

# Lamprey River Instream Flow Implementation Study



**Lamprey WMPAAC**  
**July 29, 2015**

# Evaluation of the Instream Flow Program at NHDES

<b>Activity</b>	<b>Timeframe</b>
<b>Adopted the Water Management Plans</b>	August 30, 2013
<b>Two-year implementation period</b>	September 1, 2013 – 2015
<b>Informational meetings in the Souhegan and Lamprey watersheds</b>	July 20 and July 29
<b>Draft report released</b>	September 1, 2015
<b>Public hearings in Souhegan and Lamprey Watersheds</b>	Mid – September
<b>Public comment period</b>	Mid-September through mid-October
<b>Final Report Due</b>	December 1, 2015

# Studies and discussions for the implementation period

- How can we tell if ISF management is having positive or negative ecological effects?
  - What studies are needed for long-term monitoring of ecological conditions?
  - What are the key indicators?
  - What are the criteria for applying adaptive management?
  - How can public input be improved?
  - What processes are needed for notification?
- (continued)

## Studies and discussions for the implementation period (continued)

- When and how should enforcement be applied?
- Can the process be streamlined? Can it be described briefly?
- What effects do dam removals have?
- What costs are there for studies, NHDES staff, dam modifications?
- What are the costs to business?
- What effects does management have on temperature and conductivity?

# Report outline

- I. Introduction
  - II. Lessons Learned
  - III. Impacts
  - IV. Plan for other rivers
  - V. Proposed legislation
  - VI. Development of new ISF Rules
  - VII. Public comments
  - VIII. Conclusions
  - IX. Recommendations
- (with details in several appendices)

# I. Introduction

- Describes:
  - overview and organization of the report
  - review of the ISF study and WMP

# Lamprey DR

## Protected Instream Flows

Lamprey Protected Instream Flows for Fish			Common Flow				Critical Flow				Rare Flow			
Time of Year	Controlling IPUOCR Flows	Bioperiod	Common Flow (cfs)	Common Flow (cfsm)	Allowable Duration (days)	Catastrophic Duration (days)	Critical Flow (cfs)	Critical Flow (cfsm)	Allowable Duration (days)	Catastrophic Duration (days)	Rare Flow (cfs)	Rare Flow (cfsm)	Allowable Duration (days)	Catastrophic Duration (days)
Dec 9 – Feb 28	Flow	Overwintering	238	1.3	20	57	110	0.60	10	37	73	0.40	7	30
Mar 1 – May 4	Flow	Spring Flood	622	3.4	14	42	238	1.3	10	19	146	0.80	3	9
May 5 – Jun 19	Shad spawning	Clupeid Spawning	143	0.78	13	28	62 / 156	0.34 / 0.85	5	13	57 / 242	0.31 / 1.3	4	10
Jun 20 – Jul 4	GRAF spawning	GRAF Spawning	101 / 101	0.55 / 0.55	-- / 11*	15*	18 / 156	0.10 / 0.85	5*	10*	16 / 242	0.087 / 1.3	2*	3*
Jul 5 – Oct 6	Common Shiner	Rearing & Growth	104	0.57	46	82	18	0.10	15	32	16	0.087	5	15
Oct 7 – Dec 8	Atlantic Salmon	Salmon Spawning	90	0.49	17	55	40	0.22	11	33	20	0.11	6	11

### Lamprey Protected Instream Flows for Natural Communities, Wildlife Habitats and Rare, Threatened or Endangered Wildlife and Plants

Wood Turtle - Winter Survival	>130 cfs seasonal mean - December 1 through February 28
Herbaceous Low Riverbank, mannagrass, hempweed - habitat maintenance	>500 cfs for one week or more - December 1 through April 30
Riverweed, Knotty Pondweed - growth and development	>100 cfs seasonal mean - May 1 through June 30
Wood Turtle - avoid nest flooding during management	<500 cfs daily mean - June 1 through October 15, except for natural events
Floodplain vernal pools - protection/isolation	<1,500 cfs daily mean - March 15 through July 31, except for natural events
Herbaceous Low Riverbank - growth and development	< or = 60 cfs daily mean - August through September, except for natural events

