

Rattlesnake Reservoir Recreation Management Plan

May 1, 2019

In 2017, the City of Missoula acquired the private utility company, Mountain Water and all of the assets owned by that company. In the process of transitioning this privately owned company into a municipal water utility (Missoula Water), City administrators conducted a thorough review of infrastructure to determine maintenance needs and identify local public and environmental benefits. The Rattlesnake Reservoir site was identified as a site where long-term maintenance costs could be reduced while expanding environmental and recreational opportunities. A plan developed to remove the dam, restore the riparian area and incorporate the property into the existing chain of public parks along the Rattlesnake Greenbelt. In spring of 2018, the Missoula Parks and Recreation Board designated the 45-acre site a Park Preserve (as defined in the Conservation Lands Management Plan).

The Conservation Lands Management Plan, Missoula Parks and Recreation Department (MPR) policies and various City ordinances, direct broad natural, cultural and recreational resource management goals on the Rattlesnake Reservoir site. The Rattlesnake Reservoir Recreation Management Plan describes site-specific management priorities, location of trails, trail-use designations, public access points, and signage locations on this 45-acre property. This plan was developed in conjunction with the larger planning effort to remove and restore the reservoir.

1) Special Resource Considerations

While a significant amount of site-specific data was collected as part of the larger reservoir removal project, this effort was concentrated on natural and cultural resources in the floodplain immediately adjacent to the dam. Comprehensive surveys of upland areas adjacent to the dam were informal and relatively narrow in scope. Hence, many of the recommendations for management of public recreation across this 45-acre site are based on data collected from City surveys within the greater Rattlesnake Greenbelt, North Hill's Sunlight property and the Powerline Corridor, which connects the N. Hills to Mt. Jumbo.

The Rattlesnake Greenbelt serves as a major wildlife corridor between the Rattlesnake Wilderness and the Clark Fork River. The Rattlesnake Reservoir site sits in a unique location, at the border between large, relatively intact wildlands and more developed agricultural and residential properties in the upper Rattlesnake valley. When obstacles (the reservoir, dam and chain-link fences) to wildlife passage are removed, it is anticipated that use of the area by a multitude of wildlife species will increase.

The importance of the site for terrestrial and aquatic wildlife plus the investment of millions of dollars to restore riparian habitat and ecosystem functions on-site greatly influenced the location of trails, interpretative education and designation of types of recreational use described in this plan. The unique historical significance and potential for this site to serve as a restorative exhibit offer an opportunity for public use beyond what is typical on other Park Preserves; however, managing public use to minimize impacts on wildlife and ensure successful restoration is essential on this site.

Wetlands: As plans were being developed for restoration of the Reservoir and Dam, surveys

revealed a locally unique wetland immediately downstream of the dam (Figure 1.) Spring-fed and covered by dense woody growth, this type of forested wetland is not found on any other City-owned property. Additionally, no other examples of forested wetlands within the City's open space planning region (approximately 3 mi. radius outside City limits) are known. Soil pits in this wetland uncovered a 1-foot thick dark grey clay lens, a remnant of the 12,000+ year old Glacier Lake Missoula lakebed. It's likely that prior to the construction of the Rattlesnake reservoir in the early 1900's this 10-acre wetland connected to the much smaller forested wetland fragment directly upstream of the reservoir intake (Figure 1.) Construction of man-made wetlands and seasonal overflow channels between these two wetlands is planned as part of the larger restoration project (Figure 2.) Wetlands are one of the most biologically diverse habitat types in Montana and preliminary wildlife surveys at this location documented a diversity of wildlife. The aspen groves present on the east side of this wetland also represents a locally rare and important riparian habitat that has been lost in urban areas across much of Western Montana. To protect these habitats public-use of historic and man-made wetlands will be discouraged.

Cliffs and Steep Hillsides: In the middle of the property, a cliff band provides a scenic backdrop on Rattlesnake Creek's western bank (Figure 1.) Initial investigations of the steep hillsides above these cliffs revealed no unique habitat types but evidence of cavity nesting and a multitude of wildlife trails in this area suggest it is well used by local wildlife. Direct observations of raptors (both bald eagles and osprey) fishing from these cliffs and frequent sightings of short-tailed weasels hunting on these cliffs may suggest that this relatively unique topography provides opportunities for certain predators. While the importance of these cliffs and steep hillsides for local wildlife is uncertain this area is not suitable for trail development. Loose soils above steep cliffs make trail construction difficult and pose obvious public safety hazards. Given the lack of any developed trail systems on federal public lands north of these cliffs, encouraging public access to this portion of the property would likely promote trespass onto adjacent private lands and unsanctioned trail creation on adjacent federal land.

