LINCOLN /LANCASTER COUNTY PLANNING STAFF REPORT
for March 2, 2005 Planning Commission Meeting

P.A.S.: Comprehensive Plan Amendment #05001 Stevens Creek Watershed Master Plan

PROPOSAL: To amend the 2025 Lincoln-Lancaster County Comprehensive Plan to adopt the proposed "Stevens Creek Watershed Master Plan," including associated amendments to the Future Land Use Map of the Plan.

CONCLUSION: The proposed Stevens Creek Watershed Master Plan is in conformance with the 2025 Lincoln-Lancaster County Comprehensive Plan. The Stevens Creek Watershed Master Plan will provide long term planning tools and improvement projects to address water quality, flood management, and stream stability to provide guidance for sustainable urban growth in the watershed.

RECOMMENDATION:	Approval of the proposed amendment

GENERAL INFORMATION:

LOCATION: A 55 square mile stream drainage basin located generally between Nebraska Highway 2 on the south, Cornhusker Highway on the north, the City of Lincoln corporate limits on the west and the east ridge line of the basin to about 162nd street.

EXISTING LAND USE: Mainly rural farming and acreages with small locations of commercial, industrial, trails and parks, including the unincorporated village of Walton.

ASSOCIATED APPLICATIONS: None

HISTORY: See Subarea Plan for detailed history. The City Council has adopted the Stevens Creek Floodprone Area as "best available" flood information for local flood regulation purposes.

COMPREHENSIVE PLAN SPECIFICATIONS: The 2025 Comprehensive Plan for this area includes Lincoln growth Tiers I, II, and III and generally shows the subarea as Agriculture as well as future areas for Urban Residential, Industrial, Commercial, Green Space, and Public/ Semi-Public uses. Some of the relevant language of the Plan is:

Make "green space" an integral part of all environments. (Page F 57)

Integrate the "Core Resource Imperatives" and natural resources feature concepts into future city and county studies that implement the Comprehensive Plan. (Page F 63)

Develop a Watershed Management Master Plan for Lincoln and its future growth areas. Integrate existing neighborhoods and growth areas into watershed planning. (Pg F 79)

Utilize basin master plan recommendations and components as analysis tools to be referenced and compared with proposed development within the basin, and as a guide in the preparation of future capital improvement projects. (F 79)

Future master planning efforts for largely undeveloped basins will rely more heavily on pro-active better management practice (BMP) measures and the conservation of existing natural drainage features to most effectively manage stormwater and floodplains. Designs of human made features should seek to utilize bioengineering and other naturalized techniques, incorporating trail systems and other linear park features where possible. (Pg F 80)

ANALYSIS:

1. This amendment has two related parts proposed by the Public Works and Utilities Department and the Lower Platte South Natural Resources District (NRD):

A. Adoption of the Stevens Creek Watershed Master Plan as an approved subarea plan of the Comprehensive Plan,

B. Amend the Land Use Plan to change the designation of various areas into or out of Green Space or Agricultural Stream Corridor to reflect the location of the new 100 year flood prone area as identified in the Stevens Creek master plan.

2. This amendment would adjust the Land Use Map to designate the new floodprone area as "Green Space" or "Agricultural Stream Corridor" in order to encourage this area to remain predominately in open space uses in order to preserve the flood storage, flood conveyance and water quality benefits. This is consistent with the revisions to the Land Use Plan adopted with the SE Upper Salt Creek Watershed Plan to reflect the floodprone area designation. The Land Use Plan reflects the strategies of the Comprehensive Plan to designate future urban development outside of the floodplain and floodway.

The current plan reflects the FEMA-mapped floodplain adopted in 1980. The floodprone areas adopted by the City Council as best available information in December of 2004 is a much more accurate representation of the floodplain, and includes mapping for tributaries to Stevens Creek which were previously unmapped. Thus areas now shown subject to flooding are designated as Green Space while areas removed from the floodplain are adjusted to reflect the appropriate urban land use designation.

3. The Stevens Creek Watershed Master Plan Subarea Plan is the third watershed master plan to come forward for adoption. Previously adopted plans include the Beal Slough and the Southeast Upper Salt Creek Master Plans. The Stevens Creek Master Plan involved a year and a half long process, including an extensive public outreach program that included three

open houses, an advisory committee, two bus tours, meetings with special interest groups, a web site and a newsletter.

4. There are four elements of the Stevens Creek Watershed Master Plan;
Floodplain Management Tools; including

1) Updated floodplain and floodway maps.

2) Eleven proposed Capital Improvement projects to address 26 identified problem areas. These are proposed to be used as a reference and guide by the City, County, and the Natural Resources District to work cooperatively toward project implementation as they formulate their respective CIPs and Long Range Implementation Plan.

3) Site specific Best Management Practices (BMPs) designed to address the off-site impacts from urban development. The primary recommendation is to enhance the current detention pond standards to address the water quality storm by adding a forebay and outlet structure adjustments.

4) A designation of four Opportunity Areas where several elements of current plans, policy or projects overlap to create an opportunity for an integrated approach with multiple benefits.

5. If adopted as a part of the Comprehensive Plan, appropriate amendments to the Design Standards to apply water quality BMP's would be processed. These design standard amendments would be applicable to all new development areas, not just the Stevens Creek basin.

PROPOSED AMENDMENT:

Amend the 2025 Lincoln-Lancaster County Comprehensive Plan as follows:

1. Amend the"Lincoln/Lancaster County Land Use Plan", figure on pages F23 and F25, to adjust the designation of 'Green Space" and "Agricultural Stream Corridor" to the 100 year floodprone area as shown on the attached map and to appropriately reclassify areas no longer in the floodplain.

