



# Compensatory Stream Mitigation Challenges and Opportunities

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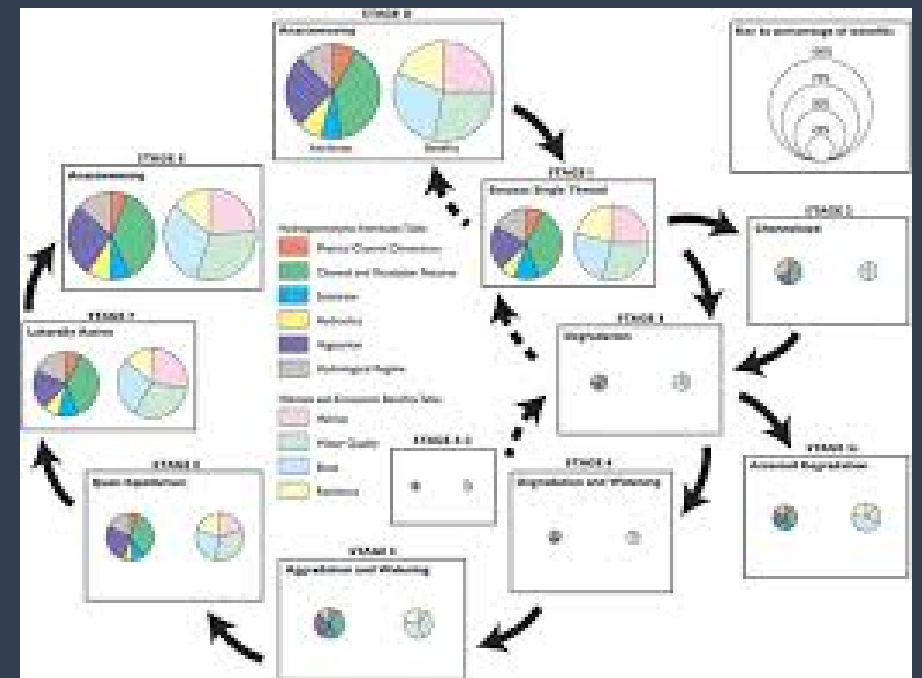
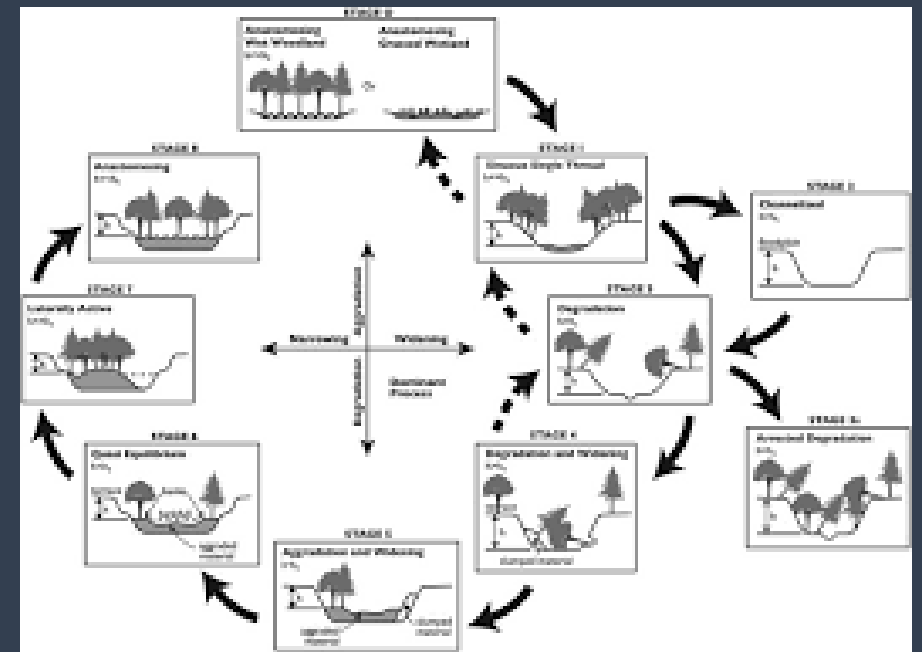
# context and trends

## research suggests...

- rivers are simplifying – shifting baselines
- common approaches limit success

## trends in practice...

- Channel Evolution Models (CEMs)
- emphasis on floodplains
- freedom space, corridors for dynamic process



