

A scenic view of a forested landscape. In the foreground, a large, textured tree trunk is visible on the left. The middle ground features a dense forest of evergreen trees surrounding a calm lake. In the background, rolling mountains are visible under a blue sky with scattered white clouds. The overall scene is bright and clear.

Beneficial Uses, Potential Impacts, and BMPs Related to Timber Watersheds

Debra Hallis and Drew Coe,
CVRWQCB

Timber Harvest



Mount Shasta

2003-2008

- Private
- Public

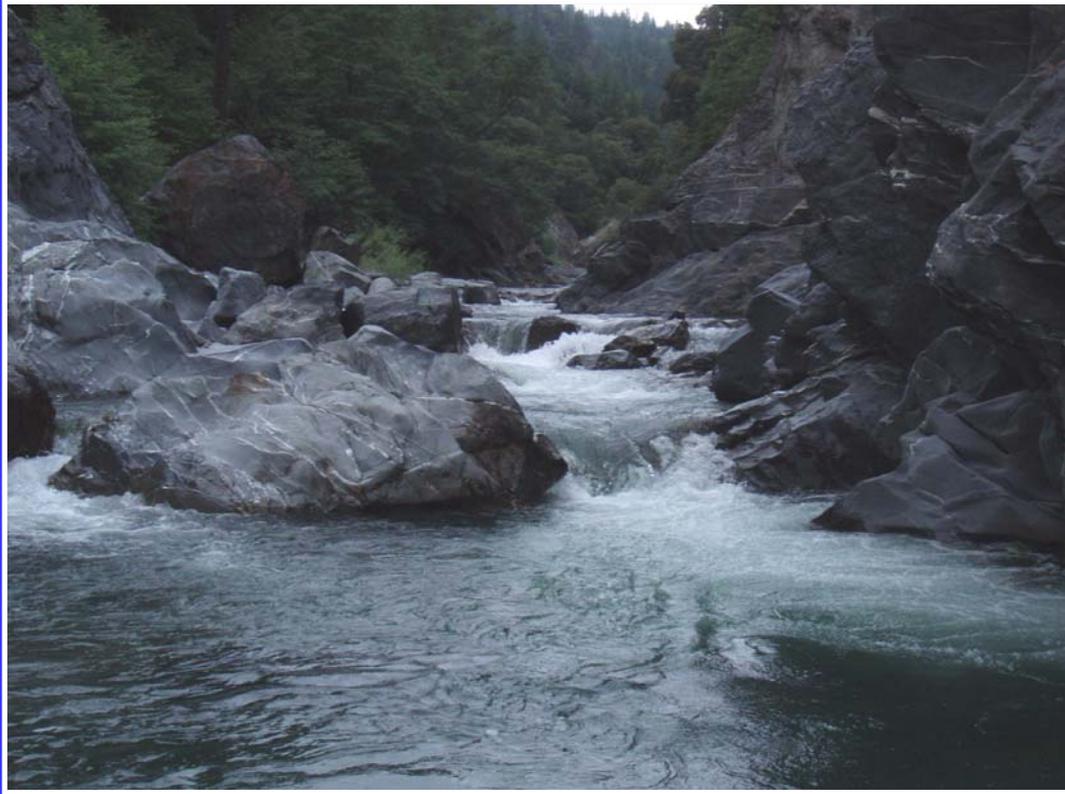
Central Valley Region - Overview



Shasta Dam

- 11,350 miles of stream
- Majority of stream length in forested headwaters
- 579,110 acres of lakes
- Region supplies over 50% of state water supply

Primary Beneficial Uses Potentially Affected by Timber Harvest



Thomes Creek

- Municipal and domestic supply
- Cold and warm freshwater habitat
- Recreation
- Migration and spawning
- Wildlife habitat

