LIST OF REACHES OUTSIDE PRIORITIZATION

Whetstone Creek

Entire Drainage to Confluence with Touchet

Coppei Creek Headwaters

North and South Forks Coppei Creek

Whisky Creek

Entire Drainage to Confluence with Touchet

Lower Patit Creek

Patit Creek Below Forks

South Fork Patit Creek

Entire South Fork Patit Drainage

South Fork Headwaters

From Rainwater Wildlife Management Boundary Upstream

Robinson Fork Headwaters

From River Mile 2.52 Upstream

Wolf Fork Headwaters

Upstream of Coates Creek

North Fork Headwaters

From River Mile 15.38 Upstream

CITY REACHES

Touchet Waitsburg

Length of Waitsburg City Levee, River Mile 10.19-12.3

Coppei Waitsburg

Coppei Creek River Mile 0-2.2

Touchet Dayton

Length of Dayton City Levee, River Mile 20.72-23.88

ABBREVIATIONS

CREP	Conservation Reserve Enhancement Program
mi	mile

Whetstone Creek Reach

Reach Description

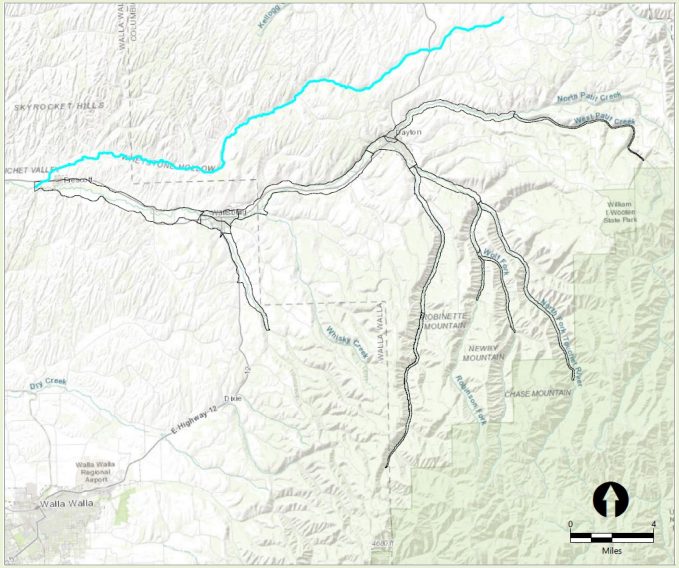
Whetstone Creek is a long, intermittent tributary to the Touchet River that drains an expansive basin north of the mainstem Touchet mainly composed of grain fields. The creek enters the mainstem Touchet just below the city of Prescott. The reach was excluded from the assessment due to a limited population of focal species. Additionally, restoration is limited by surrounding agricultural fields that constrict the floodplain.

Whetstone Creek is confined as an agricultural ditch for most of the basin and is surrounded by a narrow riparian buffer within surrounding grain fields. Channelization and linearization have removed complexity, increased transport capacity, and led to systemic incision. Riparian plantings as part of the Conservation Reserve Enhancement Program (CREP) are present along the banks, but riparian vegetation is limited because the creek traverses agricultural fields for most of its length. Because of incision, floodplain inundation is likely limited to major flood events.

Restoration in Whetstone should be aimed at reversing stream incision, expanding the channel migration area, and increasing discharge by raising the floodplain water table. Restoration in Whetstone Creek should target areas of presumed fish use in the lower section of the creek. The first step to restoration should be expanding the channel migration area where possible and expanding the width of riparian buffers. Large wood additions can help promote gravel storage to reverse detrimental incision.

Whetstone Creek

Vicinity Map



Reach Characteristics

Parent River	Touchet River
Approx. River/Creek Length (mi)	29.30
Area Drained by Reach (mi^2)	102.27
Average Slope	0.77%
Notable Tributaries	N/A

