

Flooding on Cottonwood Creek

Deer Lodge, MT

Brian P. Bender, AICP, CFM | Powell County
Chris Laity, PE | Great West Engineering

Montana AMFM Conference – Bozeman
Wednesday, March 27, 2013 | 1:30 – 2:00 PM

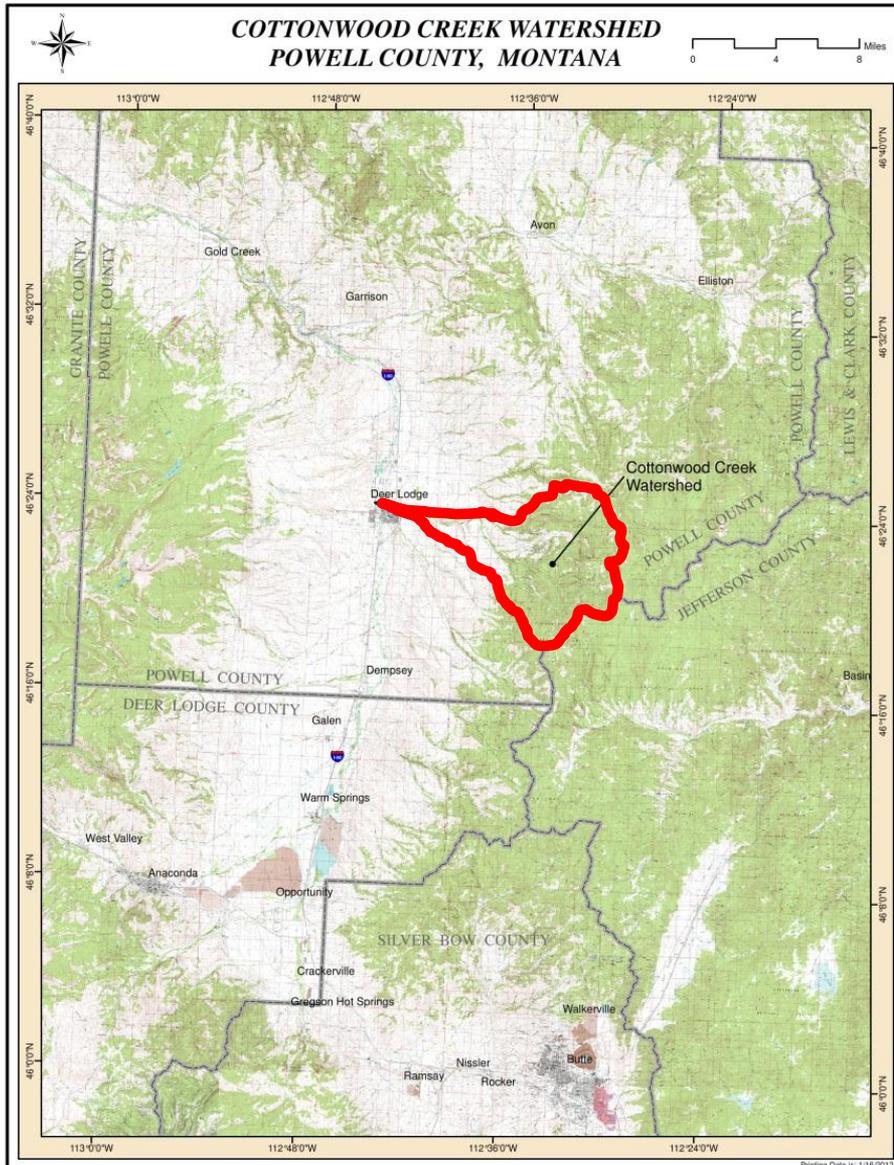


Overview

- **Setting**
- **Event**
- **Response**
- **Projects**
- **Lessons Learned**



Setting



Cottonwood Creek's watershed encompasses 63 square miles of southeastern Powell County and flows through the City of Deer Lodge before draining into the Clark Fork River