Cold Freshwater Habitat



Central Valley chinook

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Water Contact Recreation



South Branch of the Middle Fork Feather River

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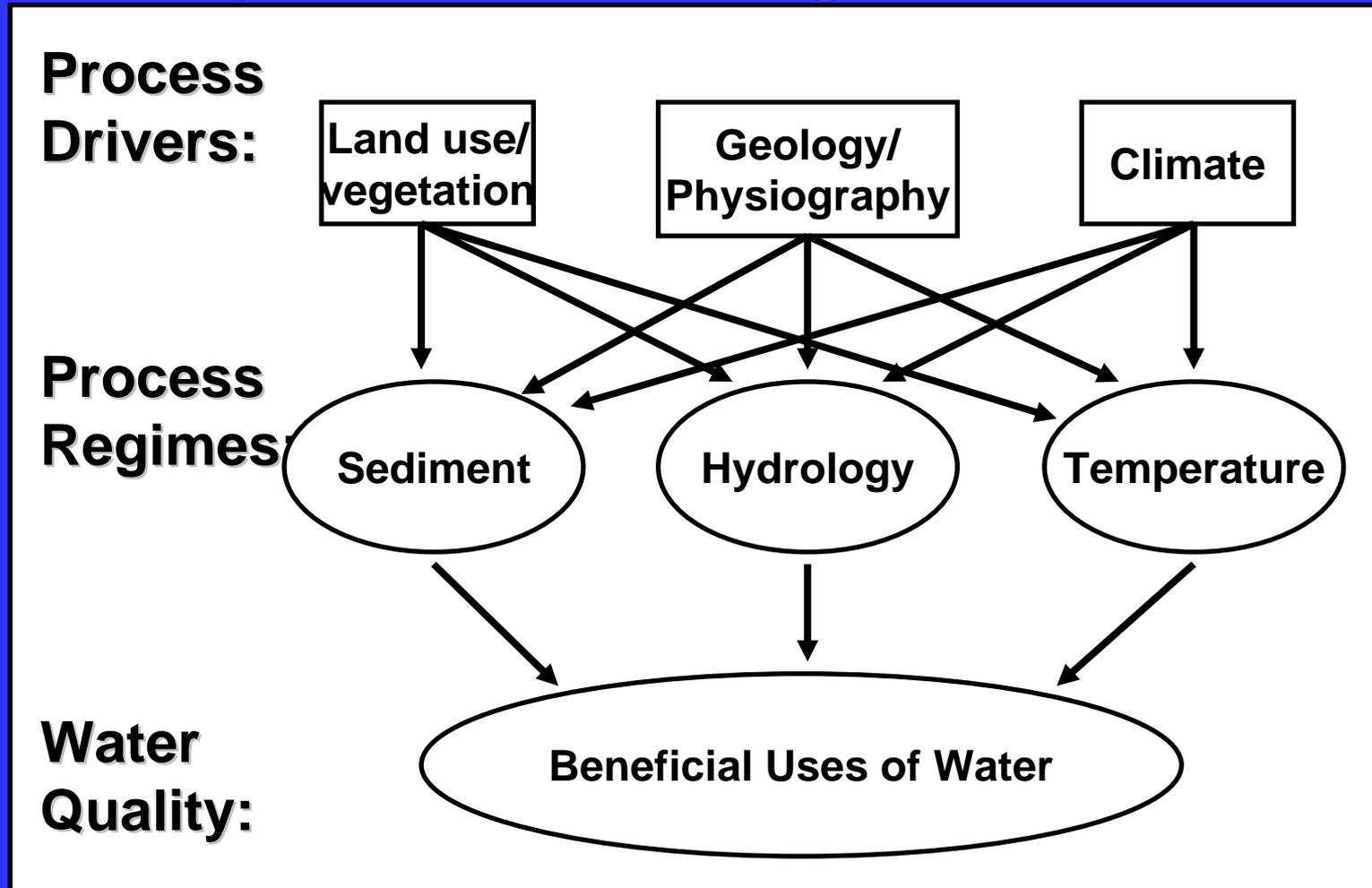
Non-Contact Recreation



Merced River, Yosemite Valley

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Water Quality a Function of Many Interacting Variables



Effective Regulation Requires Process Understanding



- Knowledge of best available science necessary to effectively guide policy implementation

McCloud, CA

Potential Impacts from Timber Harvest



Logging and Skidding: Increased Erosion Potential



- Surface erosion from harvest and skidding vs. roads

Logging Roads: Increased Erosion Potential



- Roads = primary source of sediment in forested watersheds;
- Stream crossings = highest risk.

Crossings



Regional Board
presence is necessary
at Active Inspections!



