

# 2019 Annual Fisheries Monitoring Report

Mystic Lake Hydroelectric Project

FERC Project 2301



April 2020

**NorthWestern**<sup>®</sup>  
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## Section 1.0 – Introduction

Mystic Lake Hydroelectric Project No. 2301 (Project) is operated and owned by NorthWestern Energy Corporation (NWE). The Project is situated in south-central Montana, located in the Beartooth Mountain Range and surrounded on three sides by the Absaroka-Beartooth Wilderness Area. Mystic Lake is located at the head of a high mountain canyon, (El. 7,673.5 feet above mean sea level) in the upper reaches of West Rosebud Creek. Within West Rosebud Creek drainage (213.4 square miles), Mystic Lake is the fourth and largest lake in a chain of six hydraulically-connected lakes (listed in order going downstream: Star, Silver, Island, Mystic, West Rosebud, and Emerald). The Beartooth Ranger District of the Custer National Forest manages approximately 124.7 square miles of the West Rosebud Creek drainage while the remaining 88.7 square miles is privately-owned land.

On December 17, 2007, the Federal Energy Regulatory Commission (FERC or Commission) issued a new License for the Project, effective January 1, 2010 (121 FERC ¶62, 198). The new License includes the U.S. Forest Services (USFS) Section 4(e) Terms and Conditions filed on May 3, 2007. Section 4(e) condition 16 requires the Licensee to prepare and implement a fisheries monitoring plan that must be approved by the Mystic Fisheries, Aquatic Habitats, and Water Quality Technical Advisory Committee (TAC), represented by USFS, Montana Department of Environmental Quality (DEQ), and Montana Fish, Wildlife and Parks (FWP).

NorthWestern revised the 6-year Fisheries Monitoring Plan (Plan), in consultation with the TAC, for implementation between 2016 and 2021. FERC accepted the revised Plan in a letter dated, June 17, 2016. The schedule for fisheries monitoring activities between 2016 and 2021 is outlined in Table 1-1; the sampling locations are identified in Figure 1-1.

**Table 1-1. Mystic Lake Hydroelectric Project 6-Year (2016-2021) Fisheries Monitoring Schedule (NorthWestern, 2016a).**

Year	A	B	C	D	E	F
2016				X		X
2017		X	X		X	
<b>2018</b>	<b>X</b>					<b>X</b>
2019				X	X	
2020		X	X			
2021	X				X	

A = Mystic Lake monitoring

B = West Rosebud Creek between the dam and powerhouse

C = West Rosebud and Emerald lakes fish monitoring

D = West Rosebud Creek below Emerald Lake electrofishing

E = West Rosebud Creek fall redd counts

F = Water temperature monitoring

This report summarizes fisheries monitoring efforts completed by NWE and TAC members in 2019 to comply with the fisheries monitoring plan and schedule (Table 1-1). Fisheries surveys

completed in 2019 included electrofishing survey in West Rosebud Creek below Emerald Lake and a fall Brown Trout redd count was also completed in West Rosebud Creek. Although not required by the fisheries monitoring plan additional habitat surveys in West Rosebud Creek below Emerald Lake were completed on USFS managed lands. A summary write-up is available by request from USFS or NWE.

## Section 2.0 – West Rosebud Creek Electrofishing

In 2019 electrofishing in West Rosebud Creek, below Emerald Lake occurred in the Pine Grove section. A mark recapture estimate was conducted with the mark run on May 2 and the recapture was May 10. In total, 234 Brown Trout (LL) ranging from 2.9-19.1 inches, 31 Mountain Whitefish ranging 10.9-16.3 inches, 20 Rainbows 4.3-15.1 inches, and 12 Eastern Brook Trout 4.1-8.1 inches. Typically not enough Mountain Whitefish, Rainbow Trout, or Brook Trout are captured to obtain valid estimates for these species in this section. A valid estimate on numbers of Brown Trout were obtained. The Brown Trout estimate indicates there are approximately 296 Brown Trout per mile greater than five inches. Figure 1 shows estimates of Brown Trout over 5 inches for the last four spring estimates that were completed.

