

WATER RESOURCES MANAGEMENT
in MASSACHUSETTS
The State Perspective

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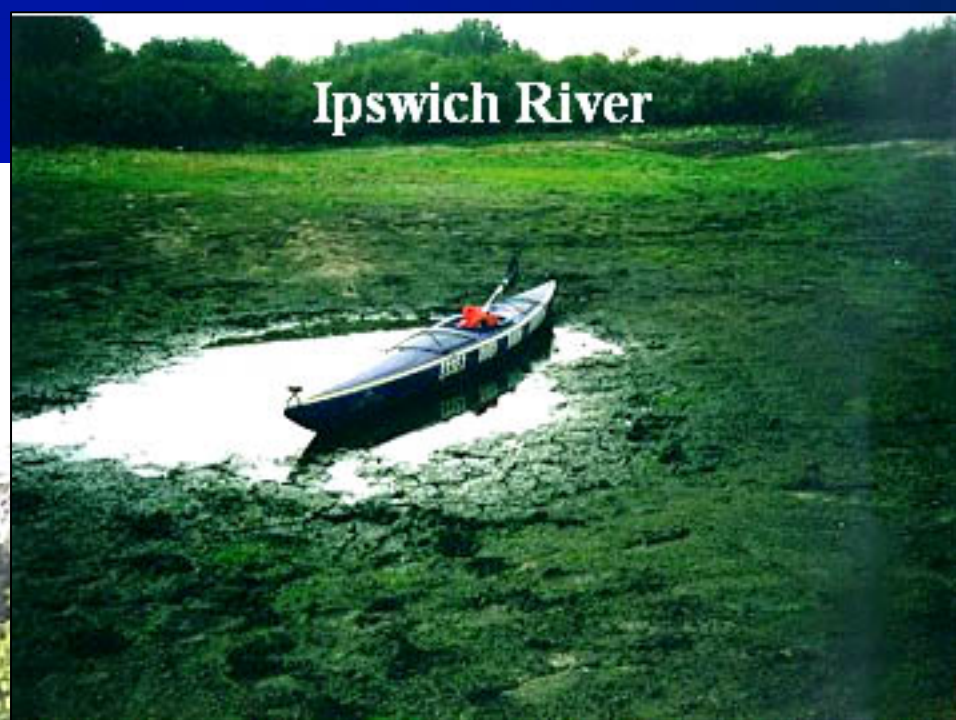
April 7, 2011

Water Abundance?

- 44 inches of rain each year
- Plenty of rivers and streams, lakes and ponds
- High precipitation events



