Maryland Forest Harvest BMP Assessment and Compliance

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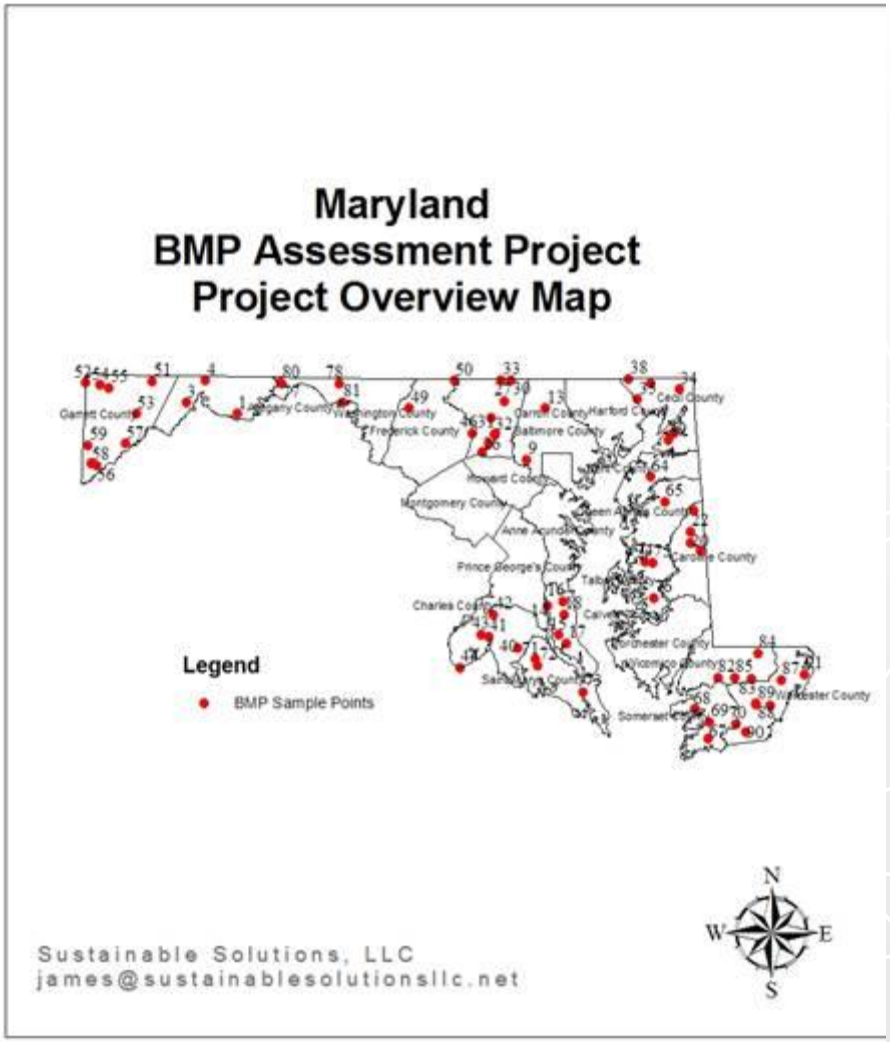
MARYLAND DEPARTMENT OF NATURAL RESOURCES

MARYLAND DNR FOREST SERVICE

Harvest Site Assessment

- Northeastern Area BMP Assessment Protocol
  - 75 samples
- State BMP checklist
  - 39 different sites
- Sites harvested 2003-2005
- Assessed 2004-2005
- Funded by USFS

