

Keeping Streamflow in Mind

Division of Ecological Restoration

The mission of the DER is to restore and protect the Commonwealth's rivers, wetlands and watersheds for the benefit of people and the environment.

- Aquatic Ecosystem Restoration
 - ▣ Wetland Restoration
 - ▣ River Restoration
 - ▣ Flow Restoration

- Technical Assistance
 - ▣ Urban River Revitalization
 - ▣ Stream Crossing Surveys

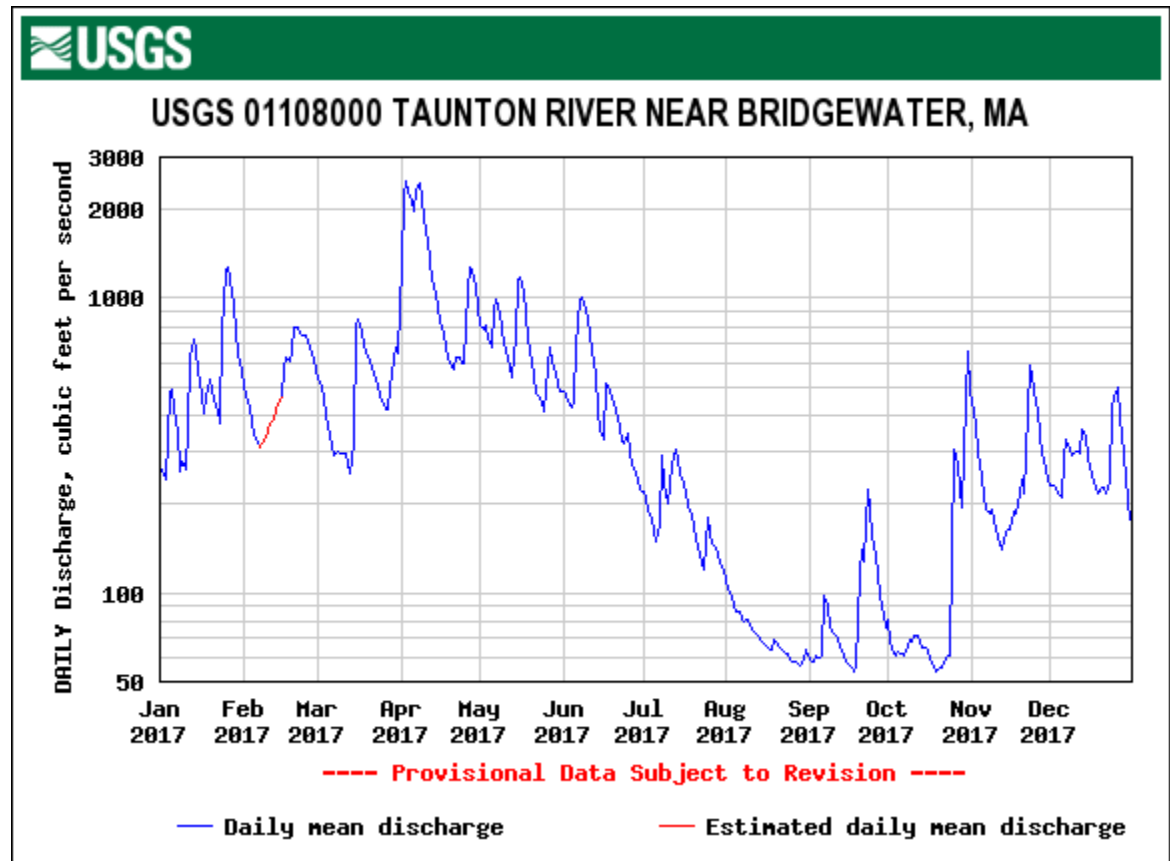


What is streamflow

Flow of water in streams, rivers and channels

Flow comes from:

- Precipitation
- Groundwater
- Overland flow, runoff



The Natural Flow Regime

Frequency

Duration

Rate of
change

Timing

Magnitude



Why is streamflow important

- Flow is considered the “master variable” in streams and the primary driver of stream ecology/health
- Flow is strongly correlated with:
 - ▣ Volume, availability and connectivity of habitat
 - ▣ Channel geomorphology
 - ▣ Water quality and temperature
 - ▣ Availability and type of food resources
 - ▣ Biological cues (e.g. fish migration and spawning)

Lake management impacts on streamflow

- High flows in fall during drawdown, low flows in Spring during refill
 - Erosion or flooding potential
 - Possible habitat alterations
 - Water quality impacts
 - Scour or low flow effects on biota
 - Effects on downstream recreational uses



