

1.0 Introduction and Background

Boxelder Creek is a natural creek which flows generally from north to south, draining an approximately 265 square mile watershed extending from southern Wyoming to its confluence with the Cache la Poudre River southeast of Fort Collins, Colorado. The lower portion of the watershed is highly urbanized, has a history of flooding and is impacted by numerous existing man-made structures (irrigation canals, culverts, etc.). The existing 100-year floodplain that was recently adopted by the Federal Emergency Management Agency (FEMA) impacts many existing residential and commercial properties and limits the ability for future development within what has become a highly desirable area.

1.1 Project Purpose and Need

Storm drainage problems have long plagued the Boxelder Creek watershed, particularly the developing area from just north of the Town of Wellington, Colorado to just south of Timnath, Colorado. Recently completed studies have suggested that damages from an infrequent flooding event would be severe and threaten both life and property. However, several stormwater mitigation alternatives that would reduce the threat of flood damage to existing homes and businesses and allow for the thoughtful and safe development of other vacant or agricultural properties have been identified.

The Boxelder Creek watershed and associated floodplain is unique in that it consists to a large degree of mostly undeveloped land (with the exception of Coal Creek within the Town of Wellington). This presents both an opportunity to implement flood and drainage mitigation projects prior to the area being developed and a constraint associated with the fact that most of the land is currently undeveloped.

Since the Boxelder Creek Watershed affects many property owners and several local governments, flood control mitigation should be developed through a cooperative effort among these affected interests. To that end, the Boxelder Creek Regional Alliance was formed to develop a regional solution that is more efficient and cost-effective to implement than the entities handling the flooding threat individually. The Regional Alliance consists of representatives from the following entities:

- Larimer County
- Town of Wellington
- City of Fort Collins
- Town of Timnath
- Town of Windsor
- The North Poudre Irrigation Company
- The Boxelder Sanitation District
- The New Cache la Poudre Irrigation Company
- A private property owner's group

- Colorado Water Conservation Board (CWCB)

The Boxelder Creek Regional Drainage Master Plan was commissioned by the Regional Alliance in order to develop a regional strategy for mitigating the impacts associated with flooding within the Lower Boxelder Creek basin that impacts the communities of the Town of Wellington, the City of Fort Collins, the Town of Timnath and portions of Larimer County. The intent of the Regional Master Plan is to establish a cost-effective strategy for implementation that will benefit the local community both now and into the future. Several alternatives have been identified in order to minimize flooding extents and mechanisms for funding the alternatives have also been considered. Engineering models and tools have been utilized to estimate the benefits and costs associated with drainage improvement alternatives.

1.2 Goals of Boxelder Creek Regional Alliance

The intent of this study is to reduce the overall flood risk to residents within the Study Area. The primary goals of the Alliance for this study and project are:

1. To identify and size a system of improvements which will achieve the greatest defined economic benefit per dollar of cost based on the revised 100-year floodplain extents.
2. Identify potential funding mechanisms for the selected project.
3. Protect public welfare and property.

In order to meet all of the project goals, alternatives analysis and economic evaluations were conducted to aid in the selection of a “Recommended Plan”. This report details the selection of the “Recommended Plan” based on the above project goals.

The alternatives evaluated are intended to minimize the flooding extents from the entire Boxelder Creek Watershed; however, some of the alternatives inadvertently address local flooding concerns as well.

1.3 Study Area

The study area for this project includes the floodplain for Boxelder Creek from just north of the Growth Management Area (GMA) of the Town of Wellington, Colorado at Larimer County Road 68, south to the floodplain and split flow confluence with the Cache la Poudre River south of the Town of Timnath, Colorado. The study area includes the projected flow path of flood overflows which split from the historic Boxelder Creek channel at its crossing at Interstate 25 about 1/3 mile north of East Prospect Street, Fort Collins, Colorado (see **Figure 1-1**).