Setting

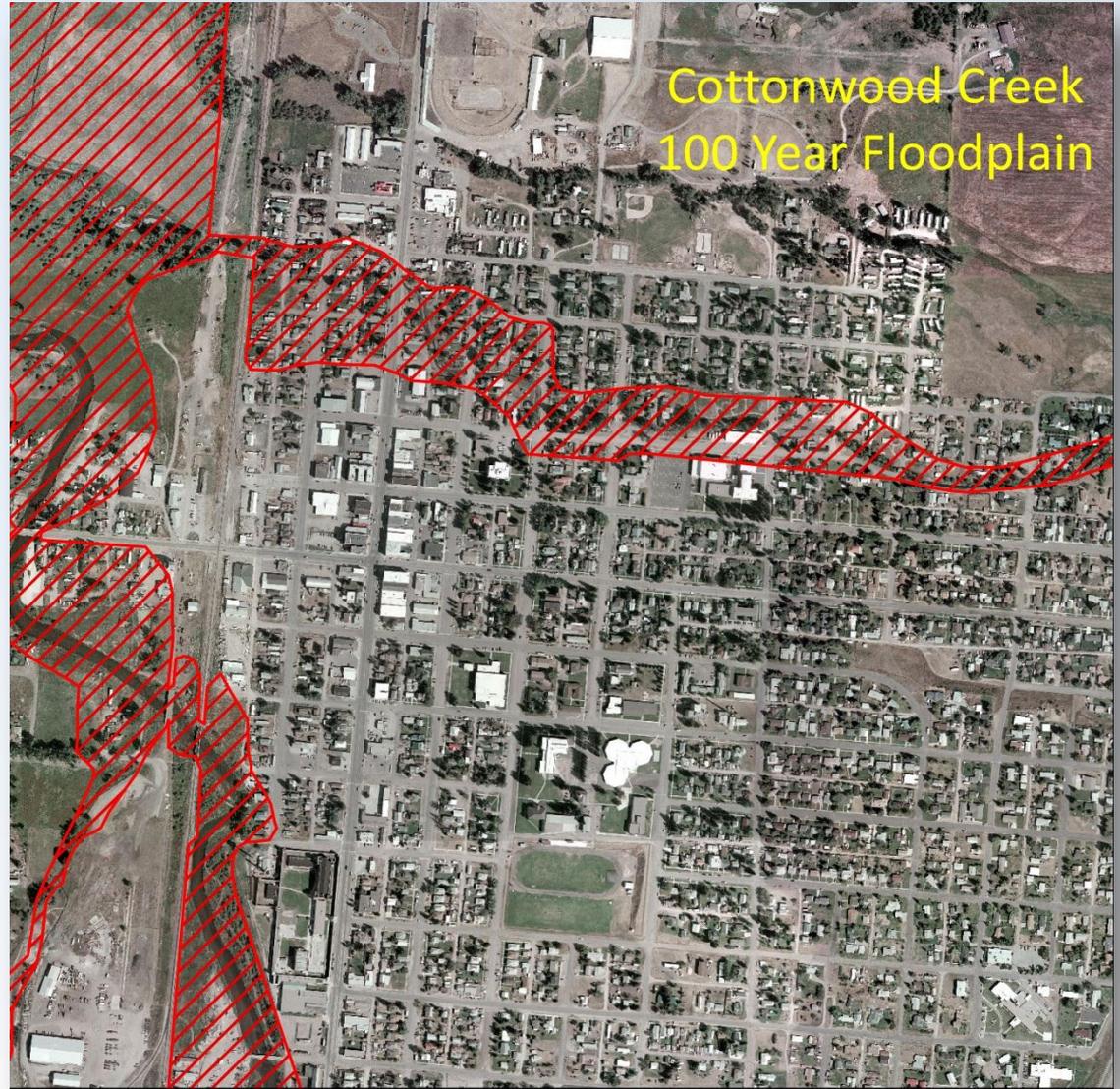
Cottonwood Creek flows through the center of Deer Lodge and most of its 3,374 residents or 48-percent of the County's total population reside within one mile of the Creek

Undersized bridges, armored banks, the loss of riparian habitats, floodplain encroachments, and barriers to fish movements characterize the urbanized channel



Setting

**Cottonwood Creek's
100 Year Floodplain
Occupies Five-percent
of the City**



Setting

Local officials have subjected the channel through Deer Lodge to repeated flood mitigation projects over the last several decades with various levels of success

**POWELL COUNTY
STREAM IMPROVEMENTS
COTTONWOOD CREEK FEMA
FLOOD CONTROL PROJECT
DEER LODGE, MONTANA
PHASE 2
MAY 2008**



LOCATION PLAN

COURTESY: USACE WPC DISTRICT

CDM Camp Dresser & McKee Inc.
HELENA, MONTANA
Consulting Engineering Construction

