



# IPSWICH RIVER WATERSHED ASSOCIATION

*The Voice of the River*

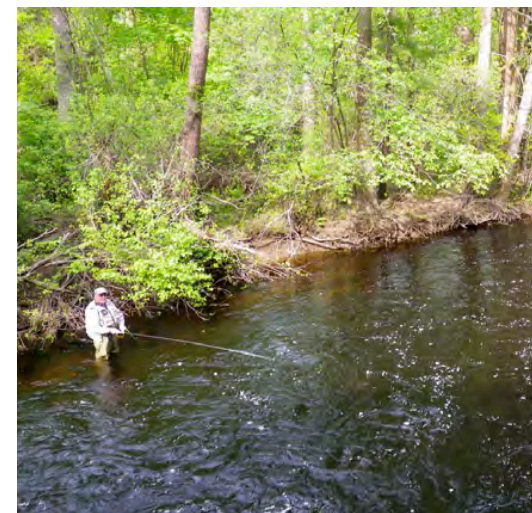




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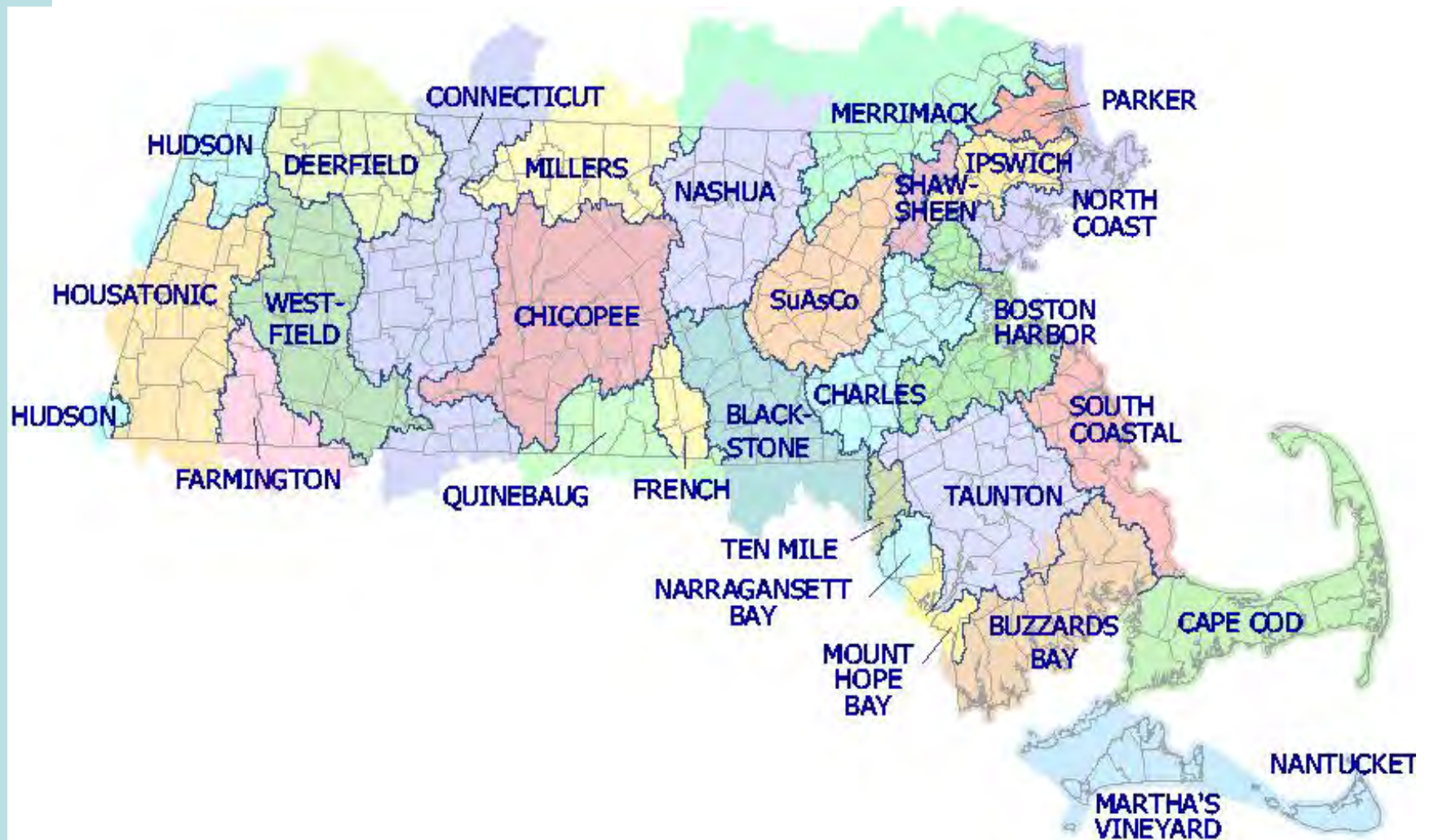
# Our Ipswich River





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# What we do: Voice of the River





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# What we do: science, field work, monitoring





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# What we do: educate, organize





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# What we do: work with youth & volunteers



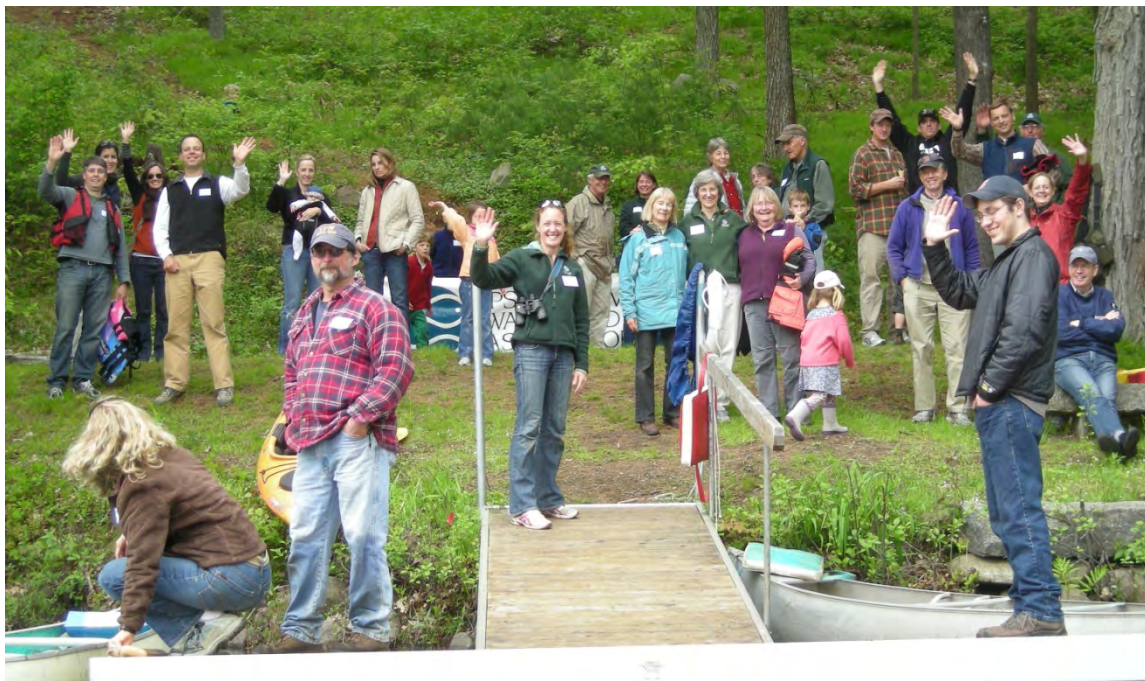




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# What we do: encourage everyone to enjoy our beautiful river





