

Lamprey River Instream Flow and Water Management Plan



Lamprey WMPAAC
November 6, 2013

Instream Flow

- The purpose of the Instream Flow Program is to ensure that rivers continue to flow in spite of the uses and stresses that people put on them.

Lamprey ISF

- Pawtuckaway LLI Decision August 2013.
- Protected flows established August 2013.
- Water Management Plan adopted Aug 2013.
- DES/Pawtuckaway Lake Improvement Association agreement September 2013.

- Implementation and testing for two years.
- A report and hearing before the Legislature September-December 2015.

Pawtuckaway LLI

- Found the deep drawdown is likely causing some problems

So:

- Changes the winter drawdown from 7 ft to 4.8 ft
- Reduced by half foot increments each year over four years

Instream Flow Program

- Identify protected flows that will support aquatic life, recreation, riparian vegetation and wildlife (instream public uses).
- Evaluate flow conditions relative to the protected flows.
- Identify water use needs.
- Develop a plan to maintain the flows that protect instream public uses and to support water use needs.

Lamprey River PISF Report

- Studied the relationship between Lamprey River hydrology and fish, recreation, others.
- Defined habitat/use change relative to flow.
- Applied historical flows to these habitat relationships.
- Defines significant breaks in flow magnitude and duration as protected flows.

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

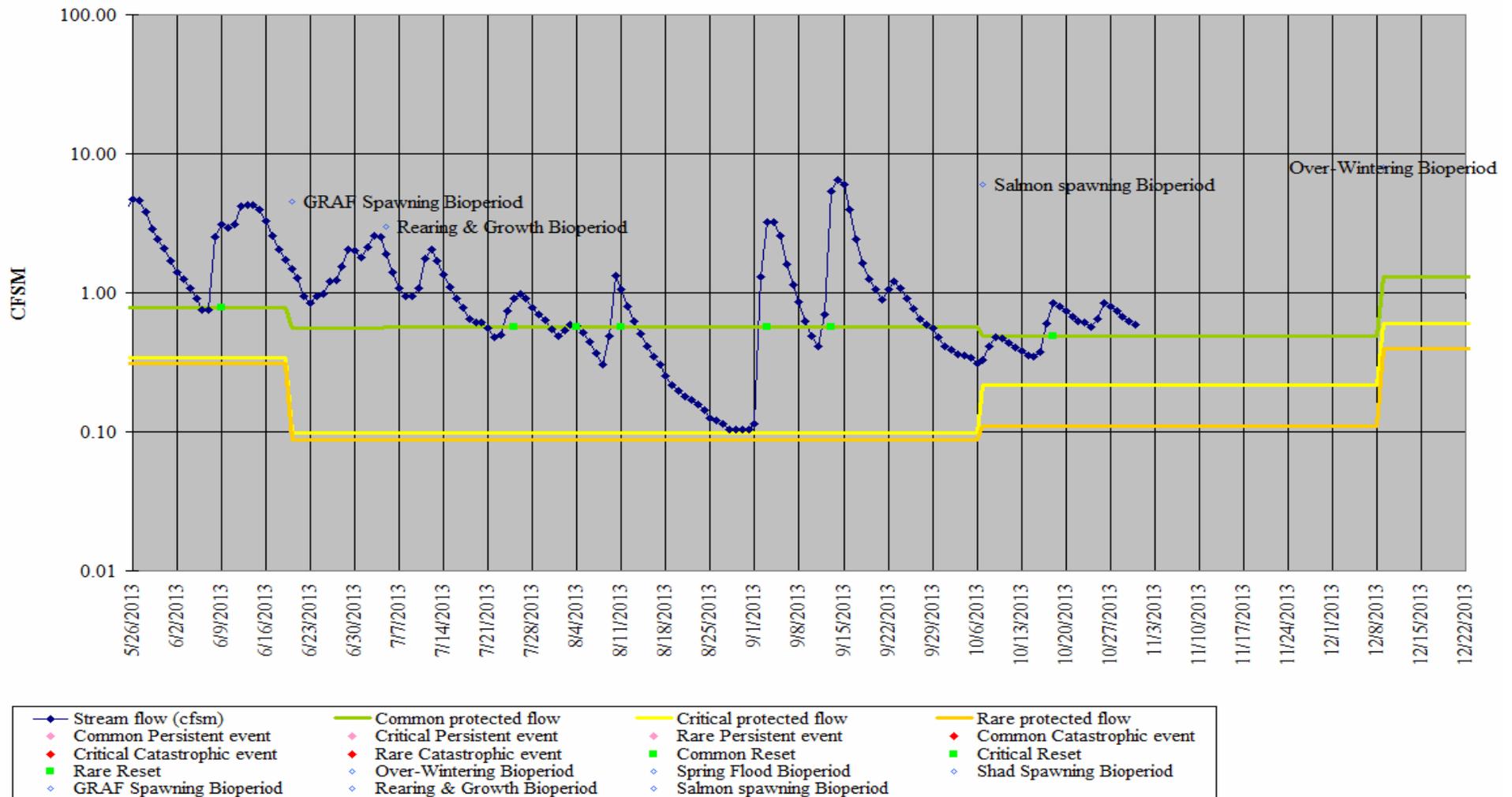
Wood Turtle - Winter Survival	>130 cfs seasonal mean - December 1 through February 28
Herbaceous Low Riverbank, mannagrass, hempweed - habitat maintenance	>500 cfs for one week or more - December 1 through April 30
Riverweed, Knotty Pondweed - growth and development	>100 cfs seasonal mean - May 1 through 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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Assessing hydrologic conditions by tracking daily stream flow and comparing with protected instream flow values.

