Stream Mitigation Work Group

Tiered Mitigation Approach:
Stream Relocation Criteria

April 8, 2008

Vision Statement

To develop a scientifically sound and predictable methodology for assessing impacts to stream ecosystems and associated compensatory mitigation proposals under review by Ohio EPA through the 401 Water Quality Certification Program.

Meeting Goals and Objectives

- Review concepts of a tiered mitigation approach for stream impacts
- Discussion regarding stream relocation standards for on-site mitigation to meet 401 requirements.

Weighting Factors Model

- Model developed based upon a draft stream mitigation system used by the Savannah District of the Army Corps of Engineers.
- Model “Ohio-ized” to reflect Ohio EPA methodologies, anti-degradation categories, aquatic life use designations, and other important measures of stream resource integrity.

Weighting Factors Model

- Scoring of weighting factors based upon relative importance of characteristic to stream resource integrity and anti-degradation considerations.
- Base scores based upon “average case” criteria established in the policy for each weighting factor. Ratio of the sum of factors for impacts vs. mitigation set to equal 1.5 (relates to current practice).

Weighting Factor Assessment Overview

Impact weighting factors:

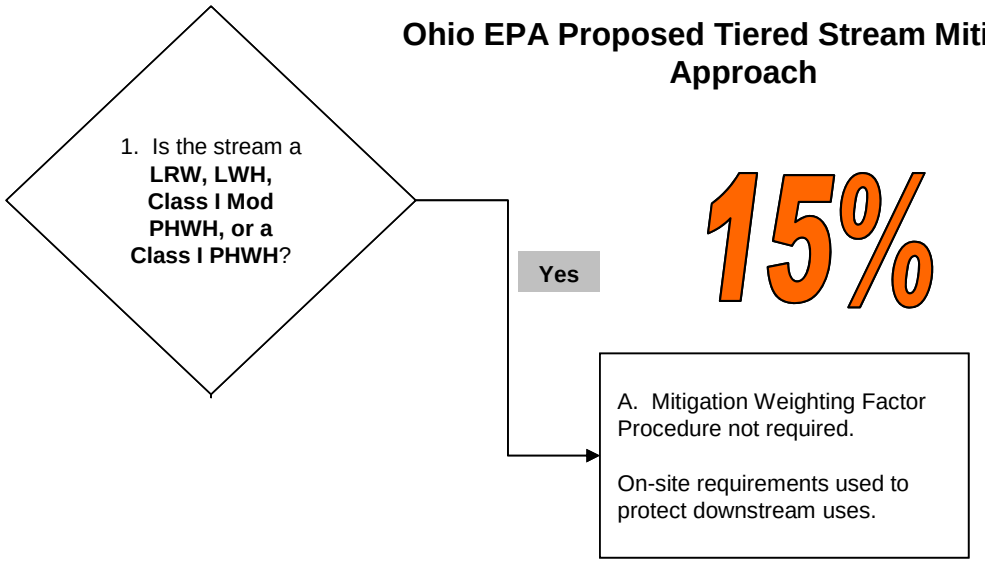
- Existing Aquatic Life Use
- Existing Habitat Quality
- Priority Area
- Existing Geomorphic Integrity
- Existing Flood Plain Quality
- Impact Category

Mitigation Weighting Factors:

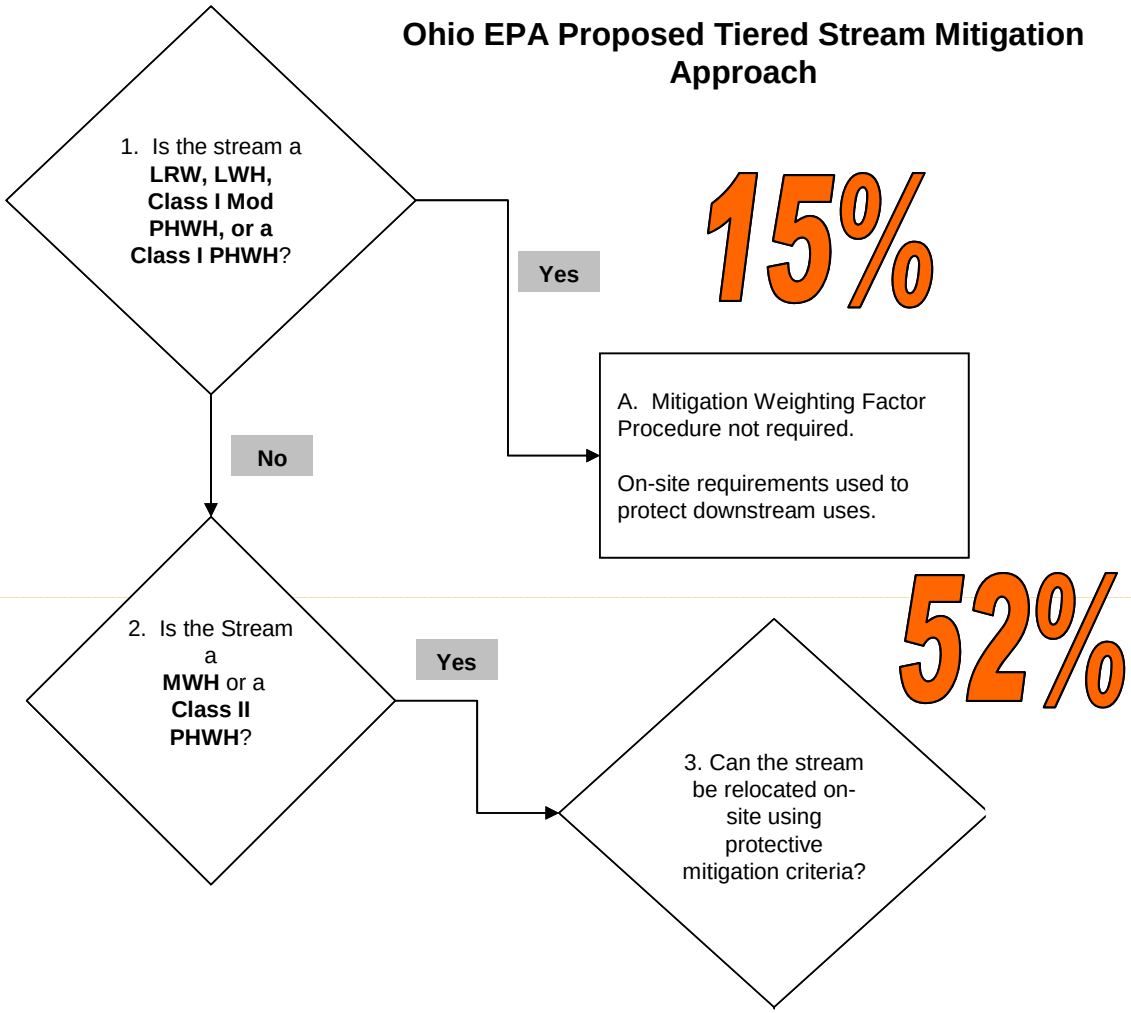
- Stream Restoration / Relocation Design
- Riparian/Floodplain Preservation
- Riparian Restoration and Enhancement
- Resulting Aquatic Life Use
- Resulting Habitat Quality
- Priority Area
- Watershed Location
- Control
- Impact/Mitigation Relationship
- Implementation Schedule
- Supplemental Water Quality Activities
- Threat to Stream Segment

