SCHRIEBER LAKE MITIGATION SITE

Project Overview

MDT Project Number: NH 27 (029) UPN # 1027007

Watershed: Watershed #1 – Kootenai River Basin

Monitoring Year: 2021

Years Monitored: 7th year of monitoring

Corps Permit Number: NWO-2013-00874-MTM

Stream Protection Act (SPA) Authorization Number: MDT-R1-40-2013

Monitoring Conducted By: Confluence Consulting Inc.

Dates Monitoring Was Conducted: July 15, 2021

Purpose of the Approved Project:

The site was constructed by MDT from 2014 to 2015 to provide 13.4 acres of compensatory wetland mitigation credits and 36,741.85 stream mitigation credits for wetland and stream impacts associated with the US Highway 2 Swamp Creek – East project and highway impacts associated with future transportation project-related wetland and stream impacts in Watershed #1 – Kootenai River Basin. The project was designed to create new wetlands, restore degraded wetlands, and provide upland buffers around all wetlands. The project restored 1,398 linear feet of the Coyote Creek channel and 2,987 linear feet of the Schrieber Creek channel.

Site Location:

Latitude: 48.106833 **Longitude:** –115.409964

County: Lincoln **Nearest Town:** Libby, MT

Map Included: See Figure 1, page 11

Mitigation Site Construction Started: Summer/2014 **Construction Ended:** Spring/2015

Dates of Any Recent Corrective or Maintenance Activities (since previous report):

Activity: Weed Spraying **Date:** June 28 - July 1, 2021

Specific recommendations for any additional corrective actions: The Montana Department of Transportation (MDT) has an ongoing weed-control program and will assess the need for additional weed treatments in 2022. MDT is working with MT Fish, Wildlife and Parks (MFWP) on the removal of beaver from the Schrieber Lake site in an effort to protect existing scrub/shrub habitat and to reduce standing surface water.

Anticipated Wetland Credit Acres: 13.40

Wetland Credit Acres Generated to Date: 14.24

Anticipated Stream Credits: 36,741.87

Stream Credits Generated to Date: 34,349.67

Previous Monitoring Reports:
https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml

Monitoring Period: 5 years from construction completion or until concurrence by US Army Corps of Engineers (USACE).

Requirements (from approved mitigation plan, banking instrument, or Department of Army (DA) permit conditions)

Performance Standards: A summary of performance standards, associated success criteria, and 2021 achievement status for the Schrieber Lake site is provided in Table 1.

Table 1. Summary of Performance Standards

Wetland Performance Standards				
Performance Standards	**Success Criteria**	**Criteria Achieved Y/N**		**Discussion**
		SC[a]	**CC[b]**	
Wetland Characteristics	The three parameter criteria are met for hydrology, vegetation, and soils as outlined in the 1987 Wetland Manual and 2010 Regional Supplement.	Y	Y	Areas that were identified as wetland habitat within the mitigation site meet the three parameter criteria.
Wetland Hydrology	Soil saturation is present for at least 12.5 percent of the growing season.	Y	Y	Areas that were identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of growing season.
Hydric Soil	Hydric soil conditions are present or appear to be forming.	Y	Y	Hydric soil characteristics have developed throughout all constructed wetlands.
	Soil is sufficiently stable to prevent erosion.	Y	Y	Disturbed soil is stable and does not exhibit signs of erosion.
	Soil is able to support plant cover.	Y	Y	Plant cover is well established across disturbed soils.
Hydrophytic Vegetation	Combined aerial cover of facultative or wetter species is 70 percent or greater.	Y	Y	Areas identified as wetland habitat within the mitigation site support a prevalence of hydrophytic vegetation (OBL, FACW, and FAC) with combined aerial cover greater than 70 percent.
	State-listed noxious weeds do not exceed 5 percent absolute cover.	Y	Y	State-listed noxious weeds were less than 5 percent absolute cover within wetland areas in 2021.
	Woody plants exceed 50 percent survival after 5 years.	N	N	Woody plant survival remains very low and is not expected to meet this success criteria.
Open Water	The project is intended to provide open water during the spring and early summer within excavated depressions. Open water with emergent, submerged, and/or floating vegetation will, therefore, be considered successful and creditable.	Y	Y	Excavated depressions throughout the entire mitigation area appear to support perennial inundation with an established aquatic macrophyte community.
Upland Buffer	Noxious weeds do not exceed 5 percent cover within upland buffer area.	Y	Y	Noxious weed cover within the upland buffer areas adjacent to Schrieber and Coyote Creek was estimated at 5 percent and 3 percent, respectively.
	Any area that was disturbed within creditable buffer zone must have at least 50 percent aerial cover of non-weed species by end of monitoring period.	Y	Y	Disturbed areas have established greater than 50 percent cover by non-noxious weed species. The upland buffer area was dominated by predominately non-native invasive grass species. Total aerial cover of vegetation was estimated between 80 and 85 percent.
Weed Control	Weed control will be based on annual site monitoring to determine weed species and the degree of infestation within the site. Control measures based on the monitoring results will be implemented by Montana Department of Transportation (MDT) to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site.	Y	Y	State-listed noxious weed species across the site have been monitored and mapped during each post-construction monitoring event. MDT administers an ongoing weed-control program.

Stream Performance Standards				
Bank Restoration Success	Ratings for the streambank will be based on the Proper Functioning Condition (PFC) rating that determines if the area supports a healthy, stable bank area adjacent to the stream: i) Functioning – The streambank supports a healthy and stable bank area adjacent to the river. ii) Functioning at Risk – one or more functions of the streambank are adjusting to changes in the design within the reach area, and more monitoring is needed. iii) Not Functioning – Measurements of the functions indicate that the site is not achieving functional goals and is not.	N/Y	Y	A PFC assessment was performed during the 2020 monitoring year within three areas of the site (the stream reaches are shown in Figure A-2 in Appendix A). Reach SC1 was rated as Functional – At Risk due to the slower vegetation establishment and areas of bare soil along the bank. See the Stream Monitoring section of this report for additional details and the 2020 PFC assessment in Appendix B of the 2020 monitoring report.
Riparian Buffer Success	Creditable buffer areas must have at least 50 percent aerial cover of non-noxious weed species by the end of the monitoring period.	Y	Y	All riparian vegetation transects exhibited 50 percent or greater aerial cover of non-noxious weed species along both Schrieber and Coyote Creeks.
	Combined aerial cover of riparian and streambank vegetation communities is 70 percent or greater.	Y	Y	Combined aerial cover of riparian and streambank vegetation along Coyote Creek and Schrieber Creek was estimated at 90 percent.
	Noxious weeds do not exceed 5 percent cover within the riparian buffer areas.	Y	Y	Noxious weed cover within riparian buffer areas adjacent to Schrieber and Coyote Creeks was estimated at 3 percent and less than 1 percent, respectively.
	Planted trees and shrubs will be considered successful where they exhibit 50 percent survival after 5 years.	N	N	Planted trees and shrubs along Schrieber Creek and Coyote Creek exhibited less than 1 percent survival in 2021.

(a) SC = Schrieber Creek.
(b) CC = Coyote Creek.

Summary Data

Wetland Delineation –The total jurisdictional wetland and aquatic habitat delineated at the Schrieber Lake mitigation site in 2021 was 55.58 acres, an increase of 0.35 acres since 2020 (Table 2; see maps in Appendix A). Open water accounted for an estimated 13.68 acres of the site, including areas within Cells 1-10 and the preservation area northwest of Schrieber Lake (5.68 acres), and Schrieber Lake (8.00 acres). Schrieber Lake (8.00 acres) and open water The extensive wetland development at this site is the result of the excavation of wetland cells, construction of channel plugs, and the restoration of meanders and bed elevations for the Schrieber and Coyote creek channels. Beaver activity, noted for the first time in 2019, is contributing to a shift in wetland development at the site. The beaver dam constructed at the outlet of Schrieber Lake has created perennial inundation across the site and has changed the site's hydrologic regime, resulting in an expansion of perennial deep-water inundation levels observed within wetland vegetation communities in 2021. Shifts in species cover and dominance were observed within several wetland vegetation communities and are expected to continue as increased hydrology persists across the site.

Table 2. Upland, Wetland, & Aquatic Habitat Acreage Delineated From 2015 Through 2021

Habitat Type	2015 Acres	2016 Acres	2017 Acres	2018 Acres	2019 Acres	2020 Acres	2021 Acres
Uplands	**52.60**	**52.60**	**52.60**	**52.60**	**52.60**	**49.47**	**49.12**
Wetlands							
USFS wetlands (no credit)	1.25	1.25	1.25	1.25	1.25	1.66	1.66
MDT wetlands	37.65	37.65	37.65	37.65	37.65	34.43	35.43
Riparian Buffer (no wetland credit)	3.90	3.90	3.90	3.90	3.90	3.90	3.90
Total Delineated Wetlands	**42.84**	**42.84**	**42.84**	**42.84**	**42.84**	**39.99**	**40.90**
Open Water							
Schrieber Lake* (no credit)	8.26	8.26	8.26	8.26	8.26	8.00	8.00
Open Water* (Cells 1-10 & Preservation Area northwest of Schrieber Lake)	N/A	N/A	N/A	N/A	N/A	6.24	5.68
Streams							
Schrieber & Coyote Creeks (no wetland credit)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Wetland and Aquatic Habitat	**52.10**	**52.10**	**52.10**	**52.10**	**52.10**	**55.23**	**55.58**
Project Area	**104.70**	**104.70**	**104.70**	**104.70**	**104.70**	**104.70**	**104.70**

*Schrieber Lake and other 'Open Water' areas all meet the recent USACE definition of open water and are shown as Open Water on Figures A-3 and A-5 in Appendix A

Vegetation – A total of 110 plant species have been identified at the site from 2015 through 2021, with 12 new species identified during the 2021 monitoring event. Six wetland, four upland, and one 'open water' community types (CT) were identified and mapped at the mitigation site in 2021 (Figure A-3, Appendix A). Dominant plant species observed within each community are listed on the Wetland Mitigation Site Monitoring form (Appendix B). Upland CT 13 – *Alopecurus* spp./*Phalaris arundinacea* was identified for the first time in 2021 in the northern "pan handle" of the site. This upland CT replaced the northern half of upland CT 1 due to shifts in species cover, from a dominance of creeping wild rye (*Elymus repens*) and smooth brome (*Bromus inermis*) to a more mesic composition and dominance by *Alopecurus* spp. and reed canary grass (*Phalaris arundinacea*). The vegetation community types, including one open water community type, identified on the site in 2021 include the following:

- Upland Type 1 – *Elymus repens/Bromus inermis*
- Upland Type 5 – *Pseudotsuga menziesii/Larix occidentalis*
- Upland Type 9 – *Crataegus douglasii/Symphoricarpos albus*
- Upland Type 13 – *Alopecurus* spp./*Phalaris arundinacea*
- Wetland Type 2 – *Betula pumila/Rhamnus alnifolia*
- Wetland Type 3 – *Phalaris arundinacea/Carex* spp.
- Wetland Type 4 – *Carex simulata/Persicaria amphibia*
- Wetland Type 6 – *Salix bebbiana/Phalaris arundinacea*
- Wetland Type 8 – *Carex* spp.
- Wetland Type 10 – *Typha latifolia*
- Open Water Type 11 – Open Water/Aquatic macrophytes (considered 'Open Water', not classified as an emergent vegetation community type)

A notable beneficial shift in species cover and dominance, due to the active beaver dam and perennial surface water, was observed within wetland CT 3 – *Phalaris arundinacea*. In 2021, inundation levels within wetland CT 3 were lower than observed in 2020, with an average of 2-2.5 feet. While the water depth was slightly lower, perennial surface water increased in cover within this CT since 2020, especially around Coyote and Schrieber Creeks, and between the excavated depressions. The seven-foot-tall aggressive reed canary grass (RCG) still dominates the CT, but large patches of the dense monoculture were absent, observed as dead, dying, or as floating mats. There was an increase in cover by *Carex* spp. and open water observed in areas once dominated by RCG. These shifts in cover by RCG, *Carex* spp., and open water are a result of more than two years of deep perennial inundation. Numerous scientific studies have evaluated and reported extended periods of flooding as a control strategy for invasive monocultures of RCG, especially flooding during summer when maximum rhizome growth and tillering occur. These studies reported consistent decreases in cover by RCG, seed germination at 0 to 10%, and large reductions in rhizome growth and tiller production, when perennial inundation and flooded conditions were greater than one year (Jenkins et al 2008; WRCGM 2009; Waggy 2010). The beaver activity and subsequent perennial inundation observed over the last few years at Schrieber Lake is successfully killing RCG rhizomes, decreasing its viable seed bank and germination, and promoting an increase in native herbaceous hydrophytic species richness and cover within this wetland CT.

Vegetation cover was measured along three belt transects (T-1, T-2, and T-3) in 2021 (Figure A-2, Appendix A). Photographs of the transect end points are provided in Appendix C. In 2021, a reduction in RCG, increase in *Carex* spp., and increase in perennial surface water were observed within the wetland CTs. To be clear, the expansion of perennial surface water noted in 2021 was primarily observed *within* the wetland CTs along all three transects (i.e., wetland CT 3, 4, and 6) in areas that exhibited greater than 5% emergent vegetion and were too small (i.e., less than 0.1-acre in size) to classify as open water CT 11. This expansion was captured by simply increasing its cover class within the associated wetland CT. In Tables 3 through 5, the "% transect length comprising open water" summarizes the length of transect occupied by open water CT 11 and does not include the perennial surface water expansion observed within wetland CTs along the transects. Instead, because 2-3 feet of surface water covered all unvegetated areas along the transects at the Schrieber Lake site, the "estimated % unvegetated" value is analogous to perennial surface water within the wetland CTs, which correspondingly demonstrated a 5 to 22 percent increase along the transects from 2020 to 2021.

Table 3 summarizes the data for T-1 from 2016 through 2021. T-1 is 284 feet long and intersects vegetation CT 3 and open water CT 11. Hydrophytic vegetation cover accounted for 75 percent of the transect in 2021, a 22 percent decrease since 2020, due to the perennial inundation present along the transect. Unvegetated surface water, 2-3 feet deep, accounted for the remaining 25 percent of the transect in 2021.

Table 3. Data Summary for T-1 From 2016 Through 2021 at the Schrieber Lake Site

Monitoring Year	2016	2017	2018	2019	2020	2021
Transect Length (feet)	**284**	**284**	**284**	**284**	**284**	**284**
Vegetation Community Transitions Along Transect	3	3	3	3	2	2
Vegetation Communities Along Transect	3	3	3	3	1	1
Hydrophytic Vegetation Communities Along Transect	3	3	3	3	1	1
Total Vegetative Species	9	10	9	7	7	6
Total Hydrophytic Species	8	9	9	7	7	6
Total Upland Species	1	1	0	0	0	0
Estimated % Total Vegetative Cover	100	100	100	100	97	75
Estimated % Unvegetated	0	0	0	0	3	25
% Transect Length Comprising Hydrophytic Vegetation Communities	100	100	100	100	97.2	97.2

Monitoring Year	2016	2017	2018	2019	2020	2021
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0	0
% Transect Length Comprising Open Water	0	0	0	0	2.8	2.8
% Transect Length Comprising Mudflat	0	0	0	0	0	0

Table 4 summarizes the data for T-2 from 2016 through 2021. T-2 is 280 feet long and intersects vegetation CT 3 and 6. Hydrophytic vegetation communities accounted for 100 percent of the transect in 2021. Hydrophytic vegetation cover accounted for 85 percent of the transect in 2021, a 10 percent decrease since 2020, due to the perennial inundation present along the transect. Unvegetated surface water, 2-3 feet deep, accounted for the remaining 15 percent of the transect in 2021.