2. Add the "Stevens Creek Watershed Master Plan, 2005" to the list of approved subarea plans on Page F 156.

3. Add a new section to the end of the Watershed Management section on page F 81 as follows:

The following watershed studies are adopted in order to provide guidance to watershed management activities within the basin:

- Stevens Creek Watershed Study and Flood Management Plan, 1998 (for rural watershed)
- Beal Slough Stormwater Master Plan, May 2000
- Southeast Upper Salt Creek Watershed Master Plan, 2003
- Stevens Creek Watershed Master Plan, 2005

Prepared by:

Mike DeKalb, 441-6370, mdekalb@lincoln.ne.gov
Planner

DATE: February 7, 2005

APPLICANT: Ann Harrell, Interim Director
Public Works & Utilities
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Glenn Johnson, General Manager
Lower Platte South NRD

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(402) 441 - 6173

or

Ben Higgins
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or

Mike DeKalb
Planning Department
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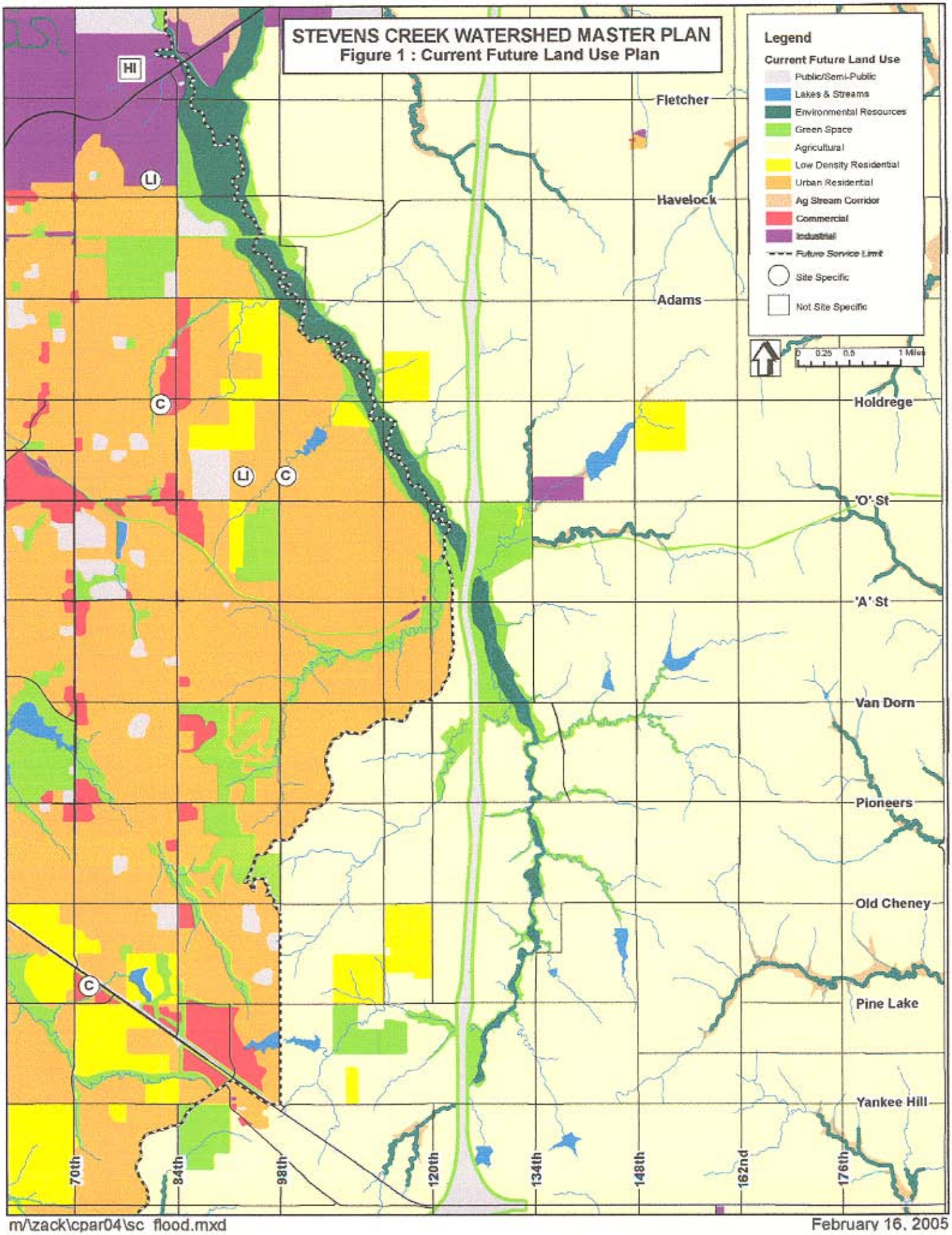