Tiered Mitigation Approach

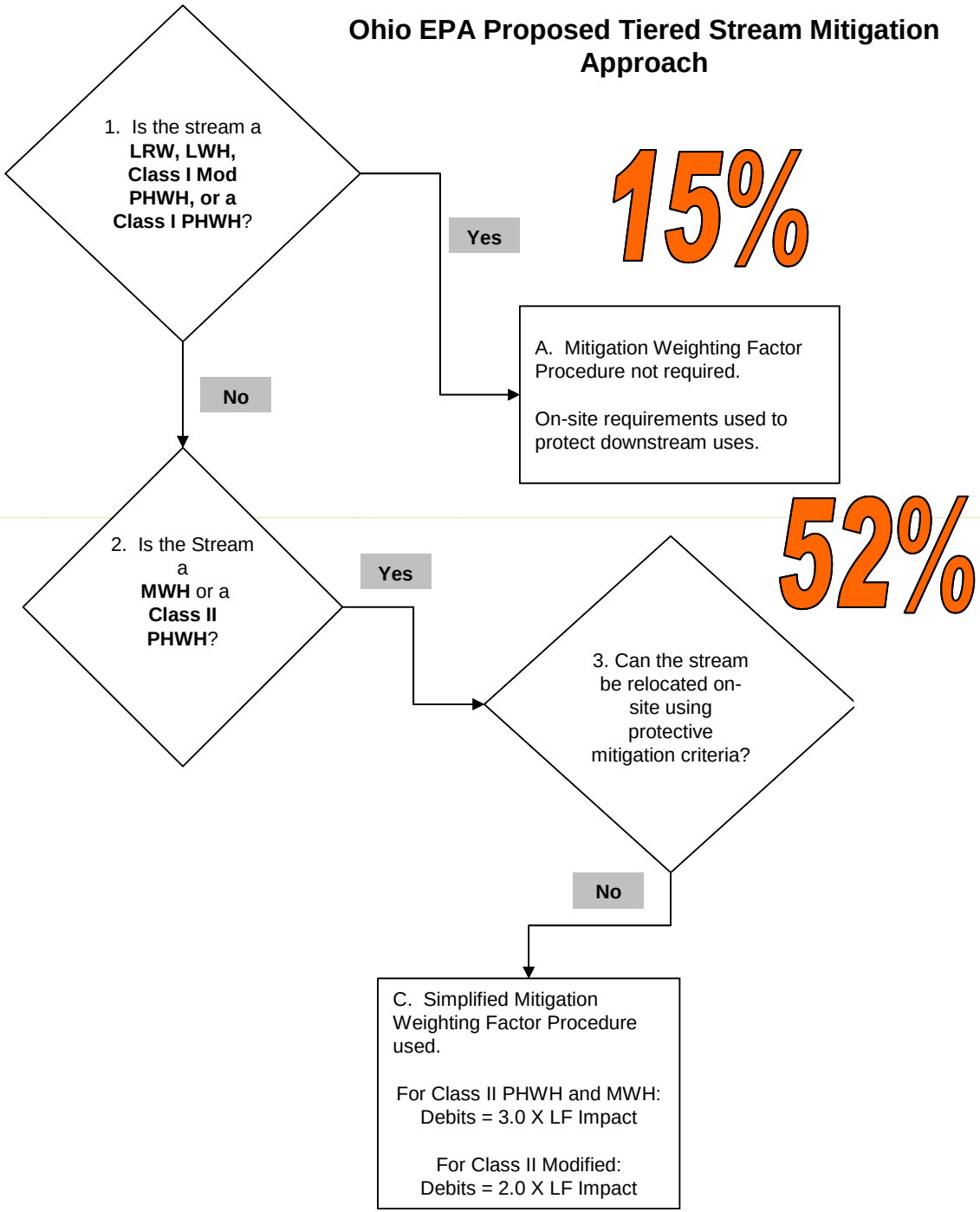
Ohio EPA Proposed Tiered Stream Mitigation Approach