Table 4. Data Summary for T-2 From 2016 Through 2021 at the Schrieber Lake Site

Monitoring Year	2016	2017	2018	2019	2020	2021
Transect Length (feet)	**280**	**280**	**280**	**280**	**280**	**280**
Vegetation Community Transitions Along Transect	1	1	1	1	1	1
Vegetation Communities Along Transect	2	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	5	6	6	6	6	6
Total Hydrophytic Species	5	6	6	6	6	6
Total Upland Species	0	0	0	0	0	0
Estimated % Total Vegetative Cover	100	100	100	100	95	85
Estimated % Unvegetated	0	0	0	0	5	15
% Transect Length Comprising Hydrophytic Vegetation Communities	100	100	100	100	100	100
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0	0
% Transect Length Comprising Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

Table 5 summarizes the data for T-3 from 2016 through 2021. T-3 is 584 feet long and intersects vegetation CT 3 and 4. Hydrophytic vegetation communities accounted for 100 percent of the transect in 2021. Like T-2 and T-3, hydrophytic vegetation cover decreased from 95 to 90 percent of the transect in 2021, due to the perennial inundation present along the transect. Unvegetated surface water, 2-2.5 feet deep, accounted for the remaining 10 percent of the transect in 2021.

Table 5. Data Summary for T-3 From 2016 Through 2021 at the Schrieber Lake Site

Monitoring Year	2016	2017	2018	2019	2020	2021
Transect Length (feet)	**584**	**584**	**584**	**584**	**584**	**584**
Vegetation Community Transitions Along Transect	2	2	2	2	1	1
Vegetation Communities Along Transect	3	3	3	3	2	2
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	11	10	12	9	6	6
Total Hydrophytic Species	10	8	10	7	6	6
Total Upland Species	1	2	2	2	0	0
Estimated % Total Vegetative Cover	100	100	100	100	95	90
Estimated % Unvegetated	0	0	0	0	5	10

Monitoring Year	2016	2017	2018	2019	2020	2021
% Transect Length Comprising Hydrophytic Vegetation Communities	94	94	94	97	100	100
% Transect Length Comprising Upland Vegetation Communities	6	6	6	3	0	0
% Transect Length Comprising Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

Priority 2B noxious weeds identified and mapped within the Schrieber Lake mitigation site included spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*), butter-and-eggs (*Linaria vulgaris*), and orange hawkweed (*Hieracium aurantiacum*). The most common noxious weed species observed on site was Canada thistle (Figure A-3, Appendix A). MDT has an ongoing weed control program for their mitigation sites and treated noxious weed infestations at this site between June 28th and July 1st, 2021.

MDT planted 1,500 woody plants in the riparian buffer along Schrieber Creek, Coyote Creek, and around some excavated wetland cells. Based on observations at the parallel and perpendicular belt transects, woody planting survival was estimated well below the required 50 percent survival. Woody survival is inhibited by competition with herbaceous vegetation, perennial inundation or extremely saturated soil conditions, herbivory by ungulates and rodents, and previous herbicide applications on adjacent noxious weed infestations. No natural recruitment of woody plants has been observed at the site.

Hydrology – During the 2021 investigation, the average depth of surface water across the site was estimated at greater than 2.0 feet with a range of depths from 0.25 to 5 feet. The deepest standing water is located within many of the excavated cells and within the creek channels. Approximately 80 percent of the AA was inundated during the 2021 site visit. The surface-water depth at the emergent vegetation and open-water boundary was estimated at 2.0 feet. In 2021, the beaver dam documented initially in 2019 at the outlet of Schrieber Lake, was still in use and supporting perennial inundation across the entire wetland area. Schrieber Lake and the remaining open water areas represented 8.00 acres and 5.68 acres of open water habitat, respectively, during the 2021 monitoring event. These areas are depicted as CT 11 on Figure A-3 in Appendix A.

The majority of wetland habitat exhibited standing surface water in 2021, and average water depths across the site decreased by 0.5 feet compared to 2020. The distinct topographic break between upland and wetland habitat at the site has primarily resulted in an increase in inundation depths within existing wetlands rather than an expansion of surface area inundation and newly created wetland habitat. Some upland areas immediately adjacent to the wetland boundary showed signs of soil saturation during the site visit but are still dominated by upland vegetation. The changes in plant community composition and wetland/open water habitat observed in 2021 are directly correlated to the perennial surface water present across the site. Continued shifts in vegetation and an increase in wetland/open water habitat are expected if the beaver dam persists and water levels remain high. Groundwater monitoring conducted by the US Geological Survey (USGS) in 2021 indicates that water levels remained high across the site throughout the 2021 summer growing season, which can be directly attributed to the beaver dam activity at the outlet of Schrieber Lake. In most years, groundwater levels drop throughout the summer, but this was not the case in 2019 through 2021. In May 2021, the USGS recorded the highest groundwater level to date, at 3.63 feet above the land surface elevation of 3,030 feet. The following groundwater level collected at the same well in June 2021 dropped to 1.60 feet above the land surface, which is similar to the groundwater level in June 2020 (i.e., 1.71 feet above the land surface [USGS 2021].

Soils – Soil test pits were excavated at four locations to evaluate the extent of hydric soil development across the site in 2021 (Appendices A and B). Wetland test pits were characterized by a sandy clay loam soil texture and hydrogen sulfide hydric soil indicator. Soil textures within upland test pits ranged from

loamy sand to sandy loam. No hydric soil indicators were observed in either of the upland test pits. Additional field observations for the four data points are provided in the wetland determination data forms in Appendix B.

Functional Assessment – The 2008 Montana Wetland Assessment Method (MWAM) was used to evaluate the site in 2021 (Appendix B). The Assessment Area (AA) includes all delineated wetlands, including the creditable wetlands (35.34 acres), wetlands within the riparian buffers of Schrieber and Coyote Creeks (3.9 acres), Schrieber Lake and remaining open water areas (13.68 acres), portions of Schrieber and Coyote Creeks that flow through the wetland areas (1.00 acres), and the wetlands on US Forest Service (USFS) lands (1.66 acres). The wetlands in the AA received a Category I rating with 92.7% of the total possible points in 2021. They were rated as exceptional for General Wildlife Habitat and Production Export/Food Chain Support and high for all other functions and values except General Fish/Aquatic Habitat and Flood Attenuation, which were rated as moderate.

Wildlife – Twelve bird species were identified in 2021 at the Schrieber Lake site. In addition to the twelve bird species, a garter snake, five ground squirrels, two northern Columbia spotted frogs, one muskrat, and a vole species were observed (Appendix B). Deer tracks were noted at the site as well.

Photographs – Ten photo points were initially established in the project area in 2015. Photographs were taken at all ten photo point locations during the 2021 site visit. In addition to established photo points, photographs were taken at each surveyed stream cross section, sampled data points, and vegetation transect endpoints. The locations of these photographs are illustrated on Figure A-2 (Appendix A) and the photographs in Appendix C. Please refer to previous years' monitoring reports for all previous annual photographs (https:// www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml).

Stream Monitoring – The survey results for 11 permanent cross sections that were established along the constructed Coyote and Schrieber Creeks (Figure A-2, Appendix A) are shown in Appendix D. The 2021 data were compared to the previous surveys and discussions to assess stream channel stability. In 2021, the banks of the constructed channels exhibited stable conditions and, with the exception of Schrieber Creek Reach 1 (SC1), were generally well-vegetated with deep-rooted plant species. The survey results indicate little to no channel morphological changes between 2020 and 2021. The nine cross sections that occur within the 2021 wetland boundary, with the exception of SC3-2, exhibited surface water elevations 0.3 to 0.5 feet below those surveyed in 2020. These results are consistent with the 0.5-foot decrease in average surface water depth observed across the site between 2020 and 2021.

The 2020 PFC assessment rated all stream reaches at the site as Functioning, with the exception of Schrieber Creek Reach 1 (SC1), which was rated as Functional – At Risk due to slower vegetation establishment, a dominance of shallow-rooted species, and areas of bare soil observed along the banks. In 2021, while vegetation cover increased minimally along this reach, it was otherwise consistent with 2020 observations, which included a dominance by shallow-rooted spreading bent (*Agrostis stolonifera*) and creeping wild rye, and minimal cover from deep-rooted species such as RCG. This reach has an upward trend, with the surrounding vegetation community transitioning to a more mesic species composition that includes the deep-rooted RCG, and increased vegetation cover observed in 2021 and expected to continue over time.

Credit Summary – Stream Credits

The goal of the stream mitigation component of the Schrieber Lake project includes restoration of approximately 2,130 linear feet of Schrieber Creek, 1,397 feet of Coyote Creek, and 978 feet of Schrieber Creek below the Schrieber/Coyote Creek confluence. When combined with the establishment of a riparian buffer of varying width on both sides of the restored channels, the project is expected to generate a total of 36,741.87 stream and riparian credits, as shown in Table 6.

Table 6. 2021 Riparian and Stream Mitigation Credits for the Schrieber Lake Site

Channel Segment	Reach	Side	Predicted Credits	2021 Credits
Coyote Creek	1A	A	4,141.63	4,141.63
		B	4,141.63	4,141.63
	1B	A	1,586.25	1,586.25
		B	1,692.00	1,692.00
Schrieber	1	A	2,392.20	1,196.1
		B	2,392.20	1,196.1
	2A	A	2,722.50	2,722.50
		B	2,722.50	2,722.50
	2B	A	576.65	576.65
		B	576.65	576.65
	3	A	3,964.83	3,964.83
		B	3,964.83	3,964.83
	7	A	2,934.00	2,934.00
		B	2,934.00	2,934.00
Total			**36,741.87**	**34,349.67**

Data collected during the 2021 monitoring event revealed continued development of vegetation cover along the stream reaches. Reach 1 of Schrieber Creek has yet to fully meet the performance criteria established for the development of deep-rooted vegetation within the riparian corridor. The ephemeral nature of this reach results in slower vegetation growth. As a result, Reach 1 of Schrieber Creek has not met all success criteria and is therefore generating half of the anticipated credits. Reaches 2A, 2B, 3, and 7 of Schrieber Creek, and Reaches 1A and 1B of Coyote Creek currently meet all success criteria and have generated the predicted credits outlined in the monitoring plan. Future monitoring will continue to assess the vegetation establishment within Reach 1 of Schrieber Creek, along with its status in meeting the success criteria and generating the anticipated stream mitigation credits. To date, the site has generated 34,349.67 stream credits.

Credit Summary – Wetland Credits

MDT anticipates generating 13.4 wetland credit acres from the Schrieber Lake project. Proposed mitigation credits from the 2014 Schrieber Lake Mitigation Plan included creating 3.06 wetland acres, re-establishing 2.53 wetland acres, enhancing 4.53 acres of the fen-carr shrubland expansion, preserving 25.6 acres of existing fen-carr *Carex* areas, and creating a 50-foot upland buffer (3.81 acres) around newly established wetlands in the center of the site. Table 7 summarizes the estimated wetland credits based on the pending USACE-approved credit ratios and the wetland delineation completed in July 2021. The 2021 wetland delineation identified 35.34 acres of creditable wetlands and 5.51 acres of creditable 'open water' within the mitigation site. Creditable wetland acreage included 5.06 acres of created wetland, 1.14 acres of re-established wetlands, 4.69 acres of enhanced wetlands, and 24.46 acres of preserved wetlands; with 3.81 acres of upland buffer around the perimeter of the delineated wetland. In accordance with the USACE-approved performance standard for this site, open water areas with submerged and/or floating vegetation will be considered successful and creditable. The open water areas at the site are considered successful and creditable as they exhibited less than 5% emergent vegetation and a diversity of submerged and floating aquatic macrophytes. Creditable open water acreage included 2.54 acres of created open water, 1.28 acres of re-established open water, 0.08-acre of enhanced open water, and 1.61 acres of preserved open water. Schrieber Lake has never received mitigation credit at this site and is therefore excluded from Table 7. The 2021 estimated credit acres for

this site have exceeded the proposed credit acres. To date, a total of 14.24 credit acres have developed at this site. Figure A-4 (Appendix A) shows the location of wetlands based on credit type.

Table 7. Summary of Wetland Mitigation Credits at the Schrieber Lake Site in 2015, and 2020 through 2021

