

## Mystic Collaborative Project


Blue Cities Approach for Restoring the Chelsea River Sub-watershed



CRWA, MyRWA and CCAG



## CRWA's Blue Cities Initiative




Peabody Square, today

Peabody Square, plan for 2009

“Blue Development incorporates designs for the built environment that engage with every stage of the water cycle. It identifies critical watershed problems, finds potential solutions, and brings people together to support restoration efforts.”

**CRWA's Blue Cities Guide, 2008**



## Building a Blue City

**Goals:**

- Identify restoration approaches that will restore hydrologic integrity
- Develop “green infrastructure” concepts
- Use redevelopment to drive subwatershed scale solutions
- Build on links to open space, public health and public realm needs





## Mystic River Collaborative

- CRWA, MyRWA, CCAG
- Goals: Develop Blue Cities plan for Chelsea Creek
  - Greener streets
  - Less flooding, less pollution
  - Cleaner Creek
  - Protect infrastructure
  - Green routes through neighborhood
  - Better access to Chelsea Creek
- Community outreach/input
- Build a strong coalition in support of vision
- Create an action plan





### Step 1: Sub-watershed Analysis and Impact Assessment

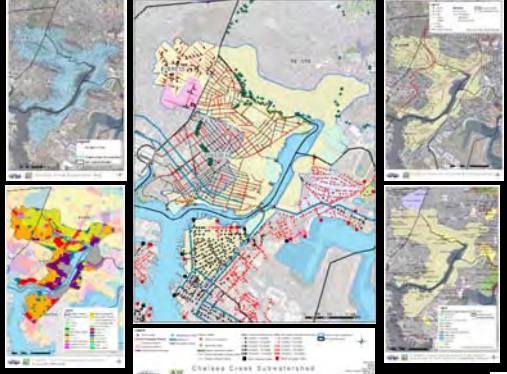
Study Area: Chelsea Creek Sub-watershed




CRWA



### Chelsea Creek Sub-watershed Existing Conditions Assessment

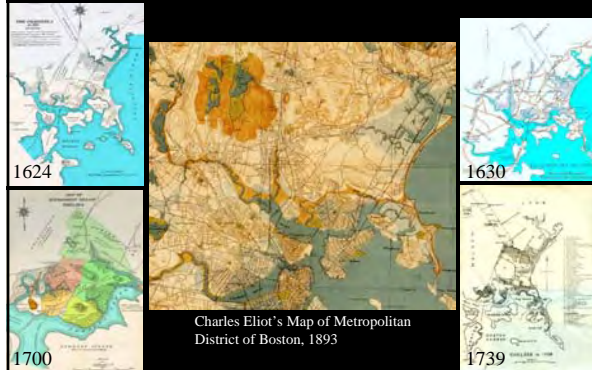


CRWA



## Step 2: Understanding the Planning and Implementation Context

### Historical Context



### Planning Context



### Chelsea Creek/Mill Creek Water Quality Assessment Summary

Receiving Waterway	Massachusetts Year 2006 List of Integrated Waters		Boston Harbor 1999 Water Quality Assessment Report		
	Status	Causes (Pollutants needing TMDL)	Status	Causes	Sources
Chelsea River* (MA71-06)	Category 5: waters requiring a TMDL	priority organics; unionized ammonia; organic enrichment; low DO; pathogens; oil and grease; taste, odor and color; turbidity; (objectionable deposits)	<p>Asbestos Life: Non-support</p> <p>Fish Consumption: Non-support</p> <p>Primary contact: Non-support</p> <p>Secondary contact: Non-support</p> <p>Aesthetics: Non-support</p>	<p>Oil &amp; grease, unknown</p> <p>Unknown toxicity</p> <p>Oil &amp; grease, taste &amp; odor, unknown, trash &amp; debris</p> <p>Oil &amp; grease, taste &amp; odor, unknown, trash &amp; debris</p> <p>Oil &amp; grease, taste &amp; odor, unknown, trash &amp; debris</p>	<p>Urban runoff/storm sewers, industrial point sources, contaminated sediments, spills</p> <p>Unknown</p> <p>Urban runoff/storm sewers, industrial point sources, spill, CSO</p> <p>Urban runoff/storm sewers, industrial point sources, spill, CSO</p> <p>Urban runoff/storm sewers, industrial point sources, oil spills, CSO</p>
Mill Creek (MA71-08)	Category 5: waters requiring a TMDL	pathogens			