Figure 1: Brown Trout spring electrofishing estimates in the Pine Grove section of West Rosebud Creek.

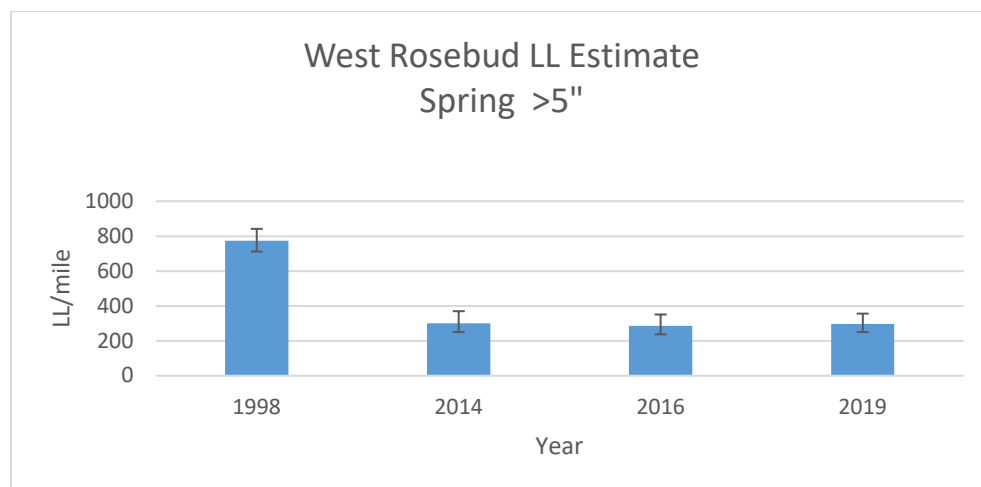


Figure 2 shows length frequency for all Brown Trout captured. This section used to be sampled in fall but was changed to spring to better represent the resident population of Brown Trout. Figure 3 shows estimates of Brown Trout over five inches for the last five fall estimates that were completed. The fall estimates show higher numbers of fish which is likely a result of migratory fish spawning in the system. They do not likely explain the population decrease since the 1998 estimate. In 2013 a mark run was completed in the fall followed by full estimate in spring 2014. The fall mark run captured 300 Brown Trout over 5 inches while the spring mark run captured only 118.

Figure 2. Brown Trout length frequency in 2019 electrofishing.