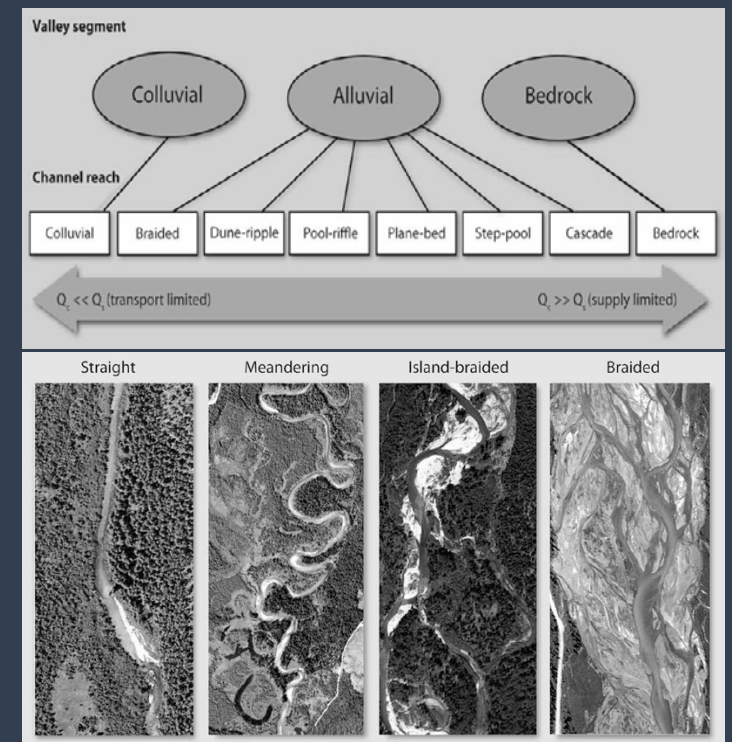
# challenges and opportunities

Challenge	Opportunity
<b>Assessment/Accounting:</b> metrics drive outcomes	a. stream type stratification b. process and function focus for assessment c. corridor units d. simplify
<b>Administration:</b> capacity constraints and loopholes	a. boost funding and capacity b. increase competency c. reduce loopholes
<b>Learning:</b> absence of learning paradigm	a. standardize/align monitoring and assessment b. term of monitoring

# assessment and accounting

## opportunity: a new metrics framework

1. stratify by watershed type
  - apply relevant parameters
  - apply ratios
2. Define process parameters
  - e.g., indicators of flow, dynamism, succession
  - apply to debit and credit sides
3. corridor units of measurement
  - valley length or acres
4. practical considerations
  - limit # of parameters



## challenge: “*metrics drive outcomes*”

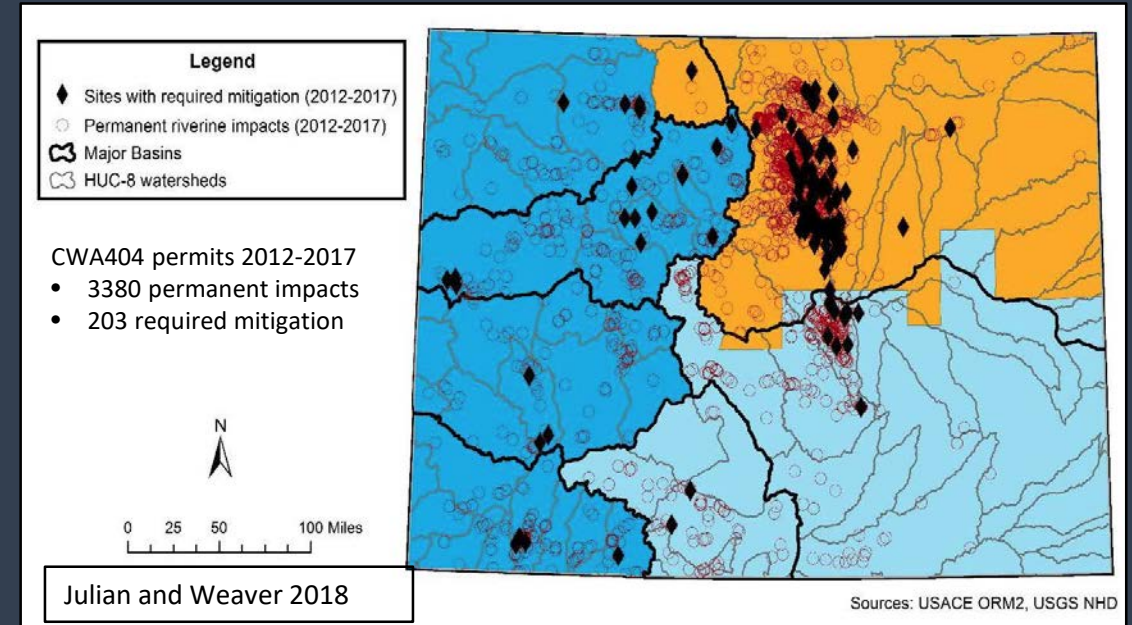
### metrics for assessment and accounting

1. metrics and accounting drive outcomes
2. form is not a valid proxy for function
3. watershed context is paramount