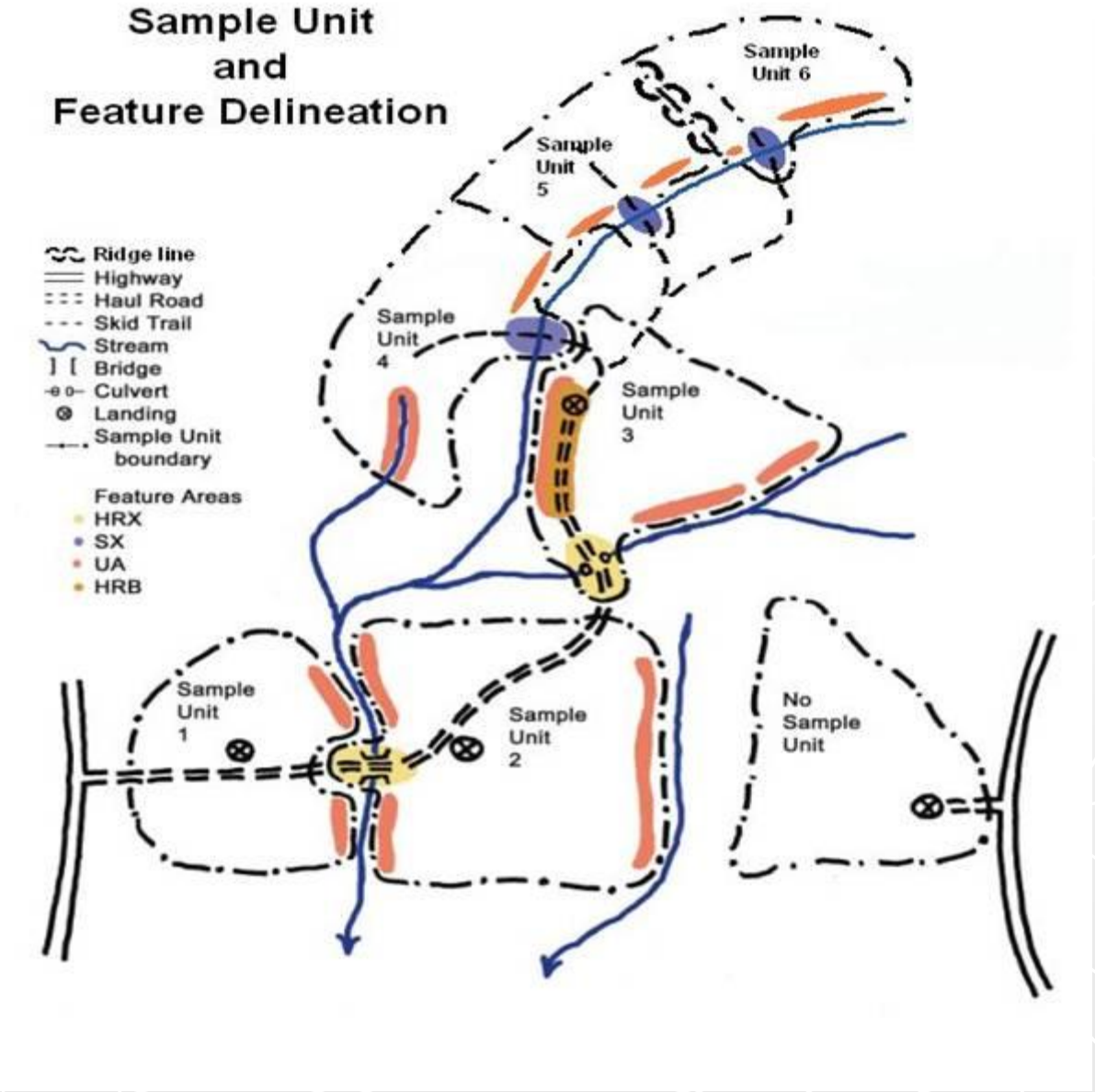


NA BMP Assessment Protocol

- Focuses on water resource protection outcome:
  - Delivered sediment to stream
  - Evaluates effectiveness not just installation
- Methodical and repeatable evaluation
- Consistent sampling in evaluation across regions
  - Allows comparison among states
- Includes auditable quality assessment checks including blind repeat samples

Principles vs. Practices

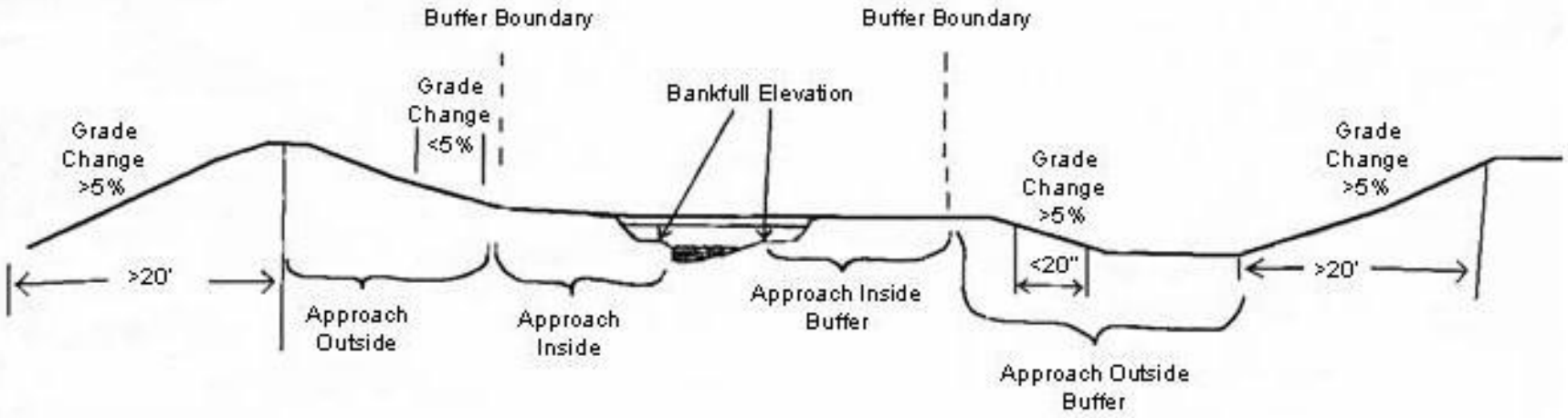
- A BMP principle is controlling water flow so that sediment is not transported to water bodies.
- Practices (BMPs) that are based on water flow control principles include:
  - broad based dip,
  - water bars,
  - culverts
- This protocol focuses on BMP principles verses practices- follow the sediment trail



Note that a single Timber Sale may have any number of sample units within it

Evaluating stream approaches

Fig. 4

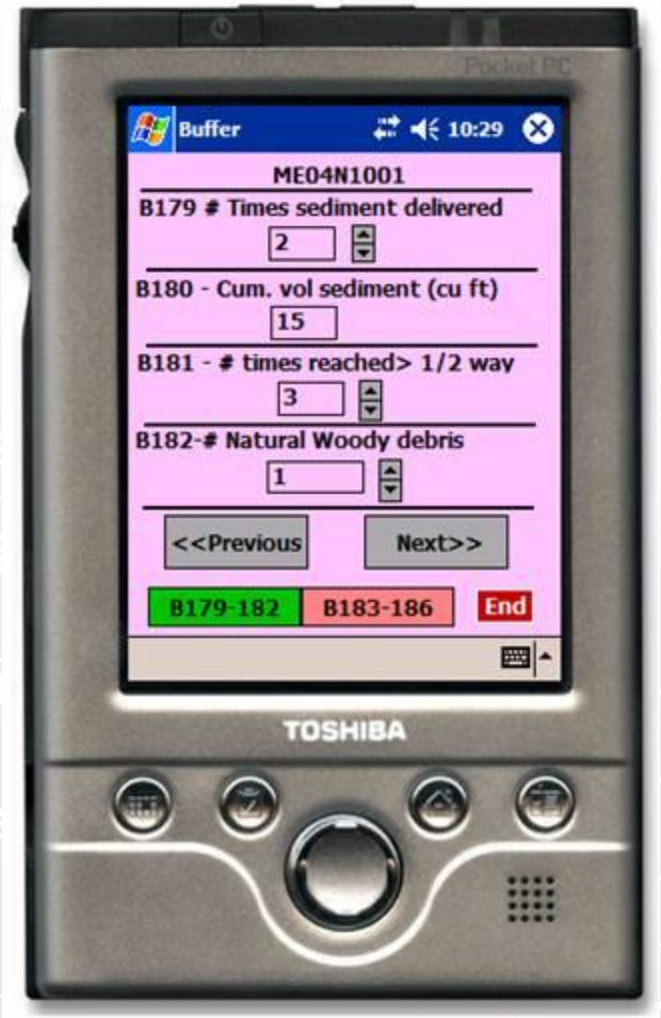


The Approach inside the buffer extends from the bankfull stream width to the state specified buffer boundary.

The Approach outside the buffer extends from the buffer boundary to a point where there is a minimum road gradient change of 5% positive or negative for a minimum length of 20'.

Any sediment contributed at or below bankful stages will enter the waterbody during a rain event.