2) Trails, Trailheads, Use and Creek Access

Public use of portions of this parcel are already occurring. Implementing rules and regulations consistent with those already established on adjacent City property is important for compliance. Currently, all City –owned parcels with the Rattlesnake Greenbelt are designated as “dog on-leash” and the entire Rattlesnake Reservoir site, including trails across Northwestern Energy (NWE) lands will also be designated as “dog on-leash”. Although, Rattlesnake greenbelt trailheads on Duncan Dr., Rattlesnake Dr. and Foxfarm Dr. are outside the scope of this plan, to maintain consistency it is recommended that a review and update of all signage at these locations occur as part of the implementation of this plan.

As Physical characteristics (e.g. topography, wetlands, creek channels, primary access points etc.) on the Missoula Water parcel; and legal constraints governing public access across the NWE property are discrete enough that for the purposes of this document recreational development on the east and west sides of Rattlesnake Creek will be addressed separately.

Recreational development on the east side of Rattlesnake Creek:

For decades, the eastern portion of this property has provided an important connection for

non-motorized travel between the Missoula Valley and the U.S. Rattlesnake Recreation & Wilderness Area. In July 1989, an easement was granted by Mountain Water Company, which legitimized this connection, and a 6-foot wide multi-use gravel path was built along the eastern property boundary. While this trail provided a direct route for easy access to federal public lands, trail design options were limited within the 20-ft. wide easement and the resulting trail is relatively straight and flat. High levels of use, high mountain bike speeds and poor sight lines on this trail has resulted in frequent conflicts and occasional collisions between bikers and other trail users. Maintaining this important recreation corridor while also improving sightlines, public safety and natural trail ascetics with an emphasis on balancing recreational use with conservation goals and minimizing user-conflict are the primary goals for trail connections on the eastside of this property.

Initial planning efforts explored splitting use at the southern property boundary and building a separate pedestrian-only trail along the “historic” user-made trail, which existed before the 1989 Mtn. Water easement. (Figure 1, user-made trail on east side of creek.) This plan was abandoned because of the proximity of this trail route to rare wetland complexes and the cost of constructing and maintaining a separate pedestrian-only trail and a new bridge over the irrigation canal. Rerouting portions of the existing trail to provide an improved recreational experience for all users while minimizing impacts to native habitats and management budgets is the preferred alternative.

Approximately, 2000 ft. of trail will be rerouted on this side of the property (Figure 2.). This rerouted trail will be a 6 ft.-8ft. wide packed gravel trail and will not exceed 8% average grade but will incorporate designs to improve flow, introduce trail heterogeneity and reduce user conflict. Specific design elements include grade changes, vegetated islands within the trail corridor, improved sight lines and increased sinuosity. If feasible, minor mountain bike technical features along short side trails to promote options for self-induced separation of users may help reduce the speed of cyclists while providing improved user experience. All abandoned sections of trail will be restored to natural conditions.

Currently, trails and access points on the east side of Rattlesnake Creek do not meet ADA standards, however, it is possible that future improvements to surrounding trails will increase accessibility and allow for a wider variety of users. Any design elements included in this rerouted section of trail to check the speed of cyclists should also provide options and/or allow for increased accessibility. North of the proposed construction/interpretative overlook (Figure 2), variable topography within a relative narrow trail corridor makes the possibility of improving accessibility all the way to the USFS boundary unfeasible.

Recreational development on the west side of Rattlesnake Creek:

Unsanctioned recreational access to portions of the property located on the west side of Rattlesnake Creek has resulted in establishment of a handful of user made trails with no clear connections to adjacent public properties. Municipal ownership and subsequent development of a restoration project for the Rattlesnake Reservoir provided an opportunity to expand public access on the west side of Rattlesnake Creek with connections to City-owned lands on the North Hills. Through negotiations with NWE, the City was granted an easement for public trails and the development of a formal trailhead on NWE property at the end of Duncan Drive. Providing an

accessible loop trail, sustainable parking area, and improved connections to trails on the North Hills while limiting off-trail public use around NWE's substation are the primary goals for the west side of this property.