Timber Harvest: Changes in Flow



- Canopy removal
- Flow path

Other Potential Impacts from Timber Harvest



- Herbicide treatments
- Petroleum spills

Non-Timber Harvest Impacts



Non-Timber Harvest Impacts



Non-Timber Harvest Impacts



Hydraulic mining at Malakoff Diggings, Yuba River

Non-Timber Harvest Impacts



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Natural Processes



New Year's Day Flood 1997 - South Fork Yuba River

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Environmental Changes



www.keepbenderbeautiful.org

Timber Harvest Doesn't Occur in Isolation



- Management overlaps with natural processes and disturbance
 - Fires
 - Floods
- Goal is to keep management from making those disturbances worse

Best Management Practices





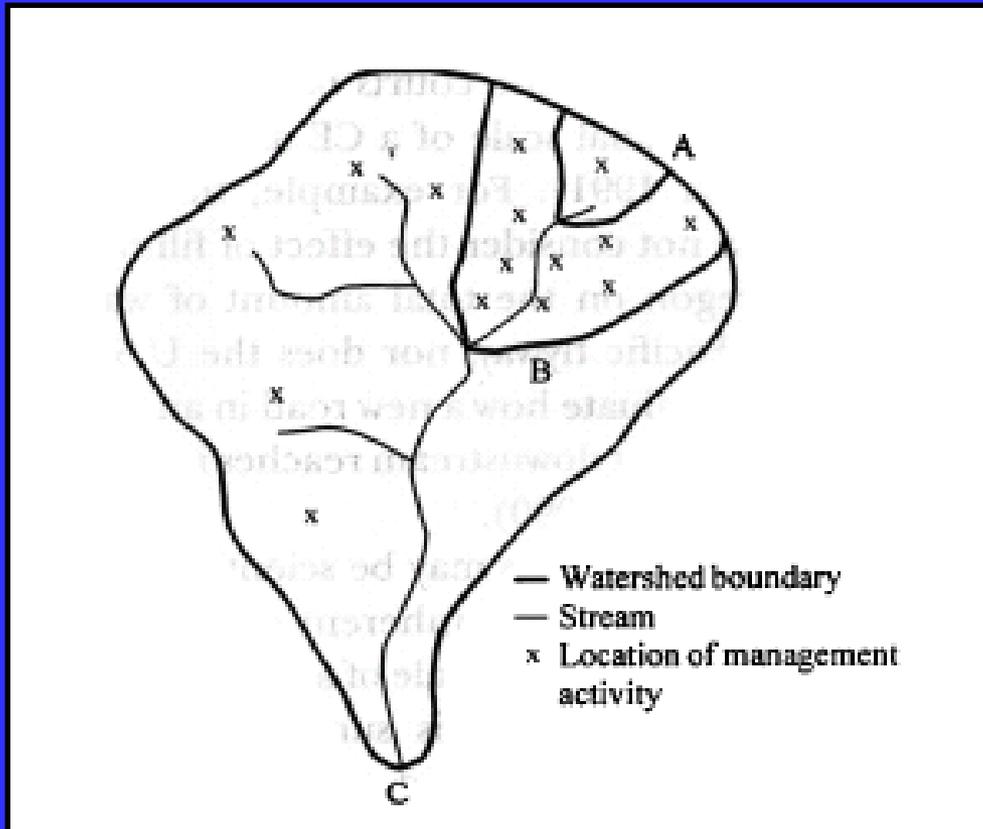
BMPs



“Best management practices have generally been shown to be relatively effective in protecting water quality and aquatic habitat”

(MacDonald, 2000)

The BMP Approach



(MacDonald, 2000)

- Water quality is protected by implementing BMPs at the local scale;
- Cumulative watershed effects are minimized.

BMPs – The Science ...



- BMP effectiveness can be highly site- and storm-specific;
- Proper selection requires understanding of physical and biological processes.

