#### Cox Brook Dam Removal, Northfield VT

Rob Evans State Floodplain Manager River Corridor & Floodplain Protection





## Steps in the right direction....

#### FEMA Hazard Mitigation Assistance (HMA) Program

- Ecosystem Service Benefits Calculator
- Pre-disaster Mitigation 2016 prioritized floodplain and stream restoration

## <u>Executive Order 13690 – Federal Flood Risk Management Standard:</u>

"Where possible, an agency shall use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration."



# The Challenge....

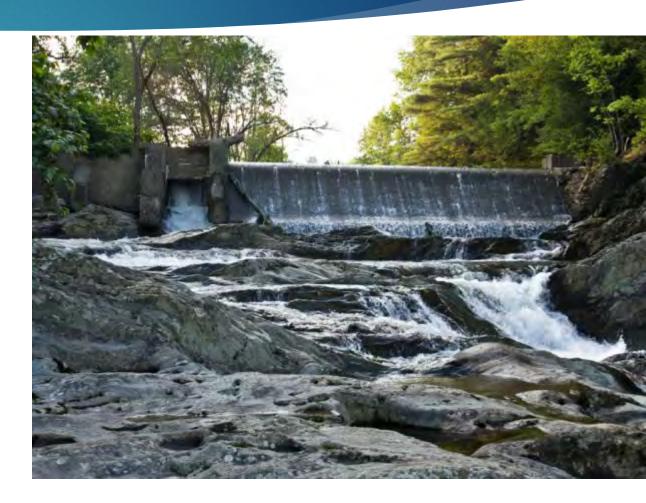




Almost 50 years old (!)

1930s low head run-of-river gravity dam

- Barrier to fish passage/sediment transport.
- Flood hazard



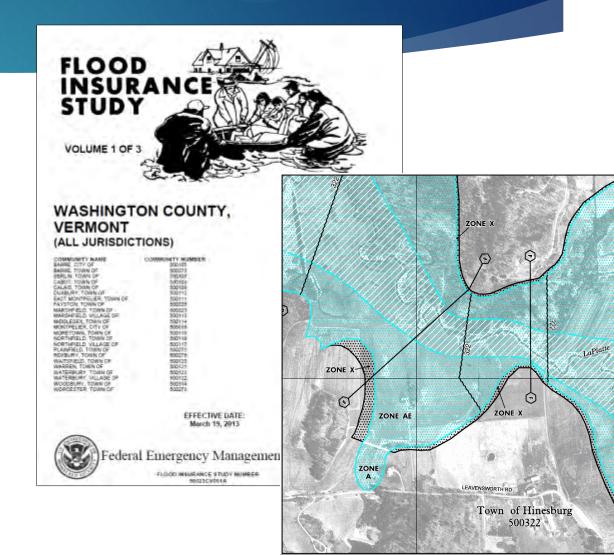
## Cox Brook Dam removal = Development



# NFIP Mapping Requirements

44 CFR § 65.3 - Requirement to submit new technical data

Letter of Map Revision (LOMR) required if physical changes impact base flood elevations



