

After the emergency response, more measured and deliberate stream repair work should begin in order to return the channel to pre-flood conditions. The best model for managing high volumes of floodwater in a stream channel is one that slows the flow of floodwaters and increases their retention over an entire watershed, spreading them out instead of concentrating them in one area. Delaware County Soil and Water Conservation Districts (DCSWCD) Post-Flood Emergency Stream Intervention Training Manual, available on DEC's website at www.dec.ny.gov/lands/86450.html, is an excellent source of information on this subject.



Post-Emergency Repairs

Emergency stream repairs should:

- Be done in a timely manner;
- Consider factors that have a long-term effect on the economic well-being of your community, such as fish habitat protection and
- Avoid contributing to future flooding problems. If done incorrectly, work in a stream can create worse problems for you and your downstream neighbors.

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Emergency Repairs

NOTE: The activities described in this publication require permits from the New York State Department of Environmental Conservation (NYSDEC) and United States Army Corps of Engineers. See "Permits Information" for emergency stream work, which must follow the normal administrative and regulatory review and approval process.



To rescue people and keep them safe after a flood, emergency repairs are often necessary in order to re-establish vital community access routes and services. Sometimes emergency repairs leave stream conditions that, if not subsequently addressed, will cause further problems. These guidelines will help you minimize adverse impacts and the need for subsequent repairs.



Guidelines for Post-flood Stream Construction

What to do and not do after a major storm



When communities are hit by major floods, roadways, bridges and culverts suffer severe damage and need to be repaired quickly. These guidelines have been developed to assist in post-flood stream repairs, or "interventions," after a major storm. These include priority repairs when public health and safety are immediately threatened, such as:

- Removing flood debris from plugged culvert pipes and bridges
- Opening up clogged stream channels
- Repairing or replacing critical infrastructure
- Reopening roads



Do not build permanent berms on top of stream banks. If you need to pile material on banks temporarily, be sure to remove it before you are done. Berms block streams from spilling into their natural floodplains and may result in increased flooding, channel scouring, or erosion caused by higher streamflow velocities and flood elevations. Also, berms are generally not engineered to withstand flood forces and will likely blow out during the next flood, increasing damage and erosion in adjacent areas.



2. Clear gravel deposits clogging the stream:

- Remove gravel deposits to pre-flood grade level only.
- When possible, relocate gravel deposits to areas where gravel was scoured away.

3. Reconstruct the stream channel

Permits Information

For information on the necessary permits to conduct work in and around waterbodies, please contact the NYSDEC regional office for your county and the U.S. Army Corp of Engineers:

Region 1	Nassau and Suffolk (631) 444-0365
Region 2	New York, Kings, Queens, Bronx, Richmond (718) 482-4997
Region 3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester (845) 256-3054
Region 4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schoharie, Schoharie (518) 357-2069
Region 5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington (518) 897-1234
Region 6	Herkimer, Jefferson, Lewis, Oneida and St. Lawrence (315) 785-2245
Region 7	Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and Tompkins (315) 426-7438
Region 8	Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne, Yates (585) 226-2466
Region 9	Allegany, Chautauqua, Cattaraugus, Erie, Niagara and Wyoming (716) 851-7165