Field Work – The Cornerstone of the Waiver

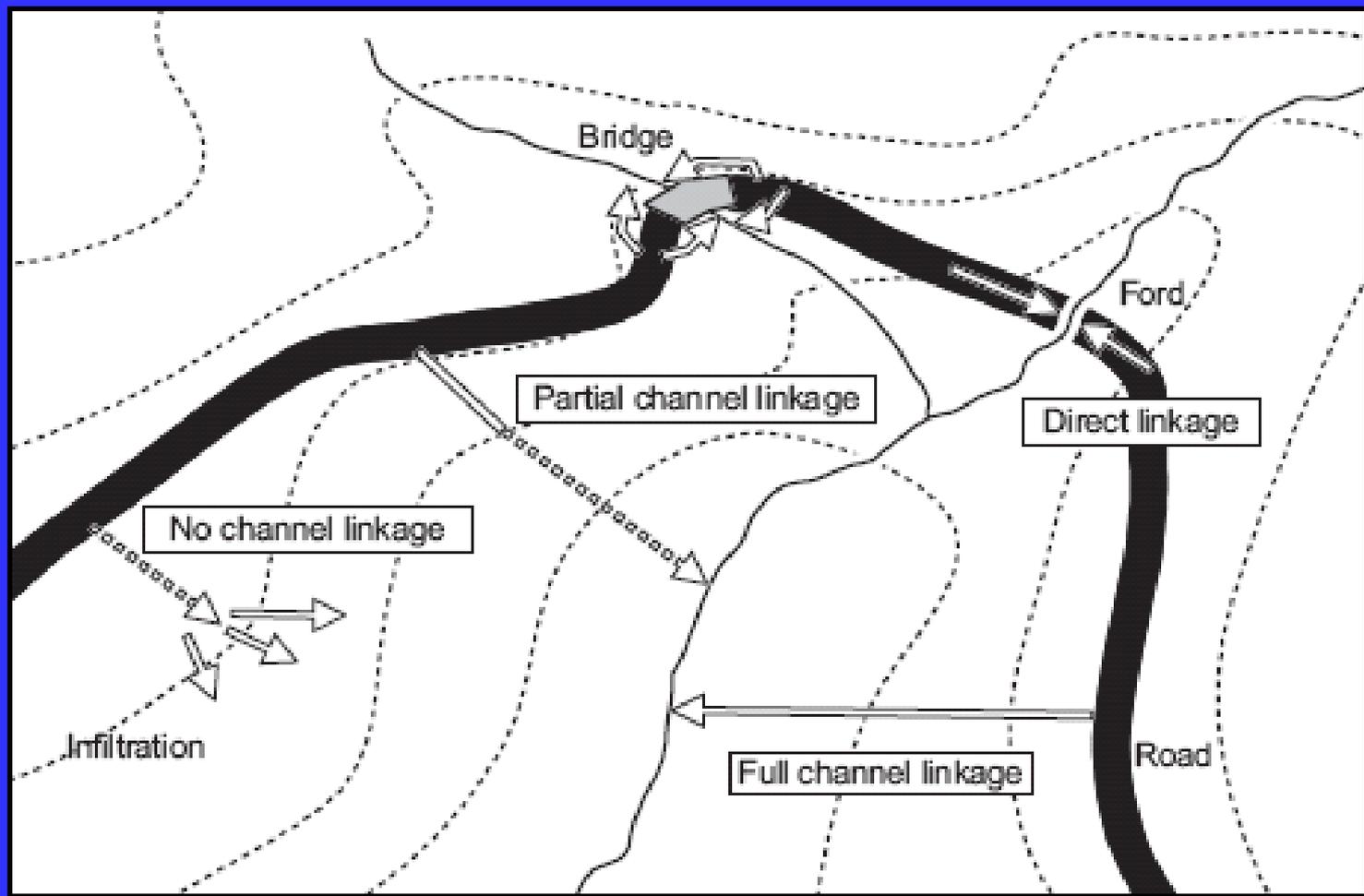


Pre-Harvest Inspections



- THPs reviewed in office;
- Staff attends almost all inspections with moderate to high risk to water quality.

BMP Examples: Minimizing Connectivity



(Croke and Hairsine, 2006)

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BMP Examples: Managing Runoff



- Decrease the erosive force of runoff;
- Proper drainage is key to minimizing onsite erosion.

BMP Examples: Managing Sediment Sources



- Maintain ground cover in erosion prone areas;
- Provide ground cover to disturbed areas;
- Decrease erodibility of erosion surface.

Rural Roads and OHV



Post-Fire Assessment



- Participate in the Federal Burn Area Emergency Response (BAER) Teams;
- Participate in the State Emergency Assessment (SEAT) Team.