\$37,000 Project Budget

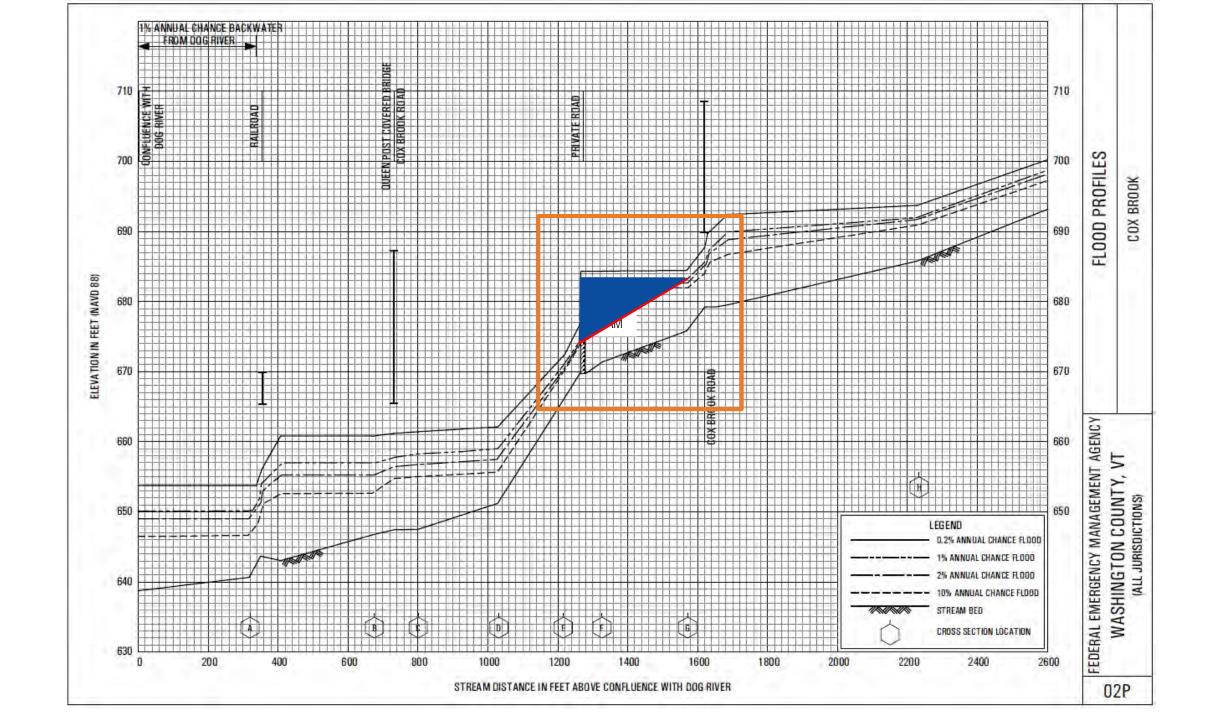






Limited impact on Flood Insurance Study and mapping





ODING SOURCE FLOODWAY	BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)
CCTION DISTANCE WIDTH (FEET) SECTION MEAN VELOCITY (SQUARE FEET) SECOND) REGULA	WITHOUT WITH
700k 106 <sup>1</sup> 97 238 6.8 752. 370 <sup>1</sup> 60 167 9.6 752. 581 <sup>1</sup> 200 1,510 1.1 765.	7 752.0 <sup>3</sup> 752.0 0.0
320 <sup>2</sup> 35 200 13.0 650. 675 <sup>2</sup> 60 325 8.0 657. 800 <sup>2</sup> 80 560 4.6 658. 1,030 <sup>2</sup> 155 850 3.0 659. 1,215 <sup>2</sup> 80 260 10.0 671.	0 657.0 657.0 0.0 3 658.3 658.3 0.0 0 659.0 659.0 0.0
1,325 <sup>2</sup> 80 760 3.4 683	
1,570° 100 615 4.2 683. 2,230° 70 265 9.8 692. 3,310° 50 225 11.5 717. 4,400° 70 265 9.8 728. 5,450° 50 575 4.5 749. 6,280° 85 260 10.0 755. 7,360° 230 400 6.5 773.	9 692.9 692.9 0.0 5 717.5 717.5 0.0 7 728.7 728.6 0.1 6 749.6 749.6 0.0 6 755.6 755.6 0.0
7,360 230 400 6.3 773.	773.1

<sup>&</sup>lt;sup>1</sup>Feet above confluence with Mad River

TABLE

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, VT (ALL JURISDICTIONS)

**FLOODWAY DATA** 

CHARLES FOLSOM BROOK - COX BROOK

<sup>&</sup>lt;sup>2</sup>Feet above confluence with Dog River

<sup>&</sup>lt;sup>3</sup>Elevation computed without consideration of backwater effects from Mad River

