

DAM REMOVALS AND RGL 18-01

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**US Army Corps
of Engineers**



National Inventory of Dams

- As of 2016, over 90,580 catalogued dams in the U.S.
- Over 1 million small dams that don't meet the criteria for inclusion in the National Inventory of Dams
- Many small dams were built in the 19th century and no longer function for their intended purposes



Costs and Benefits of Dams

■ Costs

- ▶ Ecosystem impacts (altered hydrology and temperatures)
- ▶ Water quality impacts
- ▶ Create artificial habitat for invasive aquatic species (conversion of riverine systems)
- ▶ Impacts to aquatic communities
- ▶ Legal and financial liability
- ▶ Maintenance requirements for structures, impounded waters, and associated erosion
- ▶ Archaeological and aesthetic impacts

■ Benefits

- ▶ Flood Control
- ▶ Water quality and delivery for domestic, agricultural, and industrial uses
- ▶ Predictable flow regime
- ▶ Hydropower
- ▶ Navigation, including canals
- ▶ Trapping of metals, chemicals, and nutrient sequestration
- ▶ Barriers to upstream movement of invasive species
- ▶ Flat water recreation



Effects on Aquatic Ecosystems

- Impedes movement of fishes
- Limits dispersal of freshwater mussels
- Can disrupt physiochemistry and available habitats in watersheds

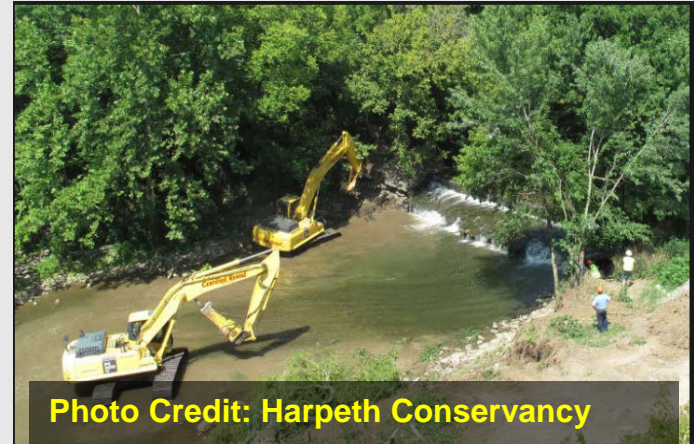


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Permitting Mechanisms for Lowhead Dam Removals

Nationwide Permit 53 (NWP 53)

- Defines lowhead dam as ‘dam built to pass upstream flows over the entire width of the dam crest on a continual and uncontrollable basis’
- Requires a pre-construction notification (PCN)
- Does not permit work in formerly impounded channel and bank stabilization
- Can work in conjunction with other NWPs (*i.e.* NWP 13 and 27)



Permitting Mechanisms for Lowhead Dam Removals

Nationwide Permit 53 (NWP 53)

- Removed dam structure must be deposited in area that has no Waters of the United States unless another Corps permit authorizes placement of material in said waters
- As a general rule, compensatory mitigation is not required for these activities because low-head dam removal restores stream ecological functions and services



Regional Conditions for NWP 53 in TN

- 1) The length of the stream/river that the low-head dam currently impounds
- 2) A sediment characterization and estimated volume of sediment/material collected behind the dam
- 3) A description of the positive and adverse environmental effects
- 4) Discussion of the steps taken to minimize potential adverse effects on the aquatic environment