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# Problems: dry river loss of fish and wildlife habitat





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# Floods

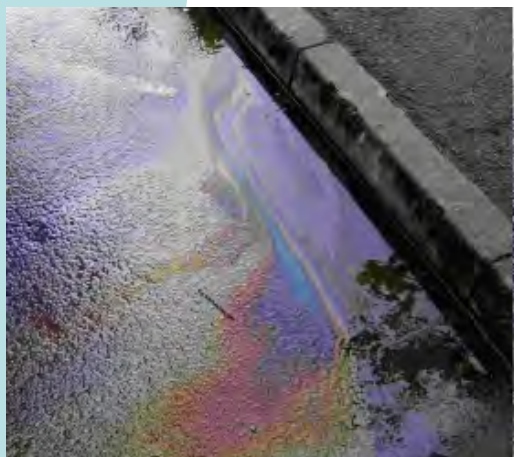




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# Water Pollution





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# Dams & Road Crossings





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# Current Status

- **Ipswich River 3<sup>rd</sup> most endangered in U.S.\***
- **“Impaired” under Federal Clean Water Act**  
**\*\***
- **“Highly stressed” by state Water Commission**
  - \* American Rivers, 2003
  - \*\*Upper watershed & estuary



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# **Environmental Impacts of Low-flows on the Ipswich River**

- River becomes a series of ponds
- Water recedes from streambanks
- Fish kills, loss of invertebrates
- Loss of river dependent species of fish
- Decreased biodiversity
- Higher water temperature
- Low dissolved oxygen
- Decreased water quality
- Negative impacts on wetlands



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Ipswich River - 1968



Ipswich River - 1999





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# Ipswich River Watershed Community Water Supplies:

~34 million gallons a day\*

## Reservoirs:

Beverly/Salem

Danvers/Middleton

Lynn

Peabody

## Groundwater (wells)

- **Danvers/Middleton,  
Hamilton, Ipswich,  
Lynnfield, North  
Reading, Topsfield,  
Wenham,  
Wilmington**
- Boxford (no public)

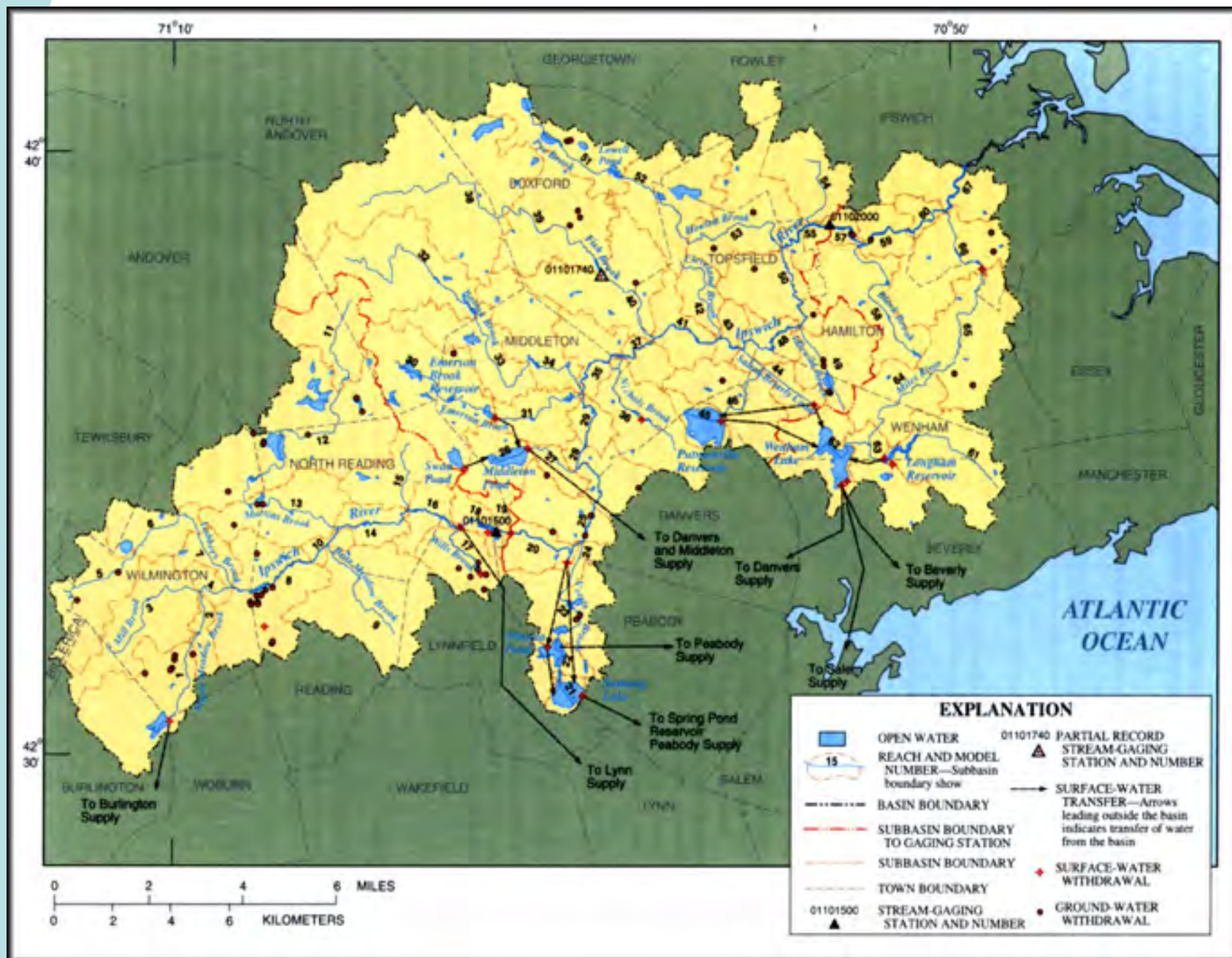
**= 330,000 people!**

\*2/3rds outside of watershed



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## Effects of Water Withdrawals on Streamflow in the Ipswich River Basin, Massachusetts

*In 1997, water withdrawals from the 155-square-mile Ipswich River Basin in northeastern Massachusetts supplied water to about 330,000 residents, two thirds of whom live outside the basin. Concern over decreased streamflow that results from water withdrawals and the potential effect this has on aquatic habitat, water quality, and recreational use of the river has intensified. Low flows in 1997 prompted the national environmental organization, American Rivers, to designate the Ipswich as one of the 20 most threatened rivers in the United States. The river also is listed under Section 303(d) of the Federal Clean Water Act as noncompliant with the Massachusetts Water Quality Standards.*

The Ipswich River Task Force, representing government agencies, environmental groups, water suppliers, and private citizens, formed in 1996 to address problems associated with withdrawals and the river. The Task Force determined that a watershed model would help: (1) determine potential effects of increased human development on water resources and wildlife habitats, (2) make decisions on permitting of existing and new water withdrawals, (3) set streamflow standards to protect biota in the river, (4) determine safe yields of water-supply reservoirs in the basin, and (5) develop a water-resource management plan.