In 2006, the construction of a suspension bridge across Rattlesnake Creek at the north end of Duncan Dr. (Figure 1) provided an important recreational link for trail users in the Upper Rattlesnake. As popularity has increased, an ad hoc parking area developed off the shoulder of Duncan Drive. Subsequent damage to vegetation and asphalt in the right-of-way as well as conflict with neighboring homeowners have also increased. Developing an official parking area and trailhead on adjacent NWE property will provide for a formal entrance to City trails and minimize existing issues. This parking lot will be designed to accommodate 8-10 vehicles (plus additional handicap parking) and to preserve existing trees (Figure 2.) This trailhead will serve as a primary access point to the Rattlesnake greenbelt and contain amenities (e.g. kiosk, trash, mutt-mitt, bike rack, etc.) commensurate to a Primary Trailhead as defined in the 2010 CLM Plan. To reduce impacts to adjacent riparian areas and because this trailhead will serve a wide diversity of users (as described below), if practical, installation of a seasonal ADA-compliant portable toilet should be considered.

Of the 4200 acres managed by the City's Conservation Lands Program, less than 15% provide opportunities for the development of accessible trails. Most of the hillsides around the Missoula Valley (e.g., Jumbo, Sentinel, North Hills) are too steep to make the construction of low-angle trails practical and flat riparian areas on the Valley floor (e.g., Tower St. Conservation Area) are often subject to seasonal flooding making the investment in accessible trails cost-prohibitive. The NWE Duncan substation property is relatively flat, rarely subject to seasonal flooding and provides a unique opportunity to establish an accessible trail from scratch, which connects users of all abilities to natural areas along Rattlesnake Creek. The accessible trail depicted in Figure 2 will be a 6-ft. wide packed gravel trail at an average grade not to exceed an 8%. As required by NWE, fencing will be installed along sections of the trail and trailhead to limit off-trail use around the electrical substation. All fencing will comply with the wildlife friendly design standards developed by Mt. Fish Wildlife and Parks. Installing logs and or boulder benches (or possibly even a bench made of salvaged materials from the dam) would provide rest spots along this trail with minimal visual impacts. No more than 4 rest spots should be established along this loop trail with final locations to be determined during trail construction. Adequate separation of the rest spots from the trail will allow for use of the benches without affecting trail use.

While the majority of the trails within the Rattlesnake Greenbelt are multi-use (allowing for pedestrians, cyclists and equestrians) the accessible loop trail across NWE property has unique characteristics that would complicate mixing uses. Options for cyclists and/or equestrians to safely pass individuals using larger mobility devices (i.e. wheelchairs, scooters, walkers etc.) will be limited at many locations along the loop trail.

Additionally, in forested riparian areas significant tree removal and trail straightening would have to occur to supply appropriate site lines for any recreationist traveling faster than a jog. Doing this would greatly reduce the experience for users with mobility issues who desire a multifaceted trail with connections to nature. For these reasons this loop trail will be closed to all cyclists (unless used as a bona-fide mobility device) and equestrians.

Creek access points:

The City of Missoula manages public parkland along miles of waterways in the Missoula Valley. However, until very recently park development and management plans did not incorporate stream access. Between 2008 and 2018, the Conservation Land Management Program has spent hundreds of thousands of dollars restoring damage from unsustainable river access and designing/constructing sustainable river access points. Restoring wildlife habitat and building sustainable river access points polled high among registered voters in the 2018 election and in the 2018 Parks Open Space and Trails survey. Planning for the river access that will inevitably occur at this location will help protect rattlesnake creek and provide for enjoyable recreational experiences.

Surveys of the Rattlesnake Reservoir property documented two locations where the public is already actively accessing the west bank of Rattlesnake Creek (Figure 1.) Both of these sites would provide good long-term creek access. The Water Company created the southernmost access when constructing an overflow drain for their 3-million gallon underground cistern. This overflow already provides low-angle, hardened creek access to a relatively channelized section of the creek. It's likely that this access would accommodate future increases in public use with few improvements. The Northernmost creek access is located on the west side of the creek directly below the dam (Figure 1.) This area will be heavily impacted by machinery when the dam is removed and the majority of the creek bank at this location will be rebuilt as part of the restoration project. Post restoration, the pools at this location will surely attract public use. Providing for this access when the bank is rebuilt will protect adjacent natural resources. Hardening the site to protect bank stability at the access point will protect against bank erosion. Incorporating large boulders, coarse woody debris and dense vegetation plantings on either side of the access point will help direct users to the preferred access point and limit expansion of this access.