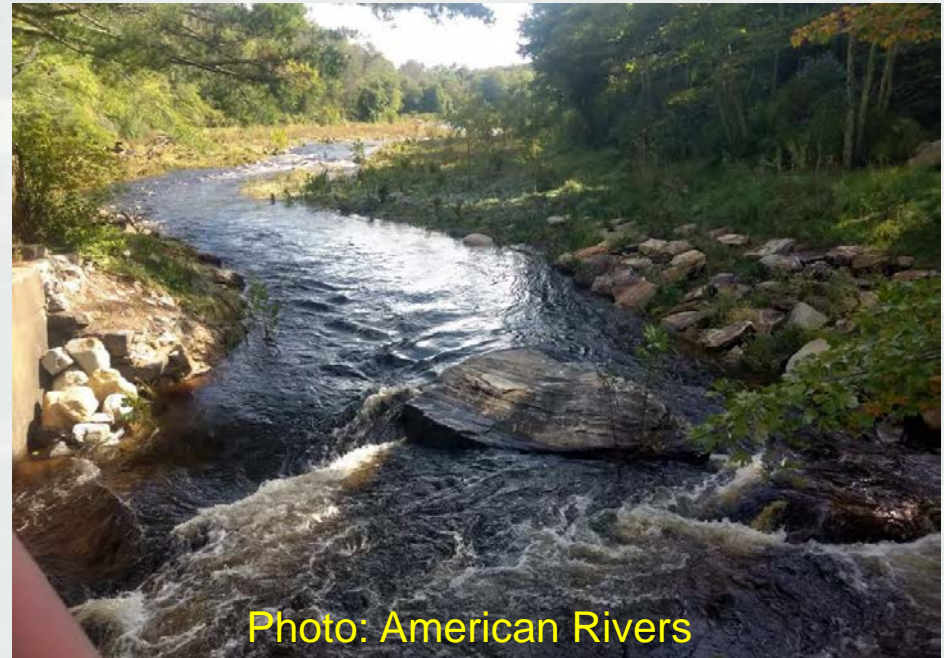


Photo: American Rivers



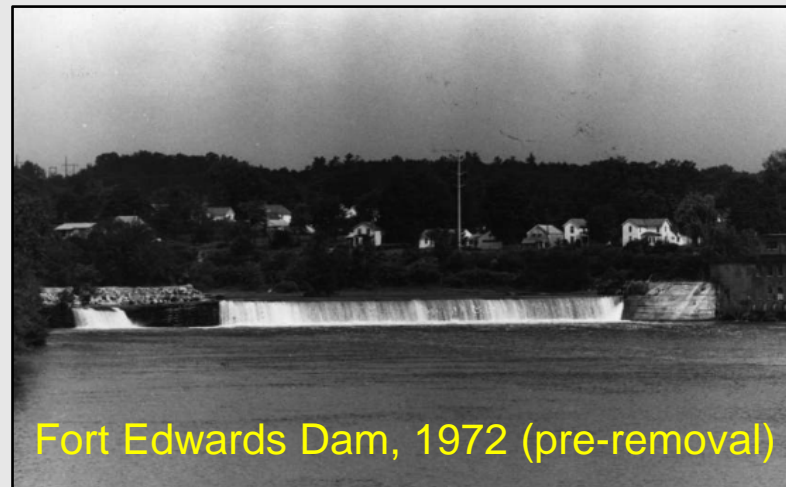
Importance of Planning in Dam Removals

- Rockdale Dam removal, Koshkonong Creek, Wisconsin
- Dam was breached in 2000
- Caused rapid dewatering (36 hours)
- Devastated downstream freshwater mussel populations for 1.7 km



The Importance of Evaluating Sediments

- Famous case of PCB contamination in the Hudson River
- Fort Edwards Dam was removed in 1973 with no consideration of pollutants in sediments
- Result: massive release of PCBs and contamination of the Hudson River for 200 miles
- Cleanup ended in 2015; PCBs still persist at high levels



