

Introduction to the Natural Resources Element

The protection of Cranston's natural resources is a common theme expressed throughout this Plan. While the methods, management techniques, and programs highlighted in the plan support protection, they are not designed to stop development. These policies enable development in ways that are compatible with protecting natural resources.

Key Challenges

The City is faced with funding and legal constraints, but also opportunities regarding the protection and use of its natural resources:

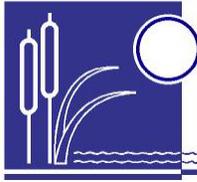
- There is a strong demand to develop remaining vacant lands, some of which have important natural resources.
- Residential development in western Cranston reduces natural habitat, consumes open land and impacts natural resources. New management programs and regulations are needed to manage development to preserve remaining resources.
- The Rise/Return sewer line and the new water line in Pippin Orchard Road increases pressure for more intensive land development in western Cranston, especially along Pippin Orchard Road.
- The City, State, several environmental and agricultural groups, and individuals have promoted the preservation of existing agricultural land by supporting local farming initiatives and co-ops.
- The City's urban ponds and streams could provide new recreation opportunities or simply visual relief; and,

- There are still open parcels that could link existing open space areas. Additional land acquisitions and easements are needed to complete these links.

Key Strategies

Practical solutions to the environmental challenges need to be implemented to ensure that the City can protect its natural resources while balancing this with real growth and maintenance of community character.

- Promotion of farm-based retail activities to protect against the loss of agricultural lands.
- Restoration plans that create buffer zones to protect the Pocasset and Pawtuxet Rivers.
- Adoption of new land use tools such as transfer of development rights.
- Adoptions of standards such as low impact development and other 'green' policies and techniques that enhance watersheds.
- Reinstate the City's community garden program in appropriate areas.



Part I - Summary and Accomplishments of the 1992 Plan

Introduction

The issues surrounding the Natural Resources element of the 1992 Comprehensive Plan focused on two themes:

Effective management of growth and change in the western half of Cranston.

A strategic approach to incremental change in the neighborhoods and commercial areas of eastern Cranston.

The 1992 Plan identified a series of issues that reflected the sentiment of these two themes. This section summarizes these issues and the approaches to address them. A table that identifies the goals and accomplishments of the 1992 Plan follows this summary.

Wastewater Management in Western Cranston

Most soil in western Cranston, where the land is un-sewered and undeveloped, is rated "severe," meaning it is more costly for a homeowner to build and operate an in-ground septic system. In soils with this designation, appropriate design, installation and maintenance are essential to protect natural systems. The 1992 Plan proposed both structural and management approaches to address this issue, which included installing sewer lines, developing a comprehensive septic system management program, and creating a Waste Water Management District.

Ground Water Quality and Supply

The far western areas of Cranston are dependent upon ground water. The 1992 Plan recommended that the City adopt Rhode Island Department of Health regulations that establish minimum criteria for yield and water quality for private wells in these areas.

Surface Water Quality

Water Quality Monitoring

The 1992 Plan reported that the water quality data for many of Cranston's rivers, ponds, and lakes was either not current or not being collected. The Plan recommended that the City work with the State to develop a water quality assessment and management study.

Point and Non-Point Source Water Pollution

Land-use activities were identified to adversely impact surface waters and the two watersheds in Cranston. Several water resource protection efforts were proposed for the City to implement.

Stormwater Management

Pollutants in stormwater runoff enter and degrade the quality of Cranston's surface waters and eventually enter Narragansett Bay. In addition, the most important watershed areas in Cranston are parts of larger watersheds that are in neighboring communities. These factors show that water quality is a regional responsibility that cannot be fully addressed at a local level. However, to address this issue, the 1992 Plan recommended establishing stormwater utilities, financed through user fees, as well as having inter-municipal cooperation with these communities.

Public Water Supply / Scituate Reservoir

The 1992 Plan recommended applying watershed protection measures to the small portion of the Scituate Reservoir's watershed, which is located in the northwest corner of Cranston. The Plan also proposed to implement the recommendations of the State's Division of Planning's Management Plan for the watershed.

Protection on Steep Slopes

Portions of western Cranston have been characterized as having moderately steep and undeveloped slopes which could be subject to

significant erosion and runoff if they are developed. The 1992 Plan proposed development controls, specifically permitted coverage of lots based on lot size and average slope, in order to minimize disturbance within a development site.

Preservation of Existing Resources

Wildlife Habitat and Rare and Endangered Species

The 1992 Plan reported that there was no inventory of wildlife species and habitat in Cranston, specifically in western Cranston where there are many wetlands, ponds, streams, and forests. While there was one 'listed' species that deserves protection, state policy does not allow revealing specific locations to protect the listed species, unless a development project is proposed. The 1992 Plan advised the City to identify and prioritize critical habitat areas in order to provide adequate protection of the species that could inhabit the resources.

Farmland Preservation

Although western Cranston still retains parts of its scenic and rural character, this area has been losing its farmland and ties to its historical past as development occurs. Options for the City, as suggested in the 1992 Plan, advocated for farmland preservation through purchases or agricultural preservation restrictions.

Conservation Commission

The local Conservation Commission can play a key role in natural resource protection efforts. The 1992 Plan recommended that the Commission be revitalized and be more active by implementing annual and long-term actions.

Changes to the Plan since 1992

The Cranston City Council approved the following change to the 1992 Comprehensive Plan.

- Amended the language to allow municipal water systems into the watershed areas to address on-site well contamination problems or to permit cluster development.

1992 Plan Actions and Accomplishments

Table 5-1 summarizes the Natural Resources Actions from the 1992 Comprehensive Plan and identifies which of these have been accomplished.

