

Finding Common Ground Between Different Types of Stream Restoration Design Methods

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Presentation Overview

- A Brief Over of Restoration Approaches
- Finding Common Ground Between Approaches



Approaches

- **National**
 - Natural Channel Design
 - Process Based
 - Stage 0
 - Beaver Dam Analogs
 - Let the Water Do the Work
- **Mid-Atlantic Region**
 - Valley Restoration
 - Regenerative Design
 - (Regional Plus)

Techniques

- Modeling
- Dam/Barrier Removal
- In-Stream Structures
- Riparian Re-Vegetation
- Floodplain Connectivity
- LWD Placement
- Levee Removal
- Stormwater BMPs
- Agricultural BMPs
- Etc.

Natural Channel Design

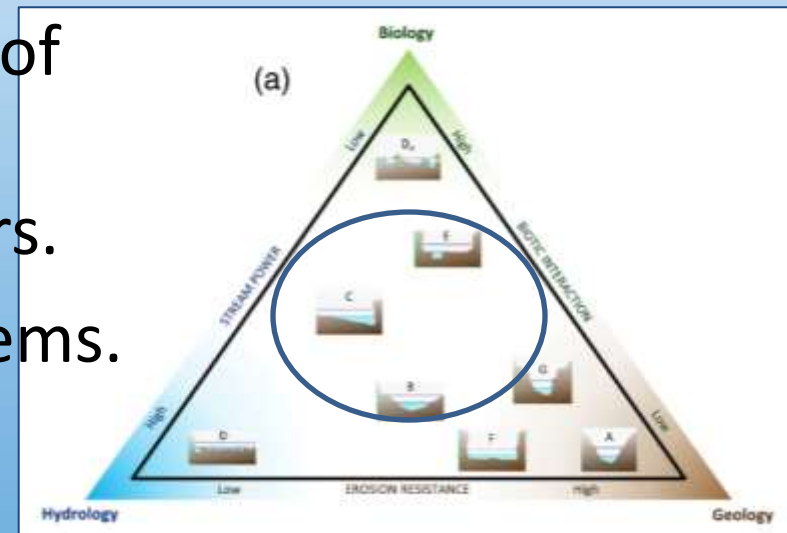
- Founded by Dave Rosgen
- Typical Design Goal
 - Stable channel that *transports* water and sediment without aggrading or degrading
- Published in the USDA, NRCS National Engineering Handbook, Part 654



Natural Channel Design

Strengths

- Method is well developed and tested. Likely used more than any other method
- Can be used for a wide range of problems and across many landscapes and process drivers.
- Mostly used in transport systems.
 - But not exclusively



Natural Channel Design

Weakness / Criticisms

- Practitioners sometimes over-assume that sediment transport is needed.
- Practitioners overuse in-stream structures.
- Projects are called NCD when they're not.

Process-Based Restoration

- Came from a desire to have more holistic restoration efforts that focus on the root cause of degradation with more cost-effective restoration methods.
- Aim is to restore normative rates and magnitudes of physical, chemical, and biological processes that create and sustain river and floodplain ecosystems.

Process Based Restoration

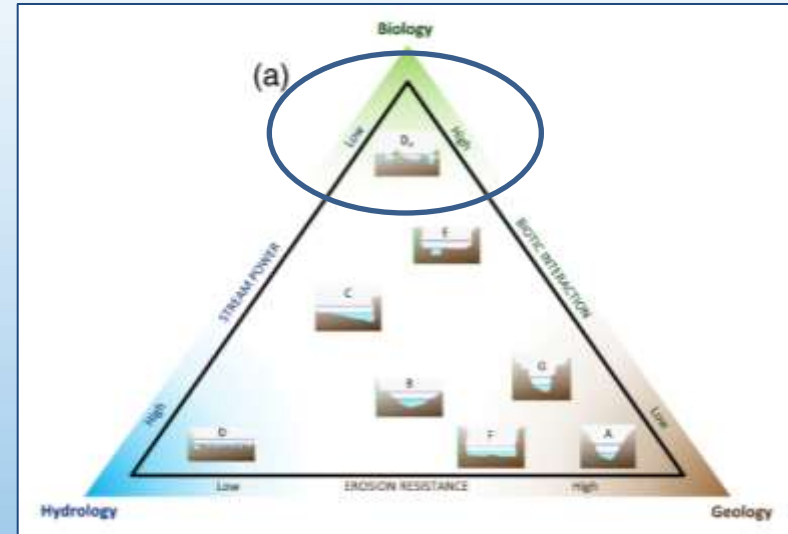
Strengths

- Often cheaper than other approaches with a “let the river do the work” philosophy
- Often restores more functions than other approaches by focusing on the river corridor.
 - Stream and floodplain; stream-wetland complex / river-wetland corridor.



