

# ***Rosebud County Floodplain Mapping Update***

Project Kickoff Meeting

September 16, 2021

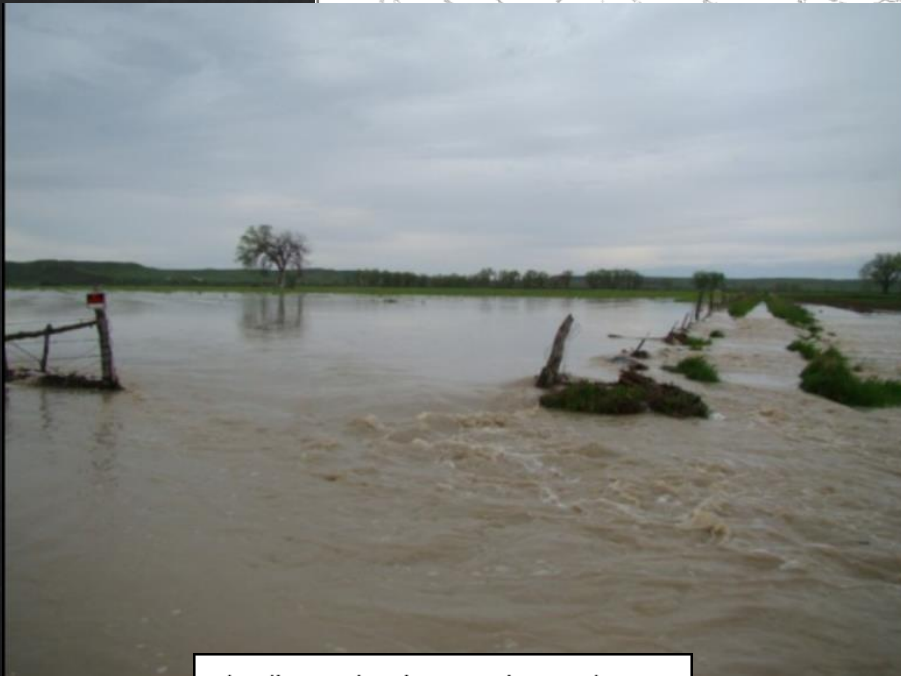


# Agenda

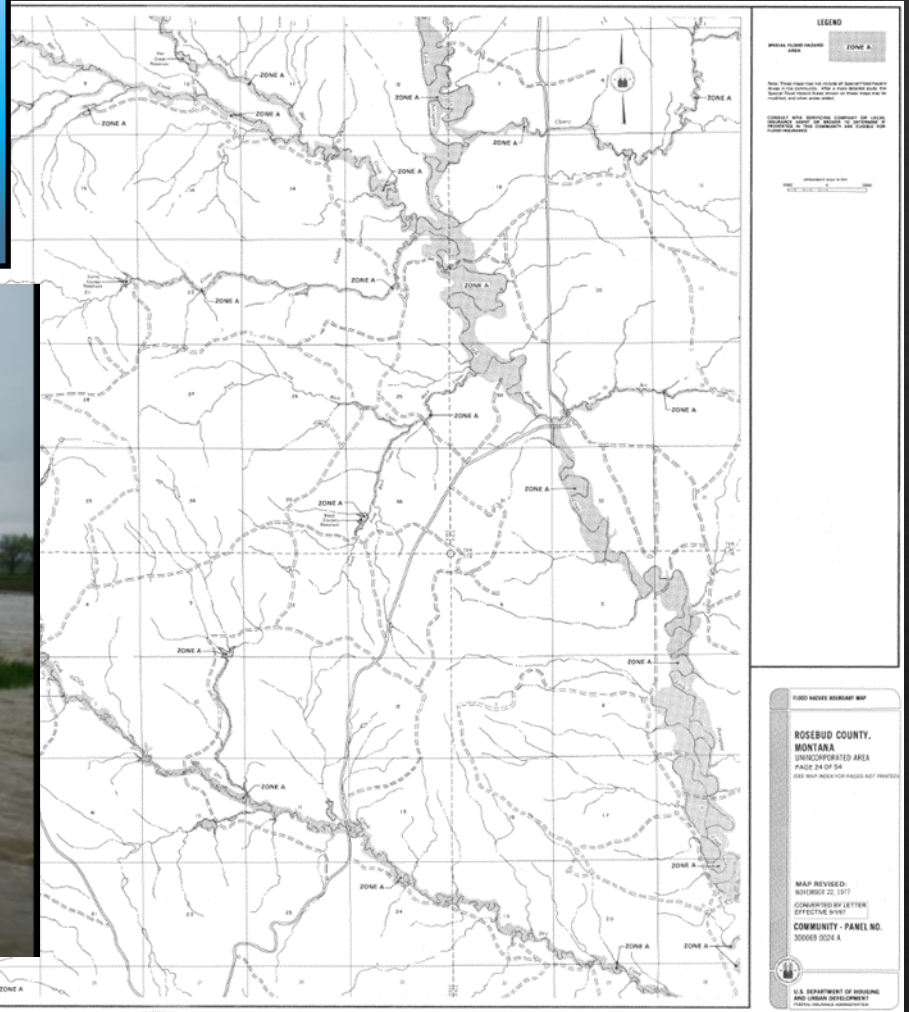
- Floodplain Maps review
- Flood Study Steps
- Project overview and project team
  - Community coordination
  - Community contribution
  - Estimated timeline
- Project website
- Mitigation planning
- Levee overview
- Questions & Discussion