### Lamprey Protected Instream Flows for Boating

Boating recreational use	>=275 cfs
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# Water Management Plans

- Water Conservation Plans
- Water Use Plans
- Dam Management Plans

## II. Lessons Learned

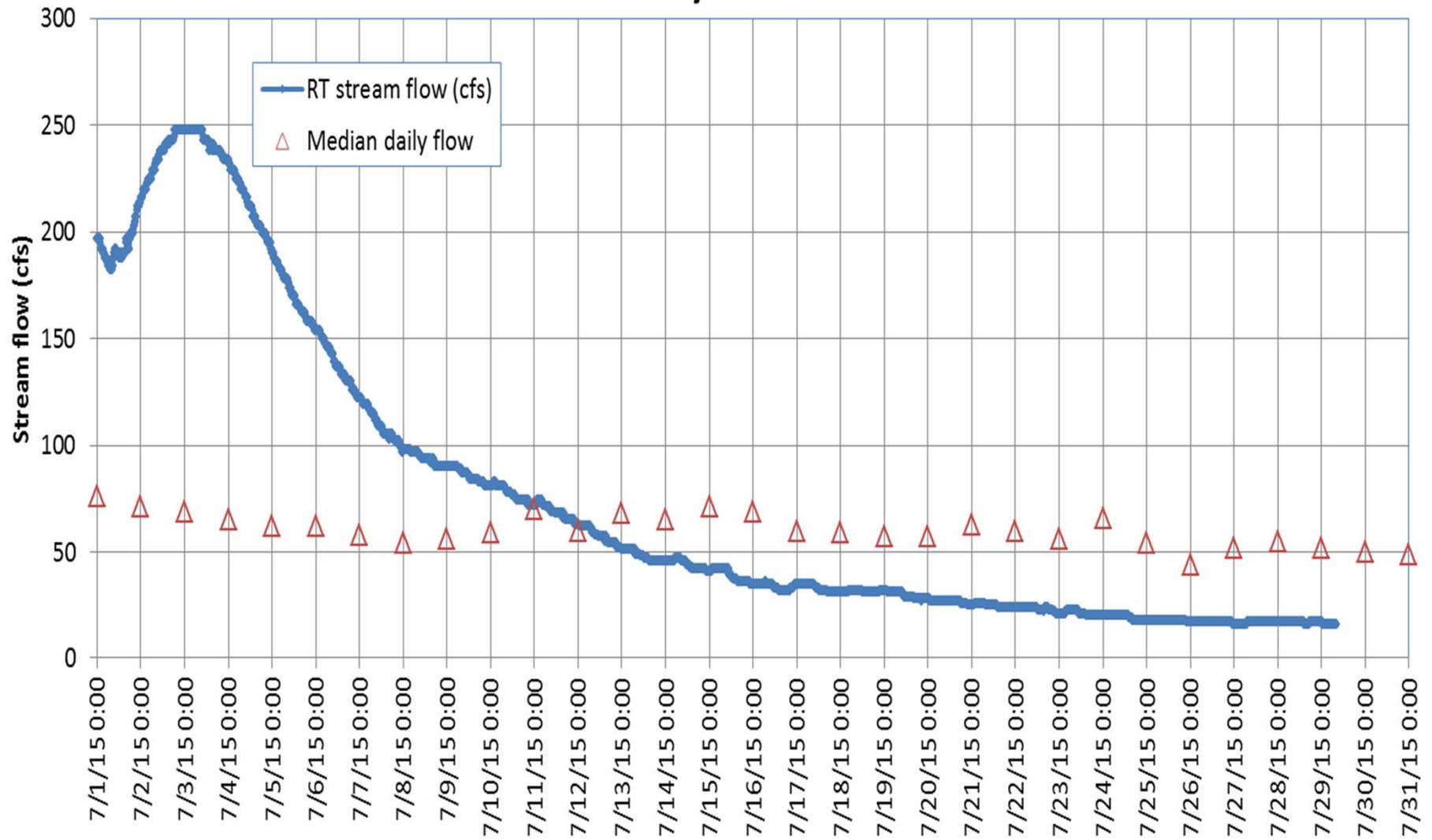
- Implementation actions
- Things that work
- Things that don't work
- Effects of various actions
- Factors affecting ability to manage