Coppei Creek Headwaters Reach

Reach Description

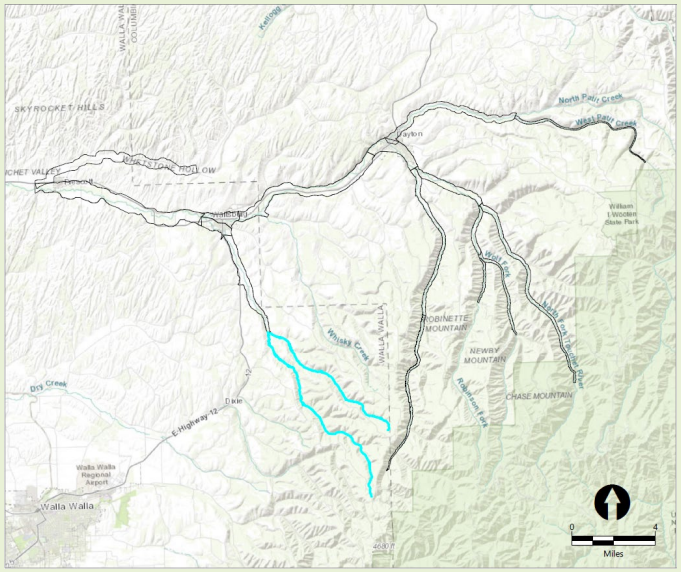
The Coppei Creek Headwaters reach includes North and South Forks Coppei Creek. These two tributaries maintain flow for most of the year. Both tributaries descend from higher elevation forested valleys to more rural and residential land near their confluence. These tributaries were not included in the assessment because flow and riparian management are considered the primary restoration strategies for the reach.

Scouring to bedrock is an issue in both forks of Coppei Creek. Both streams transition from densely forested and unconfined headwater sections to rural and residential sections lower in the basin. Roads and residences affect the channel migration area in sections, and riparian plantings are evident in the lower portions of this reach. An adequate riparian buffer is maintained for most of each reach and the channels maintain sinuosity even through the sections with greater anthropogenic influence.

Restoration in the Coppei Creek Headwaters reach should target storing gravel, eliminating anthropogenic confinements in the lower sections of the reach, and expanding riparian buffers in the vicinity of fields and residences. Large wood should be installed to promote gravel storage in areas of exposed bedrock. Low summer discharge is also an issue in the upper Coppei basin, and restoration actions that target increasing floodplain width and inundation will help store more water in the floodplain. Gravel storage will also help increase baseflow. If present, any water withdrawals from the upper basin should be minimized.

Coppei Creek Headwaters

Vicinity Map



Reach Characteristics

Parent River	Coppei Creek
Approx. River/Creek Length (mi)	19.13
Area Drained by Reach (mi^2)	23.13
Average Slope	4.35%
Notable Tributaries	N/A

Whisky Creek Reach

Reach Description

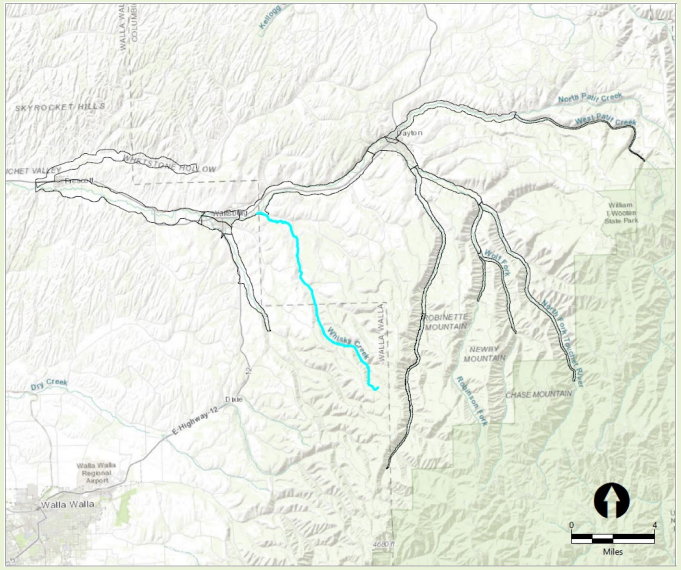
Whisky Creek is a perennial stream draining a primarily agricultural basin south of the mainstem Touchet River. Whisky Creek enters the Touchet River just upstream of Waitsburg, and the stream is dry for most of the summer. The Whisky Creek reach was excluded from the prioritization because of its ephemeral nature and a natural migration barrier that limits salmonid use.

Whisky Creek is surrounded by agricultural fields for most of the reach and lacks riparian coverage with the exception of the forested headwaters. A narrow buffer of planted riparian trees is present in the lower part of the reach, but much of the middle reach lacks riparian trees. Complexity and sinuosity are high for most of the reach with multiple flow paths available, and there are fewer channelized sections than other similarly sized tributaries in the basin.