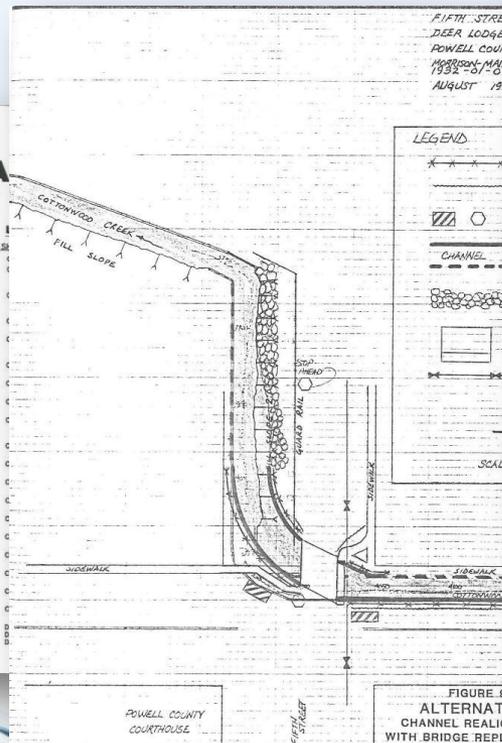


FIGURE 9
ALTERNATE
CHANNEL REALIGN
WITH BRIDGE REPLA



COTTONWOOD CREEK - 1981

Photo By:



Event



**June 2011, Cottonwood
Creek flooded after a
significant rain on snow
event in the watershed**

**Resulting in the second
largest flood in Western
Montana**



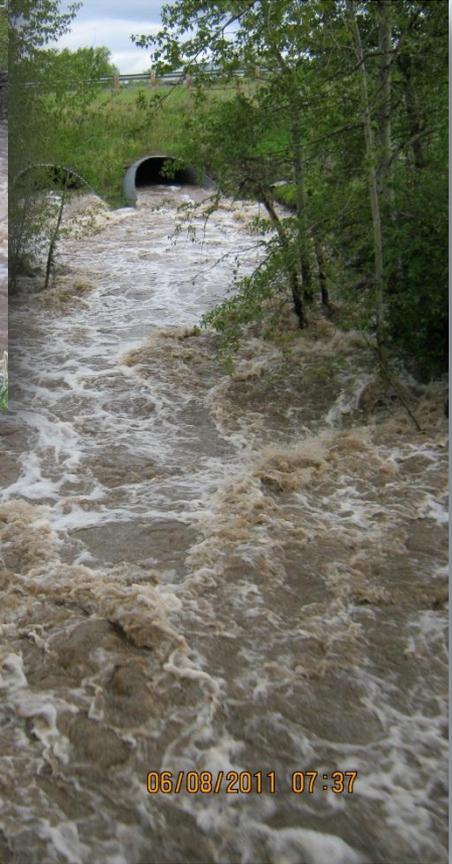
Event



**Cottonwood Creek
flooded through the
center of Deer Lodge
causing significant
damage to public
infrastructure, private
property, and habitat**

**1981 Flood – 1,850 cfs (400 yr)
100 yr event – 1,140 cfs
2011 Flood – 1,015 cfs**

Event



Response



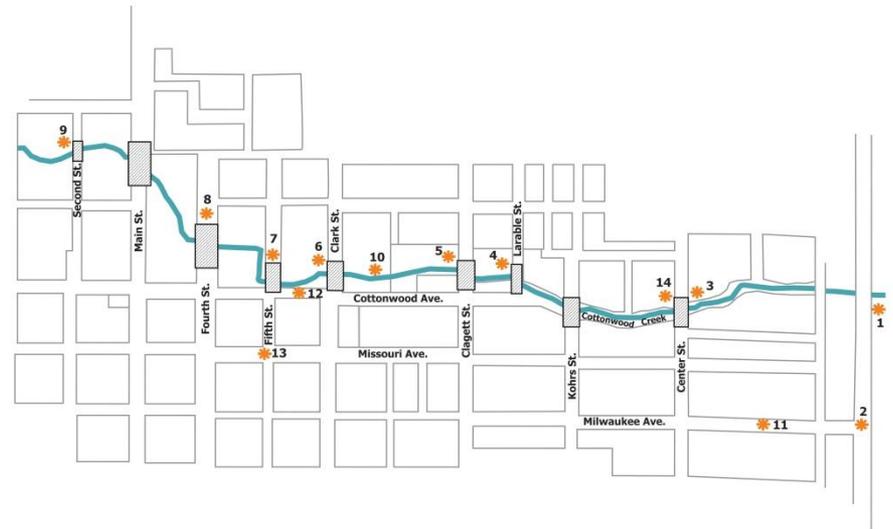
Projects

NRDP: One Project

FEMA: PW's and Second Street Bridge

**MDT: Main Street Bridge
Walk thru with Staff**

Cottonwood Creek Flood Assessment



FEMA Confirmed Project Sites

1. Culverts at Doug Johnson's Farm
2. Emergency Berm at Milwaukee Ave. and Boulder St.
3. Center St. Bridge
4. Larable St. Bridge
5. Claggett St. Bridge
6. Clark St. Bridge
7. Fifth St. Bridge
8. Fourth St. Bridge
9. Second St. Bridge
10. Retaining Walls along Cottonwood Creek
11. Milwaukee Ave.
12. Road Damage - Cottonwood Ave. between Clark & Fifth
13. Road Damage - NW corner of Missouri and Fifth
14. Exposed Water Main



August 4, 2011

Planning Department



Deen Loose, M.A., P.E.

