

2026 Nationwide Permit 27 Decision Document - Table of Contents for Process-Based Restoration

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Table of Contents with Language Relating to Process-Based Restoration found in the Nationwide Permit 27 (NWP 27).

In the General Conditions page 17 and the Decision Document page 1 is language stating that: “An ecological reference may be based aquatic ecosystemsthat existed in the region in the past.” Past aquatic ecosystems are further described in the Decision Document recognizing that stream-wetland complexes were historically common and can be “past reference.” It goes on to say that process-based restoration can be used to restore past ecosystems. It further recognizes the importance of beavers and large woody debris in these past ecosystems and the practices of placing beaver dam analogs and post assisted log structures as tools for restoration.

This table is arranged by a search of key terms, process-based restoration, conversion, anastomosing, beavers and form-based restoration.

Terms:

Process-Based Restoration

Page

1 An ecological reference may be based on the characteristics of aquatic ecosystems or riparian areas that existed in the region in the past.

(Comment: this is saying that “reference” streams could be systems that were common prior to European colonization but are no longer common because of anthropogenic changes like channelization, urbanization, valley sedimentation etc. It is opening the door to those historic conditions where trees that fell into the stream system stayed there and where beavers brought wood and dams into the system. Both the trees and the beaver dams caused those “reference” conditions to be stream-wetland complexes or anastomosing channels. The single thread reference channels we currently model are likely not the true reference condition.

22.....giving wetlands the ability to respond to changing environmental conditions

23.....rivers and streams are....complex changing systems

23.....Restoration of incised streams.....through...beaver dam analogs (BDAs) and post-assisted log structures (PALS)

107 Because of that unpredictability and for other reasons, such as greater ecosystem resilience, restoration activities should allow for a range of acceptable outcomes (Hiers et al. 2016).

123 constructed or anchored log jams that mimic the movement of large woody debris or beaver dams in a riverine system, and rock grade controls that mimic a rock slide or bedrock sill ecological reference. The proposed modifications to this NWP remove the restriction on conversions of streams and natural wetlands to better allow process-based restoration, including BDAs and PALS.

130 Beechie, T.J., D.A. Sear, J.D. Olden, G.R. Pess, J.M. Buffington, H. Moir, P. Roni, and M.M. Pollock. 2010. Process-based principles for restoring river ecosystems. *Bioscience* 60:209-222.

130 Beechie, T., J.S. Richardson, A.M. Gurnell, and J. Negishi. 2013. Watershed processes, human impacts, and process-based restoration. In, *Stream and Watershed Restoration: A Guide to Restoring Riverine Processes and Habitats*. Edited by P. Roni and T. Beechie. Wiley and Sons, Inc. (West Sussex, UK), pp. 11-49.

131 Ciotti, D.C., J. McKee, K.L. Pope, G.M. Kondolf, and M.M. Pollock. 2021. Design criteria for process-based restoration of fluvial systems. *Bioscience* 71:831-845.

139 Powers, P.D., M. Helstab, and S.L. Niezgoda. 2019. A process-based approach to restoring depositional river valleys to stage 0, an anastomosing channel network. *River Research Applications* 35:3-13.

142 Wheaton, J.M., S.N. Bennett, N. Bouwes, J.D. Maestas, and S.M. Shahverdian (editors). 2019. Low-tech process-based restoration of riverscapes: Design manual. Version 1.0. Utah State University Restoration Consortium. Logan, UT.
<http://lowtechpbr.restoration.usu.edu/manual>

Conversion – Of Streams to Stream-Wetland Corridors

Page 97Non-tidal wetlands may also be changed by conversion to another aquatic ecosystem type, as long as the NWP 27 activity resembles an ecological reference.

125 permittees considering such activities [conversion of stream to stream-wetland complex] should provide supporting information in their NWP 27 Reports or PCNs to demonstrate net increases in aquatic resource functions and services.

(Comment: The Corps is clarifying that this NWP authorizes the restoration of river-wetland corridors. In PBR beaver dams and the accumulation of LWD are processes that slow stream flow and can convert single thread channels into stream-wetland complexes.)

Anastomosing

Page

24..... Anastomosing river-wetland corridors that were common have the potential to provide greater ecological diversity, complexity, richness, and functionality....

51 In North America, multithreaded networks of stream channels and wetlands were common before land use changes..... where these anastomosing riverine systems were located,

51Harvesting beaver and removal of large wood also contributed to losses of stream and wetland complexes in river valleys (Pollock et al. 2014).

(Comment: This refers to the fact that before Europeans arrived in America, wetland-stream complexes (multi-thread not single thread channels) were the reference conditions.

92 River-wetland corridors (e.g., anastomosing river channels interspersed with wetlands and floodplains) in the United States have been substantially degraded or lost because of channel instability and changes in planform (e.g., from multiple thread channels to single thread channels).....

92 The loss or alteration of river-wetland corridors, such as their transitioning from anastomosing stream channels to single-thread stream channels because of deforestation, conversion of lands to agricultural use, and other factors, has reduced the amounts and types of ecosystem services performed by these ecosystems (Cluer and Thorne 2013).

Beavers

Page

24 - 25..... Beaver and Large Woody Debris reintroduction is a form of hydrologic restoration
“...can be more effective than in-stream habitat restoration...”

132 DeVries, P., K.L. Fetherston, A. Vitale, and S. Madsen. 2012. Emulating riverine landscape controls of beaver in stream restoration. *Fisheries* 37:246-255.

139 Pollock, M.M., T.J. Beechie, J.M. Wheaton, C.E. Jordan, N. Bouwes, N. Weber, and C. Volk. 2014. Using beaver dams to restore incised stream ecosystems. *Bioscience* 64:279-290.

Form-Based Restoration

Page

25 “Attempting to restore streams by constructing specific channel forms or shapes instead of reinstating ecological processes.....may result in streams..... providing fewer ecological functions than restoration actions that allow rivers and streams to flood and self-adjust.”

25 “Form-based stream restoration activities may be more likely to fail as hydrology and sediment loads change,....”