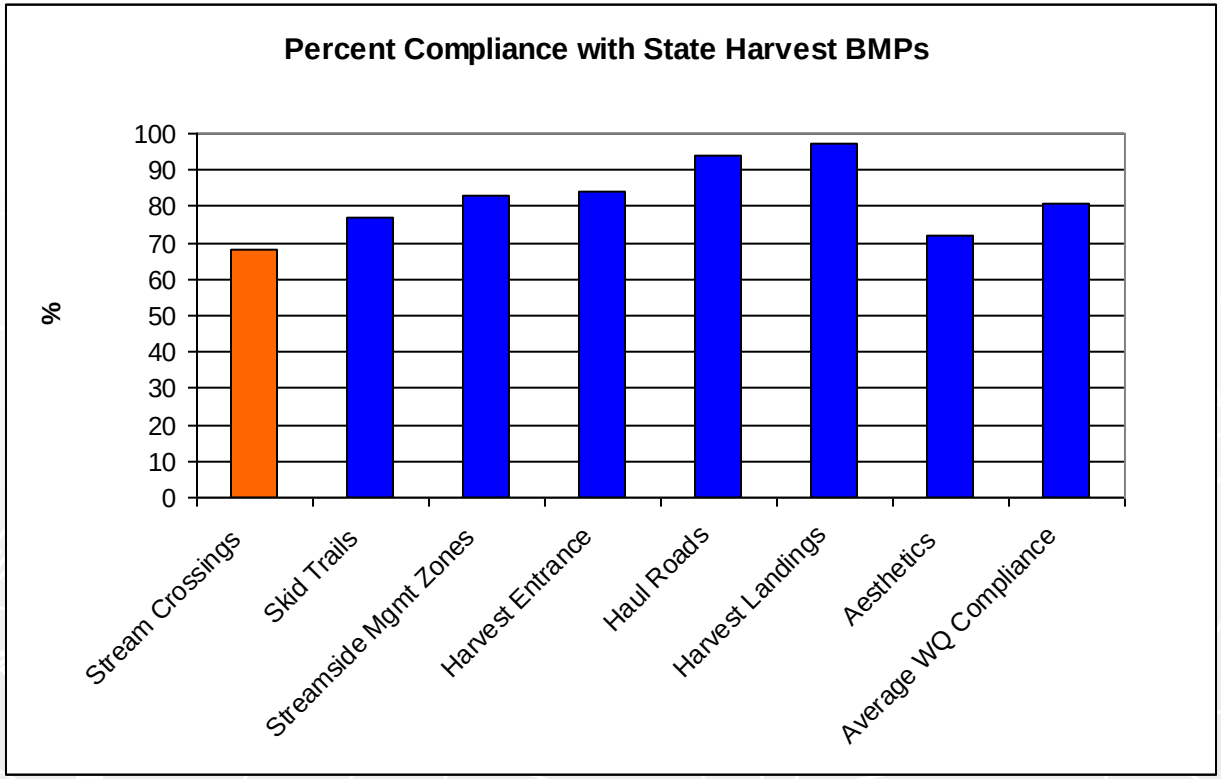
Procedure:
Buffer Evaluation



Sites selected for crossings

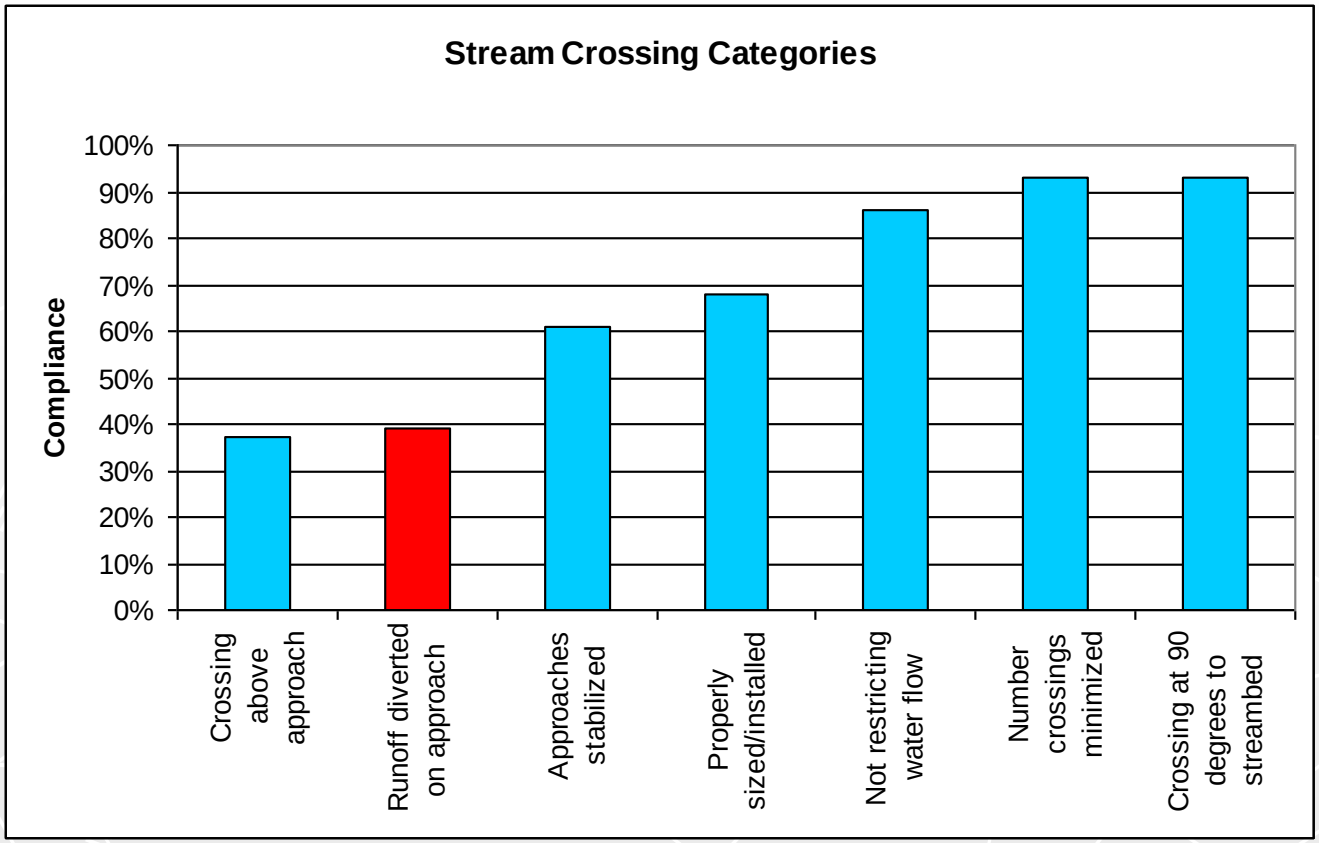
- 90% of all harvests from 2003-2004 in Maryland avoided stream crossings
- Sample sites focused on the 10% with crossings and others with buffers and wetlands