The biggest concerns for Whisky Creek are increasing the duration of continuous flow and establishing riparian vegetation. Any water withdrawals within the basin should be minimized to return flow to the creek. Riparian planting efforts should target establishing streamside shade in exposed areas. Agricultural and road confinements should be set back to expand the floodplain and promote riparian revegetation.

Whisky Creek

Vicinity Map



Reach Characteristics

Parent River	Touchet River
Approx. River/Creek Length (mi)	12.62
Area Drained by Reach (mi^2)	39.39
Average Slope	3.27%
Notable Tributaries	N/A

Lower Patit Creek Reach

Reach Description

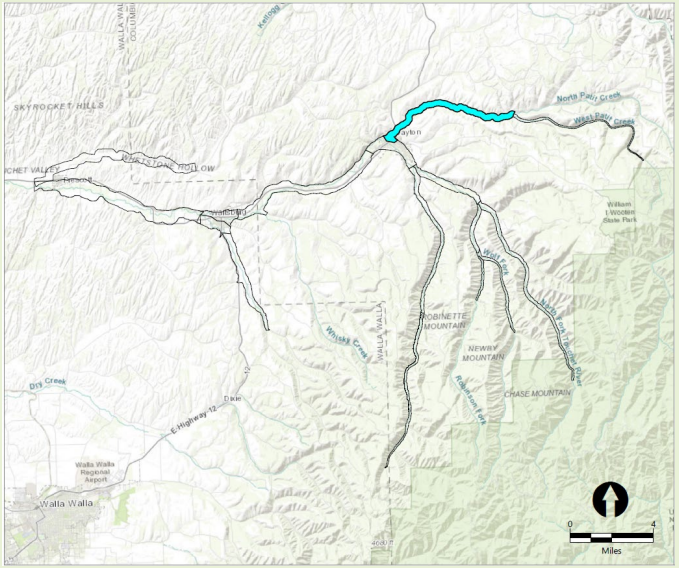
Lower Patit Creek is a perennial stream that enters the mainstem Touchet at Dayton. The lower reach below the forks passes through agricultural fields and residential and industrial property in Dayton before entering the Touchet River. The Lower Patit Creek reach was not included in the prioritization because it is highly confined by residential and agricultural property and goes subsurface for a long period during the summer.

Much of the Lower Patit Creek reach is systemically incised and disconnected from the floodplain. Like Whetstone Creek and Coppei Creek reaches, scouring to bedrock is an issue in channelized sections. Channelization is evident through many fields, and only a narrow buffer of planted riparian trees borders the channel. Geomorphically, this reach is most similar to the middle Coppei Creek reaches where incision is so great that intensive restoration would be required to re-establish floodplain connectivity and channel migration. Low or ceasing summer flows are also an issue in the Lower Patit Creek reach.

Restoration actions in this reach should target expanding channel migration and promoting floodplain benching to help widen the active channel migration area. Large wood should be installed to help retain gravel and reverse incision. Expanding riparian buffers along fields will also be essential to providing woody debris and shade in this reach. Water withdrawals should also be minimized in this reach to return flow to the creek.

Lower Patit Creek

Vicinity Map



Reach Characteristics

Parent River	Touchet River
Approx. River/Creek Length (mi)	7.84
Area Drained by Reach (mi^2)	65.82
Average Slope	1.05%
Notable Tributaries	North Fork Patit Creek South Fork Patit Creek

South Fork Patit Creek Reach

Reach Description

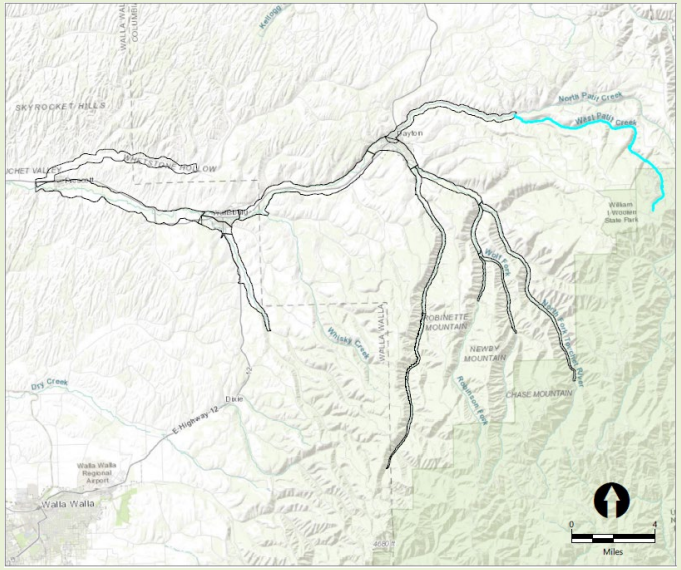
South Fork Patit Creek is an intermittent stream that drains a mostly forested, higher elevation part of the Patit Creek watershed. Some residences are present along the creek and there is some cattle grazing in the valley. The reach was not included in the prioritization because the creek dries up for much of the year. Despite this, data and field surveys show that the South Fork Patit Creek reach has a spawning population of steelhead.

