Lessons learned in Project Development

North Burnt Fork Creek

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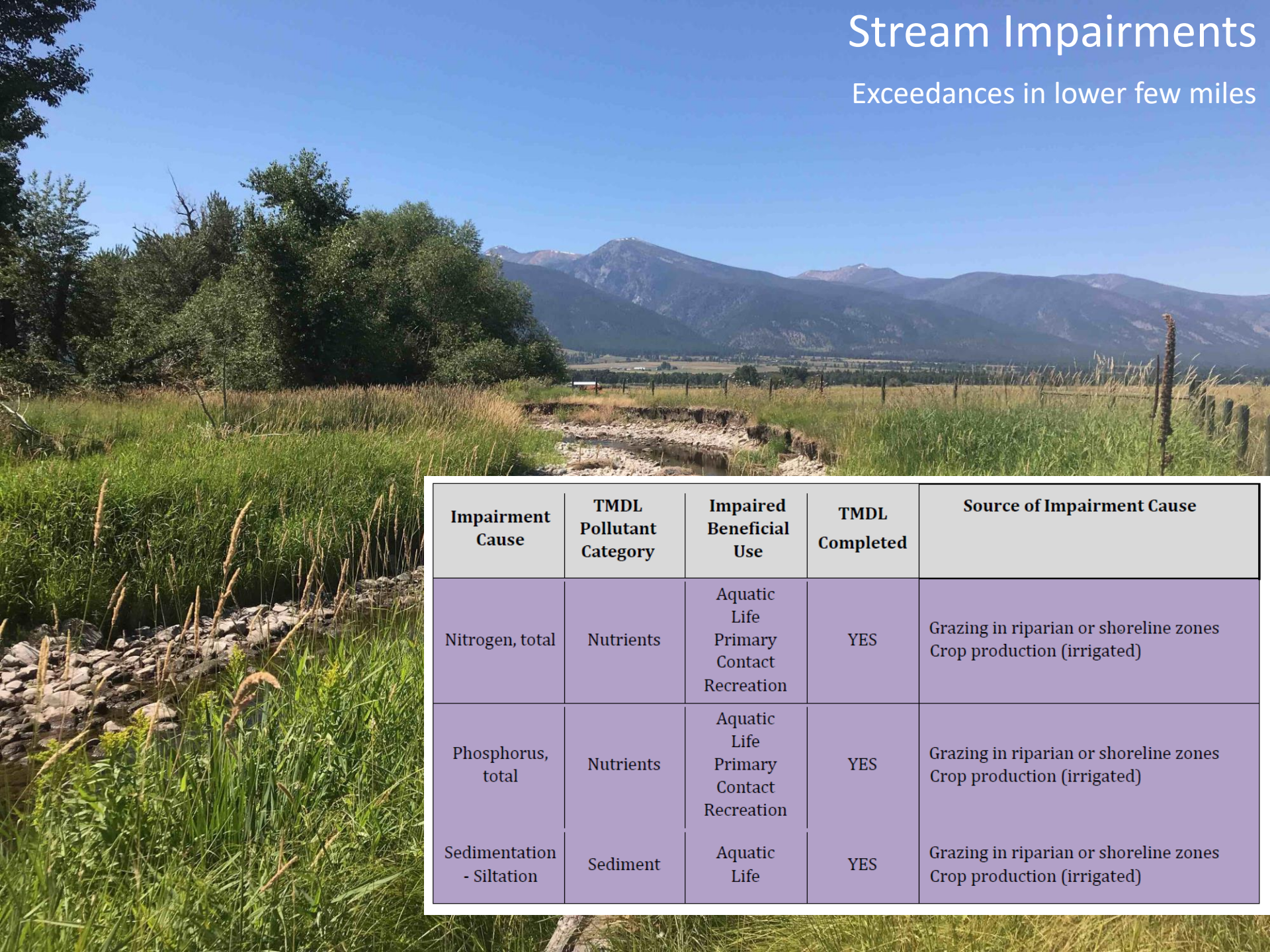
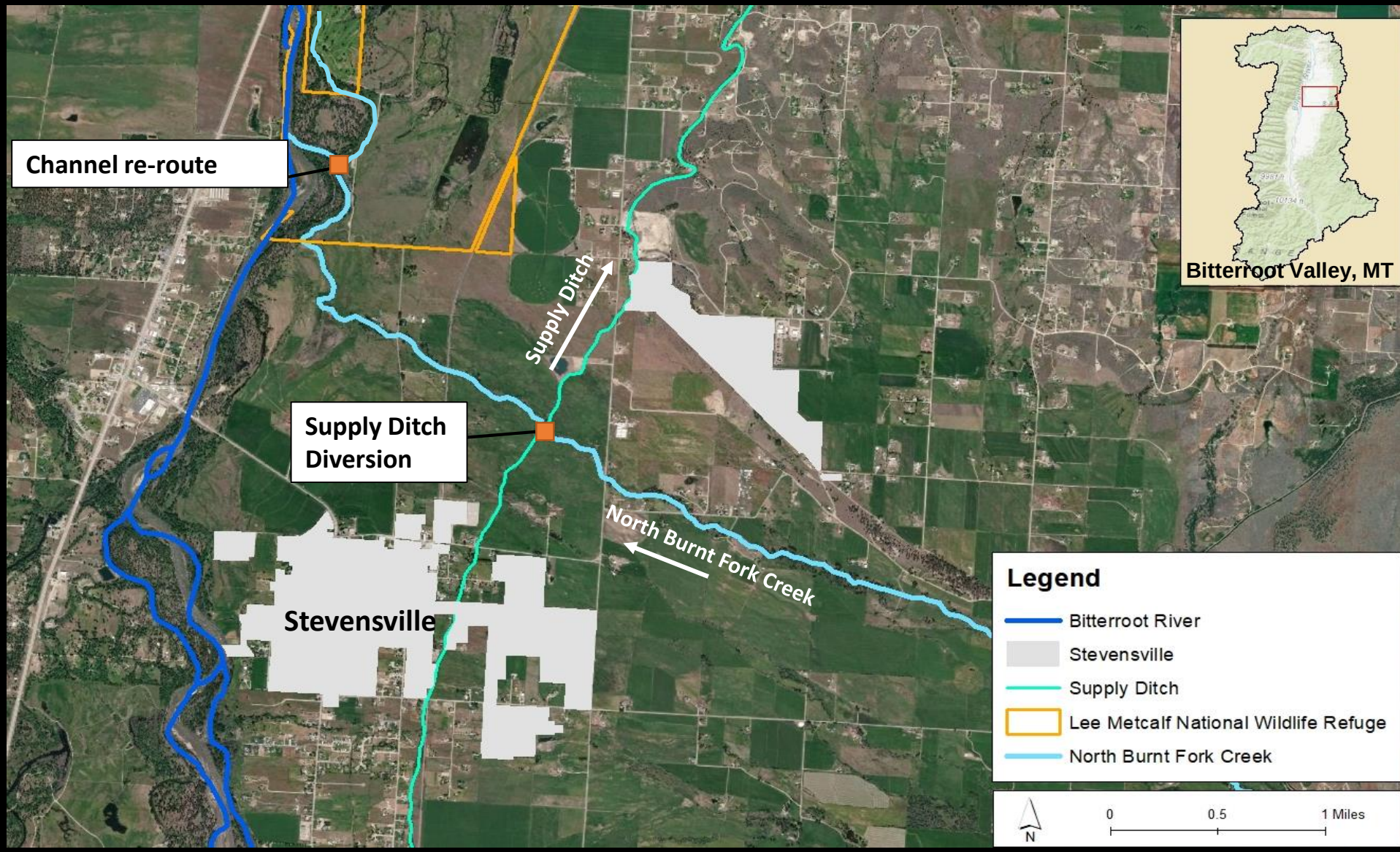
Trout Unlimited