Table 5-1 Accomplishments of the 1992 Comprehensive Plan

Action	1992 Actions	Accomplishments and Changes
Protection of Cranston's Natural and Environmental Resources		
NR-1	Develop an open space preservation strategy for western Cranston that will result in a coordinated preservation program, including the preservation of farmland and greenways.	The Historic Scenic Farm Loop in western Cranston was created to preserve scenic views and preserve farmlands and greenways, and serve as a focus for future land acquisitions.
NR-2	Enact regulatory mechanisms and incentives allowing the concentration of new development in compact areas, in order to facilitate the preservation of significant areas of open space and environmentally sensitive areas.	Regulations promoting cluster development were strengthened through the adoption of Residential Planned District (RPD) regulations.
NR-3	Identify and prioritize critical habitat areas in western Cranston such as locations of rare and endangered species. Use local zoning and land regulations to assess and mitigate development impacts on rare and endangered species and wildlife habitats.	This action was not accomplished.
NR-4	Acquire, where possible, vacant parcels of land for open space and to establish green corridors, particularly in areas abutting natural drainage ways.	The City acquired several tracts of land in western Cranston. These parcels have become part of the City's open space system and may be used for passive recreation or agricultural uses.
NR-5	Revitalize Cranston's Conservation Commission and charge it with recommending specific annual and long-term actions such as developing a volunteer water quality monitoring program, implementing open space protection measures, and conducting public education on such issues as wetlands values, septic system maintenance, household hazardous water disposal, and pesticide/fertilizer application, storage and disposal.	The Cranston Conservation Commission was re-established in May 1995 and meets on a regular basis to review subdivisions and land developments.
Wastewater Management in Western Cranston		
NR-6	Require that development plans which propose the installation of individual septic disposal systems be accompanied by an analysis which demonstrates that the septic system will be compatible with the properties of the soils in which it will be placed.	Incorporated under RIDEM OWTS permitting requirements.
NR-7	Develop a comprehensive septic system management program.	This action was not accomplished.
NR-8	Require that applicants for subdivision approval for septic system-dependent lots provide soils analyses demonstrating that the Rhode Island Department of Environmental Management's standards for well leach field separation would be sufficient to isolate drinking wells from contamination threats.	No analysis is required because RIDEM regulates for this requirement.
NR-9	Require that all subdivision proposals that envision well-dependent lots be accompanied by pump test results, which verify conformity with RIDEM's Rules and Regulations relating to the Drilling of Drinking Water Wells.	This action was implemented as staff policy and needs to be incorporated into the subdivision regulations.

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Surface Water Quality		
NR-10	Conduct a study of Cranston's lakes and ponds in order to provide comprehensive, detailed, current data regarding water quality of the City's most important surface water resources as well as the pollutant sources impacting them.	Three ponds were studied in the late 1990's. No new policies have been implemented to date. Some ponds have been monitored through a program at the University of Rhode Island over the past several years.
NR-11	Develop in-depth management programs for specific high priority water bodies in order to improve water quality and foster increased recreational use.	This action was not accomplished.
NR-12	Work with the State, including the Pawtuxet River Authority and the University of Rhode Island, to establish a volunteer water quality monitoring program modeled after the Watershed Watch Program.	Water quality monitoring is being conducted at two locations.
NR-13	Implement the watershed protection strategies recommended in the State's Scituate Reservoir Management Plan in order to ensure the future quality of this water supply. (for itemized list of actions, see P.128 of the 1992 Comprehensive Plan)	This action was not accomplished.
NR-14	Work with Northern Rhode Island Conservation District to implement USDA Soil Conservation Service "Best Management Practices" (BMP's) for agricultural sites and livestock operations including proper application, storage, and disposal of pesticides and fertilizers.	This action was not accomplished.
NR-15	Set limits on the percentage of impervious surfaces in new developments.	This action was not accomplished.
NR-16	Adopt an Underground Storage Tank Ordinance.	This action was not accomplished.
NR-17	Ensure that municipal and state salt storage piles are adequately covered.	The city highway department has one salt storage area on Phenix Avenue, and it is not covered. There are no state salt storage areas in Cranston.
NR-18	Continue to work with state and federal agencies to conduct remediation at former industrial sites such as the Ciba-Geigy plant.	Remediation continues at the site.
NR-19	Enact Stormwater BMP's to guide the design, installation, and operation of erosion and sedimentation control in new residential subdivisions.	The City contracted with Fuss & O'Neil to prepare the necessary stormwater management provisions. RIDEM is currently in the process of updating their stormwater regulations.
NR-20	Work cooperatively with surrounding municipalities to create a stormwater management utility (or utilities) to generate funds to maintain erosion and stormwater management structures.	This action was not accomplished.
NR-21	Conduct a stormwater management study in order to establish a comprehensive stormwater management plan which addresses short- and long-term infrastructure and administrative needs.	The City contracted with Fuss & O'Neil to prepare the necessary stormwater management provisions. (Phase II non Point Source Pollution)



Part II - Current Conditions and Issues

Introduction

This section provides a summary of the existing conditions and key issues regarding the natural resources within the City. As a result of these findings, acquisition of open space parcels, protection of the inland and coastal waterfront for access, and preservation of agricultural land are seen as most important. Map 5.1 illustrates the inventory and location of the remaining Agricultural and Forestry Resources within the City.

The natural resources of Cranston serve critical functions for the environment as well as provide recreation and scenic vistas. These resources, which include the rivers, ponds, wetlands, (see Map 5.2) entitled Water Features and Wetlands, for the inventory of rivers and ponds, as well as the types of wetlands found within the City's boundaries) forests, and coastal features, all play an important part in preserving the ecology and water quality. They also define the landscape of Cranston. The use and management of these resources affect their short and long-term health, and determines their ability for long term survival.

The typical concerns are the values (such as water quality protection) and hazards, such as flooding, (see Map 5.3 for the areas defined on the 2008 FEMA Flood Insurance Rate Map, as Flood Hazard Zone Areas), and the usual responses are acquisition or regulation. Consequently this section reviews recent land acquisitions and changes in regulatory programs. Note that the City has adopted a Hazard Mitigation Plan that includes review of flood hazards.

Recent Land Acquisition

Through 2005, the City of Cranston has acquired 16 parcels of land that total over 350 acres (see Figure 5-1). Almost all of them are located in western Cranston and most of them are near Burlingame Road, Hope Road, and Pippin Orchard Road.

Most of these sites were purchased directly by the City of Cranston with the funding from state agencies and local partnerships. Besides the City, non-profit groups such as the West Bay Land Trust and the Southside Community Land Trust will manage some parcels. The

City intends to retain their current uses, which are mostly farms and forests. Although not all of these parcels are contiguous, they add to the existing pattern and the diversity of protected and natural resources in western Cranston. They contain natural drainage ways as well as farmlands. These parcels will contribute to the overall quality of life as they become available for use by the residents and other visitors.