Process Based Restoration

- Applications
 - Stage 0
 - Beaver Dam Analogs
 - Let the River Do the Work
- Process Drivers
 - Mostly applicable in reaches with wide floodplains, low stream power, low sediment supply, and high biotic interaction.



Process Based Restoration

Weaknesses

- May take a long time to recognize functional uplift.
- Results may not last.
- May not align with regulatory requirements. For example:
 - Mitigation requirements
 - Resource conversion



Two Regional Approaches

- Valley Restoration
 - Developed by Art Parola and the University of Louisville Stream Institute.
- Regenerative Stream Conveyance
 - Developed by Keith Underwood and Underwood Associates
- Both are used a lot in the Mid Atlantic Region

Valley Restoration

- Common Characteristics
 - Valley-wide grade control
 - Base-flow channel
 - Wet floodplain (stream-wetland complex)
 - Often includes removal of legacy sediments



Regenerative Stream Conveyance

- Major focus is to re-connect stream to floodplain and enable robust interaction between groundwater and surface water.
- Goal is to reverse the degradation trend and reset the stream corridor into a regenerative mode.
- Regenerative Stormwater Conveyance is recognized as a BMP.



Finding Common Ground Between Approaches

Realize that Others May Define Stream Restoration Differently.



Finding Common Ground

Avoid the word “All.”

As in...

- **All** streams are customized.
- **All** streams are support systems.



Embrace the
“It Depends!”





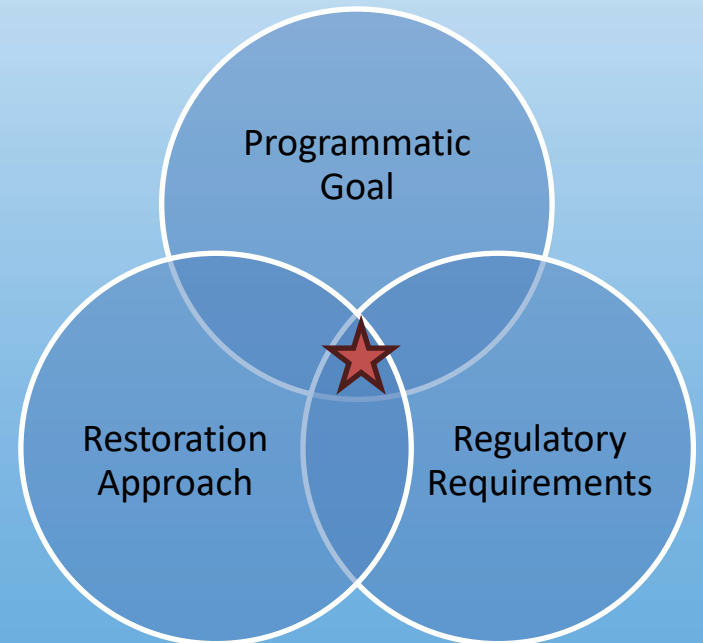


Or



Finding Common Ground: Goals Matter

- Programmatic
 - Think funding driver
 - Who is paying you to do the project and what do they want
- Examples
 - Compensatory mitigation
 - TMDL
 - Grants
 - Recreation
 - Personal
 - ESG Rating
- Don't forget Regulations



