

# Vermont Streams and Rivers Field Evaluation & Permit Review for AOP Structures

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ANR River Management Program

## What triggers a State engineering review?

Construction and maintenance projects that have the potential to impact the water quality of any river or stream may require a permit review.

Construction projects consist of any type of activity that has the potential to impact the channel from top-of-bank to top-of-bank. Activities typically include: bridges, culverts, rip-rap stabilization, or any in-stream related maintenance.

**A PERMIT IS REQUIRED IF:** The stream has watershed area of 1-square mile or larger. These streams and brooks generally have a channel bottom width (low flow) of at least 5 feet.

# **Stream Crossing Information:**

## **TOPICS TO COVER**

- 1.) Do I need a State Permit? - who do I call for help?**
- 2.) When do we want to coordinate with the Stream Alteration Engineers?**
  - At the CONCEPTUAL PLAN STAGE**
- 3.) Should we do a site visit/field evaluation early in the process? YES**
- 4.) Should we coordinate with the District Fisheries Biologist? YES**

Who to call to get the necessary permits and engineering help?

# River Management Program

Stream Alteration Engineers:

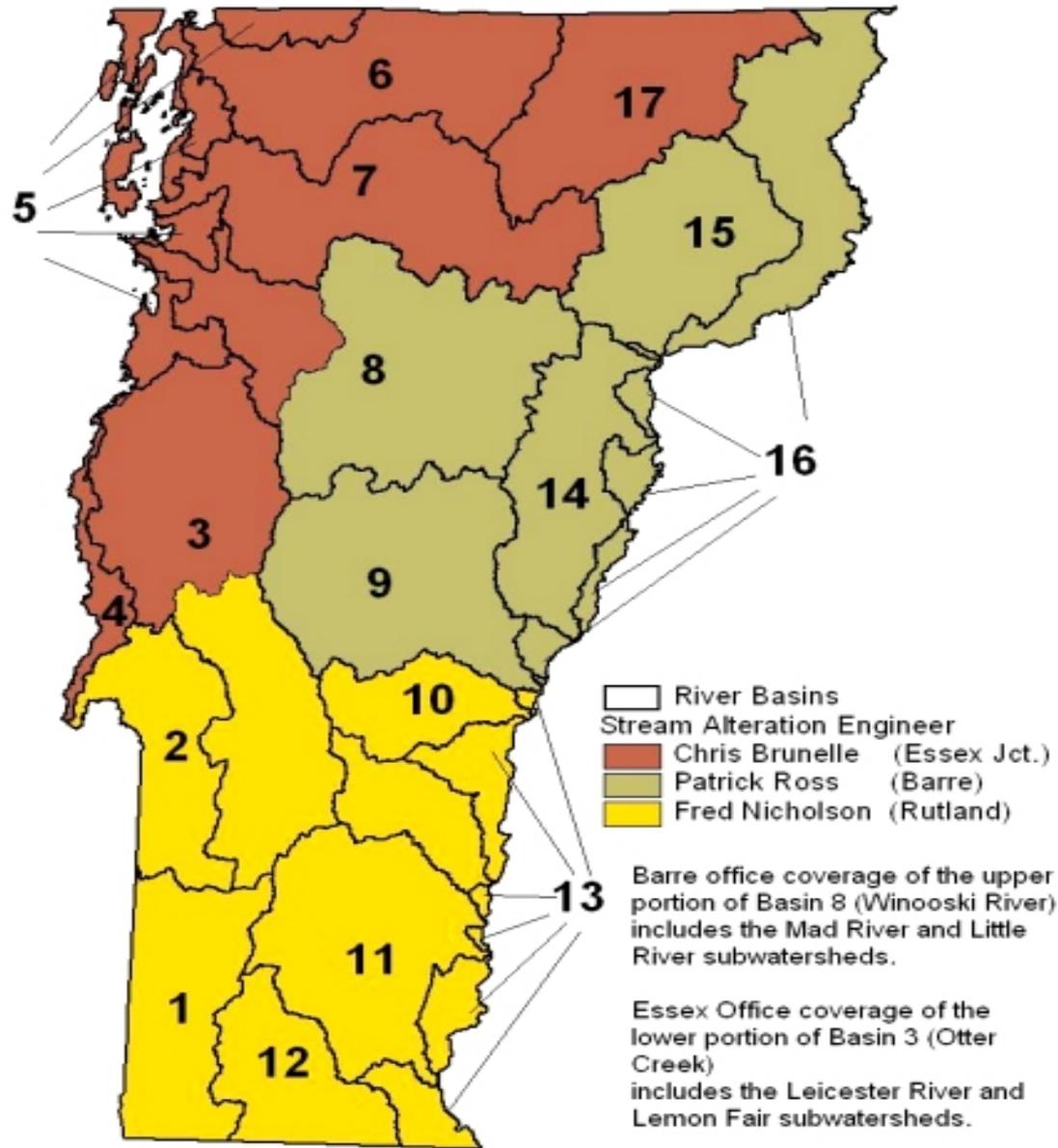
- Chris Brunelle (Essex office): 879-5631
- Fred Nicholson (Rutland office): 786-5906
- Patrick Ross (Barre office): 476-2679