Dredging and capping of river sediments in Hudson River



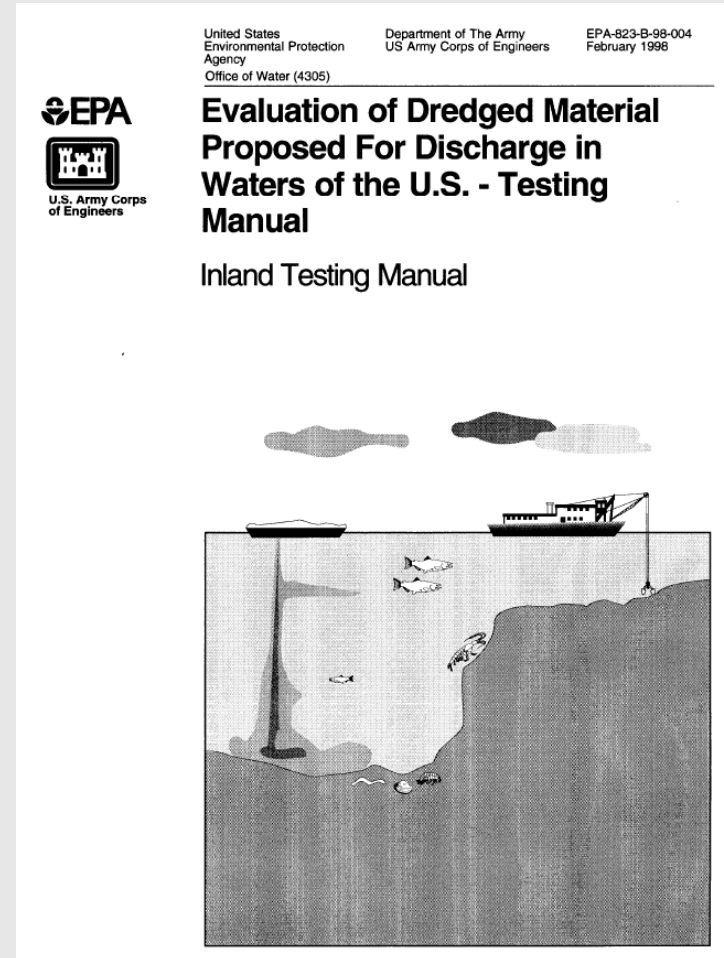
Evaluation of Dredged Sediments

- The Corps regulates dredged materials under the Clean Water Act (40 CFR 230)
“Guidelines for Specification of Disposal Sites for Dredged or Fill Material”
- The Corps is required to determine if there are potential impacts to physical and chemical characteristics of the aquatic ecosystem (40 CFR 230(c))