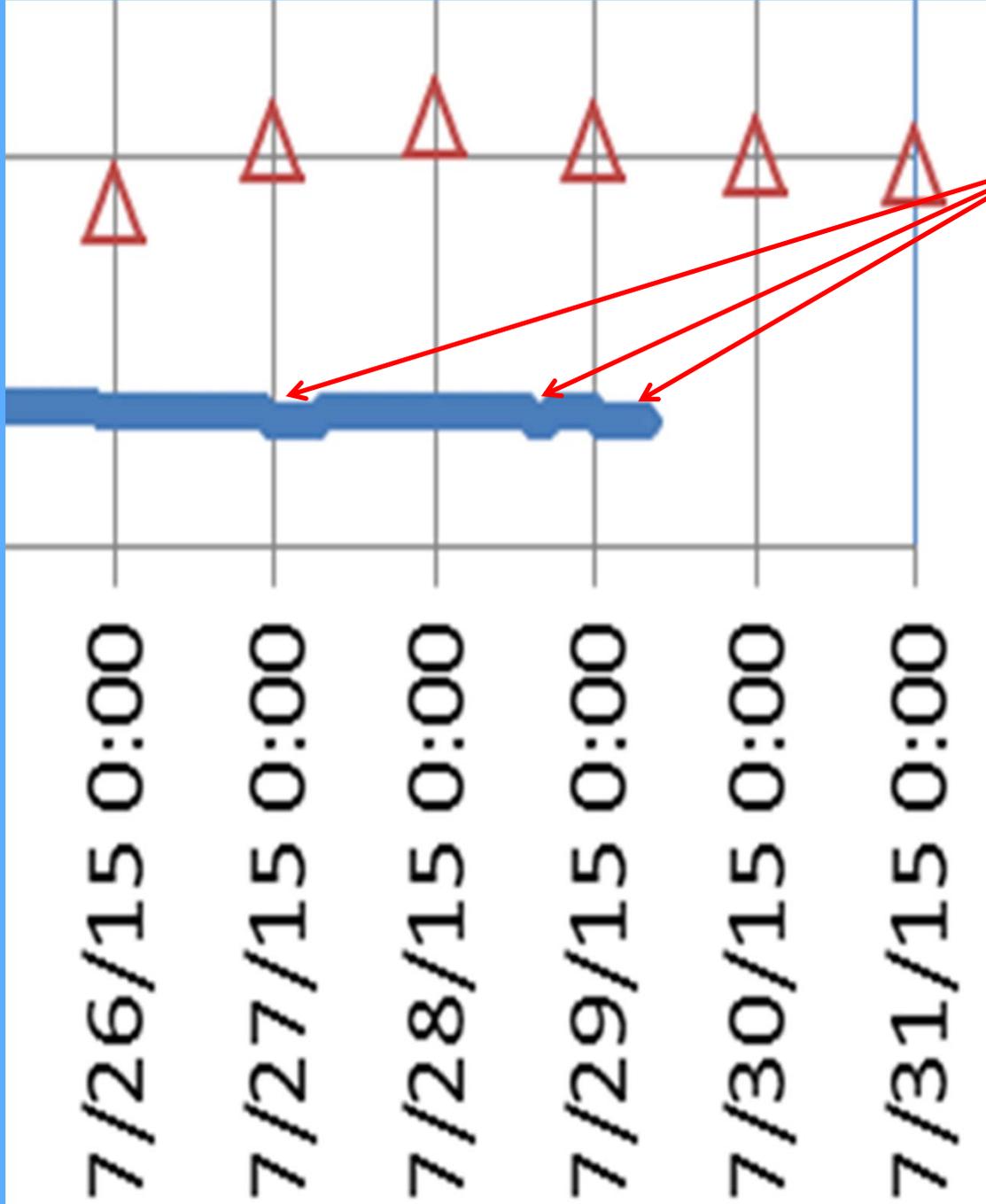
## II. Lessons

# The pilot program worked

- Study methods defined effective numerical criteria.
- Application of management meets flow goals.
- The pilot identified practical improvement for future applications