Monitoring



“If you’re not monitoring, you’re not managing”

- Dr. Sherman Swanson –
University of Nevada at Reno,
1992)

Continuum of Monitoring Approaches

Qualitative

Rigorous



Open-eye and open-
mind monitoring

“Walking in the rain”

Low cost

Few, if any, quantitative
data or results

Statistically-sound
design

Peer review

Statistical data analysis

High levels of QA/QC

Careful documentation

(Adapted from MacDonald and Smart, 1993)

Qualitative Monitoring – Primary Objectives



- Get people out on the ground;
- Rapid feedback loop to fix problems.

Waiver Monitoring



- 100% sample for timber harvest activities.
- Generally requires at least one or all phases of monitoring:
 - Agency;
 - Implementation;
 - Forensic;
 - Effectiveness.

Agency Monitoring



- Lowest risk to water quality;
- Done by CALFIRE or USFS personnel;
- No annual reporting unless violation occurs.

Implementation Monitoring



- Low to High risk activities;
- Prevent significant pollution by making sure BMPs are implemented properly;
- Typically done before start of rainy season.

Forensic Monitoring



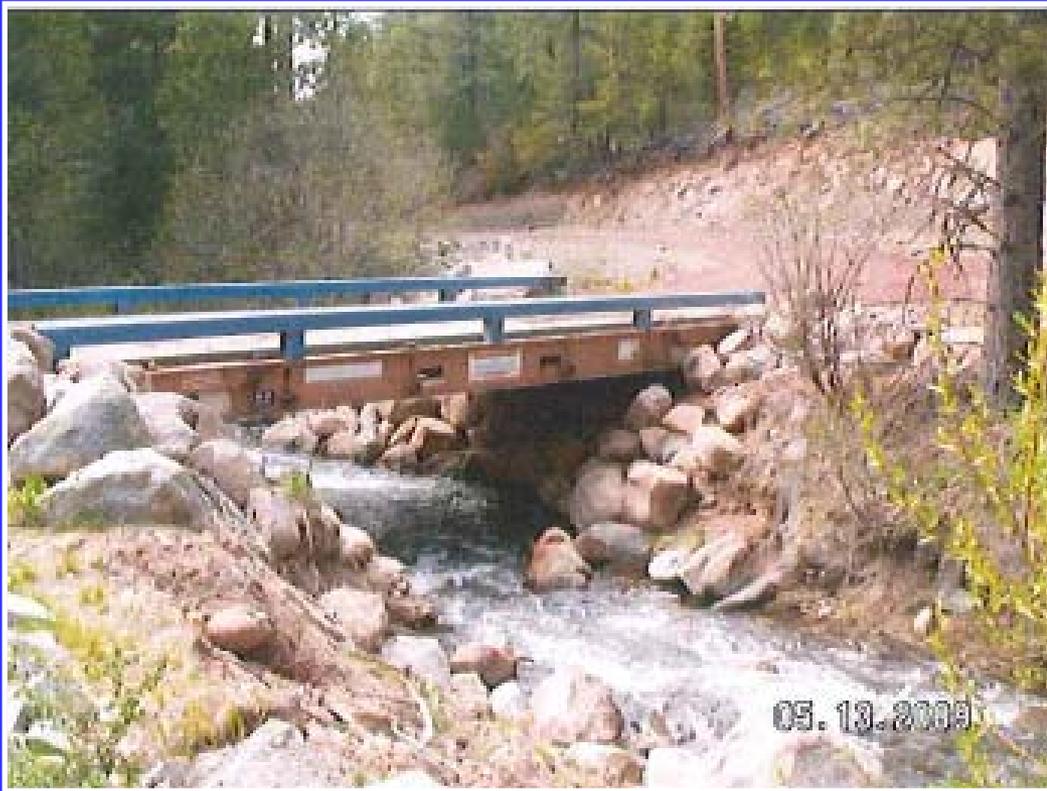
- Moderate to high risk activities;
- Monitoring done during or just after significant precipitation events.
- Looking for significant pollution in THP area.

Effectiveness Monitoring



- Moderate to high risk activities;
- Monitoring in the springtime;
- Evaluates whether BMPs were effective in protecting water quality.

