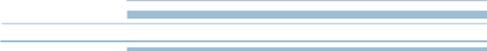


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Task 4: Update NHD in IDWR Critical Areas – Watson Irrigation District and Falls Irrigation District

COOPERATIVE AGREEMENT NO. G12AS00003

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REPORT TO THE UNITED STATES GEOLOGICAL SURVEY

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Introduction:

In Idaho, water resources management is critical to the State's agriculturally-based economy. In areas like southern Idaho, where agriculture is dominant, the current National Hydrography Dataset (NHD) often does not match the existing hydrography because of changes on the ground since the digital information was created. The expansion of agricultural land led to the construction of canals and the altering of original waterways and these changes are not always present in the current NHD.

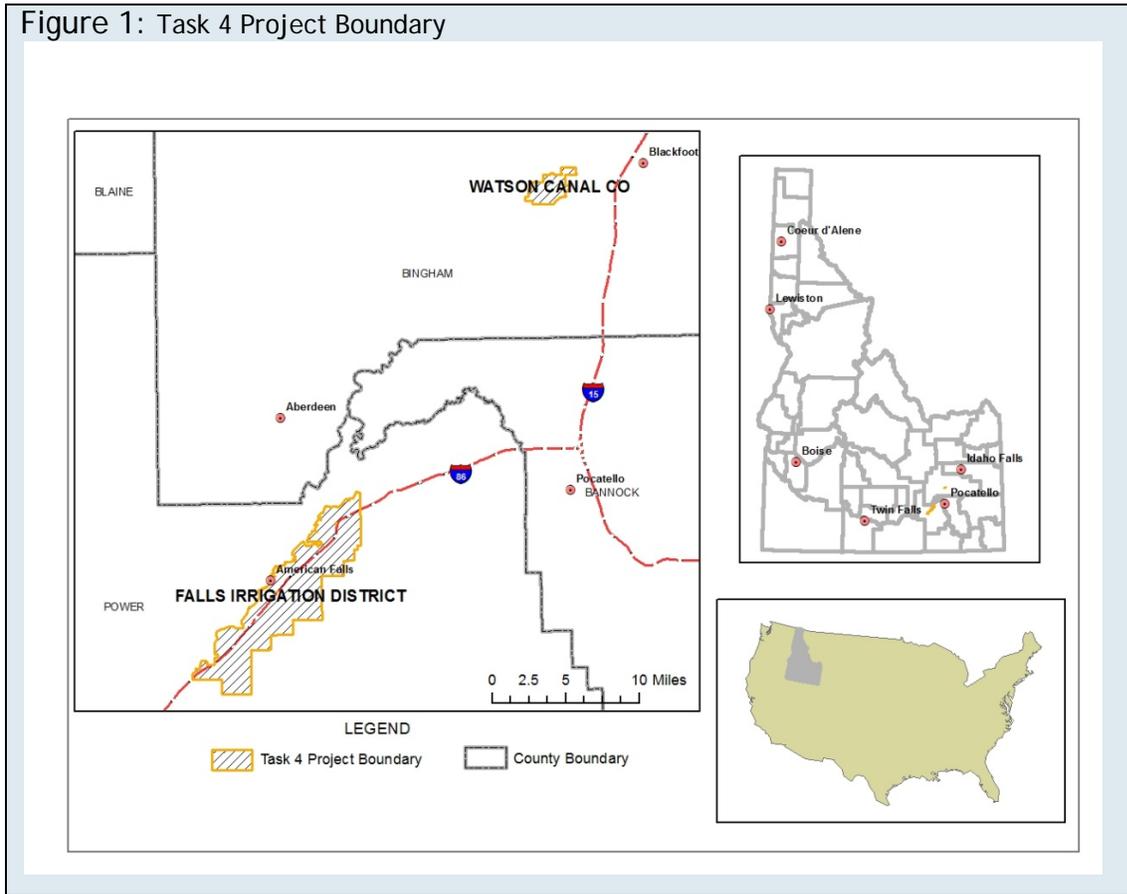
Accurate maps and digital data are the basic tools for planning and designing water projects, such as managed aquifer recharge, and are essential components of hydrologic modeling. Managed aquifer recharge projects are designed to return water to an aquifer. One method is to direct water through existing canals in the post-irrigation season with the intent of adding water to a zone of saturation below the water table. Having an accurate canal layer is important for this effort. The Idaho Department of Water Resources (IDWR) is active in many managed aquifer recharge projects targeting the Eastern Snake Plain Aquifer (ESPA).