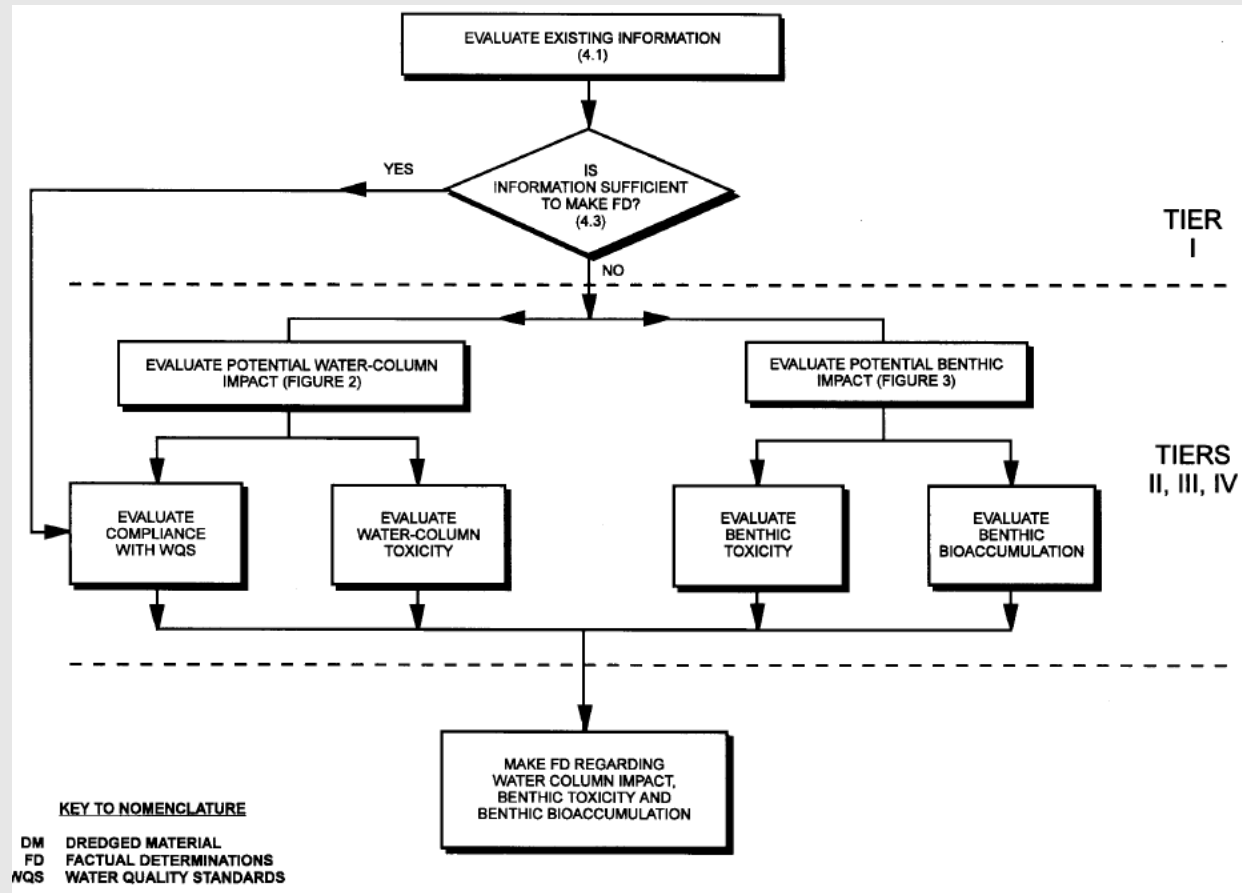
Evaluation of Dredged Sediments

- Inland Testing Manual (1998)
- Requires comparison to reference sediments
- 4 Tiers of Contaminants Evaluation
 - 1) Site Evaluation and History
 - 2) Chemical Testing
 - 3) Biological Testing (bioassay/bioaccumulation)
 - 4) Special Studies



EPA/USACE Inland Testing Manual

- Tier I: uses readily available information (previous testing, examination of upstream sources)
- Tier II: testing of sediment and water chemistry
- Tier III: use of well defined biocriteria for toxicity
- Tier IV: case-specific laboratory and field-testing (for use in special circumstances)



Invasives & Threatened/ Endangered Species

- How will invasive species be affected?
- Acute and chronic impacts to T&E aquatic species



Photo: USGS

Silver Carp



Photo: Rock River Times

Black Carp



Photo: R. Evans

Clubshell mussel



Photo: US Dept. of Justice

Snail Darter



Historical and Cultural Values

- Browns Mill Dam (TN)
 - ▶ Listed on the National Register of Historic Places (NRHP) in 1979.
 - ▶ Mill collapsed in 1991; delisted from the NRHP in 2002



- Nice Mill Dam (Rutherford Co., TN)
 - ▶ Built in
 - ▶ Breached in 2014
 - ▶ Currently is Nice Mill Dam Recreation Area



Permitting Mechanisms for Dam Removals

Nationwide Permit 13: *Bank Stabilization*

- ▶ Authorizes a variety of bank stabilization techniques
- ▶ Also authorizes maintenance activities
- ▶ Work cannot impair surface water flow in or out of Waters of the U.S.
- ▶ Requires that native vegetation be used in vegetation plans



Photo Credit: www.SWCA.com



Permitting Mechanisms for Dam Removals

Nationwide Permit 27 (NWP 27)

Aquatic Habitat Restoration, Establishment, and Enhancement Activities

- Widely used in aquatic habitat restoration, enhancement, and establishment
- A NWP 27 is also used for the development of stream mitigation banks
- Because it is providing a net lift in ecosystem function, does not require compensatory mitigation



US Army Corps
of Engineers
Nashville District

Nationwide Permit

No. 27, Aquatic Habitat Restoration, Establishment, and Enhancement Activities

Activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, and the rehabilitation or enhancement of tidal streams, tidal wetlands, and tidal open waters, provided those activities result in net increases in aquatic resource functions and services.

To the extent that a Corps permit is required, activities authorized by this NWP include, but are not limited to: The removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms, as well as discharges of dredged or fill material to restore appropriate stream channel configurations after small water control structures, dikes, and berms, are removed; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels; the removal of existing drainage structures, such as drain tiles, and the filling, blocking, or reshaping of drainage ditches to restore wetland hydrology; the installation of structures or fills necessary to establish or re-establish wetland or stream hydrology; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; reestablishment of submerged aquatic vegetation in areas where those plant communities previously existed; reestablishment of tidal wetlands in tidal waters where those wetlands previously existed; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species should be planted at the site.

This NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site provided there are net increases in aquatic resource functions and services.

