WELCOME

Eastern Subwatersheds

Stormwater Management Retrofit Study

Online Information Session

July 31 to September 19, 2014

Eastern Subwatersheds Stormwater Management Retrofit Study

- This study is one of seventeen projects in the City's Ottawa River Action Plan.
- The purpose of the study is to develop improvements to stormwater management within existing urban areas of the Eastern Subwatersheds.

Objective of the Information Session

•The following information provides an overview of existing environmental conditions, describes how different retrofit scenarios were identified and evaluated, and summarizes the draft Preferred Retrofit Plan.

•Please review the information and use the comment forms to provide any ideas, comments or suggestions you may have.

Your feedback is important to us!

Why is a Retrofit Plan required?

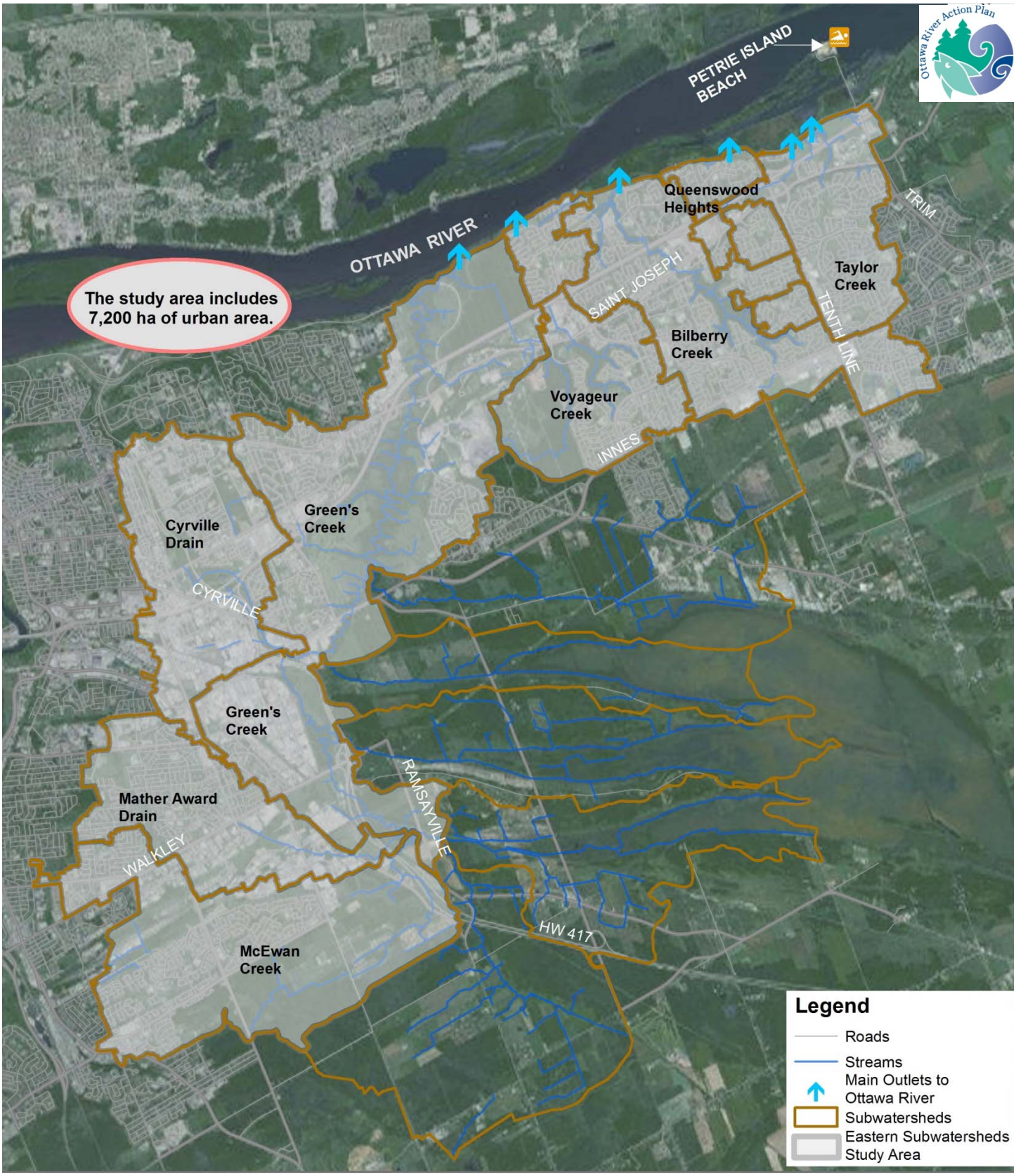
- Urban development within the Eastern Subwatersheds took place with little or no management of stormwater.
- When it rains, stormwater runs off hard surfaces like roofs, roads and parking lots, is transported in storm sewers and then discharged directly into local creeks or the Ottawa River.
- Uncontrolled stormwater carries pollutants and leads to significant increases in the volume of runoff and higher flow rate in streams.
- This affects water quality, increases erosion, degrades aquatic habitat, threatens infrastructure and contributes to beach closures at Petrie Island.