BMP Implementation



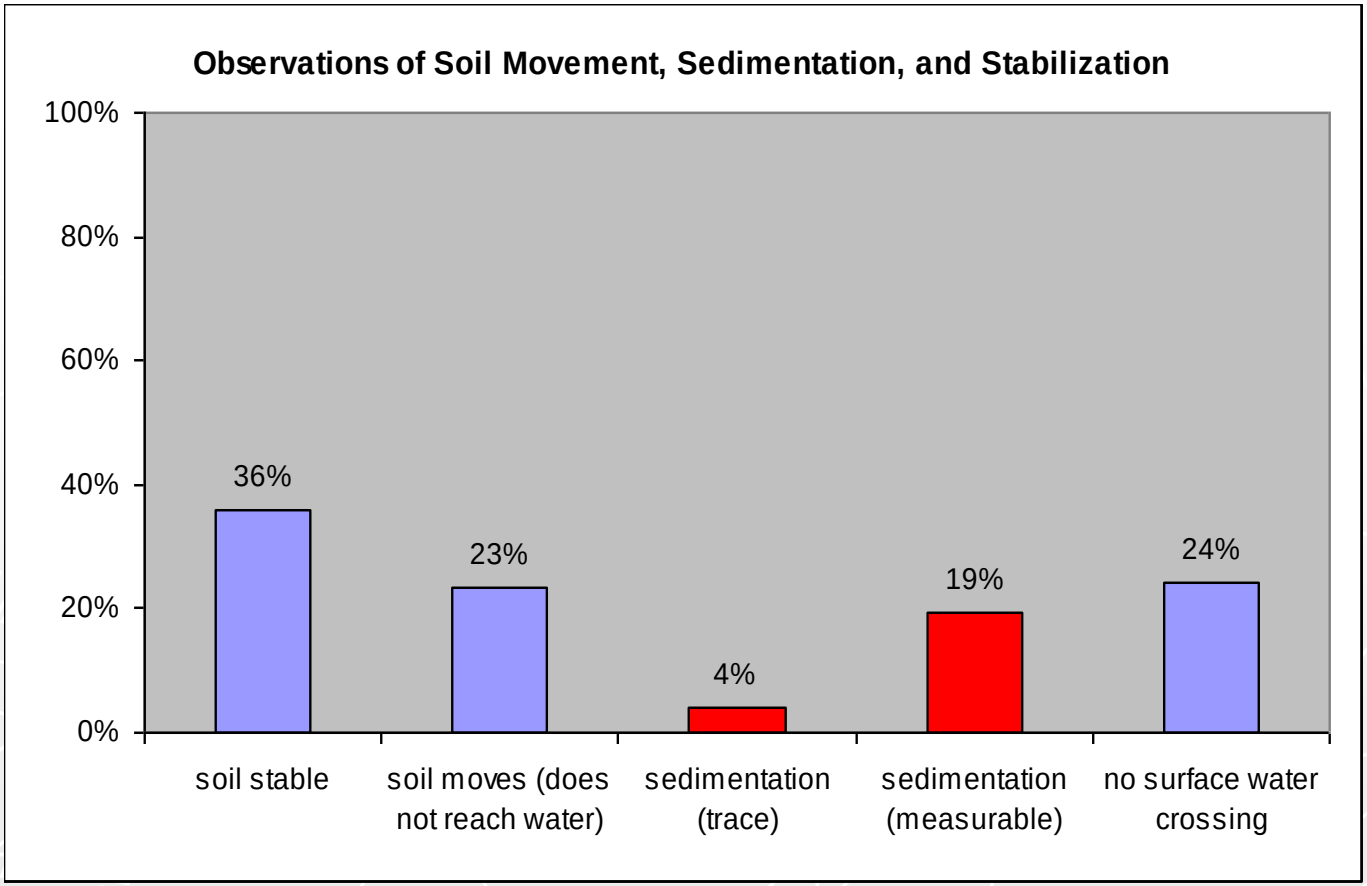
- Average compliance rate of 81% for water quality BMPs, similar to the 82% found in a 1995 survey.
- Like most states, crossings are the most difficult area for BMP compliance.
- Controlling drainage and marking buffers could also have been improved.