# Identifying Risk Through Mapping

**Floodplain Mapping:** Identifies flood risk and in turn helps keep people and property out of harm's way.



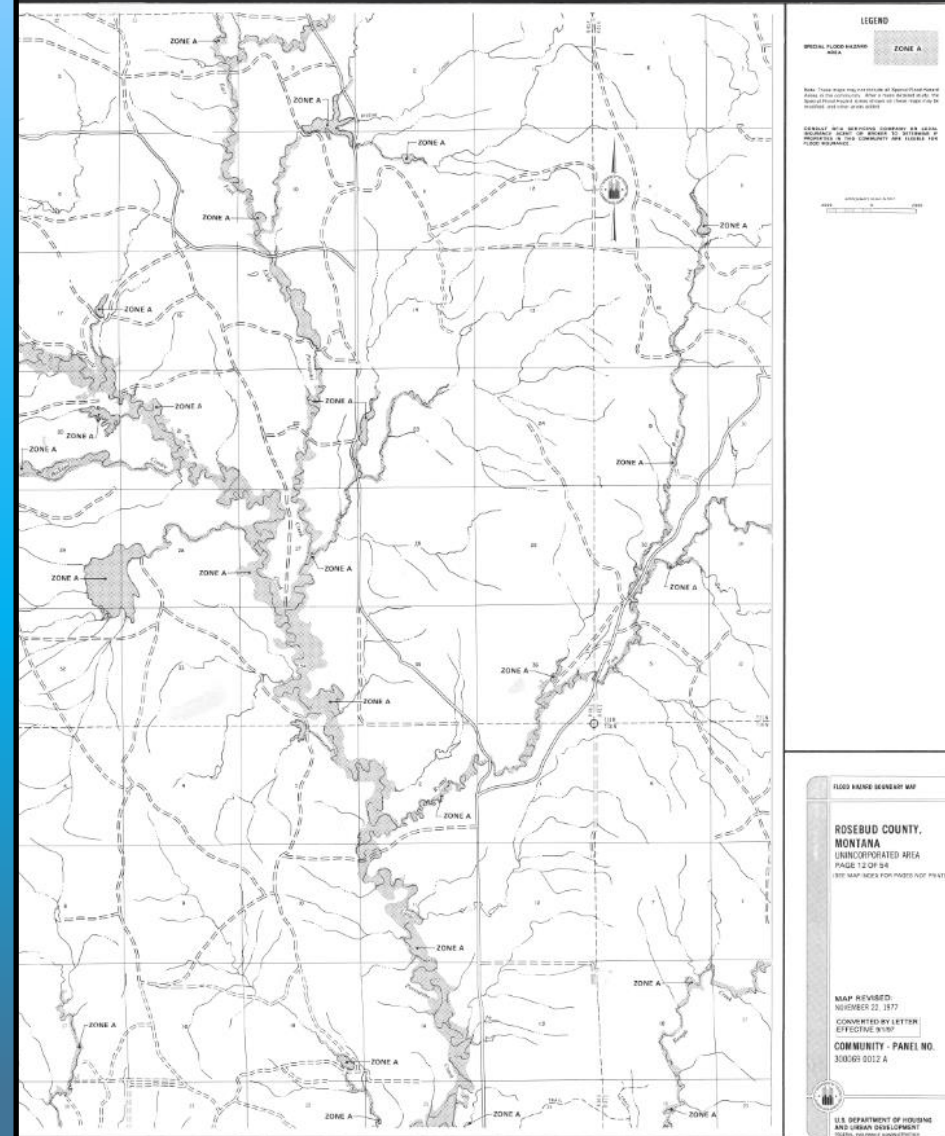
Flooding on the Big Porcupine Creek 2011  
Photo compliments of the Billings Gazette





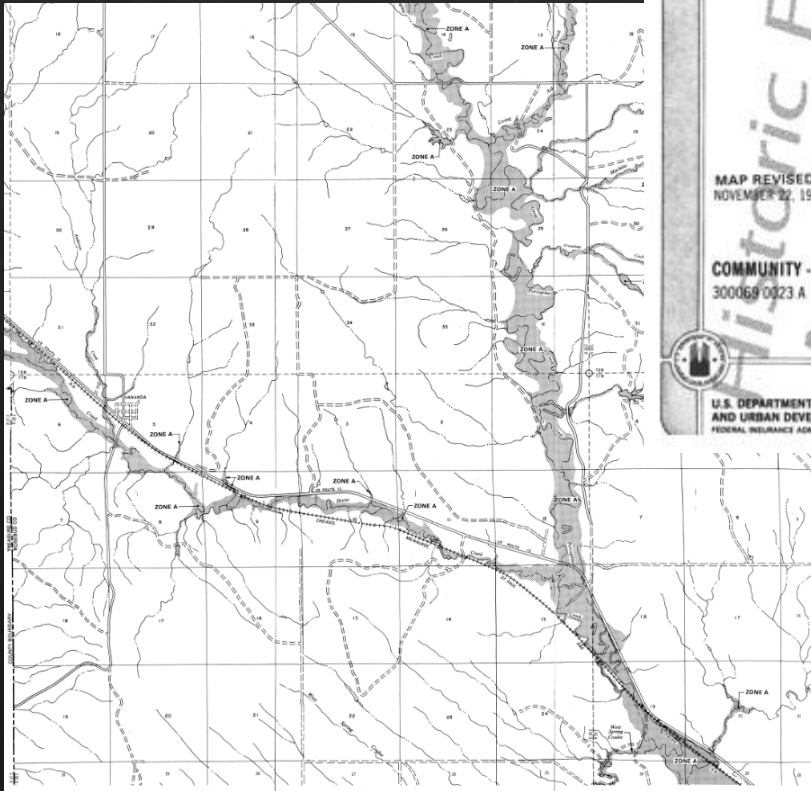
# Floodplain Maps

- Indicate areas of flood risk
- Used for
  - Floodplain regulations
  - Planning/Environmental Health
  - Emergency planning
- Coarse, general mapping
  - challenge for county/landowners
- Opportunity to upgrade/replace