RMP web address:

<http://www.anr.state.vt.us/dec/waterq/rivers.htm>

For Permits Information and Applications click on the permit tab.

# Stream Alteration Territories by Watershed:

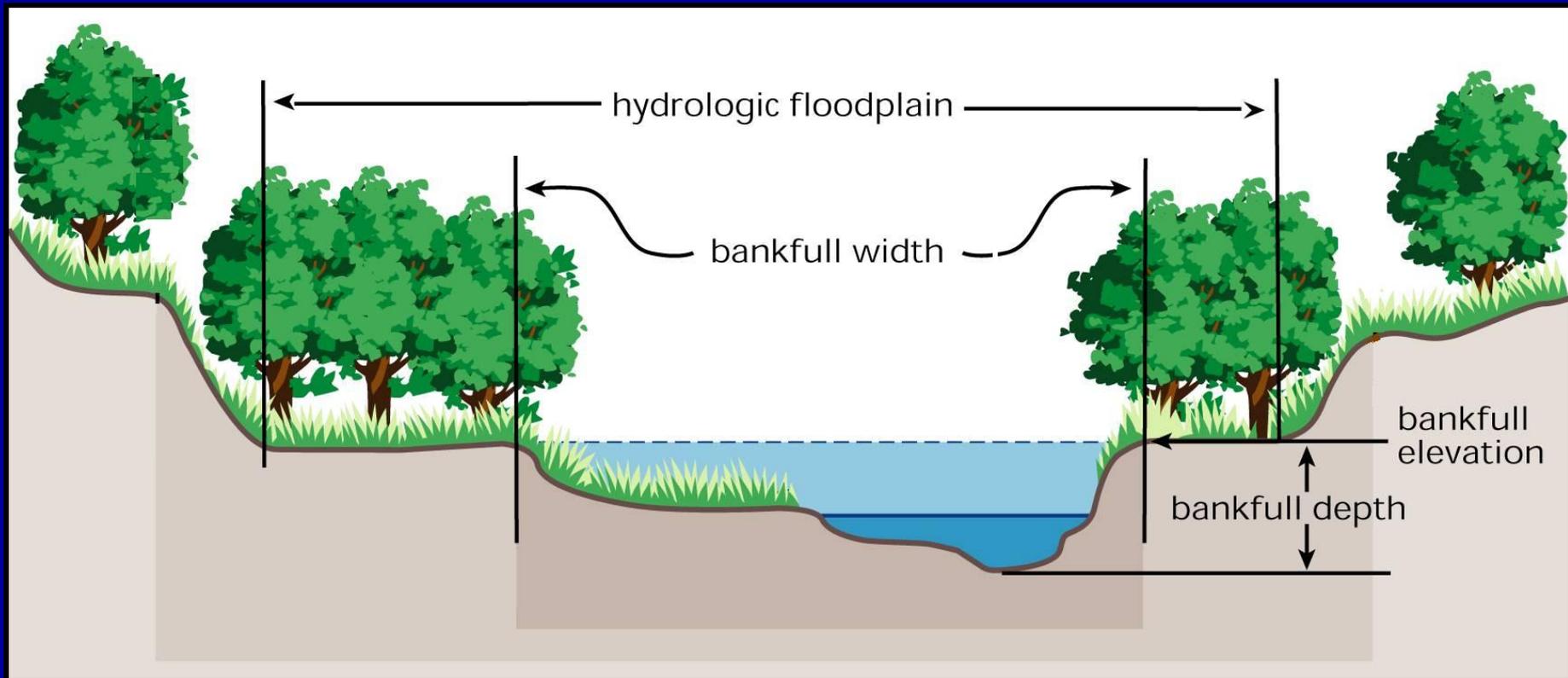


# Field Evaluation Site Visit

# What are we going to be looking