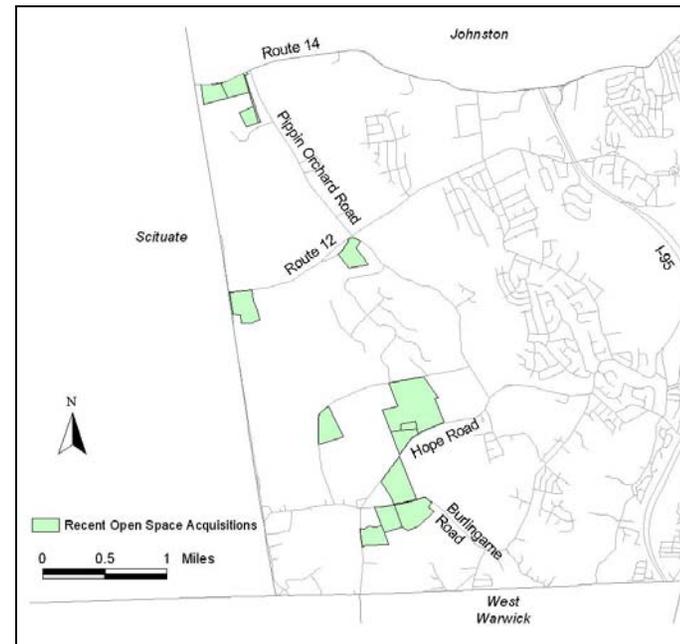
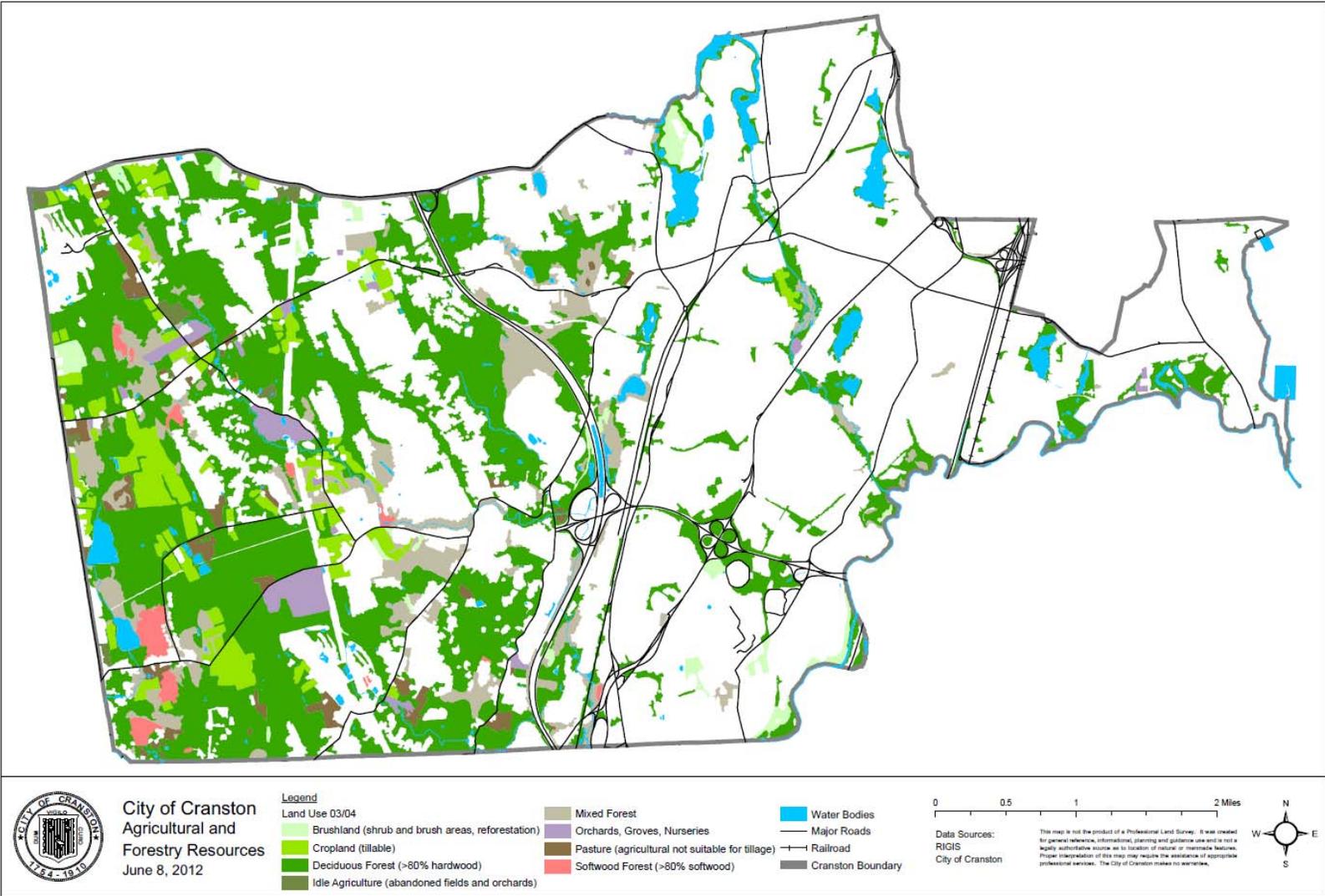
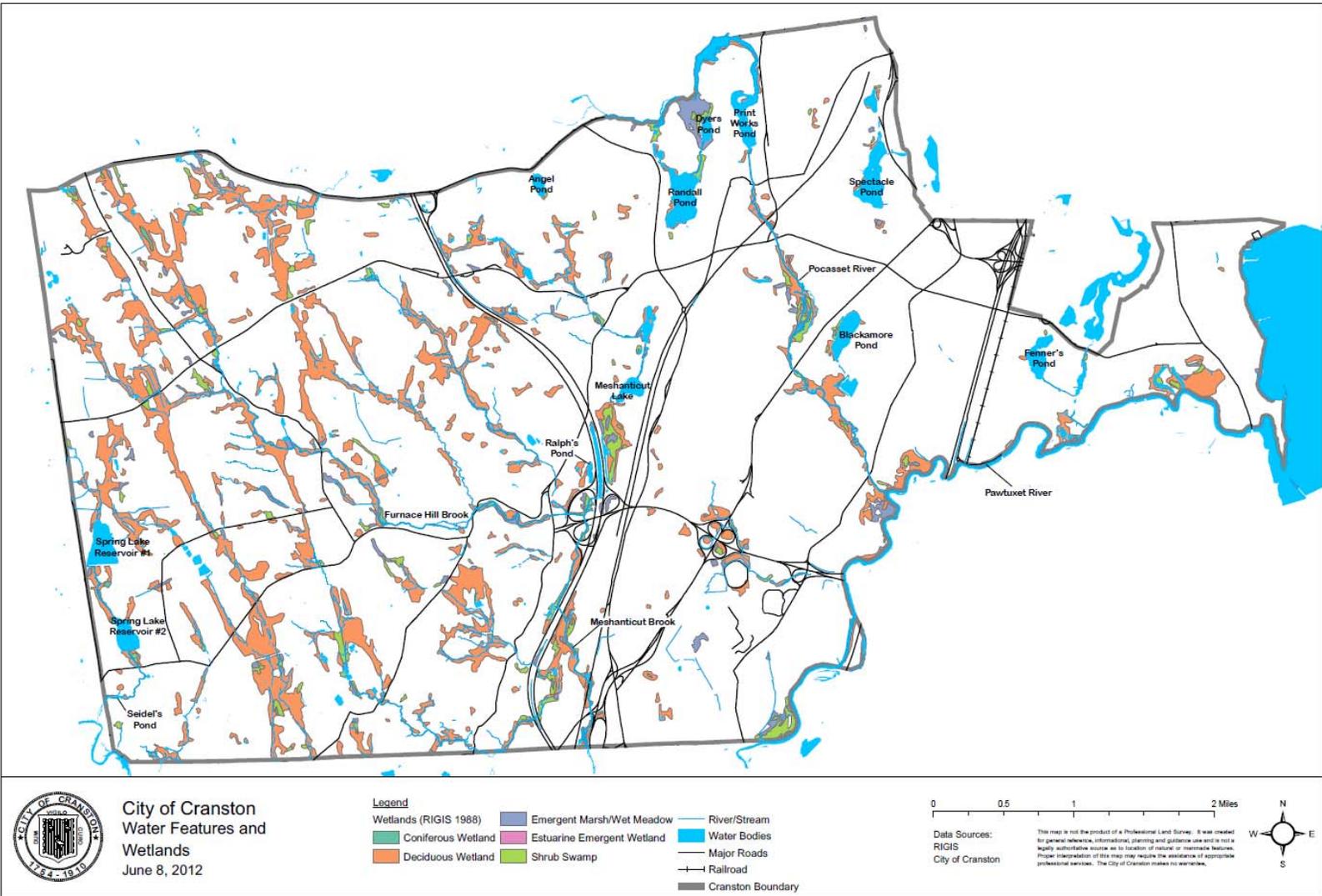