# administration

## opportunity: increase funding and training

1. boost funding and capacity
  - cost share positions
  - credit administration fees
2. increase competency
  - training for mitigation community
  - establish restoration science centers
3. reduce loopholes
  - exempt permits
  - nationwide permits



## challenge: “*capacity and loopholes*”

### principles for administration

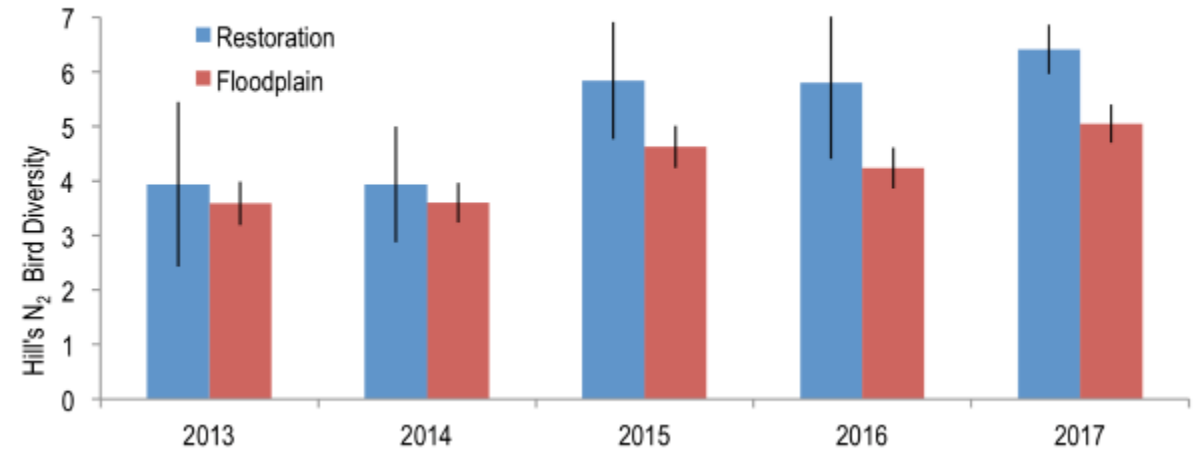
1. Evolution of mitigation will require capacity and competency
2. exempt impacts undermine mitigation

# learning

## opportunity: monitor to learn

1. align monitoring and assessment
  - ecological parameters
  - regional database
2. timescales
  - 10-year minimum
3. Incentivize learning
  - credit release

Figure 4. Average bird diversity ( $N_2$  per point) at the restoration sites and the floodplain of the Colorado River in Mexico during the breeding season, from 2013 to 2017.



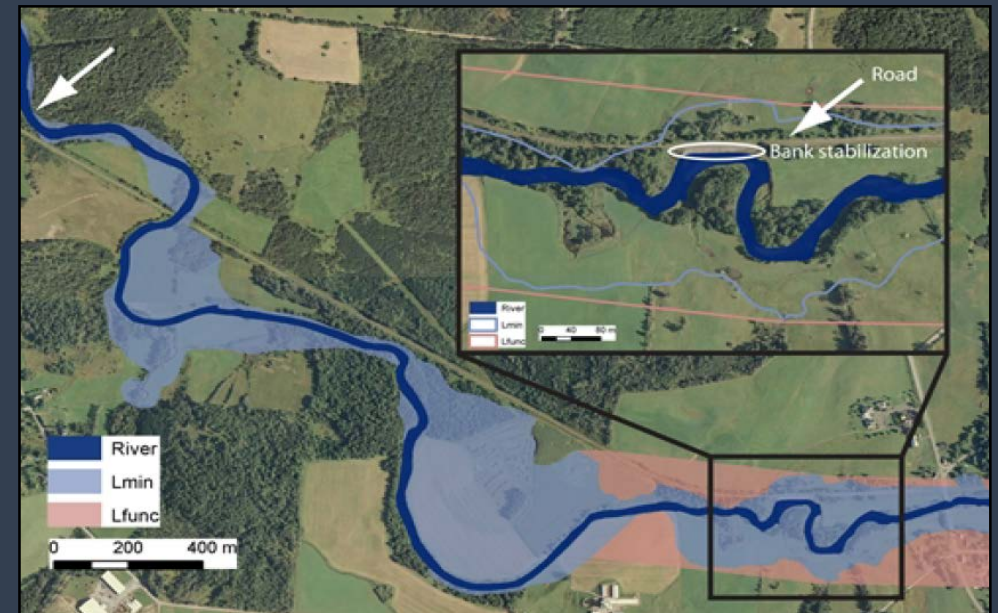
**challenge:** “*absence of a learning paradigm*”

## obstacles

1. metrics, metrics, metrics
2. ecological lift takes time
3. mindset

# guiding principles

- metrics drive outcomes – processes and complexity
- rivers are resilient systems – manage them as corridors
- experiment intentionally – test hypotheses