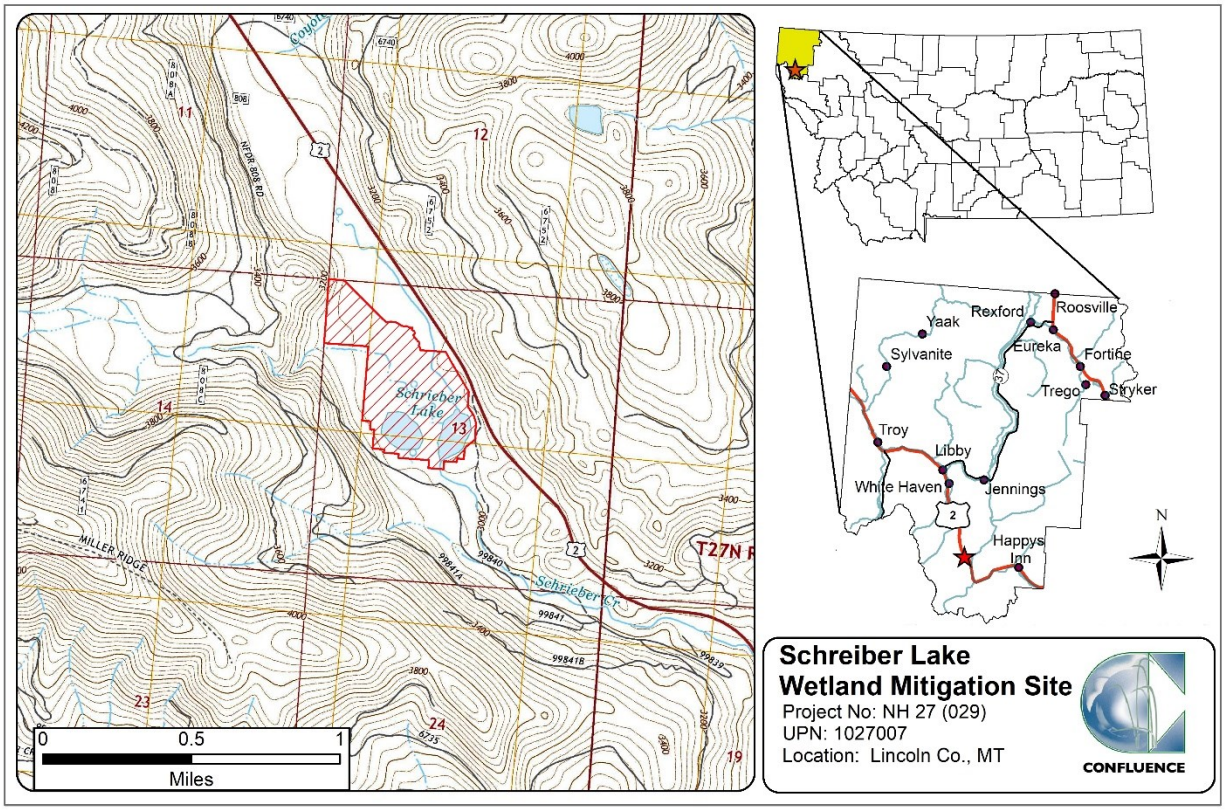
Mitigation Type	Total Proposed Acreage	Ratio	Proposed Credit Acres	2015 Delineated Acreage	2015 Credit Acres	2020 Delineated Acreage	2020 Credit Acres	2021 Delineated Acreage	2021 Credit Acres
Creation	3.06	1:1	3.06	4.80	4.80	4.69	4.69	5.06	5.06
Creation 'Open Water'	N/A	TBD	N/A	--	--	2.56	TBD	2.54	TBD
Restoration (Re-establishment)	2.53	1.5:1	1.69	2.42	1.62	1.14	0.76	1.14	0.76
Restoration 'Open Water'	N/A	TBD	N/A	--	--	1.28	TBD	1.28	TBD
Enhancement areas- Carr Shrubland expansion	4.53	3:1	1.51	4.77	1.59	4.69	1.56	4.69	1.56
Enhancement 'Open Water'	N/A	TBD	N/A	--	--	0.08	TBD	0.08	TBD
Preservation-Existing Fen-Carr-Carex Areas	25.60	4:1	6.40	25.66	6.42	24.11	6.03	24.46	6.12
Preservation 'Open Water'	N/A	TBD	N/A	--	--	2.13		1.61	TBD
Upland Buffer (50 feet)[(a)]	3.81	5:1	0.76	8.42	1.68	3.81	0.76	3.81	0.76
Permanent Project Impacts	0.02	None	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Total Mitigation Acreage	**39.51**		**13.40**	**46.05**	**16.09**	**44.46**	**13.78**	**44.65**	**14.24**

(a) Acreage includes 50-foot buffer around perimeter of delineated wetlands within MDT property and outside of the riparian buffer.

(b) Creditable Open Water acreage (5.51 acres) separated into Creation, Restoration, Enhancement, and Preservation Open Water Mitigation Area Types. 0.17-acre of Open Water acreage delinated in 2021 is not included above due to its location within the Stream and Riparian Mitigation Credit Area. Mitigation ratios and crediting for Open Water are To Be Determined (TBD) – see USACE approved performance standard for Open Water (Table 1).

Maps, Plans, Photos

Figure 1. Site Location Map



Project Area Maps/Figures: See Appendix A (Figure A-2 – 2021 Monitoring Activity Locations; Figure A-3 – 2021 Mapped Site Features; Figure A-4 – 2021 Wetland Credit Areas; Figure A-5 – 2021 Wetland Delineation)

Data Forms: See Appendix B (Site Monitoring form, USACE data forms, and MWAM forms)

Plant List: See Table B-1 in Appendix B

Photos: See Appendix C

Plans: See Appendix D of 2015 Monitoring Report
https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2015_REPORTS/2015_Schrieber_Lake_FINAL.PDF

Conclusions

Based on the results of the seventh year of monitoring, the mitigation site is continuing to develop into a diverse wetland ecosystem. The site is meeting all performance standards except the following:

1. Planted trees and shrubs will be considered successful when they exhibit 50 percent survival after 5 years.
2. Bank Restoration Success (only along Reach SC-1).

Woody plant survival is not expected to meet the established performance standard. Reach SC-1 along Schrieber Creek is an ephemeral reach that is taking longer for deep-rooted vegetation to establish but is expected to meet this success criteria in future monitoring events. No remedial actions are recommended at this time.

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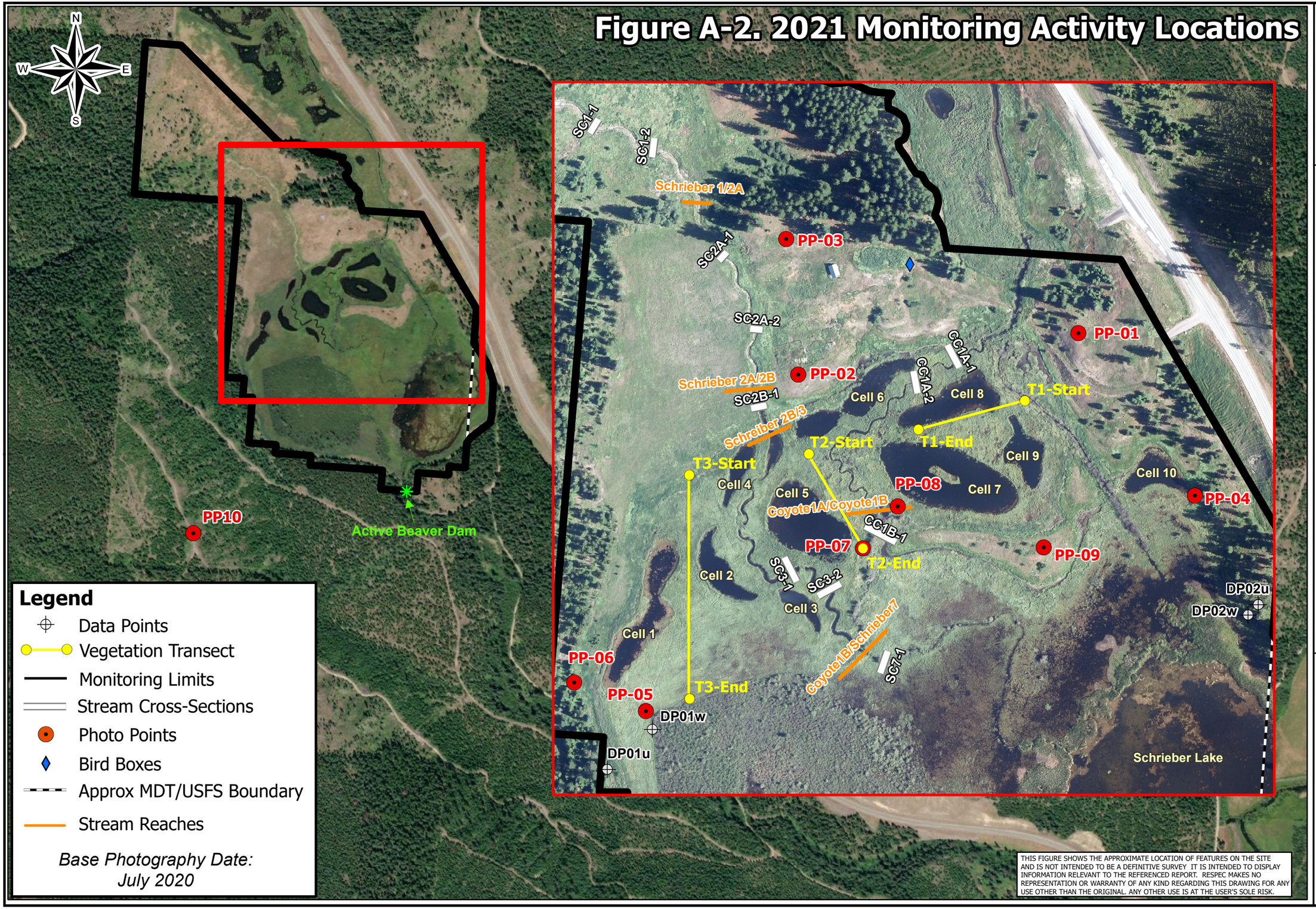
APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Schrieber Lake
Lincoln County, Montana

Figure A-2. 2021 Monitoring Activity Locations



Legend

- Data Points
- Vegetation Transect
- Monitoring Limits
- Stream Cross-Sections
- Photo Points
- Bird Boxes
- Approx MDT/USFS Boundary
- Stream Reaches

Base Photography Date: July 2020

CONFLUENCE
consulting incorporated

Schrieber Lake Mitigation Site
2021 Monitoring Activity Locations

0 100 200 400 600 800 1,000 Feet

Project: NH 27 (029)
Location: Lincoln Co., Montana
Date: October 2021
Project Manager: R. McEldowney
Drawn By: RQ

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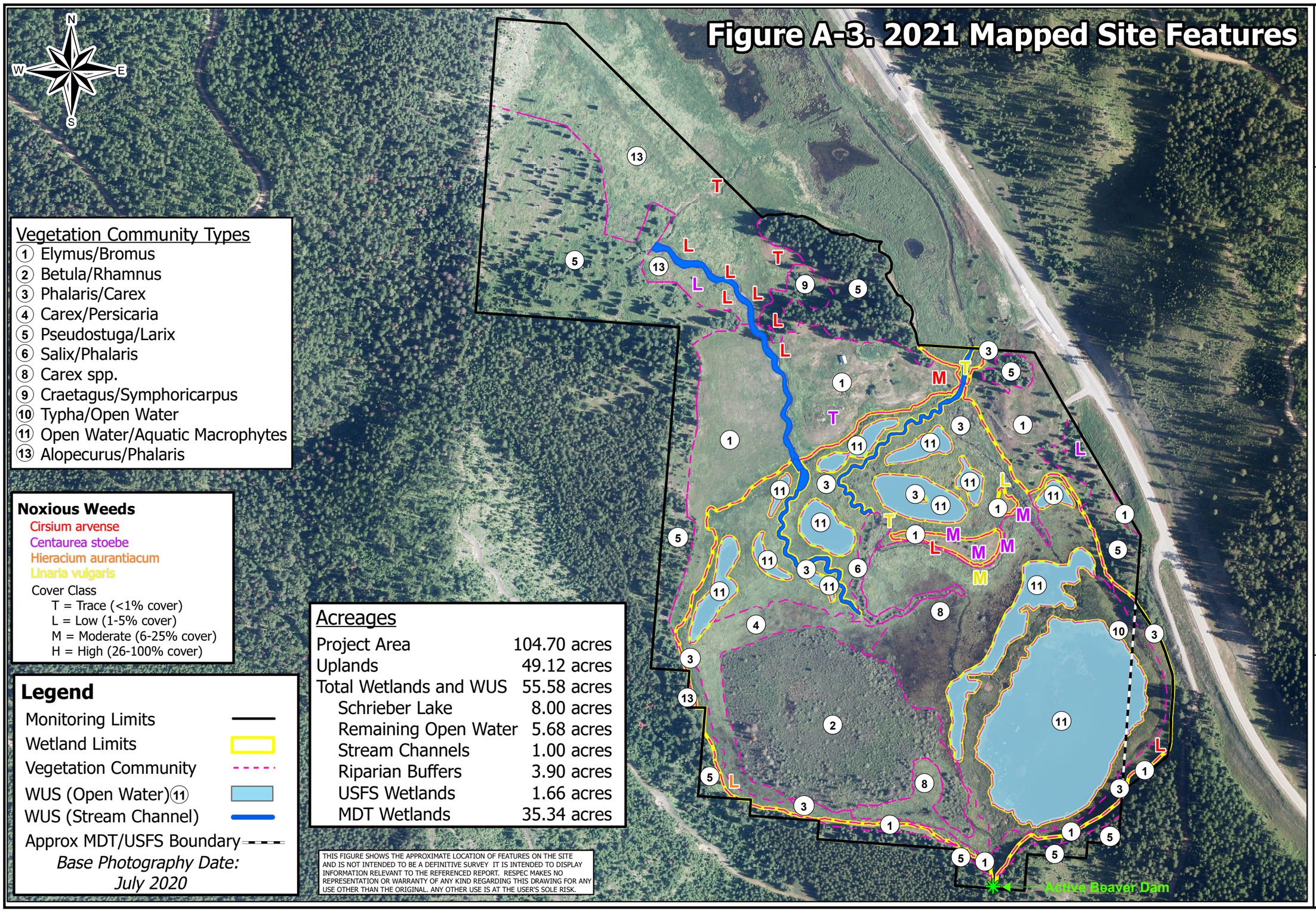
Figure A-3. 2021 Mapped Site Features



Vegetation Community Types

1. Elymus/Bromus
2. Betula/Rhamnus
3. Phalaris/Carex
4. Carex/Persicaria
5. Pseudostuga/Larix
6. Salix/Phalaris
8. Carex spp.
9. Craetagus/Symphoricarpus
10. Typha/Open Water
11. Open Water/Aquatic Macrophytes
13. Alopecurus/Phalaris

Noxious Weeds

Cirsium arvense
Centaurea stoebe
Hieracium aurantiacum
Linaria vulgaris

Cover Class
- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (6-25% cover)
- H = High (26-100% cover)

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Community
- WUS (Open Water) 11
- WUS (Stream Channel)
- Approx MDT/USFS Boundary

Base Photography Date: July 2020

Acreages

Project Area	104.70 acres
Uplands	49.12 acres
Total Wetlands and WUS	55.58 acres
Schrieber Lake	8.00 acres
Remaining Open Water	5.68 acres
Stream Channels	1.00 acres
Riparian Buffers	3.90 acres
USFS Wetlands	1.66 acres
MDT Wetlands	35.34 acres

CONFLUENCE
consulting incorporated

Schrieber Lake Mitigation Site
2021 Mapped Site Features

0 150 300 600 900 1,200 1,500 Feet

Project:	NH 27 (029)
Location:	Lincoln Co., Montana
Date:	October 2021
Project Manager:	R. McEldowney
Drawn By:	RQ