### Existing Water Quality Data for Chelsea River/Mill Creek

#### Monitoring Organizations

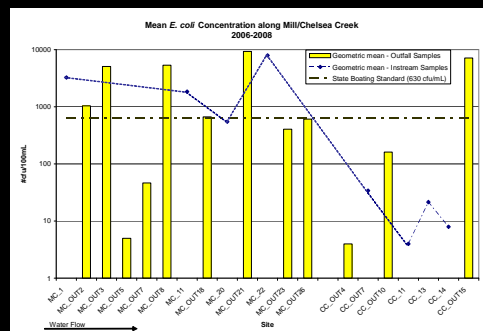
- Mystic River Watershed Association
- EPA
- MWRA
- City of Chelsea
- DEP
- Data Obtained by CRWA



### Chelsea drain and sewer system



### Chelsea River/Mill Creek E. coli data



## Water Quality Assessment Summary



Some problems are *dry weather* problems: sewers connected to or leaking into drains going directly to the river

Some problems are *wet weather* problems: polluted stormwater runoff is impacting the river



Blue Cities designs focus on *wet weather* problems



## Chelsea Creek Sub-watershed

Sub-watershed Delineation and Prioritization



- Sub-watersheds
- Green Space
- Combined Sewer Outfall
- Storm Drain Outfall



## Step 3: Developing Goals

Study Area: Chelsea Creek Sub-watershed

- Water quality goals
- Creek access goals
- Street and public realm goals
- Tree canopy goals
- Open space goals
- Political and economic goals



## Step 4: Developing Designs

community input  
strategic opportunities  
feasibility  
iterative process



## Step 5: Action Plan

Near term  
Medium term  
Long term



## Chelsea Creek Sub-watershed

Sub-watershed Delineation and Prioritization



### Priority Sub-areas

- 1) Headwaters subarea
- 2) Crescent Ave. subarea
- 3) Irving Oil / Suffolk Downs subarea
- 4) Hess Site subarea
- 5) Marginal St / Eastern Ave. subareas



Sub-watershed/ Neighborhood Assessment  
Thank you volunteers!



Chelsea Creek Sub-watershed  
Survey Routes and Neighborhood Study Areas

- 1) Headwaters
- 2) Crescent Ave. / Mill Hill
- 3) Irving Oil / Suffolk Downs
- 4) Hess Site
- 5) Marginal St / Eastern Ave.



Sub-watershed/Neighborhood Assessment  
Survey route lengths

Neighborhood/Subarea	Route	Distance (miles)
Headwaters	H-1A	1.27
	H-1B	1.31
	H-1C	2.1
	H-1D	1.5
Crescent Ave./Mill Hill	CA2	1.3
Irving Oil/Suffolk Downs	IO3	2.16
Hess Site	HS4	1.5
Marginal Street	MS5	2



Results: Section A Neighborhood  
Characterization  
Primary Neighborhood Land Use

	Residential	Residential w/ some commercial	Commercial w/ some residential	Non-residential
Headwaters	★	★	★	
Crescent Ave.		★		
Irving Oil		★		
Hess Site		★		
Marginal Street			★	



Results: Section B Yard and Lawn  
Conditions  
Primary Yard Cover

	Pavement/ Impervious Cover	Garden	Lawn/ Grass
Headwaters		★	★
Crescent Ave.			★
Irving Oil	★		★
Hess Site	★		
Marginal Street	★		



