Upper South Platte Source Water Assessment and Protection Plan

Unpaved Roads and Trails

Presented by:
Kyle Hamilton, P.E.
CH2M HILL
May 9, 2014
Background

• Four watershed / unpaved roadway system assessments – USFS chronic problem
  – Sugar Creek, Pine Creek, and Bear Creek
  – 11 Mile Canyon and surrounding areas assessment is ongoing
• Assessed the watersheds related to roads, drainage systems, sediment problems, habitat and fisheries concerns, maintenance, and more
• Developed a repeatable process, tools, and BMP tool box
• Partners include CUSP, USFS, counties, parks departments, water providers, SPEB, trout unlimited, and others
Unpaved Roads and Trails

- Typically in mountainous or rural areas
- Used by vehicles, equestrians, OHVs, pedestrians, bikers, etc.
- Often in valley bottoms along streams
  - 303d listings - sediment
- Many roads built prior to design criteria
Typical Roads
Typical Trails
Proximity to Streams
Road Networks
Drainage Systems
Structures
Impacts to Habitat
Impacts to Streams
Safety

- Speeding
- Narrow Roads
- Blind curves
- Washboards
- Limited Parking
- Steep side slopes
Road Ownership and Responsibility

- Federal: USFS, BLM, FHWA, CFL
- State Highways
- County Roads
- Private, including stream crossings
- Missing documentation
  - Undefined easements
  - Who maintains?
  - Who pays?
BMP Toolbox

- Developed as part of the Sugar Creek Assessment, and built upon with later projects
- Provides:
  - BMP Type
  - Description
  - Considerations
  - Representative Item
  - Typical Measurement Unit and Unit Cost
  - Typical Benefit to Cost Rating
BMP Examples

• Roadway Surface
  – Paving types
  – Additives for surface stabilization

• Geometrics
  – Realignment
  – Cross section strategies
  – Cross slope strategies
  – Rolling Dips
BMP Examples

• Water Control
  – Swales, ditches, culverts
  – Inlets
  – Culverts and pipes

• Erosion Control
  – Drainage capacity
  – Outlet protection
  – Conveyance protection
BMP Examples

• Stream protection from roadway runoff
  – Water control
  – Curbs and barriers
  – Vegetation strategies

• Operations and Maintenance Changes
  – Grading, surface management
  – Culvert and ditch cleaning

• Slope Stabilization
  – Seed, mulch, plantings
  – TRM
  – Walls
BMP Examples

• Sediment Control
  – Check dams
  – Sediment traps
  – Sediment basins

• Stream Protection
  – Bank protection
  – Grade control
  – Habitat improvements
  – Barrier removal
Aquatic Organism Passage

• Terminology used by USFS, FHWA, and others
• New method for roadway crossings of streams
• No longer use fish swim speeds / jump heights
• Match the natural stream characteristics
• Culvert / structure is sized for AOP
• Allows passage by aquatic species, fish, and small mammals inside the structure
Sugar Creek Sediment Mitigation Pilot Project
Sugar Creek Pilot Maintenance

- Douglas County conducted maintenance
  - Crews are very pleased with the structures
  - Easier, faster, and cheaper to maintain
  - Sediment doesn’t enter creek
  - Request for traps on every culvert
Other Sediment Control Technologies
Extreme Events

• Extreme events
  – Beetle kill
  – Wildfire
  – Heavy rainfall and floods
  – Drought

• Lack of maintenance (can become extreme)

• These increase the problems associated with unpaved roads and trails
Source Protection Connections

• Regulations and water quality (303d, etc.)
• Erosion and sediment
  – Moves downstream and fills diversion, reservoirs, etc.
  – Difficult and costly to remove once in the reservoir
  – Decreases the life span of the reservoir
• Access – Erosion can prevent access to:
  – Critical water facilities
    • Reservoirs, pump stations, pipelines, etc.
  – Power facilities required for water supply
  – Emergency situations (remote staff, etc.)
• Overall watershed health
  – State Water Plan will include watershed health
Thank You

Questions?

Kyle.Hamilton@ch2m.com
720-286-5240