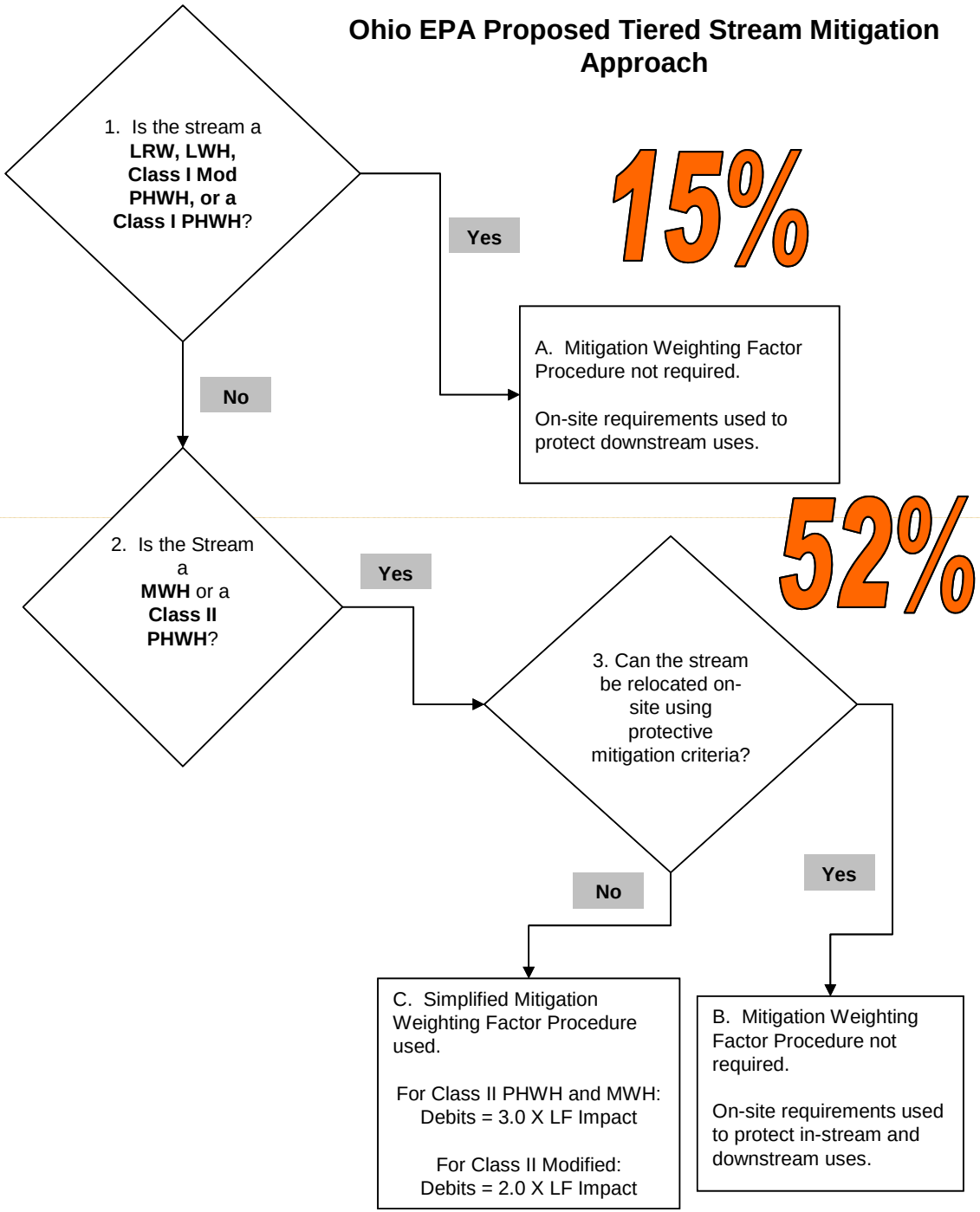
Tiered Mitigation Approach



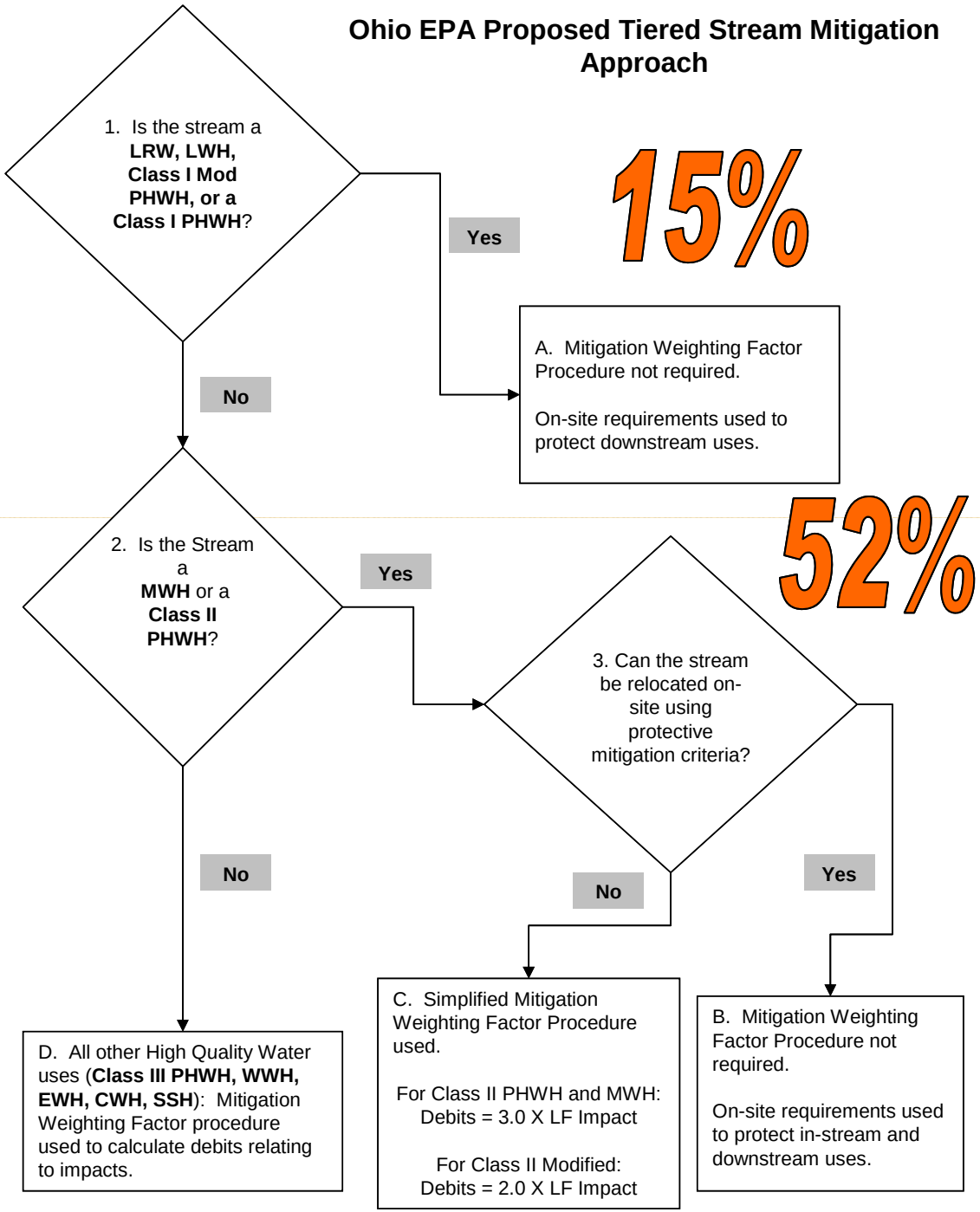
Tiered Mitigation Approach



Tiered Mitigation Approach



Tiered Mitigation Approach



BMP Approach (last meeting):

- Goal is to insure that existing stream functions are not lost from the watershed.
- Extreme caution needed – design must be constructed with the downstream use in mind.
- Protection of groundwater recharge and discharge paramount where downstream use is Class III PHWH or CWH

BMP Meeting: Summary

- Existing storm water toolbox should be used – integrate rather than re-invent
- Selective toolbox approach
- BMP's alone may not mitigate for all lost functions
- Flexibility for future innovation needed

Handout Discussion Topics for “Implementation Box B”

TODAY’S TOPIC!

Priorities for Stream Channel Design (Dan Mecklenburg)

1. Vertical Stability
   - Valley slope important – determines design criteria
     - 2% and greater should use rock-lined channels top dressed with finer grained material
   - Grade control often needed to ensure vertical stability

Priorities for Stream Channel Design (Dan Mecklenburg)

2. Appropriate Riparian (streamway or floodplain) Form
   - Ensure that channel forming flows inundate or saturate the entire riparian.
   - Extent (width)
     - Target 10X the bankfull width, lower credit for narrower, 30% of target used as minimum.
   - Composition: design criteria should require healthy soils
     - Potential to use a modification of methods used to determine suitability for septic systems.