Monitoring Example – Photo Point Monitoring



- Visual evidence of:
 - Proper implementation;
 - Water quality violations;
 - BMP effectiveness.

Photo Point Monitoring



Violation Reporting



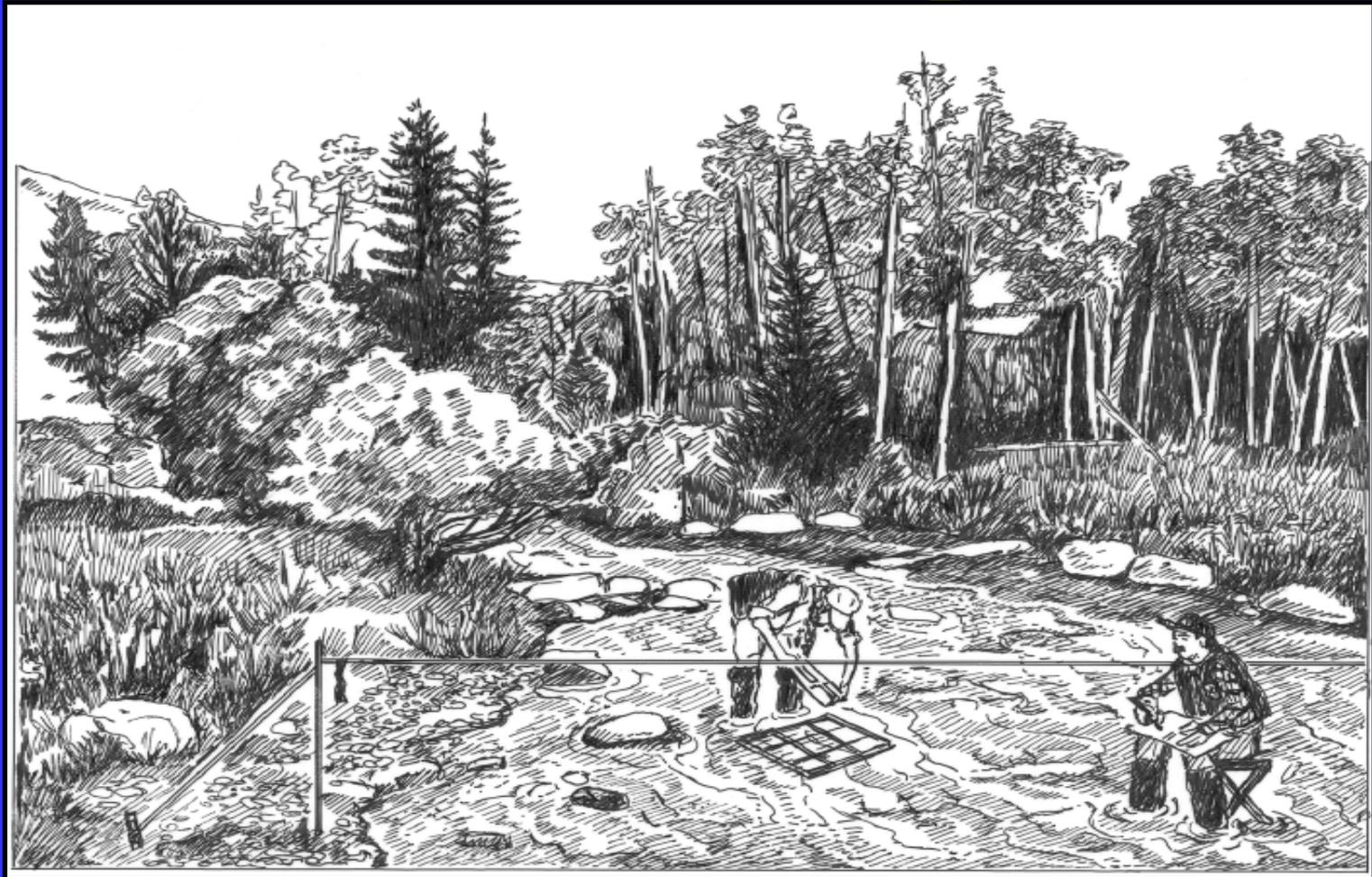
Failed legacy skid trail crossing following winter 2005/2006 storms

WQ Compliance Monitoring



- Sometimes required for high risk plans;
- Water column sampling to determine compliance with Basin Plan.