# Stream flow measurements at Lamprey River near Newmarket gage July 2015



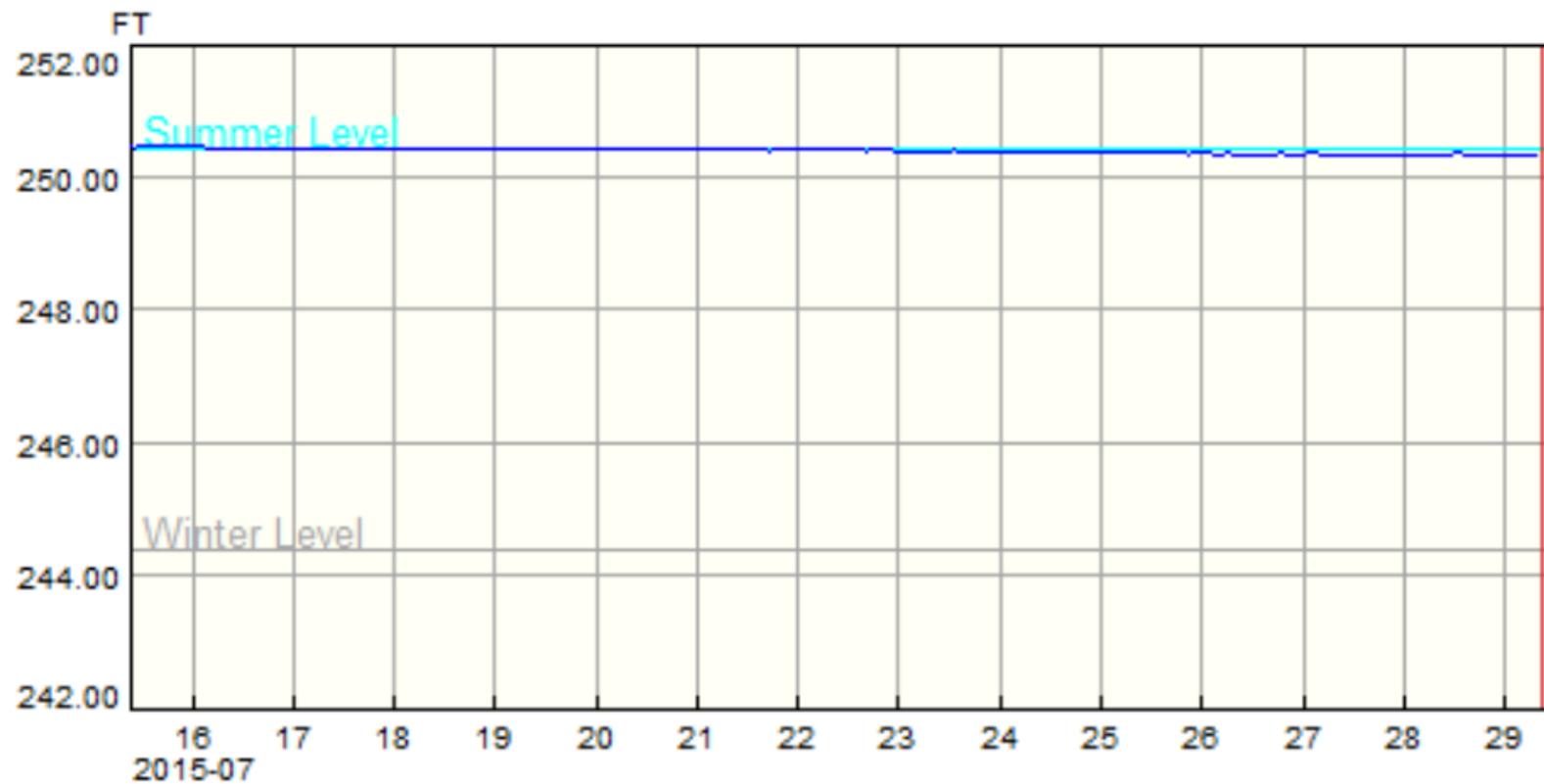


16 cfs  
during  
parts of  
days

# Pawtuckaway near full (-0.07 on 7/29/15 at 8am)

## PAWTUCKAWAY LAKE ELEVATION [FT]

Created at 07/29/2015



— OBSERVED LAKE ELEVATION

## II. Lessons

# Natural Flows

- Natural flows protect ecosystem and support many human uses
- Management using natural flows provides more flexibility for water use than other methods

## II. Lessons

# Criteria drivers

- Flow criteria should be based on the flow-dependent entities
  - Fish (and other aquatic species?)
  - Riparian species
  - Recreation

## II. Lessons

# Lakes and rivers interact

- Storage and releases from lakes affect stream flow
- Lake storage can be used to manage stream flows
- Lake uses and values need to be protected

## II. Lessons

# Getting all interests represented

- We now have a better sense of what features management affect
- Earlier involvement of interest groups
- Improved and shortened plan development

## II. Lessons

# Spinoff benefits

- Strengthened gage network
- Principles for water resource management
- Specific lake management criteria

## II. Lessons

# Inadequate monitoring

- Not enough monitoring to define baseline and trend conditions
  - Fish
  - Riparian vegetation and wildlife

# III. Impacts

- Instream Flow protection goals
- Are dam releases effective?
- Water users
- Fish and riparian species
- Recreational
- Hydropower
- Water quality
- State agencies

### III. Impacts

## Goals for ISF protection

- Biology – water quality standards for biological integrity
- Social – recreation and water use
- Hydrology – mimic the natural pattern
- Legal – Surface Water Quality Rules and Instream Flow Rules; Rivers Act and pilot program legislation

### III. Impacts

## Fish and riparian species

- Need baseline and long-term monitoring
- Assumption is that mimicking natural flows will support the expected species