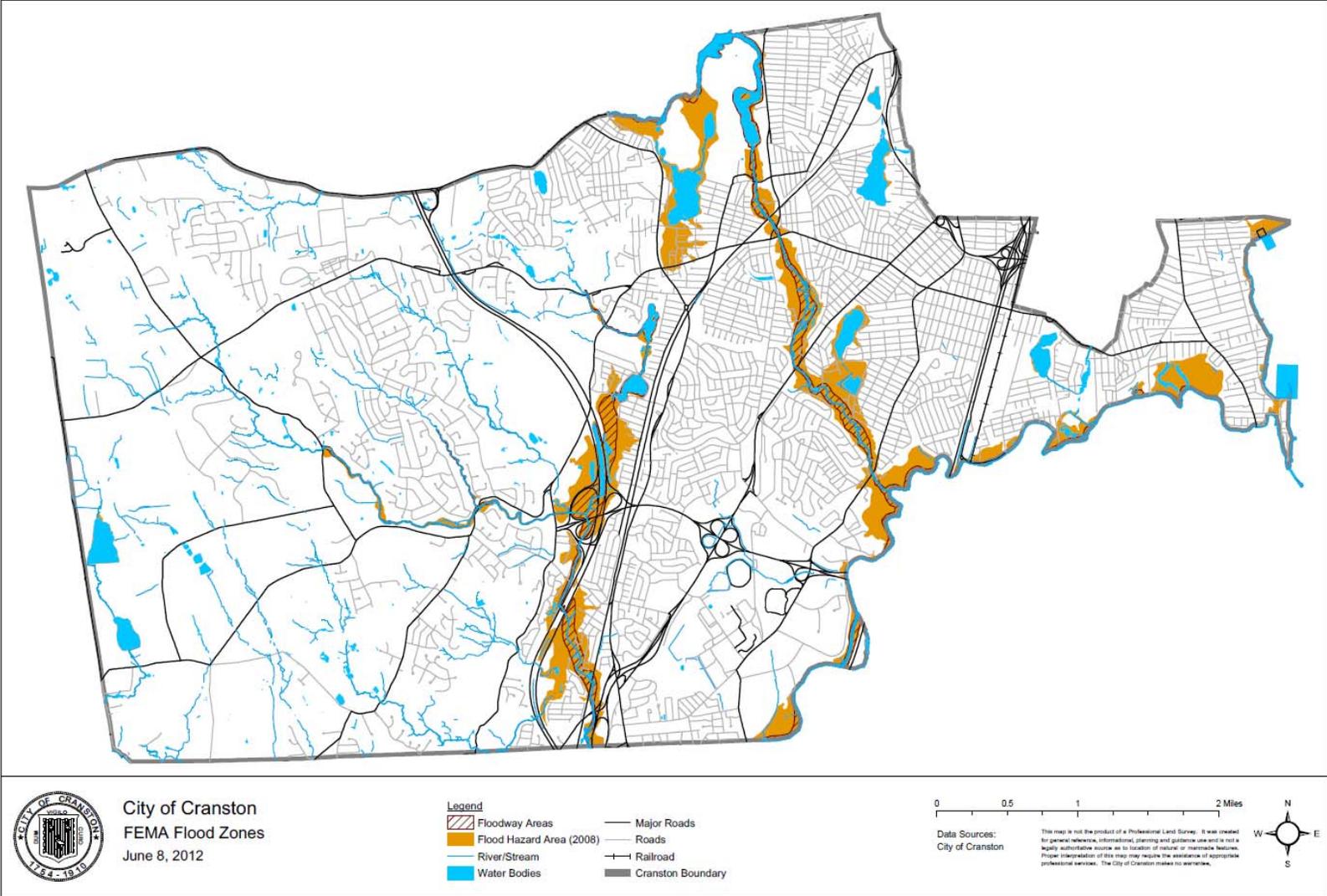
Figure 5-1 Land Acquisitions since the 1992 Plan



Map 5-1 Agricultural and Forestry Resources



Map 5-2 Water Features and Wetlands



Map 5-3 2008 FEMA Flood Insurance Rate Map

Land Acquisition Opportunities

The use of the City's open space parcels varies and is primarily based on the original purpose of acquisition. Future uses may change at some locations depending on funds, recreational needs, population growth, additional acquisitions, and future development in western Cranston. As these needs change, the City should accommodate growth and identify specific uses for sites as appropriate.

As identified in the Land Use and Housing elements, most of the development through 2005 has occurred in western Cranston. This increase has presumably generated needs for specific active-use areas. Future open space acquisitions could serve certain functions for recreation as the population of western Cranston increases. However, the City will have to be mindful of the funding source requirements that can restrict the use of these acquired properties.

