Our Ipswich River
What we do:
Voice of the River
What we do: science, field work, monitoring
What we do: educate, organize
What we do: work with youth & volunteers
What we do: encourage everyone to enjoy our beautiful river
Problems: dry river
loss of fish and wildlife habitat
Floods
Water Pollution
Dams & Road Crossings
Current Status

- Ipswich River 3rd most endangered in U.S.*
- “Impaired” under Federal Clean Water Act **
- “Highly stressed” by state Water Commission
  * American Rivers, 2003
  **Upper watershed & estuary
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
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
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 30 most threatened rivers in the United States. The river also was 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 1998 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 (GenScri). 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 80 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 groundwater 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,
Effects of pumping wells

**Natural conditions:**
Groundwater flows into stream, providing continuous flow even during droughts

**Capture:**
Pumping the well captures groundwater that would have flowed into stream

**Drying up the river:**
Well pumping pulls water from river into well

**Dry river, dead fish:**
Well dries up river totally, killing fish
Percentage Change in Land Use vs. Population 1950-1990

Source: Massachusetts Executive Office of Environmental Affairs
Problem: Lawn Watering
Massachusetts
SUSTAINABLE WATER
MANAGEMENT
INITIATIVE

Framework Summary
November 28, 2012
Factors Influencing Riverine Fish Assemblages in Massachusetts

Scientific Investigations Report 2011–5193

U.S. Department of the Interior
U.S. Geological Survey
Native Fluvial or “River” Fish

- Brook Trout
- Fallfish
- Creek Chubsucker
- Tesselated Darter
- Common Shiner
Generalist or “Pond” Fish

- Black Crappie
- Largemouth Bass
- Pumpkinseed
- Bluegill
- Yellow Perch
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)
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
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
Looking Ahead

Strategic Plan
2010-2015
June 2010 DRAFT

Ipswich River Watershed Association
The Voice of the River
Goal 1: Ensure that there is enough clean water to meet our needs
VOICE OF THE RIVER:

Advocacy
Goal 2: Protect nature and keep the Ipswich River healthy for fish and wildlife
Curtis Pond Dam - Middleton

First dam removal in the Ipswich Watershed – Completed in June, 2012
Goal 3: Provide great places to have fun outdoors.
Riverbend Ready to Expand!
Goal 4: Bring people and partners together to protect the river
Parker-Ipswich-Essex Rivers Restoration
Protecting and restoring coastal watersheds on Massachusetts' North Shore

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
12:30 pm to 1 pm
Lunch provided

Click for conference info

www.pie-rivers.org
greenscapes.org  savewaternorthshore.org
Goal 5: Build the most effective river protection organization we can
Connect to Many More People!
For more information about how you can help the Ipswich River

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