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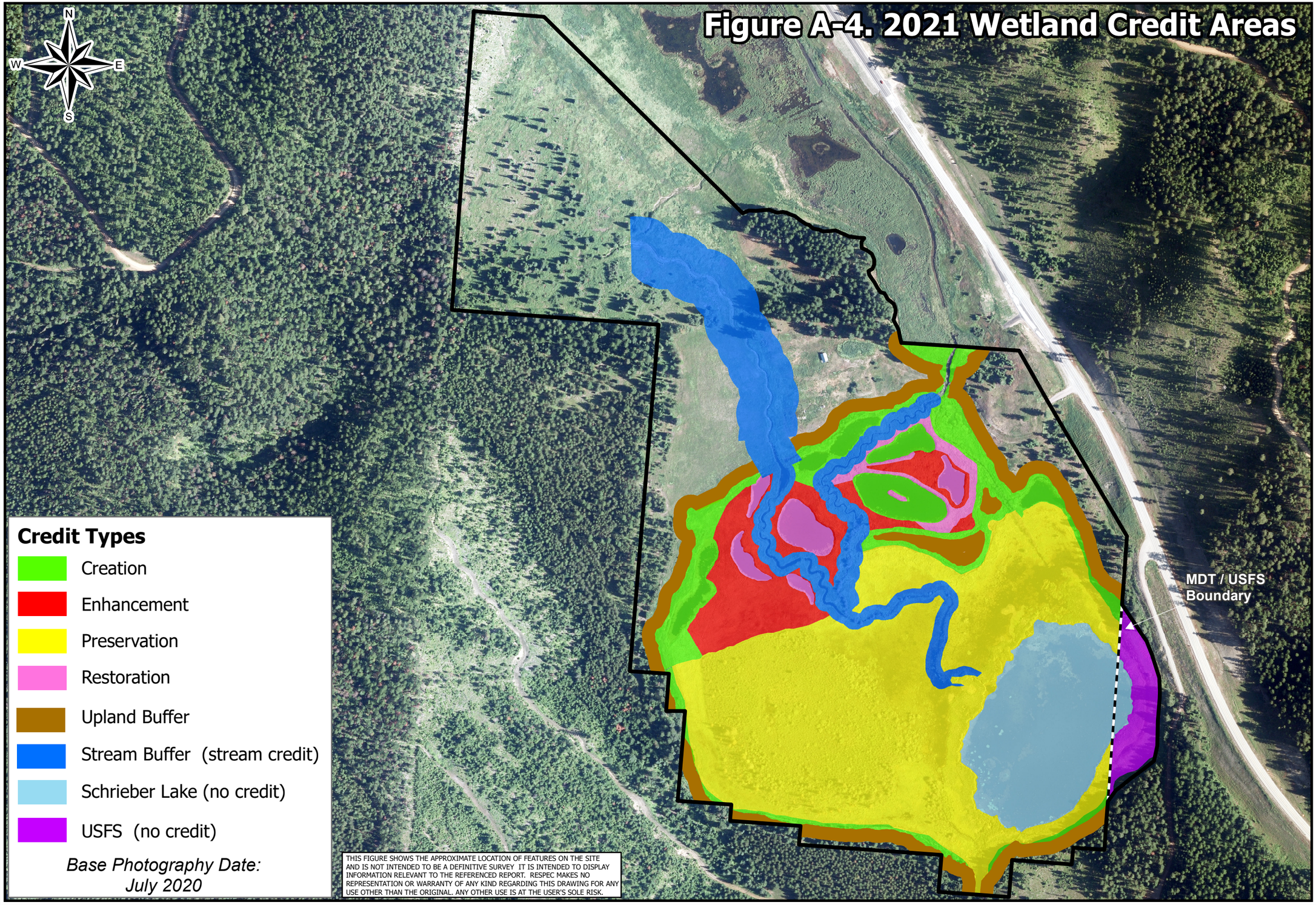
Figure A-4. 2021 Wetland Credit Areas



Credit Types

- Creation
- Enhancement
- Preservation
- Restoration
- Upland Buffer
- Stream Buffer (stream credit)
- Schrieber Lake (no credit)
- USFS (no credit)

Base Photography Date: July 2020

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY. IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

CONFLUENCE
consulting incorporated

Schrieber Lake Mitigation Site
2021 Wetland Credit Areas

0 150 300 600 900 1,200 1,500 Feet

Project: NH 27 (029)
Location: Lincoln Co., Montana
Date: October 2021
Project Manager: R. McEldowney
Drawn By: RQ

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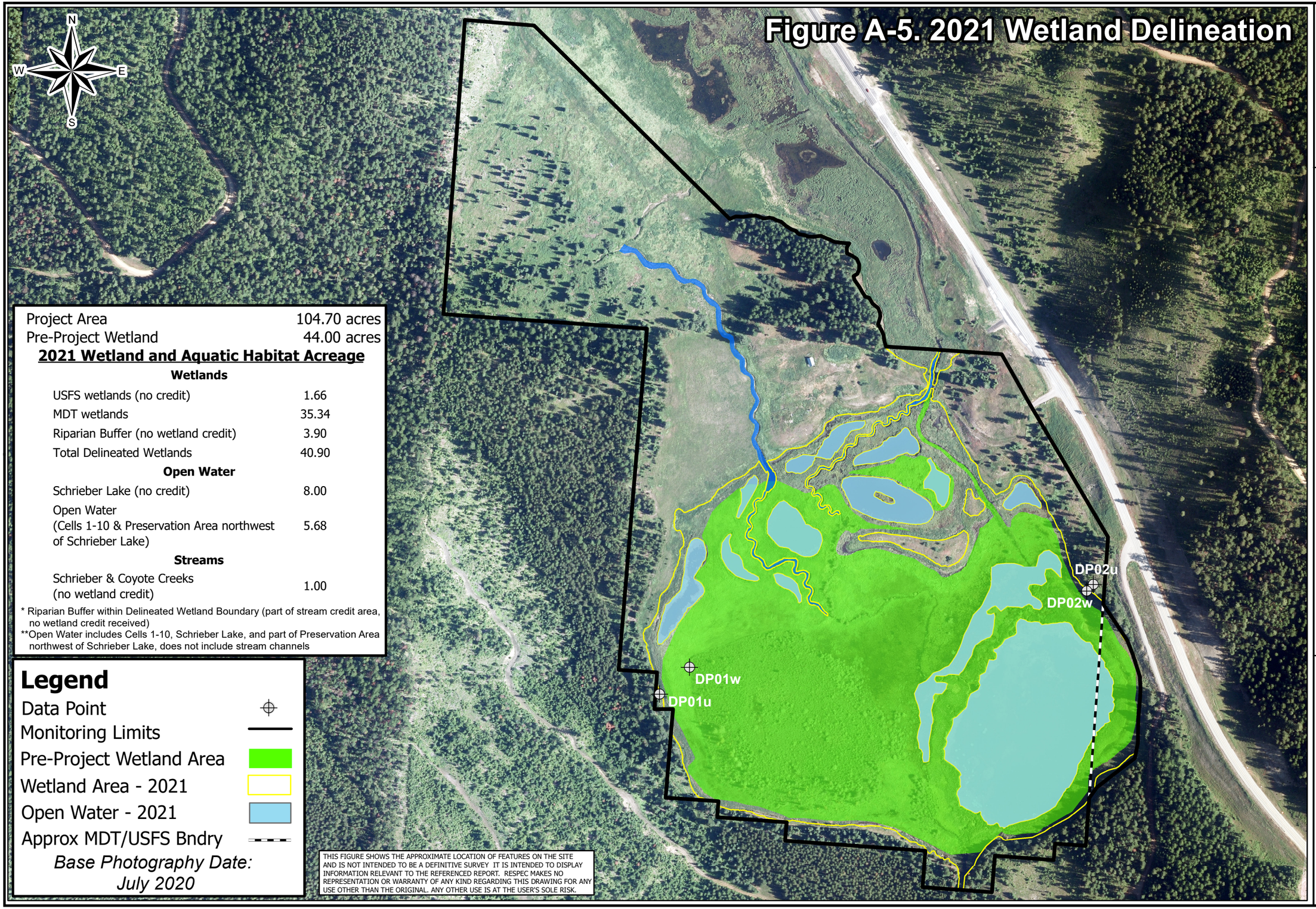
Figure A-5. 2021 Wetland Delineation



Project Area	104.70 acres
Pre-Project Wetland	44.00 acres

2021 Wetland and Aquatic Habitat Acreage

Wetlands	
USFS wetlands (no credit)	1.66
MDT wetlands	35.34
Riparian Buffer (no wetland credit)	3.90
Total Delineated Wetlands	40.90
Open Water	
Schrieber Lake (no credit)	8.00
Open Water (Cells 1-10 & Preservation Area northwest of Schrieber Lake)	5.68
Streams	
Schrieber & Coyote Creeks (no wetland credit)	1.00

* Riparian Buffer within Delineated Wetland Boundary (part of stream credit area, no wetland credit received)
**Open Water includes Cells 1-10, Schrieber Lake, and part of Preservation Area northwest of Schrieber Lake, does not include stream channels

Legend

- Data Point
- Monitoring Limits
- Pre-Project Wetland Area
- Wetland Area - 2021
- Open Water - 2021
- Approx MDT/USFS Bndry

Base Photography Date: July 2020

CONFLUENCE
consulting incorporated

Schrieber Lake Mitigation Site
2021 Wetland Delineation

0 150 300 600 900 1,200 1,500 Feet

Project: NH 27 (029)
Location: Lincoln Co., Montana
Date: October 2021
Project Manager: R. McEldowney
Drawn By: RQ

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APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Schrieber Lake
Lincoln County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Schrieber Lake Assessment Date/Time 7/14/2021

Person(s) conducting the assessment: R Quire, S Weyant, B Trudgeon

Weather: 80 degrees, sunny, clear Location: Highway 2, Swamp Creek East

MDT District: Missoula Milepost: 53.8

Legal Description: T 27N R 30W Section(s) 13

Initial Evaluation Date: 5/18/2015 Monitoring Year: 7 #Visits in Year: 1

Size of Evaluation Area: 105 (acres)

Land use surrounding wetland:

US Highway 2, US Forest Service, forested watershed, Weyerhaeuser lands to the south of the site.

HYDROLOGY

Surface Water Source: Schrieber Creek, Coyote Creek, precipitation, groundwater

Inundation: ☑ Average Depth: 2 **(ft)** Range of Depths: 0.25-5 **(ft)**

Percent of assessment area under inundation: 80 %

Depth at emergent vegetation-open water boundary: 2 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: No

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc:

Surface water, saturation, high water table, hydrogen sulfide odor, iron deposits, geomorphic position, FAC neutral test, inundation visible on aerials.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Additional Activities Checklist:

☑ Map emergent vegetation-open water boundary on aerial photograph.

☑ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)

☐ Use GPS to survey groundwater monitoring well locations, if present.

Hydrology Notes:

Water depth refers to wetland cells, not including Schreiber Lake. 80% inundation does not include the uplands in the northern "panhandle" of the project area. Beaver dam at outlet of Schrieber Lake observed in 2019 through 2021 - has created significant impact on water depths across site. Depths ranged from 3"-60". Deepest water in channels, excavated depressions, and Schrieber Lake.

VEGETATION COMMUNITIES

Site Schrieber Lake

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 1 **Community Type:** Elymus repens / Bromus spp. **Acres:** 15.03

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agrostis stolonifera	1
Alopecurus arundinaceus	2	Alopecurus pratensis	1
Bromus inermis	3	Bromus tectorum	2
Cirsium arvense	1	Elymus repens	4
Linaria vulgaris	1	Nassella viridula	1
Pascopyrum smithii	3	Phalaris arundinacea	2
Phleum pratense	3	Poa compressa	3
Poa pratensis	1	Pseudoroegneria spicata	1
Pseudotsuga menziesii	1	Symphoricarpos albus	1
Verbascum thapsus	1		

Comments:

Upland community at edges of wetland boundaries across the site. Nearly 12 acres of this community type was replaced by upland type 13 in the the northern "pan handle" of the site. This occurred as a result of a shift in dominance from Elymus repens and Bromus spp. to a dominance of Alopecurus spp. and Phalaris arundinacea.

Community # 2 **Community Type:** Betula pumila / Rhamnus alnifolia **Acres:** 10.7

Species	Cover class	Species	Cover class
Betula pumila	4	Carex spp.	3
Comarum palustre	1	Open Water	3
Persicaria amphibia	1	Phalaris arundinacea	2
Rhamnus alnifolia	2	Salix bebbiana	1
Salix boothii	1	Salix candida	1
Salix geyeriana	1		

Comments:

In 2021, many shrubs within the Carr preservation area were observed as dead or stressed from the perennial 2-3ft inundation level caused by the 2019-2021 beaver dam at the southern project boundary.

Community # 3 Community Type: Phalaris arundinacea / Carex spp. **Acres:** 12.79

Species	Cover class	Species	Cover class
Agrostis capillaris	1	Alopecurus arundinaceus	1
Alopecurus pratensis	1	Carex aquatilis	2
Carex lasiocarpa	2	Carex nebrascensis	1
Carex simulata	1	Carex utriculata	3
Carex vesicaria	1	Comarum palustre	1
Deschampsia caespitosa	0	Geum macrophyllum	0
Juncus tenuis	0	Lemna minor	1
Open Water	3	Persicaria amphibia	1
Phalaris arundinacea	4	Symphyotrichum spathulatum	0
Typha latifolia	1		

Comments:

In 2021, inundation levels within this CT were lower than observed in 2020, with an average of 2-2.5 feet. While the water depth was lower, open water areas have increased within this CT since 2020, especially around Coyote and Schrieber Creeks and between the excavated depressions. 7ft tall reed canary gras still dominates the CT, but large patches of the dense monoculture were absent, observed as dead, dying, or as floating mats. Increase in cover by Carex spp. and open water observed in areas once dominated by reed canary grass. These shifts in cover by reed canary grass, Carex spp., and open water are likely a result of more than 2 years of deep perennial inundation. In 2021, reed canary grass had also been heavily grazed in many areas by Canada geese and we suspect moose. Difficult to move through this CT.

Community # 4 Community Type: Carex spp. / Persicaria amphibia **Acres:** 2.85

Species	Cover class	Species	Cover class
Carex aquatilis	3	Carex lasiocarpa	3
Carex nebrascensis	1	Carex simulata	1
Carex utriculata	4	Carex vesicaria	1
Comarum palustre	1	Geum macrophyllum	1
Open Water	3	Persicaria amphibia	3
Phalaris arundinacea	1	Symphyotrichum spathulatum	1

Comments:

Wetland community in southwestern portion of project area.

Community # 5 Community Type: Pseudotsuga menziesii / Larix occidentalis **Acres:** 21.73

Species	Cover class	Species	Cover class
Abies grandis	2	Agrostis capillaris	1
Alopecurus arundinaceus	1	Alopecurus pratensis	1
Amelanchier alnifolia	1	Arctostaphylos uva-ursi	2
Berberis repens	1	Bromus inermis	2
Calamagrostis rubescens	2	Campanula rotundifolia	0
Carex geyeri	2	Centaurea stoebe	1
Elymus glaucus	1	Elymus repens	1
Hieracium aurantiacum	0	Larix occidentalis	2
Penstemon confertus	0	Pinus contorta	2
Pseudotsuga menziesii	3	Rosa woodsii	1
Symphoricarpos albus	2		

Comments:

Upland forested community at edges of wetland boundaries.

Community # 6 Community Type: Salix bebbiana / Phalaris arundinacea **Acres:** 0.81

Species	Cover class	Species	Cover class
Alnus incana	0	Crataegus douglasii	0
Open Water	4	Persicaria amphibia	1
Phalaris arundinacea	4	Salix bebbiana	2

Comments:

Many shrubs observed as stunted and dying due to deep perennial inundation, located along the restored confluence of Coyote and Schrieber Creeks.

Community # 8 Community Type: Carex spp. / **Acres:** 9.08

Species	Cover class	Species	Cover class
Carex aquatilis	1	Carex atherodes	1
Carex lasiocarpa	2	Carex utriculata	4
Carex vesicaria	1	Open Water	3
Persicaria amphibia	1	Phalaris arundinacea	2
Salix bebbiana	1	Salix candida	1
Scirpus microcarpus	1		

Comments:

In 2021, this community was inundated with an average of 2-2.5 feet of ponded water.