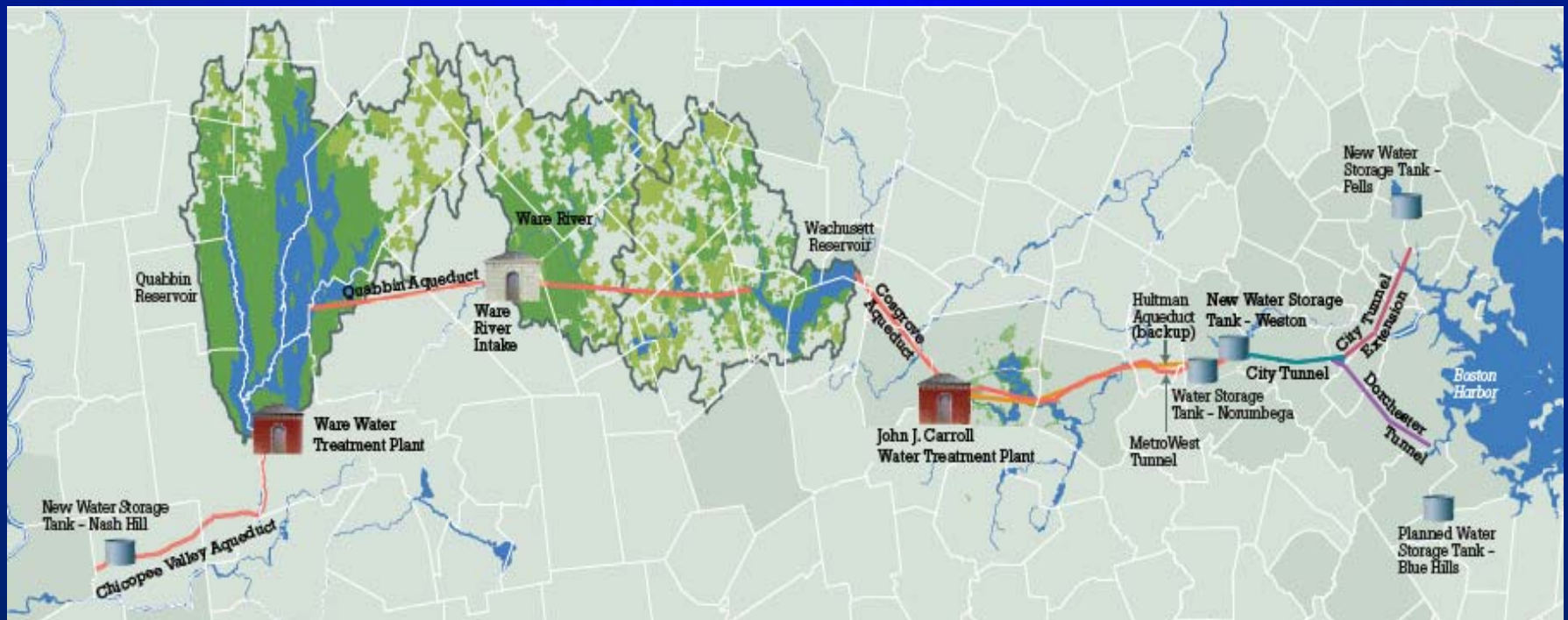
Ipswich River



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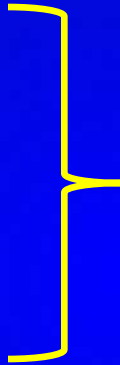
History of Water Development

- Forward thinking and planned for increasing demand – MWRA system
- Water Management Act, Interbasin Transfer Act, MA Water Policy, Water Conservation Standards



Water issues of today & What the state is doing

- Water quantity
- Stormwater
- Impervious cover



**SUSTAINABLE WATER
MANAGEMENT INITIATIVE**

- Climate change →

- **CLIMATE CHANGE ADAPTATION REPORT**
- **CLEAN ENERGY & CLIMATE PLAN FOR 2020**

Sustainable Water Management Initiative (SWMI)

- Develop safe yield
- Establish streamflow needs of aquatic life
- Develop and incorporate Streamflow Criteria into the Water Management Act & other water resource programs
- Understand the short and long-term water supply needs of Massachusetts and ensure that these needs are met

