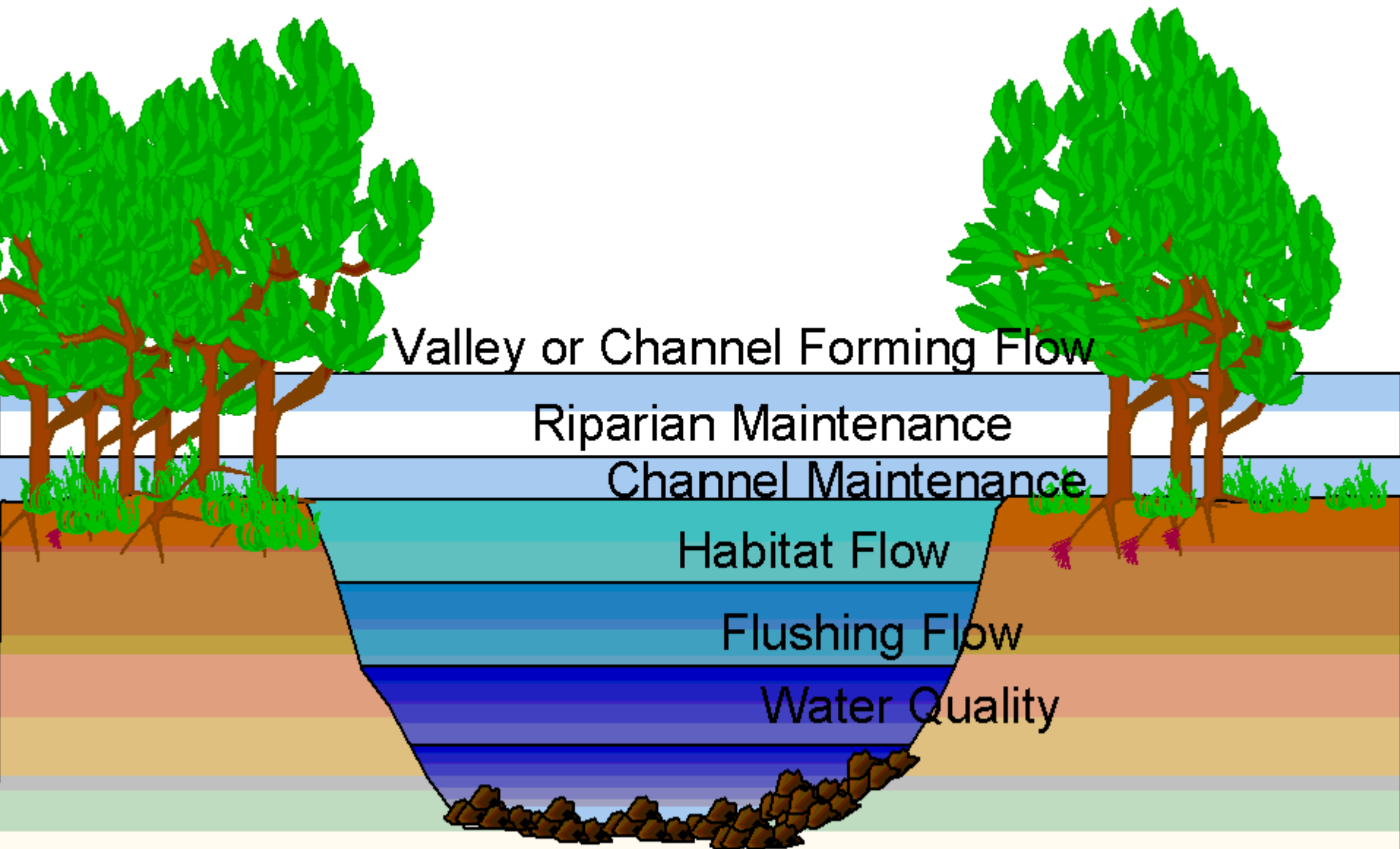


# Licensing Small Hydropower *and Conserving Fish and Other