Stream Crossing BMPs



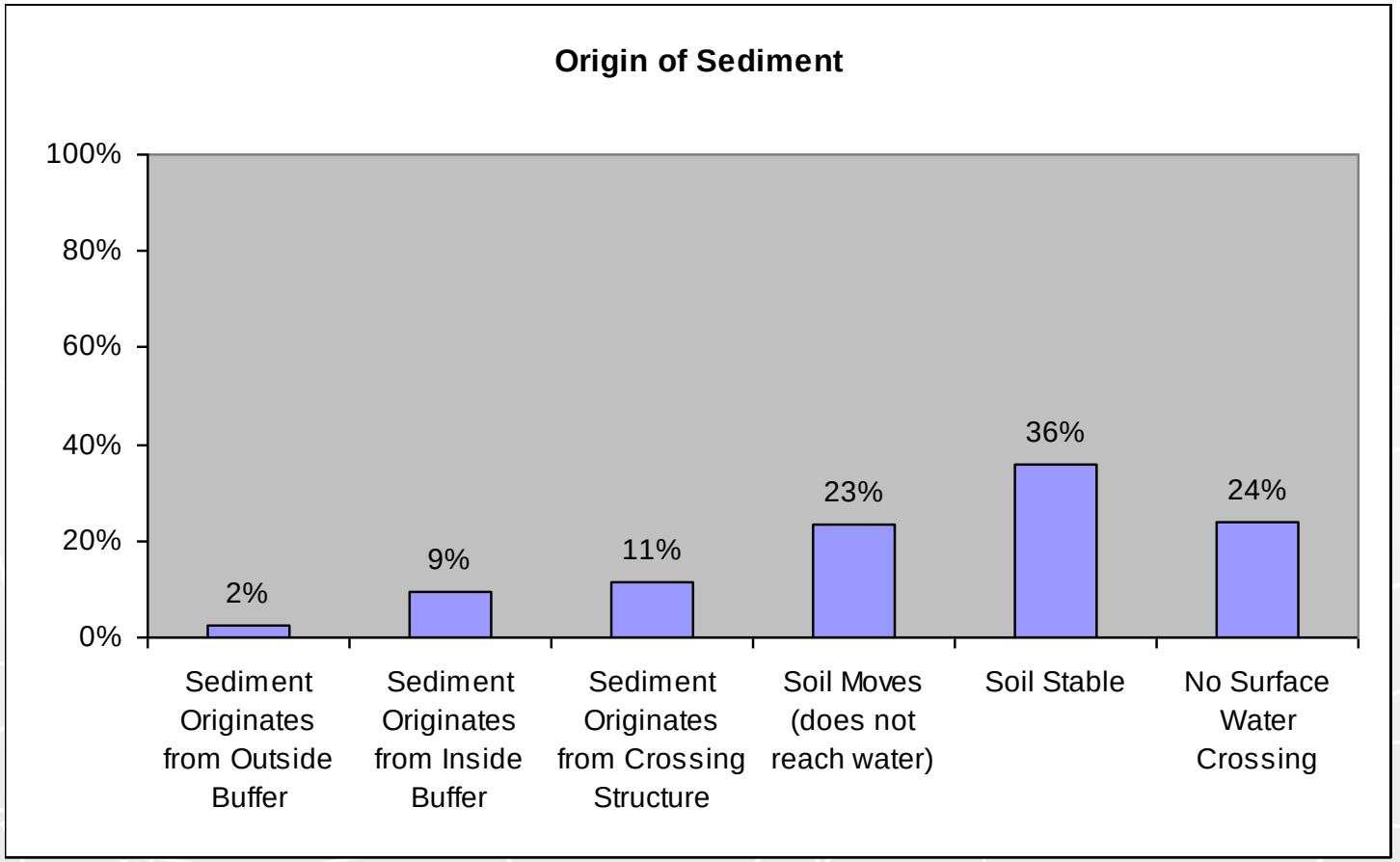
- Most to gain from diverting runoff before streams and stabilizing approaches

Sediment Delivered



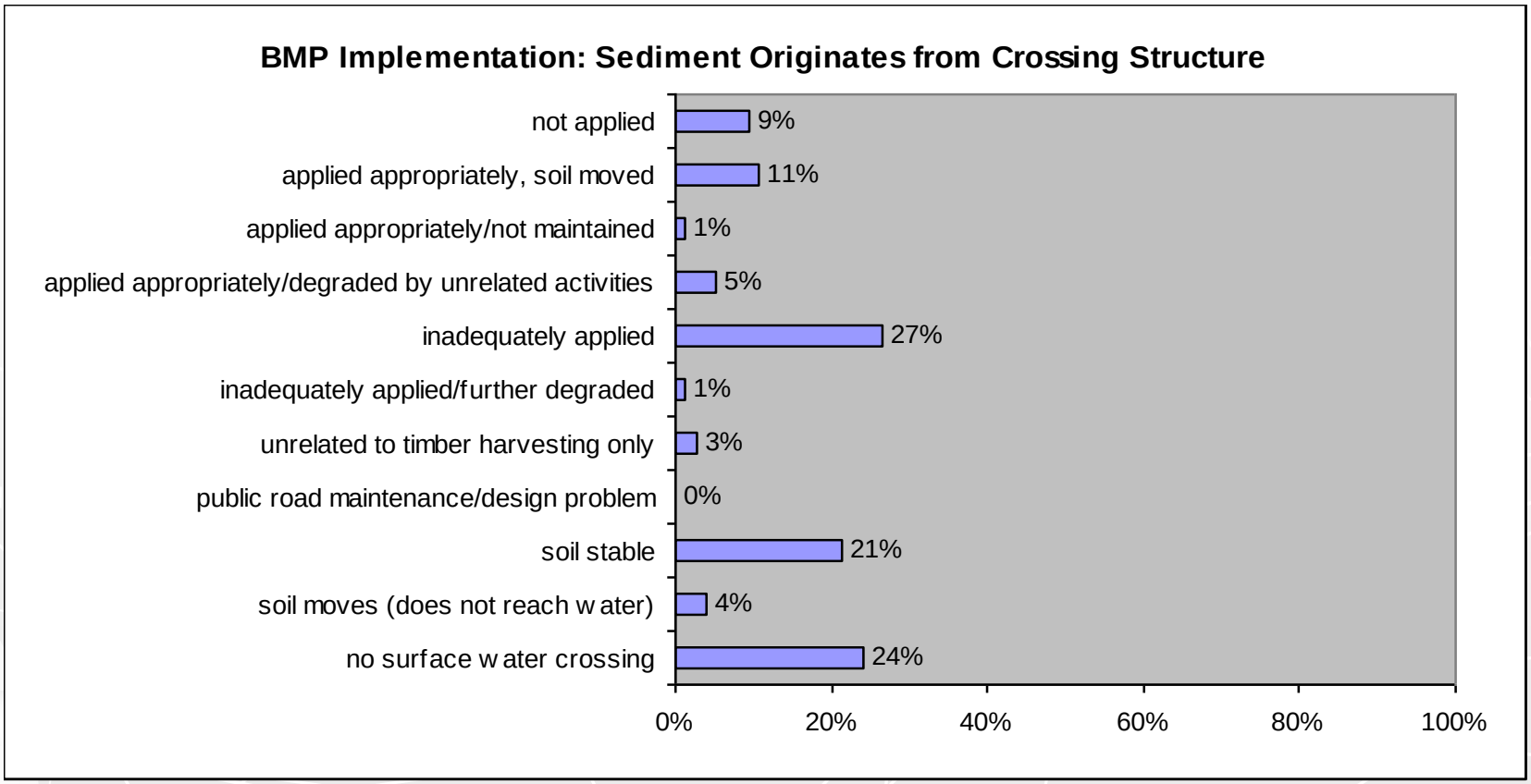
- 375 observations, 59% did not deliver sediment, another ¼ did not cross the stream
- 23% had some sediment delivered to water (15+72)
- Median volume of rills and gullies 10 ft^3 (8 ft^3 in water, bankfull area)