Lamprey PISF tracking



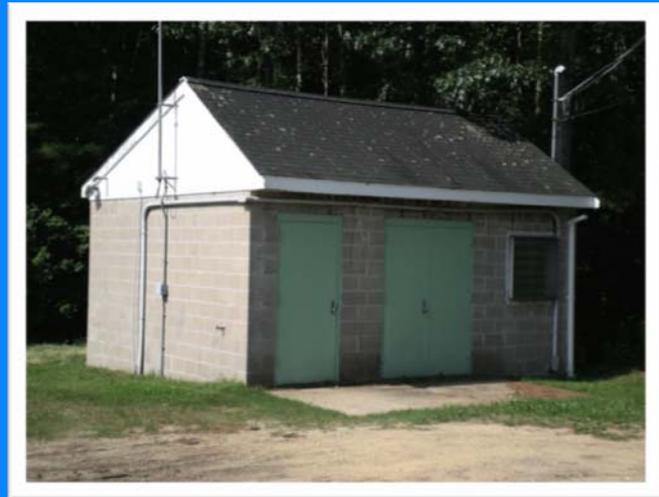
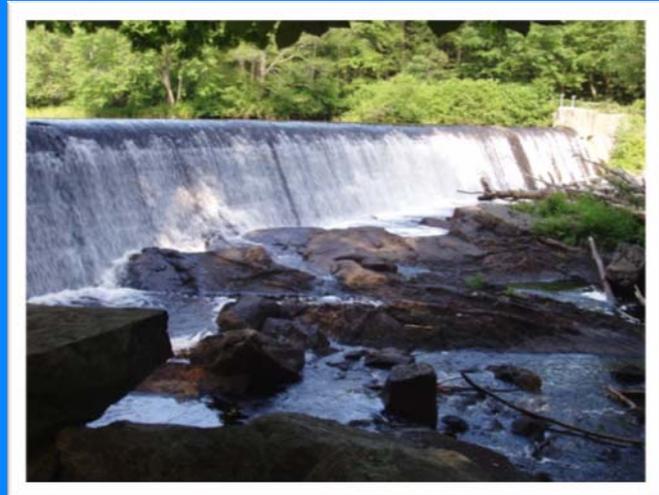
Lamprey River Water Management Plan

Protected instream flows to be maintained by implementation of Water Management Plan with objective of:

- Maintaining flows for instream public uses.
- Supporting off-stream public water supplies and agriculture.
- Maintaining the natural variability and range of flows.