Aquatic Life*

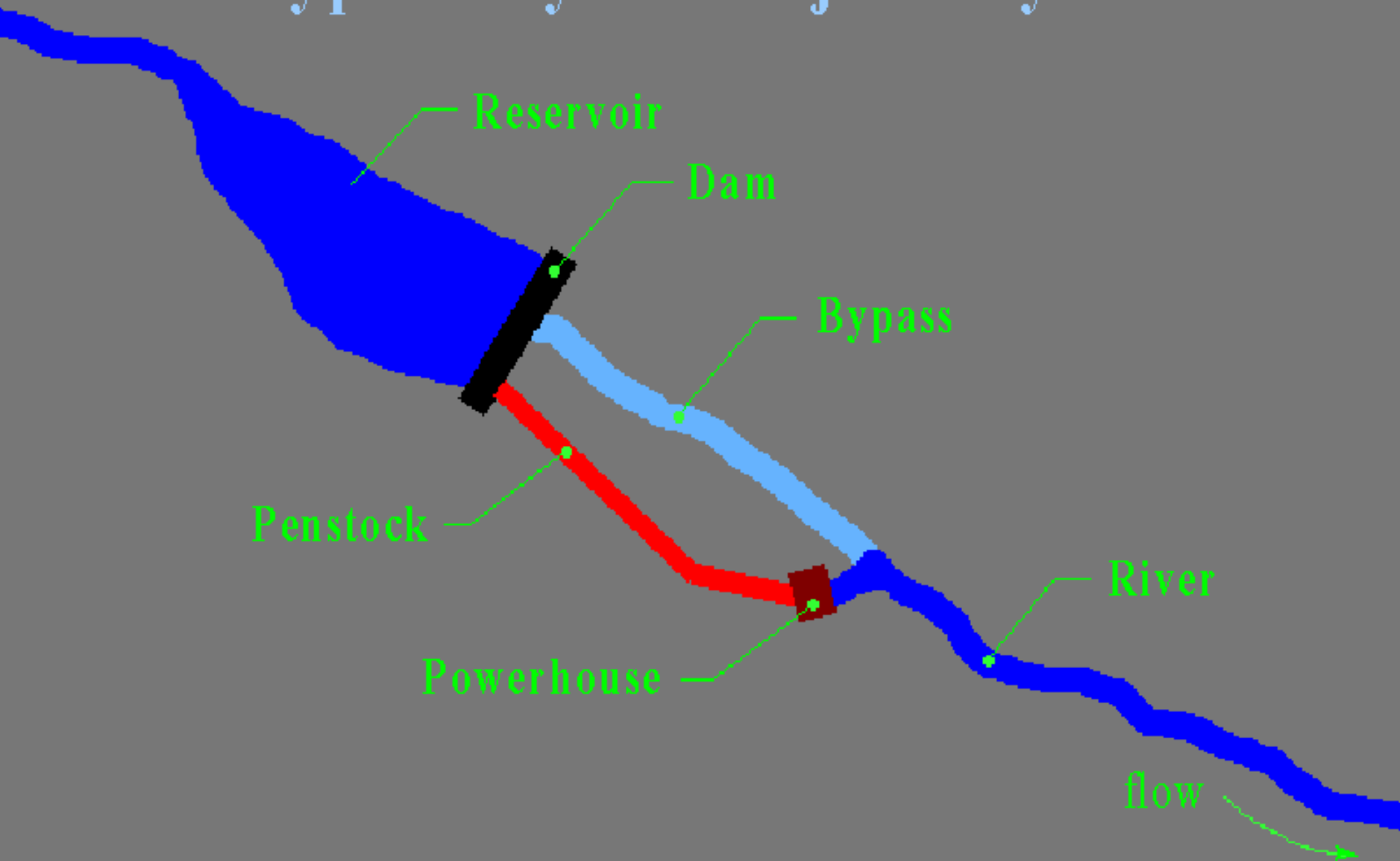
Rod Wentworth  
VT Dept. of Fish & Wildlife