Various irrigation districts have been identified to be ideal candidates for ESPA managed recharge projects because canals can be used for the recharge process and their location above the ESPA. Managers at IDWR agreed that the lands managed by the Falls Irrigation District and Watson Canal are areas that are important for recharge to the ESPA .

Area of Interest - Falls Irrigation District/Watson Canal Company:

The Task 4 Project Area consists of the areas within the Falls Irrigation District and the Watson Canal Company water right boundary. Both companies have large water rights, of approximately 125 cfs each, out of the Snake River. In addition, the Falls Irrigation District also has several groundwater rights. Snake river water is delivered to the Falls Irrigation District water users through the Main West and Main East canals and their laterals. The Watson Canal Company delivers water to its users through the Watson Slough.

Figure 1: Task 4 Project Boundary



Falls Irrigation District

The Falls Irrigation District (FID) is in Power County in Eastern Idaho. The City of American Falls is near the center of the Irrigation District boundary and has a population of 4111.ⁱ FID is in two SubBasins; the northern portion in American Falls (17040206) and the southern portion in Lake Walcott (17040209). American Falls Reservoir is along the Northwest boarder of FID. The American Falls reservoir along the Snake River forms the FID northern boundary (Figure 2a). Agriculture is the primary land use in the FID boundary.ⁱⁱ (Figure 3a)