# Rosebud County Floodplain Maps

1977 maps



FLOOD HAZARD BOUNDARY MAP

ROSEBUD COUNTY,  
MONTANA  
UNINCORPORATED AREA  
PAGE 23 OF 54  
(SEE MAP INDEX FOR PAGES NOT PRINTED)

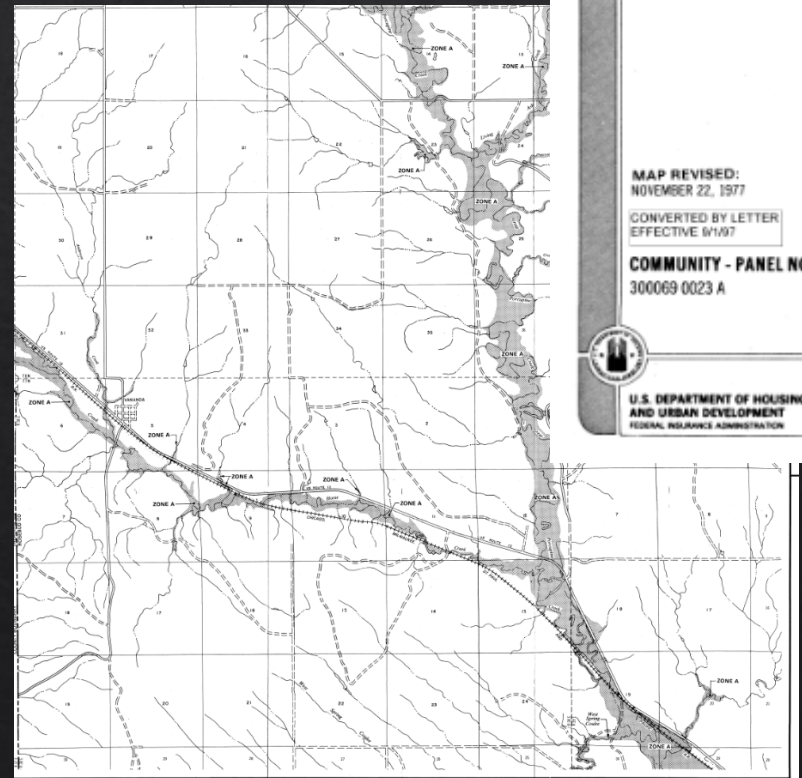
MAP REVISED:  
NOVEMBER 22, 1977

COMMUNITY - PANEL NO.  
300069 0023 A

*Historic From  
Microfiche*

U.S. DEPARTMENT OF HOUSING  
AND URBAN DEVELOPMENT  
FEDERAL INSURANCE ADMINISTRATION

effective maps



FLOOD HAZARD BOUNDARY MAP

ROSEBUD COUNTY,  
MONTANA  
UNINCORPORATED AREA  
PAGE 23 OF 54  
(SEE MAP INDEX FOR PAGES NOT PRINTED)