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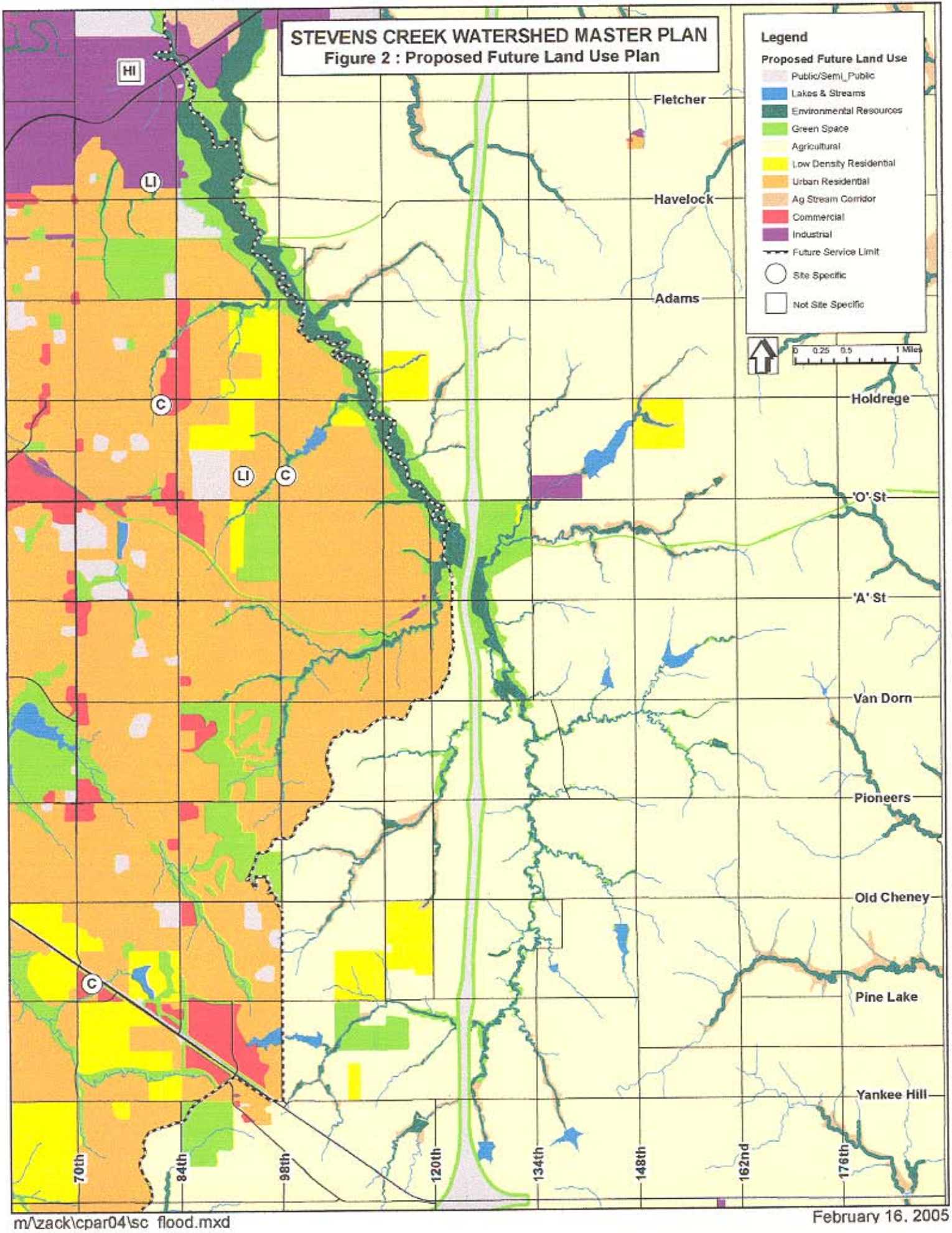
February 16, 2005



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February 16, 2005

CITY OF LINCOLN
NEBRASKA

MAYOR COLEEN J. SENG

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Public Works and Utilities Department

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February 3, 2005

Marvin Krout, Planning Director
Lincoln-Lancaster Co. Planning Dept.
555 S. 10th Street, Ste 213
Lincoln, NE 68508

Dear Marvin:

This is a request by the Public Works and Utilities Department and the Lower Platte South Natural Resources District (NRD) for a Comprehensive Plan Amendment to adopt the Stevens Creek Watershed Master Plan to be scheduled for the March 2, 2005 Planning Commission agenda.

The Stevens Creek Watershed Master Plan is a joint project of the City of Lincoln and the Lower Platte South NRD in cooperation with the County, and it represents the third master planning effort to date. Master Plans for Beal Slough and Southeast Upper Salt Creek have previously been adopted as subarea plans. The Master Plan was initiated in order to develop long-term planning tools and improvement projects to address water quality, flood management, and stream stability to provide guidance for sustainable urban growth in the watershed. The Master Plan consists of four major elements: 1) Floodplain Management Tools, 2) Capital Improvement Projects, 3) Site-Specific Structural Best Management Practices, and 4) Opportunity Areas.

The enclosed Plan represents an extensive and inclusive public process to solicit input from a broad range of stakeholder groups, which included the involvement of a 25-member Citizen Advisory Committee and is detailed in the report. We are also scheduled to brief the Neighborhood Roundtable at their meeting next week on February 10th.

Should you have any questions or need further information, please contact Ben Higgins or Nicole Fleck-Tooze in the Public Works and Utilities Department.

Sincerely,

Ann Harrell, Interim Director
Public Works & Utilities Dept.

Glenn Johnson, General Manager
Lower Platte South NRD

cc: Don Thomas, Doug Pillard - Co. Engineering
Lynn Johnson, J.J. Yost, Terry Genrich - Parks Dept.
Nicole Fleck-Tooze, Ben Higgins - PW/U Dept.
Mike DeKalb - Planning Dept.
Pat O'Neill - CDM
Milan Wall, Vicki Luther - Heartland Center for Leadership Development

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LINCOLN
The Community of Opportunity

Executive Summary

Introduction

The City of Lincoln (City) and the Lower Platte South Natural Resources District (NRD) are in the process of developing a Comprehensive Watershed Management Plan for the City of Lincoln and its future growth areas. This comprehensive watershed plan is being developed basin by basin, through the completion of watershed master plans for individual basins. Watershed master plans are used as planning tools to be referenced in conjunction with proposed development and as a guide in the preparation of future capital improvement projects.

The City and NRD have previously adopted watershed master plans for the Beal Slough and Southeast Upper Salt Creek basins (Figure ES-1). The Stevens Creek Watershed Master Plan (Master Plan) is the third master planning effort to date and is summarized in this report, together with the study components that served as its foundation. The Master Plan for the Stevens Creek Watershed has been prepared because significant near-term growth within the basin is expected as identified in the Lincoln-Lancaster County Comprehensive Plan.