Figure 2a: Task 4 Hydrography - Falls Irrigation District

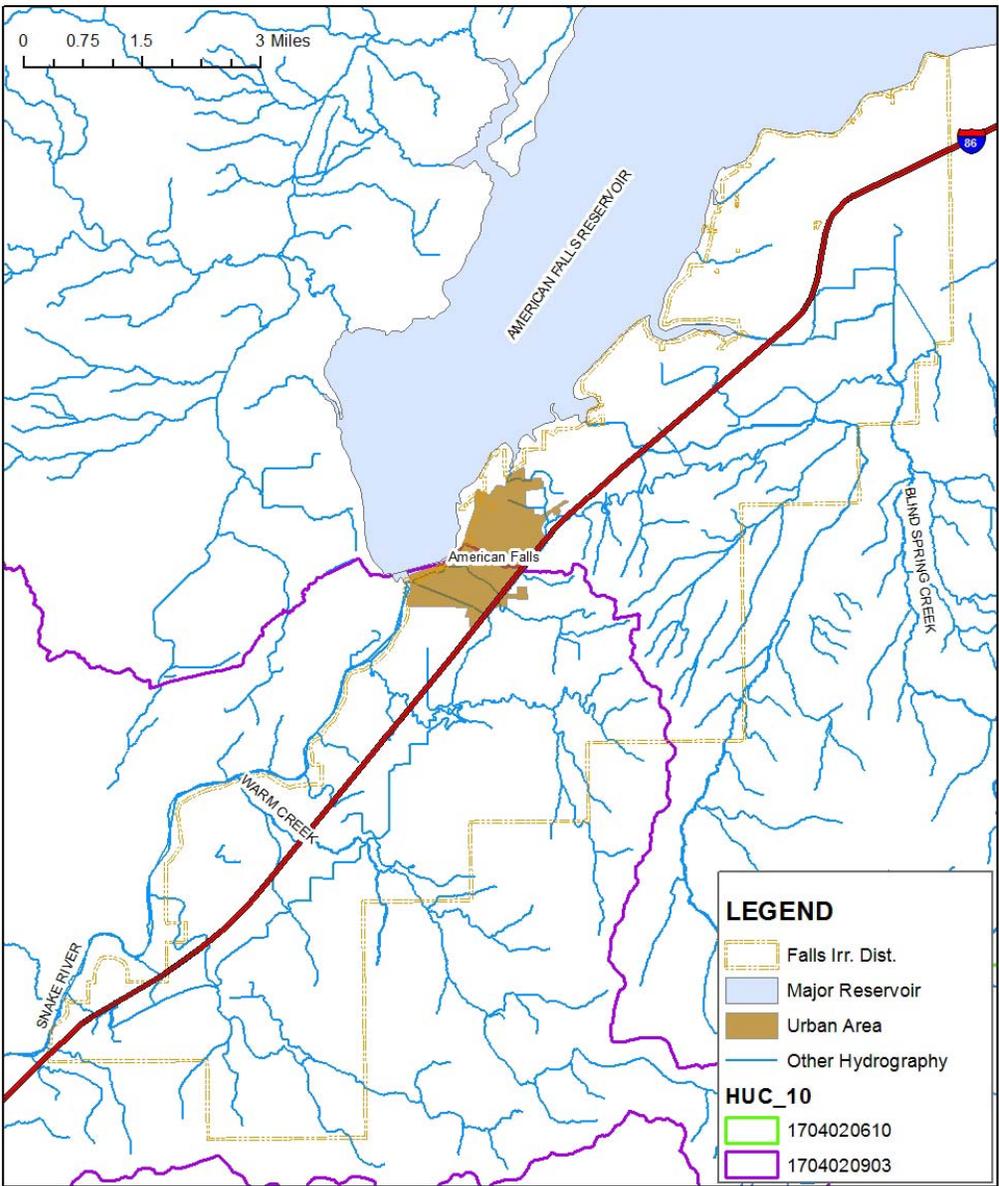
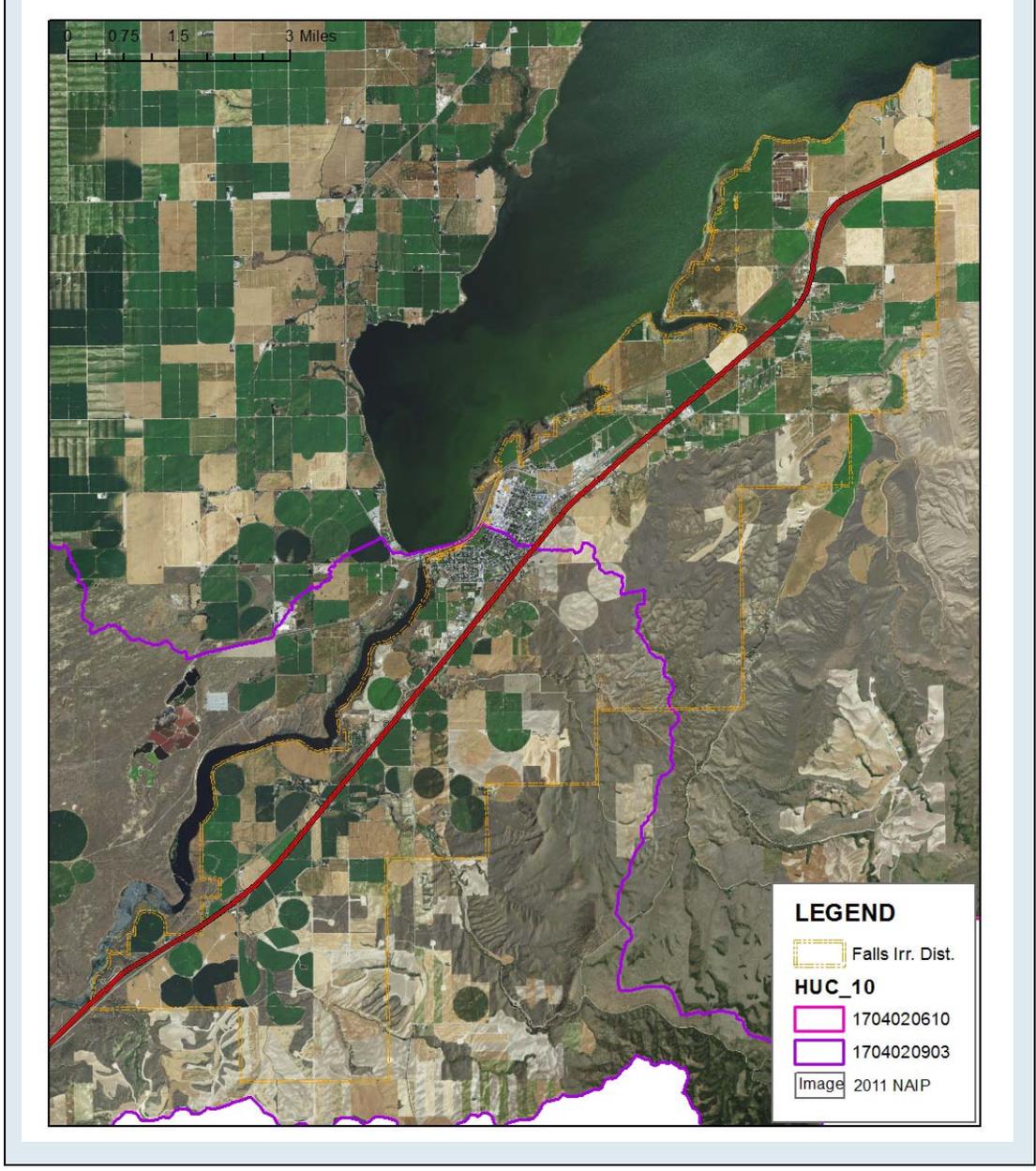