Preservation of Agricultural Land

Land that is used for agricultural purposes contributes substantially to the overall quality of life for the residents of Cranston, protects natural resources, and prevents land development. Several local and state programs and partnerships support the preservation of agricultural land. The City contains over 580 acres of active farms (see Map 5.4), including 35 acres of prime farmland at Urban Edge Farm, which was purchased and preserved by the Rhode Island Division of Agriculture in 2002. The South Bay Community Land Trust is managing the property for the State. The model farm hosts a program by the Land Trust that "grows" a new generation of farmers, by demonstrating environmentally sound land stewardship and farming practices. The new farmers collaboratively manage the farm's operation and maintenance. Table 5.2 inventories other active farms in the City, along with the acreage of each farm.

Cranston Historic Scenic Farm Loop

The City of Cranston established the Historic Scenic Farm Loop in 2002, along rural roads in western Cranston to identify certain farms and scenic areas. This loop, which is shown on a map # 7.2, entitled Cranston Historic Farm Route, and described in the Open Space element:

- Improves awareness and allows people to enjoy the remaining farmland;
- Promotes the economic vitality of the farms by attracting visitors and;
- Preserves scenic qualities of the land and farms.

Rhode Island Farm Ways

The Rhode Island Farm Ways program, which began in 2004, is administered by RI Department of Environmental Management (DEM). The purpose of this statewide program is to work with farmers to increase 'agri-tourism' or 'agri-tainment' on their farms, provide professional development and training, and help market their products and services. This type of program supports the continuation of farms as businesses as well as helps protect the rural and agriculture uses and character so prevalent in western Cranston.

West Bay Land Trust

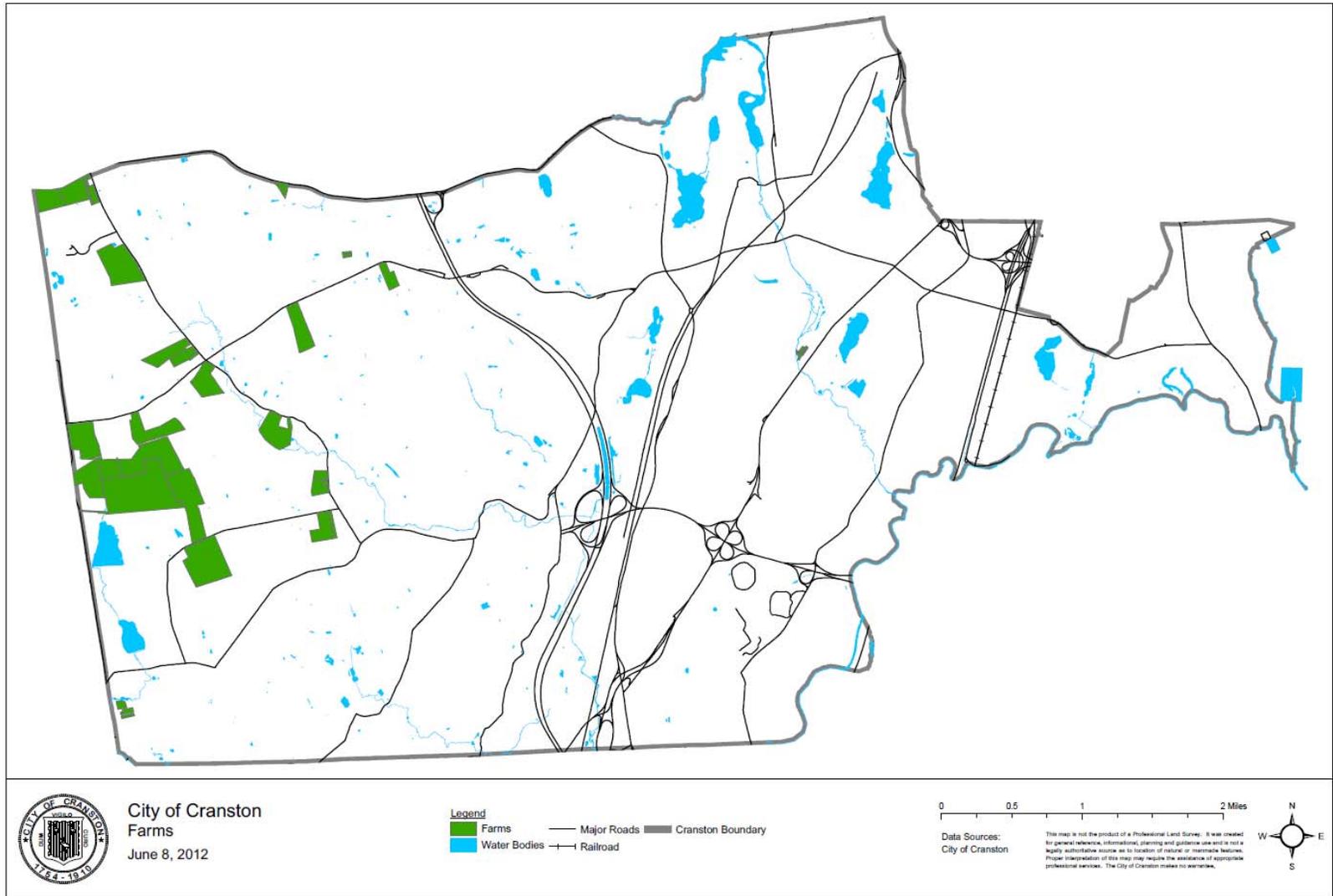
The West Bay Land Trust (WBLT) has been involved with preservation management of land in Cranston. For example, the WBLT manages the 250-acre Knight Farm (identified on the Cranston Historic Farm Route map #7.2) that was recently purchased by the City with assistance from the Champlin Foundation and the RIDEM. It also was responsible for establishing the Historic Scenic Farm Loop along with support from the Cranston City Council and Planning Department.

Pawtuxet River Authority

The Pawtuxet River Authority (PRA) focuses on a variety of ways to protect and improve both the natural and recreational benefits of the Pawtuxet River and its tributaries. Under authority of the State, the PRA manages several parcels of land along the Pawtuxet River, organizes recreational activities, educates people about the River's importance, and promotes its benefits.

The PRA's most recent land acquisition included a 48-acre parcel located along the River in the Howard Industrial Park. This type of land stewardship protects natural resources and open space for the citizens of Cranston as well as other people that live, work, and utilize the River.