Stream Impairments

Exceedances in lower few miles



Impairment Cause	TMDL Pollutant Category	Impaired Beneficial Use	TMDL Completed	Source of Impairment Cause
Nitrogen, total	Nutrients	Aquatic Life Primary Contact Recreation	YES	Grazing in riparian or shoreline zones Crop production (irrigated)
Phosphorus, total	Nutrients	Aquatic Life Primary Contact Recreation	YES	Grazing in riparian or shoreline zones Crop production (irrigated)
Sedimentation - Siltation	Sediment	Aquatic Life	YES	Grazing in riparian or shoreline zones Crop production (irrigated)



TROUT UNLIMITED

Supply Ditch Crossing


April 2019
+ 60 cfs

Common Summer Conditions:

Flow: 0.5-1cfs

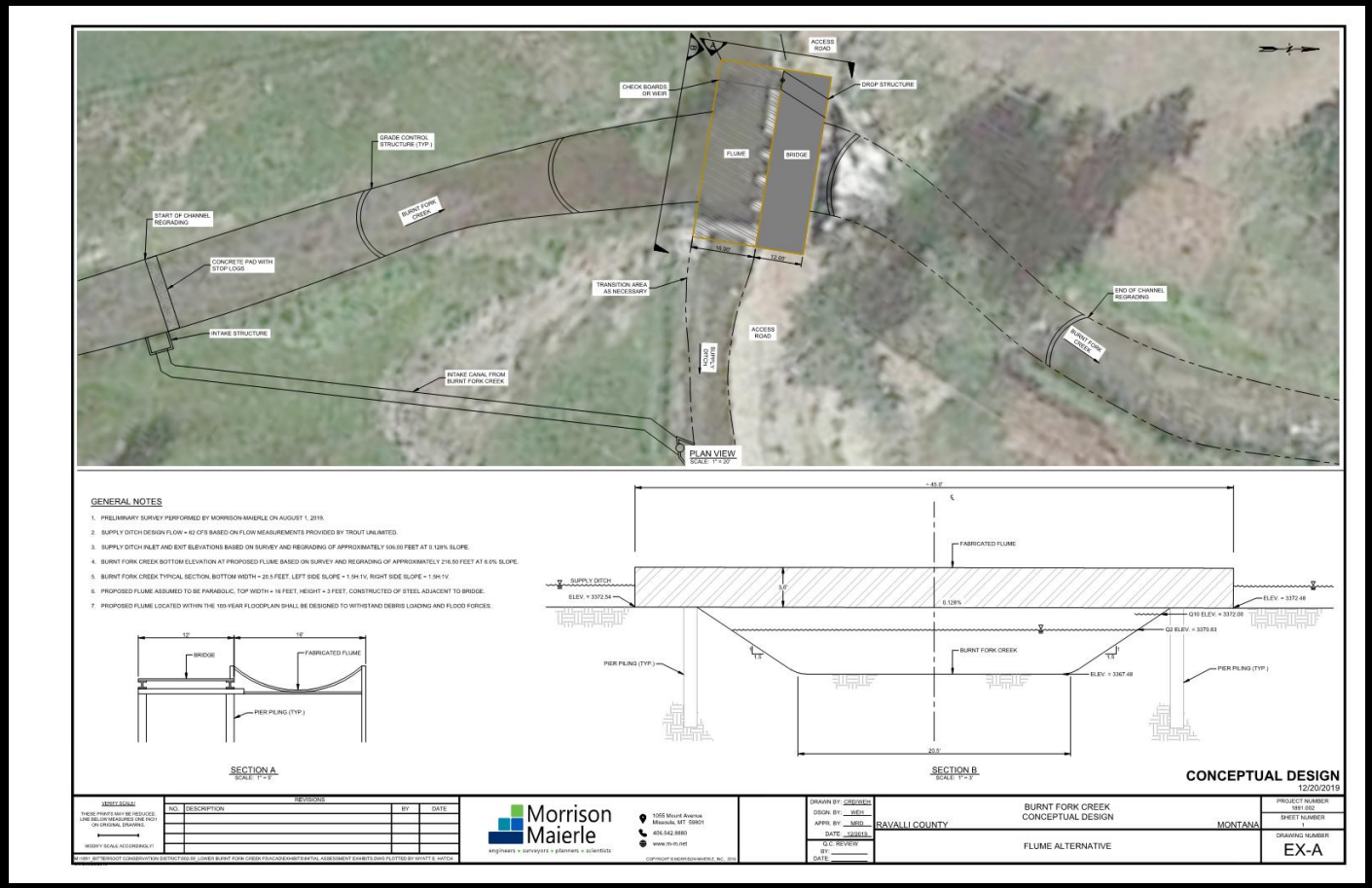
Temperature: 65-75 degrees

Low Flows (July 2019)