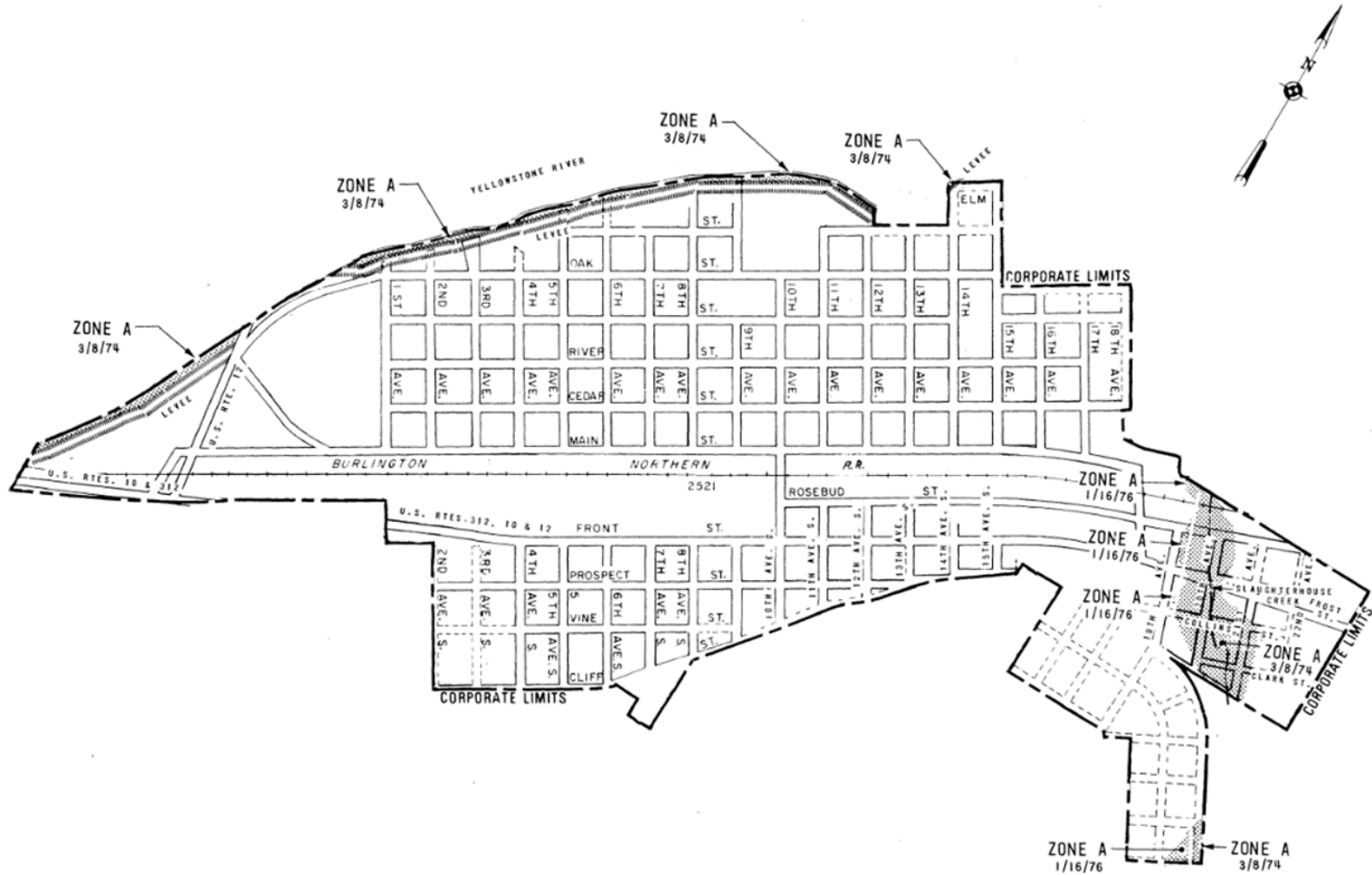
MAP REVISED:  
NOVEMBER 22, 1977

CONVERTED BY LETTER  
EFFECTIVE 6/1/97

COMMUNITY - PANEL NO.  
300069 0023 A

U.S. DEPARTMENT OF HOUSING  
AND URBAN DEVELOPMENT  
FEDERAL INSURANCE ADMINISTRATION

# City of Forsyth Floodplain Maps



MAP REVISED  
1/16/76

FIA FLOOD HAZARD BOUNDARY MAP  
No. H 01

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
Federal Insurance Administration  
CITY OF FORSYTH, MT  
(ROSEBUD CO.)



# Flood Study Steps

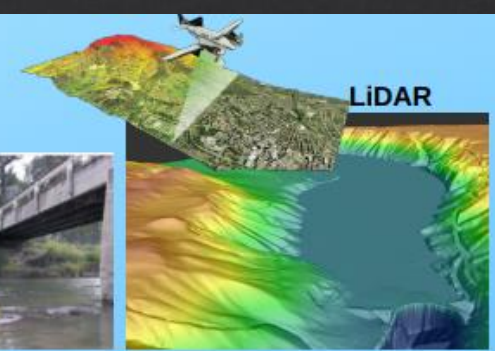
**Step 1 - Survey:** measurements are made of the topography around the river, along with any culverts, bridges, and road crossings. LIDAR uses an airplane to collect ground elevation over a large area, and ground survey supplements the airborne data.

**Step 2 - Hydrology:** determines how much water there will be in the river during a flood event. Data from stream gages will tell how many cubic feet of water per second the river will carry during the flood.

**Step 3 - Hydraulics:** once the first two steps are complete, calculations can show where the water will go during the flood. The elevation data is combined with the flood flow data to determine where the water will go when it overflows the channel.

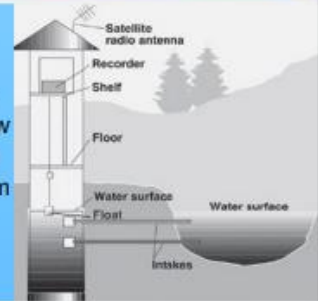
**Step 4 - Mapping (delineation):** the results from step 3 are combined with the elevation data and official maps to see how far the water will spread out. The area shown to be underwater during the flood is the regulatory floodplain.

**Step 1 - Survey:** The type of the survey depends on the size of the study area and type of study.



## Step 2 - Hydrology:

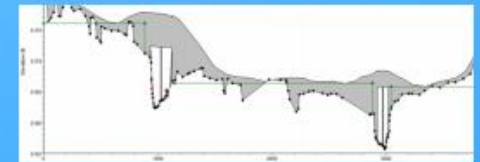
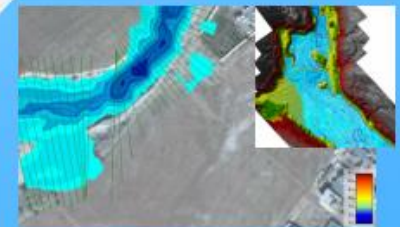
Stream gage stations are an important tool to determine flow rates. If nearby stream gages aren't available, gage data from a similar location is used to determine the flow rate.