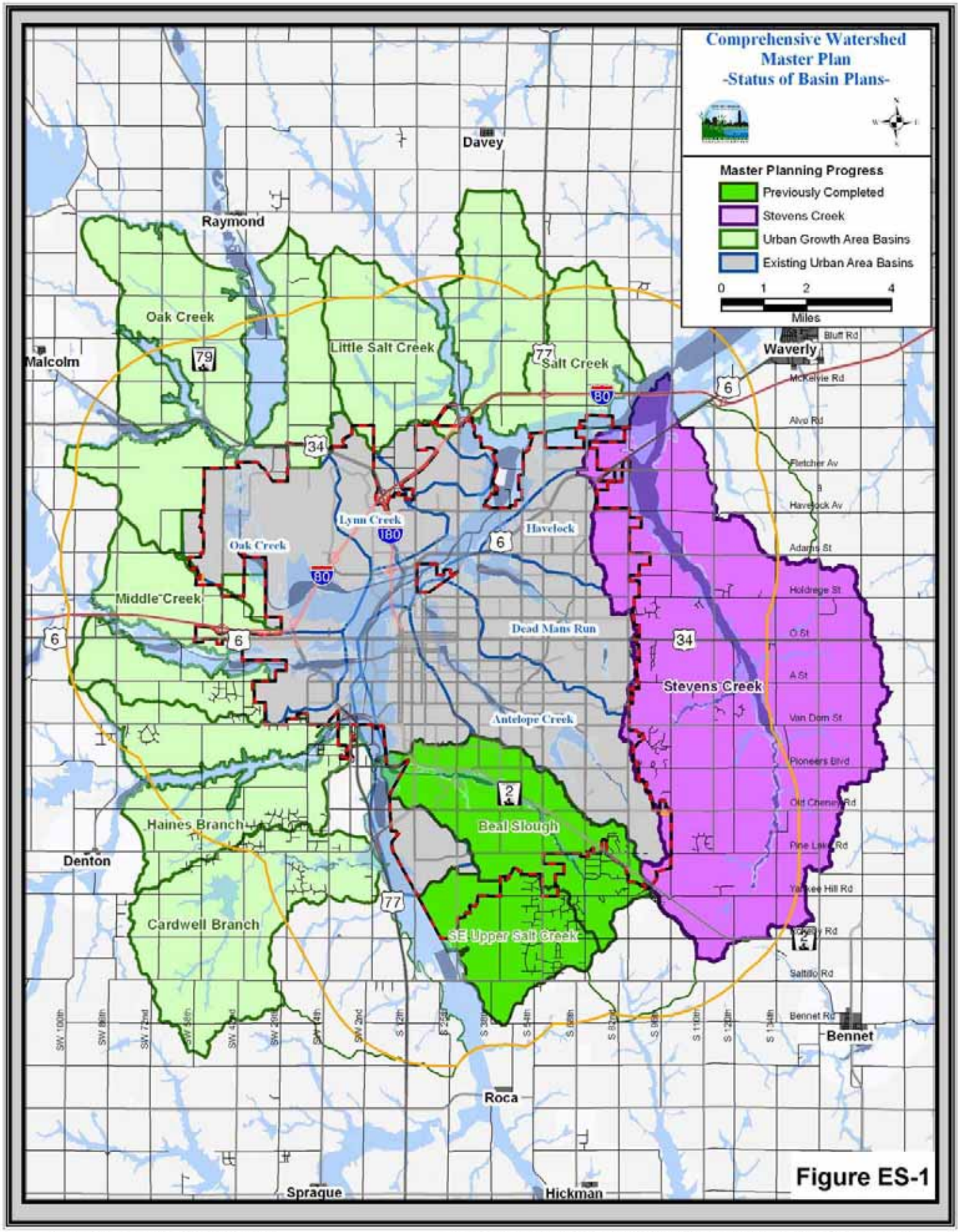
The Stevens Creek Watershed is located immediately east of the City's existing municipal limits (Figure ES-1). The watershed drains approximately 55 square miles from the headwaters near Highway 2 to its confluence with Salt Creek located just north of Highway 6. The watershed is approximately 15 miles in length with a maximum width of about 6 miles. The purpose of the Master Plan is to outline long-term planning tools and improvement projects to address water quality, flood management, and stream stability to provide guidance for sustainable urban growth in the watershed.

The project team was led by the City and NRD, in cooperation with Lancaster County (County). The City/NRD retained the consultant team of Camp Dresser & McKee Inc. (CDM), in association with Intuition & Logic (I&L), Heartland Center for Leadership Development (HC), Kirkham Michael Consulting Engineers (KM), and E&A Consulting Group, Inc. (E&A) to provide assistance with the master planning effort.

Public Participation Process

As part of the master planning process, a comprehensive public participation process was used to solicit input from a broad range of stakeholder groups. The stakeholder groups included landowners, developers, realtors and other business interests, environmental groups, and neighborhood representatives. The public participation process included the following:

- A questionnaire sent to approximately 4,000 people early in the study process to gather input from a wide range of stakeholders.
- The involvement and input of a 25-member Citizen Advisory Committee representing a broad cross section of interests in the watershed, including elected officials, which met with the project team on a monthly basis. Committee members included Ann Bleed, Andrew Campbell, Robert Christiansen, Dick Dam, Mike Eckert, Peggy Fletcher, Beth Goble,



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Rick Hodtwalker, Tony Koester, Marvin Lambie, Russell Miller, Kathy Newberg, Patte Newman, Brock Peters, Dean Petersen, Marleen Rickertsen, Jane Schroeder, Alan Slattery, Jason Smith, Steven Smith, Lyle Vannier, Jack Wagener, John Watson, Bob Wolf, and Bob Workman.

- A series of three open houses in September 2003, September 2004, and January 2005 that attracted over 500 people, and representation at four additional public information events.
- A series of six meetings with landowners regarding alternative management approaches.
- A series of three interest group meetings with a range of stakeholders to discuss alternative management approaches, attended by approximately 100 individuals.
- A series of eight newsletters mailed to over 700 individuals and organizations. In addition, a project website was used to post alternatives under consideration, upcoming events, and materials distributed to the Advisory Committee.
- Watershed bus tours for Advisory Committee members and elected officials.

The public input and feedback received during this process was used by the project team to formulate and refine its master plan recommendations. Section 1 of the Master Plan provides further details regarding the public participation process.