Results: Section B Yard and Lawn  
Conditions



Nichols Street - Everett



Prescott Condos - East Boston



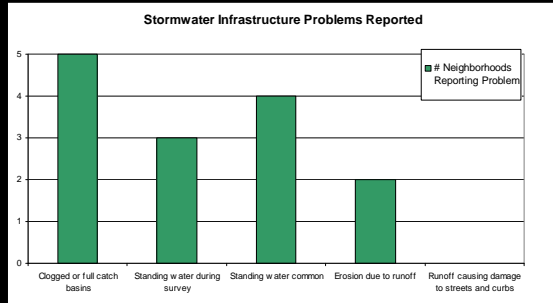
Shawmut Street - Chelsea



Crescent Ave. - Chelsea



## Results: Section C Stormwater Drainage



## Results: Section C Stormwater Drainage

Where were these problems observed?

	Clogged/Full Catch Basins	Standing Water During Survey	Standing Water Common	Erosion due to Runoff
Headwaters	★	★	★	★
Crescent Ave.	★			
Irving Oil	★	★	★	★
Hess Site	★		★	
Marginal Street	★	★	★	★



## Clogged Catch Basins



## Standing Water

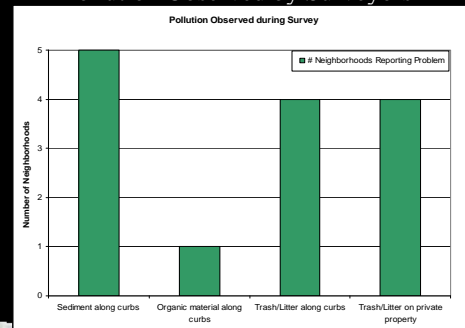


## Sanitary Sewer Problem Observed



## Results: Section D Non-Point Source Pollution

Pollution Observed by Surveyors



Rated 3 or above on question 18



### Results: Section C Stormwater Drainage

Where was pollution observed?

	Sediment along curb	Organic material along curb	Trash along curb	Trash on properties
Headwaters	★		★	★
Crescent Ave.	★			★
Irving Oil	★		★	★
Hess Site	★	★	★	
Marginal Street	★		★	★



Rated 3 or above on question 18

### Pollution Observed During Surveys



Property along Shawmut Street - Chelsea



Sediment accumulation Washington Ave. - Chelsea

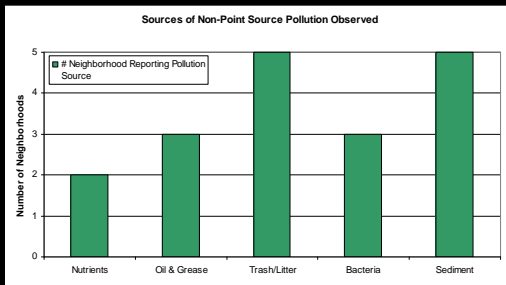


Catch basin along East Eagle Street - East Boston



### Results: Section D Non-Point Source Pollution

Pollution Sources Observed by Surveyors



### Results: Section C Stormwater Drainage

Where were pollution sources observed?

	Nutrients	Oil & Grease	Trash	Bacteria	Sediment
Headwaters	★		★	★	★
Crescent Ave.			★		★
Irving Oil		★	★	★	★
Hess Site		★	★	★	★
Marginal Street	★	★	★		★



### Non-Point Source Pollution Sources Observed



Trash pile Guam Rd. - Chelsea



Trash and sand pile at Boston DPW Yard - East Boston



Construction along Eastern Ave - Chelsea



Uncovered dumpster along Ferry St - Everett



### Results: Section E Rooftops and Down Spouts

Where is most rooftop runoff going?