Potential Project

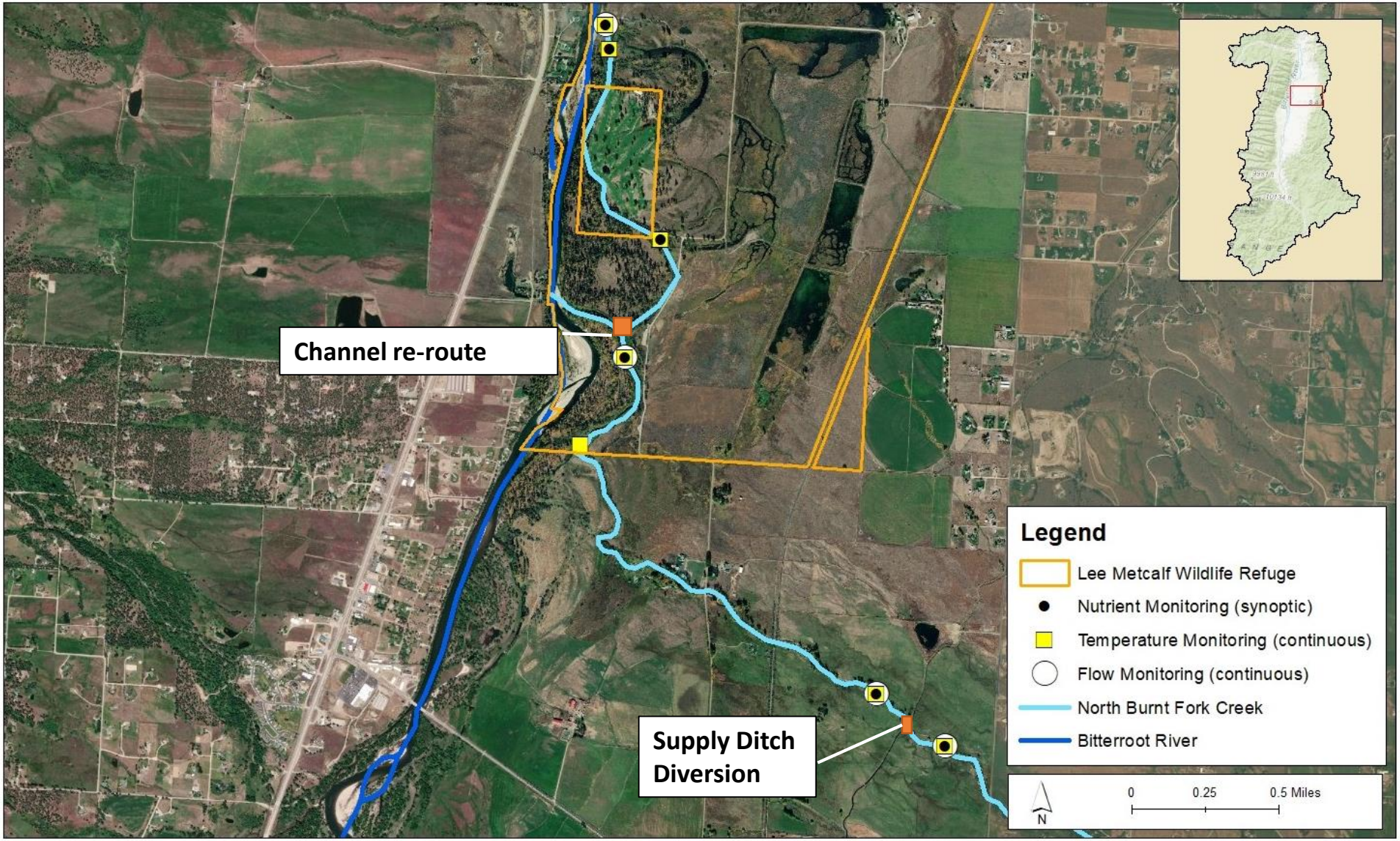
Can we upgrade Supply Ditch infrastructure to:

- Eliminate co-mingling of stream and ditch water
- Eliminate passage barriers
- Allow full management of irrigation water (improve?)