When implemented, the Retrofit Plan will:

- Improve water quality in the creeks, the local reach of the Ottawa River and at Petrie Island Beach
- Reduce flooding and erosion in the creeks
- Improve the health of the creeks

Study Area

PLANNING AND GROWTH MANAGEMENT
URBANISME ET GESTION DE LA CROISSANCE



Objectives of the Stormwater Management Retrofit Plan

1.Reduce flood risk to public health and safety and to property along the Creek corridors.
2.Reduce erosion impacts in the Creek corridors that are detrimental to property, infrastructure and stream habitat.
3.Preserve/re-establish a more natural hydrologic cycle.
4.Improve water quality in the Creeks and the Ottawa River by reducing the impact of runoff.
5.Reduce the impacts of runoff on Petrie Island Beach.
6.Protect, enhance or rehabilitate natural features and functions along the Creek corridors.
7. Increase public awareness of stormwater management and public involvement.

Existing Conditions

Built Environment:
Land use in the study area is primarily single family residential. There are about 650km of storm sewers, 90 storm sewer outfalls and 24 existing stormwater management facilities in the study area.

Hydrology:
Average imperviousness ranges from about 29% for Voyageur Creek to about 38% for Mather Award Drain and 49% for Cyrville Drain. When it rains, stormwater runs off very quickly, resulting in high peak flows and velocities that erode creek banks.

Stream Processes:
Many of the Eastern Subwatersheds' headwater streams have been eliminated or piped. Bank erosion is common along many reaches, with the most active erosion taking place along Bilberry, Voyageur and Taylor Creeks.

Water Quality:
Water quality is characteristic of many urban watercourses: the levels of bacteria, chlorides, nutrients and heavy metals in the creeks exceed the Provincial Water Quality Objectives.

Aquatic Ecology:
There is a variety of cool and warm water fish species in Taylor, Bilberry and Voyageur Creeks. The urban tributaries to Green's Creek have warm water species present.

Degraded water quality

Yellow Perch

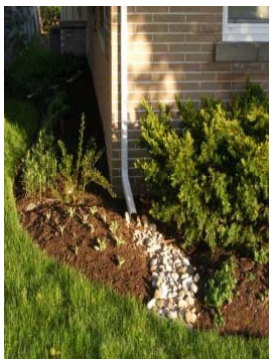
Erosion

How was the Study carried out?

The Retrofit Study has been conducted as a Master Plan under the Municipal Class Environmental Assessment (EA) process. It looked at how stormwater management measures can be applied to existing communities.

The retrofit measures considered in the Study include:

- **Lot Level** measures that can reduce runoff where it is generated - such as redirecting downspouts
- **Conveyance** measures that transport runoff - such as bioretention cells, swales, and perforated pipes
- **End-of-Pipe** measures that capture runoff at the end of the drainage system and release it slowly - such as wet ponds and constructed wetlands
- **Stream Rehabilitation** measures that can reduce erosion, improve fish habitat and protect infrastructure



Roof Downspout Redirection

Bioretention/ Bioswales

Constructed Wetland

Perforated Pipe (during construction) used to promote infiltration

Permeable Driveway

Hybrid Wet Pond/Wetland

Alternative Retrofit Strategies

Three alternative retrofit strategies were developed that represent a range of effort to retrofit stormwater management measures. These strategies were compared with the existing condition – the "Do Nothing" strategy.