Community # 9 Community Type: Crataegus douglasii / Symphoricarpos albus **Acres:** 0.74

Species	Cover class	Species	Cover class
Achillea millefolium	0	Alopecurus arundinaceus	1
Alopecurus pratensis	2	Cirsium arvense	1
Crataegus douglasii	5	Cynoglossum officinale	0
Dactylis glomerata	0	Elymus trachycaulus	1
Galium triflorum	0	Phalaris arundinacea	2
Symphoricarpos albus	4	Taraxacum officinale	0
Urtica dioica	0		

Comments:

Upland community type in the northern portion of project area.

Community # 10 Community Type: Typha latifolia / Open Water **Acres:** 4.63

Species	Cover class	Species	Cover class
Aquatic macrophytes	1	Comarum palustre	2
Myriophyllum sibiricum	1	Nuphar polysepala	0
Open Water	4	Phalaris arundinacea	1
Typha latifolia	5		

Comments:

Wetland community type that surrounds Schrieber Lake.

Community # 11 Community Type: Open Water / Aquatic macrophytes **Acres:** 13.68

Species	Cover class	Species	Cover class
Aquatic macrophytes	4	Myriophyllum sibiricum	1
Nuphar polysepala	0	Open Water	5
Persicaria amphibia	2	Typha latifolia	1

Comments:

Open water community, which decreased by 0.56 acres since 2020, represented areas dominated by an average of 2-3 feet of standing water, less than 5% emergent wetland vegetation, and a diversity of submergent/floating aquatic macrophytes. This community type replaced wetland community type 12 - Carex lasiocarpa in 2020.

Community # 13 **Community Type:** Alopecurus spp. / Phalaris arundinacea **Acres:** 11.61

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Alopecurus pratensis	4
Bare Ground	2	Bromus inermis	3
Elymus repens	2	Phalaris arundinacea	3
Poa compressa	2	Poa pratensis	2
Sisymbrium altissimum	1		

Comments:

New community observed in 2021, located in the upland "pan handle" of site. Although reed canary grass provided slightly more (<5%) cover than smooth brome within this upland area, smooth brome was observed frequently and is considered an additional codominant within this community. This upland pan handle area appears to be transitioning into a more mesic vegetation community than observed during previous monitoring events.

Total Vegetation Community Acreage **104.7**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Schrieber Lake Date: 7/14/2021

Transect Number: 1 **Compass Direction from Start:** 251

Interval Data:

Ending Station 93 **Community Type:** Phalaris arundinacea / Carex spp.

Species	Cover class	Species	Cover class
Carex lasiocarpa	4	Carex utriculata	2
Open Water	1	Persicaria amphibia	1
Phalaris arundinacea	5		

Ending Station 101 **Community Type:** Open Water / Aquatic macrophytes

Species	Cover class	Species	Cover class
Aquatic macrophytes	1	Open Water	5
Persicaria amphibia	2	Typha latifolia	1

Ending Station 284 **Community Type:** Phalaris arundinacea / Carex spp.

Species	Cover class	Species	Cover class
Carex lasiocarpa	3	Carex utriculata	3
Lemna minor	0	Open Water	4
Persicaria amphibia	2	Phalaris arundinacea	3
Typha latifolia	1		

Transect Notes:

Difficult to move through. Reed canary grass greater than 7ft tall, decreased in cover in 2021, and observed as absent, dead, dying, or floating mats in many areas along transect. Water at times greater than 3ft deep, boats neccesary for monitoring this transect and caution taken by crew. Open water increased in 2021 as compared to 2020.

Transect Number: 2 **Compass Direction from Start:** 152

Interval Data:

Ending Station 260 **Community Type:** Phalaris arundinacea / Carex spp.

Species	Cover class	Species	Cover class
Carex lasiocarpa	4	Carex utriculata	3
Carex vesicaria	2	Open Water	3
Persicaria amphibia	3	Phalaris arundinacea	3

Ending Station 280 **Community Type:** Salix bebbiana / Phalaris arundinacea

Species	Cover class	Species	Cover class
Open Water	2	Persicaria amphibia	1
Phalaris arundinacea	4	Salix bebbiana	0

Transect Notes:

Difficult to move through. Reed canary grass greater than 7ft tall, decreased in cover in 2021, and observed as absent, dead, dying, or floating mats in many areas along transect. Water at times greater than 3ft deep, boats neccesary for monitoring this transect and caution taken by crew. Open water increased in 2021 as compared to 2020.

Transect Number: 3 **Compass Direction from Start:** 175

Interval Data:

Ending Station 484 **Community Type:** Phalaris arundinacea / Carex spp.

Species	Cover class	Species	Cover class
Carex aquatilis	3	Carex lasiocarpa	4
Carex utriculata	2	Persicaria amphibia	2
Phalaris arundinacea	5	Typha latifolia	1

Ending Station 584 **Community Type:** Carex spp. / Persicaria amphibia

Species	Cover class	Species	Cover class
Carex aquatilis	3	Carex lasiocarpa	3
Carex utriculata	3	Open Water	3
Persicaria amphibia	3	Phalaris arundinacea	2

Transect Notes:

Difficult to move through dense vegetation and water that covered unconsolidated ground surface. Reed canary grass greater than 7ft tall, with minimal decrease in cover as compared to 2020. Water at times greater than 2.5ft deep and caution taken by crew. Open water increased in 2021 as compared to 2020.

PLANTED WOODY VEGETATION SURVIVAL

Schrieber Lake

Planting Type	#Planted	#Alive	Notes
Various Species	1500		

Comments

MDT planted 1,500 woody plants in the riparian buffer along Schrieber Creek, Coyote Creek, and around some wetland excavations. In 2020 and 2021, based on observations at the parallel and perpendicular belt transects, woody planting survival was estimated as well below the required 50% survival. For most of the plantings, competition with herbaceous vegetation such as reed canary grass is problematic, as are the deep perennial inundation conditions present in most of the wetland habitat across the site. MDT staff (contacted July 2017) indicated that some of the woody plantings along the Schrieber Creek corridor were likely adversely affected by weed spraying activities at the site.

Schrieber Lake

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: Bird Boxes

How many? 2

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Old nesting materials were present in bird boxes, but did not appear to be in use during 2021 monitoring site visit.

Species	#Observed	Behavior	Habitat
Canada Goose	9	FO, L	
Common Nighthawk	1	FO	
Common Yellowthroat	1		
Eastern Kingbird	2	FO	
Great Blue Heron	5	FO, L	
Killdeer	6	F, FO, L	
Mallard	8	L	
Red-winged Blackbird	25	FO, L	
Ruddy Duck	2	L	
Spotted Sandpiper	1	F	
Tree Swallow	2	FO	
Woodpecker Sp.	2		

Bird Comments

BEHAVIOR CODES

BP = One of a breeding pair **BD** = Breeding display **F** = Foraging **FO** = Flyover **L** = Loafing **N** = Nesting

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Columbia Spotted Frog	2	No	No	No	
Garter Snake	3	No	No	No	
Ground Squirrel	5	No	No	Yes	
Muskrat	1	No	No	No	
Vole sp.	1	No	No	No	
White-tailed Deer		No	Yes	No	

Wildlife Comments:

A diversity of bird and wildlife species utilize the site.

Schrieber Lake

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

☐ One photograph for each of the four cardinal directions surrounding the wetland.

☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.

☐ At least one photograph showing the buffer surrounding the wetland.

☑ One photograph from each end of the vegetation transect, showing the transect.

Photo #	Latitude	Longitude	Bearing	Description
CC1A-1	48.106803	-115.410891	320	CC1A-1 right bank
CC1A-1	48.106803	-115.410891	50	CC1A-1 upstream
CC1A-2	48.1066	-115.41127	175	CC1A-2 left bank
CC1A-2	48.1066	-115.41127	85	CC1A-2 upstream
CC1B-1	48.105509	-115.411518		
CC1B-1	48.105509	-115.411518	200	CC1B-1 downstream
DP01u	48.103703	-115.414208		
DP01w	48.104011	-115.413766		
DP02u	48.105212	-115.407479		
DP02w	48.105136	-115.407579		
PP-1	48.107033	-115.409592	197	Photo Point 1, Photo 2
PP-1	48.107033	-115.409592	164	Photo Point 1, Photo 3
PP-1	48.107033	-115.409592	242	Photo Point 1, Photo 1
PP-10	48.100529	-115.415406	39	Photo Point 10
PP-2	48.106591	-115.412511	205	Photo Point 2, Photo 2
PP-2	48.106591	-115.412511	162	Photo Point 2, Photo 3
PP-2	48.106591	-115.412511	104	Photo Point 2, Photo 4
PP-2	48.106591	-115.412511	69	Photo Point 2, Photo 5
PP-2	48.106591	-115.412511	323	Photo Point 2, Photo 1
PP-3	48.10754	-115.412747	183	Photo Point 3
PP-4	48.105948	-115.408236	287	Photo Point 4
PP-5	48.104136	-115.413847	173	Photo Point 5, Photo 1
PP-5	48.104136	-115.413847	35	Photo Point 5, Photo 2
PP-5	48.104136	-115.413847	359	Photo Point 5, Photo 3
PP-6	48.104297	-115.414628	150	Photo Point 6, Photo 1

PP-6	48.104297	-115.414628	103	Photo Point 6, Photo 2
PP-6	48.104297	-115.414628	52	Photo Point 6, Photo 3
PP-7	48.105398	-115.411691	228	Photo Point 7, Photo 1
PP-7	48.105398	-115.411691	299	Photo Point 7, Photo 2
PP-7	48.105398	-115.411691	355	Photo Point 7, Photo 3
PP-8	48.105714	-115.411356	320	Photo Point 8, Photo 1
PP-8	48.105714	-115.411356	49	Photo Point 8, Photo 2
PP-8	48.105714	-115.411356	79	Photo Point 8, Photo 3
PP-9	48.105502	-115.409787	323	Photo Point 9, Photo 1
PP-9	48.105502	-115.409787	120	Photo Point 9, Photo 2
SC1-1	48.10823599	-115.4148624	300	SC1-1 upstream
SC1-1	48.108236	-115.414862	30	SC1-1 left bank
SC1-2	48.108116	-115.414221	10	SC1-2 left bank
SC1-2	48.108116	-115.414221	280	SC1-2 upstream
SC2A-1	48.107386	-115.413401	315	SC2A-1 downstream
SC2A-1	48.107386	-115.413401	45	SC2A-1 left bank
SC2A-2	48.106889	-115.41299	185	SC2A-2 downstream
SC2A-2	48.106889	-115.41299	275	SC2A-2 downstream
SC2B-1	48.106342	-115.412902	175	SC2B-1 downstream
SC2B-1	48.106342	-115.412902	265	SC2B-1 right bank
SC3-1	48.105212	-115.412439	240	SC3-1 upstream
SC3-1	48.105212	-115.412439	330	SC3-1 left bank
SC3-2	48.10509	-115.412014	160	SC3-2 downstream
SC3-2	48.10509	-115.412014	70	SC3-2 left bank
SC7-1	48.104608	-115.41138	20	SC7-1 left bank
SC7-1	48.104608	-115.41138	110	SC7-1 downstream
T-1 end	48.106268	-115.411205	71	Transect 1 end
T-1 start	48.106526	-115.410102	251	Transect 1 start
T-2 end	48.105398	-115.411692	332	Transect 2 end
T-2 start	48.106037	-115.412335	152	Transect 2 start
T-3 end	48.104242	-115.413401	335	Transect 3 end
T-3 start	48.105866	-115.413539	175	T-3 start

Comments:

Schrieber Lake

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☐ One photo from the wetland toward each of the four cardinal directions
☐ One photo showing upland use surrounding the wetland.
☐ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

The total wetland and aquatic habitat delineated at the Schrieber Lake mitigation site in 2021 was 55.58 acres, an increase of 0.35 acres since 2020 (Table 2; see maps in Appendix A). Schrieber Lake occupied 8.00 acres and remaining 'open water' areas represented a total of 5.68 acres.

Functional Assessments

☑ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Functional Assessment Comments:

Classified as Category I wetland.

Maintenance

Were man-made nesting structure installed at this site? Yes

If yes, do they need to be repaired? No

If yes, describe the problems below and indicate if any actions were taken to remedy the problems

Were man-made structures built or installed to impound water or control water flow

into or out of the wetland? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

Active beaver dam observed at outlet along southern project boundary. If the beaver dam remains, water levels are expected to remain perennially high across the site, which is influencing - in both positive and negative ways - the germination, survival, persistence, dominance, and diversity of herbaceous and woody species. Surface water depth across the site is ~0.5-1 ft lower than 2020, reed canary grass decreased in cover, but still dominates all other species by far and is over 7ft tall; making this site hazardous and many areas nearly inaccessible for crew to conduct monitoring activities. Kayak needed to conduct monitoring.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Schrieber Lake | City/County: Lincoln | Sampling Date: 7/14/2021

Applicant/Owner: MDT | State: Montana | Sampling Point: DP01u

Investigator(s): R Quire, S Weyant | Section, Township, Range: S 13 T 27N R 30W

Landform (hillslope, terrace, etc.): Hillside | Local relief (concave, convex, none): convex | Slope (%): 9

Subregion (LRR): LRR E | Lat: 48.103703 | Long: -115.414208 | Datum: NAD 83

Soil Map Unit Name: 108: Andic Dystric Eutrochrepts, lacustrine terraces-Andic Dystrochrepts, | NWI classification: Not Mapped.

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:
Forested upland point, located upslope from wetland boundary.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Abies grandis	5	☐	FACU
Pinus contorta	10	☑	FAC
Pseudotsuga menziesii	20	☑	FACU

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Amelanchier alnifolia	5	☑	FACU
Arctostaphylos uva-ursi	10	☑	FACU
Rosa woodsii	2	☐	FACU

Herbaceous Stratum Plot size (5 Foot Radius)

Campanula rotundifolia	1	☐	FACU
Carex geyeri	2	☐	NL
Centaurea stoebe	1	☐	NL
Elymus repens	15	☑	FAC
Penstemon confertus	10	☑	NL
Verbascum thapsus	1	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 70

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	0	X 2	0
FAC species	25	X 3	75
FACU species	44	X 4	176
UPL species	13	X 5	65
Column Totals	82 (A)		316 (B)

Prevalence Index = B/A = 3.85366

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:
BG/litter=70%. Data point is dominated by upland vegetation.

