



USFS Stream Channel/Floodplain Restoration Project Effectiveness Monitoring

- Big Meadow Creek/Cookhouse Meadow Restoration – Completed 2006
- Blackwood Creek Phase I – Fish Ladder Removal- Completed 2003
- Blackwood Creek Phase II- Bridge Replacement- Completed 2006
- Blackwood Creek Phase IIIA- Stream Channel/Floodplain Reconstruction – Completed 2009



Restoration Goals and Approach defines Monitoring Design

- Monitoring designed to determine if restoration approach was
- successful in achieving identified short and long term restorations goals.

- Monitoring designed to be cost/effective

- Based on understanding of processes and ecosystem linkages often chose indicators of processes, that have well understood linkages to ecosystem components that are difficult and/or expensive to measure.

Big Meadow Creek /Cookhouse Meadow

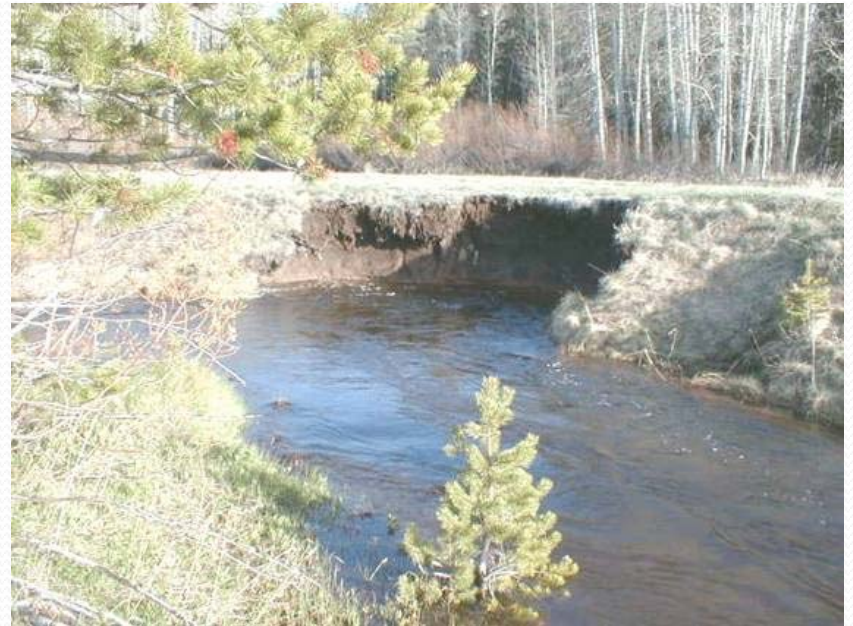
Goal: Abandon existing incised G₄ channel, and construct a new C₄ channel type within Cookhouse Meadow. Conversion in channel type is expected to achieve the following two objectives.

1. Restore stream channel geomorphic function in terms of channel stability, and aquatic habitat features.
2. Restore floodplain connectivity which will;
 - Increase meadow surface flooding frequency, so that the surface floods two out of every three years on average,
 - Restore seasonal ground water levels and associated capillary rise in the central meadow to support growth of moist and wet meadow vegetation through August 15 under average hydrologic conditions, and reverse the trend of dry meadow grasses and conifer invasion.

The Problem : Big Meadow Creek in Cookhouse Meadow



1981



2000

Restoration Actions:

- Construction of 2,400 feet of new C4 channel. Raised elevation of the stream channel by approximately 6 to 10 feet, so that riffle elevation is 1 to 1.5 feet from the top of bank.
- Plug and partial fill of 1,400 of old channel
- Harvest meadow sod, placed on newly constructed channel banks and used as plugs in filled areas
- Placement of willow wattles, willow mats, and willow stakes within floodplain and channel banks.









May 2007

Monitoring Questions based on restoration goals and objectives:

Goal: Convert channel in Cookhouse Meadow from a Rosgen G₄ channel to a Rosgen C₄ channel.

Objective 1: Restore channel stability and improve aquatic habitat.

• Is the channel maintaining the desired characteristics of either a C₄ or E₄ channel, as defined by the Rosgen stream channel classification system? Is the channel evolving from the constructed C₄ stream type to an E₄ channel type?

Objective 2: Restore channel/floodplain connectivity and subsequent riparian habitat response.

- Is the meadow surface flooding at the 1.5 year reoccurrence interval frequency?*
- Is the ground water level in the central meadow sufficiently shallow to support the colonization and maintenance of desired meadow species?*
- Are dry meadow grass species and conifers in the central meadow being out competed and replaced with desired meadow species indicative of wetter hydrologic conditions?*
- What is the response of planted vegetation in the project such as sod along the new channel, willow stakes and willow wattles?*

Results: 2009 Monitoring Report

- Is the channel maintaining the desired characteristics of either a C₄ or E₄ channel, as defined by the Rosgen stream channel classification system? Is the channel evolving from the constructed C₄ stream type to an E₄ channel type?

Indicators: Measurements of channel morphology (E ratio, bankfull w/d ratio, sinuosity, gradient) obtained through cross section measurements , longitudinal profiles, and pebble counts. Visual observations documented in photopoints and spot photos.

Result: Question 1, yes. not yet for question 2. Visual observations note lateral and point bar formation, as well as the development of scour and corner pools .