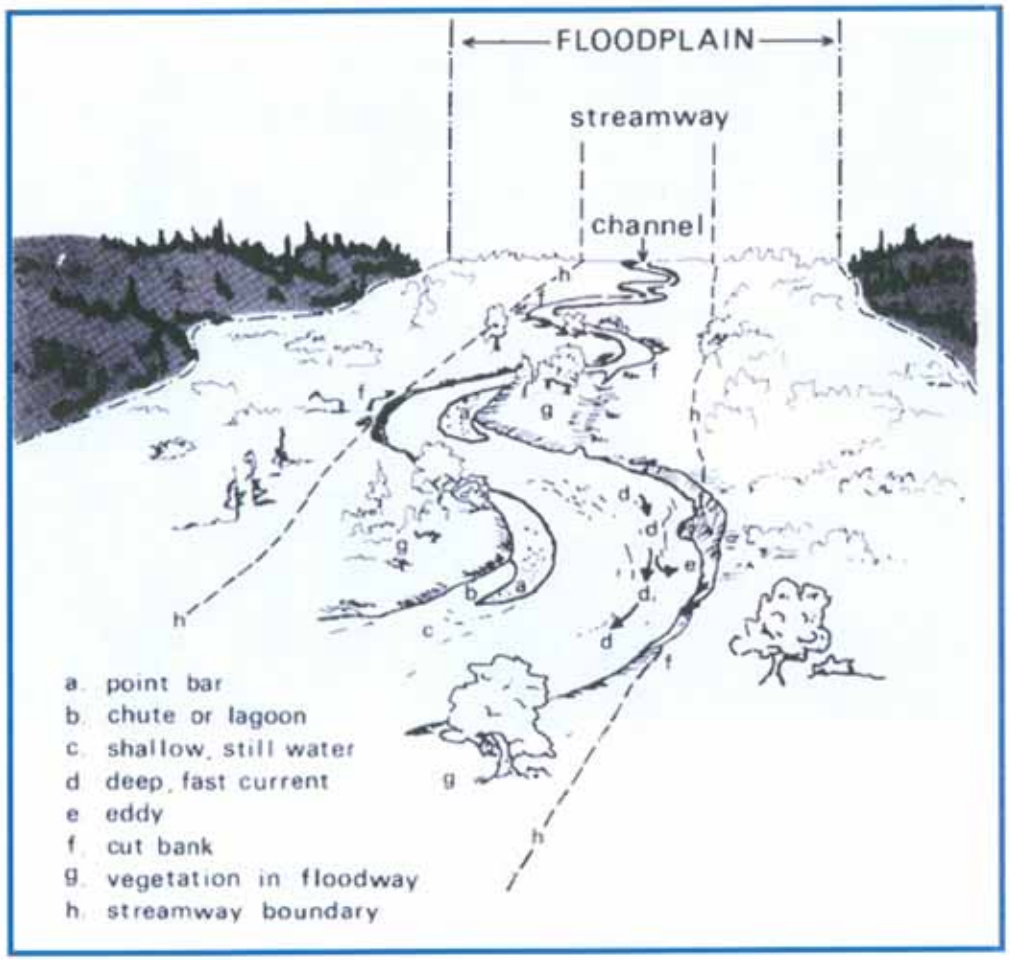
Clarification

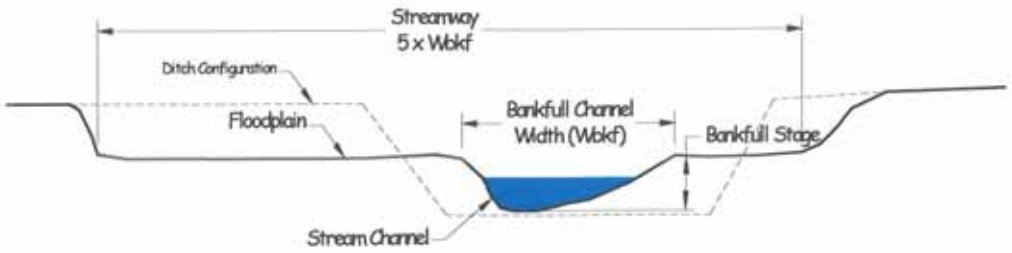
- During the April 3, 2008 meeting, several participants commented that design of the streamway for relocated streams must consider existing site conditions as well as the history of the area. These considerations were included in the information provided by Dan Mecklenburg but they were omitted from the slide presentation for the meeting. My apologies.

Priorities for Stream Channel Design (Dan Mecklenburg)

3. Appropriate Channel Form
   - Constructed streams: ensure suitable dimension, pattern, and profile using standardized natural channel design methods
   - Self-forming streams: ensure vertical stability and proper floodplain extent

4. Habitat for Aquatic Life
   - Set target habitat index scores based on potential
   - Riparian vegetation appropriate for setting
   - Control schemes for undesirable vegetation


FLOODPLAIN
streamway
channel
a. point bar
b. chute or lagoon
c. shallow, still water
d. deep, fast current
e. eddy
f. cut bank
g. vegetation in floodway
h. streamway boundary


Streamway
5 x Wbkf
Ditch Configuration
Floodplain
Bankfull Channel
Width (Wbkf)
Bankfull Stage
Stream Channel

Discussion Topics

- *Where the length of the replacement channel is less than the length of impact, should the debit calculation only include the difference between the impacted length and the replacement length?*
  - *(this would mean that the mitigation credit calculation form would not need to be completed for the replacement channel).*
  - *Alternative: simplified methodology to calculate the credit value of the replacement channel, such as that provided in Box C.*

Discussion Topics

- *What are the appropriate design criteria for this approach?*
- *Should there be a requirement for permanent protection for the replacement channel, or would we allow future impacts (relocations, etc.) to occur if the site use changes in the future?*

Discussion Topics

- *Are special conditions required for different land use impacts (surface mining vs. parcel development vs. linear projects vs. agricultural impacts?)*
- *What would be the appropriate monitoring requirements for these replacement channels during the post-construction period?*

Implementation

- How would this component be best incorporated in the protocol?
  - Should specific design criteria be included?
- What information should be required in the 401 application?
- What monitoring requirements should be included?

NEXT STEPS