SOIL

Sampling Point: DP01u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-03	10YR 2/1	100					Sandy Loam	**Roots/duff present**
03-08	10YR 4/1	100					Sandy Loam	
08+							Gravel	**Gravel bottom**

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No evidence of hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Schrieber Lake | City/County: Lincoln | Sampling Date: 7/14/2021

Applicant/Owner: MDT | State: Montana | Sampling Point: DP01w

Investigator(s): R Quire, S Weyant | Section, Township, Range: S 13 T 27N R 30W

Landform (hillslope, terrace, etc.): Floodplain | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): LRR E | Lat: 48.104011 | Long: -115.413766 | Datum: NAD 83

Soil Map Unit Name: 105: Aquic Udifluvents, poorly drained, 0-5% slope | NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:
PEM/PSS riverine/slope wetland.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Dominant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Betula pumila	5	☑	OBL
Salix bebbiana	10	☑	FACW
Salix candida	10	☑	OBL

Herbaceous Stratum Plot size (5 Foot Radius)

Carex aquatilis	9	☐	OBL
Carex lasiocarpa	40	☑	OBL
Carex utriculata	15	☑	OBL
Comarum palustre	5	☐	OBL
Persicaria amphibia	1	☐	OBL
Phalaris arundinacea	5	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 25

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	85	X 1	85
FACW species	15	X 2	30
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	100 (A)		115 (B)

Prevalence Index = B/A = 1.15

Hydrophytic Vegetation Indicators

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:
25% cover provided by shallow standing water. Evidence of hydrophytic vegetation includes passing the rapid test, passing the dominance test, and a prevalence index less than or equal to 3.0.

SOIL

Sampling Point: DP01w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100						**Soils not textured.**

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Soils could not be textured due to depth of innundation. Evidence of hydric soil indicators include sulfidic odor.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 18

Water Table Present? Yes ☑ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Evidence of wetland hydrology includes 18 inches of surface water, high water table, soils saturated to surface, sulfidic odor, innundation on aerials, geomorphic position, and a positive FAC-Neutral test.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Schrieber Lake | City/County: Lincoln | Sampling Date: 7/14/2021

Applicant/Owner: MDT | State: Montana | Sampling Point: DP02u

Investigator(s): R Quire, S Weyant | Section, Township, Range: S 13 T 27N R 30W

Landform (hillslope, terrace, etc.): Hillside | Local relief (concave, convex, none): convex | Slope (%): 9

Subregion (LRR): LRR E | Lat: 48.105212 | Long: -115.407479 | Datum: NAD 83

Soil Map Unit Name: 105: Aquic Udifluvents, poorly drained, 0-5% slope | NWI classification: Rp1FO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:
Upland sample point located on forested hillside upslope of wetland boundary.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Pinus ponderosa	7	☑	FACU
Pseudotsuga menziesii	8	☑	FACU

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Amelanchier alnifolia	1	☐	FACU
Rosa woodsii	1	☐	FACU
Spiraea betulifolia	3	☐	FACU
Symphoricarpos albus	15	☑	FACU

Herbaceous Stratum Plot size (5 Foot Radius)

Achillea millefolium	1	☐	FACU
Elymus repens	51	☑	FAC
Galium boreale	5	☐	FACU
Onosmodium bejariense	3	☐	NL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 40

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	0	X 2	0
FAC species	51	X 3	153
FACU species	41	X 4	164
UPL species	3	X 5	15
Column Totals	95 (A)		332 (B)

Prevalence Index = B/A = 3.49474

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:
BG/litter=40%. Data point is dominated by upland vegetation.

SOIL

Sampling Point: DP02u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-05							Litter/duff	**Slightly decomposed plant material**
05-13	10YR 3/1	100					Loamy Sand	**Gravelly.**

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No evidence of hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Schrieber Lake | City/County: Lincoln | Sampling Date: 7/14/2021

Applicant/Owner: MDT | State: Montana | Sampling Point: DP02w

Investigator(s): R Quire, S Weyant | Section, Township, Range: S 13 T 27N R 30W

Landform (hillslope, terrace, etc.): Floodplain | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): LRR E | Lat: 48.105136 | Long: -115.407579 | Datum: NAD 83

Soil Map Unit Name: 105: Aquic Udifluvents, poorly drained, 0-5% slope | NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:
PEM riverine/slope wetland.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Carex atherodes	25	☑	OBL
Carex utriculata	25	☑	OBL
Lemna minor	1	☐	OBL
Scirpus microcarpus	4	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 45

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	55	X 1	55
FACW species	0	X 2	0
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	55 (A)		55 (B)

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:
Shallow water=45%. Evidence of hydrophytic vegetation includes passing the rapid test, passing the dominance test, and a prevalence index less than or equal to 3.0.

SOIL

Sampling Point: DP02w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-08	10YR 2/2	100					Sandy Clay Loam	**Low mineral comp, high roots**
08+							Gravels	**Gravel bottom**

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Evidence of hydric soil indicators include sulfidic odor.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☑ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 18

Water Table Present? Yes ☑ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Evidence of wetland hydrology includes surface water, high water table, saturated soils, iron deposits, innundation on aerials, sulfidic odor, geomorphic position, and a positive FAC-Neutral test.

MDT Montana Wetland Assessment Form (revised March 2008

1. Project name Schrieber Lake **2. MDT project#** NH 27 (029) **Control#** 1027007

3. Evaluation Date 7/15/2021 **4. Evaluators** R Quire, S Weyant, B Trudgeon **5. Wetland/Site# (s)** Schrieber Lake

6. Wetland Location(s): **T** 27N **R** 30W **Sec1** 13 **T** **R** **Sec2**

Approx Stationing or Mileposts Approximately Milepost 53.8

Watershed 1 - Kootenai **Watershed/County** Lincoln

7. Evaluating Agency CCI for MDT

8. Wetland size acres 55.58

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 55.58

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Aquatic Bed		Permanent/Perennial	25
Depressional	Emergent Wetland		Permanent/Perennial	10
Riverine	Unconsolidated Bottom		Permanent/Perennial	5
Slope	Emergent Wetland		Permanent/Perennial	30
Slope	Emergent Wetland		Seasonal/Intermittent	10
Slope	Scrub-Shrub Wetland		Permanent/Perennial	20

11. Estimated Relative Abundance Rare

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is <=15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is <=15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Highway 2 and USFS roads are adjacent to the AA, land is not cultivated, minimal noxious weeds, and low disturbance.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Spotted knapweed, Canada thistle, and Linaria vulgaris

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

Site is in a relatively flat valley bottom that has historically been used for agriculture and hay production. The valley sides are heavily forested with secondary growth coniferous forest. Nearly entire AA has permanent/perennial water regime, and dominated by hydrophytic vegetation. PSS wetlands occur along pre-existing creek channels and in southwest corner of the site where a "carr" fen occurs. The fen supports bog birch and has been reported in previous years to support hoary willow.

13. Structural Diversity: (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
>=3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: aquatic bed, emergent, scrub-shrub

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species)	○ D ○ S	
Secondary habitat (list Species)	◉ D ○ S	Grizzly bear
Incidental habitat (list species)	○ D ○ S	
No usable habitat	☐ S	

ii. Rating (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USFS personnel observed a grizzly bear upstream of the AA in the Schrieber Creek drainage in 2010, and a collared grizzly was documented on site in 2021. Wolverines could potentially be in the area.

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species)	◉ D ○ S	Salix candida (S3/S4),Western toad (S2);
Secondary habitat (list Species)	◉ D ○ S	Townsend's big-eared bat (S3), hoary bat (S3)
Incidental habitat (list species)	○ D ◉ S	Westslope cuthroat trout (S2), fisher (S3)
No usable habitat	☐ S	

ii. Rating (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use MDT BRR. USFS, MTNHP and MFWP databases and discussions with reg wildlife and fisheries biologists. Western toads observed by MDT and Kootenai Nat'l Forest personel in April 2011.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence):

Substantial

Substantial (based on any of the following [check]):

- [x] observations of abundant wildlife #s or high species diversity (during any period)
- [x] abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- [ ] presence of extremely limiting habitat features not available in the surrounding area
- [x] interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):

- [ ] few or no wildlife observations during peak use periods
- [ ] little to no wildlife sign
- [ ] sparse adjacent upland food sources
- [ ] interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- [ ] observations of scattered wildlife groups or individuals or relatively few species during peak periods
- [ ] common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- [ ] adequate adjacent upland food sources
- [ ] interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Good habitat diversity with substantial wildlife evidence.

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☐ **NA** here and proceed to 14E.) Cold Water

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◯ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** .7M

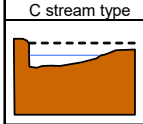
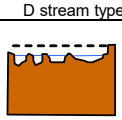
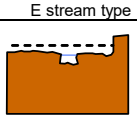
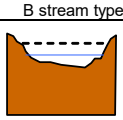
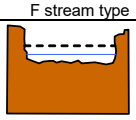
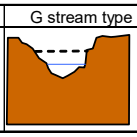
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .7M

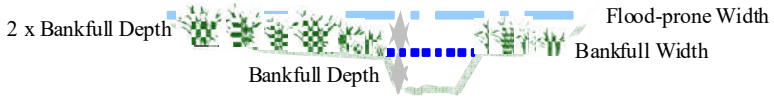
iii. Final Score and Rating: .7 M **Comments:** Brook Trout documented in Schrieber Creek immediately up and downstream of Schrieber Lake by FWP in 2011 (MFISH query). Westslope Cutthroat documented upstream, outside project area.

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width 25 / **Bankfull width** 10 = **Entrenchment ratio** 2.5

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? **Y** ◯ **N** ◉

Comments: Stream channels in AA have free access to most of their floodplains. Floodplains dominated by herbaceous vegetation.

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: Extensive areas of inundation, much great than 5 ac-feet, observed in 2021 and previous monitoring events.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA has potential to receive minor sedimentation from nearby US Hwy 2 and adjacent hillsides that have been logged.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click ☐ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Shorelines and banks are well vegetated with primarily reed canary grass, with lesser cover by Carex spp.

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** 1 E

Comments: High level of biological activity, veg component > 5 ac, perennial, has surface and subsurface outlets

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- [x] The AA is a slope wetland
- [x] Springs or seeps are known or observed
- [x] Vegetation growing during dormant season/drought
- [x] Wetland occurs at the toe of a natural slope
- [ ] Seeps are present at the wetland edge
- [x] AA permanently flooded during drought periods
- [ ] Wetland contains an outlet, but no inlet
- [x] Shallow water table and the site is saturated to the surface
- [ ] Other:

ii. Recharge Indicators

- [ ] Permeable substrate present without underlying impeding layer
- [ ] Wetland contains inlet but no outlet
- [ ] Stream is a known 'losing' stream; discharge volume decreases
- [ ] Other:

iii. Rating (use the information from i and ii above and the table below to arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information		NA		

Comments: AA with perennial inundation/saturation to the surface.

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: This wetland complex contains a fen, is relatively undisturbed, and so is fairly unique in the watershed.

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** (●) **N** (○) (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☑ Educational/scientific study; ☐ Consumptive rec.; ☐ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

This site is open to public access and has a high potential for education, especially for birders since there is a great hill at the entrance to the site that provides a good vantage point for low impact bird viewing.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Schrieber Lake

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	H	.8	1	44.46	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	50.02	☐
C. General Wildlife Habitat	E	1	1	55.58	☑
D. General Fish Habitat	M	.7	1	38.91	☐
E. Flood Attenuation	M	.6	1	33.35	☐
F. Short and Long Term Surface Water Storage	H	1	1	55.58	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	55.58	☐
H. Sediment/Shoreline Stabilization	H	1	1	55.58	☐
I. Production Export/Food Chain Support	E	1	1	55.58	☑
J. Groundwater Discharge/Recharge	H	1	1	55.58	☐
K. Uniqueness	H	1	1	55.58	☑
L. Recreation/Education Potential (bonus points)	H	.2	NA	11.12	☐
Totals:		10.2	11	566.92	
Percent of Possible Score			**92.73** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☑ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☑ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

☐

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

Table B-1. Schrieber Lake Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Abies grandis	Grand Fir	FACU
Achillea millefolium	Common Yarrow	FACU
Agrostis capillaris	**Colonial Bent**	**FAC**
Agrostis scabra	Rough Bent	FAC
Agrostis stolonifera	Spreading Bent	FACW
Algae, green	Algae, green	N/A
Allium cernuum	**Nodding Onion**	**FACU**
Alnus incana	Speckled Alder	FACW
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FAC
Alopecurus pratensis	Field Meadow-Foxtail	FAC
Amelanchier alnifolia	Saskatoon Service-Berry	FACU
Antennaria microphylla	**Littleleaf Pussytoes**	**UPL**
Antennaria sp.	Pussytoes	N/A
Apocynum androsaemifolium	Spreading Dogbane	FACU
Arctostaphylos uva-ursi	Red Bearberry	FACU
Berberis repens	Creeping Oregon-grape	UPL
Betula pumila	Bog Birch	OBL
Bromus carinatus	Mountain Brome	UPL
Bromus inermis	Smooth Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Calamagrostis rubescens	Pinegrass	UPL
Campanula rotundifolia	Bluebell-of-Scotland	FACU
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex bebbii	Bebb's Sedge	OBL
Carex geyeri	Geyer's Sedge	UPL
Carex inops	Long-stolon Sedge	UPL
Carex lasiocarpa	Woolly-Fruit Sedge	OBL
Carex nebrascensis	Nebraska Sedge	OBL
Carex simulata	Analogue Sedge	OBL
Carex sp.	Sedge	N/A
Carex utriculata	Northwest Territory Sedge	OBL
Carex vesicaria	Lesser Bladder Sedge	OBL
Centaurea stoebe	Spotted Knapweed	UPL
Cirsium arvense	Canadian Thistle	FAC
Cirsium vulgare	Bull thistle	FACU
Comarum palustre	Purple Marshlocks	OBL
Convolvulus arvensis	**Field Bindweed**	**UPL**
Cornus canadensis	Canadian Bunchberry	FAC
Crataegus douglasii	Black Hawthorn	FAC

Table B-1. Schrieber Lake Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Cynoglossum officinale	Gypsy-Flower	FACU
Dactylis glomerata	Orchard Grass	FACU
Deschampsia caespitosa	Tufted Hair Grass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus glaucus	Blue Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willow Herb	FACW
Equisetum arvense	Field Horsetail	FAC
Fragaria virginiana	Virginia Strawberry	FACU
Galium triflorum	Fragrant Bedstraw	FACU
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Gnaphalium palustre	Western Marsh Cudweed	FACW
Hypericum perforatum	Common St. John's-Wort	FACU
Juncus nodosus	Knotted Rush	OBL
Juncus tenuis	Lesser Poverty Rush	FAC
Larix occidentalis	Western Larch	FACU
Lemna minor	Common Duckweed	OBL
Lepidium draba	Whitetop	UPL
Leucanthemum vulgare	Ox-Eye Daisy	FACU
Linaria dalmatica	Dalmatian Toadflax	UPL
Linaria vulgaris	Butter-and-eggs	UPL
Maianthemum stellatum	Starry False Solomon's-Seal	FAC
Moss	Sphagnum/Aulacomnium moss	N/A
Myriophyllum sibiricum	**Siberian Water-Milfoil**	**OBL**
Nassella viridula	Barkworth Green Needlegrass	UPL
Nuphar polysepala	**Yellow Pond-Lily**	**OBL**
Onosmodium bejariense* var. *bejariense	**Soft-Hair Marbleseed**	**UPL**
Pascopyrum smithii	Western-Wheat Grass	FACU
Penstemon confertus	**Yellow Beardtongue**	**UPL**
Penstemon sp.	Beardtongue	N/A
Persicaria amphibia	Water Smartweed	OBL
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FACU
Pinus contorta	Lodgepole Pine	FAC
Pinus monticola	Western White Pine	FACU