The U.S. Geological Survey (USGS), in cooperation with the Massachusetts Departments of Environmental Management and Environmental Protection, developed a numerical watershed model using the Hydrologic Simulation Program-Fortran (HSPF) to simulate the hydrology and complex water-use patterns in the Ipswich River

Basin (fig. 1). The pumping of water from a well that is hydraulically connected to a stream can deplete the flow of the stream, but the effect is delayed, depending on aquifer properties and distance of the well from the stream. Streamflow depletions were computed for each pumped well using STRMDEPL, an analytical program developed for use within the HSPF graphic-user interface (GenScn). Withdrawals were input to the HSPF model, and the model was calibrated to streamflow measured at two USGS gaging stations (South Middleton and Ipswich) for the period 1989-93. The coefficient of model-fit efficiency indicates that at a minimum, the model explained 90 percent of the variance in the observed monthly flow and 79 percent of the variance in the observed daily flow.

### EFFECTS OF WATER WITHDRAWALS

The effects of water withdrawals on streamflow were examined for the 1989-93 calibration period by comparing simulations with (1) actual withdrawals, (2) no withdrawals, (3) stopping only ground-water withdrawals, and (4) stopping only surface-water withdrawals. Three long-term simulations (1961-95)—under average monthly 1989-93 withdrawal rates, with no withdrawals under 1991 land-use conditions, and with no withdrawals under undeveloped land-use conditions—were also run to evaluate streamflow over a wider range of climatic conditions and to compute 1-, 7-, and 30-day low-flow frequencies.

Flow-duration curves developed for the 1989-93 simulations (fig. 2) indicate that, at both gaging stations,

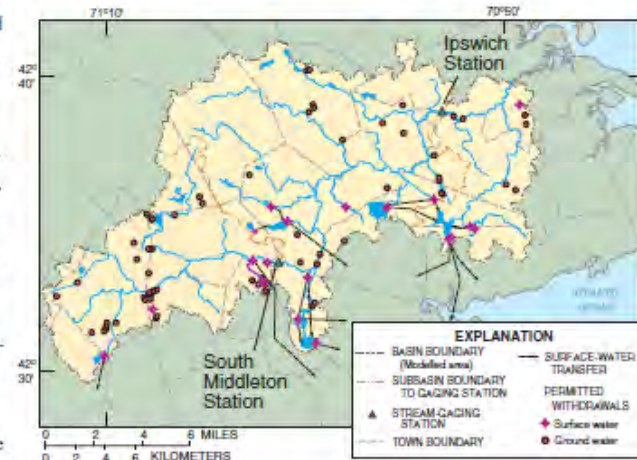
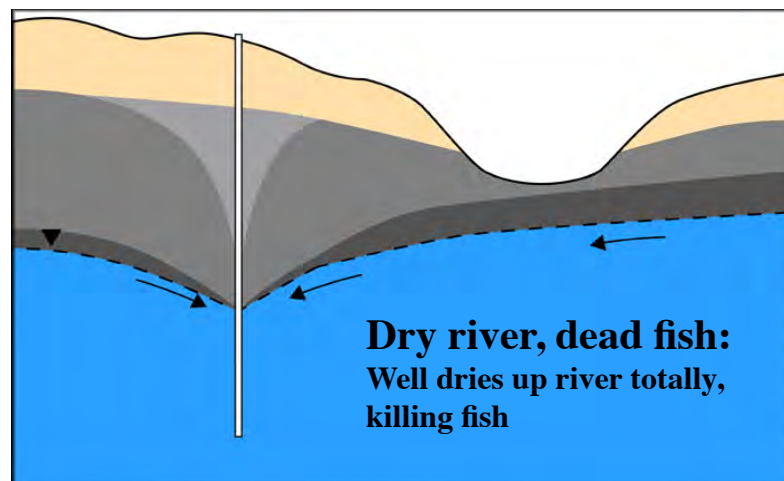
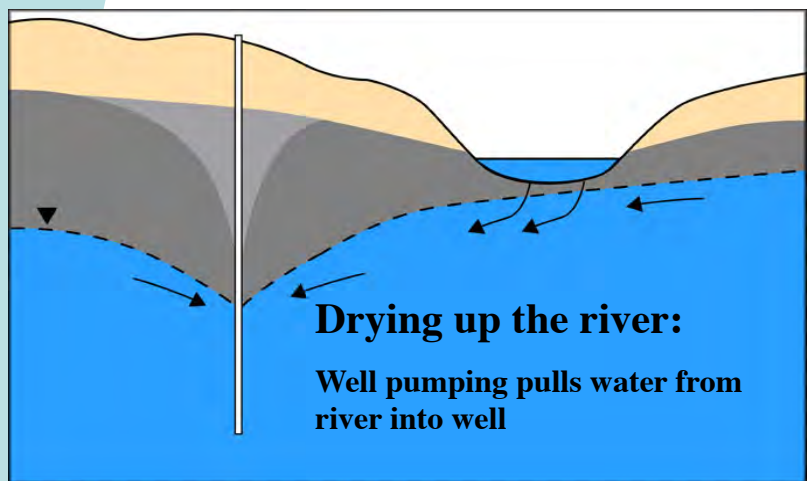
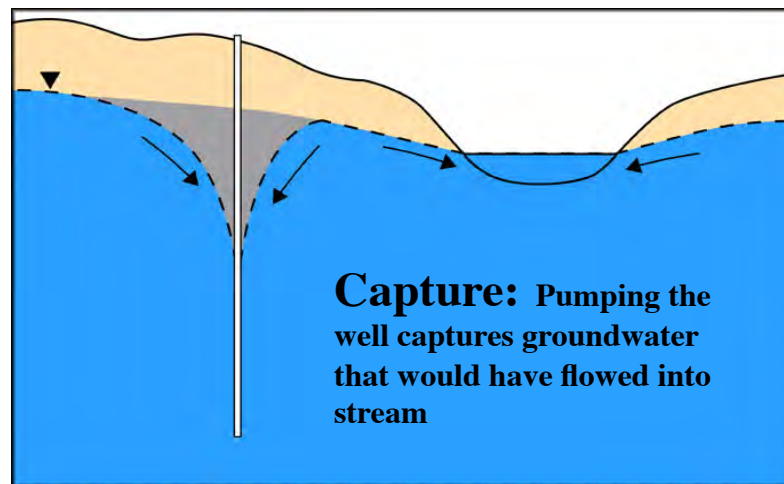
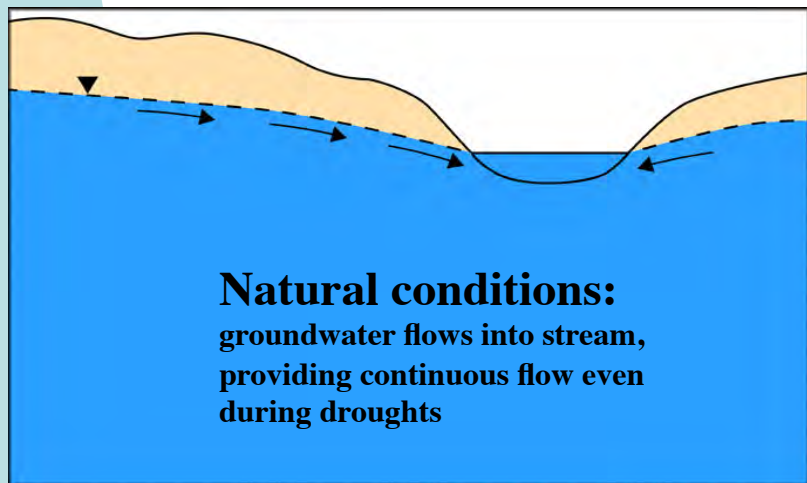


Figure 1. Water withdrawals points in the Ipswich River Basin, Massachusetts.