Entities Encompassed by Water Management Plan

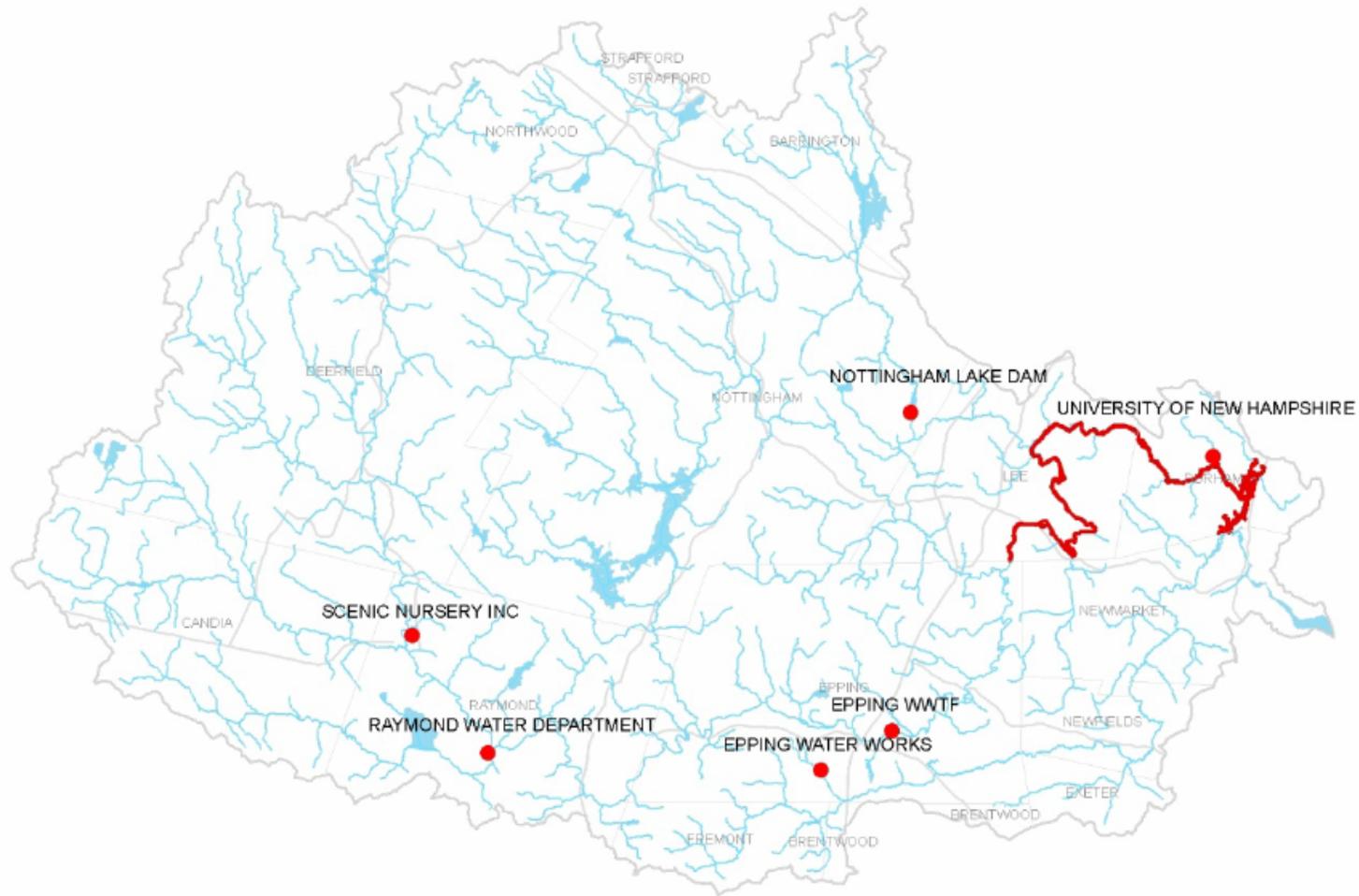
- **Dam Owners** – owner of a dam with an impoundment having a surface area greater than 10 acres.
- **Water Users** – registered and having a withdrawal or return location within 500 ft of a designated river and its tributaries.