When flowing, the creek has an adequate channel migration area for most of the reach, and a moderate riparian vegetation buffer. Riparian vegetation density increases with upstream distance. The road and abundant road crossings are primary confining features as well as some residences in the floodplain. Large, cobble-sized substrate indicated transport capacity was high when the stream was flowing, and multiple bedrock pools were observed in the dry creek bed.

Restoration actions in this reach should target increasing the duration of continuous flow and storing smaller-sized alluvium to help initiate beneficial geomorphic processes. This is a likely spawning reach for the Patit steelhead, so storing gravel adequate for spawning will help expand fish habitat. Low-tech log structures such as beaver dam analogs could be used to promote sediment storage and elevation of the water table to increase baseflow. Water withdrawals should also be minimized in this reach to return water to the creek. Establishing a longer window of cold-water habitat will increase the chance of juveniles emerging in this reach surviving the summer and growing longer before entering the mainstem Touchet.

South Fork Patit Creek

Vicinity Map



Reach Characteristics

Parent River	Patit Creek
Approx. River/Creek Length (mi)	11.68
Area Drained by Reach (mi^2)	22.59
Average Slope	3.90%
Notable Tributaries	N/A

South Fork Headwaters Reach

Reach Description

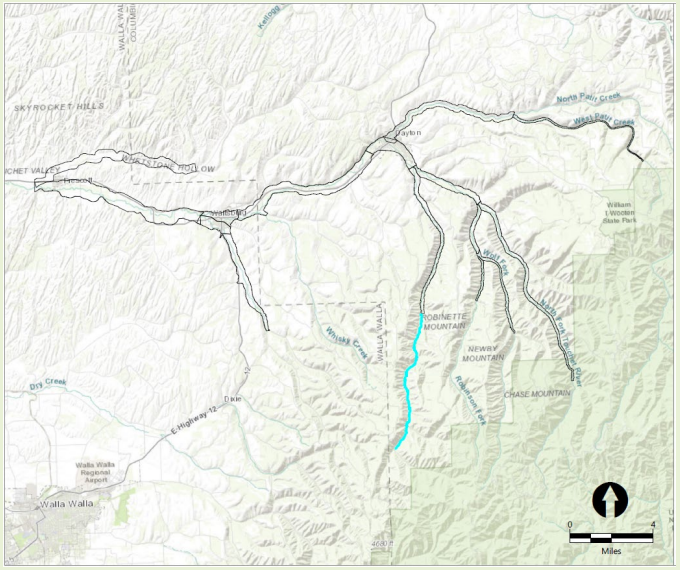
The South Fork Headwaters reach begins at the boundary of the Umatilla Tribe's Rainwater Wildlife Area at river mile 8.9 and continues upstream 11.83 river miles until the transition to the Green Fork Touchet River. Most of the reach is protected within the Rainwater Wildlife Area and drains densely forested valleys with minimal anthropogenic influence.

The floodplain is densely vegetated with conifers throughout the reach, and the reach exhibits high complexity with many side channels and small islands. The South Touchet Road crosses the river in multiple locations and is the primary confining feature in the valley along with a few residences above the Rainwater boundary. Gravel bar and island building is evident in the reach, indicating active geomorphic processes and channel migration throughout the floodplain.

This reach was not included in the assessment because it is within the Rainwater Wildlife Management area. This protection has maintained it as high-quality salmonid habitat with minimal anthropogenic influence. Low summer flows are a concern in the South Fork, especially downstream near the mouth. Any restoration actions in this reach should target storing more snowmelt runoff in the floodplain aquifer for slow release during the summer. This could include low-tech restoration features like beaver dam analogs to help raise the water table. Additionally, restoration should aim to limit the influence of roads in the floodplain and attempt to vegetate exposed gravel bars and islands.

