

# Dams in the Hudson River Estuary Watershed, Their Effects and Opportunities for Mitigation

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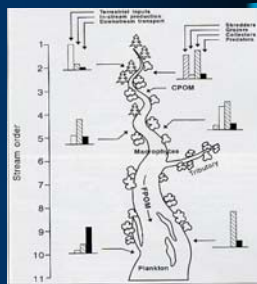
# Hudson River Watershed an Ecosystem Perspective

- 13,390 square miles
- 315 miles long
- > 62 tributaries to tidal estuary

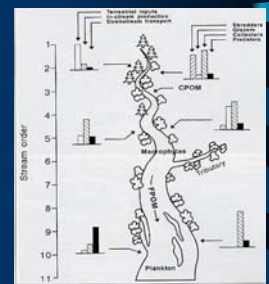


# Stream Continuum Concept

Stream Gradients		
	Upstream	Downstream
Benthos	Course	Fine
Water Quality	Clear, cold, high D.O	Turbid, warmer, lower, D.O.
Exposure	Forested/ Shaded	Exposed
Nutrient	CPOM	FPOM

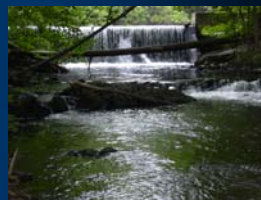


# Saw Kill Creek



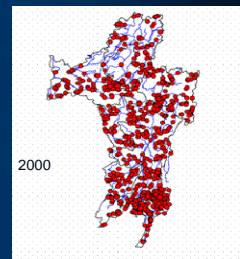
# Effects of Dams on Streams

- Creates an impoundment (river to lake environment)
- Disrupts the stream continuum
  - Altered sediment transport
  - Habitat changes/fragmentation
- Reduces dissolved oxygen
- Reduces sustainability



# Dams on Tributaries to the Hudson River Estuary

- 357 dams in Hudson River Tributary Watersheds
- 106 in Dutchess County
  - 64 Class A (low hazard)
  - Average age = 65 years



Source: D.P. Swaney, K. E. Limburg, and K. Stainbrook. 2006.

## Hudson River Tributaries- Dam Observations

- Many obsolete dams in state of disrepair
- Many low hazard class dams
- Few serve economic or ecological purpose



= opportunities for restoration

## Dam Mitigation Options

- Partial breach
- Removal of structure
- Rock Ramps
- Installation of fish way



## Possible Effects of Tributary Dam Mitigation

- Restore stream continuum
  - Improve water quality
  - Restore sediment transport regimes
  - De-fragment in-stream communities
- Restore migratory fish spawning habitat



## Dam Removal Trade-offs

- Restored stream channel vs. wetland and impoundment resources
- Sediment transport vs. sediment retention
- Historic and cultural resources vs. ecological restoration



## Restore America's Estuaries Principle #1 of Habitat Restoration

"Preservation of existing habitat is critical to the success of estuarine restoration"

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