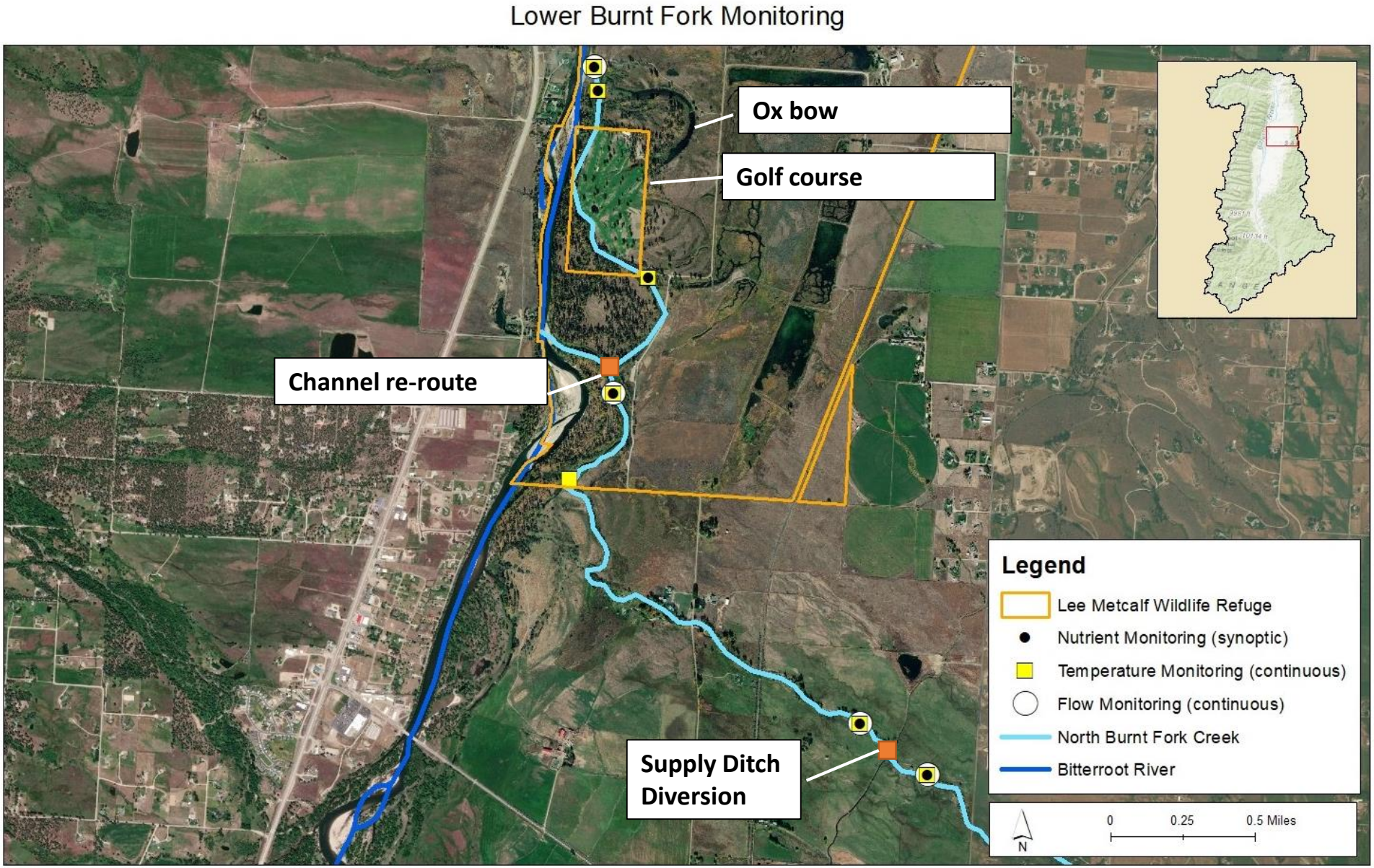
Lee Metcalf National Wildlife Refuge

Lower Burnt Fork Monitoring



Lee Metcalf National Wildlife Refuge

Flow, Temperature and Nutrient Monitoring: August, Sept, Oct



Nutrients: TN,TP, TSS, Nitrate+Nitrite

Results

	Supply Ditch (Upstream-Downstream)	**Lee Metcalf** (Upstream-Downstream- north path)
Temperature (summer)	↓ 65-75 degrees. Below Supply generally 2 degrees cooler than above. Supply Ditch water cooler. Increased flow.	↑↓↑ 60 degrees with cold GW inflows Lack of riparian cover. **Groundwater** near golf course decreases temp. Oxbow increases temp.
Flow (summer)	↑ Supply Ditch inefficiencies slightly augment streamflow	↑ Substantial groundwater inflows in lower ¾ mile **(August: 1 cfs to 12 cfs along northern channel)**

- Supply ditch leakage augments temperature and flow. Infrastructure upgrades need to consider this.
- Lee Metcalf: North path has increased flow (good) and temp (bad). Some cold refugia. Lots of riparian restoration opportunities to limit solar exposure with either path.