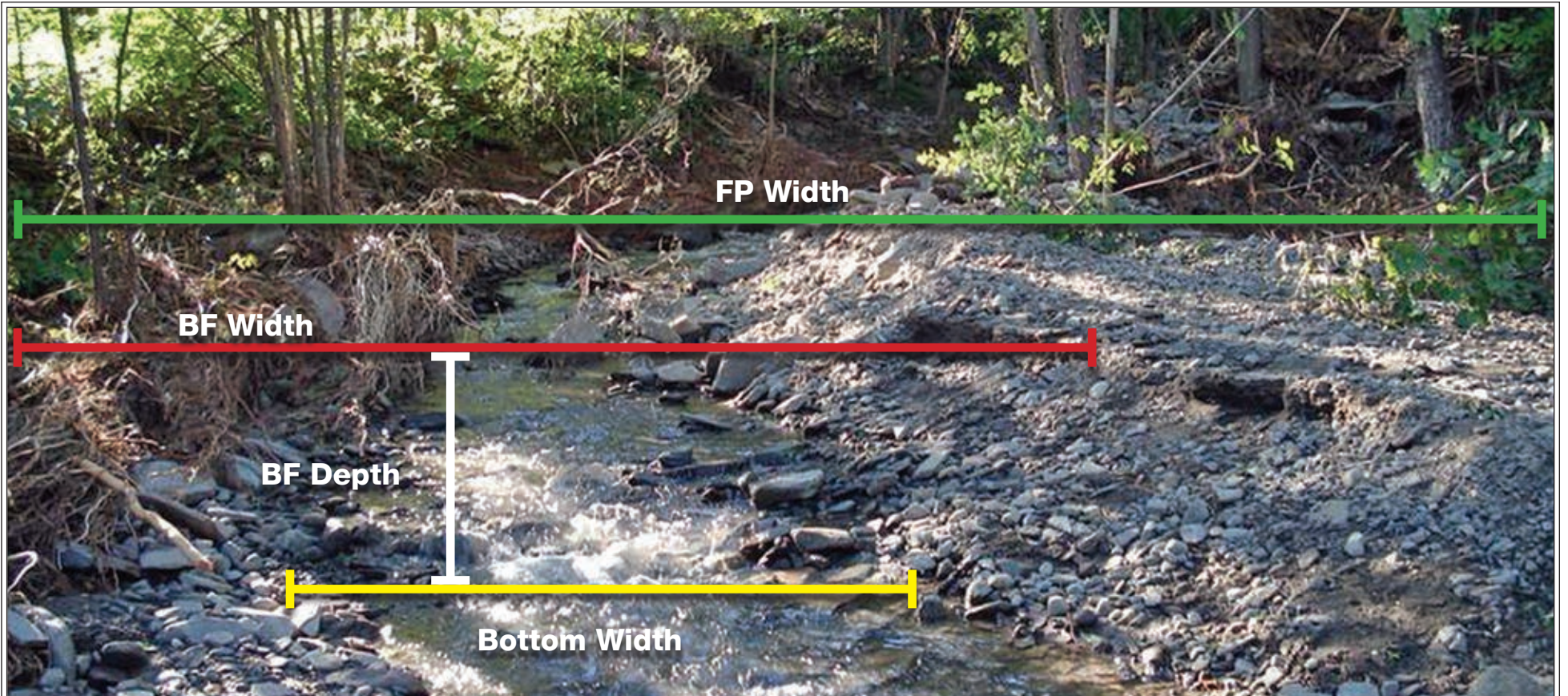
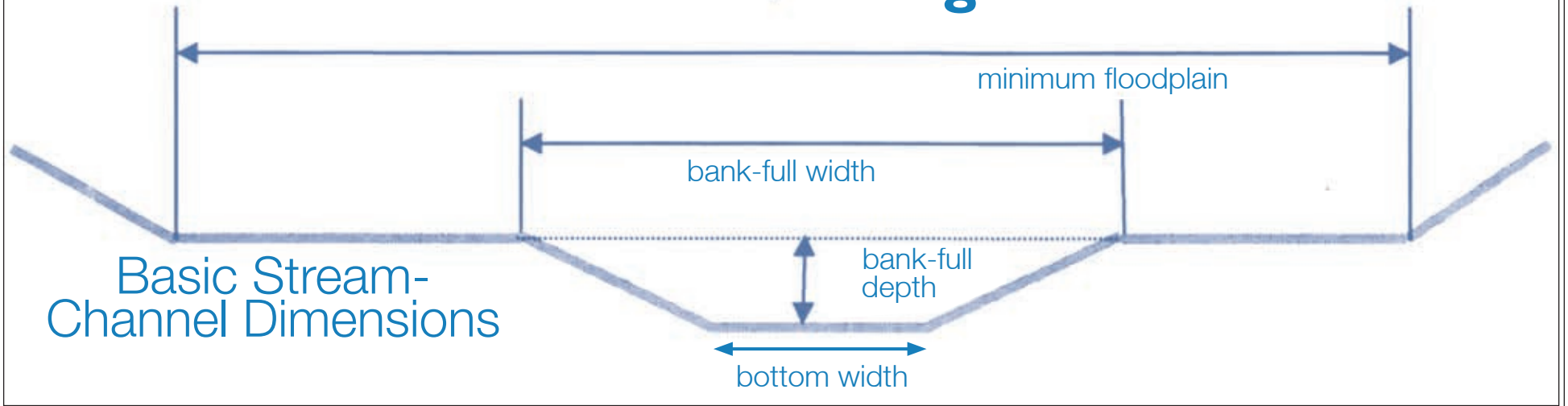
U.S. Army Corps of Engineers Contact Information