Limited impact on Flood Insurance Study and mapping

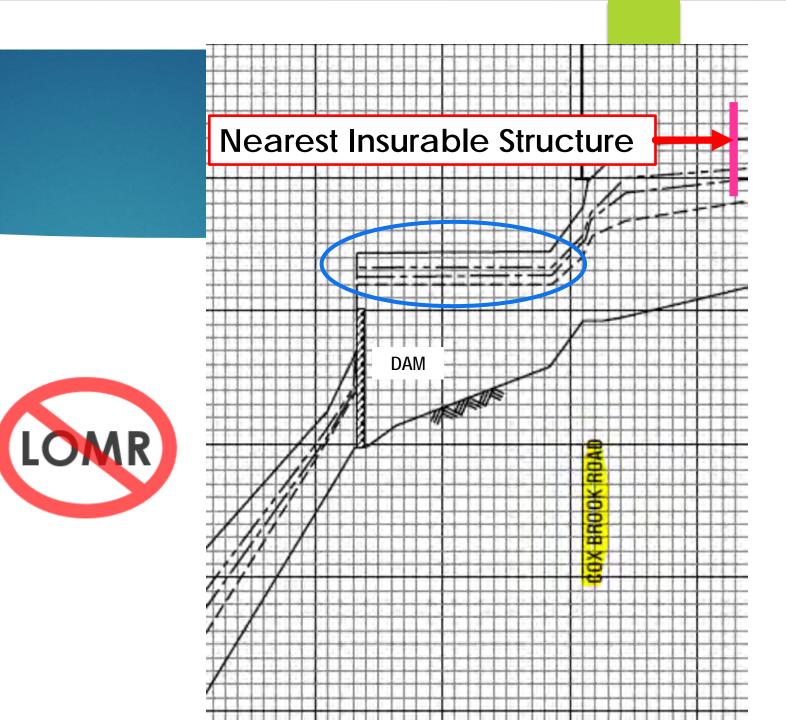


No Flood Insurance Implications



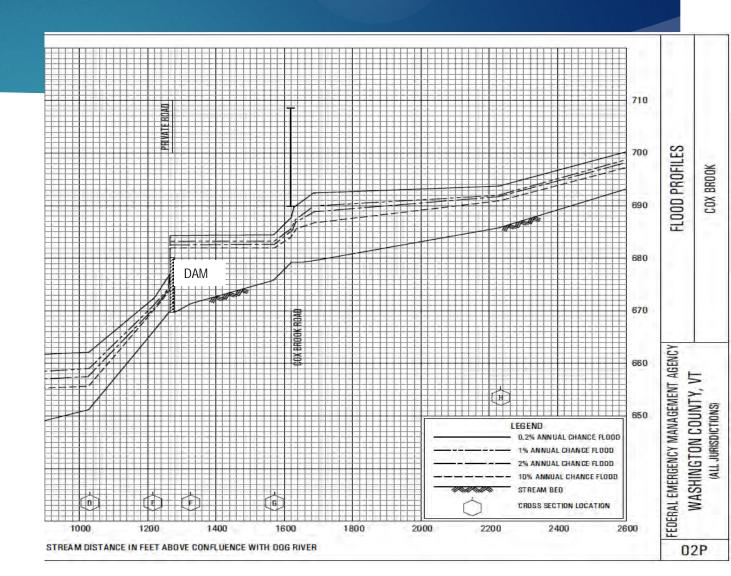
Limited impact on Flood Insurance Study and mapping

No Flood Insurance Implications





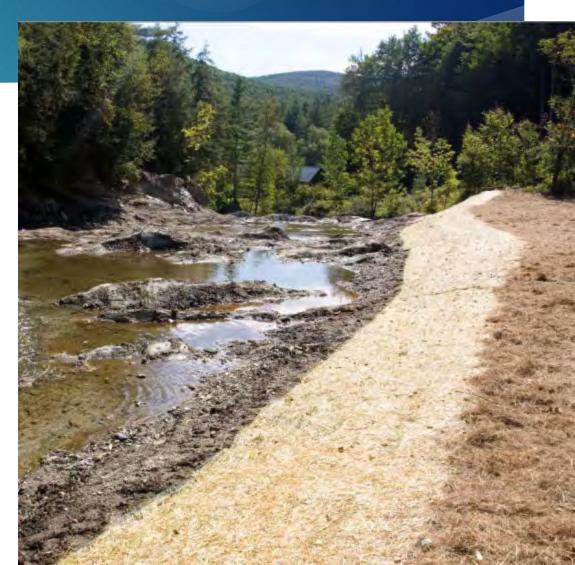
- Limited impact on Study and Mapping
- No Flood Insurance Implications
- Age of Flood Insurance Study



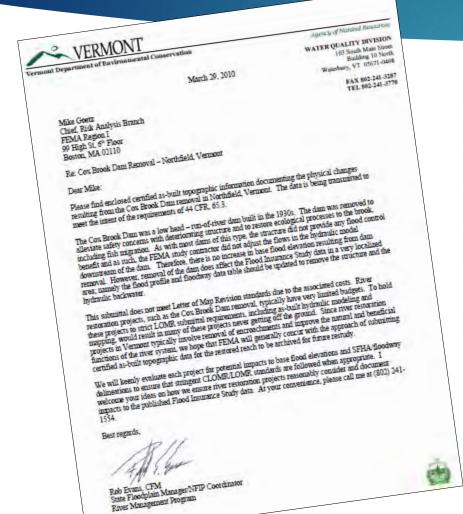
# Cox Brook Dam Removal In Summary

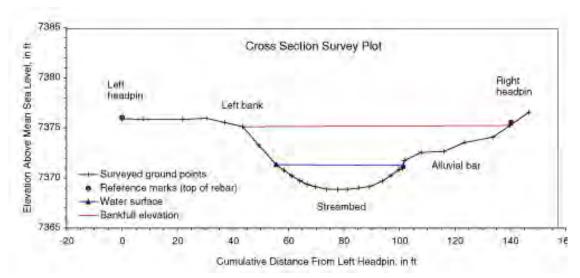
#### Project resulted in:

- Minimal impact to mapped Special Flood Hazard Area
- Very localized reductions in Base Flood Elevations
- No impacts to insurable structures
- No LOMR application due to relative cost



# Cox Brook – Sharing the As-built Data





## Beyond dam removals?



#### Recommendations

- Create policies that provide reasonable accommodation of restoration projects;
- Establish more formal protocol for sharing as-built data w/o embarking on full-blown LOMR process;
- Create a companion screening tool to aid in determining whether CLOMRs/LOMRs are needed and establish documentation requirements.



# Floodway requirements on planting projects....

- Buffer plantings are an encroachment in the floodway.
- Must obtain a CLOMR or certified hydraulic analysis
- Modeling must assume trees and full maturity



#### **HMA Grant Guidance**

Property Acquisition & Structure **Demolition:** 

The property must be deedrestricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.



Ray Doberty, State Hazard Mitigation Officer Vermon Division of Emergency Management Homeland Security

Waterbury, VT 05671-1300

Proposed Tree Planting at Acquisition Sites

Proposed Tree Planting at Acquisition Sites
Acquired with Hazard Mitigation Grant Program ("HMGP") Funds

This is in response to your annul dated April 27, 2015 regarding the proposal for the planting of hees on aloven 1111 marcels of land, which were acquired using HMGP funds under FEMA-4022-DR. This is in response to your emul dated April 27, 2015 regarding the proposal for the planting of the eleven (11) parcels of land, which were acquired using HMGP funds under FEMA-4022-DR.

- Town of Bethel, 2811 Gilena Brook Road = 150 trees

  Town of Bethel, 132 Spring Hollow Road = 300 trees

  Town of Bethel, 132 Spring Hollow Road = 300 trees = 500 Willow Stakes

- Town of Bethel, 13. Spring Hollow Road = 300 trees = 500 Willow Stakes

  Town of Bethel, 251 March Meadow Road = 160 trees = 500 Willow Stakes Town of Bettiet, 251 Marsh Mentiow Rosa 100 trees = 500 willow 5 Town of Granyille, 4266 Route 100 = 110 trees + 200 willow Stakes

- Town of Granythe, 4200 Route 100 = 110 frees + 200 Willow Stakes

  Town of Pittsfield, 6 and 11 Partnerites Place and 3604 VT Route 11 = 300 frees = 300 Town of Royalton, 43 Royalton Hill Road = 160 trees Town of Braintree, 2044 Theyer Brook Road - 315 trees

Town of Rochester, 205 and 209 N Main Street = 300 overs

In a subsequent email dated April 27, 2015 you submitted a corrected list of property locations as the subsequent email dated April 27, 2015 you submitted a corrected list of property locations as the In a subsequent email dated April 27, 2015 you submitted a corrected list of property locations of land, which were acquired using HMGP finds under FEMA-1995, 4001 & 4022-DB original May 4, 2015 list contained errors. The revised list proposed planting trees on nine (9) nine (9) sites you specifically identified are Town of Granville, 4401 and 4463 VT RT 100 (1993-4R) = 110 trees = 200 willow stakes

Traces of RingHold & and 11 Daymandra Black and 3604 RT 100 (4002, 160) = 200 willow stakes

- Town of Granville, 4401 and 4463 VT RT 100 (1995-4R) = 110 trees = 200 willow stakes.

  Willow stakes.

  11 Particular Place and 3604 RT 100 (4022-16R) = 300 trees = 300
- Willow stakes

  Town of Bethel, 251 Marsh Meadow Road (4001-1R) = 160 trees + 500 willow stakes

  Tracks of Darkot 123 Services Hallow Provided Address 110 trees + 500 willow stakes

  Tracks of Darkot 123 Services Hallow Provided Address 110 trees + 500 willow stakes Town of Belbel, 251 Marsh Mendow Road (4001-1R) = 160 trees + 500 willow states

  Town of Bethel, 132 Spring Hollow Road (4022-11F) = 300 trees + 500 willow states

  Town of Bethel, 2R11 Gilead Brook Road (4022-11F) = 300 trees + 500 willow states Town of Royalton, 43 Royalton Hill Road (1995, 8R) = 150 trees