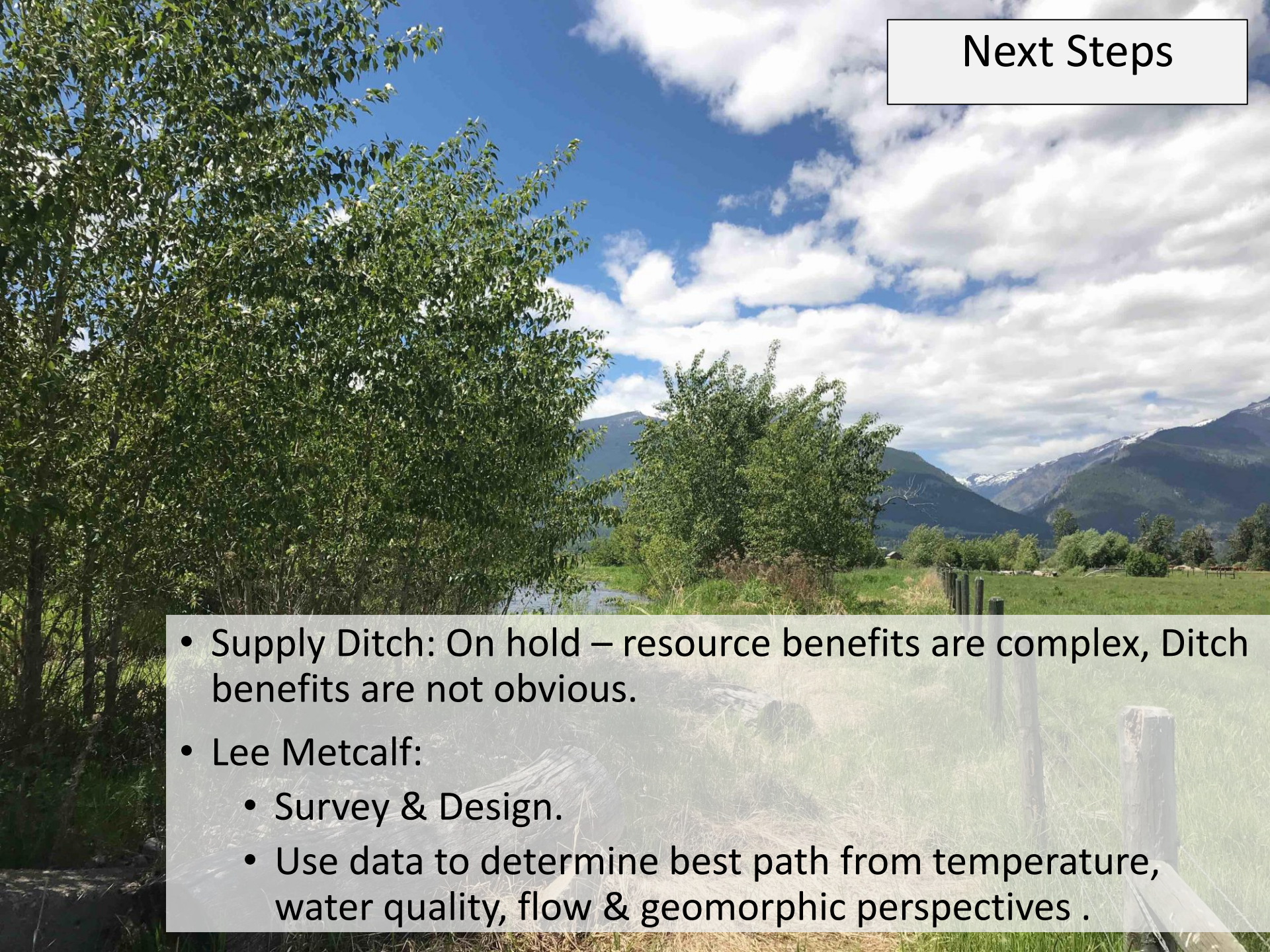
Results

	Supply Ditch (Upstream-Downstream)	**Lee Metcalf** (Upstream-Downstream- north path)
TSS	↑ Doubles, Max=2-8mg/L	↓↑ Increase begins at split
TN	↑ All samples under water quality standards	↑↓ All samples under water quality standards
TP	↓ Aug & Sept samples exceed water quality standards at both sites. Dilution	↓↑ Aug & Sept samples exceed water quality standards above Golf course. Dilution

Nutrients:

- TP is high throughout lower Burnt Fork
- Supply Ditch can diminish water quality (TSS, TN), but also dilutes high TP. Alternatives to spilling?
- Lee Metcalf: ?

Next Steps



- Supply Ditch: On hold – resource benefits are complex, Ditch benefits are not obvious.
- Lee Metcalf:
  - Survey & Design.
  - Use data to determine best path from temperature, water quality, flow & geomorphic perspectives .