GEIR guidance

- Keep outflow during drawdown below 4 cfs
- When target water level is achieved, match outflow to inflow to the greatest extent possible, maintaining a stable water level
- Keep outflow during refill above a discharge of 0.5 cfs

Eutrophication and Aquatic Plant Management in Massachusetts

Final Generic Environmental Impact Report

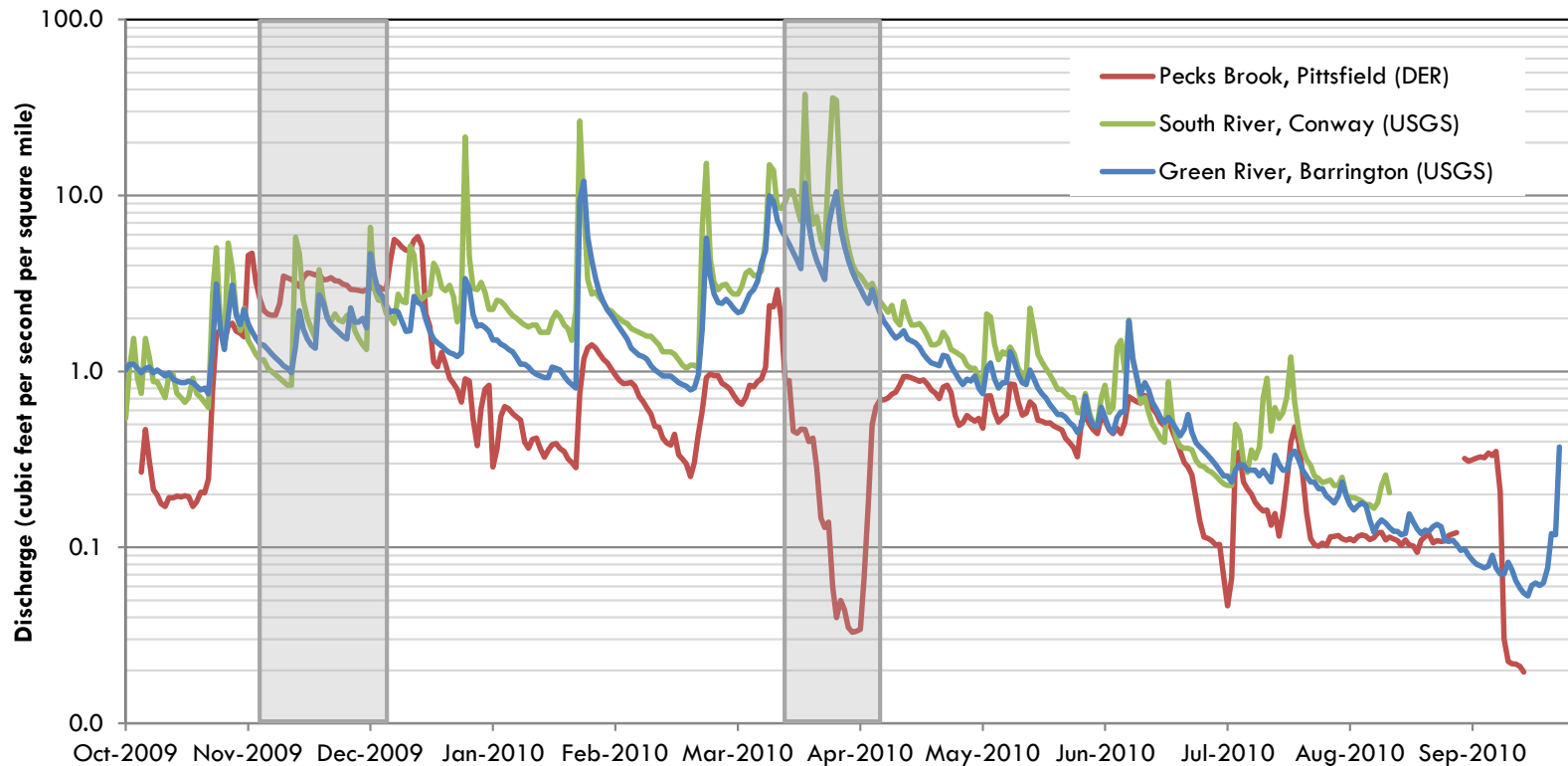


Executive Office of Environmental Affairs
Commonwealth of Massachusetts
2004

Lake management impacts on streamflow

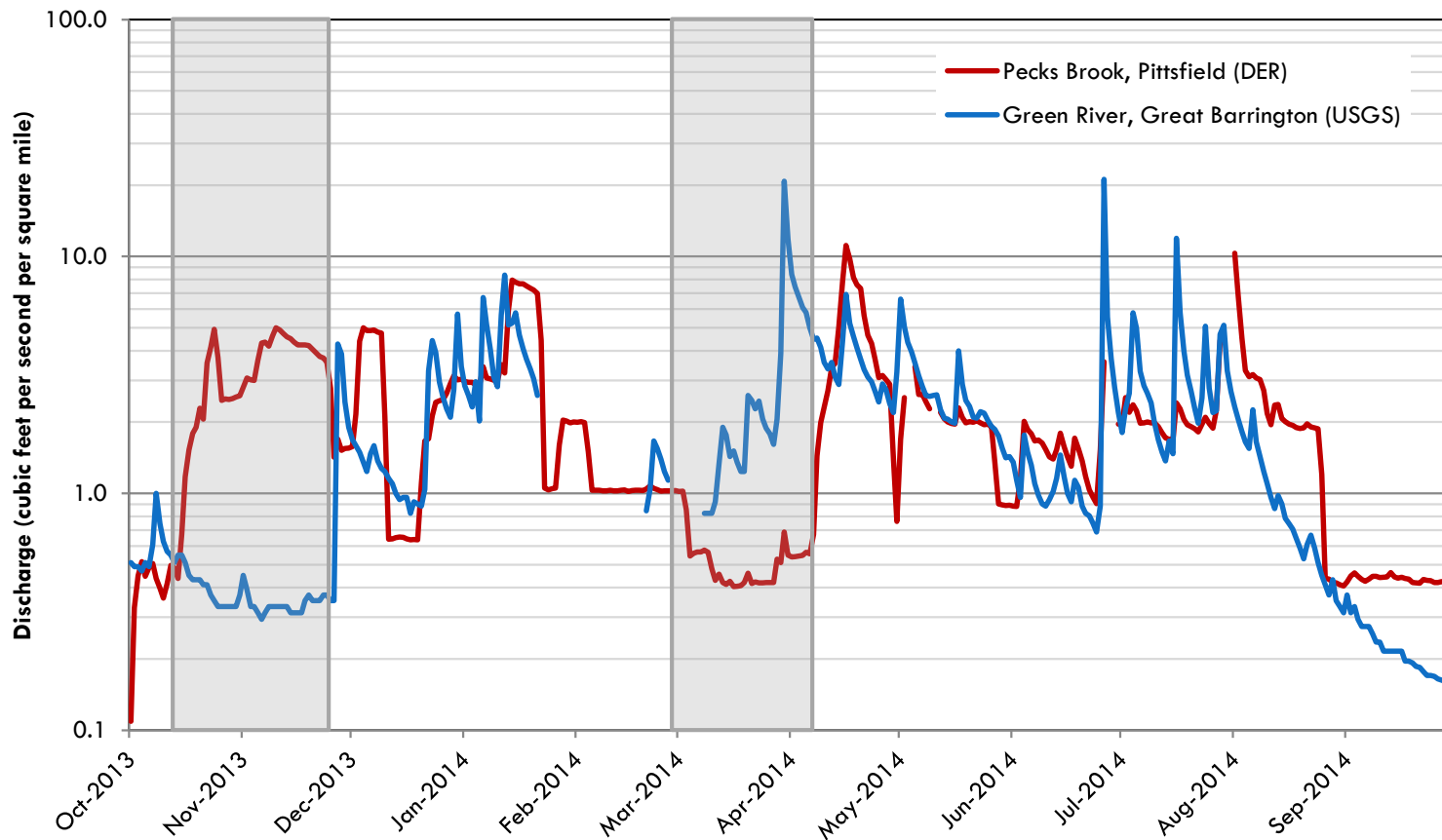
Winter drawdown/spring refill can impact streamflow

Pecks Brook Streamflow vs. nearby USGS reference gages



Lake management impacts on streamflow

Pecks Brook Streamflow vs. nearby USGS reference gages



Pilot project on Onota Lake/Pecks Brook

- Since 2014, have been implementing alternative dam management
- Lots of Partners (LAPA West, City of Pittsfield, HVA)
- Developed guidance document to be used alongside existing Order of Conditions/GEIR



Pilot project goals

Improve streamflow and ecological condition of Pecks Brook, while continuing to allow for lake drawdown, refill, and recreational lake levels