1. Opportunistic Implementation:

A lower level of lot level (10%) and conveyance measures combined with the most effective end-of-pipe facilities (5 facilities).

2. Moderate Implementation:

A moderate level of lot level (30%) and conveyance (30%) measures combined with additional end-of-pipe facilities in (10 facilities).

3. Significant Implementation:

A significant level of lot level (50%) and conveyance (50%) measures combined with all feasible (screened) end-of-pipe facilities (20 facilities).

Bioretention/ Bioswales

Rain Garden

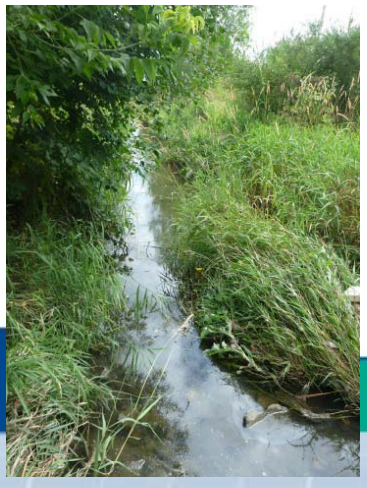
Infiltration Basin

Evaluation of Alternative Strategies

- Water Quality
- Runoff Impacts at Petrie Island
- Flood Risk
- Erosion
- Hydrologic Cycle
- Open Space and Parks
- Natural Features
- Life Cycle Cost
- Complexity of Implementation

•Modeling was applied to estimate the relative effectiveness of each strategy in removing key pollutants such as **total suspended solids**, **total phosphorus** and ***E.Coli* bacteria**.
•Modeling will also be applied to determine the reduction of *E. coli* at Petrie Island Beach.

McEwan Creek



Petrie Island

Orléans

Creek Chub

Results of the Evaluation

Strategy	Overall Score	Cost
1. Opportunistic	75	$65M
2. Moderate	109	$136M
3. Significant	112	$200M

Note: costs = 50 year life cycle cost

- The **Opportunistic** strategy would provide minimal environmental improvements and require relatively minor changes in current public behavior and City programs.
- The **Moderate** strategy would provide moderate environmental improvements and require a considerable shift in current public behavior and City programs.
- The **Significant** strategy would provide considerable environmental improvements but may be very difficult to achieve given both the higher cost and significant change in public behavior that would be required.

The Draft Preferred Retrofit Strategy

The Moderate Stormwater Management Retrofit Strategy has been selected as the Draft Preferred Strategy because:

- it provides considerable improvement in pollutant removal (19 to 23% removal of *E.coli* and 18 to 24 % removal of suspended solids)
- it results in reductions in the frequency and duration of flows in the watercourses leading to reduced risk of flooding and erosion
- it will require a reasonable level of effort to implement an achievable program of a range of retrofit measures (lot level conveyance, end-of-pipe and stream rehabilitation)
- it provides a gradual return to a more natural flow regime in the creeks, providing opportunities for stream rehabilitation

