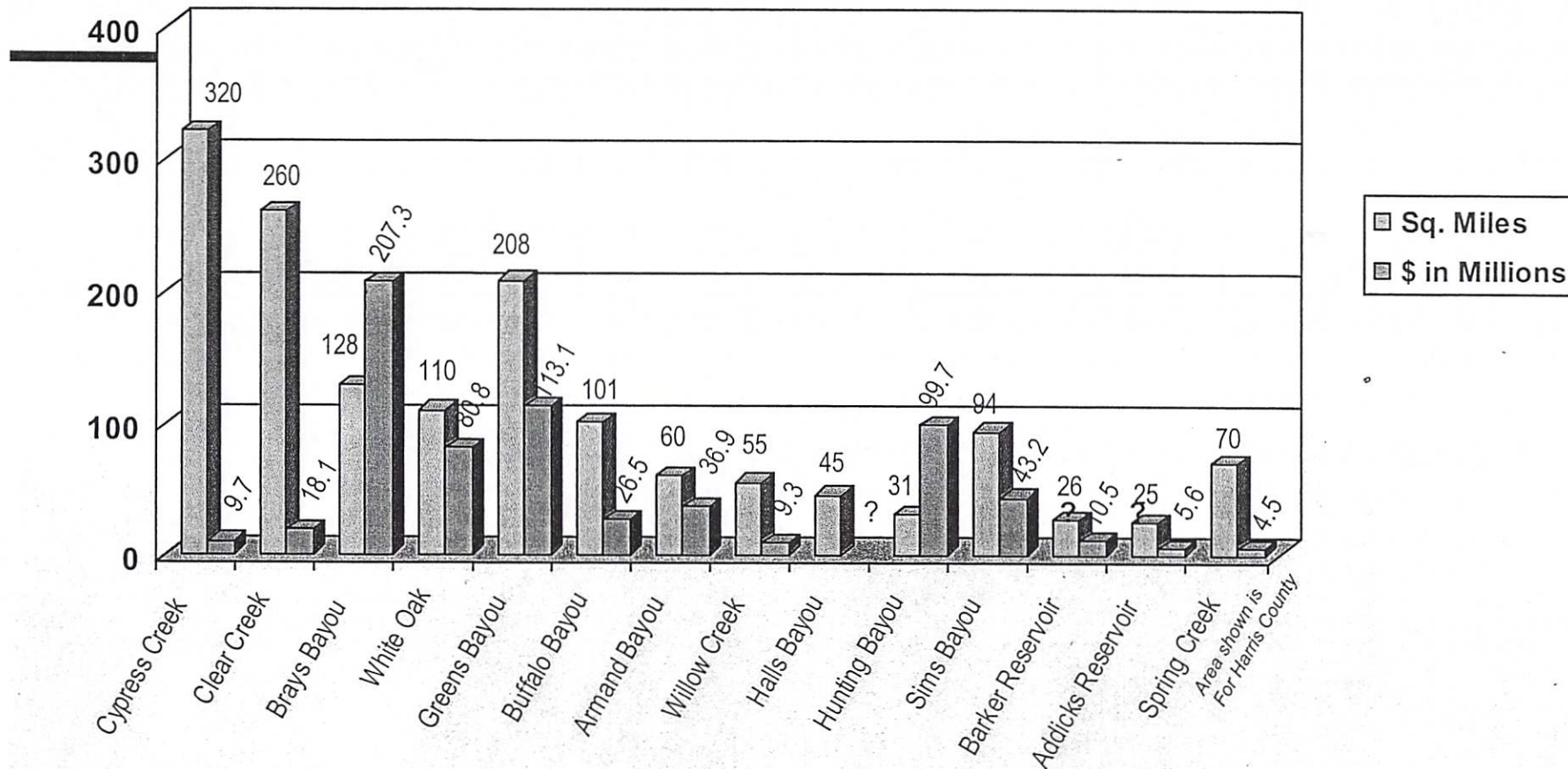


**Texas Water
Development Board**



¹ Source: HCFCD (power point presentation), Bayou Preservation Association, March 25, 2014

AREA TO CAPITAL COMPARISON



Watershed (5 year period)

Data for the Capital Improvement Plan submitted by Harris County Flood Control District for a five-year period beginning 03/01/03 and accepted by Harris County Commissioners Court on 02/04/03 meeting.

The total 5-year Capital Improvement Plan of \$795.5m includes \$113.0M for home-buyout, \$9.1M (San Jacinto River) and \$18.5M for 7 small buyouts which are not shown in graph.