3) Interpretation of Historic and Cultural Resources

The Rattlesnake Reservoir site will be managed as a Park Preserve, as defined in Missoula's Conservation Lands Management Plan, following restoration of the site. In an effort to maintain natural and aesthetic characteristics on Park Preserves, infrastructure (e.g., benches, kiosks, signage etc.) is typically exclusive to the trailhead alone. However, exceptions to this policy have occurred where opportunities exist to interpret and protect important cultural and/or natural resources along trail systems well beyond the trailhead. The Rattlesnake Reservoir site has multiple opportunities to interpret both historical human use as well as the 2018-2021 efforts to restore the site to natural conditions. Given the property's close proximity to urban areas and potential for higher levels of use, an investment in on-site education will certainly reach a large segment of the public.

Initial site assessments identified three potential locations for interpretive installations (Figure 2.) As per City policy, the Missoula Parks and Recreation board will approve the educational content and final design of these installations at a later date. At all locations, minimizing visual impact, utilizing local building resources, reducing long term maintenance costs and, where practical, incorporating historical artifacts from the Dam are important design considerations. General recommendations for each location and a brief description of the most obvious historical themes associated with these locations are described below. These recommendations are intended to serve as a guide to future, more deliberate interpretative planning. To promote public stewardship and trail etiquette interpretative signage at all locations will contain some information

about responsible recreation.

On the eastside of Rattlesnake Creek, adjacent to the multi-use trail, is one of the few locations where observers can view the entire reservoir/restoration project (Figure 2, “construction overlook.”) During demolition of the dam and restoration of the site, a temporary viewing area at this location will allow the public to learn about the project and watch the progress. Following construction, this site would provide a good location to establish permanent education about the Rattlesnake watershed, the riparian restoration project, and important wetlands/habitats on site. To minimize conflict between trail users, a formal “pull-out” should be established at this location to enable full separation between people reading interpretive signage and through-travelers on the trail.

On the west side of Rattlesnake Creek, the most upstream creek access point (Figure 2) is located adjacent to the Rattlesnake Dam. As identified in the 2018 “Rattlesnake Dam Historic and Cultural Resource Survey and Evaluation” prepared by Jeffery MacDonald (Heritage Preservation Consulting & Services) for Trout Unlimited prior to dam removal, this immediate area also contains the most evidence of 20th century advancements in water utility technologies (Figure 3.) Besides the main dam structure, other infrastructure at this location includes: an old head gate which fed the Williams ditch and may have supplied agricultural and/or domestic water before the dam was built; dry-stacked river stone embankments which served as part of the original dam; evidence of a 30” wood water pipe first used to supply domestic water to Missoulians; and more modern mid-20th century improvements. This location is most suited for telling the story of Missoula’s drinking water. In spring 2019, City employees and Trout Unlimited will develop plans to preserve some elements of water utility infrastructure on the Rattlesnake Reservoir site and where practical, salvage of historic building materials, valves, gates etc. to help tell this story. At the northernmost creek access point (Figure 2) a small informational kiosk will be constructed incorporating these salvage materials.

This portion of the Rattlesnake Greenbelt also lies along the travel route used by Salish peoples for generations to hunt bison in Eastern Montana. A lone bark-peeled pine (killed in 2010 by mountain pine beetles) ¼-mile downstream of the dam, provides evidence of historic hunting and gathering in the area. Thompson Smith’s 2010 report on the importance of the bull trout to the Salish and Pend d’Oreille people illustrates the importance of Rattlesnake Creek as an historic bull trout fishery. Tom McDonald, Division Manager of the Confederated Salish and Kootenai Fish, Wildlife, Recreation and Conservation Office, provided evidence that the construction of the Rattlesnake Dam in the early 20th century effectively ended the use of the creek by the S&K tribes for fish harvest (personal communication, 2017.) Rather than diluting Native American history across the multiple interpretative panels on-site, City staff will work with the S&K tribe to provide this information at the main entrance to the area. The new trailhead to be constructed on the NWE parcel will serve as a primary entrance to this portion of the Rattlesnake Greenbelt. An informational kiosk containing Native American history, a trail map and rules/regulations shall be constructed at that trailhead.