- (Riparian plant and wildlife communities follow the same assumption)
- Fish are assessed by comparison with the Target Fish Community

### III. Impacts

## Water users

- Water users have effects on flows and are also affected by management
- Most water users have few requirements
- Most management where there is:
  - Consumptive uses
  - Inducing recharge
- Costs - variable
- Survey conducted February 2015

### III. Impacts

## Recreation - boating

- No obvious impacts
- Long-term tracking
- Availability and duration of flows that meet boating preferences

# IV. Plan for other Designated Rivers

- Process
- Methods
- Priorities
- Resources needed
- Schedule

#### IV. Plan for other Rivers

## Methods and Process

- Use the same methods for determining protected flow criteria
- Different process
  - focus the studies
  - consultants
  - public input

#### IV. Plan for other Rivers

## Priority rivers

- 45 out of 1000 designated river miles done
- Priorities - different criteria than the pilot
- Will the legislature pick the progression or leave the decision to NHDES?

#### IV. Plan for other Rivers

## Resources needed

- Two additional staff
- Funding :
  - dam retrofits
  - consultants for PISF studies
  - independent reviews
  - river models



# V. Legislation

- Changes to Rivers Act–RSA 483
- Changes to Water Conservation Act–RSA 485.61
- Replace pilot program legislation?

# IX. Recommendations

- Legislation changes
- Develop fish data statewide
- Review gage data relative to ISF needs
- Long-term monitoring
- Same ISF assessment methods
- ISF studies by consultants; WMP by DES
- Develop criteria for adaptive management

A photograph of a man fishing in a river. The man is wearing a blue cap, a dark vest over a light shirt, and blue jeans. He is standing on a rocky bank with some greenery. The river is dark and calm, with some rocks and debris visible in the water. The background is filled with lush green trees and foliage.

# Comments or questions?

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