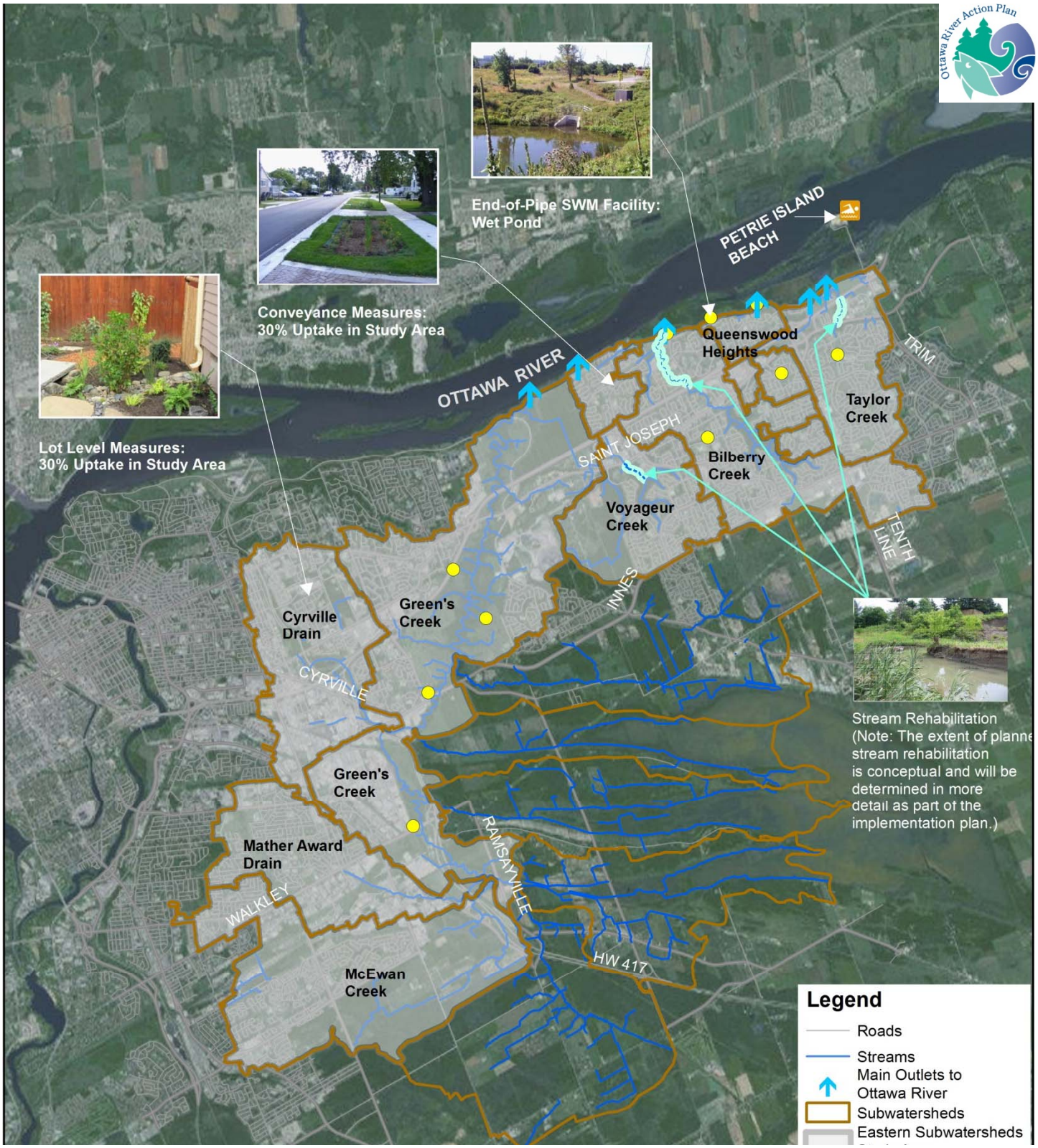
What does the Draft Preferred Retrofit Strategy include?

The draft Preferred Retrofit Strategy includes:

- The "greening" of about 30% of streets with the addition of bio-retention measures and/or perforated pipes as road reconstruction and re-surfacing are undertaken on a life cycle basis
- A variety of lot level measures such as rain gardens and permeable pavers for up to 30% of residential, commercial, industrial and institutional lands
- Construction of 10 stormwater management facilities
- Selective stream rehabilitation projects




Draft Preferred Stormwater Management Retrofit Plan



Next Steps

July to September 2014	• Implementation Plan • Develop Guidelines for New Development • Finalize Retrofit Plan
Late Fall 2014	• Post Notice of Completion of Class EA and provide 30 day review period
2015	• Begin implementation of Retrofit Plan