## Step 3 - Hydraulics:

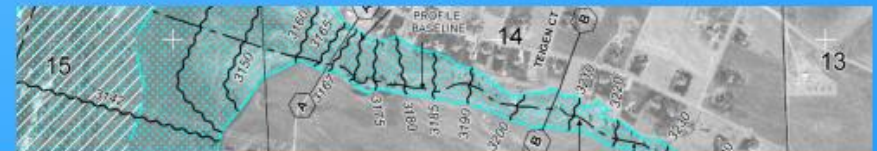
5 main components to the model

- 1) Hydrology (stream flow data)
- 2) Cross Sections (measurements of the river bottom at key locations)
- 3) Roughness (thickness of vegetation, land cover, etc determined by surveyors)
- 4) Structures (road crossings, culverts, bridges, etc.)
- 5) Downstream conditions



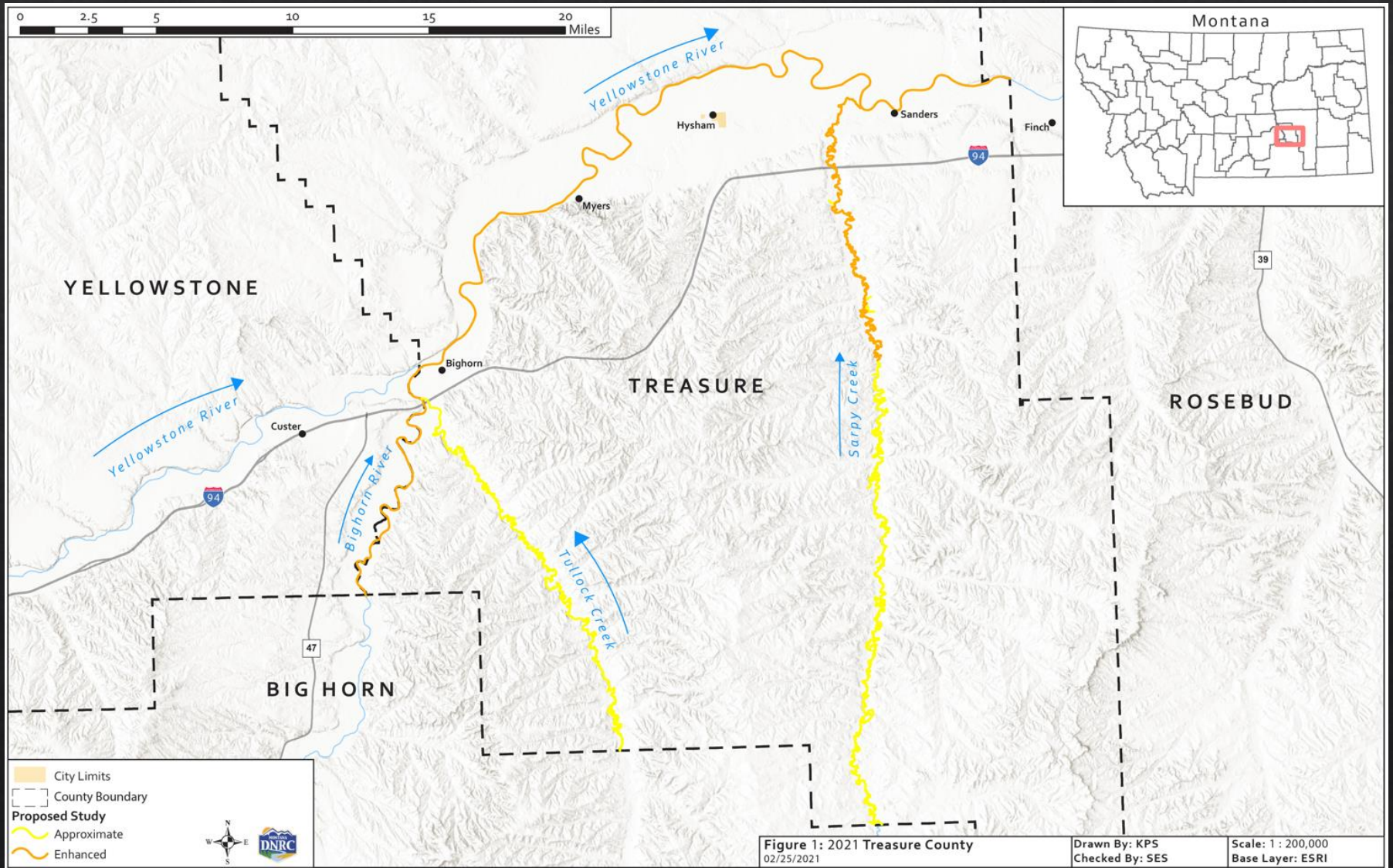
## Step 4 - Mapping (delineation):

The result will be the floodplain boundary and a depth grid identifying the shallower and deeper areas of flooding.





# Proposed study





# Project Team

- DNRC Floodplain Staff — Tiffany Lyden, Nadene Wadsworth, Steve Story, Peri Turk, Katie Shank, Doug Brugger, Traci Sears, Shaye Bodine



- Treasure County

- FEMA Region VIII



- DNRC Contractors:

- Topography/LiDAR —



- Survey Work—



- Hydrology—



- Hydraulic Analysis and Floodplain Mapping



# Community Coordination

- Landowner notifications survey work
  - DNRC contractors will send letters
- Work in floodplain during new study
  - Work with DNRC to update contractors



- Historic flood information sharing
  - Photos, data collected

 DOWL

July 24, 2019

Landowner Name  
Street Address  
City, ST, Zip

Dear Landowner,

The Montana Department of Natural Resources and Conservation (DNRC) has hired our firm to conduct survey work in Carbon, Stillwater, and Yellowstone Counties. The work includes surveying cross sections across the Clarks Fork of the Yellowstone River, Rock Creek, Red Lodge Creek, Rosebud Creek, and the Stillwater River. The work will be used to increase the accuracy of the floodplain mapping in these areas. You can find more information about this on DNRC's website: [www.floodplain.mt.gov/floodstudy](http://www.floodplain.mt.gov/floodstudy).