Figure 3a: Task 4 General Land Use - Falls Irrigation District



Watson Canal Company

The Watson Canal Company (WCC) is in Bingham County in Eastern Idaho. The town of Riverside (population 838) ⁱⁱⁱ is on the northern company boundary. The WCC is in the American Falls SubBasin and in two Watersheds; 1704020602 and 1704020603. There are no major lakes or reservoirs in the WCC boundary. The Snake River is to the south of the WCC boundary (Figure 2a). Agriculture is the primary land use in the WCC boundary.^{iv} (Figure 3b)

Figure 2b: Task 4 Hydrography - Watson Canal Co.

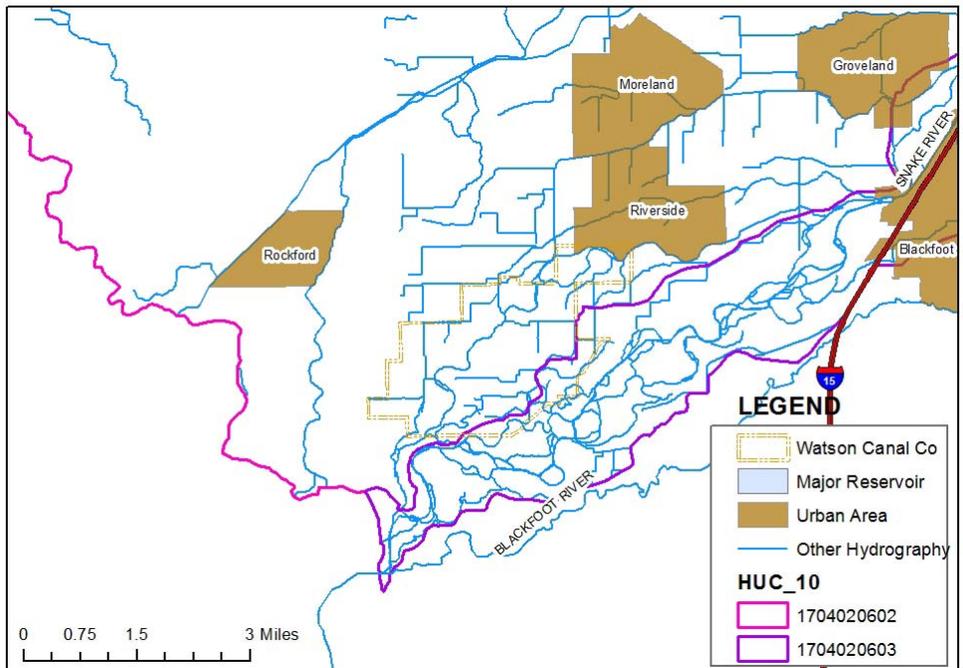
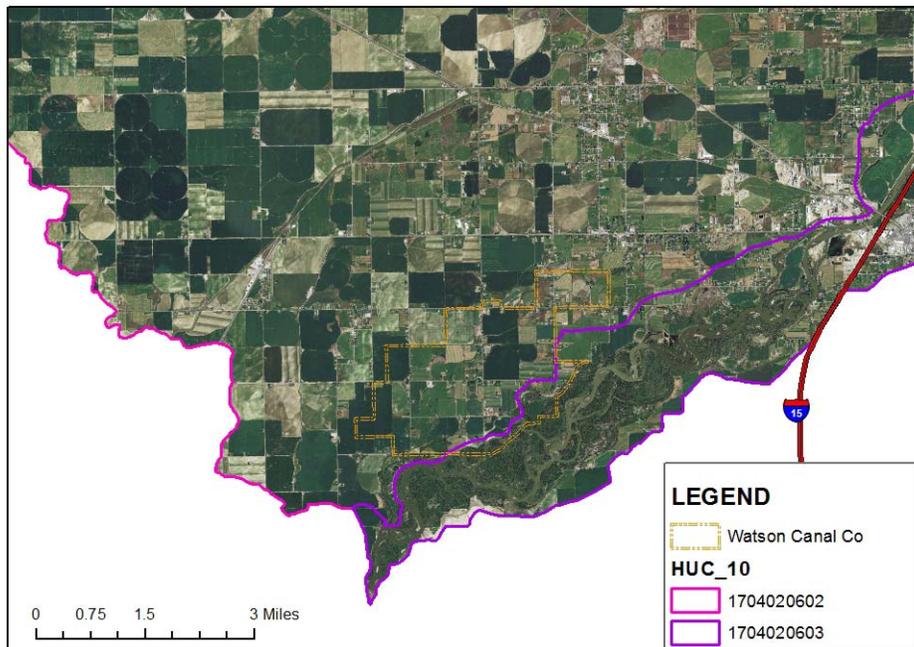