The Biological Condition Gradient – A Concept

Biological Condition

Natural structure & function of biotic community maintained

1

Minimal changes in structure & function

2

Evident changes in structure and minimal changes in function

3

Moderate changes in structure & minimal changes in function

4

Major changes in structure & moderate changes in function

5

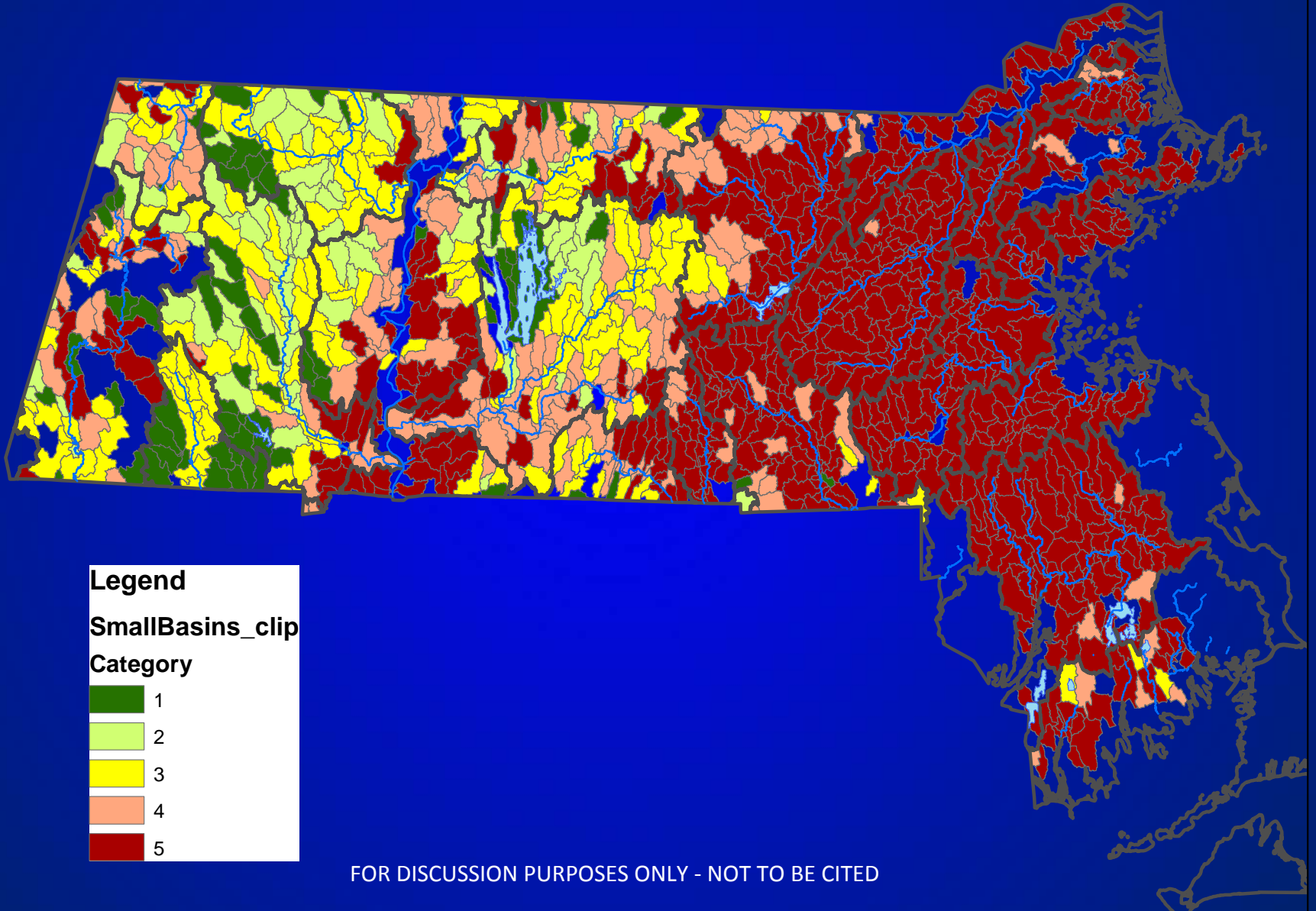
Severe changes in structure & function

6

(TNC, 2008)