Table B-1. Schrieber Lake Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[1]
Pinus ponderosa	Ponderosa Pine	FACU
Plantago sp.	Plantain	N/A
Poa compressa	Flat-Stem Blue Grass	FACU
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa sp.	Blue Grass	N/A
Potentilla anserina	Silverweed	OBL
Potentilla norvegica	Norwegian Cinquefoil	FAC
Pseudoroegneria spicata	Bluebunch Wheatgrass	UPL
Pseudotsuga menziesii	Douglas-Fir	FACU
Rhamnus alnifolia	Alder-Leaf Buckthorn	FACW
Rosa woodsii	Woods' Rose	FACU
Rumex acetosella	Common Sheep Sorrel	FACU
Salix bebbiana	Gray Willow	FACW
Salix boothii	Booth's Willow	FACW
Salix candida	Sage Willow	OBL
Salix geyeriana	Geyer's Willow	FACW
Salix sp.	Willow	N/A
Scirpus microcarpus	**Red-Tinge Bulrush**	**OBL**
Scutellaria galericulata	Hooded Skullcap	OBL
Shepherdia canadensis	Russet Buffalo-Berry	UPL
Sisymbrium altissimum	**Tall Hedge-Mustard**	**FACU**
Symphoricarpos albus	Common Snowberry	FACU
Symphyotrichum spathulatum	Mountain American-Aster	FAC
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	UPL
Trifolium aureum	**Yellow Clover**	**UPL**
Trifolium aureum	Yellow Clover	UPL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Urtica dioica	Stinging Nettle	FAC
Utricularia minor	**Lesser Bladderwort**	**OBL**
Vaccinium sp.	Huckleberry	N/A
Verbascum thapsus	Great Mullein	FACU

[1] 2018 NWPL (USACE 2018)

New species identified in 2021 are **bolded.**

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Schrieber Lake
Lincoln County, Montana

Schrieber Lake: Photo Point Photographs

Photo Point: 1 – Photo 1 Location: Northwest Boundary
Bearing: 242 degrees Year: 2015

Photo Point: 1 – Photo 1 Location: Northwest Boundary
Bearing: 242 degrees Year: 2021

Photo Point: 1 – Photo 2 Location: Northwest Boundary
Bearing: 200 degrees Year: 2015

Photo Point: 1 – Photo 2 Location: Northwest Boundary
Bearing: 200 degrees Year: 2021

Photo Point: 1 – Photo 3 Location: Northwest Boundary
Bearing: 164 degrees Year: 2015

Photo Point: 1 – Photo 3 Location: Northwest Boundary
Bearing: 164 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 2 – Photo 1 Location: Near Corral
Bearing: 323 degrees Year: 2015

Photo Point: 2 – Photo 1 Location: Near Corral
Bearing: 323 degrees Year: 2021

Photo Point: 2 – Photo 2 Location: Near Corral
Bearing: 205 degrees Year: 2015

Photo Point: 2 – Photo 2 Location: Near Corral
Bearing: 205 degrees Year: 2021

Photo Point: 2 – Photo 3 Location: Near Corral
Bearing: 162 degrees Year: 2015

Photo Point: 2 – Photo 3 Location: Near Corral
Bearing: 162 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 2 – Photo 4 Location: Near Corral
Bearing: 104 degrees Year: 2015

Photo Point: 2 – Photo 4 Location: Near Corral
Bearing: 104 degrees Year: 2021

Photo Point: 2 – Photo 5 Location: Near Corral
Bearing: 69 degrees Year: 2015

Photo Point: 2 – Photo 5 Location: Near Corral
Bearing: 69 degrees Year: 2021

Photo Point: 3 Location: West of Corrals
Bearing: 183 degrees Year: 2015

Photo Point: 3 Location: West of Corrals
Bearing: 183 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 4 Location: East corner of Cell 10
Bearing: 287 degrees Year: 2015

Photo Point: 4 Location: East corner of Cell 10
Bearing: 287 degrees Year: 2021

Photo Point: 5 – Photo 1 Location: Corner of carr
Bearing: 143 degrees Year: 2015

Photo Point: 5 – Photo 1 Location: Corner of carr
Bearing: 143 degrees Year: 2021

Photo Point: 5 – Photo 2 Location: Corner of carr
Bearing: 35 degrees Year: 2015

Photo Point: 5 – Photo 2 Location: Corner of carr
Bearing: 35 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 5 – Photo 3 Location: Corner of carr
Bearing: 359 degrees Year: 2015

Photo Point: 5 – Photo 3 Location: Corner of carr
Bearing: 359 degrees Year: 2021

Photo Point: 6 – Photo 1 Location: South end of Cell 1
Bearing: 150 degrees Year: 2015

Photo Point: 6 – Photo 1 Location: South end of Cell 1
Bearing: 150 degrees Year: 2021

Photo Point: 6 – Photo 2 Location: South end of Cell 1
Bearing: 103 degrees Year: 2015

Photo Point: 6 – Photo 2 Location: South end of Cell 1
Bearing: 103 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 6 – Photo 3 Location: South end of Cell 1
Bearing: 52 degrees Year: 2015

Photo Point: 6 – Photo 3 Location: South end of Cell 1
Bearing: 52 degrees Year: 2021

Photo Point: 7 – Photo 1 Location: South end of Transect 2
Bearing: 228 degrees Year: 2015

Photo Point: 7 – Photo 1 Location: South end of Transect 2
Bearing: 228 degrees Year: 2021

Photo Point: 7 – Photo 2 Location: South end of Transect 2
Bearing: 299 degrees Year: 2015

Photo Point: 7 – Photo 2 Location: South end of Transect 2
Bearing: 299 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 7 – Photo 3 Location: South end of Transect 2
Bearing: 355 degrees Year: 2015

Photo Point: 7 – Photo 3 Location: South end of Transect 2
Bearing: 355 degrees Year: 2021

Photo Point: 8 – Photo 1 Location: Interior of site
Bearing: 320 degrees Year: 2015

Photo Point: 8 – Photo 1 Location: Interior of site
Bearing: 320 degrees Year: 2021

Photo Point: 8 – Photo 2 Location: Interior of site
Bearing: 49 degrees Year: 2015

Photo Point: 8 – Photo 2 Location: Interior of site
Bearing: 49 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 8 – Photo 3 Location: Interior of site
Bearing: 79 degrees Year: 2015

Photo Point: 8 – Photo 3 Location: Interior of site
Bearing: 79 degrees Year: 2021

Photo Point: 9 – Photo 1 Location: Upland island center of site
Bearing: 323 degrees Year: 2015

Photo Point: 9 – Photo 1 Location: Upland island center of site
Bearing: 323 degrees Year: 2021

Photo Point: 9 – Photo 2 Location: Upland island center of site
Bearing: 120 degrees Year: 2015

Photo Point: 9 – Photo 2 Location: Upland island center of site
Bearing: 120 degrees Year: 2021

Schrieber Lake: Photo Point Photographs

Photo Point: 10 Location: Overlook
Bearing: 39 degrees Year: 2015

Photo Point: 10 Location: Overlook
Bearing: 39 degrees Year: 2021

Schrieber Lake: Vegetation Transect Photographs

Transect 1: Start Location: T-1
Bearing: 251 degrees Year: 2015

Transect 1: Start Location: T-1
Bearing: 251 degrees Year: 2021

Transect 1: End Location: T-1
Bearing: 71 degrees Year: 2015

Transect 1: End Location: T-1
Bearing: 71 degrees Year: 2021

Transect 2: Start Location: T-2
Bearing: 152 degrees Year: 2015

Transect 2: Start Location: T-2
Bearing: 152 degrees Year: 2021

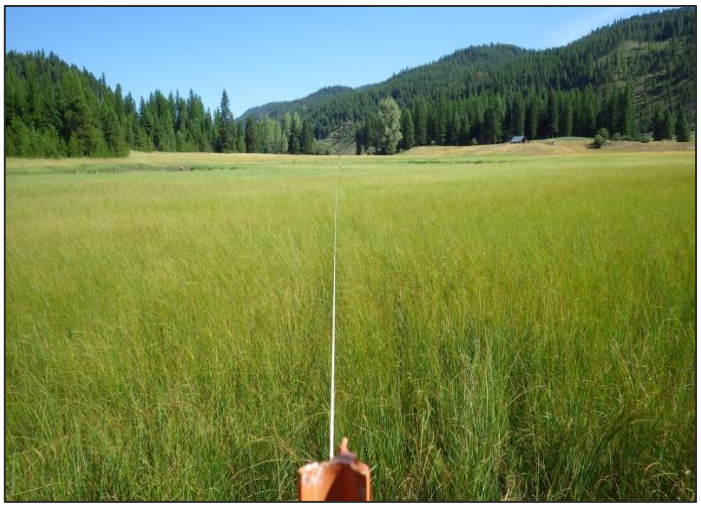
Schrieber Lake: Vegetation Transect Photographs

Transect 2: End Location: T-2
Bearing: 332 degrees Year: 2015

Transect 2: End Location: T-2
Bearing: 332 degrees Year: 2021

Transect 3: Start Location: T-3
Bearing: 175 degrees Year: 2015

Transect 3: Start Location: T-3
Bearing: 175 degrees Year: 2021



Transect 3: End Location: T-3
Bearing: 355 degrees Year: 2015

Transect 3: End Location: T-3
Bearing: 355 degrees Year: 2021

Schrieber Lake: Data Point Photographs

Data Point: DP01w Location: Veg Com 2
Year: 2021

Data Point: DP01u Location: Veg Com 1
Year: 2021

Data Point: DP02w Location: Veg Com 1
Year: 2021

Data Point: DP02u Location: Veg Com 5
Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: SC1-1 Location: Schrieber Creek
Bearing: 300° – upstream Year: 2016

Cross-Section: SC1-1 Location: Schrieber Creek
Bearing: 300° – upstream Year: 2021

Cross-Section: SC1-1 Location: Schrieber Creek
Bearing: 30° – Left Bank Year: 2016

Cross-Section: SC1-1 Location: Schrieber Creek
Bearing: 30° – Left Bank Year: 2021

Cross-Section: SC1-2 Location: Schrieber Creek
Bearing: 280˚ – upstream Year: 2016

Cross-Section: SC1-2 Location: Schrieber Creek
Bearing: 280˚ – upstream Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: SC1-2 Location: Schrieber Creek
Bearing: 10° – Left Bank Year: 2016

Cross-Section: SC1-2 Location: Schrieber Creek
Bearing: 10° – Left Bank Year: 2021

Cross-Section: SC2A-1 Location: Schrieber Creek
Bearing: 315° – downstream Year: 2016

Cross-Section: SC2A-1 Location: Schrieber Creek
Bearing: 315° – downstream Year: 2021

Cross-Section: SC2A-1 Location: Schrieber Creek
Bearing: 45° – Left Bank Year: 2016

Cross-Section: SC2A-1 Location: Schrieber Creek
Bearing: 45° – Left Bank Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: SC2A-2 Location: Schrieber Creek
Bearing: 185° – downstream Year: 2016

Cross-Section: SC2A-2 Location: Schrieber Creek
Bearing: 185° – downstream Year: 2021

Cross-Section: SC2A-2 Location: Schrieber Creek
Bearing: 275° – Right Bank Year: 2016

Cross-Section: SC2A-2 Location: Schrieber Creek
Bearing: 275° – Right Bank Year: 2021

Cross-Section: SC2B-1 Location: Schrieber Creek
Bearing: 175° – downstream Year: 2016

Cross-Section: SC2B-1 Location: Schrieber Creek
Bearing: 175° – downstream Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: SC2B-1 Location: Schrieber Creek
Bearing: 265° – Right Bank Year: 2016

Cross-Section: SC2B-1 Location: Schrieber Creek
Bearing: 265° – Right Bank Year: 2021

Cross-Section: SC3-1 Location: Schrieber Creek
Bearing: 240° – Upstream Year: 2016

Cross-Section: SC3-1 Location: Schrieber Creek
Bearing: 240° – Upstream Year: 2021

Cross-Section: SC3-1 Location: Schrieber Creek
Bearing: 330° – Left Bank Year: 2016

Cross-Section: SC3-1 Location: Schrieber Creek
Bearing: 330° – Left Bank Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: SC3-2 Location: Schrieber Creek
Bearing: 160° – downstream Year: 2016

Cross-Section: SC3-2 Location: Schrieber Creek
Bearing: 160° – downstream Year: 2021

Cross-Section: SC3-2 Location: Schrieber Creek
Bearing: 70° – Left Bank Year: 2016

Cross-Section: SC3-2 Location: Schrieber Creek
Bearing: 70° – Left Bank Year: 2021

Cross-Section: SC7-1 Location: Schrieber Creek
Bearing: 110° – downstream Year: 2016

Cross-Section: SC7-1 Location: Schrieber Creek
Bearing: 110° – downstream Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: SC7-1 Location: Schrieber Creek
Bearing: 20° – Left Bank Year: 2016

Cross-Section: SC7-1 Location: Schrieber Creek
Bearing: 20° – Left Bank Year: 2021

Cross-Section: CC1A-1 Location: Coyote Creek
Bearing: 50° – Upstream Year: 2016

Cross-Section: CC1A-1 Location: Coyote Creek
Bearing: 50° – Upstream Year: 2021

Cross-Section: CC1A-1 Location: Coyote Creek
Bearing: 320° – Right Bank Year: 2016

Cross-Section: CC1A-1 Location: Coyote Creek
Bearing: 320° – Right Bank Year: 2021

Schrieber Lake: Cross-Section Photographs

Cross-Section: CC1A-2 Location: Coyote Creek
Bearing: 85° – Upstream Year: 2016

Cross-Section: CC1A-2 Location: Coyote Creek
Bearing: 85° – Upstream Year: 2021

Cross-Section: CC1A-2 Location: Coyote Creek
Bearing: 355° – Right Bank Year: 2016

Cross-Section: CC1A-2 Location: Coyote Creek
Bearing: 175° – Left Bank Year: 2021

Cross-Section: CC1B-1 Location: Coyote Creek
Bearing: 200° – Downstream Year: 2016

Cross-Section: CC1B-1 Location: Coyote Creek
Bearing: 200° – Downstream Year: 2021