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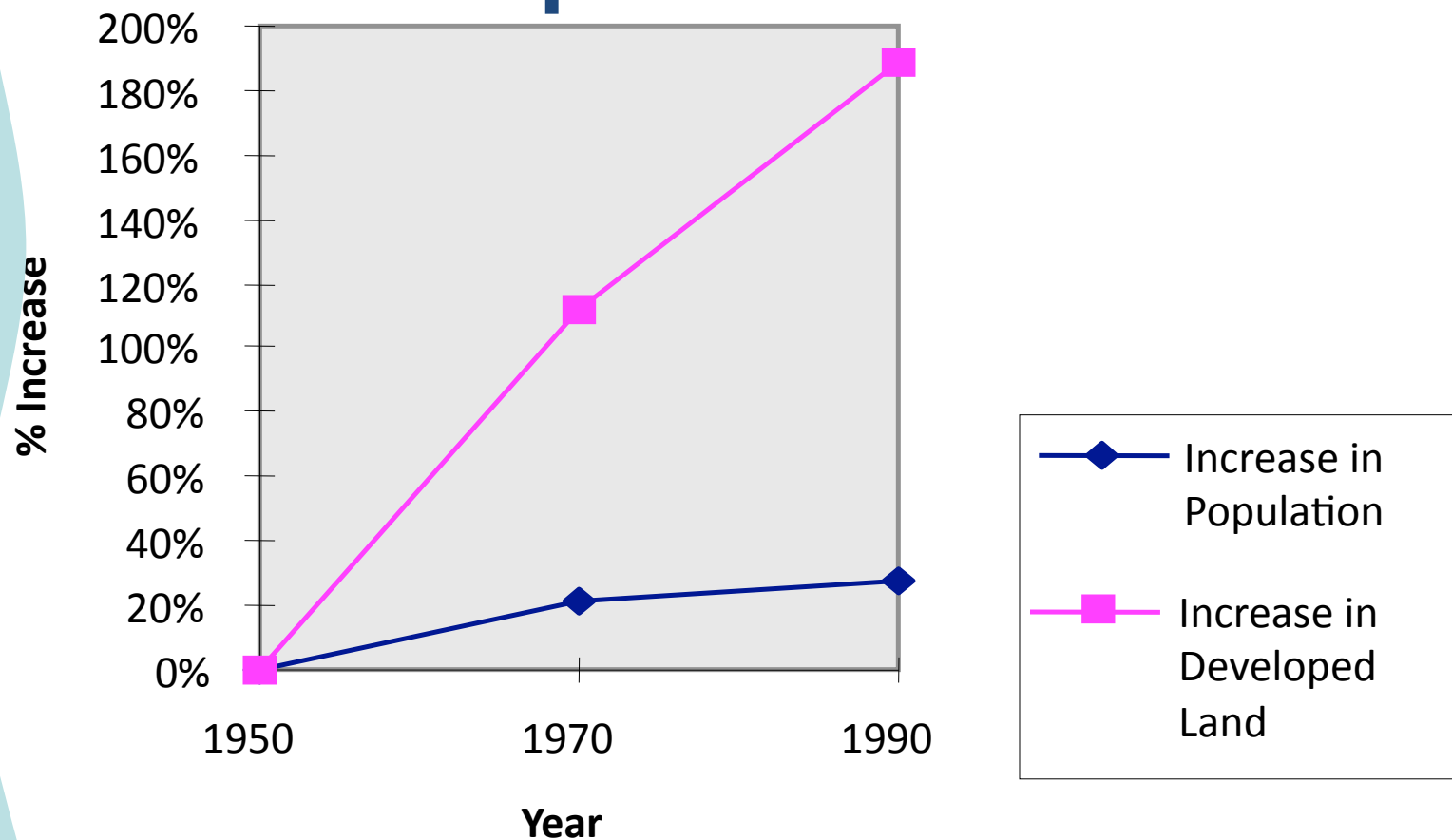
# Effects of pumping wells





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# Percentage Change in Land Use vs. Population 1950-1990



*Source: Massachusetts Executive Office of Environmental Affairs*



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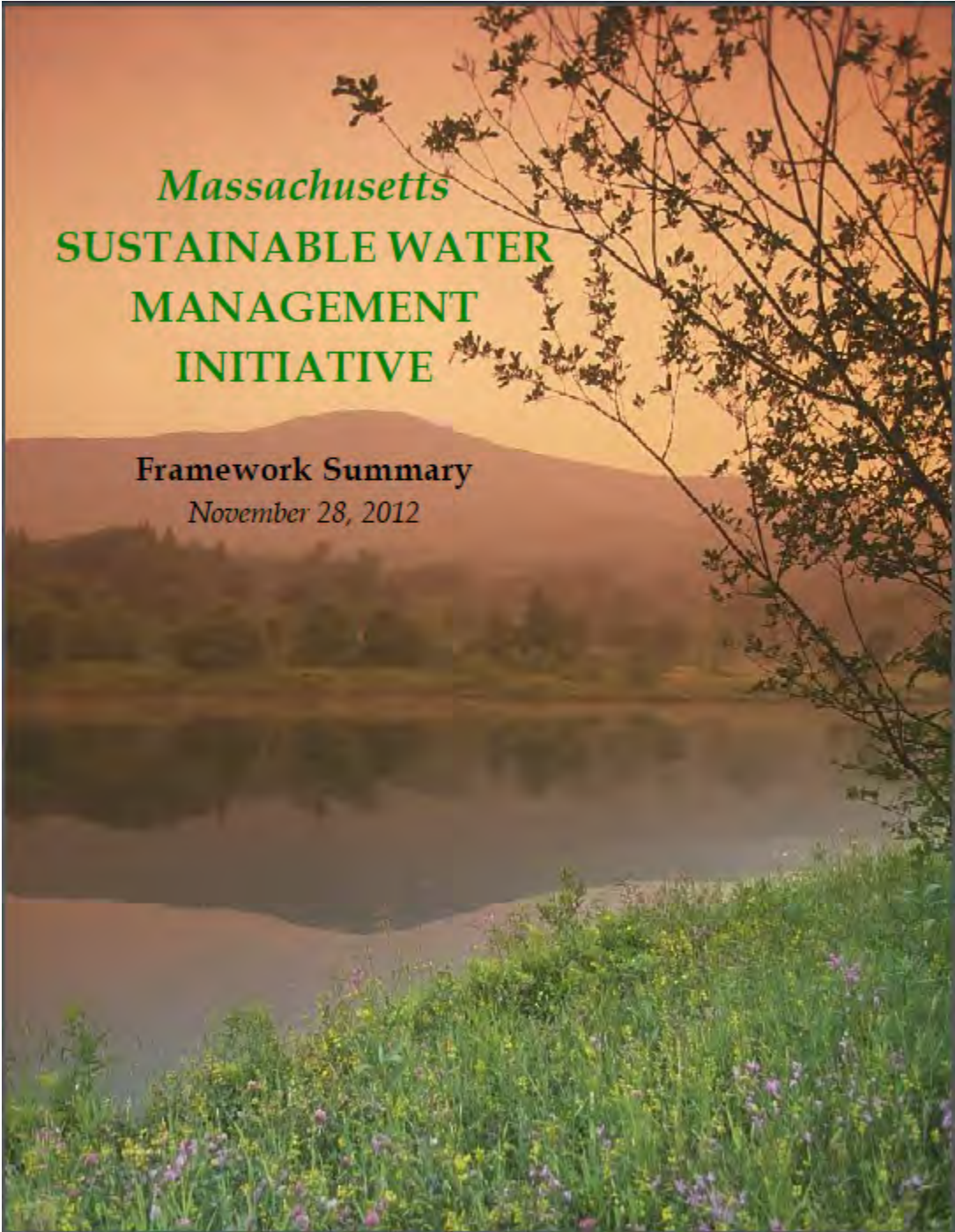
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# Problem: Lawn Watering