Omaha District

United States Army Corps of Engineers  
Omaha District  
Wyoming Regulatory Office

**WYOMING STREAM MITIGATION PROCEDURE  
Version 2 (WSMP v2)**

- step forward in enabling mitigation
- opportunity to establish regional metrics and test assumptions

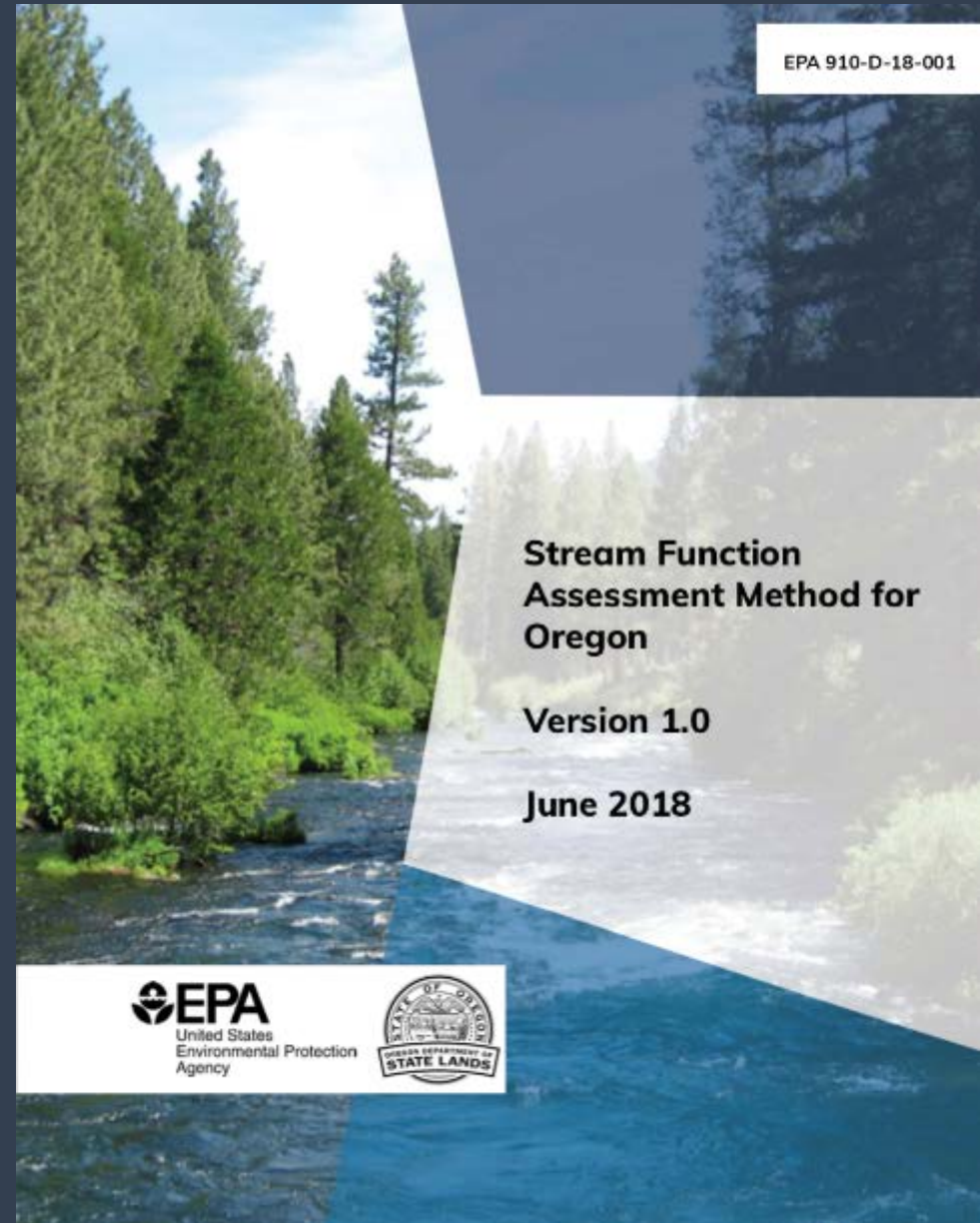


- July 2018 -



# cases in point

- stream type
- indicators of process



EPA 910-D-18-001

## Stream Function Assessment Method for Oregon

Version 1.0

June 2018



# cases in point

- ecological outcomes
- trends and causes



U.S. Army Corps of Engineers  
Omaha District



Yellowstone River  
Conservation District Council

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## Yellowstone River Cumulative Effects Analysis

FINAL

December 2015

# cases in point

- channel migration easements
- ILF and mitigation banks

Montana Statewide In-Lieu Fee  
Mitigation Program Instrument

Sponsored by  
Montana Aquatic Resources Services,  
Inc.

January 15, 2013



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