

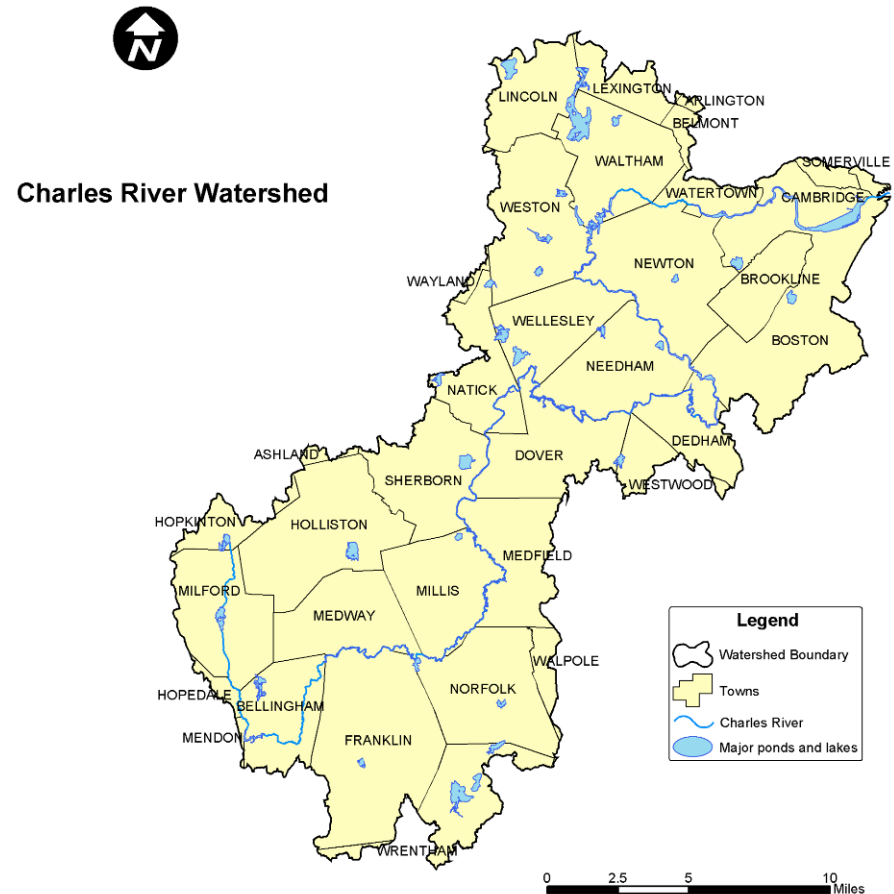
CRWA's Residential Rain Garden Program

Elisabeth Cianciola
NEWEA Spring Meeting
June 5, 2017



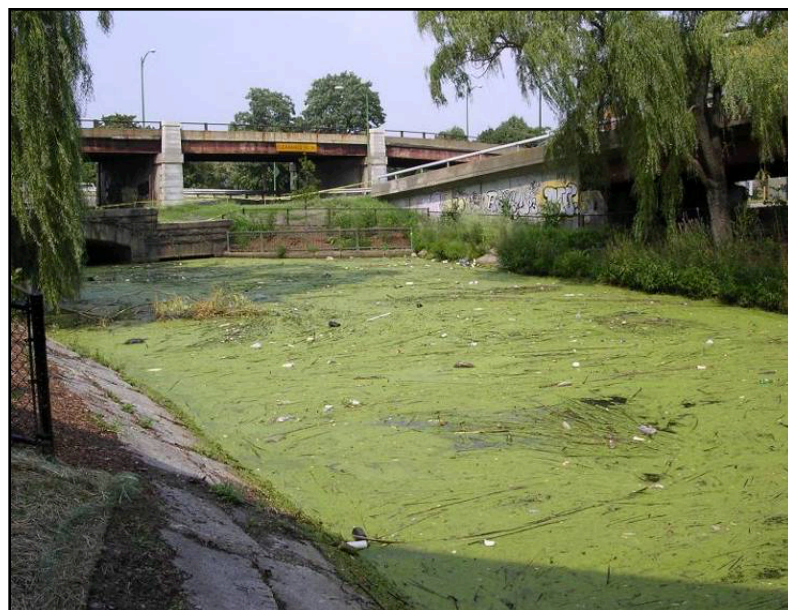
Charles River Watershed Association

- Environmental science and advocacy organization founded in 1965
- Mission: To use science, advocacy and the law to protect, preserve and enhance the Charles River and its watershed