Common Ground: Right Tool for the Problem

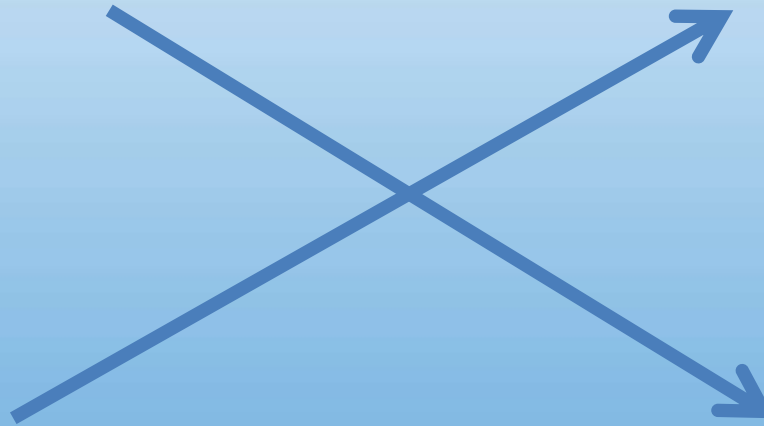
Tools

Problems

Restoration Approaches

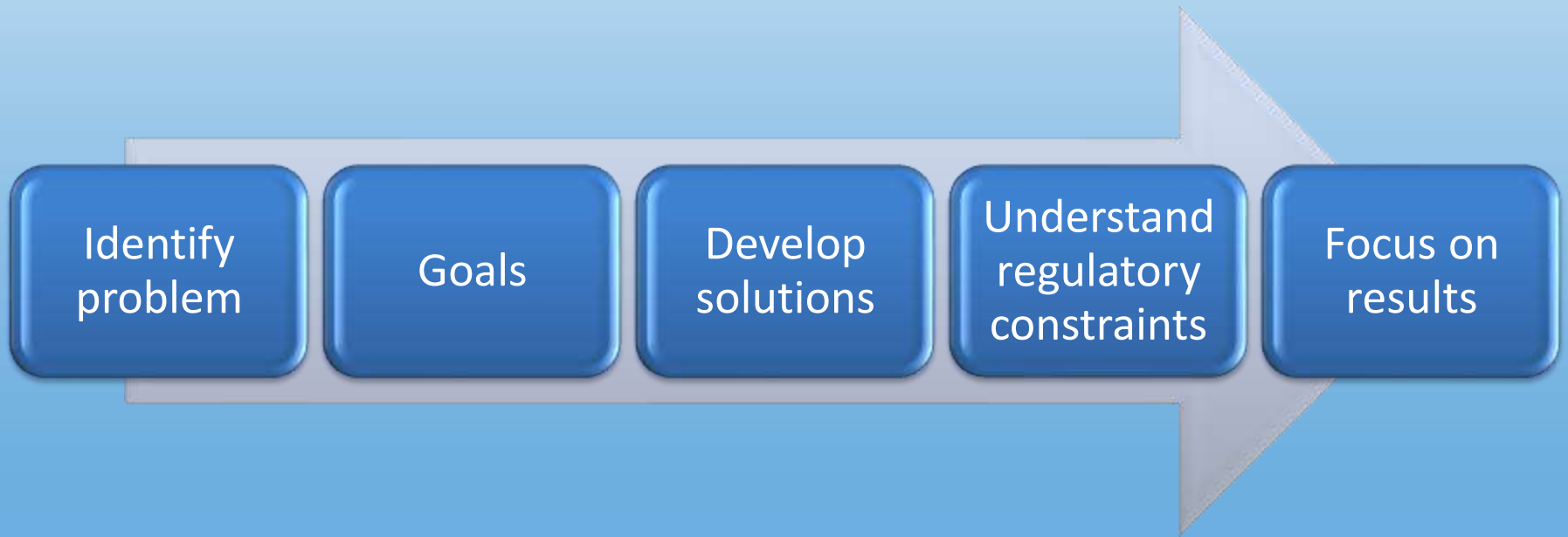


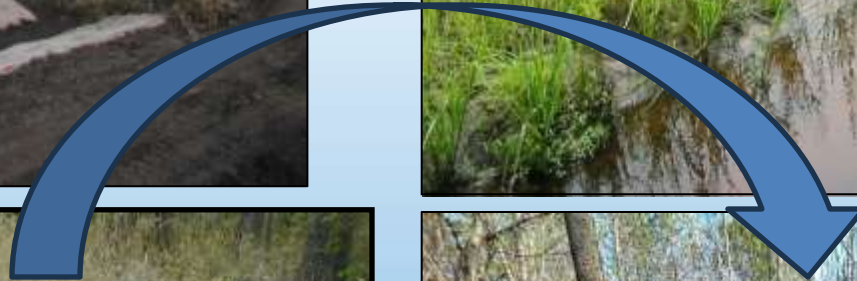
Stream Impairment



Finding Common Ground Between Approaches

Recognize that the Approach Name Matters Less than the Result.







Finding Common Ground Summary

- Recognize that we may define stream restoration differently.
- We work within diverse programs with diverse goals.
- We have many tools, strive to use the right one for the given problem.
- Recognize that the name matters less than the result.