Covering DEC Regions 1, 2 and 3:
US Army Corps of Engineers NY District
 ATTN: Regulatory Branch
 26 Federal Plaza, Room 1937
 New York, NY 10278-0090
 For DEC Regions 1 & 2 and Westchester and Rockland counties in Region 3, call (917) 790-8511. For other counties in Region 3, call (917) 790-8411.
 E-mail: CENAN.PublicNotice@usace.army.mil

Covering DEC Regions 4 & 5:
Department of the Army
 ATTN: CENAN-OP-R
 NY District, Corps of Engineers
 1 Buffington Street
 Building 10, 3rd Floor
 Watervliet, NY 12189-4000
 Call (518) 266-6350 - Permits Team Call (518) 266-6360 - Compliance Team
 E-mail: cenan.rfo@usace.army.mil

Covering DEC Regions 6, 7, 8 & 9:
US Army Corps of Engineers
 Buffalo District
 ATTN: Regulatory Branch
 1776 Niagara Street
 Buffalo, NY 14207-3199
 Call (716) 879-4330
 E-mail: LRB.Regulatory@usace.army.mil

Instructions for Reconstructing Stream Channels



1. Reconstruct the stream channel to pre-flood, bank-full dimensions

- Proper stream-channel dimensions can be obtained by measuring an undamaged or “reference” stream reach immediately upstream or downstream of the planned worksite.

Reconstruct the damaged channel using the bank-full depth, bank-full width, and floodplain width measurements from a comparable reach. See the Basic Stream-Channel Dimensions diagram for where to measure these dimensions.



- After severe flooding, an undamaged stream reach comparable to a damaged section may be difficult to find. In these circumstances, stream-channel dimensions can be calculated using the Bank-full Hydraulic Geometry Tables for Selected Hydrologic Regions (Regional Tables). Find directions for using Regional Tables on DEC’s website at www.dec.ny.gov/lands/86450.html

2. Avoid creating a head cut (an abrupt vertical drop)

- Installing rock cross-vanes, or another similar in-stream structure, may be required to prevent head cutting.
- Please seek technical assistance from your county’s soil and water conservation district or NYSDEC.



3. Avoid scouring/down-cutting (increasing channel depth)

- Reconstructing the channel to bank-full dimensions, the appropriate grade, and with as much floodplain access or bench as available room allows should minimize channel scouring and bank erosion afterwards.

- Often, flooding causes an alternating damage pattern of scouring/down-cutting and gravel deposits in a stream. Therefore, a source of material for filling scour holes may be located downstream of the scoured/down-cut reach.



4. Repair eroded banks

- If space allows, slope eroding banks to a stable slope, such as 3:1 (units of width to units of elevation) or flatter. Slope protection or erosion-control methods may be required. Slopes of as much as 2:1 may be considered when using rocks or other stable materials.
- To prevent future erosion on a river bend, incorporate rock vanes to deflect current away from the bank.



Important Notes on Water Quality When Working Near Streams

- All actions that cause erosion or affect water quality should be minimized to the greatest extent practicable, including the release of turbid (muddy) water.
- Machinery should be operated from the stream banks, avoiding use in flowing water to the greatest extent practicable.
- To avoid disruption of trout spawning, in-stream work should be avoided to the greatest extent practicable from November 1 - June 15.

NOTE: County soil and water conservation districts can be a great resource for information, training and help when working in and around waterbodies. Find a complete list of county contacts on the New York State Soil and Water Conservation Committee’s website: www.nys-soilandwater.org/contacts/county_offices.html