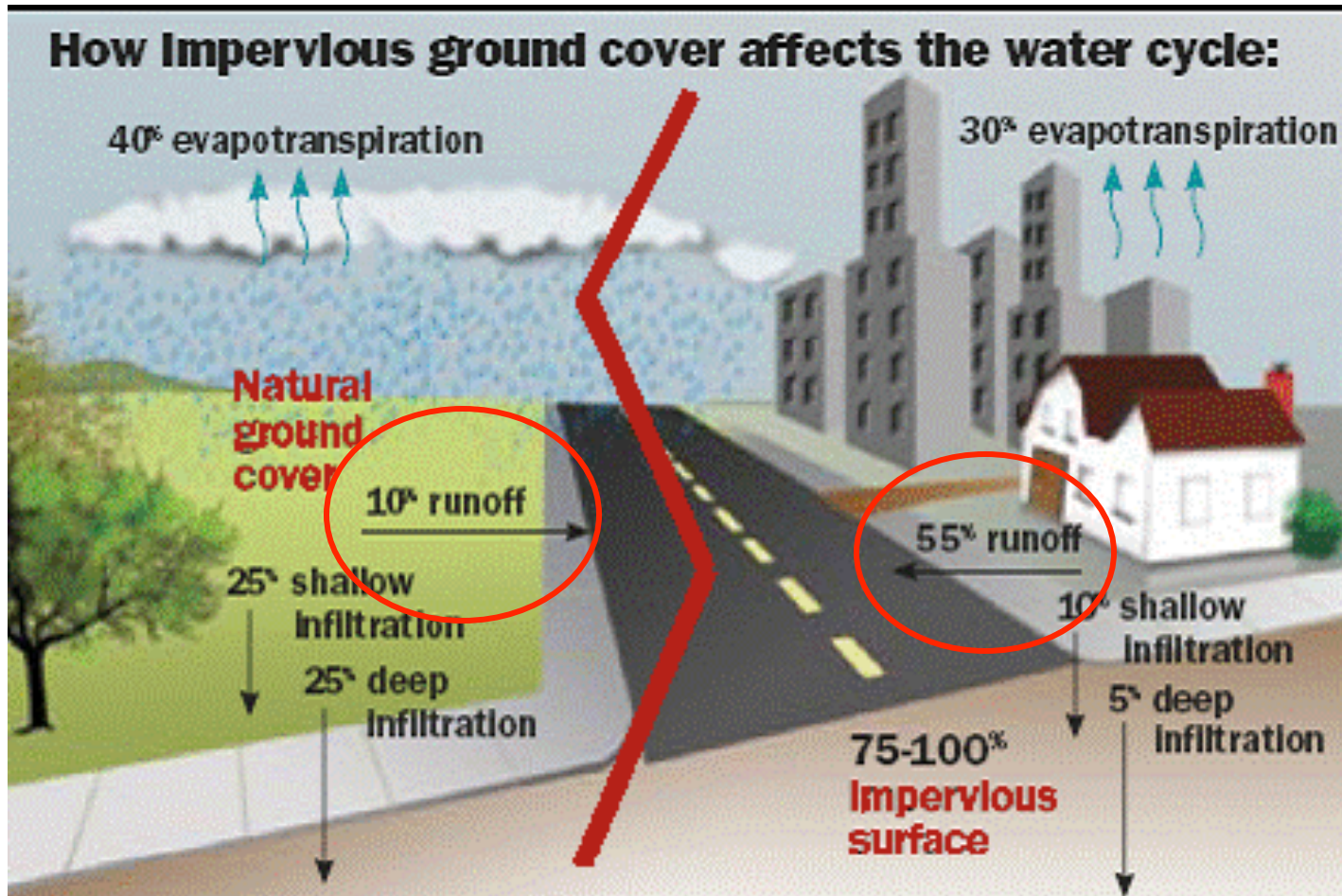


Impacts of Urbanization on Rivers

- Water quality
- Sediments
- Floods and low flows
- Groundwater
- Ecosystem and habitat
- Algal blooms



Impacts of Urbanization on Natural Water Cycle



In Massachusetts, average annual *runoff increases* from 4.2" to 23" and groundwater *recharge decreases* from 21" to 6.3".