	Impervious Cover (driveway/road)	Pervious Cover (lawn/garden)	Direct to Storm Drain	Rain Barrel or Rain Garden
Headwaters	★	★		
Crescent Ave.		★		
Irving Oil	★			
Hess Site	★			
Marginal Street	★			



**Results: Section E Rooftops and Down Spouts**  
Is any runoff going to rain barrels or rain gardens?



**Results: Section E Rooftops and Down Spouts**  
Is any runoff going to rain barrels or rain gardens?



	Rain Gardens
Headwaters	Very few ★
Crescent Ave.	
Irving Oil	
Hess Site	
Marginal Street	Very few ★



**Results: Section E Rooftops and Down Spouts**  
Is any runoff going to rain barrels or rain gardens?

	Rain Barrel
Headwaters	★
Crescent Ave.	
Irving Oil	
Hess Site	
Marginal Street	



Rain Barrel in use along Nichols St. - Everett



**Reducing Non-Point Source Pollution**  
**Steps to take in your neighborhood**

- Hold a neighborhood clean up
- Construct a rain garden on a public site
- Increase public awareness about:
  - Littering/waste management
  - Sediment control (sediment piles, construction sites, street sweeping)
  - Stormwater friendly properties: rain barrels, rain gardens, reduced lawn cover
  - “Green infrastructure”



**Results: Section F Open Space and Connectivity**  
Can you access Chelsea Creek?

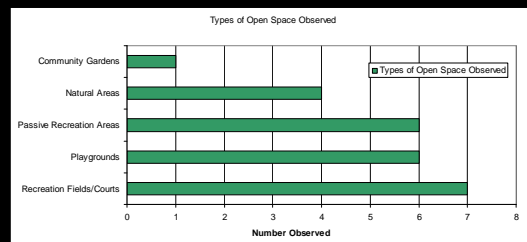
	Visible	Physically Accessible
Headwaters		
Crescent Ave.	★	
Irving Oil	★	★
Hess Site	★	★
Marginal Street	★	★



Chelsea Creek Access at Condor St. Urban Wild



**Results: Section F Open Space and Connectivity**  
**Types of Open Space**



## Open Space



## Results: Section G Green Street Potential

### Streets Identified as Good Green Street Candidates

Everett: Woodlawn St.  
Elm St.  
Jefferson Ave.  
Nichols St. (maybe)

Chelsea: Washington Ave.  
Springvale Ave.  
Crescent Ave.  
Louis St.  
Willow St.  
Shawmut St.  
Central Ave.  
Eastern Ave. (maybe)

East Boston: Glendon St.  
Vallar Rd.  
Waldemar Ave.  
Condor St. (maybe)  
Putnum St. (maybe)



## Results: Assets and Priorities for Action Headwaters Neighborhood



- Assets
- Good lawns
  - Using rainwater properly
  - A lot of green space
  - Many gardens
  - Area is well kept and clean
  - Healthy trees
  - Potential for rain gardens
  - Great park
  - Minimal commercial and industrial activity



## Results: Assets and Priorities for Action Headwaters Neighborhood



- Priorities for Action
- Clean Terry and Nichols Streets to reduce trash in catch basins
  - More trees
  - Clean storm drains
  - Use more rain gardens and rain barrels
  - Address flooding problems at housing development
  - Improve access to Chelsea Creek



## Results: Assets and Priorities for Action Crescent Ave. Neighborhood



- Assets
- Clean streets
  - School that provides recreational space

## Results: Assets and Priorities for Action Crescent Ave. Neighborhood



- Priorities for Action
- More trees
  - Improved access to Chelsea Creek

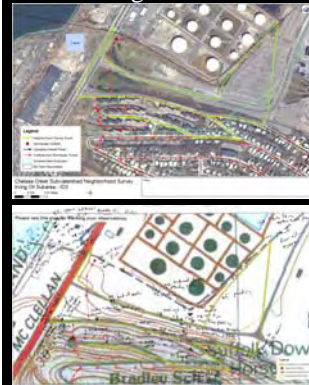
Results: Assets and Priorities for Action  
Irving Oil Suffolk Downs Neighborhood



Assets

- Good view of Chelsea Creek
- Potential for increased access to Chelsea Creek
- Some open space
- Storm drain stenciling

Results: Assets and Priorities for Action  
Irving Oil Suffolk Downs Neighborhood



