



SILVER CREEK

RESTORATION AND GEOMORPHIC ASSESSMENT

The streams in the Silver Creek watershed are spring-fed, exhibit a relatively consistent hydrology, and other than human influence, function like most other spring-fed streams that are highly stable and exhibit very slow rates of natural recovery. It is apparent that improving habitat conditions for wild trout within the foreseeable future will require active restoration actions including narrowing over-widened channel segments, adding woody debris and other forms of in-stream structure, creating more sinuous channels, and reducing fine sediment deposition. Implementation of any restoration action requires an understanding of the desired target conditions from which a restoration plan/design can be established.

GOAL:

CREATE HABITAT CONDITIONS SUITABLE FOR A SUSTAINABLE, RESILIENT WILD TROUT SPRING CREEK FISHERY.

PURPOSE AND NEED

Silver Creek is biologically, culturally, historically, and economically relevant to Idaho and the West: Silver Creek is prized for its stunning clear waters, catch and release trout fishery, abundant wildlife, and vibrant history.

An assessment like this has not been done: Although many isolated investigations concentrating on one part of Silver Creek or on general conditions within the watershed have been performed, a geomorphically-based assessment at multiple scales of this type has not been performed.

The overall purpose of the assessment is to develop a report suitable for guiding approaches and implementation strategies for future restoration and enhancement projects.

SILVER CREEK WATERSHED

ASSESSMENT & RESTORATION DESIGN

PROJECT OVERVIEW

Conditions in the Silver Creek watershed have changed over decades resulting in many of the observed impacts adversely affecting fish habitat.

The magnitude of impacts relative to the rates of "natural" recovery suggest habitat is unlikely to be repaired by natural stream evolution within the foreseeable future (i.e., many decades). To restore the fishery high quality, accessible habitat for all life stages is needed: rearing habitats and refugia for juveniles, large pools for adults, and abundant, connected spawning and overwintering habitats. Channel restoration is therefore recommended to improve conditions by building new habitat (active restoration) and/or accelerating the stream's ability to naturally repair itself and create new habitat (passive restoration).

GOALS OF THE ASSESSMENT

- Document past, existing (baseline), and potential target conditions.
- Identify potential actions to improve habitat relative to the Silver Creek goal that can be applied throughout the watershed.
- Provide a conceptual restoration plan for two priority reaches within the watershed.