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Map 5-4 Farms

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FARM	AREA	PLAT & LOT
Perugino & Son Farm	8.37 acres	27-86
Stamp Farms	1.6 acres	36-41
Pippin Orchard Nurseries (Bel Terra)	28.2 acres	28-196
Russo's Farm	11.77 acres	28-8, 9, 51
Iannelli Farm	3.35 acres	35-11, 36-12, 58
Pippin Orchard	20.0 acres	34-23
Confreda Greenhouses & Farms	203.1 acres	29-4, 31-7, 8, 24
The Good Earth Organic Gardening Center	20.0 acres	34-3
Forest Hill Nurseries & The Lawn Beauticians	4.2 acres	9-2430 to 2436, 3500, 3089, 3513
Scratch Farm, Pak Express Farm, Blue Skys Flower Farm, Four Friends CSA, Big Train Farm, Xiong Farm	2.0 acres, 2.0 acres, 1.0 acre, 5.0 acres, 3.0 acres, 1.0 acre	33-5
Urban Edge Farm	35 acres	33-9, 10, 11, 19
Zephyr Farm	5.0 acres	28-6, 40
Ice Pond Farm	8.0 acres	30-17, 28, 45
PAS VINA Farm, LLC	61.6 acres	32-18
Tortorella Farm	8.0 acres	34-5, 22
Jock's Horse Farm	50.38 acres	29-11
Cloverdale Farm	70.0 acres	31-4, 5, 22
Al's Greenhouses	30.0 acres	34-14
Total	582.57 acres	

Table 5-2 Inventory of Farms

Environmental and Resource Regulation

Wastewater Management in Western Cranston

The issue of wastewater management in Western Cranston was detailed in the 1992 Plan. The focus was to improve the design and management of the individual septic disposal systems (ISDS) due to the “severe” or poor quality of the soils and steep slopes in this part of the City. The physical (soil) characteristics (Map5.5 show the soil classification, and slope information) have not changed since that time, and recent development is mainly residential. However, changes in the management of wastewater have included: improved RIDEM regulations (now known as Onsite Wastewater Treatment Systems (OWTS)); system inspections; and technical assistance.

Potential Extension of Sewer Service in Western Cranston

An 11-mile, pressurized sewer return line (RISE Line) runs between the power plant at the Johnston Resource Recovery Station and the Cranston Sewage Treatment Plant, and passes through western Cranston. Additional information on the line and other utility infrastructure such as the water line in Pippin Orchard Road is included in the Services and Facilities Element.

There is potential to connect sewer lines to this main line since the City recently signed an agreement with owners of the line that allows the City to tap into it. Connections will be more expensive due to the high cost of connecting to a pressurized system. Development pressure in western Cranston has resulted in both existing and new homes and businesses to request connections to this line. The City must develop a mechanism or policy which regulates the allocation of the limited RISE Line capacity.

Increased development will affect the area’s natural resources through the need for advanced treatment septic disposal systems in the poorer soils, increased stormwater runoff, encroachment into protected areas, and the loss of natural habitats and open spaces. The option for connections to the RISE Return line should be tied to additional requirements to better preserve and protect the resource areas. This could include such actions as larger setbacks from streams and their bordering wetlands.

Conservation Commission

The Cranston Conservation Commission is charged to promote, protect, and develop the City’s ecological resources in order to maintain and preserve its natural environment. The Commission also advises the City Planning Department and makes recommendations to the Mayor and the City Council. The Commission continues to support several conservation and preservation programs including:

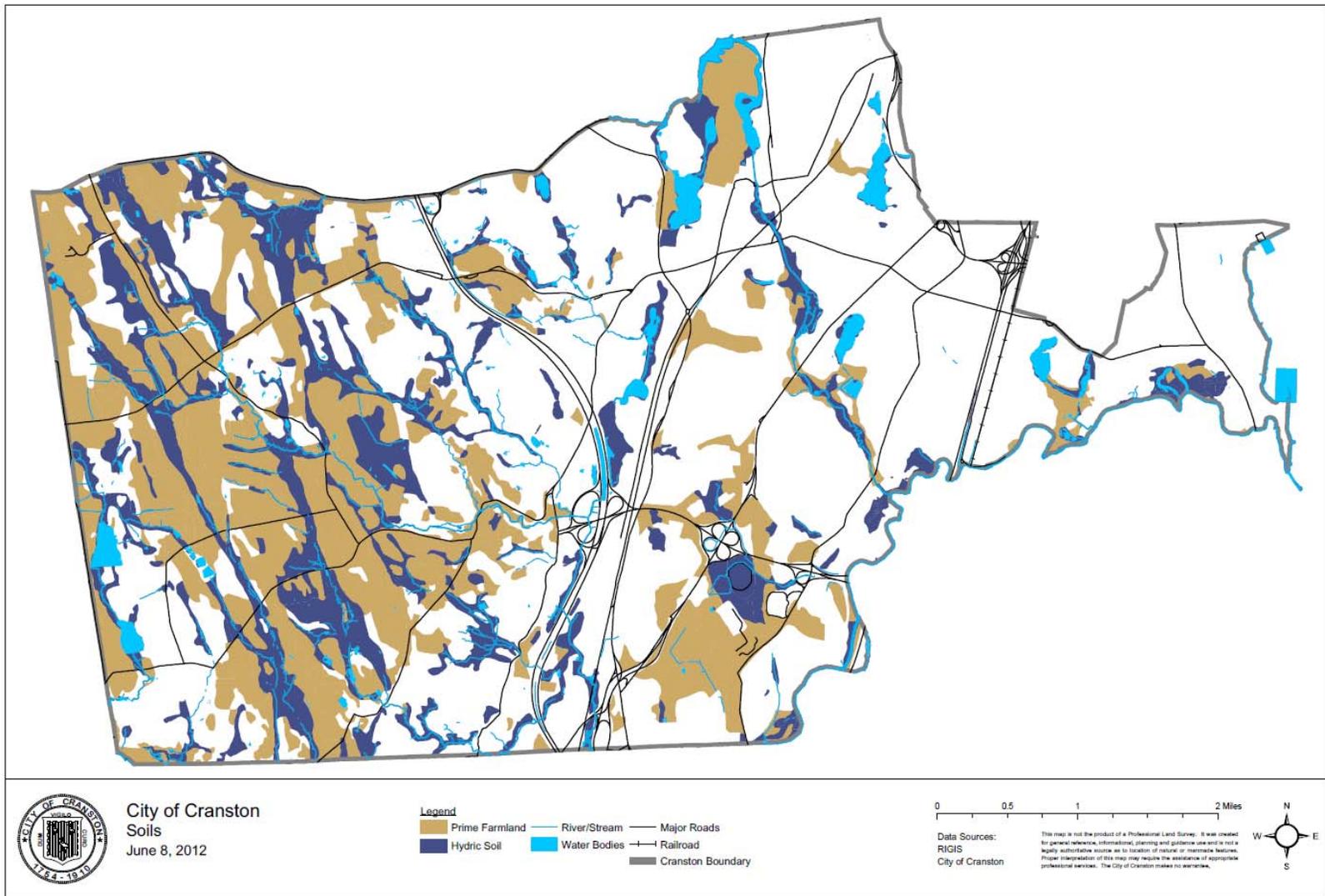
- Open space acquisition and the Historic Scenic Farm Loop;
- Coordination with other City groups regarding open space;
- The use of small, urbanized areas of open space, and;
- Tree beautification, planting and nurseries.

