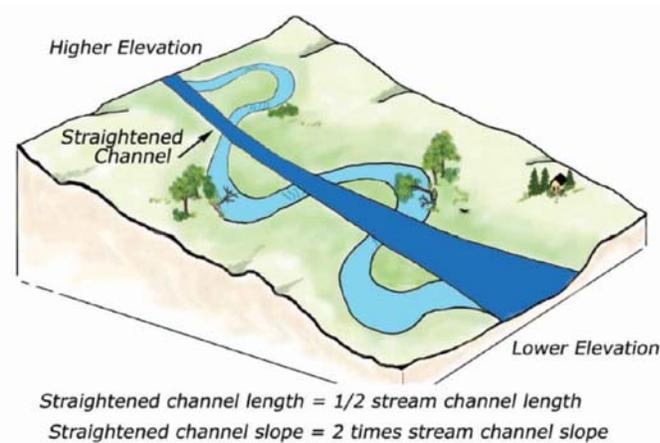


## Practice Title

# Channelizing

## Photo(s)/Diagram



## Summary of Practice

Channelization is the straightening or deepening of a natural stream channel. Streams come in many shapes and sizes. They range in character from steep, swift-flowing mountain streams to flat, slow-flowing pasture streams. The nature of a stream is influenced by the amount of water the stream carries, the geology and soils it flows through, and the shape and slope of the valley that confines it. Each stream channel is formed, maintained and altered by the stream itself through the processes of erosion and deposition of sediment. Over time the stream will establish a channel shape that accommodates its spring thaws and summer droughts. If something happens to change the conditions that have shaped the stream over time, then the stream will change its channel to adapt to different conditions. Often times, people will straighten the stream in an effort to reduce flooding. However, this straightening often doesn't have a significant effect on flooding, and can exacerbate downstream flooding.

## Impact on Stream and Floodplain Processes and Functions

Straight streams tend to shoot water like a fire hose. When the bends and curves (meanders) are removed, the stream continues to drop the same elevation, but over a shorter linear distance. This increases the slope of the channel, which in turn increases the stream's velocity. Remember that the meanders, riffles, pools, and floodplains of a natural stream channel

provide resistance that dissipates the stream's energy. Without these features, the stream has more energy to use eroding its bed and banks. Often, the stream will cut into its bed, causing large steep eroding slopes. This process will continue until the stream can reach the equilibrium that was present prior to channelization.

### **Impact on Your Property**

Erosion often naturally occurs at the outside of meander bends in a stream channel. This does not suggest that straightening a channel will eliminate erosion problems— quite the contrary. Straightening a stream will result in a shorter, steeper channel, in which water moves faster and has more energy. This change may upset the balance of the stream, causing erosion, loss of land, increased sediment supply, loss of aquatic habitat, or other problems.

### **Impact on Neighbor's Property**

Channel straightening is sometimes proposed to address flooding or erosion problems. The premise is often that a straight, smooth channel moves the water through faster, so less is available to spill out onto the floodplain. Erosion problems are addressed by moving the main flow away from the eroding bank, which is frequently located on the outside of a bend. Although straightening or relocating a stream may provide relief at a specific location, it drastically alters the stream flow characteristics and may cause additional problems both upstream and downstream of the project site. This is because the channel-straightening project tends to focus on one stream function—water transport—without adequately accounting for other functions, such as energy dissipation and sediment transport.

Confining flow to a paved channel may have flood conveyance benefits to the immediate area. However, habitat is lost and downstream areas will be impacted. One solution to the increased erosion potential of a straightened stream is to protect the bed and banks with rock or concrete. This smooth, hard channel enables the water to speed through even faster, taking its energy with it. Downstream areas will have higher peak flows, because the water gets there faster, which may increase flooding problems. In addition, downstream areas will be subject to increased erosion, unless the project incorporates sufficient energy dissipation structures. Be a good neighbor – don't solve one stream problem by moving it downstream onto someone else's property or into someone else's jurisdiction.

## **Recommended Use**

Flat valleys are often the easiest places to build roads—except for the streams that meander from one valley wall to the other. Over the years, many streams have been moved or straightened to accommodate road construction and minimize the need for bridges. This tends to increase the speed and energy of the water within each section that has been straightened. Years later, the stream may still be eroding its bed and/or banks in an effort to restore a stable channel length and slope. Channelizing is therefore not a recommended method as it overlooks many important stream functions and typically creates more problems than it solves.

## **Permits Needed**

In-stream work will require a DEC Article 15 Stream Disturbance Permit. An ACOE permit is required when more than 25 cubic yards of fill material will be used below the “ordinary high water mark” (the approximate yearly flood level); the DEC can advise you about determining these limits. Please contact [info@catskillstreams.org](mailto:info@catskillstreams.org) to schedule a site visit from a local resource professional that can advise on the best options for your streamside.

## **Resources (Links, Articles, etc.)**

[http://www.everything2.com/index.pl?node\\_id=1188008](http://www.everything2.com/index.pl?node_id=1188008)

<http://www.epa.gov/region7/wetlands/ChannelizationFS04-Final.pdf>

[http://mdc.mo.gov/documents/fish/streams/str\\_238.pdf](http://mdc.mo.gov/documents/fish/streams/str_238.pdf)

## **Photo Sources**

Amy Reges, Upper Susquehanna Coalition

Federal Interagency Stream Restoration Working Group

Herkimer-Oneida Counties Comprehensive Planning Program

## **Text Sources**

Thigpen, Janet. 2006. Stream Processes: A Guide to Living In Harmony with Streams. Chemung County Soil & Water Conservation District. Available of web: <http://www.chemungcountyswcd.com/homepage.html>.