Except for the relocation of non-tidal waters on the project site, this NWP does not authorize the conversion of a stream or natural wetlands to another aquatic habitat type (e.g., stream to wetland or vice versa) or uplands. Changes in wetland plant communities that occur when wetland hydrology is more fully restored during wetland rehabilitation activities are not considered a conversion to another aquatic habitat type. This NWP does not authorize stream channelization. This NWP does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Compensatory mitigation is not required for activities authorized by this NWP since these activities must result in net increases in aquatic resource functions and services.

Reversion: For enhancement, restoration, and establishment activities conducted: (1) In accordance with the terms and conditions of a binding stream or wetland enhancement or restoration agreement, or a wetland establishment agreement, between the landowner and the U.S. Fish and Wildlife Service (FWS), the Natural Resources Conservation Service (NRCS), the Farm Service Agency (FSA), the National Marine Fisheries Service (NMFS), the National Ocean Service (NOS), U.S. Forest Service (USFS), or their designated state cooperating agencies; (2) as voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or (3) on reclaimed surface coal mine lands, in accordance with a Surface Mining Control



Permitting Mechanisms for Dam Removals

- Nationwide Permit 27: *Aquatic Habitat Restoration, Establishment, and Enhancement Activities*
 - ▶ Activities must be part of a restoration initiative/plan that will provide a net ecological lift
 - ▶ Permits restoration work in formerly impounded channel and bank stabilization activities
 - ▶ Requires the use of existing or conceptual models for the target aquatic resource type in the region
 - ▶ Does not authorize channelization



USACE RGL 18-01

USACE Regulatory Guidance Letter (RGL) 18-1: *'Determination of Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures from Rivers and Streams'*

- Dated September 25, 2018
- Applies to removal of structures that still fulfill their purposes, which are proposed to restore structure, functions, and dynamics



US Army Corps
of Engineers.

REGULATORY GUIDANCE LETTER

No. 18-01 Date: 25 September 2018

SUBJECT: Determination of Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures from Rivers and Streams.

1. Purposes, Applicability, and Definitions

Purposes. The U.S. Army Corps of Engineers (Corps) has the authority to issue permits under Section 404 of the Clean Water Act and Sections 9 and 10 of the Rivers and Harbors Act of 1899. Under 33 CFR 320.4(r) and 33 CFR 330.1(e)(3), the Corps may require that these Department of the Army (DA) permits include compensatory mitigation to offset unavoidable impacts to waters of the United States. Compensatory mitigation can be provided through restoration activities that improve the physical, chemical, and biological processes performed by rivers and streams with the goal of returning the natural/historic functions performed by those rivers and streams. The removal of obsolete dams and other obsolete in-stream structures can be an effective approach to restoring river and stream structure, functions, and dynamics. These restoration activities may be performed by mitigation banks and in-lieu fee programs to generate mitigation credits that can be sold or transferred to permittees to fulfill compensatory mitigation requirements in DA permits. These restoration activities can also be conducted as permittee-responsible mitigation. The regulatory requirements for compensatory mitigation by mitigation banks, in-lieu fee programs, and permittee-responsible mitigation are provided in 33 CFR Part 332.

This document provides guidance to district engineers on: 1) factors they should consider when determining the amount of mitigation credit generated from the removal of obsolete dams or other structures; 2) recommendations for quantifying mitigation credits; and 3) recommendations for the treatment of losses of wetland that result from the removal of dams and other structures. This guidance covers aspects of these restoration activities that are not explicitly addressed by the compensatory mitigation regulations at 33 CFR Part 332.

Applicability. This guidance applies to compensatory mitigation projects to restore river and stream structure, functions, and dynamics that involve the removal of obsolete dams and other structures, including the removal or replacement of undersized or perched culverts. This guidance also applies to compensatory mitigation projects that involve the removal of dams or other structures that are still fulfilling their intended purpose(s), but are



USACE RGL 18-01

- Does not apply to previously authorized mitigation banks, in-lieu fee projects, or permittee-responsible projects
- Does not apply to projects received prior to the issuance of RGL 18-01
- Minimization measures need to be considered to minimize short-term adverse effects
- Objectives should not include recovery to pre-impact state due to subsequent watershed changes
- Provides guidance on:
 - ▶ Factors to be considered when determining the amount of mitigation credit generated from the removal of obsolete dams
 - ▶ Recommendations for quantifying mitigation credits
 - ▶ Recommendations for the treatment of losses of wetlands that results from dam removal
 - ▶ Credits can also include perched/undersized culvert removals if part of an approved mitigation plan