# Different Flows Perform Different Functions...



# Typical Hydro Project Layout



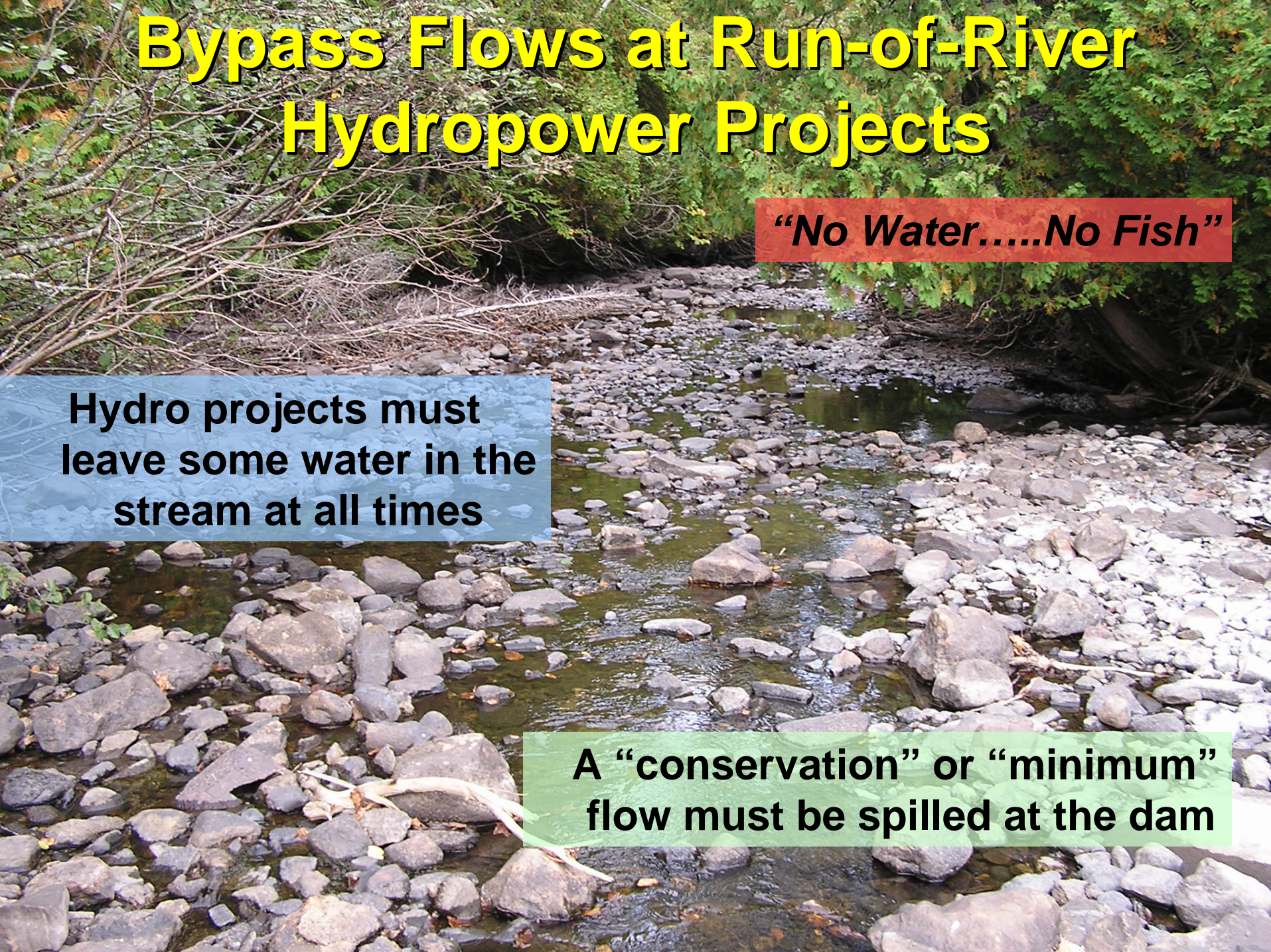


# Bypass Flows at Run-of-River Hydropower Projects

***“No Water.....No Fish”***

**Hydro projects must leave some water in the stream at all times**

**A “conservation” or “minimum” flow must be spilled at the dam**

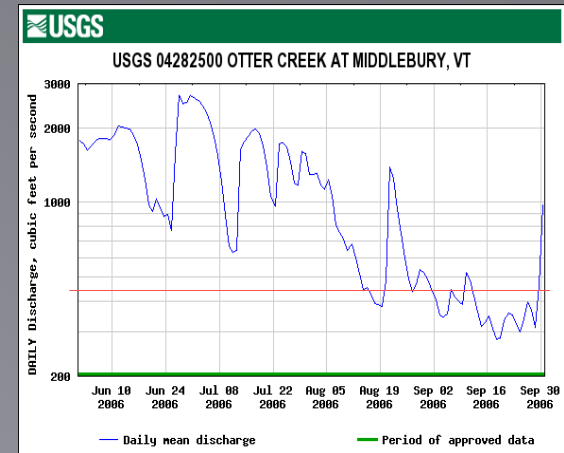