The study area was also subdivided into several reaches and zones for purposes of evaluating the alternatives. These study reaches and zones include the following:

- **Upper Study Area**—from County Road 68 to County Road 54 including the following flow path reaches:
 - Upper Boxelder Creek
 - Coal Creek
 - Indian Creek

- **Middle Study Area**—from County Road 54 to the natural Boxelder Creek channel crossing of I-25 including the following flow path reaches:
 - Middle Boxelder Creek
 - Boxelder Creek Overflow

- **Lower Study Area**—from the natural Boxelder Creek channel crossing of I-25 to the confluence with the Cache la Poudre River including the following flow path reaches:
 - Lower Boxelder Creek (including overflow to the Cache la Poudre River)
 - Cooper Slough (and flow splits)
 - Boxelder I-25 Split Flow Path through Timnath (Timnath Overflow)

Above County Road 68, there are several existing flood control reservoirs constructed by the United States Soil Conservation Service (SCS) (now the Natural Resources Conservation Service) in the 1960's. These reservoirs perform well at protecting downstream areas during more frequent rainfall-runoff events, however, due to the vast urban development below these reservoirs and the limited conveyance capacity of the existing channel, the potential for significant flooding exists.

Figure 1-1 Northern Half

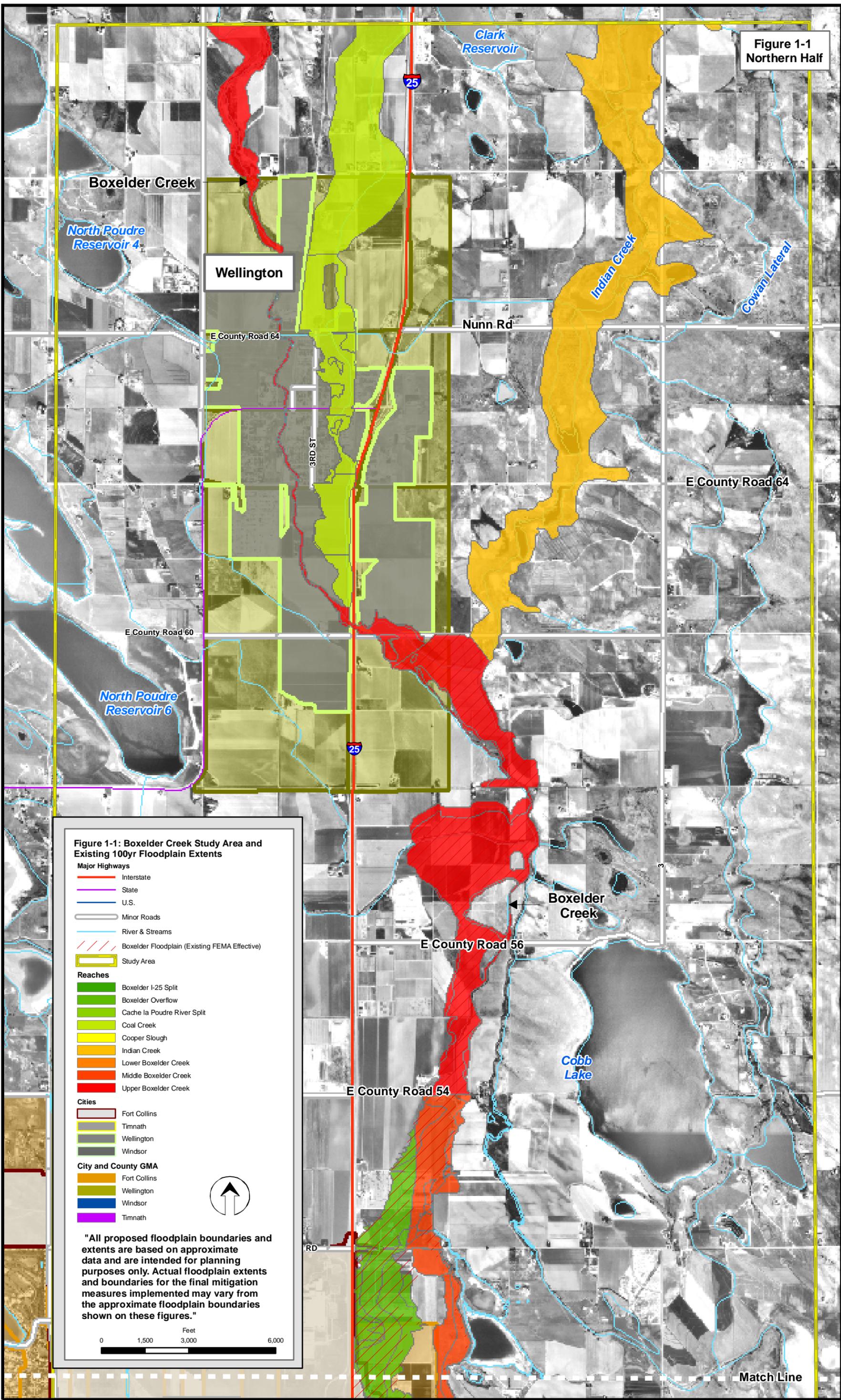


Figure 1-1: Boxelder Creek Study Area and Existing 100yr Floodplain Extents

- Major Highways**
- Interstate
 - State
 - U.S.
 - Minor Roads
 - River & Streams
 - Boxelder Floodplain (Existing FEMA Effective)
 - Study Area
- Reaches**
- Boxelder I-25 Split
 - Boxelder Overflow
 - Cache la Poudre River Split
 - Coal Creek
 - Cooper Slough
 - Indian Creek
 - Lower Boxelder Creek
 - Middle Boxelder Creek
 - Upper Boxelder Creek
- Cities**
- Fort Collins
 - Timnath
 - Wellington
 - Windsor
- City and County GMA**
- Fort Collins
 - Wellington
 - Windsor
 - Timnath

"All proposed floodplain boundaries and extents are based on approximate data and are intended for planning purposes only. Actual floodplain extents and boundaries for the final mitigation measures implemented may vary from the approximate floodplain boundaries shown on these figures."

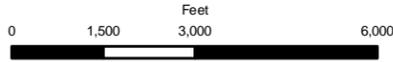


Figure 1-1: Boxelder Creek Study Area and Existing 100yr Floodplain Extents (A)