South Fork Headwaters

Vicinity Map



Reach Characteristics

Parent River	Touchet River
Approx. River/Creek Length (mi)	11.83
Area Drained by Reach (mi^2)	43.64
Average Slope	3.77%
Notable Tributaries	Griffin Fork Burnt Fork Green Fork

Robinson Fork Headwaters Reach

Reach Description

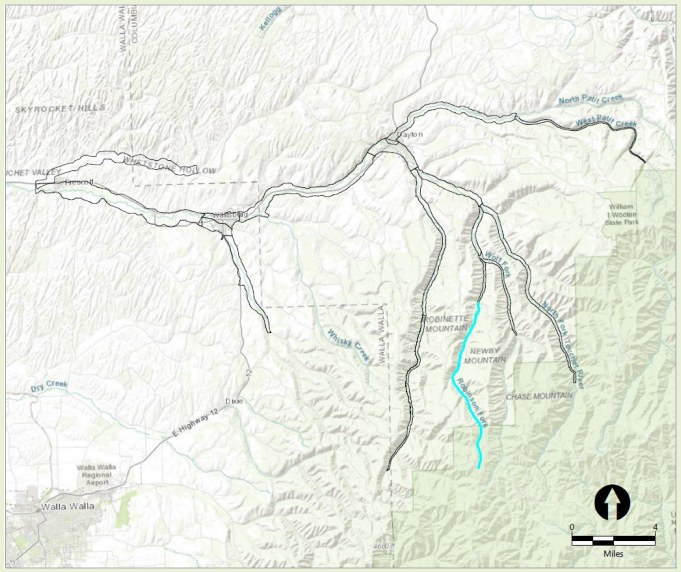
The Robinson Fork Headwaters reach begins at the upstream boundary of the prioritized Robinson Fork reach at river mile 2.52 and continues 8.88 river miles upstream. The upper Robinson Fork valley is vegetated with conifers, but there are both logging and livestock operations in the upper watershed. The reach was not included in the prioritization due to property access limitations.

The portion of the reach just upstream of the assessment boundary is densely vegetated, but further upstream the creek runs through a more open valley with hillsides that have been influenced by fires, logging, or both. Dirt roads and logging roads are abundant within the floodplain and act as confining features. Low flows in the summer are also a problem in the Robinson Fork. The channel appears to have moderate complexity and meanders and gravel bars provide evidence of active channel migration.

Restoration in the upper Robinson Fork should target limiting the effects of livestock and logging, revegetating the surrounding hillsides, and reducing the quantity of dirt roads in the floodplain. Restoring surrounding and riparian forests will also help maintain snowpack longer and provide increased summer baseflow. Reducing floodplain roads will promote beneficial geomorphic processes and help revegetate these exposed areas.

Robinson Fork Headwaters

Vicinity Map



Reach Characteristics

Parent River	Wolf Fork Touchet River
Approx. River/Creek Length (mi)	8.88
Area Drained by Reach (mi^2)	13.35
Average Slope	6.05%
Notable Tributaries	N/A

Wolf Fork Headwaters Reach

Reach Description

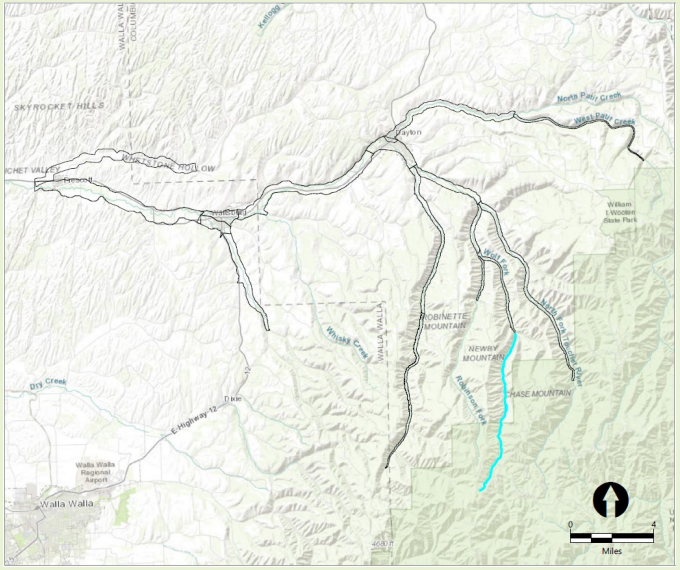
The Wolf Fork Headwaters reach begins at the assessment reach boundary at Coates Creek and continues 8.08 river miles upstream. This reach and its tributaries drain densely forested valleys descending from some of the highest elevation ridges and peaks in the Touchet basin. This reach was not included in the assessment due to property access limitations.