Figure 3b: Task 4 General Land Use - Watson Canal Co.



Methods:

The Idaho NHD Technical Point of Contact downloaded the appropriate SubBasins from the NHD website (<http://nhd.usgs.gov/data.html>). The project area consists of portions of Hydrologic units (HU), American Falls (17040206) and Lake Walcott (17040209).

The existing NHDFlowlines were photorectified using 2009 NAIP imagery. If there was data provided by local cooperators, it was used to update names for unnamed flowlines. Data provided by local cooperators was also used to clarify flowline direction and connectivity in areas where it could not be determined through imagery or existing maps.

The photorectified and updated data was provided to the State of Idaho Technical Point of Contact. The USGS NHD GeoEdit Tools were used to incorporate changes for submittal to the USGS for inclusion into the NHD.

Results:

Updates Provided to USGS for Incorporation into the NHD

During the update process, 149 NHDFlowlines were inserted, updated, or deleted. In addition, there were 2 Waterbody edits, 3 NHD Area edits, and zero NHDLine edits (Table 2). Updates were submitted to USGS for incorporation into the NHD. See Figure 5a and Figure 5b for representations of all the updated linework as a result of this project.

Table 2: Number of Edits per Subbasin	
NHDFlowline Edits	Update/Modify
1704020602	54
1704020603	25
1704020610	2
1704020903	68
TOTAL	149
NHDWaterbody Edits	
1704020602	0
1704020603	0
1704020610	0
1704020903	2
TOTAL	2
NHDArea Edits	
1704020602	1
1704020603	1
1704020610	0
1704020903	1