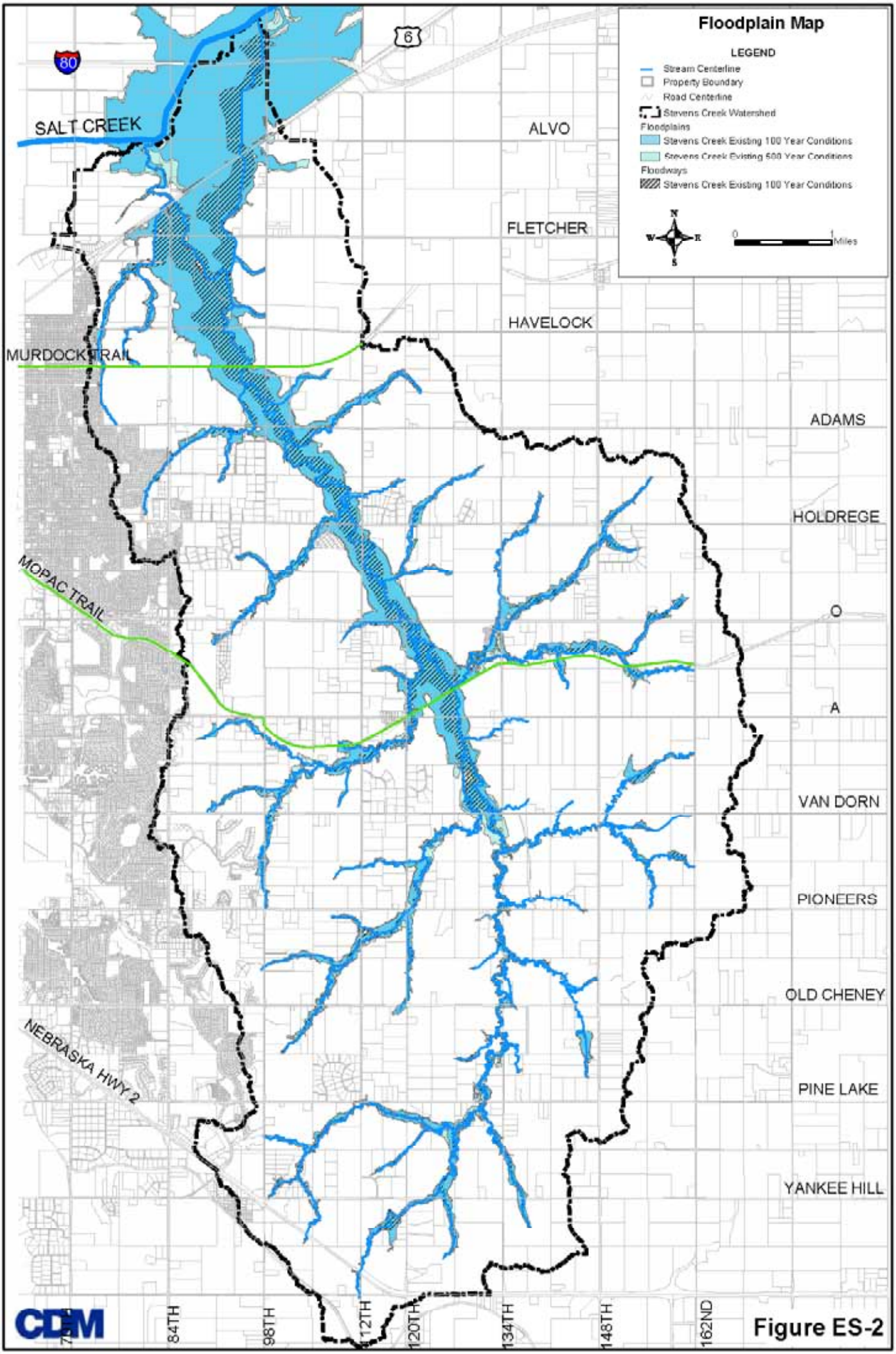
Master Plan Elements

The Master Plan consists of four major elements: 1) Floodplain Management Tools, 2) Capital Improvement Projects, 3) Site-Specific Structural Best Management Practices (BMPs), and 4) Opportunity Areas. A brief summary of each major element follows:

Floodplain Management Tools

One of the major elements of the Master Plan is updated 100-year floodplain and floodway boundary maps. This information will provide a planning tool to protect future homes and businesses from flood hazards and provide guidance for sustainable urban growth in the watershed. The Master Plan reflects the floodprone areas shown on Figure ES-2 as adopted by the City Council in December of 2004 for local regulatory purposes. The Master Plan recognizes that these floodprone areas will be reflected on the Federal Emergency Management Agency (FEMA) floodplain maps at some time in the future when FEMA finalizes the Flood Insurance Rate Map Physical Map Revision.

The Master Plan also includes a strategy for adopting design standards needed to address stormwater volume and timing issues of individual detention basins within the larger watershed to avoid adverse downstream flooding impacts. As described in Section 6, this will involve using the computer models developed as part of the master planning process to design stormwater facilities for private development. In addition, the Master Plan assumes the goals and objectives of the Comprehensive Plan regarding floodplain management and the Flood Standards for New Growth Areas will be implemented. These


Floodplain Map
LEGEND
Stream Centerline
Property Boundary
Road Centerline
Stevens Creek Watershed
Floodplains
Stevens Creek Existing 100 Year Conditions
Stevens Creek Existing 500 Year Conditions
Floodways
Stevens Creek Existing 100 Year Conditions
N
W
E
S
0
1
Miles
80
6
SALT CREEK
ALVO
FLETCHER
HAVELOCK
MURDOCK TRAIL
ADAMS
HOLDREGE
MOPAC TRAIL
O
A
VAN DORN
PIONEERS
OLD CHENEY
NEBRASKA HWY 2
PINE LAKE
YANKEE HILL
84TH
98TH
112TH
120TH
134TH
148TH
162ND
CDM
Figure ES-2

include designating areas for future urban development generally outside of the floodplain and applying No Net Rise, Compensatory Storage, and preservation of Minimum Flood Corridors where development encroaches into the floodplain.