CRWA's Blue Cities Initiative



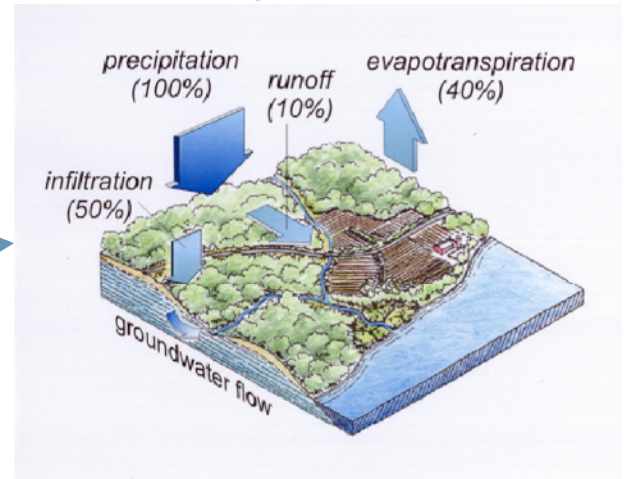
Blue Cities is a water-oriented approach to urban development and redevelopment that promotes designs for the built environment that engage with every stage of the water cycle. Going beyond “green” building, “blue cities” embraces green infrastructure design with the aim of restoring the natural water cycle in the built environment



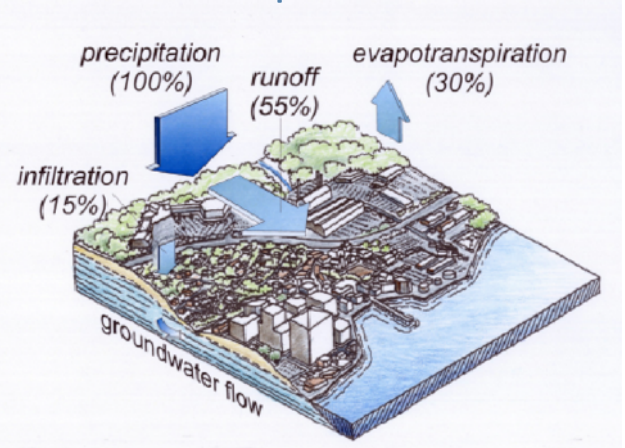
CRWA's Blue Cities Initiative

- Water-centric planning and urban design
- Mimic natural water cycle and restore hydrology
- Retrofit sites to incorporate “green infrastructure”
- Build on links to open space, public health and public realm needs

Pre-development



Post-development



Residential/ small site-scale approaches

- Rain gardens
- Cisterns/ rain barrels
- Stormwater planters



#1 Find a landowner partner

Partnership with Franklin Department of Public Works

Good partner because:

- Have history of building & maintaining GI
- Town uses well water for drinking water supply
- Water quality improvements in upper watershed benefit the rest of the river

#2 Seek Funding

Potential costs

- Contracting with a landscape architect
- Materials to build a demonstration project
 - Educational signage
- Developing & printing workshop materials
- Refreshments for workshop
- Recording the workshop
- Hosting a webpage or blog
- Developing & hosting a database
- Materials for participants to build their own GI

#3 Plan the workshop

Selecting date and location

- Indoor meeting space for 15-20 people
- Public parking or public transportation options
- Screening for demonstration project suitability
 - Public vs. private land
 - Site access for DPW/contractor vehicles
- Spring vs. fall workshop dates
- Identify resources you can provide to facilitate implementation