Entities Encompassed by Water Management Plan

Affected Water Users

DES Registration ID	Name of Water User	Description of Water User
20045	EPPING WATER WORKS	EPPING WATER WORKS
20061	RAYMOND WATER DEPARTMENT	WATER WORKS
20066	UNIVERSITY OF NH	WATER WORKS
20747	SCENIC NURSERY INC	SCENIC NURSERY INC
20126*	MILL POND VIEW LLC	NOTTINGHAM LAKE DAM

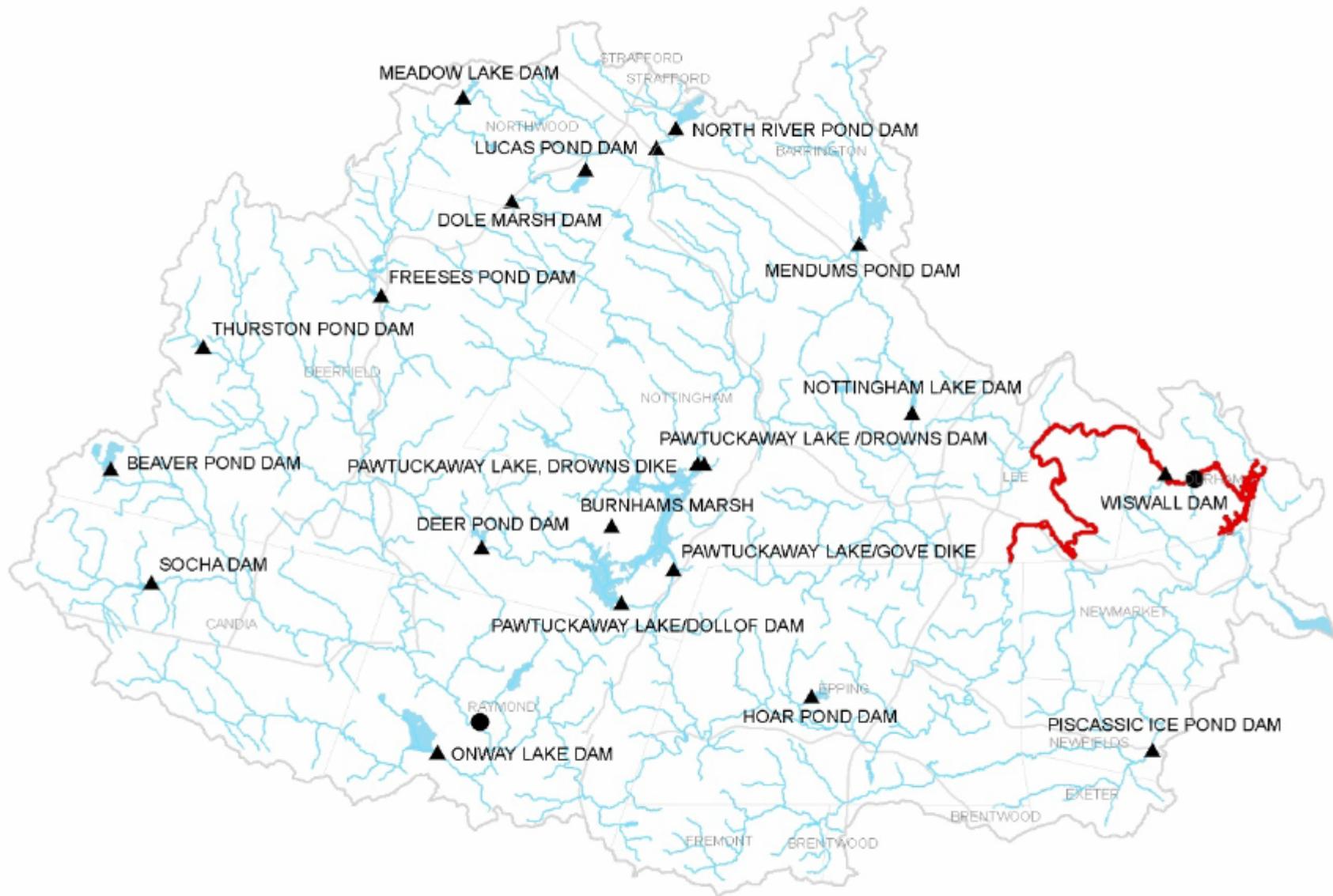


Entities Encompassed by Water Management Plan

Affected Dam Owners

DES ID #	Affected Dam Name	Affected Dam Owner
037.03	Socha Dam	Ms. Marie Socha
061.02	Freeses Pond Dam	Town of Deerfield
061.07	Beaver Pond Dam	NH DRED
061.18	Thurston Pond Dam	Town of Deerfield
071.04	Wiswall Dam	Town of Durham
078.07	Hoar Pond Dam	Town of Epping
171.01	Piscassic Ice Pond Dam	Mr. Gilbert Lang
183.08	Lucas Pond Dam	NH F&G
183.16	Meadow Lake Dam	NH DRED
183.18	Dole Marsh Dam	NH F&G
184.01	Mendums Pond Dam	NH DES
184.02	Pawtuckaway Lake/Dolloff Dam	NH DES
184.03	Pawtuckaway Lake/Gove Dike	NH DES
184.04	Pawtuckaway Lake/Drowns Dam	NH DES
184.05	North River Pond Dam	NH DES
184.08	Nottingham Lake Dam	Mill Pond View, LLC
184.11	Deer Pond Dam	Mr. Chris Stillbach
184.19	Pawtuckaway Lake/Drowns Dike	NH DES
201.01	Onway Lake Dam	J & D Realty Trust

NH DES – New Hampshire Department of Environmental Services, managed by the Dam Bureau
NH DRED – New Hampshire Department of Resources and Economic Development
NH F&G – New Hampshire Fish and Game Department



Water Management Plan

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graph TD; A[Water Management Plan] --- B[Conservation Plan]; A --- C[Water Use Plan]; A --- D[Dam Management Plan];
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Conservation
Plan

Water Use
Plan

Dam Management
Plan

Conservation Plans

Elements of Individual Plans:

- Identification of water source and uses of the **Affected Water User.**
- Description of water use patterns.
- Description of existing water conservation measures.
- Water conservation requirements of Env-WS 2021 – Water Conservation Rules.
- Conservation Plan implementation schedule.

Water Use Plans

Elements of Individual Plans:

- Define water use patterns and needs of the **Affected Water User**.
- Potential for water use modification (timing, location, volume).
- Coordination with Dam Management Plans to maintain protected instream flows.
- Develop implementation schedule and evaluate any costs.

Dam Management Plans

Elements of Individual Plans:

- Summarize dam characteristics, operations and limitations.
- Assess potential water availability.