Capital Improvement Projects

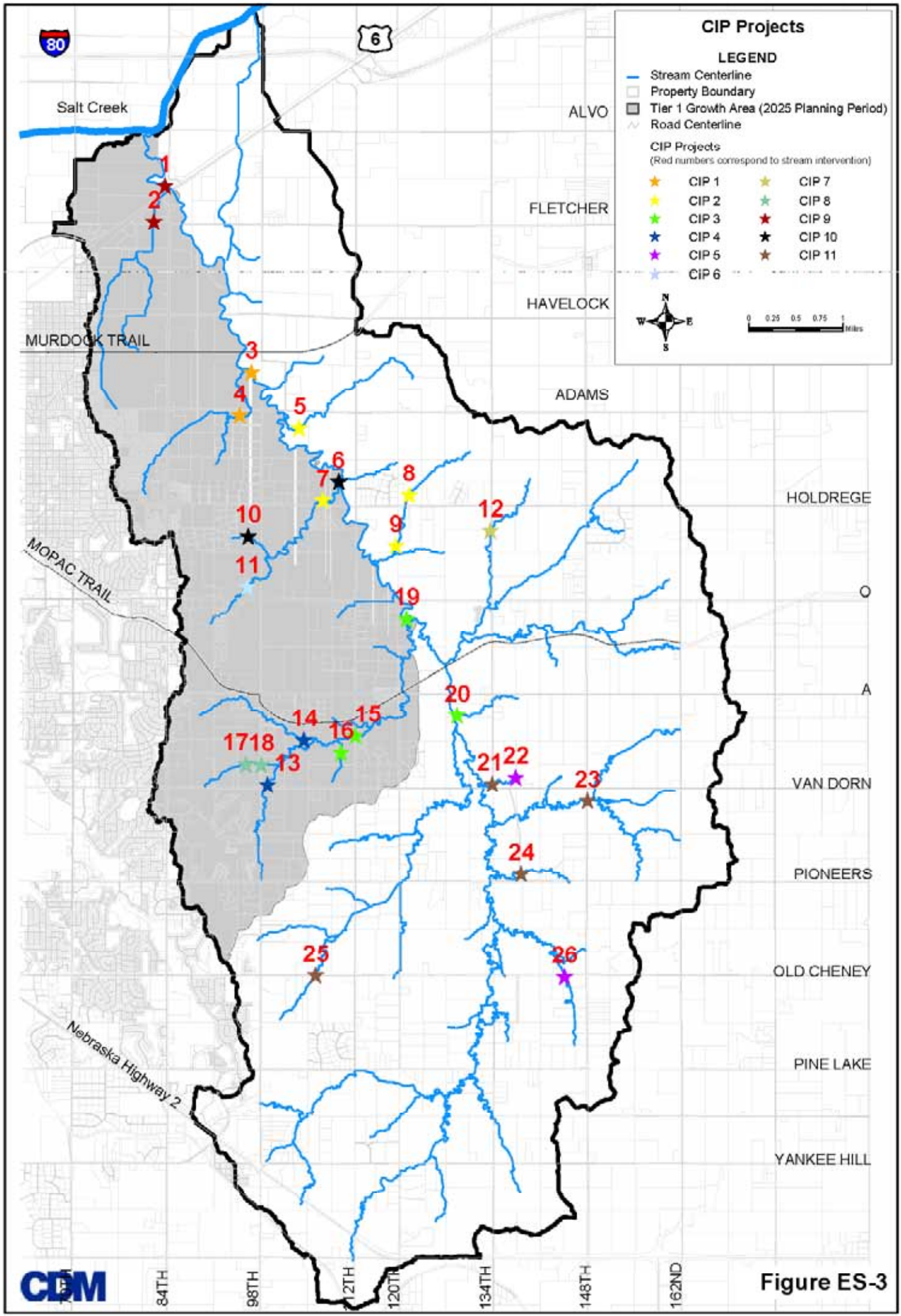
The process of formulating capital improvement projects required the identification of primary and secondary problem areas in relation to the public interest. Primary problems are those that pose a public safety concern with respect to building flooding, stream instability, or severe maintenance conditions. In addition, primary problems include systemic problems that create a clear influence elsewhere in the watershed and will be significantly more costly to address the longer they are delayed into the future.

Secondary problems include sites where stream degradation or instability exist but are not likely to propagate to other areas of the watershed. Secondary problems also include infrequent flooding of habitable buildings. Secondary problems are not considered as serious primary problems and should be addressed in conjunction with other infrastructure projects occurring in the watershed. For example, many secondary problems can be addressed at the same time roadways are improved and water and wastewater pipelines are installed if they are located in the same general vicinity. In addition, secondary problems can be combined with routine maintenance activities.

The Master Plan includes 11 capital improvement projects to address the 26 primary problem areas identified in the watershed. In this watershed, only stream instability problems met the criteria for primary classification. The primary problem areas were grouped and prioritized to form the basis for 11 capital improvement projects that are shown on Figure ES-3. The photographs shown below illustrate the typical type of improvements recommended for the Stevens Creek Watershed. The total capital cost for all 11 capital improvement projects is estimated to be approximately $10.3 million as summarized in Table ES-1. Section 9 of the Master Plan provides further detail regarding the classification process and conceptual improvements for the 26 primary problem areas.

Typical stream improvement project recommended for Stevens Creek.

6 months after construction


CIP Projects
LEGEND
Stream Centerline
Property Boundary
Tier 1 Growth Area (2025 Planning Period)
Road Centerline
CIP Projects
(Red numbers correspond to stream intervention)
CIP 1
CIP 2
CIP 3
CIP 4
CIP 5
CIP 6
CIP 7
CIP 8
CIP 9
CIP 10
CIP 11
N
W
E
S
0 0.25 0.5 0.75 1 Miles
80
6
Salt Creek
ALVO
FLETCHER
HAVELOCK
MURDOCK TRAIL
ADAMS
HOLDREGE
MOPAC TRAIL
VAN DORN
PIONEERS
OLD CHENEY
PINE LAKE
YANKEE HILL
Nebraska Highway 2
84TH
98TH
112TH
120TH
134TH
148TH
162ND
1
2
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8
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17
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19
20
21
22
23
24
25
26

Figure ES-3

Table ES-1
Capital Improvement Project List

Capital Improvement Project	Stream Intervention Number	Construction Sequence	Project Cost
1	3	1	$1,256,000
	4	1	
2	5	1	$1,336,000
	7	1	
	9	1	
	8	1	
3	19	1	$1,201,000
	15	1	
	16	1	
	20	1	
4	14	2	$776,000
	13	2	
5	22	2	$725,000
	26	2	
6	11	3	$863,000
7	12	3	$1,118,000
8	17	3	$1,006,000
	18	4	
9	1	3	$657,000
	2	4	
10	6	4	$748,000
	10	4	
11	21	4	$594,000
	23	4	
	24	4	
	25	4	
		Total	$10,280,000

The City, County, and NRD should use this Master Plan as a reference and guide for the implementation of improvement projects in the Stevens Creek Watershed through the City and County Capital Improvement Programs and NRD's Long Range Implementation Plan. The agencies should use cooperative efforts to address project timing, prioritization between basins, and the sharing of responsibility.