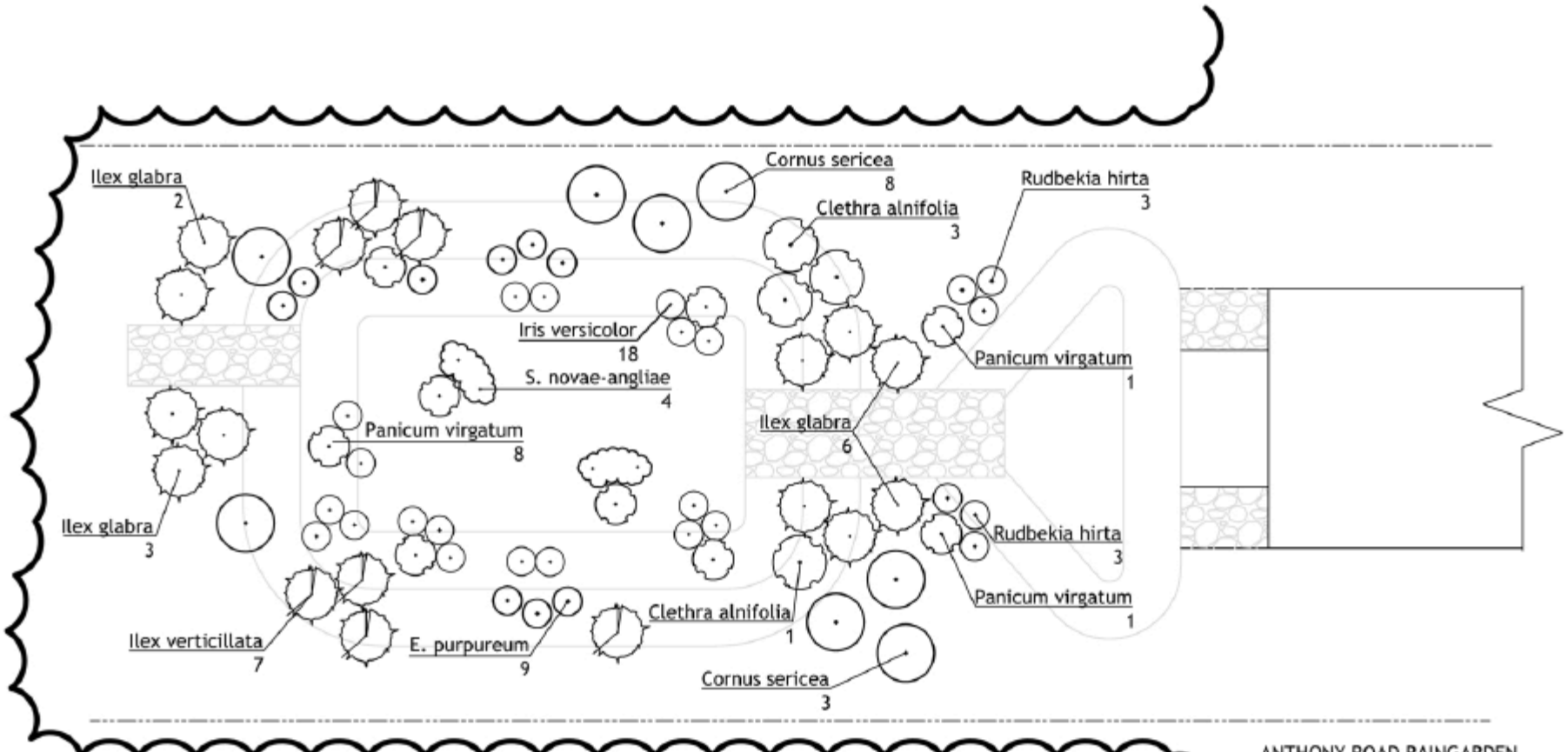
#4 Advertise the workshop

Easily manage registration online (ex. Eventbrite)

Potential resources

- Local newspaper
- Town website, Facebook page, Twitter, Patch, etc.
- Community groups
 - email invitations to members
 - hang flyers at library, Town Hall, schools, rec centers, etc.

#5 Plan the demonstration



ANTHONY ROAD RAINGARDEN
MAY 2016
SCALE 1" = 10'

NAME	QTY.
Clethra alnifolia	4
Cornus sericea	8
Eupatorium purpureum	9
Ilex glabra	11
Ilex verticillata	7
Iris versicolor	18
Panicum virgatum	9
Rudbeckia hirta	6
S. novae-angliae	4

#6 Compile workshop rain garden content

- Define presentation roles
- Develop user-friendly guidance specific to the location
Don't reinvent the wheel!
- Develop strategy for supporting workshop participants after the workshop

preservation, protection...
for *your* enjoyment!