Figure 5a: Task 4 Updates - Falls Irrigation District

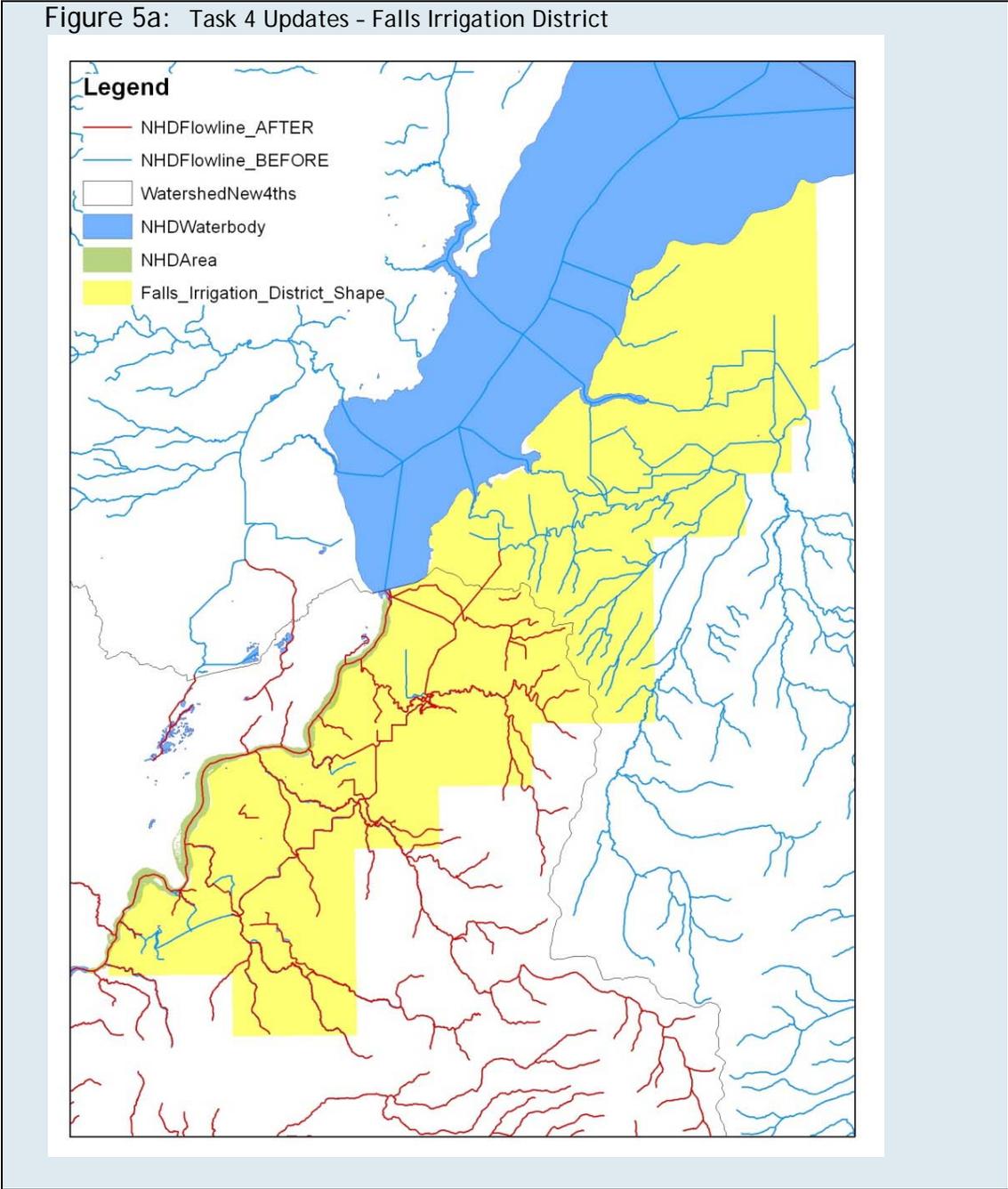
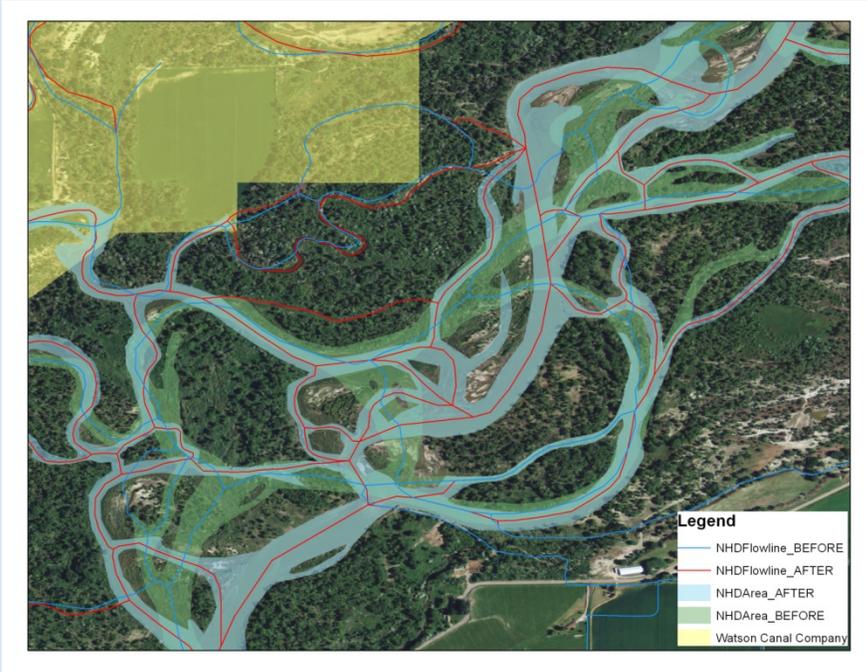
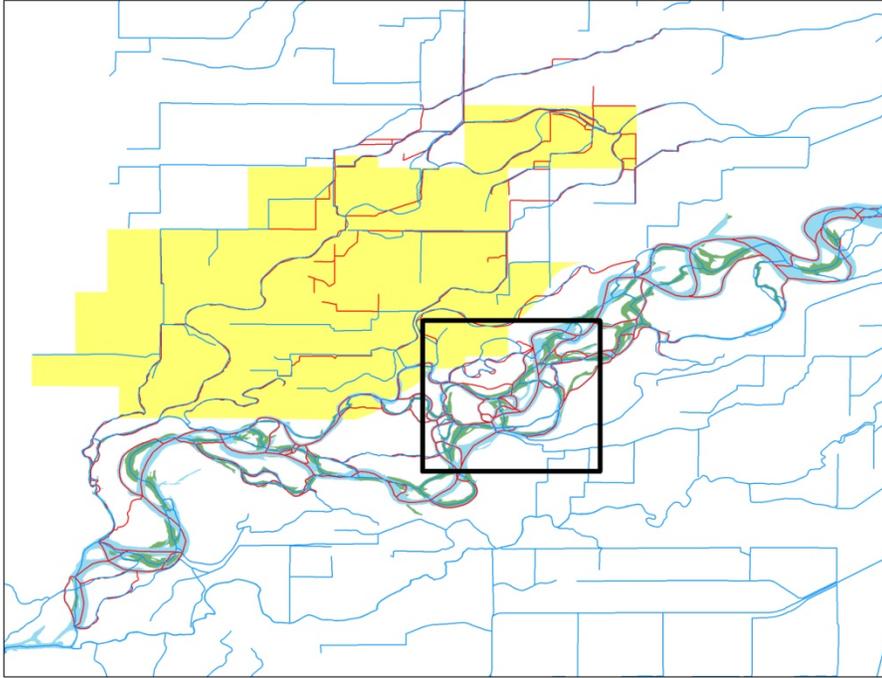