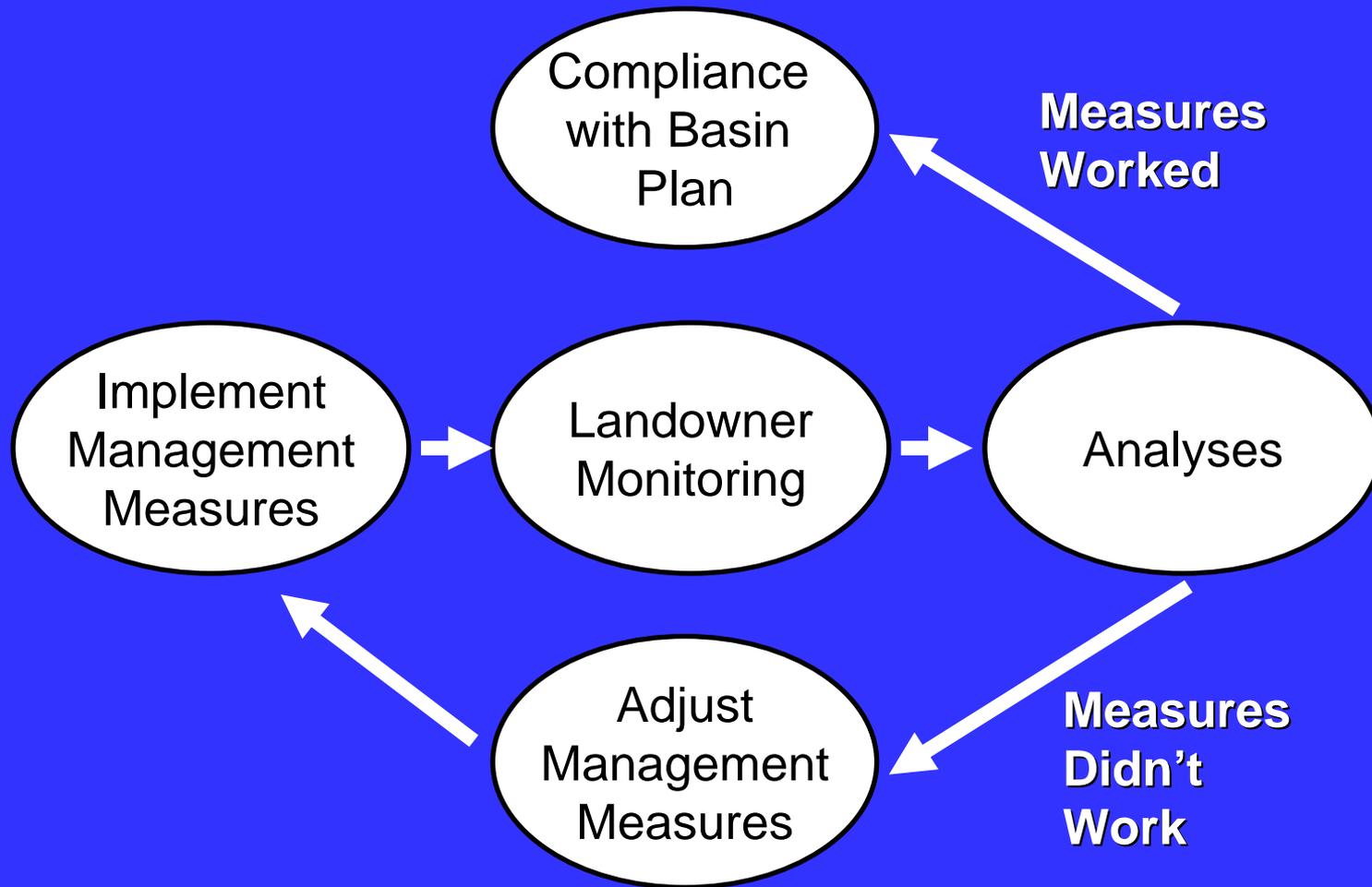
Assessment and Trend Monitoring



(Bunte and Abt, 2001)

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Adaptive Management



Monitoring Limitations



- Not able to rigorously test assumptions of BMP approach regarding:
 - BMP effectiveness;
 - Cumulative watershed effects;
- Collaborative monitoring needed.