- Discuss potential impacts of dam management.
- Discuss potential for dam management to meet instream flow requirements.
- Propose dam management activity, schedule and estimate costs of Plan.

Strategies for Maintenance of the Protected Instream Flows

- Under Instream Flow Rules (Env-Wq 1903.01) the **de minimis** amount is always available for off-stream water use regardless of river conditions.
 - De minimis amount is equal to 5% of 7Q10, which is the lowest continuous 7-day flow having a 10 year recurrence interval.
 - 7Q10 of Lamprey River at the USGS gage in Merrimack is 4.8 cfs, so de minimis is 0.24 cfs or 155,105 gallons per day.

Changes to the WMP as a result of comments

- Defined maximum summer lake level change
- Alewife barriers
- Loon nesting protections
- Pawtuckaway plant surveys
- Winter relief flows delayed until 2017-18
- Continued T measurements
- Notifications will be distributed prior to relief flows

WMP Implementation

- DES will establish a long-term ecological monitoring program.
- DES will assess variability/sustainability of water management (ESWM.)
- DES will develop criteria to apply adaptive management to actions that do not result in the expected results.

DES PLIA Partnership Agreement

- Larger proportion of release from Drowns Dam
- Monitoring of phosphorus and aquatic plants
- Two more winter test releases
- Notifications, meetings and articles
- Dam operations plan
- Evaluation of adaptive management

Next Steps in the Instream Flow Program

- Implementation period
 - Pawtuckaway Lake Agreement studies and activities
 - Monitoring and testing of river and lake environmental conditions
 - Legislative Review in 2015
 - Report
 - Public

Studies and discussions for the implementation period

- How can we tell if ISF management is having positive or negative ecological effects? What studies for long term monitoring of ecological conditions?
- Criteria for applying adaptive management?
- How can public input be improved?
- What processes are needed for notification?
- When and how should enforcement be applied.

Legislative Review 2015

- September 2015 – report to the legislature on the effects of the pilot program, recommended legislation
- December 2015 – public hearing on the effects of the pilot program
- The legislative subcommittee on instream flows will report to the legislature and the governor, its findings and any recommendations for proposed legislation.
- Legislature will then determine the future shape of the program.



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**Comments or
questions?**