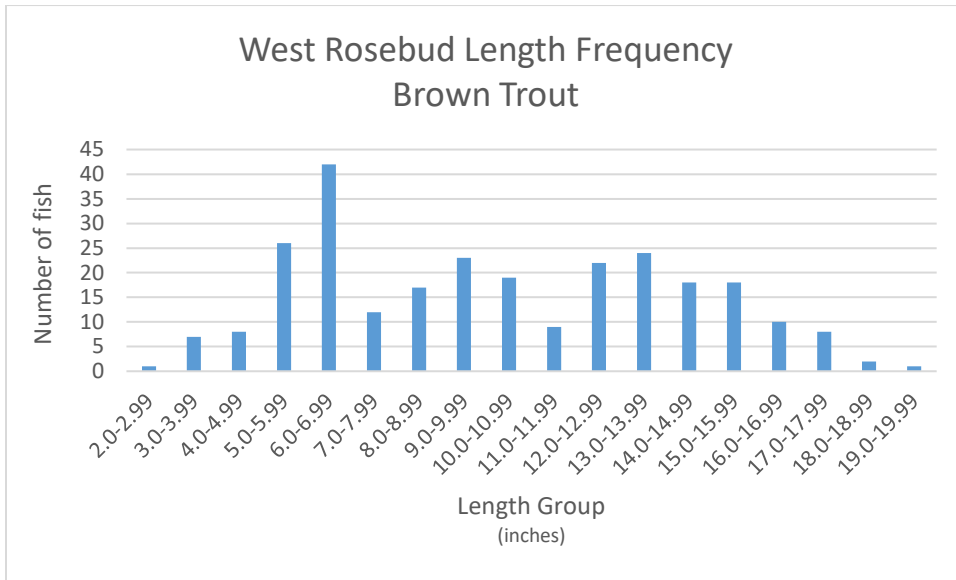
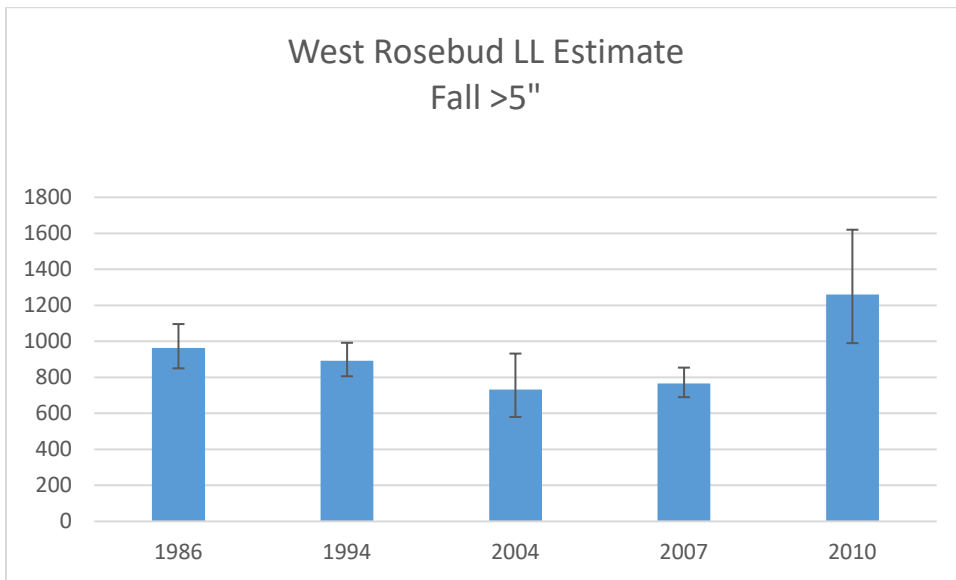


Figure 3. Brown Trout fall electrofishing estimates in the Pine Grove section of West Rosebud Creek.



## Section 3.0 – West Rosebud Creek Redd Counts

Redd surveys in West Rosebud Creek have occurred annually since 2008 (NorthWestern, 2016a). The survey reach is a 1.5-mile-long reach of West Rosebud Creek between the Pine Grove Campground and the bridge on the Mackay property, referred to as the Mackay Flat section (*refer to previous annual reports for maps*). The Mackay Flat section serves as an important spawning area for both resident West Rosebud Creek fish and migratory rainbow and brown trout from the Stillwater and Yellowstone rivers. Details of previous spring and fall redd counts completed between 2008 and 2018 are provided in the respective annual reports (PPL Montana, 2011; 2012; 2013; 2014 and NorthWestern, 2015; 2016b; 2017; 2018).

The *2016-2021 Fisheries Monitoring Plan* (NorthWestern, 2016a) includes fall redd surveys, focused on brown trout, in West Rosebud Creek scheduled to occur every other year, starting in 2017. Spring redd surveys were discontinued in the revised 6-year fisheries monitoring plan due to the challenges associated with spring surveys and high streamflows.