Priorities for Action

- Improved access to Chelsea Creek
- Improved recreational opportunities along Chelsea Creek
- “Green” stormwater infrastructure

Results: Assets and Priorities for Action  
Hess Site Neighborhood



Assets

- Access to open space including Condor St. Urban Wild and American Legion Park
- Access to urban gardens
- Strong neighborhood associations and community organizations

Results: Assets and Priorities for Action  
Hess Site Neighborhood



Priorities for Action

- Address lack of green space
- Traffic calming measures
- Green space and infrastructure that promote physical fitness (i.e. walking and bike paths)
- Reduce litter

Results: Assets and Priorities for Action  
Marginal Street Neighborhood



Assets

- Some open space
- Some access to Chelsea Creek
- Creek is being used by residents for fishing

Results: Assets and Priorities for Action  
Marginal Street Neighborhood



Priorities for Action

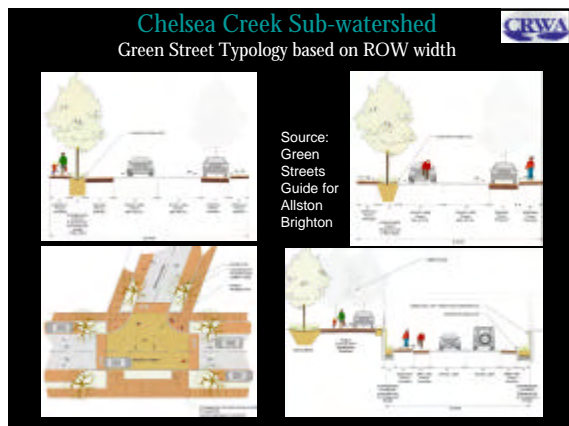
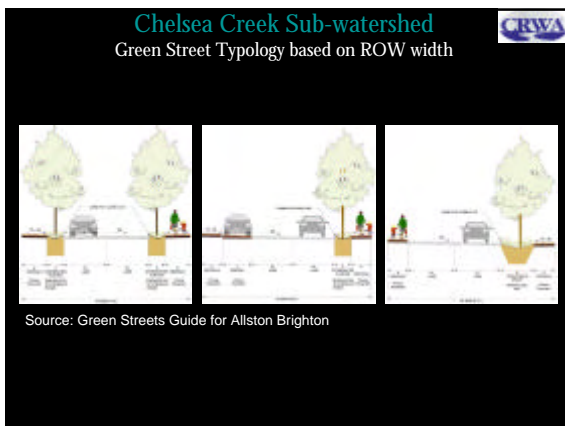
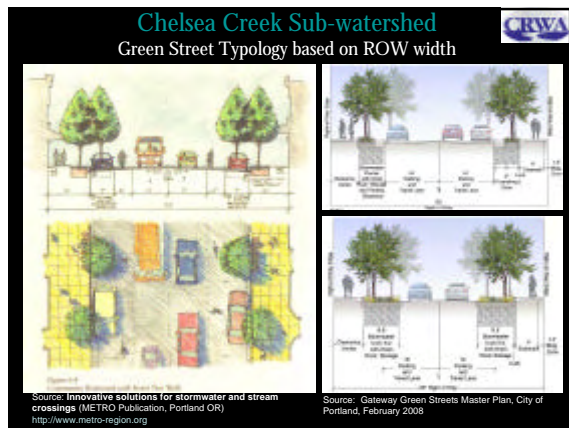
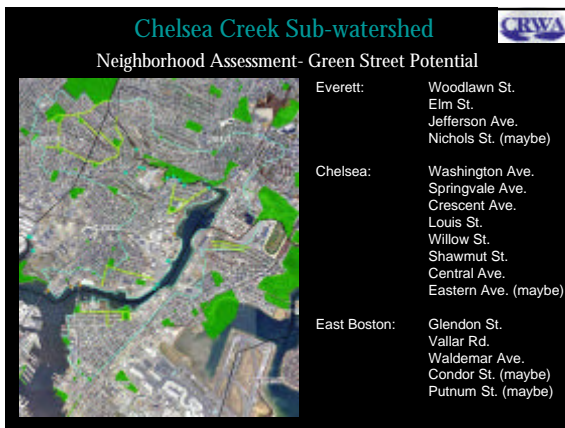
- Improved upkeep and maintenance of Creek access areas to promote use
- Improved marking of access routes
- Education about water quality and fish consumption

Thanks again for all great information and photos!