Site-Specific Structural Best Management Practices

The Master Plan includes using structural BMPs to offset the impacts from urban development on stream stability and water quality. The urbanization process significantly alters the hydrologic characteristics of a watershed, increasing flow rate, volume, and velocity of stormwater runoff, which causes long-term erosion problems. In addition, the impervious surface area collects pollutants such as oil and grease that leak from automobiles, which are eventually washed away by the stormwater runoff into natural streams and lakes. Structural BMPs are constructed facilities designed to remove pollutants and slow down the runoff before the stormwater enters the receiving stream. Structural BMPs are designed to address the smaller, more frequent rainstorms that carry the majority of pollutants and are believed to cause the greatest amount of erosion and sediment deposition.

Two alternative methods were generated to install BMPs in the watershed based on a range of approaches discussed with the Citizen Advisory Committee. The methods included 1) Regional Structural BMPs, and 2) Site-Specific Structural BMPs. Advantages and disadvantages for each method were evaluated, which included an analysis of cost and effectiveness. The evaluation is described in Section 6 of the Master Plan and resulted in selecting site-specific structural BMPs as the recommended alternative. This method provides a cost-effective approach to maintain the integrity of the natural streams, preserve water quality, and can be efficiently integrated in the City's current development standards. The Master Plan includes guidance for revisions to the City's design standards for site-specific BMPs, which would be applied consistently to all new developments. Section 7 of the Master Plan provides further details on how to integrate structural BMPs into new development sites.

Currently, City standards for new developments require detention basins designed to control the 2-, 10-, and 100-year storm events. Structural BMPs can be efficiently integrated with detention basins as shown on Figure ES-4. This includes adding a sediment forebay and designing the outlet structure to control the smaller, more frequent rainstorms. This integrated facility will provide both water quantity (flooding) and quality (pollutant removal and stream stability) benefits**.** Structural BMPs can also be integrated into the site using alternative approaches independent from the stormwater detention basin.

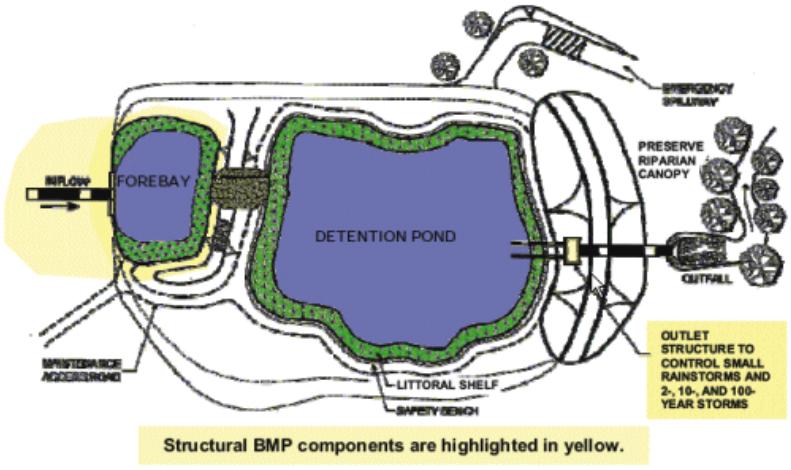


Figure ES-4
Integrated Detention Pond and Structural BMP

The estimated cost to integrate a structural BMP into the City's current detention basin design requirements is $210 per acre of drainage area. The additional cost for maintenance is estimated to be $500 per year per facility.

One of the key concerns expressed during the public participation process was the question of who should bear the cost for offsetting the impacts to water quality and stream stability caused by future urbanization. In response to this input, the cost-share concept

embodied in this Master Plan assumes that there is both private and public responsibility relative to how structural BMPs function together as a system to address water quality and stream stability throughout the watershed. The following concepts are embodied as part of this Master Plan element that outline public/private roles and responsibilities:

- A public-private cost share concept where the City and NRD share in the cost of constructing the BMP portion of the facility, jointly providing funding for $100 of the $210 cost estimated per acre of drainage area. City/NRD funding is anticipated to be provided on a first-come, first-serve basis and be contingent upon City/NRD approval of the proposed cost share program. In addition, the cost share program would be subject to yearly budget approvals, voter approval of general obligation bonds, and NRD board approval.

- Revisions to the subdivision standards to require a $2,500 escrow for the first 5 years of maintenance ($500/year).

- Revisions to the drainage standards to establish uniform criteria for the development of a maintenance plan to be submitted with the preliminary plat and referenced in the subdivision agreement. A good maintenance plan will not only provide a guide for future property owners but will help ensure that maintenance responsibilities are clear when ownership is transferred from the developer.

- The development of a proactive education program by the City/NRD.