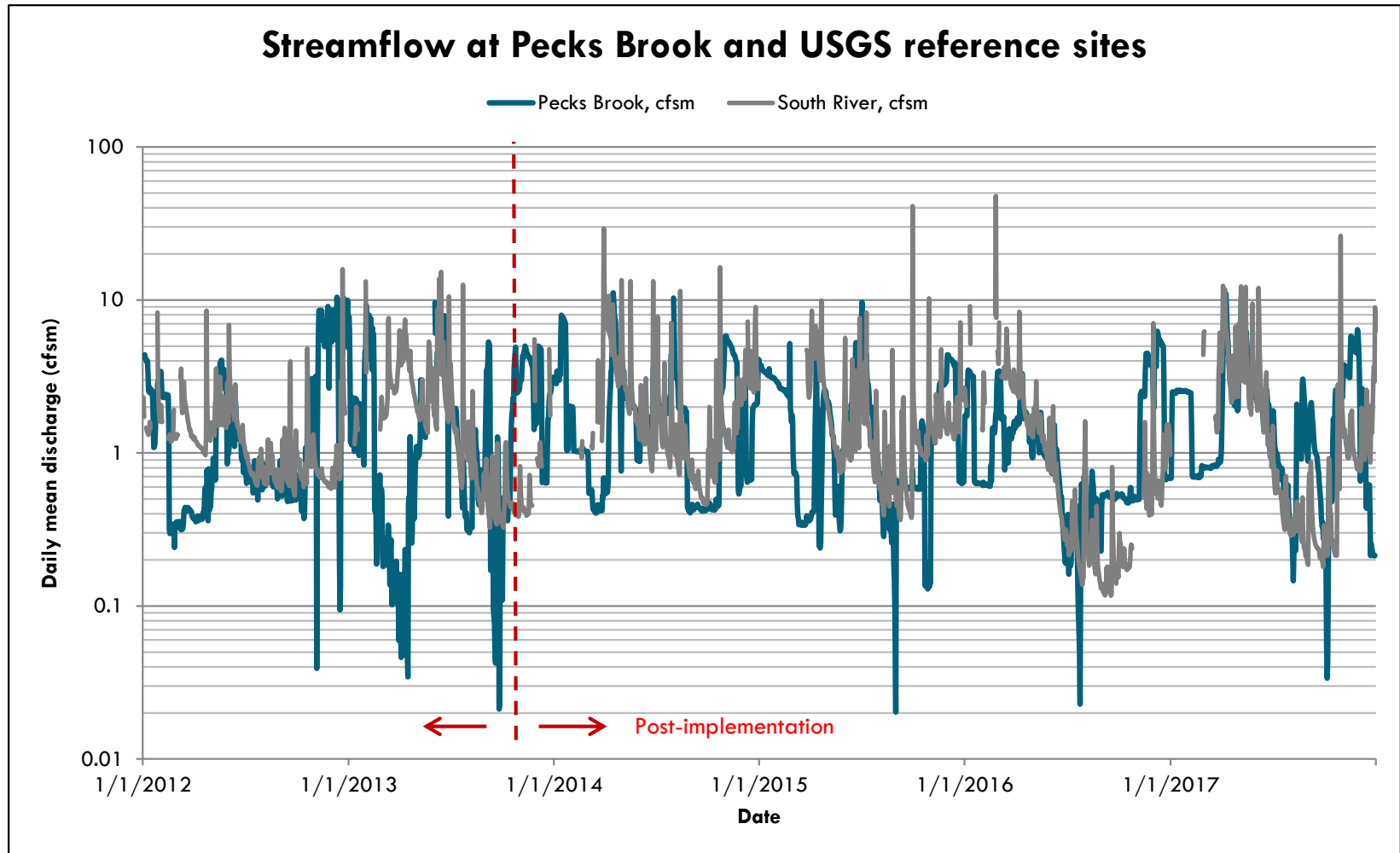
- ❑ Provide adequate streamflow
- ❑ Minimize extreme rates of change
- ❑ Encourage natural variability



Results

- Fewer low flow periods were observed
- Rapid rates of change minimized
- Macroinvertebrate assemblage scores doubled (while reference streams stayed the same) – indicating a healthier community
- Fish species richness increased but relative abundance of fluvial fish decreased

Results



Next steps/Takeaways

- Continue to work with towns/lake associations/conservation commissions to improve streamflow downstream of managed dams
- Prioritize managed lakes for improved dam management

Manage lakes while
keeping streamflow
in mind!



Questions



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