You are receiving this letter because our survey personnel have identified your property as a location that would be helpful to use for accessing the areas where the survey work is to be performed. Prior to initiating work, DOWL would like to speak with you further to discuss the possibility of accessing the stream through your property. Please contact Greg Gabel with DOWL using the contact information below. If you reach his voicemail, please leave your contact information and our team will reach out to you as soon as possible.

If you have any other questions or would like more information regarding this project, please contact Nadene Wadsworth with the DNRC using the contact information below.

Thank you,

 DOWL

DOWL  
Greg Gabel, P.E., CFM  
Project Manager  
222 N 32<sup>nd</sup> Street Suite 700  
Billings, MT 59101  
[ggabel@dowl.com](mailto:ggabel@dowl.com)  
406-656-6399

 The Montana Department of  
Natural Resources  
& Conservation

Dept. of Natural Resources and Conservation (DNRC)  
Nadene Wadsworth, Outreach Specialist  
DNRC Floodplain Management Program  
1424 9<sup>th</sup> Ave.  
Helena, MT 59601  
[Nadene.Wadsworth@mt.gov](mailto:Nadene.Wadsworth@mt.gov)  
(406) 444-5918



# Estimated Project Schedule

Topographic (LiDAR) Done can be accessed from  
state library

Survey Work- Fall 2021

Hydrology- Fall 2021

Hydraulics – mid- late 2022

Draft Maps – late 2022 to early 2023

Public review of draft maps – early 2023

FEMA Map Production/  
Preliminary Maps - late 2023

Public review of preliminary maps – 2024

FEMA maps finalized – 2025



Community  
Contribution

# Community Contribution

CITY OF DILLON, MONTANA

125 N. IDAHO  
DILLON, MT 59725

TODD HAZELBAKER  
DIRECTOR OF OPERATIONS

NEAL STRAUS  
TREASURER



MICHAEL KLAKKEN  
MAYOR

406-683-4245  
FAX 406-683-6361

JANI OLSEN  
CLERK

JAMES P. DOLAN  
CITY ATTORNEY  
406-988-0067

Dear Landowner,

The City of Dillon has been working with FEMA and the Montana Department of Natural Resources & Conservation (DNRC) to conduct new flood studies and update floodplain maps for Blacktail Deer Creek and the Beaverhead River. The new maps are intended to provide more reliable and detailed information about flood-prone areas along these waterways.

You are receiving this notification because proposed floodplain mapping changes could affect your property.

Visit this website [www.floodplain.mt.gov/beaverhead](http://www.floodplain.mt.gov/beaverhead) to view the draft floodplain maps.

Attend one of our public open houses to get more information about this project and learn how it may affect your property:

Thursday, May 9<sup>th</sup> 5:00 – 7:00pm

Department of Natural Resources

840 N. Montana St

Dillon, MT

Monday, May 13<sup>th</sup> 5:00 – 7:00pm

Lima Town Hall

5 W Section Corner

Lima, MT

Staff from the DNRC Floodplain Program and the City will be on hand during the open houses to answer questions and provide an overview of the project. We look forward to seeing you there!

For more information about the overall project, or the draft maps, feel free to contact us directly:

Todd Hazelbaker  
Dillon Floodplain Administrator  
[operations@dillonmt.org](mailto:operations@dillonmt.org)  
406.683.4245

Tiffany Lyden  
MT Dept of Natural Resources and Conservation  
[tlyden@mt.gov](mailto:tlyden@mt.gov)  
406.444.0599

RECEIVED

MAY 03 2019

D.N.R.C

Page 1





# Project website

Water Adjudication

Water Management

Water Operations

Board of Water Well Contractors

Dam Safety

Floodplain Management

Training

Silver Jackets

Permitting and Regulations

Outreach

News

Mapping and Technical Resources

Disaster and Recovery

Community Rating System

Big Hole Floodplain Study Products

Flood Insurance

Property Owner Resources

Cool Tools

Contacts

Gallatin Mapping Updates

Grants

Musselshell River Flood Maps

Update

## Carbon County Floodplain Maps Update



### Carbon County Floodplain Maps Update



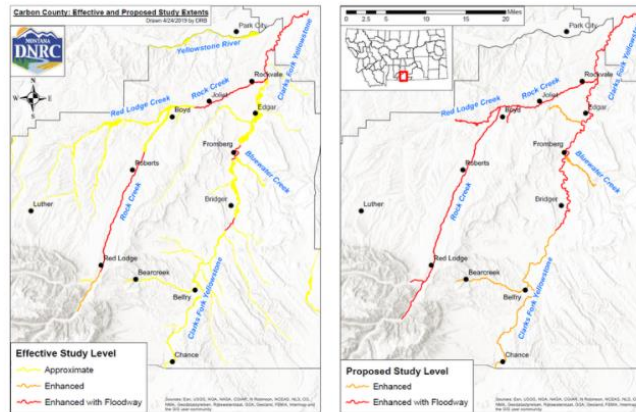
Carbon County is working with MT DNRC and FEMA to update flood studies and floodplain maps for the Clarks Fork of the Yellowstone, Rock Creek, and tributaries. Updated floodplain maps will depict the latest, most accurate flood risk data, and will be used to eventually replace some of the existing FEMA floodplain maps in Carbon County.