These and other efforts help maintain and improve the diversity of the environment in Cranston and ensure that these resources are protected through appropriate measures.



Stillhouse Cove

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Map 5-5 Soils



Part III - Strategies and Actions

This section identifies actions for this element through a series of programs and strategies that will help resolve existing and future issues. A summary of the proposed actions, time frames, and responsibilities for the Natural Resources element is at the end of this section (see Table 5-3).

Protection of Cranston's Natural Resources

Adopt a 'Farm-Based Retail District'

The adoption of a farm based retail district will improve the potential to preserve agricultural land. Where much of western Cranston remains as farmland, special zoning regulations will promote the protection of the farms and retain the area's natural, cultural, and historic assets. The zoning district will encourage the continuation of agricultural activities especially when used with other programs for promoting the economic vitality of farms.

A farm-based retail district, similar to one recently adopted in South Kingstown, Rhode Island, would support the continuation of existing farms and encourage the development of new ones by allowing retail operations to expand, thereby increasing the customer base. This ordinance would allow farmers to be more competitive, maintain productive farmland, retain the rural character of the area, support historic preservation goals, and most importantly, preserve the natural resources within the district. The ordinance would also support other programs that promote preservation of open space and 'agri-tourism' / 'agri-tainment', such as Rhode Island Farm Ways, Rhode Island Center for Agricultural Promotion and Education (RICAPE), RIDEM and Rhody Fresh.

Adopt a 'Green' Building Program

Many communities are beginning to realize the benefits of adopting a "green" building program. The City of Cranston has the opportunity to reduce impacts to the environment, improve building efficiency, and lowering utility bills by encouraging the construction of green buildings.

New advances in building science, technology, and operations are available to designers, builders, and owners who want to "build green" and maximize environmental and economic performance as well as improve the health of people in the building. Environmental benefits include:

- Enhance and protect ecosystems and biodiversity,
- Improve air and water quality,
- Reduce solid waste,
- Conserve natural resources.

Economic benefits include:

- Reduce operating costs,
- Improve employee productivity and satisfaction.

Health and community benefits:

- Improve air, thermal, and acoustic environments,
- Enhance occupant comfort and health,
- Minimize strain on local infrastructure,
- Contribute to overall quality of life.

These improvements would be directed by a set of "green building" principles to encourage owners, architects, developers, and contractors to incorporate meaningful sustainable building goals early in the design process for all facilities.

Offer 'Brownfield' Assistance for Industrial Redevelopment

Brownfields are properties made more expensive and complicated to develop because of the presence or potential presence of a hazardous substance, pollutant, or contaminant. Brownfield sites may include any residential, industrial, or commercial property.

State and federal money is available to support redevelopment of brownfields in Cranston. The City, private businesses, and non-profits can use such funds to analyze the legal, regulatory, and financial barriers to clean and reuse contaminated sites, conduct

planning studies, and undertake community involvement processes. Intense local and regional interest in brownfields for environmental cleanup and urban redevelopment has led to a competitive demand for brownfield funding. State and federal sources include:

- Revolving Loans - EDA, CDBG (HUD)
- Assessment Grants - HUD, EPA, DOT
- Tax Incentives – Low-income housing, mill building, and historic rehabilitation tax credits.

These funds can be used to assess and remediate sites, and to support redevelopment of existing and new uses.

Adopt a Transfer of Development Rights Program (TDR)

The City of Cranston should adopt a transfer of development rights (TDR) ordinance as one tool to help manage growth throughout the City. Hundreds of counties and municipalities across the nation have passed legislation to use TDR programs for this purpose. TDR programs have been used successfully in other jurisdictions to protect thousands of acres of agricultural, historically, or ecologically sensitive land for the purpose of stimulating economic growth and managing urban development.

Under a TDR program, development rights are transferred from "sending areas," which are designated for protection, to "receiving areas," which are designated for growth. Conservation easements permanently protect land in the sending areas from which the development rights have been sold.

The intent of a TDR program is to:

- Protect significant resources with a minimum investment of government funds.
- Encourage development in those areas where infrastructure can support increased development.
- Create a market whereby landowners with property in a sending area may sell their development rights to a developer in a receiving area.
- Compensate landowners for the restrictions placed on their potential development options.

There are several key characteristics of TDR that can help manage land in Cranston:

- Landowners may choose to sell the development rights to their land;
- Development rights in a TDR program are not forfeited but are transferred to another property;
- The sale of development rights is a private transaction between a landowner and a developer, public funds are not involved;
- A TDR program relies on zoning to function.

Manage Land Development Along the Scenic Farm Loop

The City of Cranston should adopt regulations focused on maintaining the land use character and quality along the Scenic Farm Loop. These regulations could include mandatory cluster subdivision regulations to site houses away from scenic view sheds, discouragement of frontage lots with very large frontage requirements, limitations on driveway cuts for safety as well as scenic qualities.

Encourage Cluster Subdivisions

Cluster subdivision designs preserve the landscape character and natural resources of land. However, encouraging cluster subdivisions may require the offer of density bonuses, where more units than allowed by zoning are placed in a certain area of the parcel but important natural resources and views are preserved. The use of a sliding scale of bonus units could be used to obtain more significant protections of views and resources.

Surface Water Quality

Establish Watershed Management Plans

The Pawtuxet River and the Providence and Seekonk Rivers' watersheds in Cranston need to be protected according to RIDEM standards that address EPA National Pollutant Discharge Elimination System (NPDES Phase II) requirements. The Pawtuxet River Authority is designated as the Watershed Council for the Pawtuxet River watershed, which includes more than 95 percent of Cranston. RIDEM issues stormwater permits under the NPDES program and the City should work to ensure compliance with these regulations.

The City is preparing Phase II Stormwater Management Plans, with the assistance of the Pawtuxet River Authority to establish watershed management plans according to RIDEM standards as required by NPDES Phase II requirements. The City should also seek non-point source mitigation funds from the State to assist with meeting NPDES II requirements.

Adopt Low Impact Development Techniques

Watershed protection can be improved through the adoption of standards, such as low impact development techniques. These techniques maintain and enhance the pre-development hydrologic regime of urban and developing watersheds to better manage stormwater from new construction. Said techniques can be applied in areas that range from a whole watershed to a small parking lot. For example, Stormwater Best Management Practices (SBMPs) can be required for the whole watershed or applied to a single development. The City should require BMP's to manage stormwater for all new construction to preserve and protect the watershed.