Match Line

Figure 1-1
Southern Half

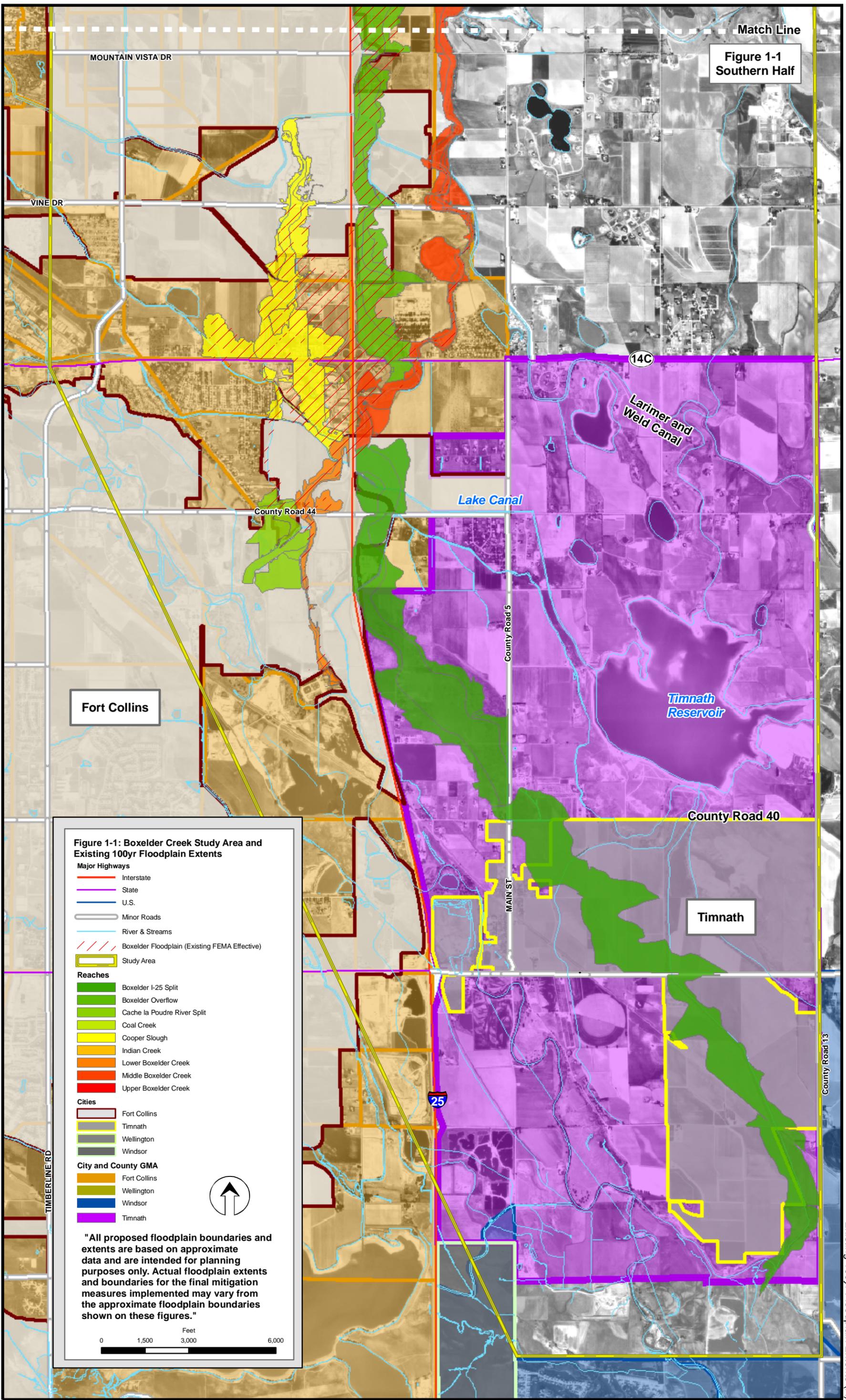


Figure 1-1: Boxelder Creek Study Area and Existing 100yr Floodplain Extents

- Major Highways**
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 - U.S.
 - Minor Roads
 - River & Streams
 - Boxelder Floodplain (Existing FEMA Effective)
 - Study Area
- Reaches**
- Boxelder I-25 Split
 - Boxelder Overflow
 - Cache la Poudre River Split
 - Coal Creek
 - Cooper Slough
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Figure 1-1: Boxelder Creek Study Area and Existing 100yr Floodplain Extents (A)

Table 1-1 provides a summary of the reach and the floodplain zone within the reach.

Table 1-1: Study Reaches and Associated Flooding Zones	
Reach	Flood Zone
Upper Boxelder Creek	Upper: Zone A; Lower: Zone AE
Coal Creek	Upper: Zone A; Lower: Zone AE
Indian Creek	Zone A
Middle Boxelder Creek	Zone AE with floodway
Boxelder Creek Overflow	Zone AE with floodway
Cooper Slough and splits	Zone AE with floodway
Lower Boxelder Creek	Zone AE with floodway
Boxelder I-25 Split Flow through Timnath	Upper: Zone AE; Lower: Zone A
Cache la Poudre Overflow	Zone AE with floodway

Figure 1-2 shows the different floodplain zones within the Study Area.

1.4 Scope of Report

The Scope of Work undertaken as part of this study included the following tasks or phases of work:

- Phase I: Data Collection
- Phase II: Data Analysis
- Phase III: Economic Analysis
- Phase IV: Compilation of Draft Master Plan
- Phase V: Public Outreach

1.5 Public Outreach

Several avenues of public outreach and community involvement were undertaken as part of developing this Regional Drainage Master Plan. These efforts included:

- Information newsletters and mailings to residents within the Study Area
- Invitation to the public to attend regular Alliance meetings
- Informational flyers
- Newspaper articles and press releases
- Public Open House (March 7, 2006)
- Work sessions with Town Board, City Council and County Commissioner representatives

A summary of the public outreach undertaken as part of the development of this Master Plan is presented in **Appendix G**.