# Agency Procedure for Determining Acceptable Minimum Stream Flows

*Based on the US Fish & Wildlife Service  
New England Flow Policy*

**Flow Standards based on seasonal  
median flows -- New England  
Aquatic Base Flow (ABF) Method**



Habitat  
Availability



Stream Flow

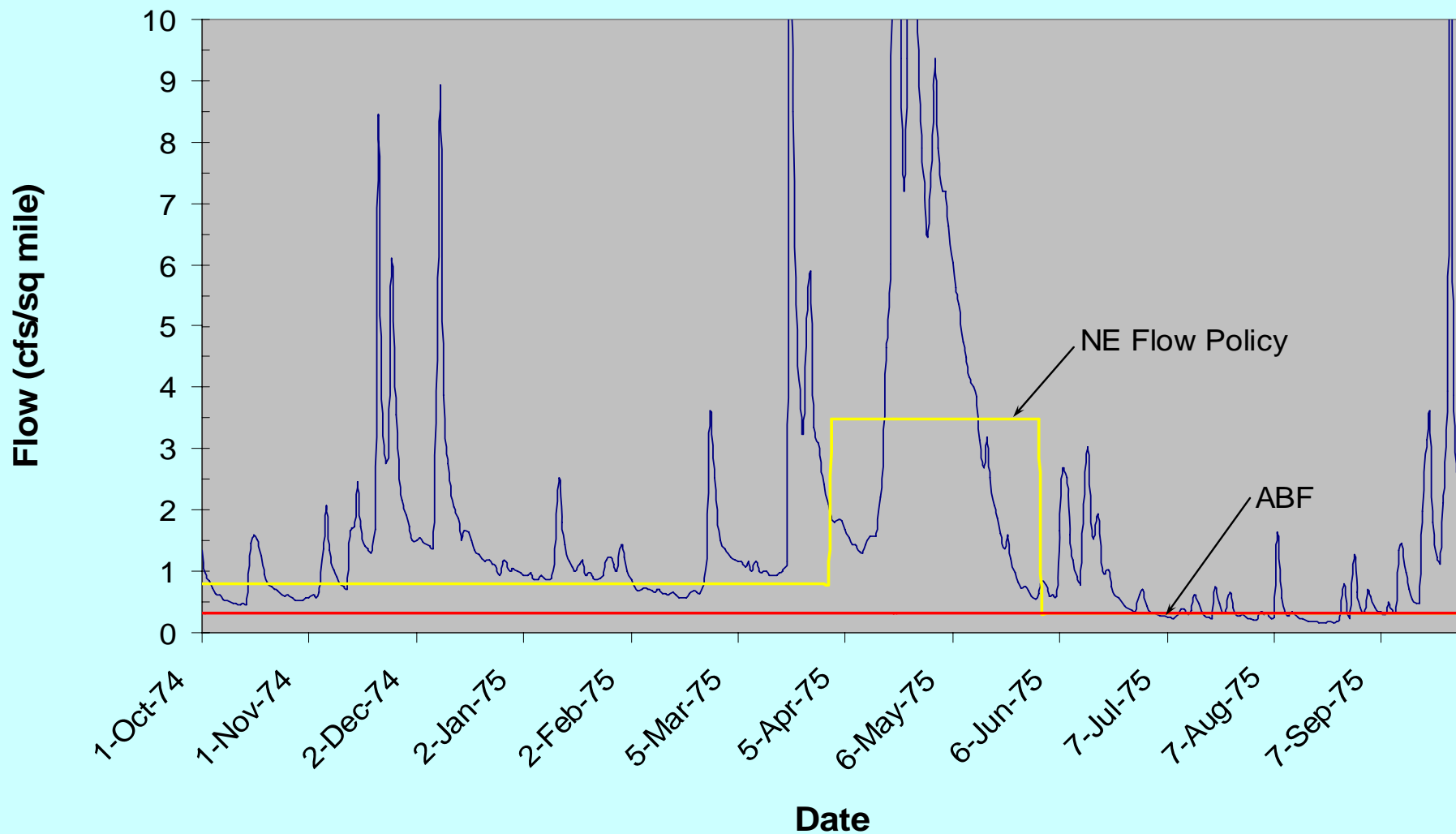
**Alternatively, applicants  
may do site specific  
studies**