Projects



Projects

Debris Removal
(including sandbags placed in yards and alleys)

Channel Cleanup
(emphasis on segments above bridges and below decks)



Projects

Re-setting
Floodwalls at a
Greater Depth

Coordination
with Property
Owners



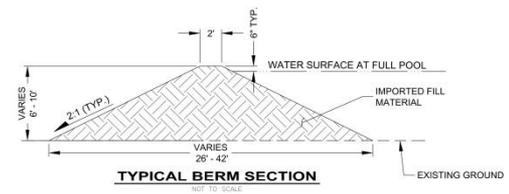
Lessons Learned

- **Prepare**
(Planning efforts)
- **Response**
(Organization!)
- **Documentation**
(Clear and concise)
- **Work with FEMA and understand limitations**
(Communication)
- **Work with other Agencies**
(Avoid duplication)
- **Citizen Response**
(Engagement)
- **Plan to prevent**
(Plan maintenance)

Future



BERM SITE PLAN



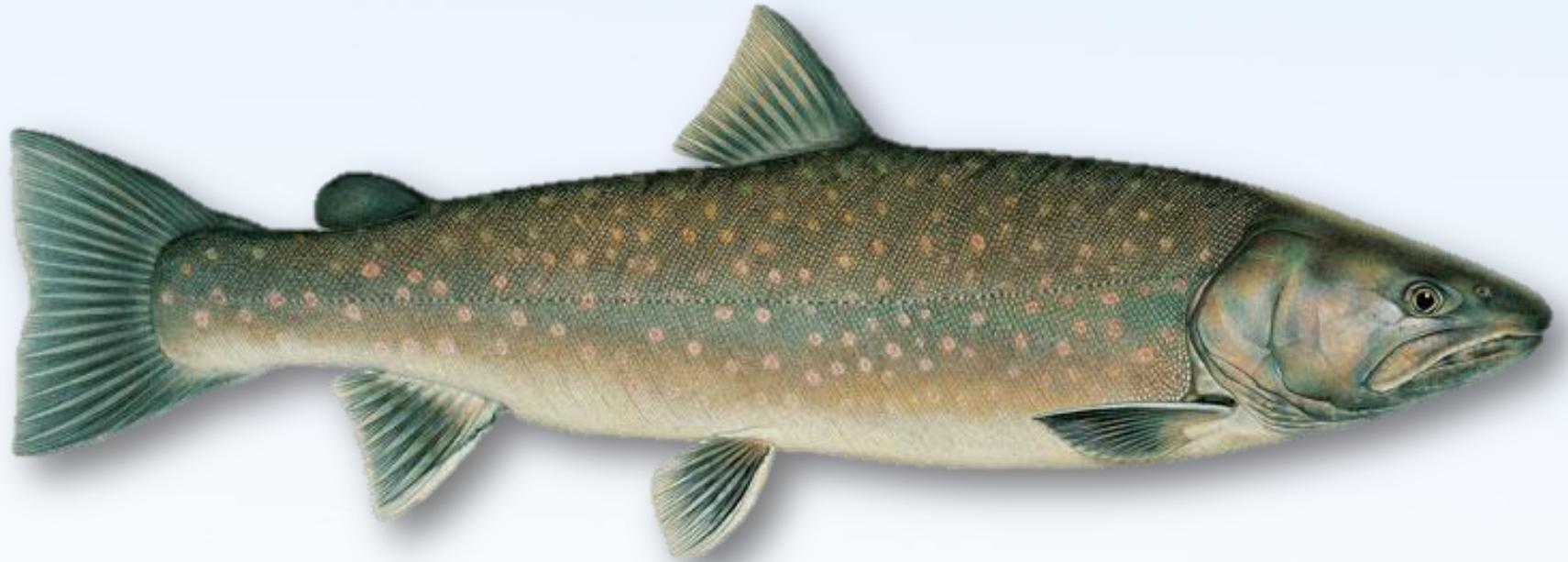
TYPICAL BERM SECTION
NOT TO SCALE



PRELIMINARY BERM LAYOUT AND SECTION

POWELL COUNTY
COTTONWOOD CREEK FLOOD MITIGATION

Questions?



Contact Information

**Brian P. Bender, AICP, CFM
Powell County Planning Director
409 Missouri Ave., Suite 101
Deer Lodge, MT 59722
bbender@co.powell.mt.us
406.846.9729**

**Chris Laity, PE
Project Manager
Great West Engineering
P.O. Box 4817
2501 Belt View Drive
Helena, MT 59604
claity@greatwesteng.com
406.495.6170**