Figure 5b: Task 4 Updates - Watson Canal Co.



Discussion and Conclusions:

Issues and Challenges

- 1) *Extensive photorevision was necessary.* Because of the large amount of agricultural activity in the project area, the existing NHDFlowlines did not reflect current ground conditions.
- 2) *Complexity of the Braiding of the Snake River.* A significant amount of time was required in order to update the braiding of the Snake River near the Watson Canal Company boundary. (Figure 5b)
- 3) *The complexity of the GeoEdit Tools.* Many major edits were required to both the NHDFlowline and NHDArea and/or Waterbody feature classes. This was time consuming for IDWR staff.

Conclusion

Although photorevision is an effective way to update hydrography, input from local sources is critical in accurately depicting connectivity, vertical relationships, and flow direction. Cooperation from local managers was achieved by providing maps and data products that they found useful in their business processes.

IDWR was able to provide better data for development and monitoring of managed recharge projects and other water management projects. In working together, all the cooperators have a product that is better than what any one organization could have produced.

Acknowledgements:

Thank you to Eric Rafn for his work with preparing the linework for this project.

End Notes:

- i <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>
- ii Visual analysis of GAP data. <http://gapanalysis.usgs.gov/>
- iii <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>
- iv Visual analysis of GAP data. <http://gapanalysis.usgs.gov/>