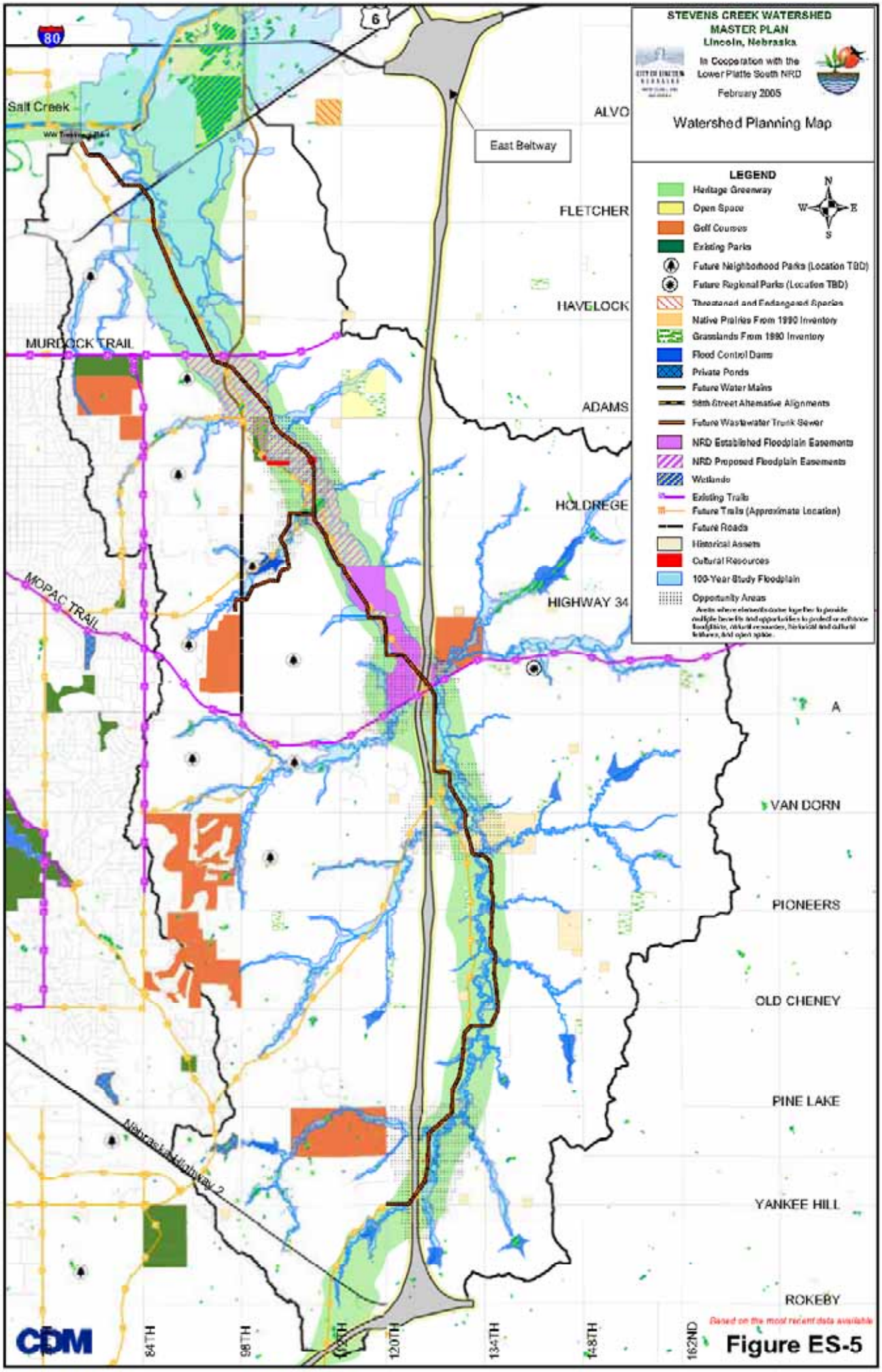
- The improvement/refinement of the City/NRD partnership to share in the responsibility of inspections on a regular rotation basis.

Opportunity Areas

Figure ES-5 is a Watershed Planning Map that overlays a wide variety of natural and built elements to support an integrated approach to watershed planning in Stevens Creek. Opportunity Areas are very general planning locations within the watershed that highlight where natural elements and/or existing or future infrastructure come together. These are areas with the potential for multiple benefits and opportunities to protect or enhance features like floodplains, natural resources, historical and cultural features, and open space.

Four Opportunity Areas are highlighted on the map along the Salt Valley Heritage Greenway, which follows the main channel of Stevens Creek. These highlighted areas generally recognize where natural features like the floodplain and drainage corridors overlap or are in the vicinity of other elements such as the East Beltway corridor, existing or future trails, NRD conservation easements, or historical and cultural resources.

As future planning continues for Stevens Creek, these areas should be referenced as a guide by City and County departments and the NRD, particularly with regard to opportunities to integrate parks, open space, and stormwater or floodplain benefits.


STEVENS CREEK WATERSHED
MASTER PLAN
Lincoln, Nebraska
In Cooperation with the
Lower Platte South NRD
February 2005
Watershed Planning Map
LEGEND
Heritage Greenway
Open Space
Golf Courses
Existing Parks
Future Neighborhood Parks (Location TBD)
Future Regional Parks (Location TBD)
Threatened and Endangered Species
Native Prairies From 1990 Inventory
Grasslands From 1990 Inventory
Flood Control Dams
Private Ponds
Future Water Mains
56th Street Alternative Alignments
Future Wastewater Trunk Sewer
NRD Established Floodplain Easements
NRD Proposed Floodplain Easements
Wetlands
Existing Trails
Future Trails (Approximate Location)
Future Roads
Historical Assets
Cultural Resources
100-Year Study Floodplain
Opportunity Areas
N
W
E
S
Salt Creek
East Beltway
ALVO
FLETCHER
HAVELOCK
ADAMS
HOLDREGE
HIGHWAY 34
MURDOCK TRAIL
MOPAC TRAIL
Nebraska Highway 2
VAN DORN
PIONEERS
OLD CHENEY
PINE LAKE
YANKEE HILL
ROKEBY
84TH
98TH
120TH
134TH
148TH
162ND
CDM
Based on the most recent data available
Figure ES-5

Summary

The Stevens Creek Watershed Master Plan provides the City and NRD with the necessary planning tools and capital improvement projects to address flood management, water quality, and stream stability for achieving sustainable urban growth in the watershed. By using the detailed study information and applying the Master Plan elements described above, multiple goals will be achieved including:

- Protection of future homes and businesses from flood hazards
- Reduction of future impacts to water quality and stream stability due to urbanization
- Preservation of aquatic and riparian habitat
- Long-term stream stability that protects public infrastructure
- Development guidelines that address stormwater quantity and quality
- Opportunities for multiple benefits through an integrated approach to watershed planning