Corps Guidance on Credit Determination

- RGL 18-01 -

- ▶ Covers aspects of restoration not covered under 33 CFR 332 'Compensatory Mitigation for Loss of Aquatic Resources'
- ▶ Functional or condition assessment should be used to quantify the mitigation credits (i.e. TN SQT)
- ▶ Even with proposed credits, there needs to be monitoring to determine if the ecological lift that was proposed has happened and will persist
- ▶ Reduces the barriers needed for typical site protection associated within the entire mitigation project
- ▶ Riparian area and floodplains next to the restored stream reaches proposed to generate mitigation credit should be provided long-term protection
 - Mitigation credit adjustments will be considered for areas lacking site protection



Corps Guidance on Credit Determination

- RGL 18-01 -

Major credit generation areas from RGL 18-01 guidance:

- ▶ Area that responds to the physical removal of dam/barrier (including upstream and downstream areas)
- ▶ Establishing new floodplain riparian areas
- ▶ Improvement of T&E species habitat (if likely to create new habitat)
- ▶ Diadromous fishes (if likely to create new habitat)
- ▶ Improved instream habitat and water quality
- ▶ Preservation credit for preserved buffers
- ▶ **MUST MONITOR AND DEMONSTRATE FUNCTIONAL LIFT**



Loss of impoundment wetlands

- Clean Water Act objective (restore physical, chemical, and biological integrity of Nation's waters), applies to all waters, not just wetlands
- Losses of impoundment wetlands through stream restoration via removal of obsolete structures should not require wetland compensatory mitigation if net increase in functions
 - There can be exceptions
- Stream restoration activities that result in net increases in aquatic resource functions should not require compensatory mitigation
 - When making this determination consider the riverine *system*
 - Streams
 - Wetlands
 - Riparian areas/floodplains