The Wolf Fork Headwaters are the source of some of the coldest flows in the Touchet basin during the summer months. Anthropogenic influences in the lower part of this reach include dirt roads and residences in the floodplain. Further upstream, the entire floodplain is vegetated, and channel complexity and woody debris quantities are high. There appears to be some logging on ridges in this basin. These headwater reaches are relatively undisturbed and appear to be excellent headwater habitat for resident salmonids.

Restoration in the Wolf Fork Headwaters reach should be aimed at reducing the impacts of residences and roads in the lower parts of this reach. Setting back roads from the floodplain will help expand channel migration opportunities to develop sinuosity in this high-gradient reach. The supply of woody debris in this reach is very high. Restoration could involve low-tech log structures to help promote the formation of jams that can help form pools and store spawning-sized gravel in this high-gradient reach.

Wolf Fork Headwaters

Vicinity Map



Reach Characteristics

Parent River	North Fork Touchet River
Approx. River/Creek Length (mi)	8.08
Area Drained by Reach (mi^2)	15.97
Average Slope	6.52%
Notable Tributaries	Coates Creek Whitney Creek

North Fork Headwaters Reach

Reach Description

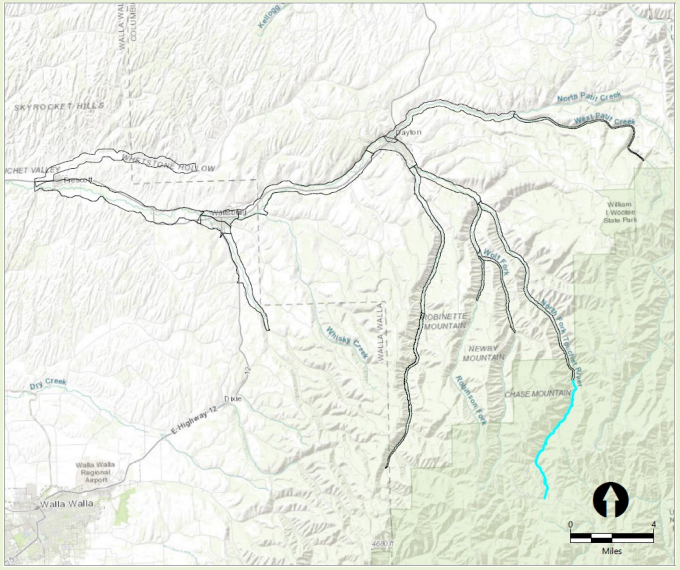
The North Fork Headwaters reach runs from the assessment boundary at the mouth of Spangler Creek 6.2 river miles upstream. The entire reach parallels the North Touchet Road, and the Bluewood Ski area is located at the upstream end of the basin. This reach was not included in the assessment because it is above the presumed habitat extent of anadromous salmonids.

The North Touchet Road is a defining feature influencing the floodplain in this reach. The road acts as an encroachment, confining the available channel migration area. Riparian vegetation is dense and mostly coniferous, but there are signs of logging activity and/or fires in the surrounding hillsides. Aerial imagery indicates moderate complexity where the channel is not confined by the road, and woody debris is abundant in the channel. The North Fork is also a relative stronghold for cold water and abundant flow in the summer.

Restoration in this part of the basin should target increasing forest coverage in the hillsides because removing the confinement of the North Touchet Road is not a feasible restoration option. Open areas affected by logging, fires, and the ski area could be targeted to develop mature forests, which would help delay snowmelt and preserve more water for summer. Additionally, any slash from forest management practices and fires could be added to the creek to help augment woody debris.