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*Massachusetts*  
**SUSTAINABLE WATER  
MANAGEMENT  
INITIATIVE**

**Framework Summary**

*November 28, 2012*



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Prepared in cooperation with the  
Massachusetts Department of Conservation and Recreation, the  
Massachusetts Department of Environmental Protection, and the  
Massachusetts Department of Fish and Game

## Factors Influencing Riverine Fish Assemblages in Massachusetts



Scientific Investigations Report 2011–5193

U.S. Department of the Interior  
U.S. Geological Survey





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# Native Fluvial or “River” Fish



Brook Trout



Fallfish



Creek Chubsucker



Tessellated Darter



Common Shiner



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# Generalist or “Pond” Fish



Black Crappie



Largemouth Bass



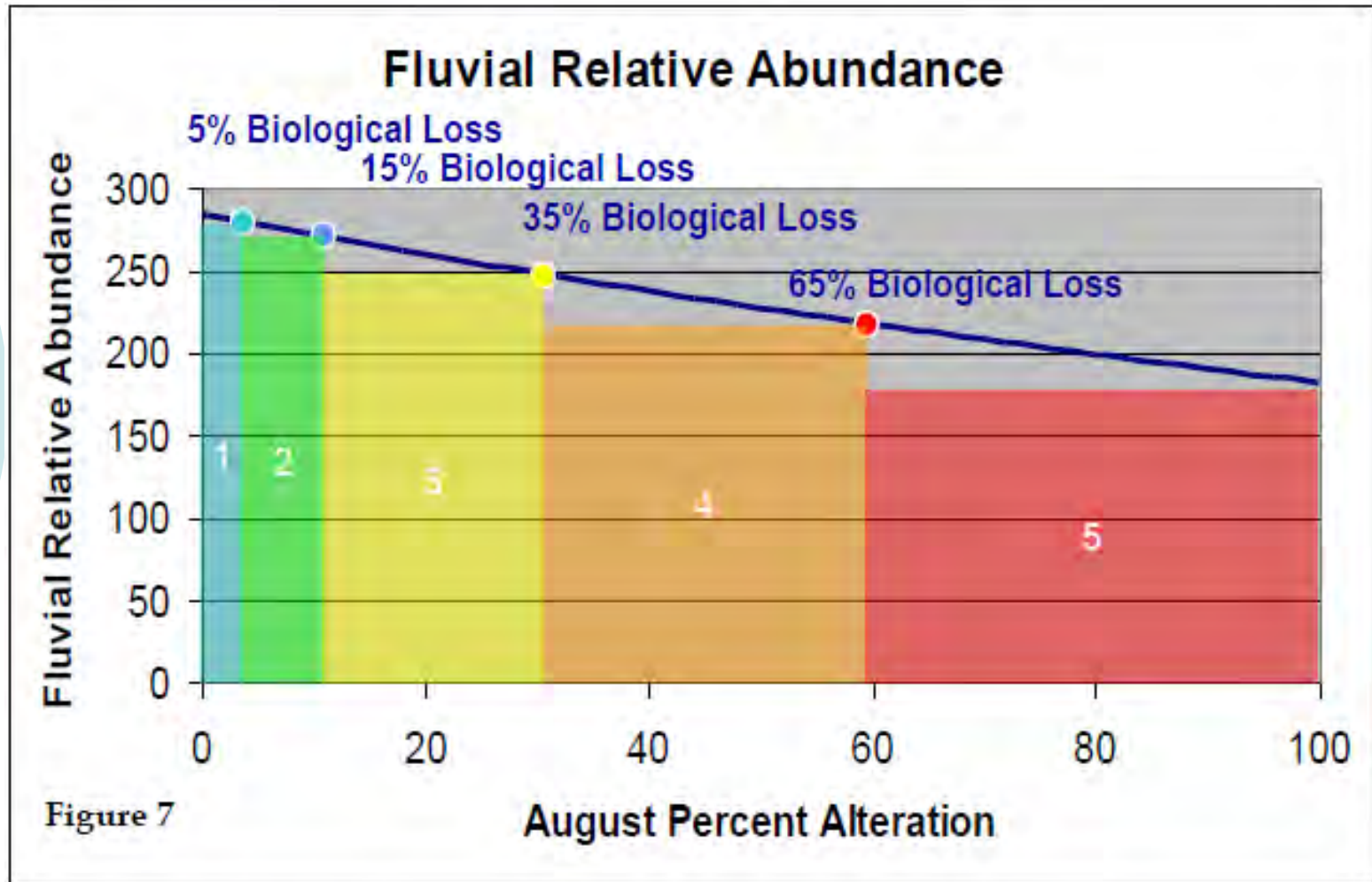
Pumpkinseed



Bluegill



Yellow Perch





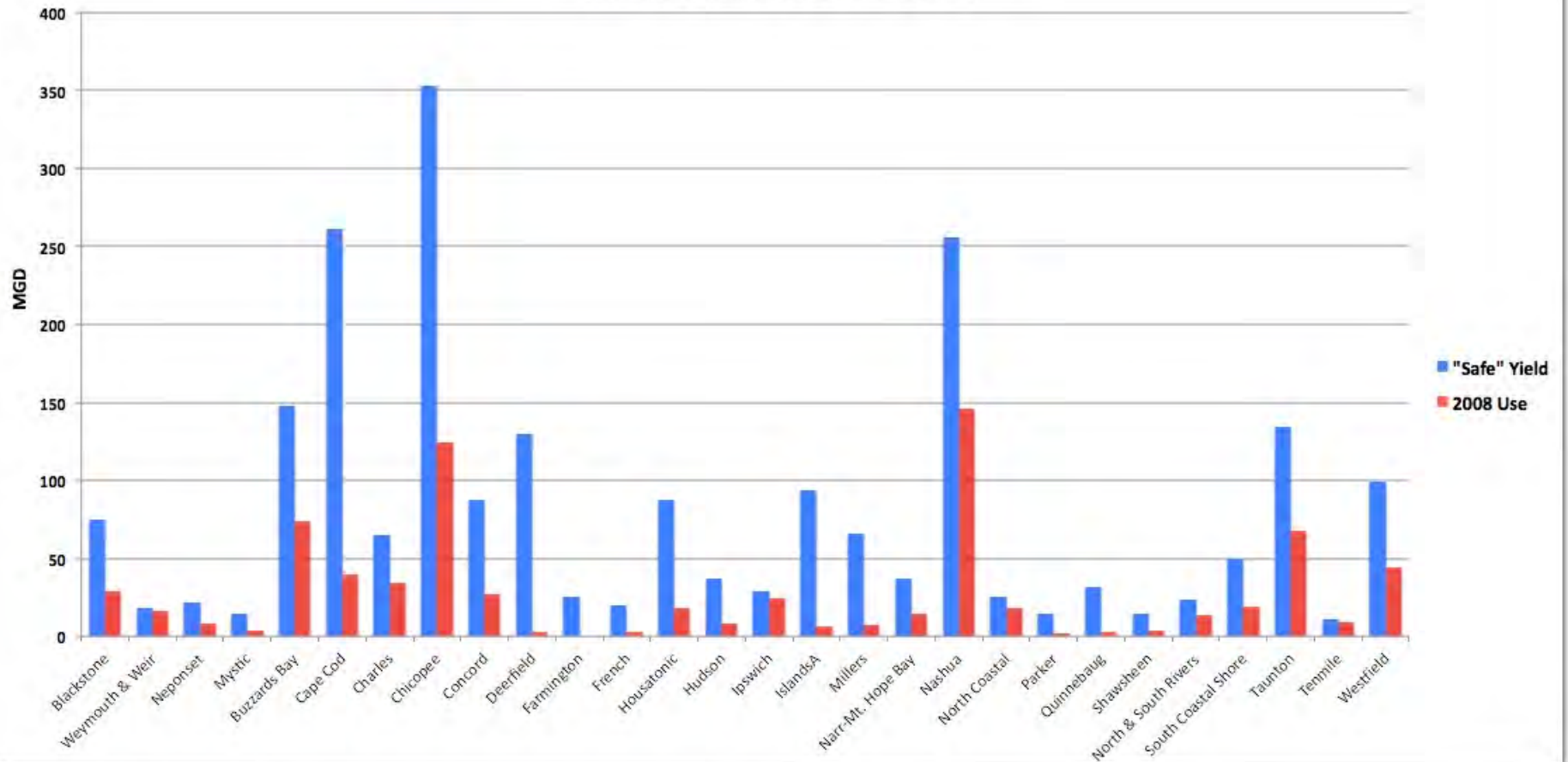
# SWMI

*For many stressed rivers like the Ipswich,  
original promise of SWMI remains unfulfilled*

## Key issues with SWMI vs. WMA:

- Safe Yield still does not include ecological criteria
- Exempts registered withdrawals
- Establishes “Critical Water Supply Areas”