Origin of Sediment



- Most frequently from crossing itself
- Nearly as much from approaches inside the buffer

More care in application

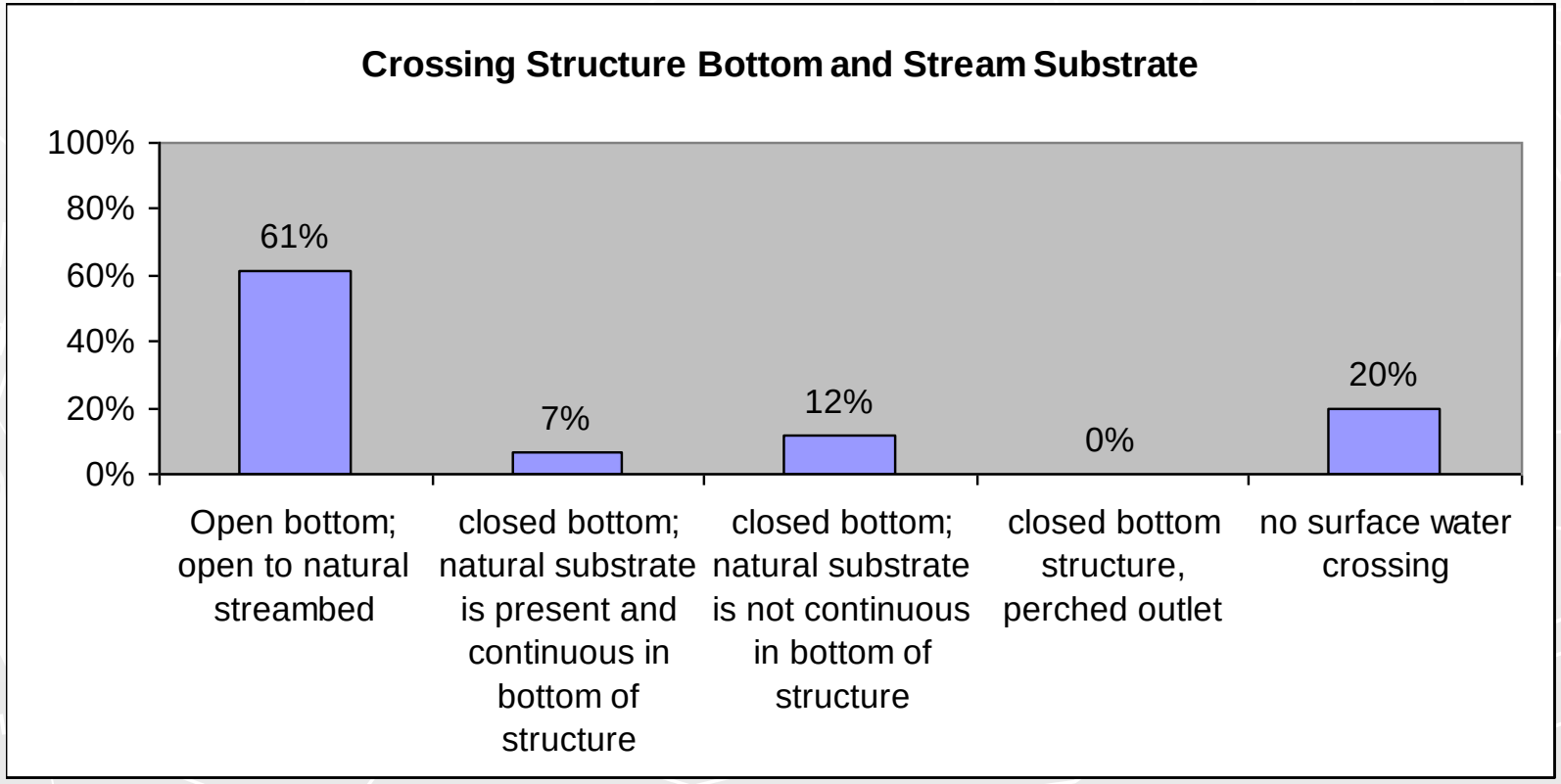


- Less than 10% from not applying BMPs
- Some soil moved even with proper BMPs
- More frequently from not applying the BMPs well enough

Crossings

Stream Crossing for Fish Passage

- Most crossings did not restrict flow or disrupt passage
- 12% had poor conditions for passage for stream organisms