For more information, see: [Background on existing floodplain maps](#) and [Flood Study Process](#).

[2020 Hydrologic Analysis Report: Pioneer-Technical Services](#)

DNRC held project kick-off meetings on October 3rd & 4th, 2019 with Carbon County, Joliet, Red Lodge, Bear Creek, and Fromberg. To view the slides that were presented: [click here](#).

Below are the study extents for the project. [To view a larger image click here](#).



Below is a tentative project timeline. [Click here to view the project timeline](#).



### Project Timeline Carbon County Floodplain Maps Update



#### More Info

[Background on existing floodplain maps](#)

[Flood Study Process](#)

[Hydrologic Analysis Report - 2020](#)

#### Contact Carbon County

Page Dringman

Carbon County Floodplain Administrator  
(406) 932-5470

[email](#)

#### Contact DNRC

Tiffany Lyden

MT DNRC Outreach Specialist  
(406)444-0599

[email](#)

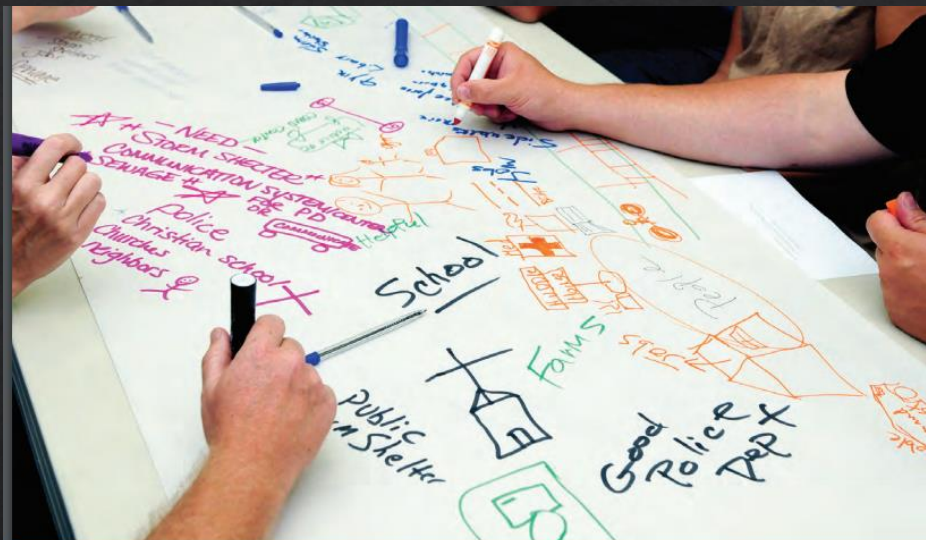
Nadene Wadsworth

MT DNRC Outreach Specialist  
(406)444-6732

[email](#)

# Mitigation Planning

- Status of plan?
  - Include floodplain mapping project in plan



## Local Mitigation Planning Handbook

March 2013



# Mitigation Technical Assistance

In process of developing

May be able to provide engineered mitigation actions as a result of updated flood risk



# Forsyth Levee



[USACE National Levee Database](#)

## Forsyth - Yellowstone RB

Location **Forsyth, Rosebud County, Montana** USACE Districts **Omaha** FEMA Regions **8**

Info  Map  DOWNLOAD DATA

SUMMARY SYSTEM SEGMENTS RISK FEMA - NFIP/FIRM FEATURES PROFILE ATTACHMENTS

### Levee System Overview

VIEW

approximately 10,700 feet long with a height between 3 and 10 feet and 1 vertical on 2 horizontal (1V:2H) side slopes. The Forsyth Montana Flood Protection Project incorporated and improved upon this existing system to increase the level of flood risk reduction for the city. The plan of improvement for the Forsyth Montana Flood Control Project consisted of the following: an impervious compacted earth-fill levee; a concrete retaining wall at the city water plant; a reinforced concrete cantilever floodwall with a cutoff toe on the riverside; a landside retaining wall; a landside underseepage control blanket located in multiple areas along the landside toe; two sandbag closure structures, one at Highway 10 and one at the Burlington Northern Railroad; multiple drainage structures to facilitate interior drainage; rock protection on embankments, slopes, and channels; and levee slope and crest cover.

The Forsyth-Yellowstone River RB levee system also incorporates two tiebacks, one at each end of the system. At the downstream end of the system, the levee ties to existing ground in a cultivated field. According to the 1983 O&M Manual, the levee ties to existing high ground at the upstream end of the system. The levee system at these two locations requires the tie-offs to complete the flood protection provided by the project. Any areas located above the levee tie-offs are not protected by the levee and are not incorporated within the project. The total length of the levee system is approximately 2.42 miles.

### Levee Performance and Potential Lost Benefits

VIEW

### What is Behind the Levee?

Population	Structures	Property Value
2,154	959	\$254,186,983.60

### Structure and Features

VIEW

Total Miles	Length of Embankment (miles)
2.49 Miles	2.42
Length of Floodwall (miles)	Year Constructed
0.03	1948
Maximum Average Height	Number of Closure Structures
6.50	2

### Key Documents

VIEW

Levee System Summary





# Forsyth Levee



Water Resources Division  
1424 9th Ave, Helena, MT 59620-1601 Phone: (406) 444-6601 Fax: (406) 444-0533

GREG GIANFORTE, GOVERNOR

1539 ELEVENTH AVENUE

STATE OF MONTANA

DIRECTOR'S OFFICE: (406) 444-2074  
FAX: (406) 444-2654

PO BOX 201601  
HELENA, MONTANA 59620-1601

City of Forsyth  
247 N 9th Ave  
Forsyth, MT 59327

Dear Mayor, Kopitzke:

The Department of Natural Resources and Conservation (DNRC) floodplain program, Rosebud County, and the City of Forsyth have been working to undertake a new flood hazard study for Rosebud County, including the City of Forsyth which will update the existing Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). FEMA recently awarded DNRC a grant to complete the project. Accordingly, we are beginning the process of holding community kickoff meetings and launching the initial project tasks.