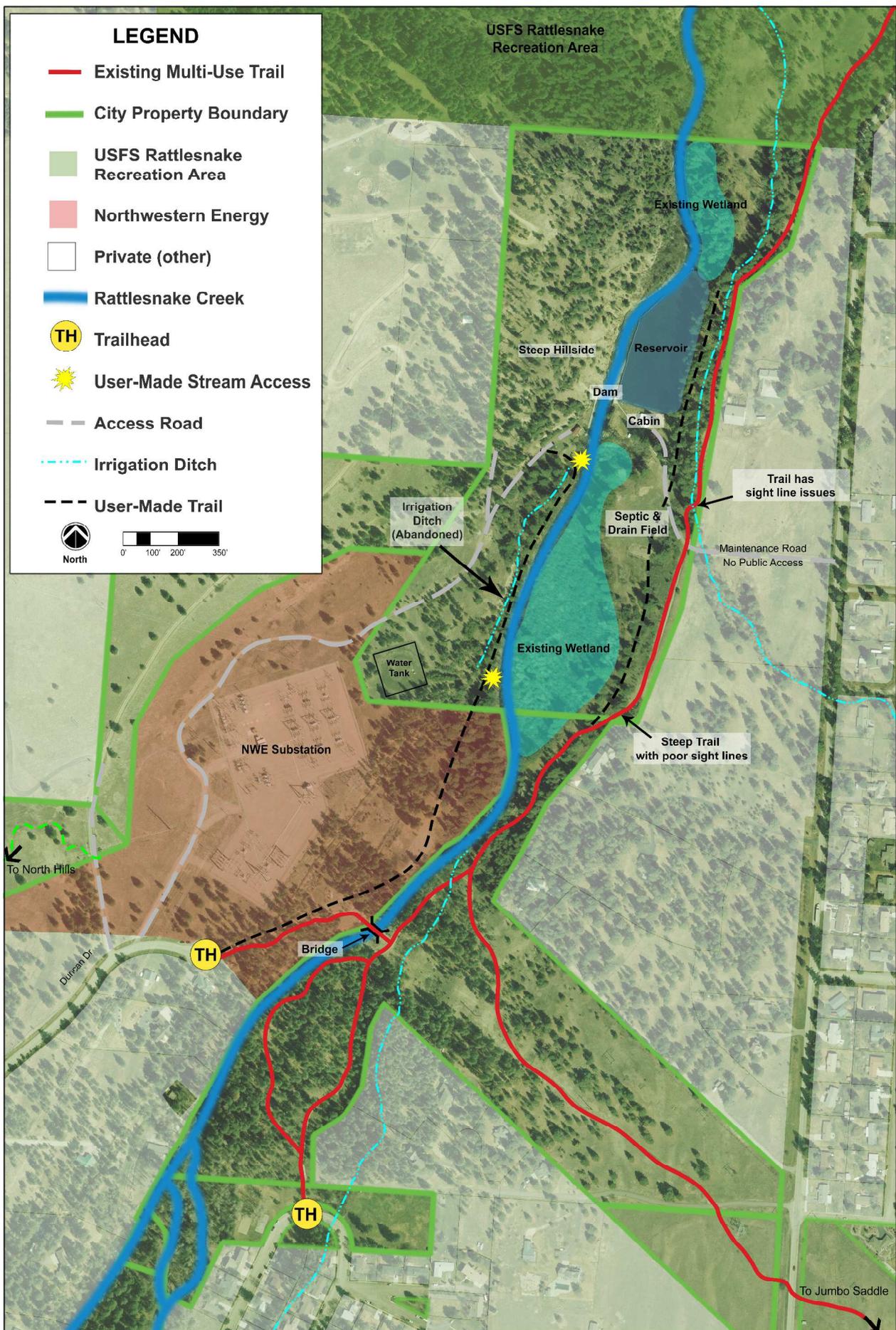
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Citations