for during the field evaluation and site visit:

**An overview on sizing crossing structures in relation to Bankfull Width (BFW) or Ordinary High-water (OHW)**

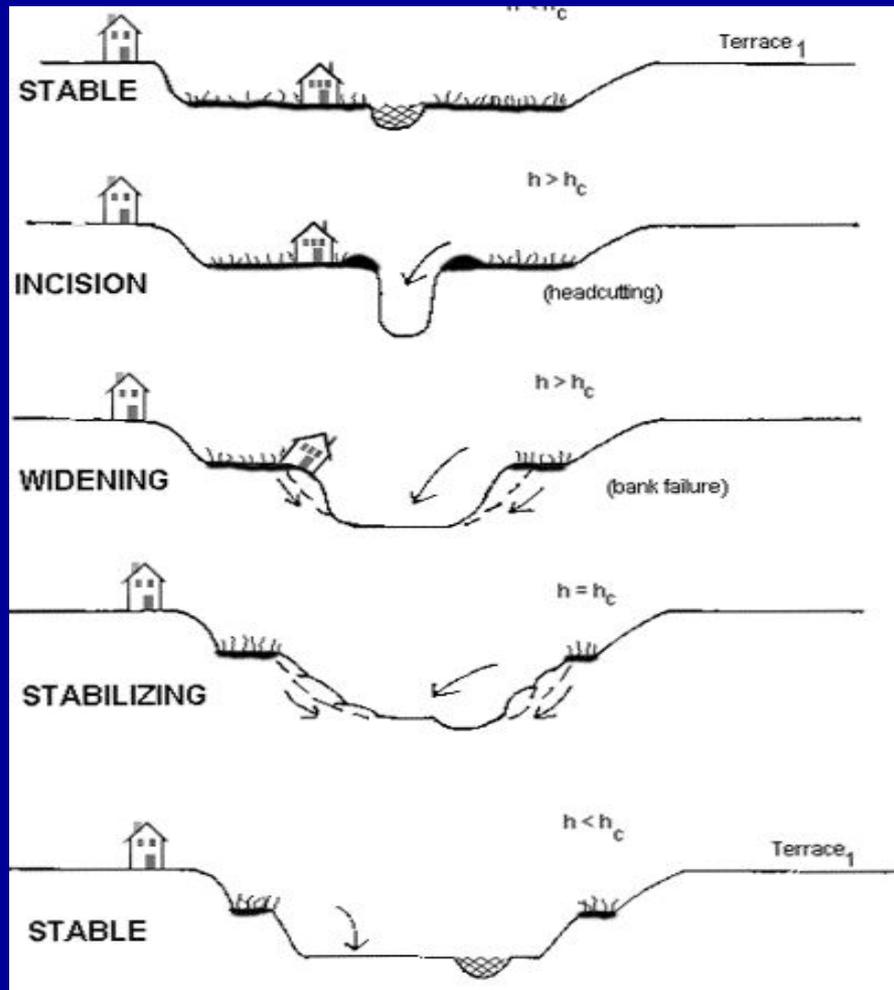
**How do you recognize BFW/OHW in the field?**



What's going on in the watershed?