#7 Conduct workshop







#8 Workshop Follow-up

- Ask participants to provide feedback before they leave the workshop for future reference
- Identify a project team member to contact participants at a later time
 - Did any incentives provided work?
 - What are the barriers to implementation?
- Collect specifications to add demonstration project and participants' projects to database

#9 Track results

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Input Infiltration BMPs											
2		<u>Site address</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Impervious drainage area (sq ft)</u>	<u>Rain garden area (sq ft)</u>	<u>Water height in garden (ft)</u>	<u>Media depth (ft)</u>	<u>Water Quality Depth (ft)</u>	<u>Irrigation reduction (ft3)</u>			
3		257 Fisher Street	42.078821	-71.408365	1577.50	135.00	1.17	1.25	0.14	67.23			
4		Panther Way	42.090289	-71.412555	25700.40	2644.00	1.50	2.00	0.24	1,317			
5		Del Carte	42.095301	-71.382554	34412.40	2000.00	2.50	2.00	0.19	996			
6		Anthony Road	42.095445	-71.437228	9480.00	393.00	1.00	1.50	0.07	196			
7		Pleasant & Miller					1.00	1.25	#DIV/0!	0			
8									#DIV/0!	0			
9									#DIV/0!	0			
10									#DIV/0!	0			
11									#DIV/0!	0			
12									#DIV/0!	0			
13									#DIV/0!	0			

DRAFT

Infiltration BMP
(no underdrain)

Treatment Depth (in)

References

0.25 0.5 1.0

See Spreadsheet 9: Structural BMP Effectiveness Matrix

Use this calculator for determining phosphorus reduction credits resulting from Infiltration BMPs. Required input fields are highlighted in yellow. All other fields are calculated.

Infiltration basin /
raingarden /
bioretention areas

60% 80% 95%

Infiltrating water
quality swale

60% 80% 95%

Infiltration trench /
subsurface
retention

50% 75% 90%

Porous pavement

50% 75% 90%

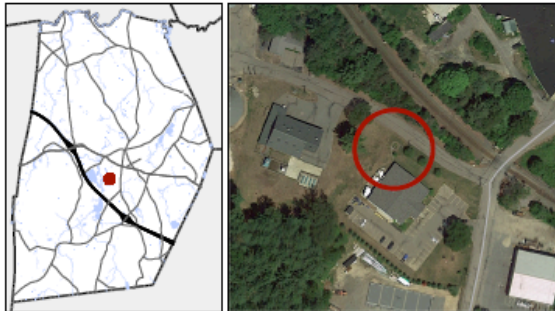
Input Infiltration BMPs

Site Name	BMP Type	Land Use	Impervious PLE rate (lb/acre/yr)	Impervious Catchment Area (acres)	Water Quality Depth (in)	Water Quality Volume (yd ³)	Treatment Effectiveness	Reduction Credit (lbs/yr)	Reduction Credit (kg/yr)
257 Fisher Street	Infiltration basin / raingarden / bioretention areas	Medium Density Residential	1.52	0.04	1.00	4.87	90%	0.049	0.0224
Panther Way	Infiltration basin / raingarden / bioretention areas	Medium Density Residential	1.52	0.59	1.00	79.32	95%	0.85	0.39
Del Carte	Infiltration basin / raingarden / bioretention areas	Low Density Residential	1.07	0.79	1.00	106.21	95%	0.80	0.36
Anthony Road	Infiltration basin / raingarden / bioretention areas	Low Density Residential	1.07	0.22	1.00	29.26	95%	0.22	0.10
Pleasant & Miller			#N/A	0.00		0.00	#N/A	#N/A	#N/A
0.00			#N/A	0.00		0.00	#N/A	#N/A	#N/A