North Fork Headwaters

Vicinity Map



Reach Characteristics

Parent River	Touchet River
Approx. River/Creek Length (mi)	6.20
Area Drained by Reach (mi^2)	11.73
Average Slope	6.38%
Notable Tributaries	N/A

Touchet Waitsburg City Reach

Reach Description

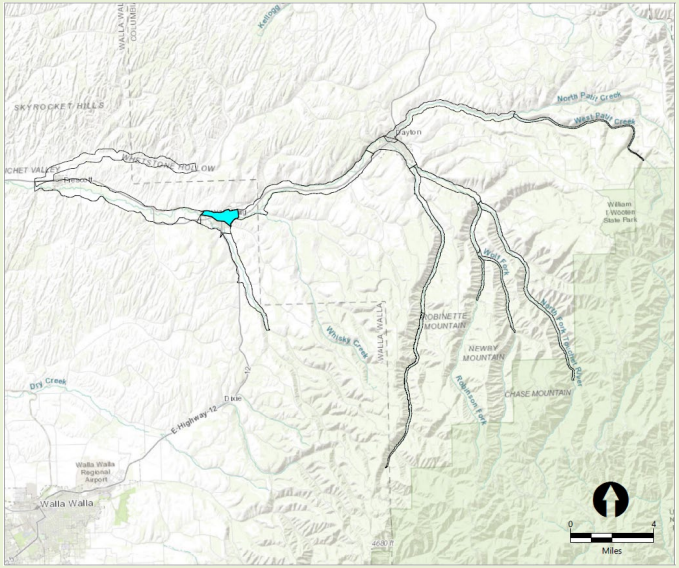
The Touchet Waitsburg city reach spans the length of the levees on both banks in Waitsburg. U.S. Army Corps of Engineers levees exist on both banks for most of the reach, and there is a noted breach in the right bank levee just upstream of the Highway 12 bridge. The Touchet Waitsburg city reach was excluded from the prioritization because the levees would limit any instream work.

The Touchet Waitsburg city reach is highly confined, but some large wood forced pools were observed, and sinuosity was moderate. A small buffer of mature riparian trees lines both banks for most of the reach, and pockets of vegetated floodplain are present both upstream and downstream of Waitsburg. The channel was incised to bedrock in multiple areas within this reach. The river was also actively eroding a steep left bank just upstream of Waitsburg and threatening riverside houses. Pools and gravel bars were more abundant upstream Waitsburg, and the downstream reach to the wastewater treatment plant was more confined but still had pools forced by riprap. A 50-foot-tall soft right bank was observed at the lower end of the reach where the river abuts Bolles Road.

Floodplain reconnection and instream restoration in this reach are limited by the levees and residential infrastructure along the banks. Any efforts at restoration within the reach should target expanding riparian buffers around levees. There is some opportunity for smaller scale engineered log jam implementation between Main Street and the wastewater treatment plant to help promote floodplain inundation and store gravel.

Touchet Waitsburg

Vicinity Map



Reach Characteristics

Parent River	Walla Walla River
River Length (mi)	2.11
Valley Length (mi)	1.73
Sinuosity	1.21
Average Slope	0.49%
Area Drained by Reach (mi^2)	353.22
Notable Tributaries	Wilson Creek

Coppei Waitsburg City Reach

Reach Description

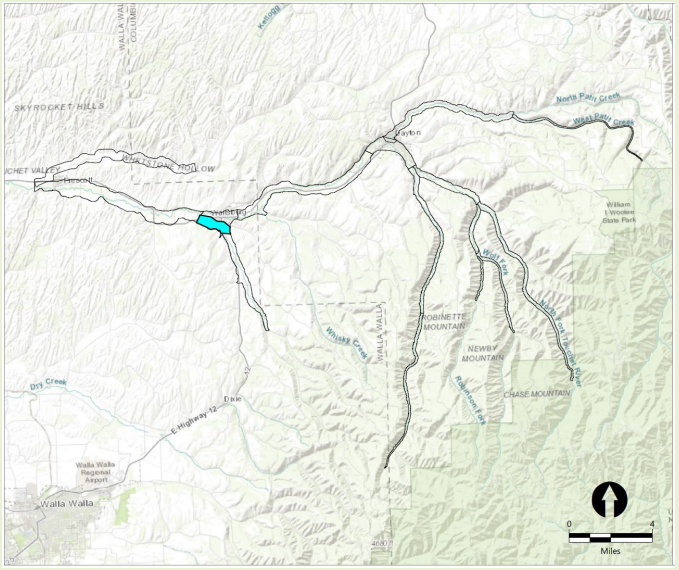
The Coppei Waitsburg city reach includes 2.2 creek miles from the mouth to the Meinberg Road bridge. The creek is systemically incised within a steep ditch for most of the reach and disconnected from the residential floodplain. This reach was excluded from the prioritization because streamside residences and infrastructure would limit access and project implementation.