3 Credit generation zones

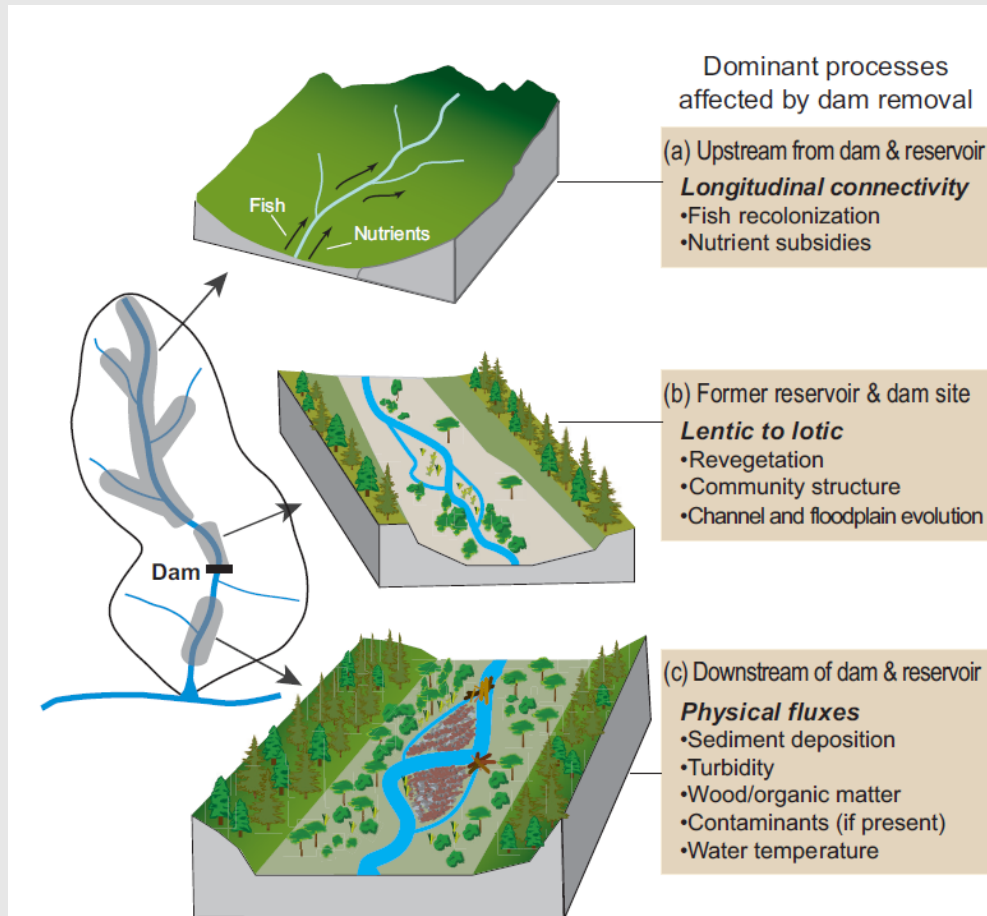
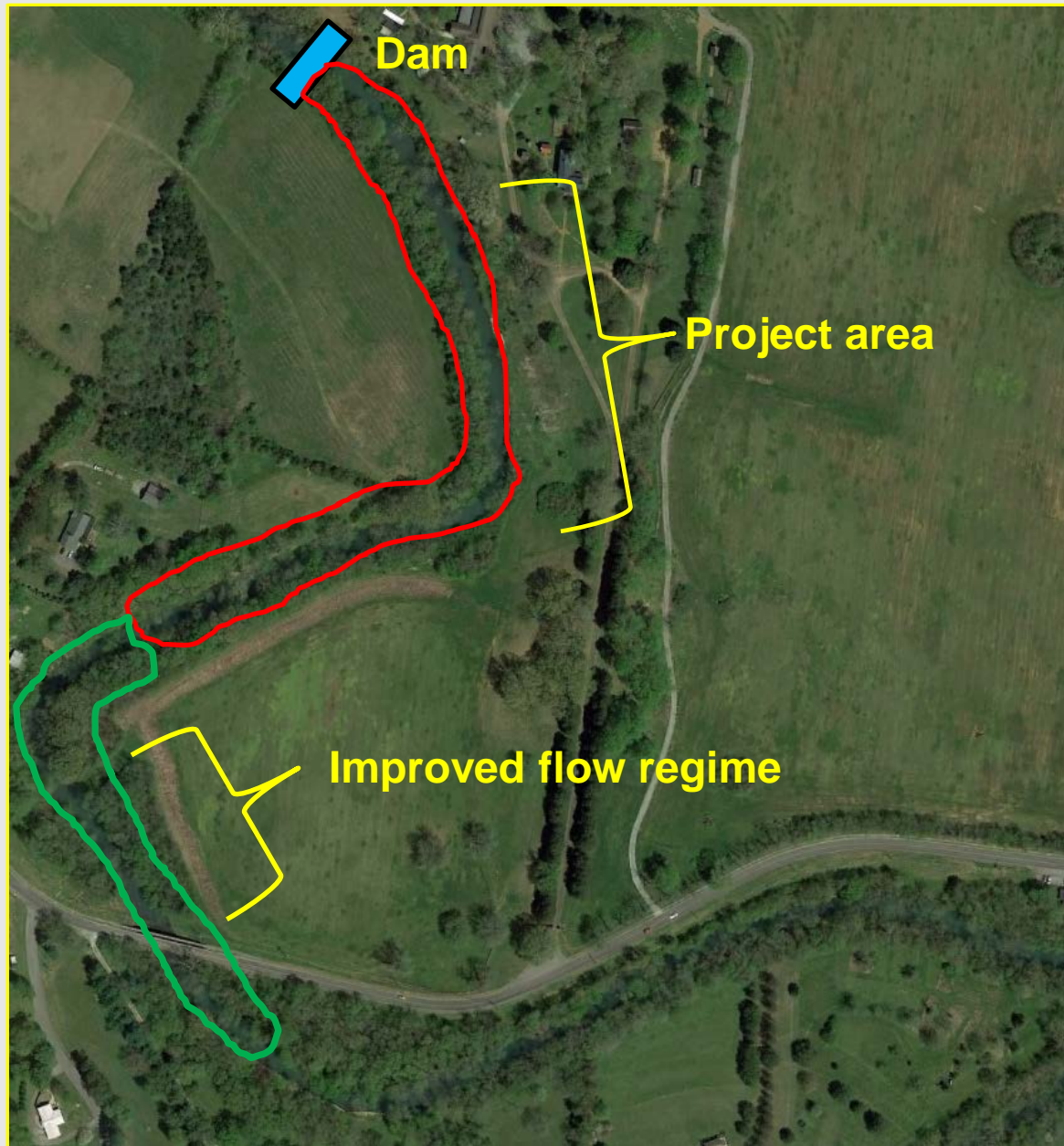


