

**Table 1 - Instream Protected Flows for the Segments of the Lamprey River Designated as Protected Pursuant to RSA 483:15, XIII**

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 / <b>156</b>	0.34 / <b>0.85</b>	5	13	57 / <b>242</b>	0.31 / <b>1.3</b>	4	10
Jun 20 – Jul 4	GRAF spawning	GRAF Spawning	101 / <b>101</b>	0.55 / <b>0.55</b>	-- / <b>11*</b>	15*	18 / <b>156</b>	0.10 / <b>0.85</b>	5*	10*	16 / <b>242</b>	0.087 / <b>1.3</b>	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

**Bold** values are upper limits for instream flow for protection of GRAF spawning. Management activities should not create flow that exceed these magnitudes and durations.

Watershed area for calculating cfsm is 183 square miles at the index location used. Index location is the gage USGS 01073500 LAMPREY RIVER NEAR NEWMARKET, NH

-- No Common Flow Allowable duration is described for this bioperiod because high flows and Catastrophic durations are limiting.

\* GRAF Spawning and Clupeid Spawning bioperiods partly overlap, so durations during this bioperiod begin counting May 5 (previous bioperiod) but apply only during this bioperiod.

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 (>0.71 cfsm)
Herbaceous Low Riverbank, mannagrass, hempweed - habitat maintenance	>500 cfs for one week or more - December 1 through April 30 (>2.73 cfsm)
Riverweed, Knotty Pondweed - growth and development	>100 cfs seasonal mean - May 1 through June 30 (>0.55 cfsm)
Wood Turtle - avoid nest flooding during management	<500 cfs daily mean - June 1 through October 15, except for natural events (<2.73 cfsm)
Floodplain vernal pools - protection/isolation	<1,500 cfs daily mean - March 15 through July 31, except for natural events (<8.20 cfsm)
Herbaceous Low Riverbank - growth and development	< or = 60 cfs daily mean - August through September, except for natural events (<0.33 cfsm)

Lamprey Protected Instream Flows for Boating	
Boating recreational use	>=275 cfs (>1.50 cfsm) within the range of the natural monthly frequency and maintaining level trend over 5 year average

**Instream Protected Flows for the Segments of the Lamprey River Designated as Protected Pursuant to RSA 483:15, I**

**Table 1 - Attachment - Definitions**

**Bioperiod** - biological periods - time segments within a year having biological significance for survival or propagation of species.

**cfs** - cubic feet per second - a measure of flow - one cubic foot is 7.481 gallons and one cfs is equivalent to almost 450 gallons per minute.

**cfs<sub>m</sub>** - cubic feet per second per square mile of watershed - a rate of flow - used to determine stream flow in cfs at ungaged locations by multiplying the drainage area of the ungaged location and cfs<sub>m</sub>. Cfs<sub>m</sub> is derived from gages with known drainage areas.

**GRAF** - Generic Resident Adult Fish - a combination of the most common species representing the majority of fish species in the Lamprey Target Fish Community.

**IPOOCR** - acronym for the instream flow protected entities listed in RSA 483 (Instream Public Use, Outstanding Characteristic, and Resources).

**PISF** - Protected Instream Flows - described as **Common, Critical and Rare** flow levels that are to be protected from overly long durations that would result in catastrophic conditions.

**Flow levels, flow durations, flow condition, and relief flow definitions**

**Flow levels** - common, critical and rare flow magnitudes - assigned to a bioperiod and associated with durations

**Common Flow** - the flow corresponding to the highest habitat magnitude above which the frequency of occurrence begins to decline significantly with incremental increase in habitat magnitude. Common flow magnitudes represent near optimal habitat availability conditions that are exceeded during approximately 45% of the bioperiod.

**Critical Flow** - the flow corresponding to the second to the lowest habitat magnitude for which the frequency of occurrence increases significantly with incremental increase in habitat magnitude. Critical flow magnitudes describe less habitat availability than that provided by the common flow, but this habitat magnitude is not unusual. Critical flows represent habitat availability conditions that are exceeded during approximately 65% to 85% of the bioperiod.

**Rare Flow** - the flow corresponding to the lowest of habitat magnitudes for which the frequency of occurrence increases significantly with incremental increase in habitat magnitude. Rare flow habitat availability is severely reduced and very uncommon. Rare flow represents habitat availability that is exceeded during more than 90% of the bioperiod.

**Durations** - allowable or catastrophic - limits on the consecutive days when flow is below a protected flow magnitude. Flow durations are reset at the beginning of each new bioperiod.

**Allowable** - duration occurring in an average year. Flow below protected flow levels may often continue for this duration.

**Catastrophic** - duration occurring once in ten years. Flows below protected levels for catastrophic durations initiate management activities pursuant to a Water Management Plan.

**Conditions** - the result of stream flow relative to protected flow magnitude and duration.

**Typical** - condition when flow is within the desirable range. Flow has not exceeded allowable duration for any protected flow level.

**Persistent** - condition when flow is below a protected magnitude for more than the allowable duration, but less than the catastrophic duration. Repeated persistent conditions become a catastrophic condition resulting in management activities pursuant to a Water Management Plan.

**Catastrophic** - condition when catastrophic durations are exceeded for any protected flow level or if a persistent condition occurs repeatedly. Repeated persistent conditions become a catastrophic condition if occurring during the same bioperiod over three consecutive years. A catastrophic condition initiates management activities pursuant to a Water Management Plan.

**Relief flows** - those flows that may provide relief from catastrophic conditions - relief flows require flows for a duration of two days at or above the next higher protected flow level. Relief flows reset the duration clock to zero for the protected flow level exceeded. Relief flows may be natural or may be artificially created by releases from storage.