Increasing Effect of Human Activity

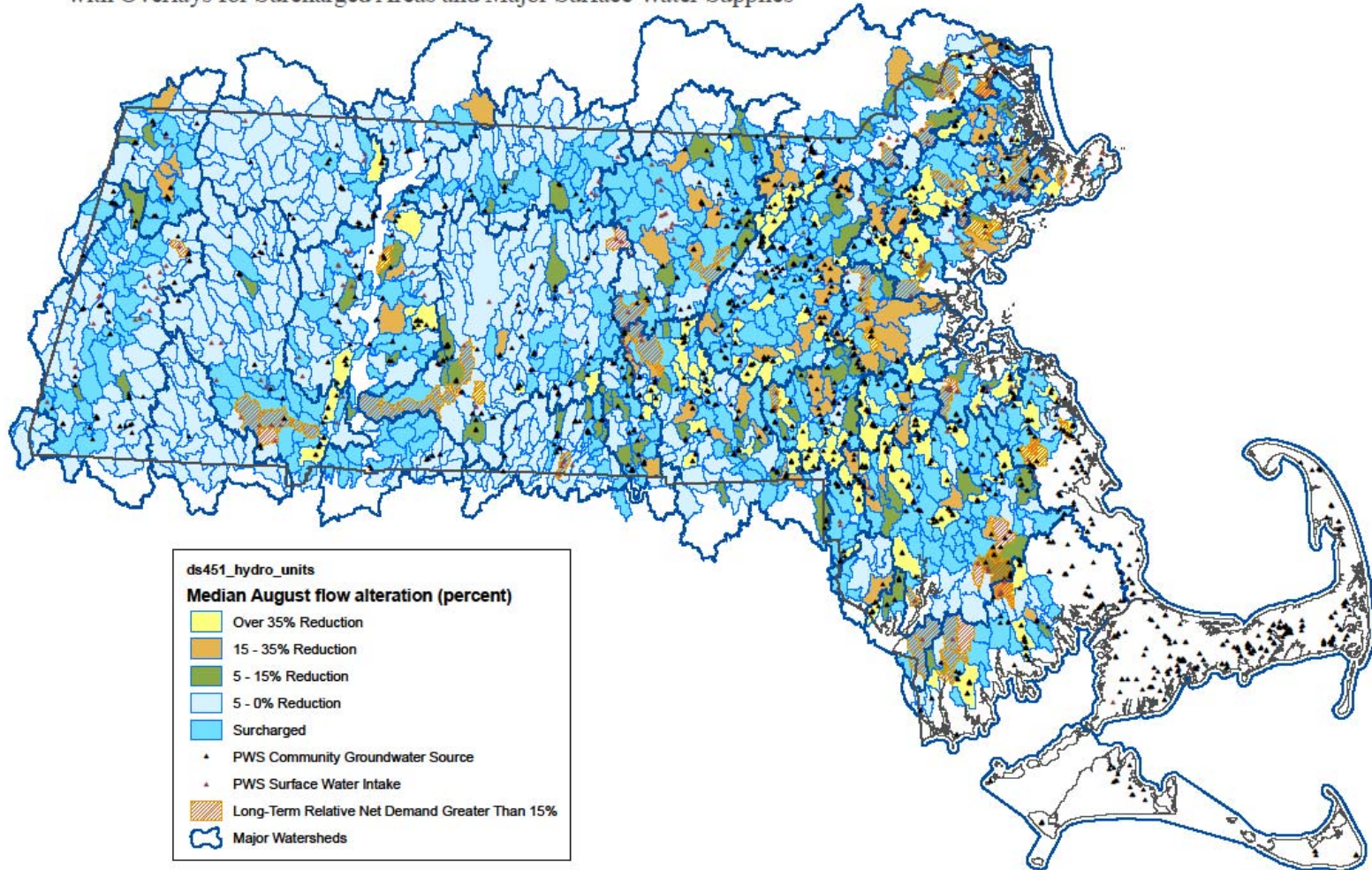
Habitat Categories



FOR DISCUSSION PURPOSES ONLY - NOT TO BE CITED

Flow Alteration Levels

DRAFT: Five Levels of Mean August Flow Reduction,
with Overlays for Surcharged Areas and Major Surface Water Supplies



prp @ DCR DWSP OWR 11/8/10

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Stream Flow Criteria

Fluvial Fish Relative Abundance	
Biological Category (BC)	August Percent Alteration
1	< 5%
2	< 15%
3	< 35%
4	< 65%
5	> 65%

Flow Level (FL)	% Allowable Alteration of Estimated Unimpacted Median Flow*			
	AUG	OCT	JAN	APR
1	< 5%	< 5%	< 5%	< 5%
2	< 15%	< 5%	< 5%	< 5%
3	< 35%	< 15%	< 15%	< 15%
4	Feasible mitigation and improvement			
5				