Figure 1. Spatial domains influenced by dam removal: (a) upstream of the reservoir, (b) within the reservoir or former impoundment, and (c) downstream of the dam. The boxes on the right represent the dominant processes that influence ecological responses in each domain.





Take Home Points on Dam Removals

- Pre-application meetings are important
- Post removal monitoring very important
- Data needs may vary depending on project
- Sediment management very important

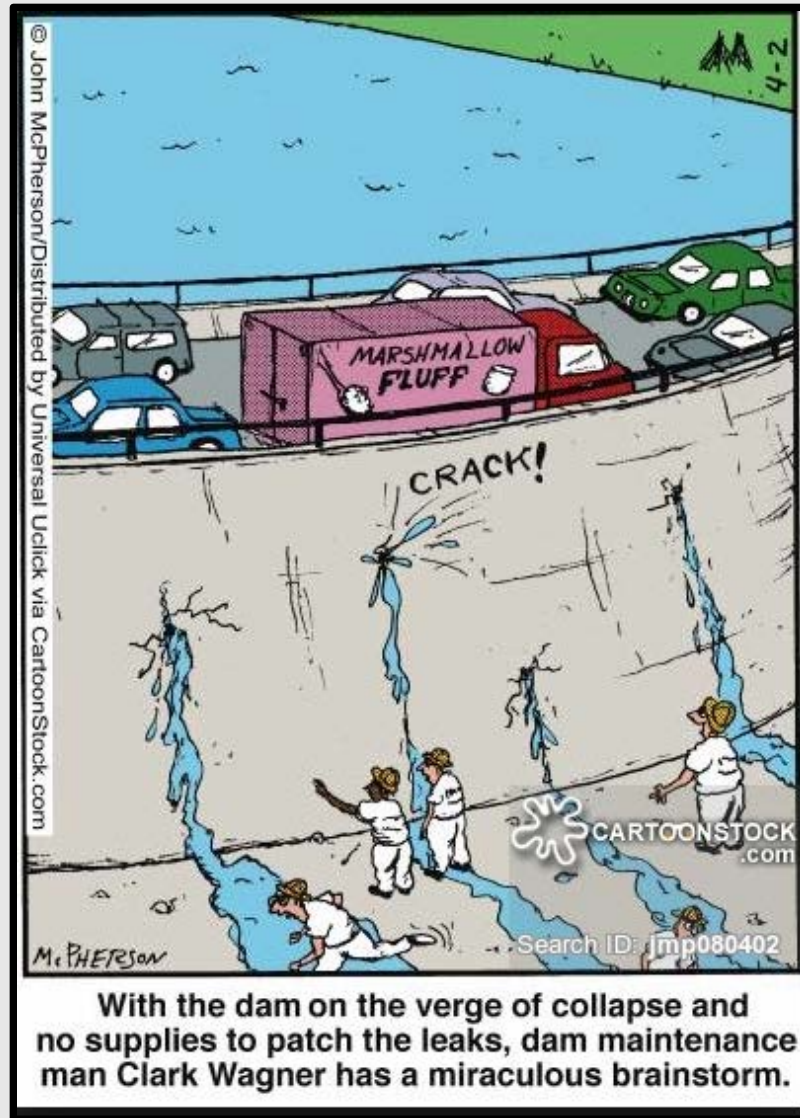


Dam Removal Resources

- Data Needs and Case Study Assessment for Dam Fate Determination and Removal Projects - A Checklist; ERDC TN-EMRRP-SR-66; *Jock Conyngham*
- Clearinghouse for Dam Removal Information:
 - ▶ <http://library.ucr.edu/wrca/collections/cdri/reports.html>
- Section 408 Process: EC 1165-2-216
- US Army Corps of Engineers RGL 18-01:
<https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Guidance-Letters>



Questions?



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