# New England Aquatic Base Flow (ABF) Method

- **Recommends the August median flow and where applicable, seasonal median flows for spawning and incubation**
- **For rivers lacking adequate gage data, “default” regional average values are used**

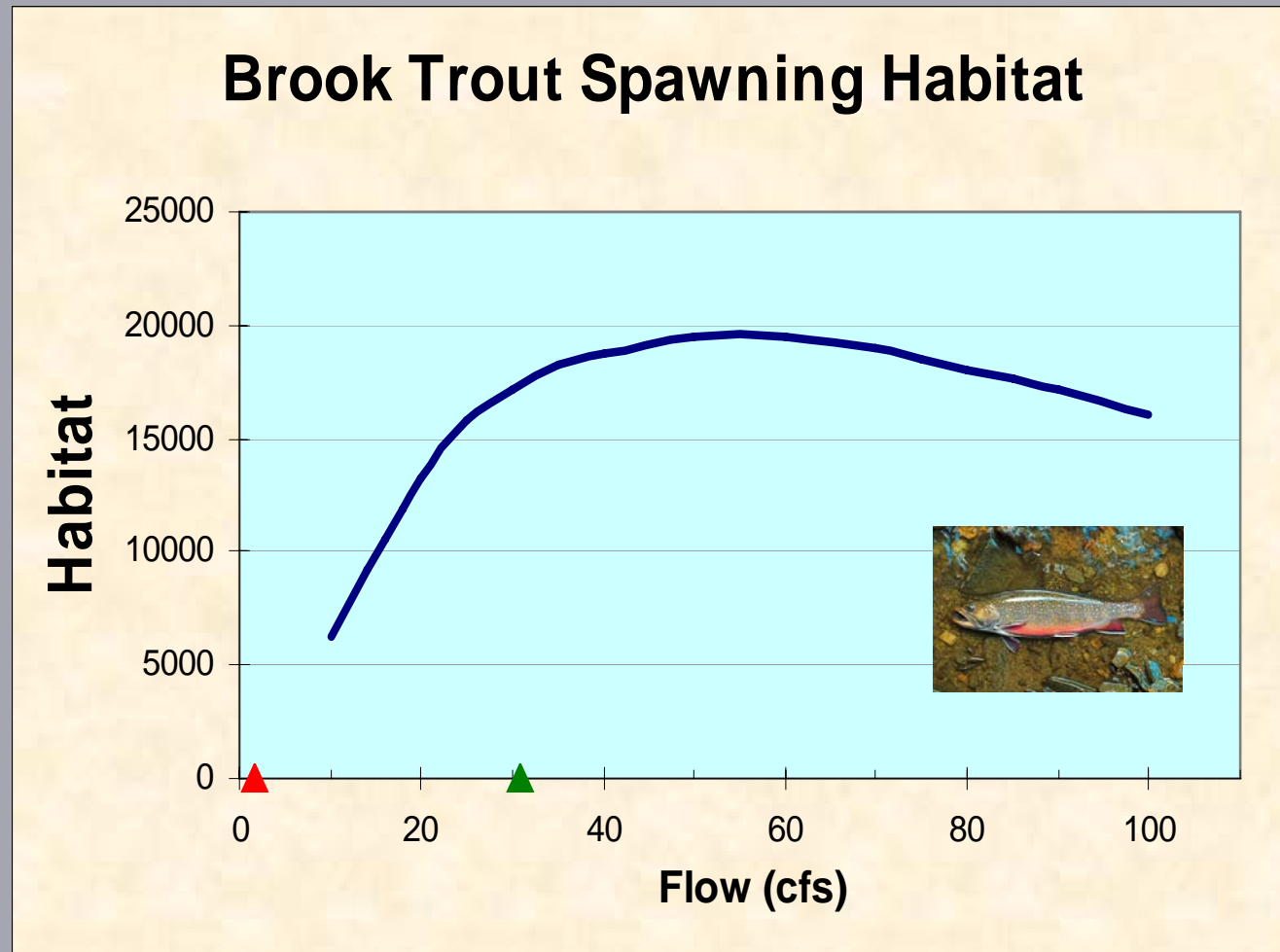
Season	Period	Median Flow Standard	Default (cfs/mi <sup>2</sup> )
Fall/winter	Oct 1 - Mar 31	February	1.0
Spring	Apr 1 - May 31	April/May	4.0
Summer	Jun 1 - Sep 30	August	0.5