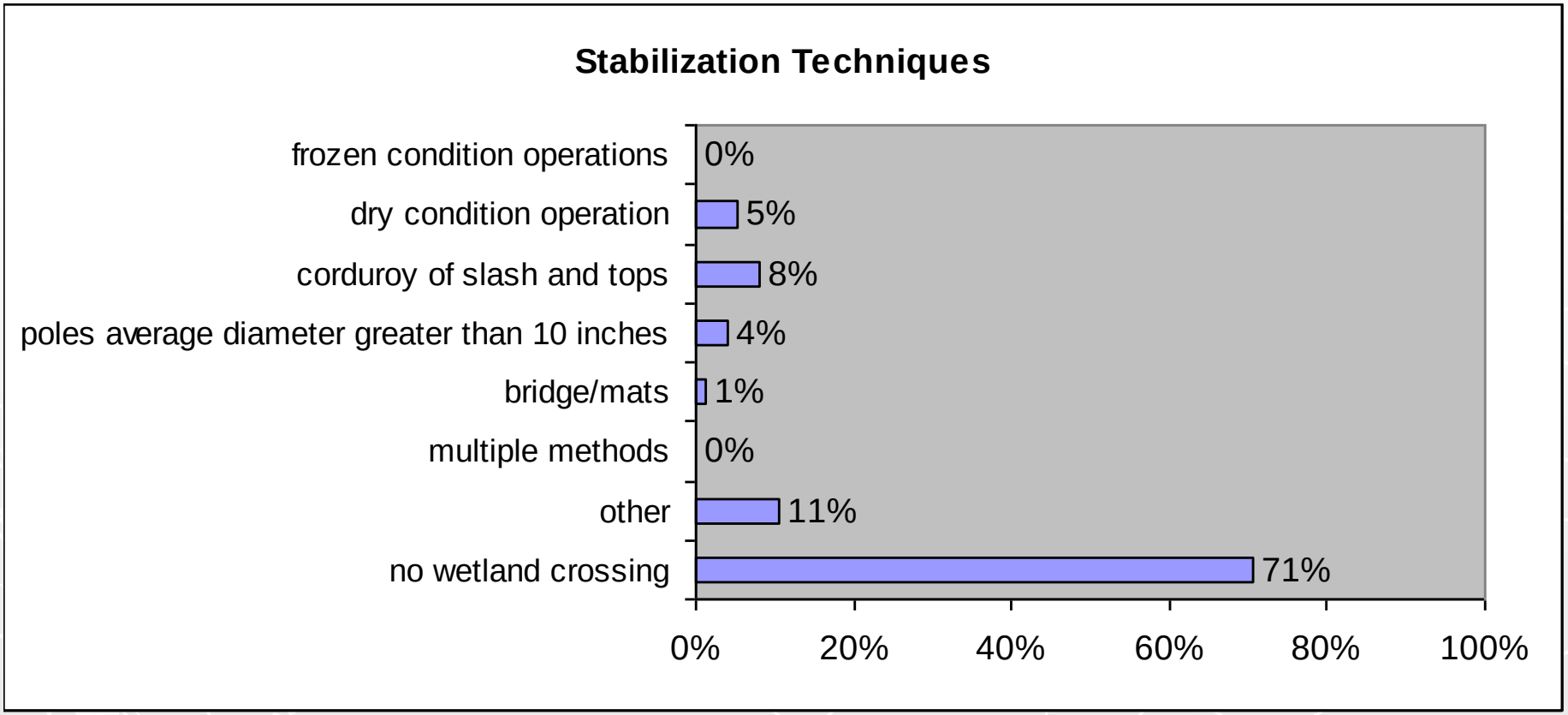
Stream Shading

- Average basal area in buffers was 82 ft^2 (compared to 60 required)
- Shade to streams frequently was reduced by harvesting, but average crown closure was 78% after harvest
- Over ¾ of measurements met minimum BA, and 90% of state BMP evaluations considered the overall buffer width and basal area in compliance

Stream Buffers

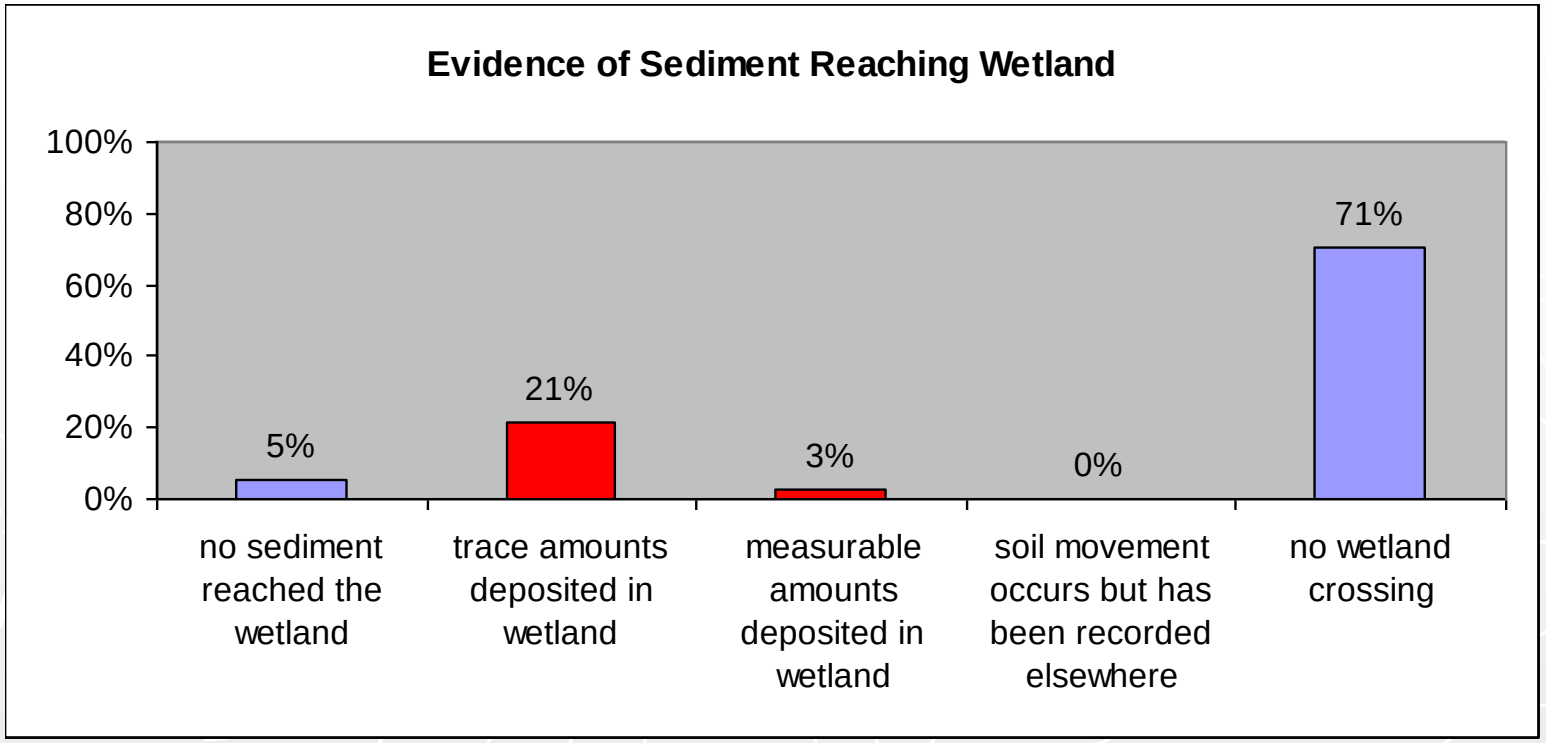
- Almost 49,000 linear feet of buffers were sampled
- Sediment was observed entering the buffer at 39 locations
- Sediment was observed entering the water at 6 locations
- Total estimated sediment delivery was 1 ft^3