Figure 1-2
Northern Half

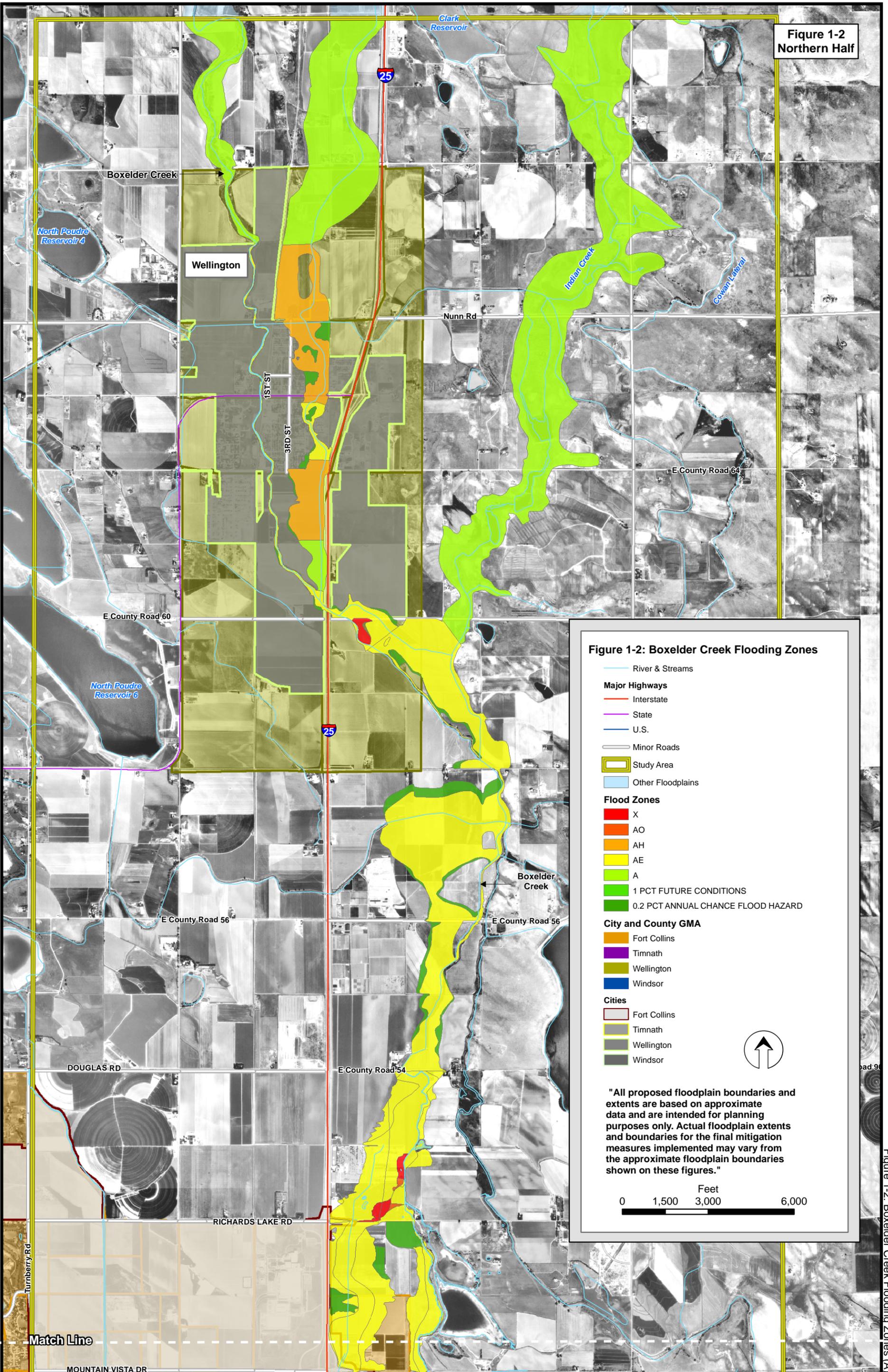


Figure 1-2: Boxelder Creek Flooding Zones (A)