# Mad River Daily Flow Hydrograph Water Year 1975



# Site-specific Studies: Evaluate the Relationship between Aquatic Habitat and Flow

The flow reserved for aquatic life is negotiated based upon study results.

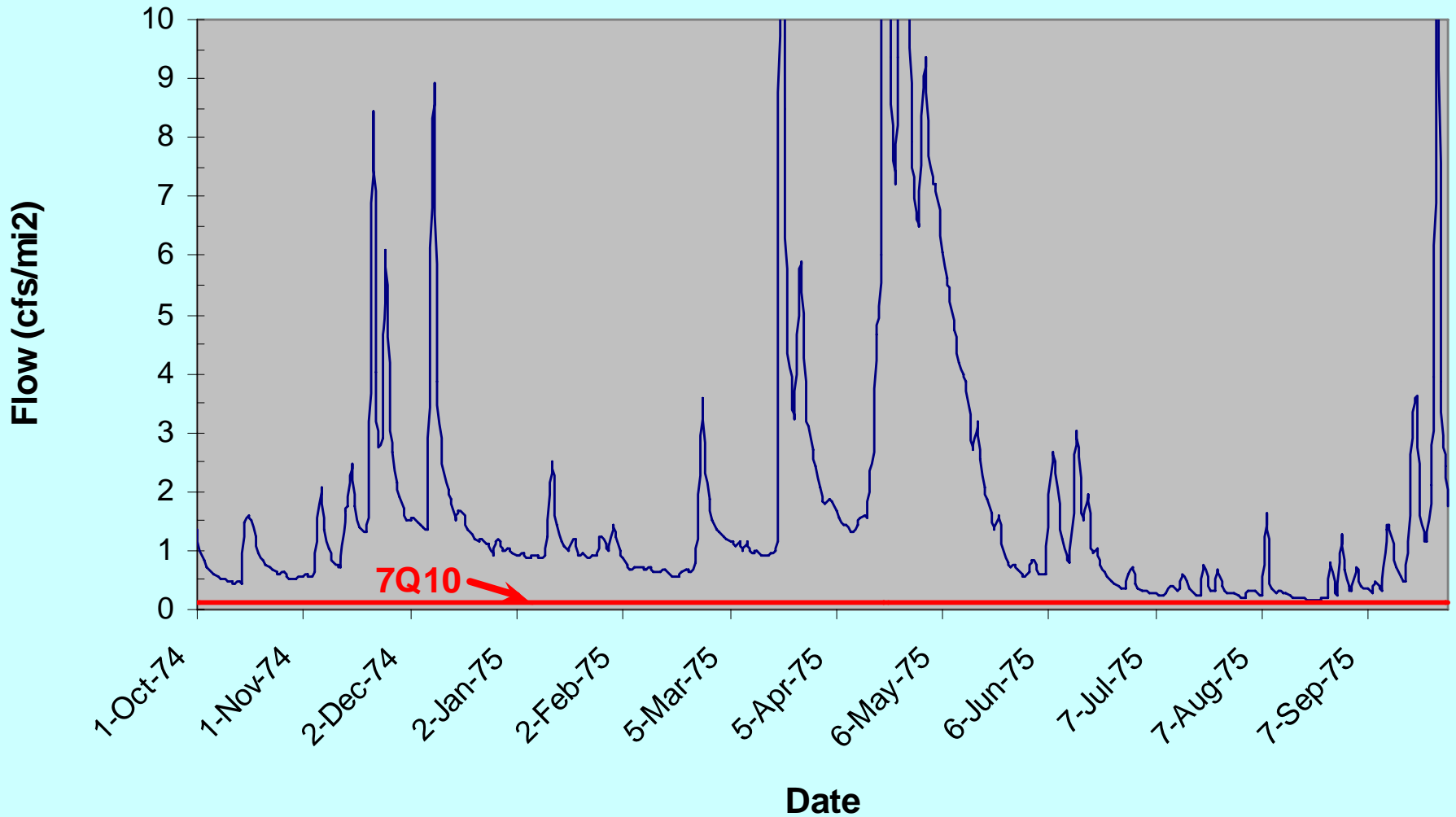




# 7Q10

- The lowest flow that occurs for 7 consecutive days, on average every 10 years
- Used as a worst-case drought flow for design of wastewater treatment plants
- As a flow standard:
  - No biological basis
  - Will not protect aquatic life; severe degradation is likely