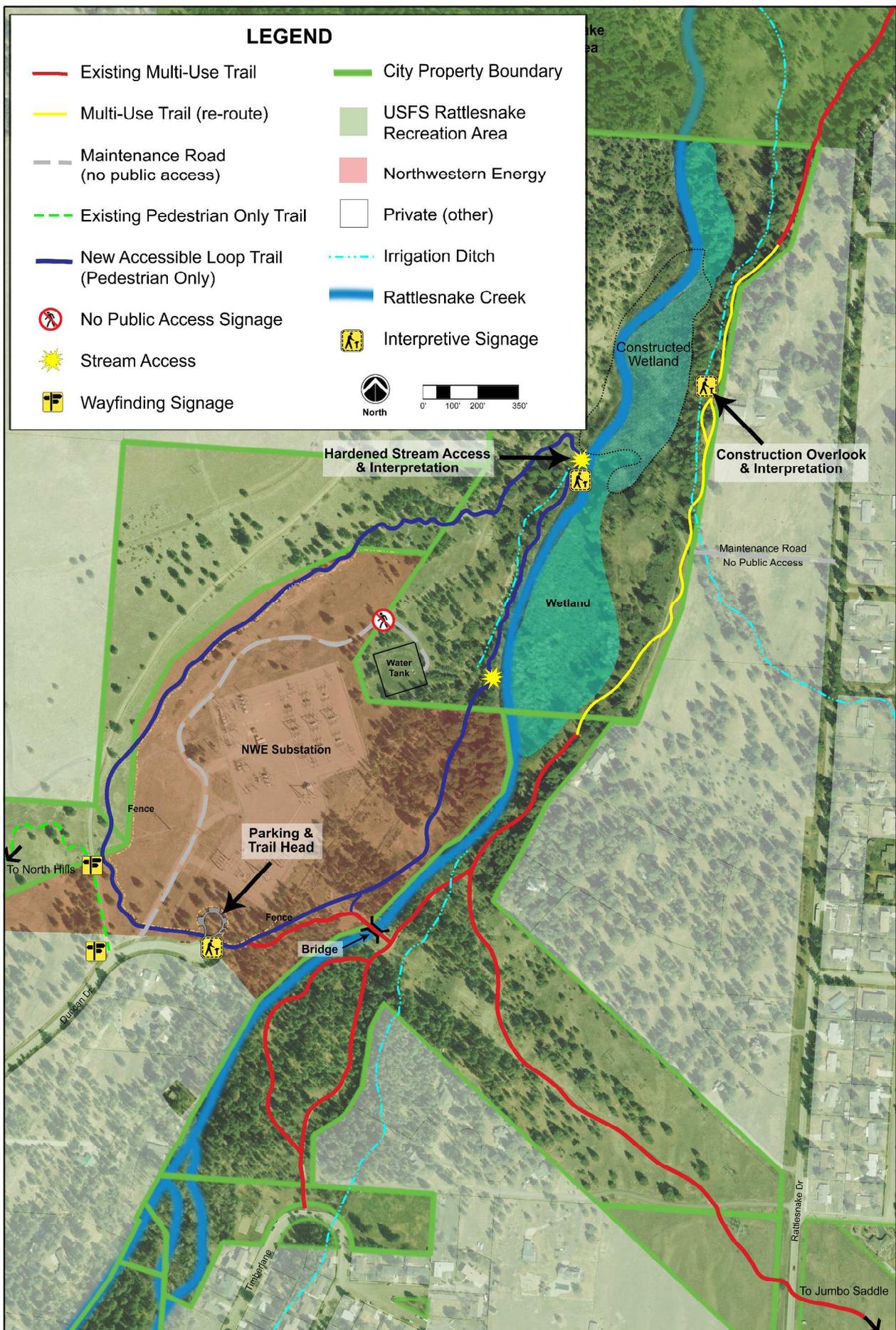
Macdonald, Jeffery. "Rattlesnake Dam, Historic and Cultural Resource Survey and Evaluation" *Report prepared for Trout Unlimited (2018)*. Missoula, Mt.

Smith, Thompson. "aay u sqe'lix" a History of Bull Trout and the Salish and Pend d'Oreille People." *Publication of the Natural Resource Department, Confederated Salish and Kootenai Tribes (2010)*.

The Rattlesnake dam effectively ended the use of Rattlesnake creek by the tribe as a bull trout fishery (Tom McDonald, personal communication, September 2017)



**Figure #1 Rattlesnake Greenbelt
Existing Conditions**



Rattlesnake Reservoir Site
Figure #2 Conceptual Recreation Plan

FIGURE 3: Key features at the Rattlesnake Dam as identified in the 2018 MacDonald survey

Rattlesnake Dam – Historic and Cultural Resource Survey and Evaluation - 2018



Figure 8 - Feature Location Key

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|----------------------------|----------------------------|
| 1. Main Dam Structure | 6. Abandoned Head gate |
| 2. East Screening Facility | 7. Exposed Twin Pipe Stubs |
| 3. West Screening Facility | 8. Garage |
| 4. Elevated Cistern | 9. Main Reservoir |
| 5. Chlorinating Building | 10. North Head Gate |