Figure 1-2
Southern Half

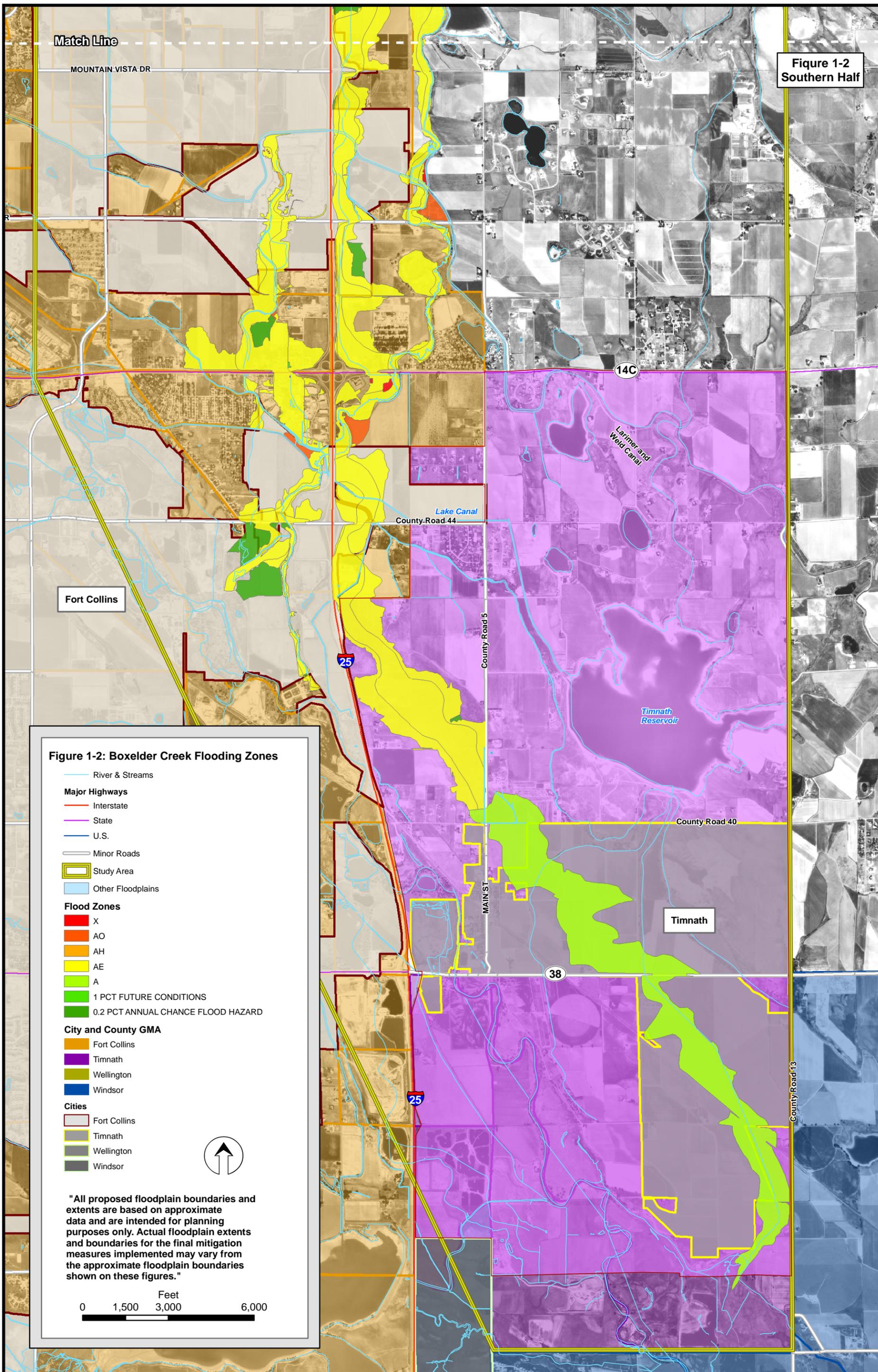


Figure 1-2: Boxelder Creek Flooding Zones

- River & Streams
- Major Highways**
 - Interstate
 - State
 - U.S.
 - Minor Roads
- Study Area
- Other Floodplains
- Flood Zones**
 - X
 - AO
 - AH
 - AE
 - A
 - 1 PCT FUTURE CONDITIONS
 - 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- City and County GMA**
 - Fort Collins
 - Timnath
 - Wellington
 - Windsor
- Cities**
 - Fort Collins
 - Timnath
 - Wellington
 - Windsor

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0 1,500 3,000 6,000
Feet

Figure 1-2: Boxelder Creek Flooding Zones (B)