- Creates new grandfathered baseline at the usage during 2003-05 plus 5%, regardless of impacts

**"Safe" Yield vs Actual 2008 Use**  
 (not including Connecticut and Merrimac basins)





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# IPSWICH RIVER Watershed Action Plan



**Horsley & Witten, Inc.**  
Sandwich, Massachusetts

October 2003



# Water Conservation

- “First resort” water source
- Cost effective
- Practical
- Can avoid infrastructure expansion costs and environmental impacts
- Reducing summer demand is key
- Large savings have been achieved when motivation to save has been strong



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# Solutions:

**Save water, use native plants, keep water local, reduce runoff, reduce lawn watering, remove dams**







## Successes – water use & withdrawals:

- Reading now 100% MWRA
- Wilmington can purchase from MWRA
- N. Reading MEPA filing to switch to MWRA
- Additional towns have access to MWRA
- Water use declining in several communities



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# Looking Ahead



**Strategic Plan  
2010-2015**

**June 2010 DRAFT**

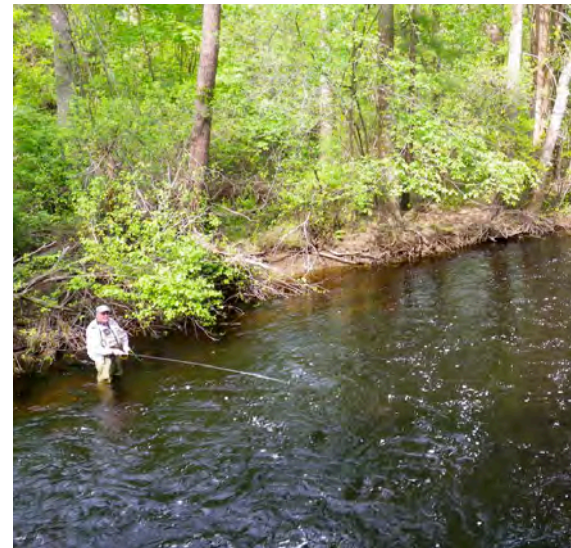


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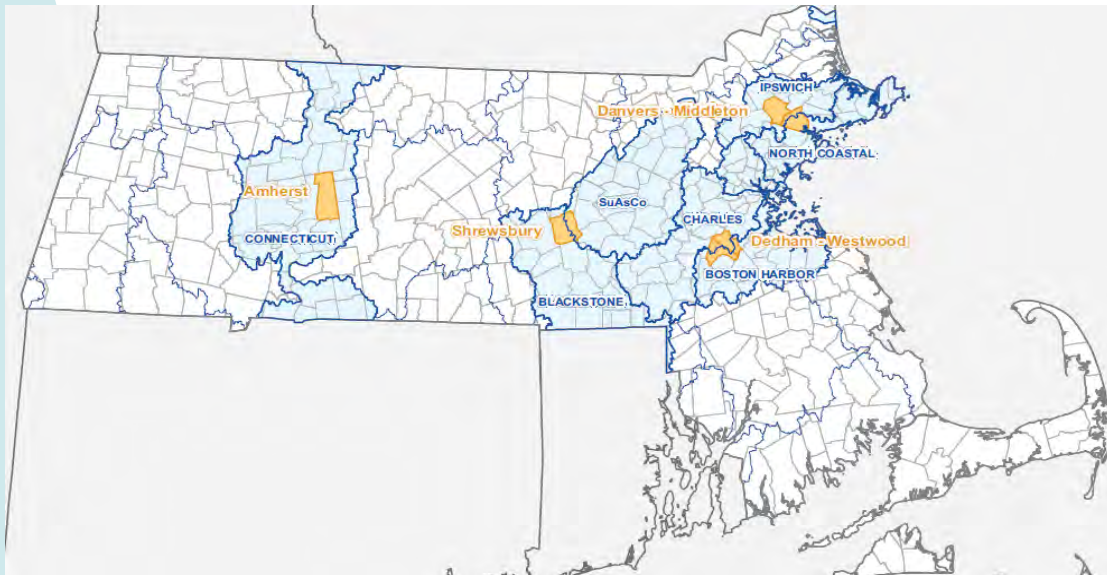
# Goal 1: Ensure that there is enough clean water to meet our needs