The lower Coppei Creek reach passes through a narrow but sinuous ditch for most of the reach. The final section before the confluence with the mainstem is a stagnant, exposed ditch with little riparian cover and extensive growth of invasive reed canarygrass on the banks. The creek flows along the southwest outskirts of Waitsburg, and beaver activity was observed in the section between Orchard and 7th Street. Portions of the reach are well shaded by large willows while other sections are exposed and invasive reed canarygrass dominates the banks. Summer flows were minimal and the creek was dry in places.

Restoration within this reach could target removing invasive grass from the banks and establishing riparian trees in the exposed areas. This will also benefit streamside residences because trees will help stabilize soft eroding banks. Reed canarygrass also promotes accumulation of very fine sediment, which is detrimental to water quality and spawning habitat. Promoting floodplain connectivity is not a desirable goal through the city reach, and the creek is so incised that any floodplain expansion will be within an inset floodplain.

Coppei Waitsburg

Vicinity Map



Reach Characteristics

Parent River	Touchet River
River Length (mi)	2.20
Valley Length (mi)	1.71
Sinuosity	1.30
Average Slope	0.62%
Area Drained by Reach (mi^2)	36.48
Notable Tributaries	N/A

Touchet Dayton City Reach

Reach Description

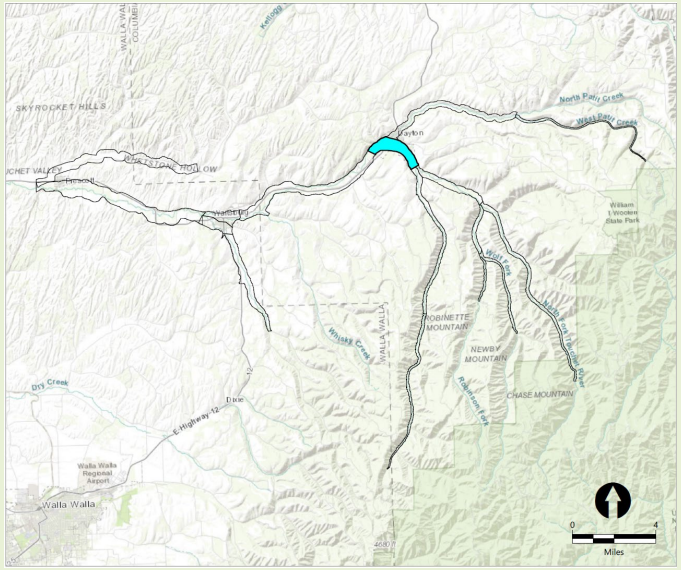
The Touchet Dayton city reach includes 3.16 river miles of mainstem and the total length of the Dayton levees on both banks. The river passes through a highly linear reach with a weir before absorbing the flow of Patit Creek and turning southwest towards Waitsburg. Some pockets of floodplain are present at the downstream end of Dayton, but levees and riverside properties limit the scope of restoration projects in this reach.

Complexity is moderate just below the North and South Fork confluence with abundant gravel bars and split flow. The reach then enters a linear and narrow section confined between levees and a steep valley wall. Some vegetated floodplain and side channels are present through the golf course portion of the reach. Riparian vegetation is limited to a few pockets of mature trees within the leveed floodplain, but the barren levees leave much of the banks exposed and radiate heat during the summer months. Much of this reach has a plane bed morphology, but some pools are present downstream of Dayton where the leveed floodplain expands.

Any restoration within the Touchet Dayton city reach should be scaled down appropriately considering the surrounding infrastructure. Large wood additions should be aimed at establishing split flow and accessing available pockets of floodplain near the North Fork/South Fork confluence and downstream of the Highway 12 bridge. Restoration actions should consider the impact on water levels to the levees and streamside residences near the downstream end of the reach.

Touchet Dayton

Vicinity Map



Reach Characteristics

Parent River	Walla Walla River
River Length (mi)	3.16
Valley Length (mi)	2.82
Sinuosity	1.11
Average Slope	0.81%
Area Drained by Reach (mi^2)	231.05
Notable Tributaries	Patit Creek