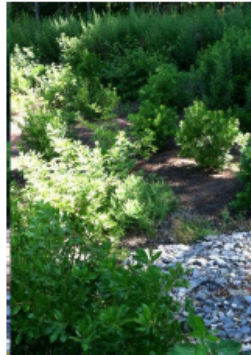
#10 Public outreach



rain garden SITE #5

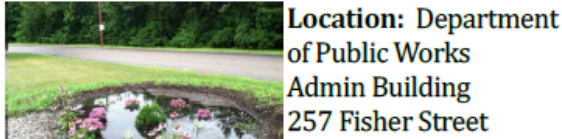
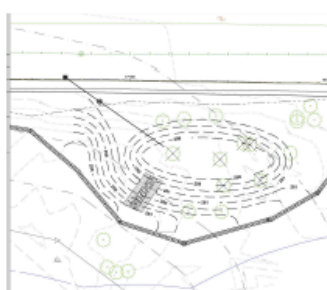
Location: Panther Way
North of the Franklin
Police Station

Water Source: Impervious
surface (16,200 sq ft of
roadway)
Stormwater flows along
roadway into catchbasin
and is then piped into
the rain garden.



Rain Garden Size:
40,900 cu ft
Designed to hold
water from a 100
year storm.

Plants:
Inkberry, Red Twig
Dogwood &
Bayberry (shrubs)



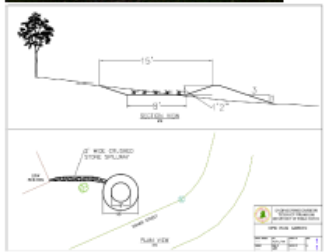
Location: Department
of Public Works
Admin Building
257 Fisher Street



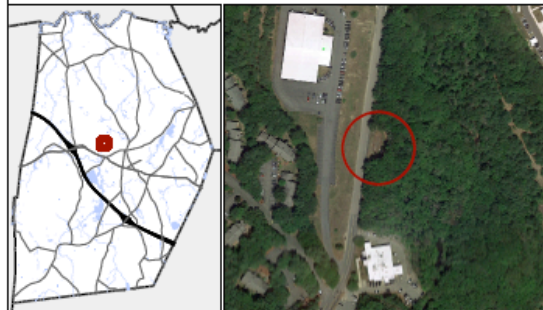
Water Source: Roof runoff
captured by two down
spouts.
Approxiamtely 1,600 sq ft
of roof area drains to rain
garden.

Rain Garden Size:
125 cu ft
Designed to hold and
treat the first 1" of
rainfall.

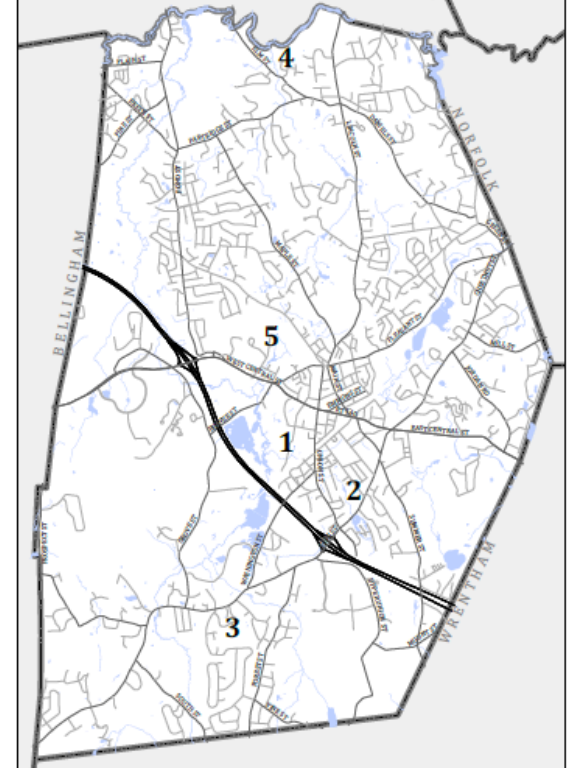
Plants:
Inkberry & Low Bush
Blueberry (shrubs)
Coneflower, Iris &
Asters (perennials)



rain garden SITE #1



town of FRANKLIN



Rain Garden
Tour 2016
in partnership with CRWA



NO SMOKING
PLEASE BE
NICE



What next?

Explore other potential landowner partners