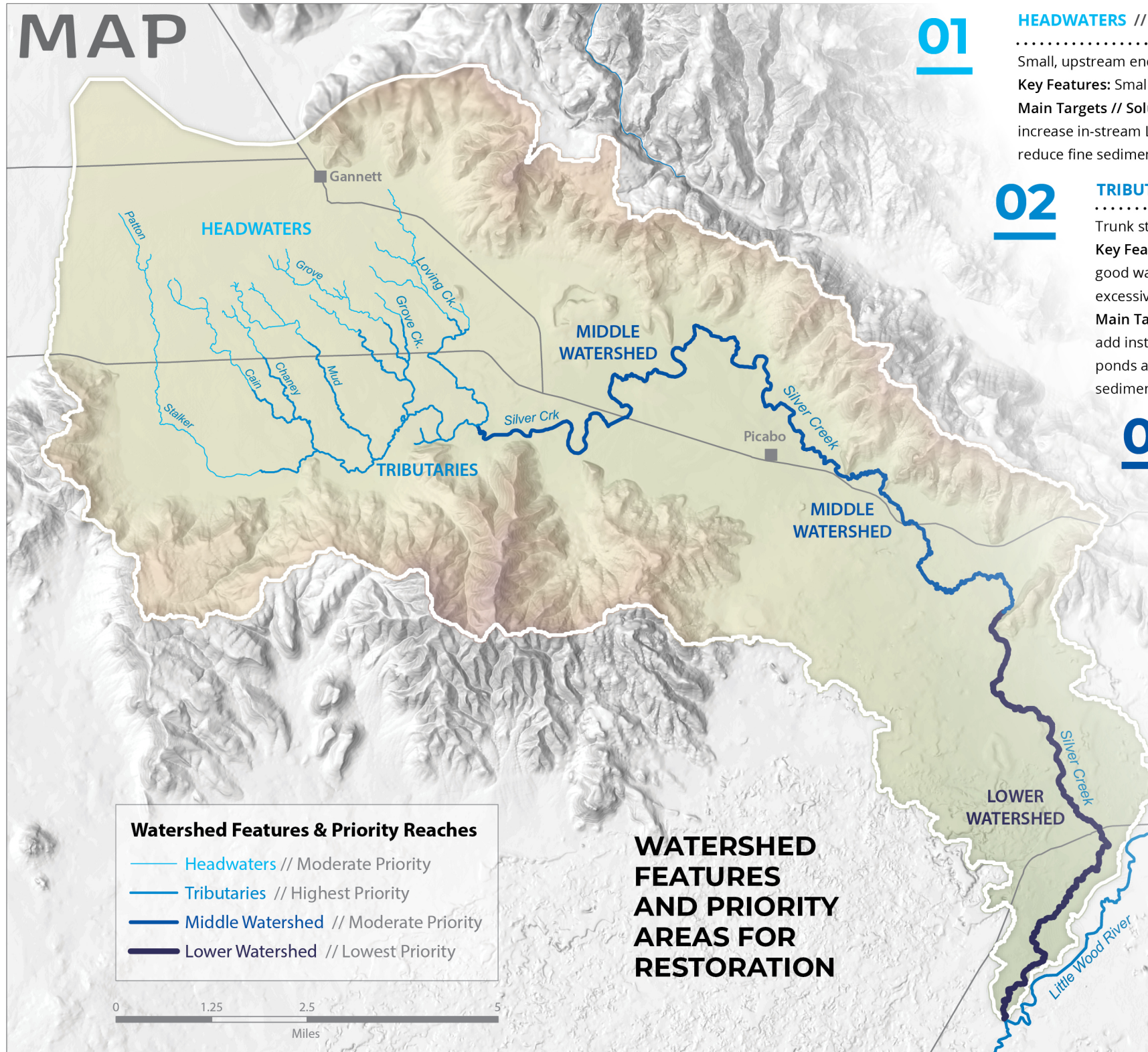
INTENDED USE AND LIMITATIONS

The assessment is intended to be utilized by stakeholders, landowners, and other groups within the watershed to inform future restoration and enhancement efforts. It seeks to provide information on the geomorphic setting, key parameters, watershed and reach-specific conditions.

The assessment is based on available information and restoration tools and concepts are meant to be implemented by professionals informed by site-specific conditions. This is not a cookbook to be used for implementation without further data collection and design of construction ready plans.

WATERSHED

MAP



Watershed Features & Priority Reaches

- Headwaters // Moderate Priority
- Tributaries // Highest Priority
- Middle Watershed // Moderate Priority
- Lower Watershed // Lowest Priority

WATERSHED FEATURES AND PRIORITY AREAS FOR RESTORATION

01

HEADWATERS // MODERATE PRIORITY
 Small, upstream ends of headwater tributaries.
Key Features: Small streams with mixed habitat and fish use potential.
Main Targets // Solutions: Increase sinuosity, reduce width-to-depth ratio, increase in-stream LWD/structure forcing constrictions and pools with cover, reduce fine sediment inputs. Increase riparian vegetation.

02

TRIBUTARIES // HIGHEST PRIORITY
 Trunk stream of tributaries and Silver Creek Preserve.
Key Features: Over-widened, single-threaded channel, generally good water temperatures, high habitat connectivity, few pools, excessive fine sediment.
Main Targets // Solutions: Reduce stream width, increase sinuosity, add instream LWD/structure forcing constrictions and pools, use ponds as sediment traps, improve riparian vegetation, use ponds as sediment traps where appropriate.

03

MIDDLE WATERSHED // MODERATE PRIORITY
 Main-stem Silver Creek from Preserve downstream to Priest Road (roughly 1 mile south of Hwy 20)
Key Features: Over-widened, single-threaded channel, poor summer water temperatures, many disconnected side channels, poor floodplain connection, poor riparian habitat.
Main Targets // Solutions: Reconnect relic side channels and habitat, reduce stream width, add LWD/structure forcing constrictions and pools with cover, improve riparian vegetation, use ponds as sediment traps where appropriate.

04

LOWER WATERSHED // LOWEST PRIORITY
 From Priest Road downstream to the confluence with the Little Wood River.
Key Features: Confined valley with poor floodplain connection, high summer water temperatures, poor habitat connectivity.
Main Targets // Solutions: Low restoration potential, poor benefit-to-cost ratio, opportunities should focus on improving riparian vegetation and adding in-stream LWD/structure within existing channel.



Restoration objectives should focus on a sustainable, wild trout fishery by reducing over-widened and simplified channel forms, increasing in-stream hydraulic structural complexity, and improving riparian vegetation.

A SUSTAINABLE, RESILIENT WILD TROUT SPRING CREEK FISHERY

RESTORATION

SPRING-FED CREEK

Spring-fed hydrology // Very similar to Silver Creek // Lots of fine sediment

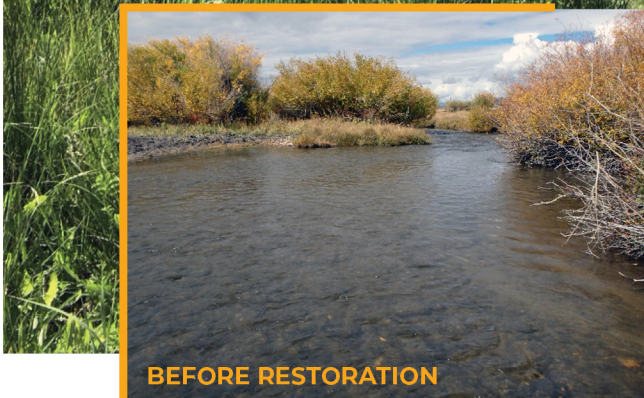
PROJECT GOALS INCLUDED

Reduce channel width

Increase shade

Increase sinuosity

Increase in-stream structure



BEFORE RESTORATION



TWO YEARS AFTER RESTORATION

TECHNIQUE 1

Brush Bank / Roughened Edge



Restoration of Upper Lemhi River: Roughness provided by woody material provides short term bank stability through slowing of flow velocities // Incorporation of live vegetation re-establishes long term bank strength through root structure // Biodegradable fabric used to retain fine-grained sediment comprising newly constructed banks.

TECHNIQUE 2

Stream Fencing



Increase hydraulic roughness on streambank // Increase floodplain soil stability // Promote natural vegetation and seed recruitment through sediment deposition // Key is to use the stream's natural sediment load to capture and retain sediment creating a new bank and narrower channel over time.

TECHNIQUE 3

Bank/Outside Bend



Incorporation of live vegetation re-establishes long term bank strength through root structure // Biodegradable fabric used to retain fine sediment fill creating a new bank narrowing the channel. Vegetation incorporated to provide long-term structure and cover.