Harvests with wetlands



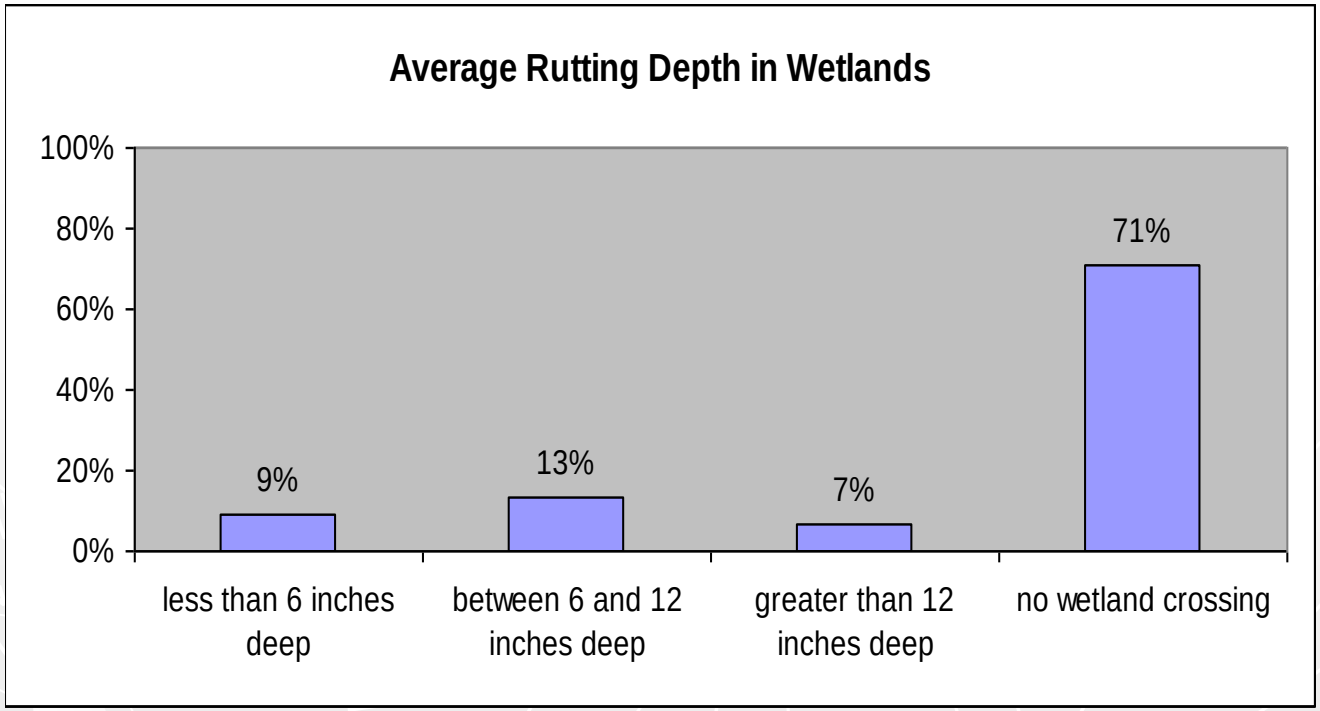
- 29% of sample units had wetland crossings, statewide
- 71% avoided wetlands

Sediment to Wetlands



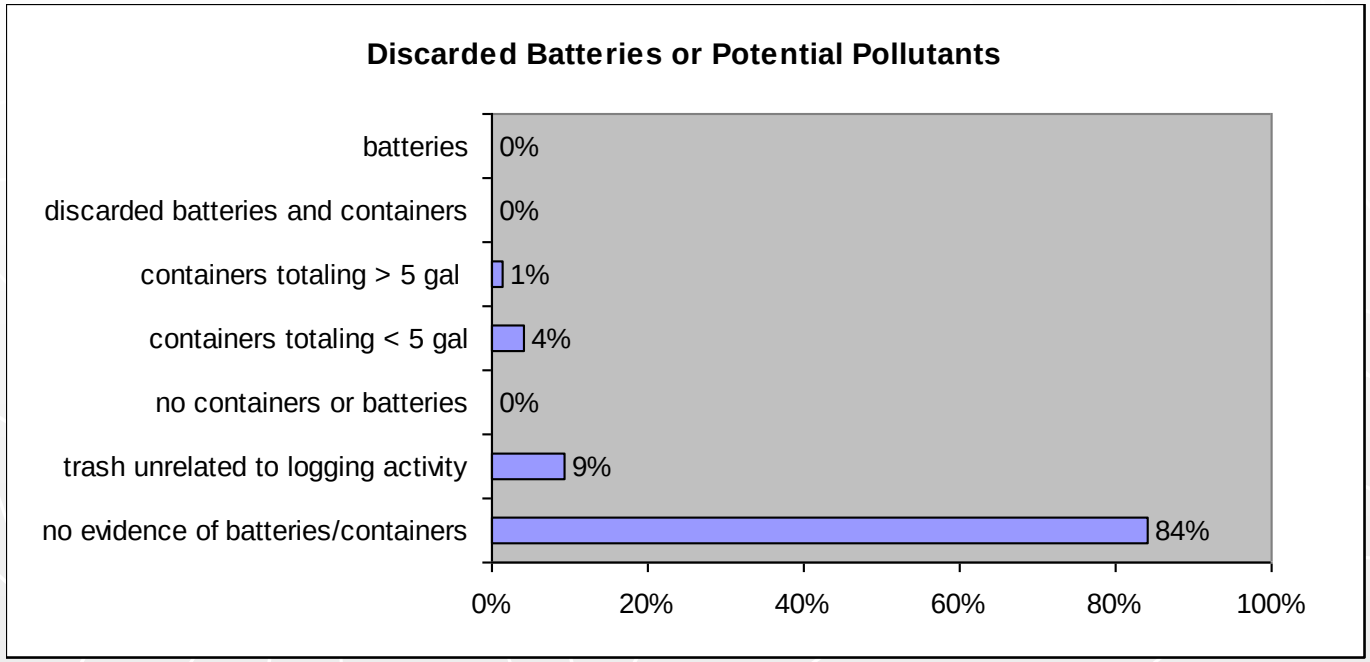
- Where wetlands are entered, sediment impacts are common
- Most sediment impacts in wetlands involve only trace amounts of soil movement

Rutting in wetlands



- Wetlands more common on the Eastern Shore
- Rutting that should be repaired occurred over half the time in wetlands

Potential Pollutants



- Signs of trash and chemical pollutants infrequent
- Trash was a more frequent complaint in 1995 survey

Summary

- 81% BMP compliance overall
- 77% effective in preventing sediment delivery
- Stream crossings and approaches offer the best opportunity for improvement
  - Watch where the water bars deliver sediment
  - Divert water close to crossings