# Mad River Daily Flow Hydrograph Water Year 1975



**7Q10 Flow  
Mad River -- Moretown**



# The Fish and Wildlife Department provides advice on:

- What to do next
- Studies or information needed; study design and scope
- Information on the fisheries resources



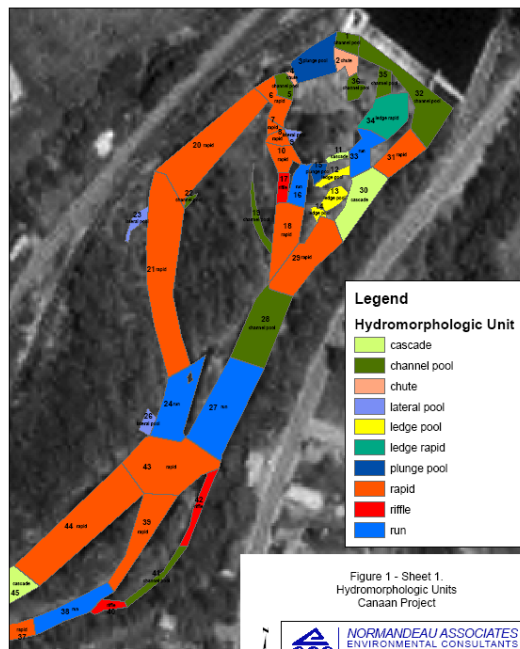
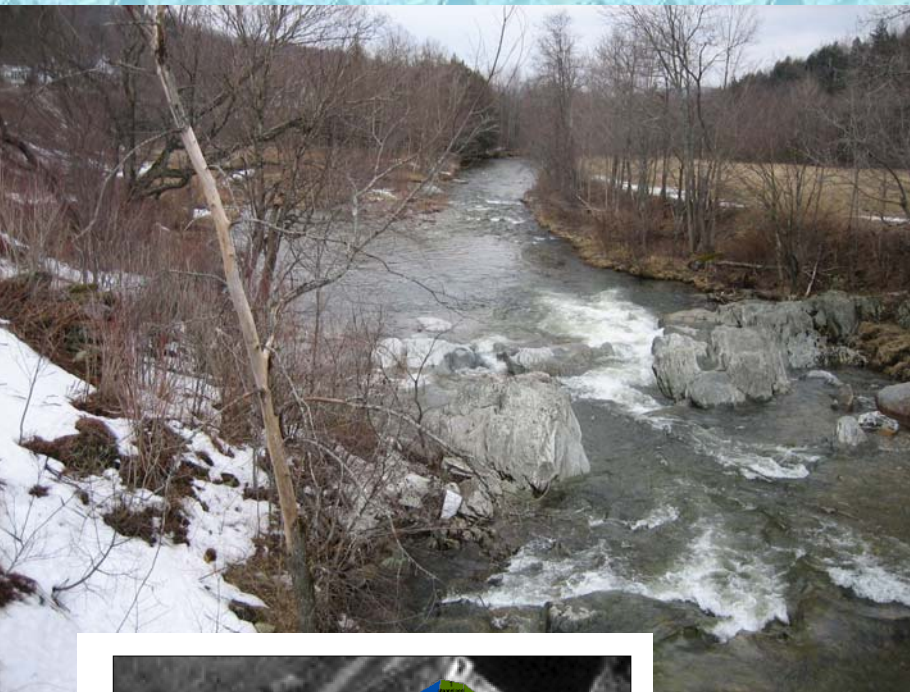


Figure 1 - Sheet 1.  
Hydromorphologic Units  
Canaan Project

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project: 206700-000  
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project name: Canaan Project  
file name: 206700-Canaan.mxd