Implementation of Stream Flow Criteria

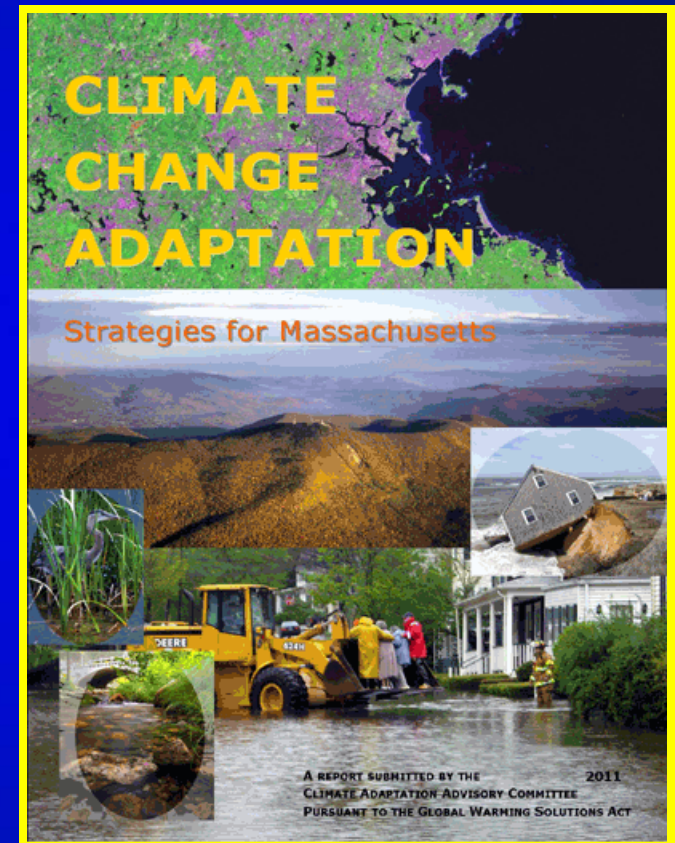
- No Backsliding
- Water Management Act Permitting Rules
- Other Regulatory Programs: MEPA, Wetlands Protection Act, Interbasin Transfer Act
- Incentives, Technical Assistance

SWMI

- Streamflow classification and criteria for first time in MA
- Science is developed and cutting-edge
- Predictability in permitting
- Protection of aquatic life

Climate Change Adaptation

- Report to the MA Legislature
- MA is experiencing Climate Change today!
- Will affect public health, water resources, infrastructure, coastal resources, energy demand, natural features, recreation, and economy



Water

- Altered timing/amount of streamflow due to reduced snowpack
- Increased winter precipitation as rain
- Increased frequency of short-term droughts
- Warmer water temperatures – less dissolved oxygen
- Increased frequency of extremely hot days and subsequent water demand
- Increased likelihood and size of damaging rainstorms
- Significant erosion and damage due to storm surge

Examples of Aquatic Vulnerabilities

■ Aquatic Ecosystems

- Altered hydrology & habitat fragmentation \Rightarrow alter community structure and dynamics, disrupt migratory patterns & life cycles
- \uparrow water temperature will \uparrow vulnerability to invasive species and pathogens & \uparrow mortality
- \uparrow surface runoff and nutrient loading \Rightarrow \downarrow quality and direct mortality of native species

■ Inland Wetland Ecosystems

- \uparrow winter (rain)/spring precipitation, \uparrow flooding, storm events \Rightarrow altered hydrologic processes
- \downarrow summer precipitation & drought \Rightarrow drying of wetlands
- \uparrow winter temperatures/ \downarrow snowpack and ice \Rightarrow altered hydrologic processes

Examples of Aquatic Strategies

- **Aquatic Ecosystems**

- Restore and protect aquatic ecosystems and buffers
- Preserve and expand habitat connectivity/reduce fragmentation
- Improve modeling, mapping and data collection and encourage adaptive management

- **Inland Wetland Ecosystems**

- Protect and restore floodplains
- Increase protection of vegetated buffers around wetlands, waterways and water bodies

Contact Information

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