Is the stream stable?

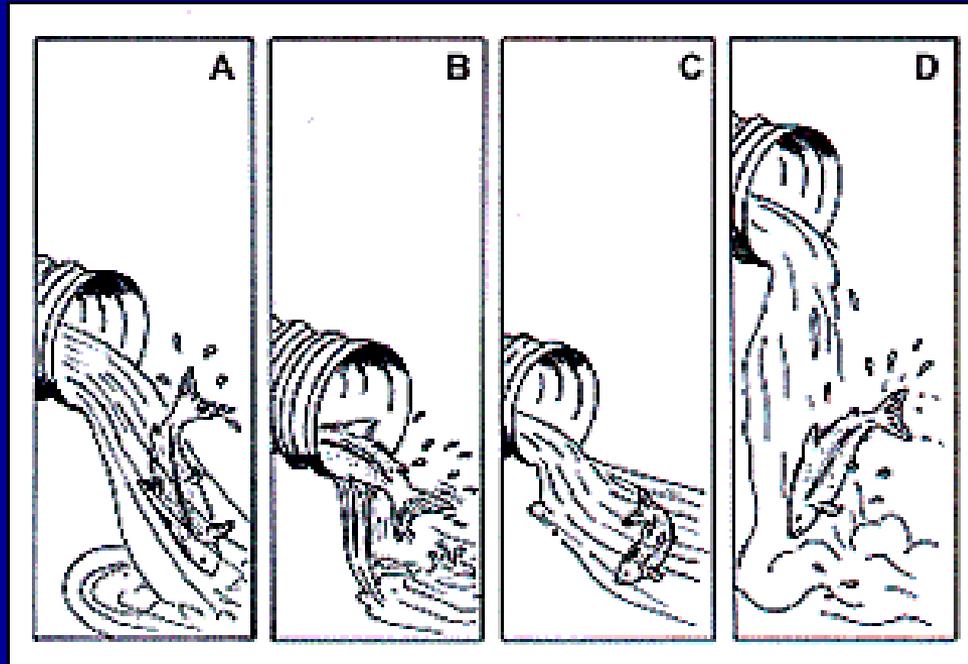
How far should we survey?



# When is a culvert a good idea for a crossing?

- Generally streams with BFW or OHW width 12' or less.
- In streams that are fairly stable i.e. not a lot of bed and bank scour and erosion.
- Potentially crossings that require a lot of fill to bring the road to finish grade.

Examples of Problematic culverts  
What do they look like?



- Improperly installed culverts can be a maintenance issue and an environmental issue (example: fish passage):
  - (A) water velocity too great,
  - (B) water in culvert too shallow,
  - (C) no resting pool below culvert, and
  - (D) jump too high.

## Example of a perched culvert problem:

Perched crossings are above the level of the stream bottom at the downstream end. Perching can result from either improper installation or from years of downstream bed erosion.



## Example of shallow low flow problems associated with culverts:

Shallow crossings have water depths too low or many fish or other organisms to move through them and may lack appropriate bed material. Pipes should be sized to be buried into the streambed to allow for substrate and water depths that are similar to the surrounding stream.



Example of an undersized culvert:

Problems associated with - Sediment discontinuity



# An undersized culvert damaged by flooding.



Where we want to be...

Buried pipe-arch example:



Does it pass the flood, the sediment and the fish?

A pipe arch with passage issues replaced with a buried culvert...



Old Pipe-Arch



New Buried Pipe-Arch

Once the initial field evaluation is complete and we have input from the District Fisheries Biologist on passage requirements...what do we need to submit for a permit?

The following Permit information is needed:

Engineering Plans (to include):

Layout

Profile

Critical Cross Sections

Hydrology and Hydraulics evaluation

Sediment and Erosion control plan

Appropriate permit application –

Generally a Stream Crossing Permit or AOT Title 19 Review

Please call us with engineering or permitting questions!

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