The new study requires a review and assessment of any existing flood control structures. FEMA requires that Levee Sponsor/Owners provide engineering certification to ensure the levee is sound and to qualify for a reduced flood risk category on the landward side of the levee systems, in accordance with FEMA's accreditation requirements (44 CFR 65.10). DNRC has identified one levee that is owned and maintained by The City of Forsyth: Right Bank Levee (see attached figure). The existing status of this levee, based on the effective FIRMs is:

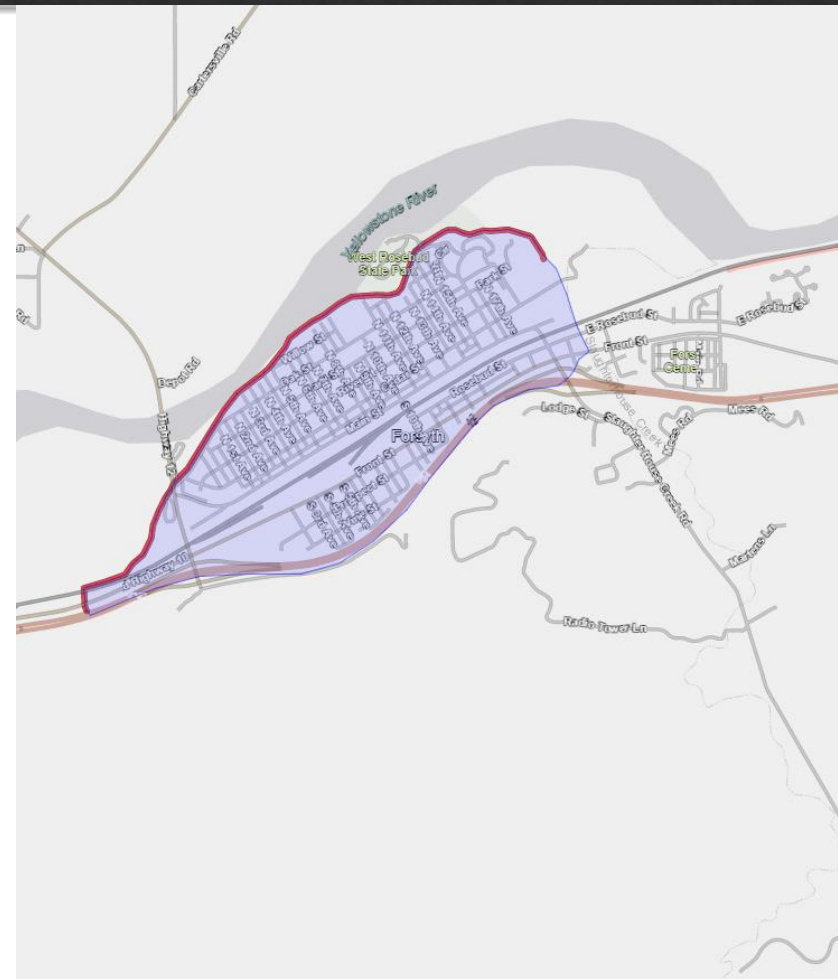
- The Right Bank levee shows as "accredited" providing a reduced flood risk on the landward side of the levee.

As the Owner/Sponsor of this levee, the city is responsible for providing all the necessary data, documentation, and certification (by a licensed professional engineer, or federal agency) to FEMA and DNRC, demonstrating that the levee system complies with FEMA's minimum requirements for accreditation (per 44 CFR 65.10).

This letter serves as our formal request of the city's intent to pursue FEMA accreditation of the levee system identified above.

The city may choose to pursue certification at the county's expense for potential accreditation by FEMA. Accreditation status from FEMA will result in the levee showing reduced risk on the landward side of the levee on the future FIRMs. Residents that live behind an accredited levee may receive reduced flood insurance premiums.

ADJUDICATION BUREAU (406) 444-0560	COMPACT IMPLEMENTATION PROGRAM (406) 444-5700	STATE WATER PROJECTS BUREAU (406) 444-6646	WATER MANAGEMENT BUREAU (406) 444-6637	WATER OPERATIONS BUREAU (406) 444-0860	WATER RIGHTS BUREAU (406) 444-6610
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Leveed Area: Estimated area of a floodplain from which flood water is excluded by the levee system. This map feature is not related to FEMA Flood Insurance Rate Mapping products.

X



An aerial photograph of a river valley. A large dam is visible in the lower-left quadrant, with a reservoir behind it. The river flows through the center of the valley, surrounded by lush green trees and vegetation. The terrain appears to be a mix of forested areas and open fields.

# Discussion

Nadene Wadsworth  
MT DNRC

[Nadene.Wadsworth@mt.gov](mailto:Nadene.Wadsworth@mt.gov)

(406) 444-6732

Tiffany Lyden  
MT DNRC

[Tlyden@mt.gov](mailto:Tlyden@mt.gov)

(406) 444-0599