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# VOICE OF THE RIVER: Advocacy



## Sustainable Water Management Initiative Pilot Project Phase 1

Completed for

Massachusetts Department  
of Environmental Protection  
One Winter Street  
Boston, MA 02108

Completed by

Comprehensive Environmental, Inc.  
225 Cedar Hill Street  
Marlborough, MA 01752

In Association with

Tighe & Bond, Inc.  
53 Southampton Road  
Westfield, MA 01085

August 7, 2012



**Tighe & Bond**



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## Goal 2: Protect nature and keep the Ipswich River healthy for fish and wildlife





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# Curtis Pond Dam - Middleton

**First dam removal in the Ipswich Watershed – Completed  
in June, 2012**

Before



After





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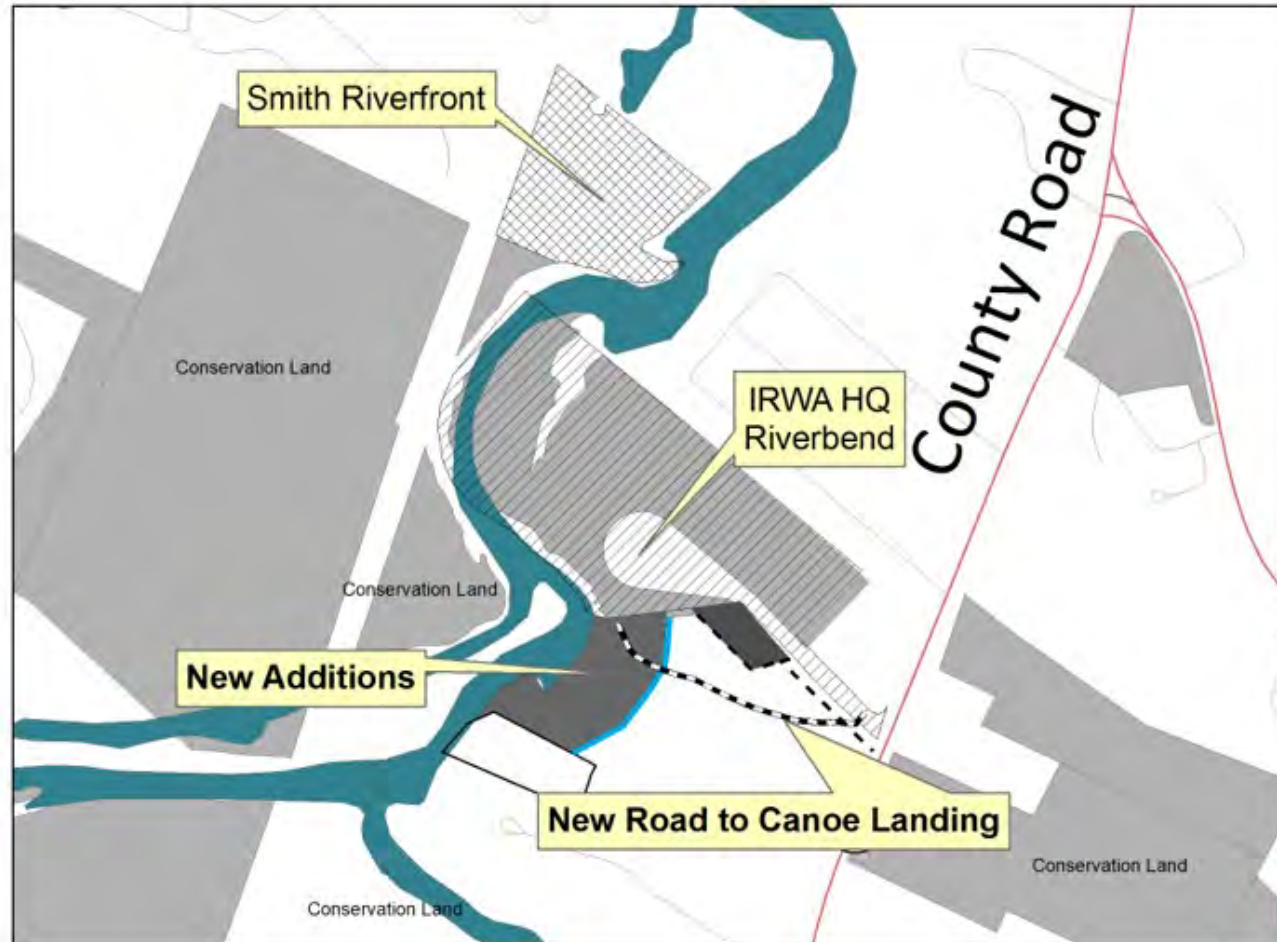
## Goal 3: Provide great places to have fun outdoors





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# Riverbend Ready to Expand!







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## Goal 4: Bring people and partners together to protect the river



[www.pie-rivers.org](http://www.pie-rivers.org)

## Parker-Ipswich-Essex Rivers Restoration

Protecting and restoring coastal watersheds on Massachusetts' North Shore

HOME

THE REGION

THE PARTNERSHIP

RESTORATION



Home

### Roads, Runoff and Water Management in Northeastern, MA

A Free Conference in the Areas of Stormwater Management , Water Conservation & Road-Stream Crossings

**Helping Towns Navigate the  
New Water Rules with Cost  
Effective, Sustainable Solutions**

Thursday, April 11th

8:30 am to 1 pm

[Click for conference info](#)