Create River Restoration Plans

The Pocasset and Pawtuxet Rivers offer scenic views for those that visit, hike, and boat along these rivers. However, some areas have been degraded through development and need additional protection to enhance their scenic qualities. The City should create restoration plans for the banks of these rivers where roadways and developments have degraded them. A restoration plan should include a comprehensive approach including:

- Thinking in terms of a total watershed plan;
- Balancing the river's diversity;
- Maintaining appropriate uses for appropriate places;
- Encouraging direct contact with the river;
- Emphasizing restoration not development;
- Stimulating widespread participation and partnerships.

Public participation is critical since it is needed to implement and sustain any restoration plan. A plan could include support from the non-profits such as the Pawtuxet River Authority, educational, and awareness programs. This may encourage users to help clean the riverbanks and report potential developments that negatively affect these rivers.

Natural Resource Action Program

Table 5-3 Summary of the Actions and Responsibilities for this Plan

	Action	Responsibility
Protection of Cranston’s Natural and Environmental Resources		
NR-1	Use local zoning and land use regulations to assess and mitigate development impacts on rare and endangered species: <ul style="list-style-type: none"> Identify and prioritize critical habitat areas in western Cranston Locate habitats of rare and endangered species. 	City Council Planning Commission Planning Department Conservation Commission
NR-2	Adopt watershed management plans: <ul style="list-style-type: none"> Prepare plans in accordance to RIDEM standards to address potential pollution in compliance with NPDES Phase II requirements Seek non-point source pollution mitigation funds from the state to assist in preparation. <i>Related Action: SF-5</i>	City Council Planning Commission Planning Department DPW
NR-3	Promote a ‘green’ building program for all new construction: <ul style="list-style-type: none"> Consider a LEED-type program to analyze energy efficiency and sustainability. <i>Related Action: SF-6</i>	City Council Plan Commission Planning Department Building and Zoning DPW
NR-4	Ensure that the State and Federal “brownfield” programs are identified as potential resources for redevelopment of industrial sites. <ul style="list-style-type: none"> Continue to work with state and federal agencies to complete the remediation activities at contaminated sites such as the former Ciba-Geigy plant. Expand The List Of Sites 	City Council Planning Commission Planning Department Economic Development DPW Conservation Commission
NR-5	Adopt a Transfer of Development Rights ordinance: Use development regulations to better manage development throughout the City <i>Related Action: LU-6</i>	City Council Planning Commission Planning Department
NR-6	Adopt a ‘farm-based retail’ district: <ul style="list-style-type: none"> Pattern regulation similar to the South County, Rhode Island proposal (Farm and Forestry Strategies Report). 	City Council Planning Commission Planning Department
NR-7	Develop a comprehensive septic system management program. <i>Related Action: SF-12</i>	City Council Public Works Department

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NR-8	<p>Continue to implement the open space preservation strategy for Western Cranston:</p> <ul style="list-style-type: none"> Identify high value agricultural sites and open space areas to be permanently preserved. Identify and implement strategies to protect the aforementioned property. <p><i>Related Action:</i> LU-10</p>	<p>City Council Planning Commission Planning Department Conservation Commission</p>
NR-9	<p>Amend the cluster development regulations to reflect conservation design standards (i.e. conservation subdivisions)</p> <ul style="list-style-type: none"> Use program in order to facilitate the preservation of significant areas of open space and environmentally sensitive areas. Require Conservation Subdivisions as the preferred form of land development. <p><i>Related Action:</i> LU-1</p>	<p>City Council Planning Commission Planning Department</p>
NR-10	<p>Require all subdivisions that propose on-site wells to include an analysis of groundwater:</p> <ul style="list-style-type: none"> Set standards suitable to verify conformance with RIDEM's Rules and Regulations relating to Drinking Water Wells. 	<p>Planning Commission Planning Department DPW</p>
Surface Water Quality		
NR-11	<p>Adopt programs for improvement of the City's lakes and ponds:</p> <ul style="list-style-type: none"> Base the programs on the water quality data collected since the last Comprehensive Plan. Continue to support, and where possible further develop, the volunteer pond watching program for sampling of water quality. 	<p>DPW Conservation Commission</p>
NR-12	<p>Develop management programs for specific water bodies in order to improve water quality and foster increased recreational use.</p> <p><i>Related Action:</i> SF-5</p>	<p>City Council Planning Commission Planning Department DPW Conservation Commission</p>
NR-13	<p>Implement the watershed protection strategies recommended in the State's Scituate Reservoir Management Plan in order to ensure the future quality of this water supply.</p> <ul style="list-style-type: none"> Prohibit underground storage tanks Increase minimum residential lot size to 120,000 sq ft per lot Revise subdivision regulations to require specific erosion and stormwater controls for new road construction and improve water quality in the runoff Exclude the watershed area from future extension of utility services, except to service existing well contamination problems and septic system failures, after exhausting all other remedies. 	<p>City Council Planning Commission Planning Department DPW</p>
NR-14	<p>Implement Best Management Practices (BMP's) for pesticides and fertilizers:</p> <ul style="list-style-type: none"> Work with local farms to implement the practices Work with local businesses to manage bulk storage and movement of the materials 	<p>Conservation Commission</p>
NR-15	<p>Implement Best Management Practices (BMP's) for stormwater and erosion controls:</p> <ul style="list-style-type: none"> Include requirements for all new subdivision and development projects. Implement the recommendations of the Fuss & O'Neill stormwater management study. 	<p>Planning Commission Planning Department Conservation Commission</p>
NR-16	<p>Adopt an Underground Storage tank ordinance.</p>	<p>City Council DPW Conservation Commission</p>

5. NATURAL RESOURCES

NR-17	Ensure that municipal salt storage piles are adequately covered.	City Council DPW
NR-18	Establish Watershed Management Plans, where necessary in cooperation with adjacent communities.	City Council Plan Commission Planning Department Conservation Commission
NR-19	Adopt standards, such as Low Impact Development techniques, to better manage stormwater from roadways in new construction. <ul style="list-style-type: none"> Reduce impervious surfaces in new developments such as with porous pavements and reduced travel lane widths to reduce runoff. <i>Related Action:</i> LU-2	Planning Commission Planning Department Conservation Commission DPW
NR-20	Create restoration plans for the banks of the Pocasset and Pawtuxet rivers where roadways and development have degraded the rivers	Planning Commission Planning Department Conservation Commission DPW
NR-21	Adopt a nutrient loading ordinance: <ul style="list-style-type: none"> Reduce pollutant loading to the rivers, streams and water bodies. <i>Related Action:</i> SF-5	City Council Planning Commission Planning Department Conservation Commission