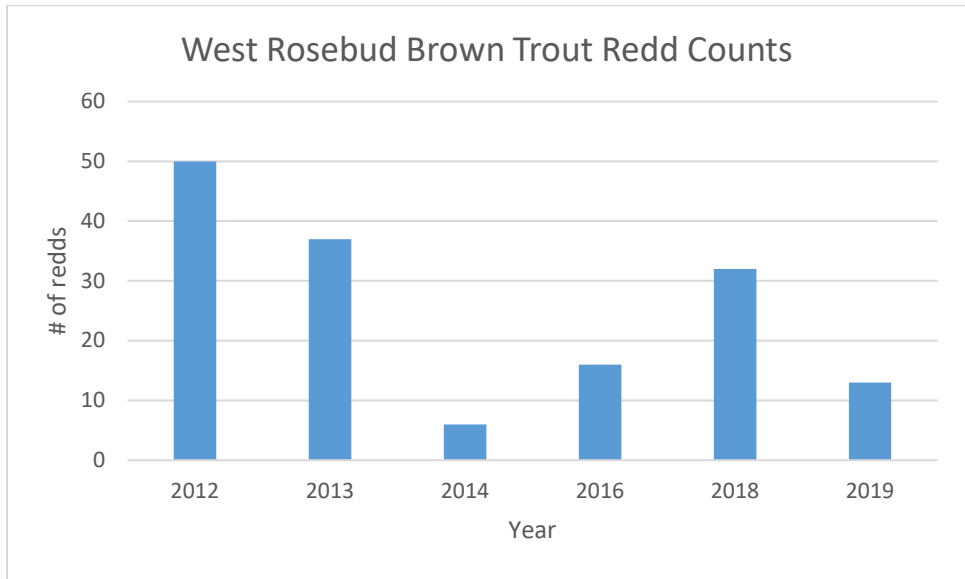
Fall redd surveys typically occur between mid-October and mid-November (Table 4-1). By mid- to late-November, the stream reach surveyed is often iced over. In 2016, FWP completed a fall redd survey instead of in 2017 (due to a scheduling error) and recorded 16 brown trout redds on November 22, 2016. In 2018, FWP completed two redd surveys, one on October 30 and a second on November 12. A summary of survey dates for each year is shown in Table 4-1

**Table 3-2: Survey dates for redds in West Rosebud Creek, Fall 2009-2019.**

Year	Fall Survey Date(s)
2019	Nov 7
2018	Oct 30, Nov 12
2017	No Survey
2016	Nov 22
2015	Oct 27, Nov 5
2014	Oct 29
2013	Oct 12, Nov 7
2012	Oct 31; Nov 14, 15
2011	Oct 31; Nov 1, 15
2010	Oct 5 (iced over, no survey)
2009	Nov 11

A Brown Trout redd survey was completed on November 7<sup>th</sup>. Figure 4 shows the fall redd counts completed back to 2012. This year was the second lowest count of fall redds recorded. This year fall was more like winter and it is likely the cold water temperatures prohibited some spawning activity. The water temperature at Emerald Lake Campground dropped below 4° C for good on October 19. It was 2.1° C the day of the redd count and ranged from 1.5° to 3° C for the rest of the fall. For comparison it didn't drop below 4° C until October 31 last year with late October temps hovering around 5.5°-6° C. The water temperature when the count was completed on October 31 was 5.1° C.

Figure 4. Brown Trout fall redd counts in West Rosebud Creek.



## **Fisheries Monitoring Schedule for 2020**

In 2020, fisheries monitoring efforts in the Project area will focus on fish surveys in West Rosebud Creek between the dam and powerhouse and fish surveys in West Rosebud and Emerald lakes (*refer to Table 1-1*).

NorthWestern will continue to prepare and submit annual reports summarizing the previous year's monitoring activities to the TAC and posting the reports on the Mystic Lake Project Coordination website ([www.mysticlakeproject.com](http://www.mysticlakeproject.com)). Every 6 years, the TAC will re-evaluate and update the Fisheries Monitoring Plan, as necessary for the term of the Project License (40 years).

A comprehensive 6-year (2016-2021) fisheries monitoring report with an updated 6-year (2022-2027) fisheries monitoring plan will be prepared in 2022 and submitted to the TAC for review and approval prior to filing with the Commission. These two reports will be filed with the Commission no later than December 31, 2022. The final reports will also be posted on the Mystic Lake Project Coordination website.



## References

121 FERC ¶62, 198. 2007. Order Issuing New License.

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