Questions or Comments?





### Chelsea Creek Sub-watershed

Toolkit of Best Management Practices - Streets

Curb Extensions with Planters    Permeable Paving    Street Trees

Planters within sidewalks    Permeable Pavers

### Chelsea Creek Sub-watershed

Toolkit of Best Management Practices- Large Non Residential Sites

Daylighted Streams    Planters along buildings

Planters in Courtyards    Vegetated Swales in parking lots

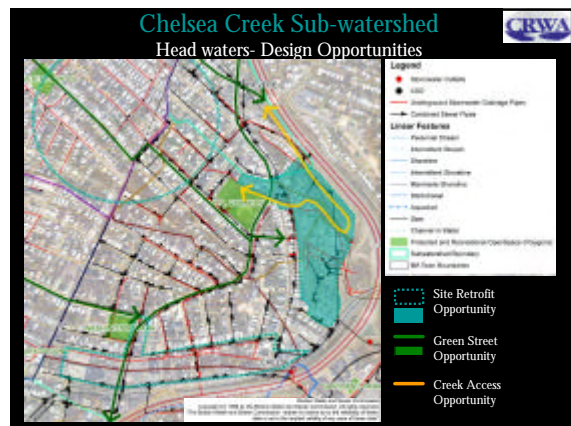
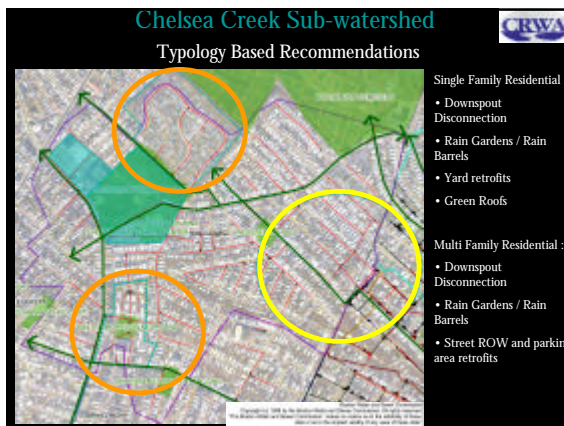
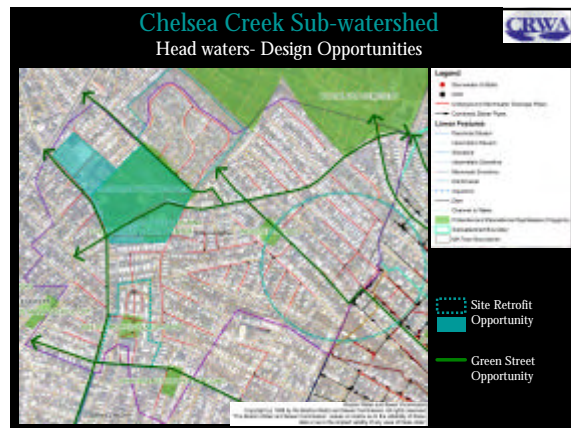
Planters in parking lots

### Chelsea Creek Sub-watershed

Toolkit of Best Management Practices - Residential Properties

Rain garden    Downspout Disconnection

Green roof    Rain barrel    Cistern







Chelsea Creek Sub-watershed  
Condor Street Subarea



Chelsea Creek Sub-watershed  
Condor Street Subarea



Chelsea Creek Sub-watershed  
Condor Street Subarea



Chelsea Creek Sub-watershed  
Condor Street Subarea