Lunch provided





# PIE-Rivers Region

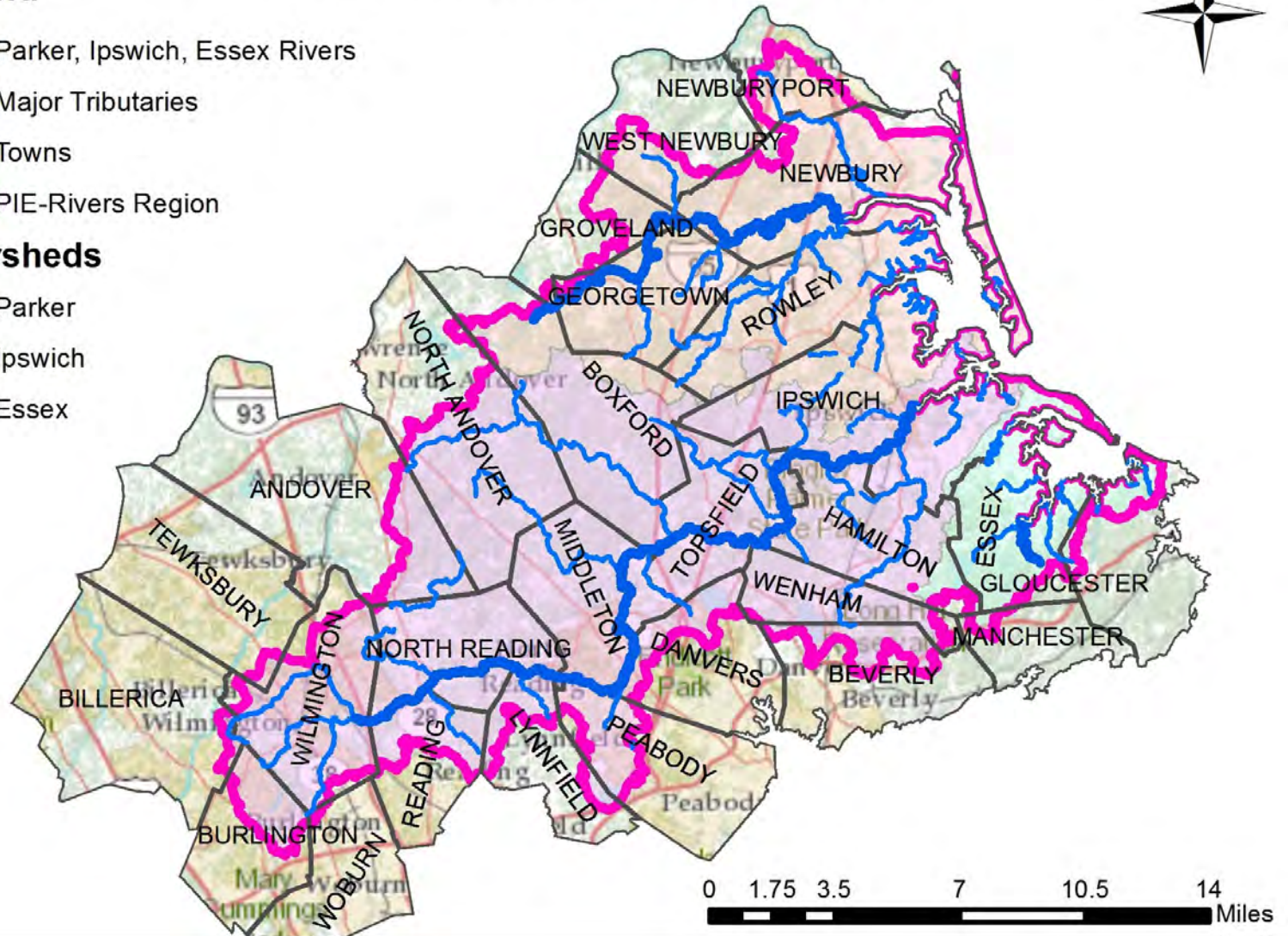


## Legend

-  Parker, Ipswich, Essex Rivers
-  Major Tributaries
-  Towns
-  PIE-Rivers Region

## Watersheds

-  Parker
-  Ipswich
-  Essex





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greenscapes.org

savewaternorthshore.org

**Greenscapes Guide**  
Creating a beautiful healthy yard the natural way...

**Saving you time and money... and protecting our water**  
[www.greenscapes.org](http://www.greenscapes.org)

saveaternorthshore.org - Mozilla Firefox

Save Water North Shore

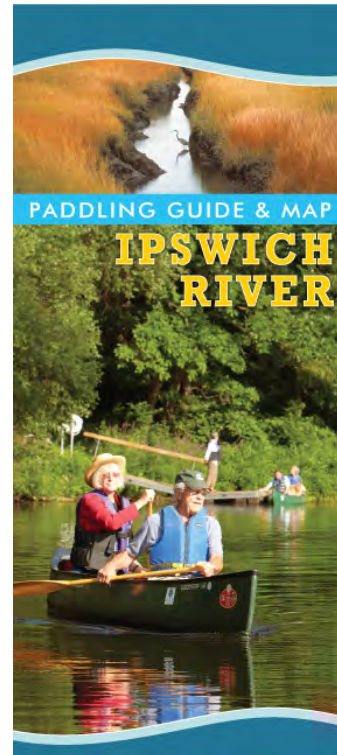
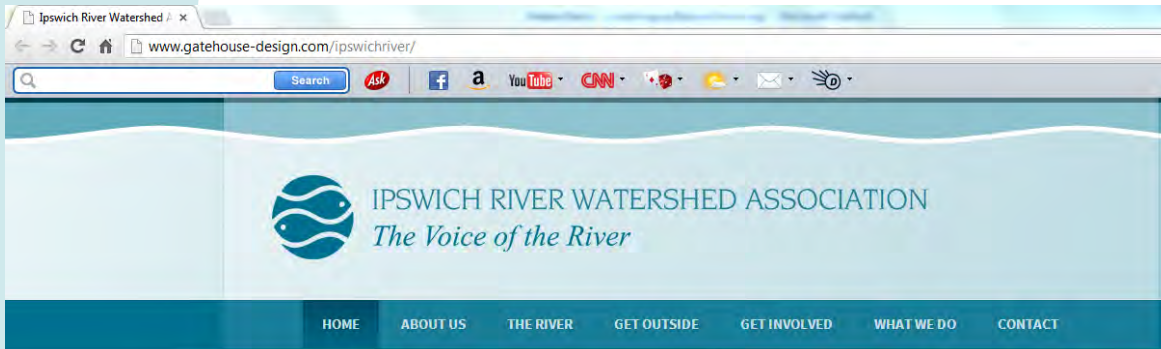
Home | About Us | Water In Your Town | Save Water at home | Save Water at work | Save Water in communities | Rebates

Lisa S. and her family's rain barrel provides plenty of water for use in their extensive gardens and entertainment for the kids on hot summer days.

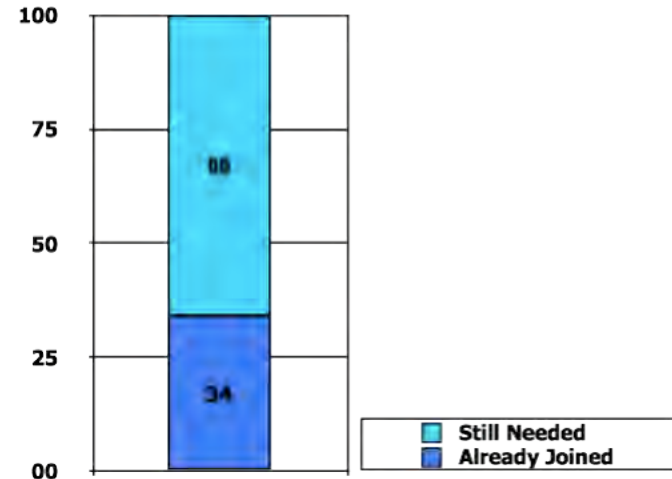
"We live right uphill from the Ipswich River. It feels good to keep some runoff out of the river and to save money on outdoor watering. The kids love playing with the water from the barrel and helping me water the plants!"

[Click here](#) to learn more about these and other local water winners!

# Goal 5: Build the most effective river protection organization we can



## Member Drive Please Join Us!





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# Connect to Many More People!





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# For more information about how you can help the Ipswich River



143 County Road, PO Box 576  
Ipswich, MA 01938  
978-412-8200

[irwainfo@ipswichriver.o  
rg](mailto:irwainfo@ipswichriver.org)

[www.ipswichriver.org](http://www.ipswichriver.org)

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