Schrieber Lake: Cross-Section Photographs

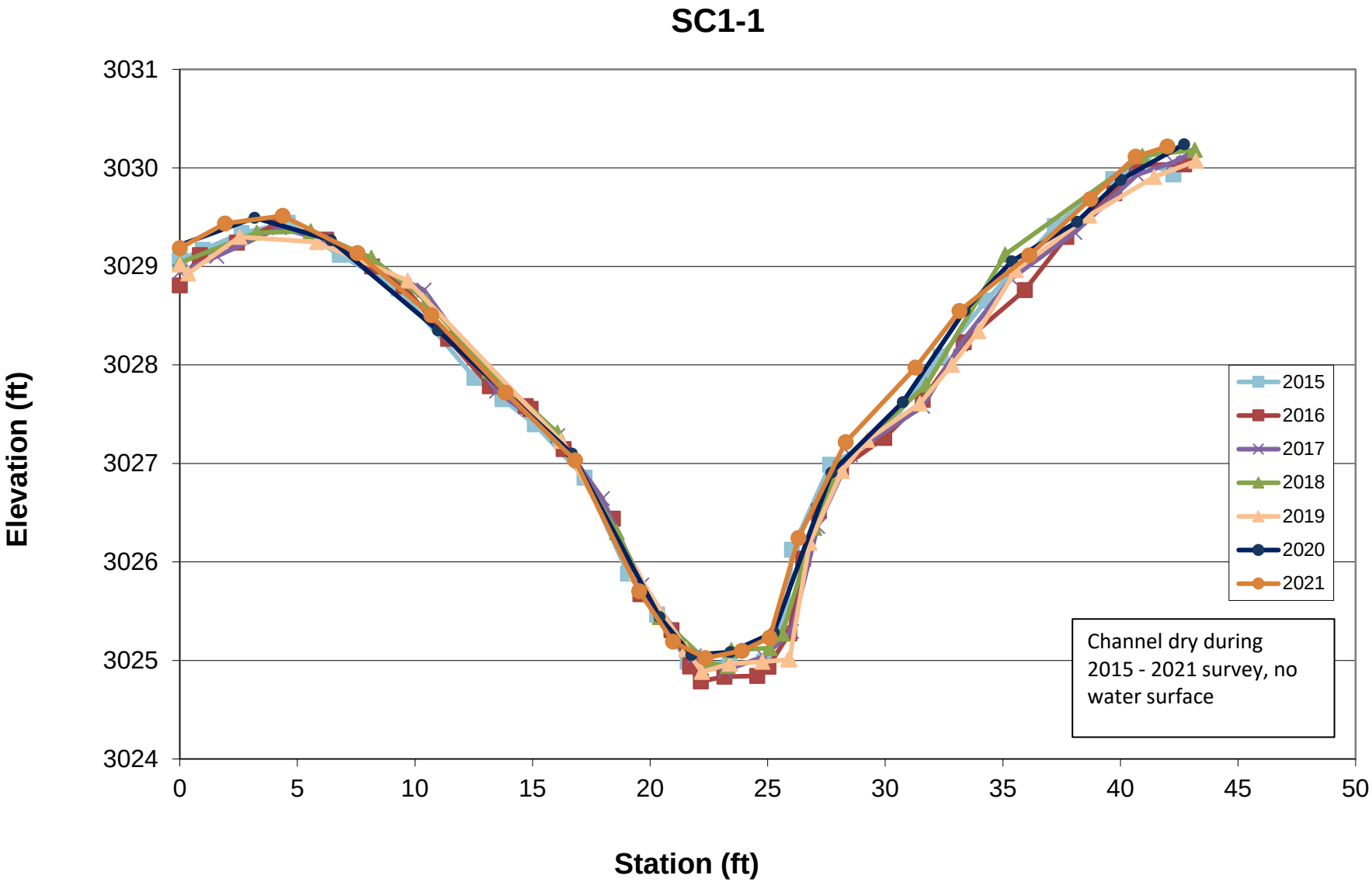
Cross-Section: CC1B-1 Location: Coyote Creek
Bearing: 110° – Left Bank Year: 2016

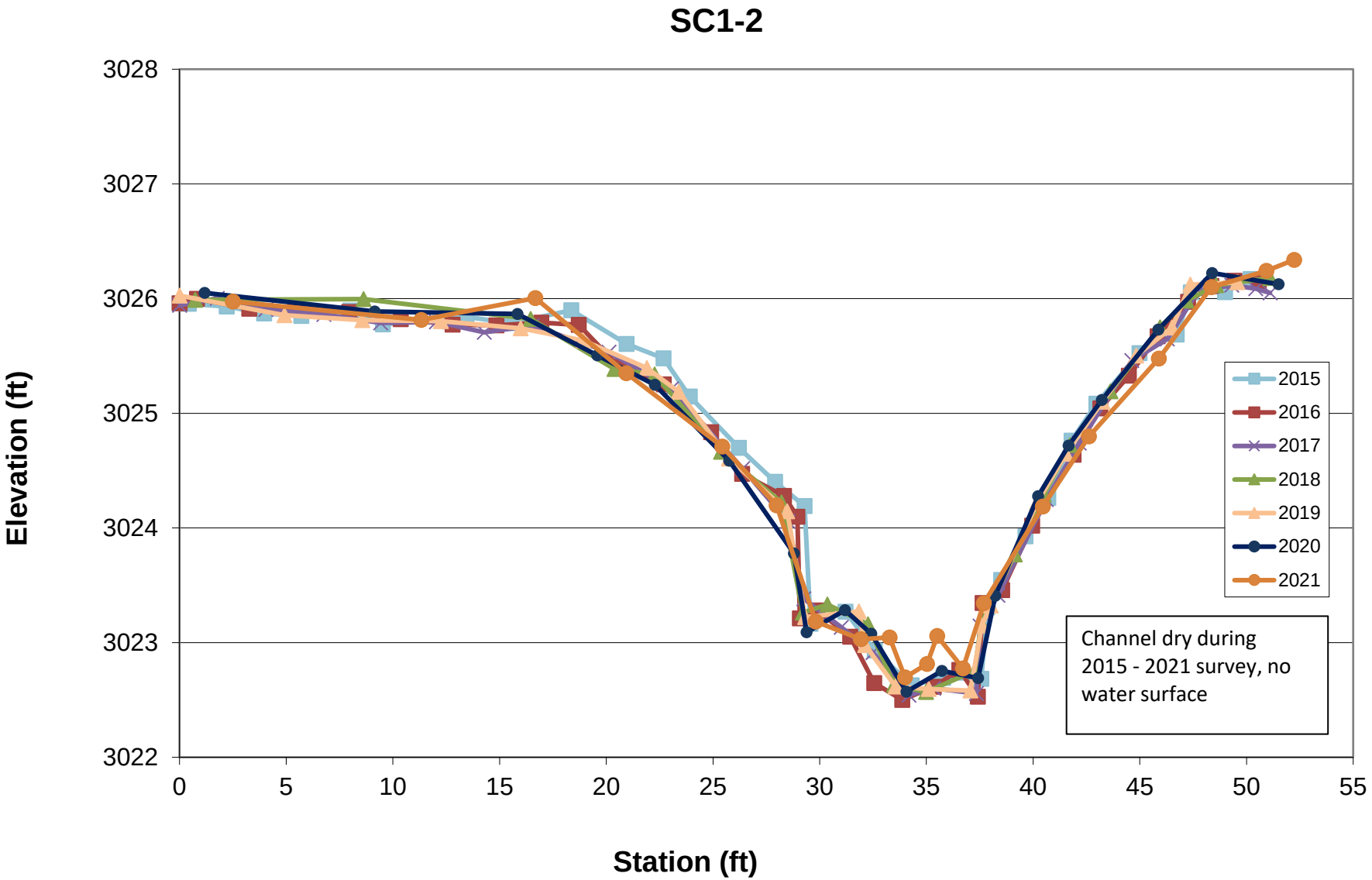
Cross-Section: CC1B-1 Location: Coyote Creek
Bearing: 110° – Left Bank Year: 2021

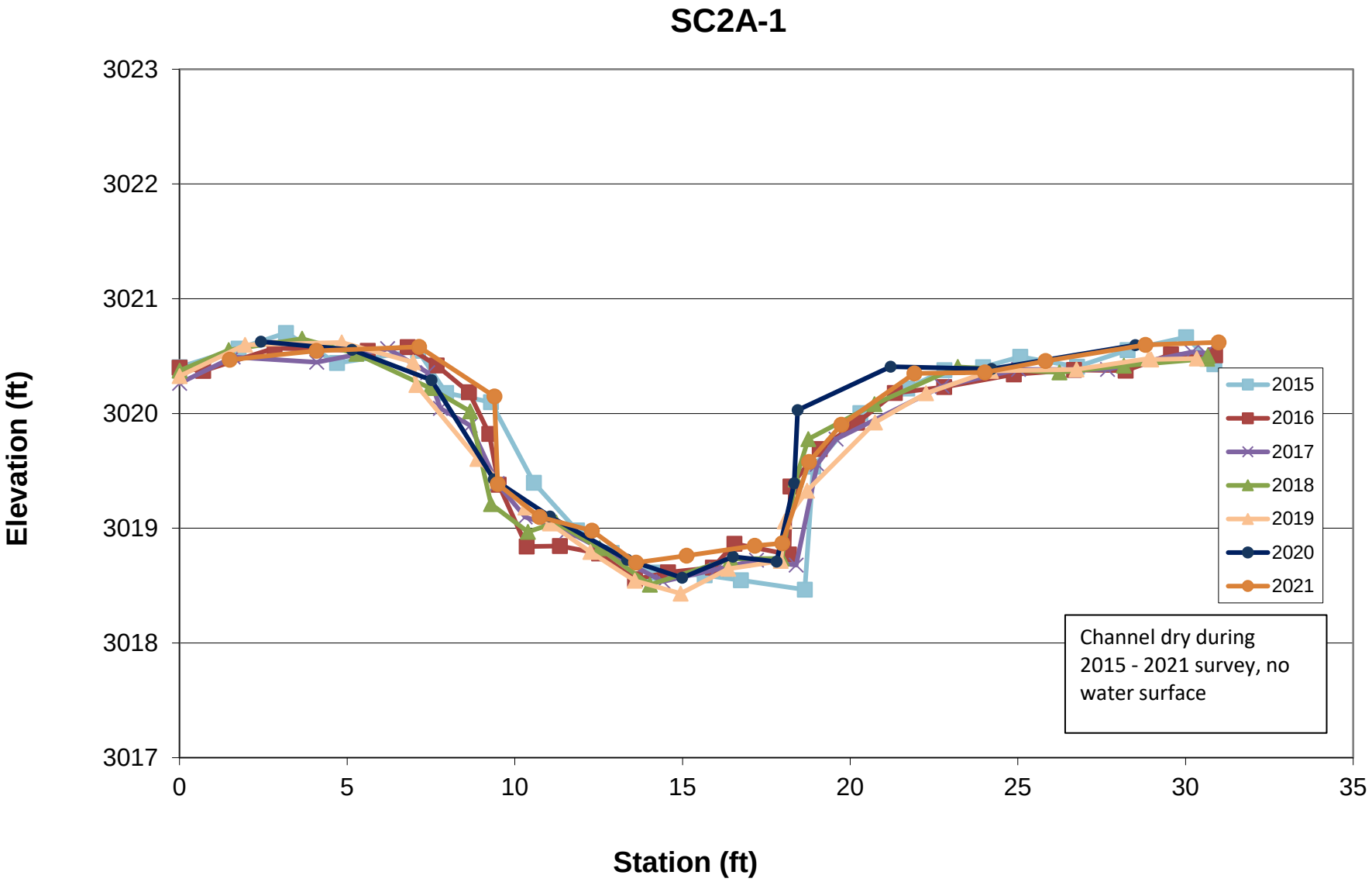
APPENDIX D

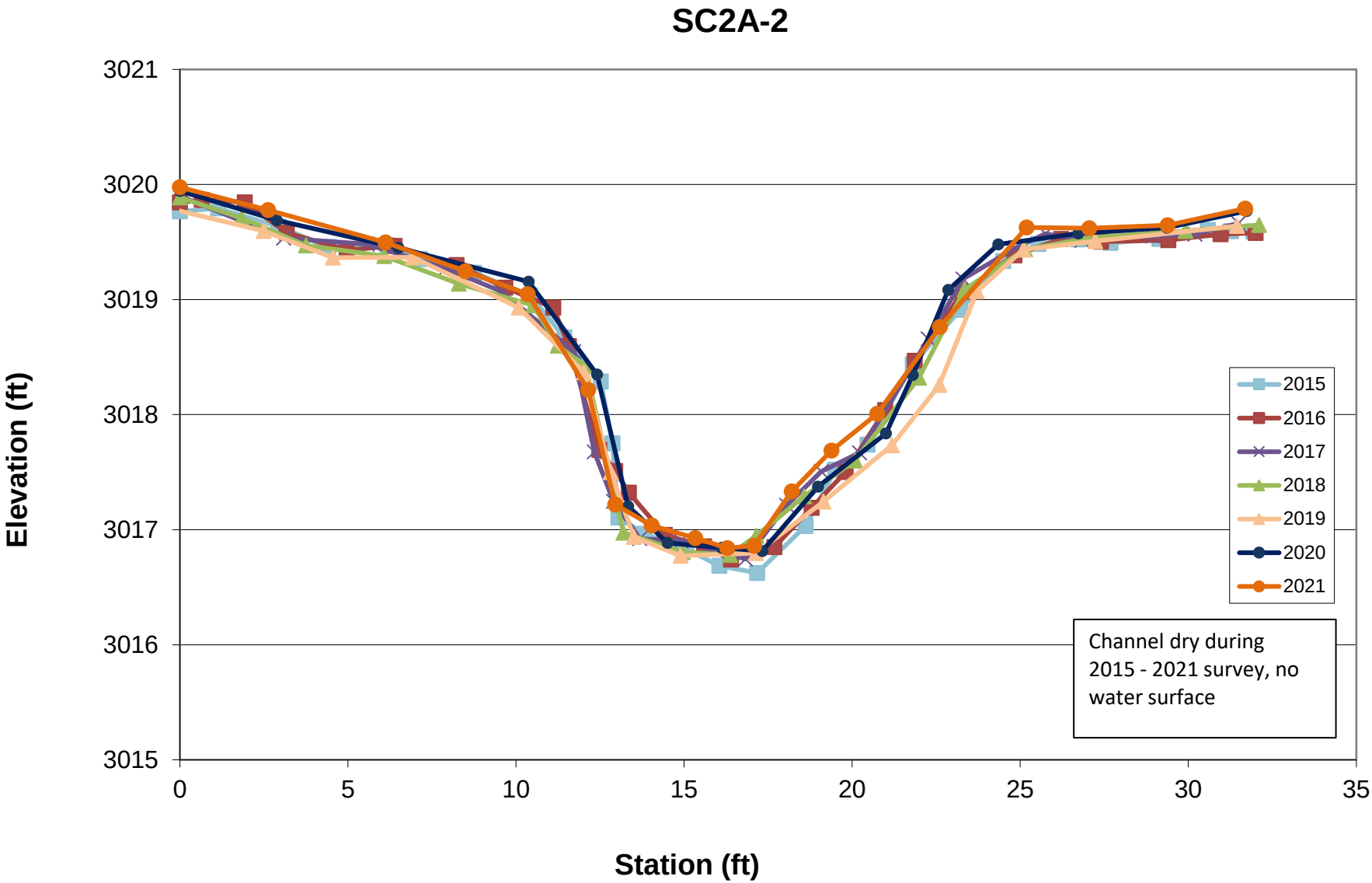
Surveyed Stream Cross Sections

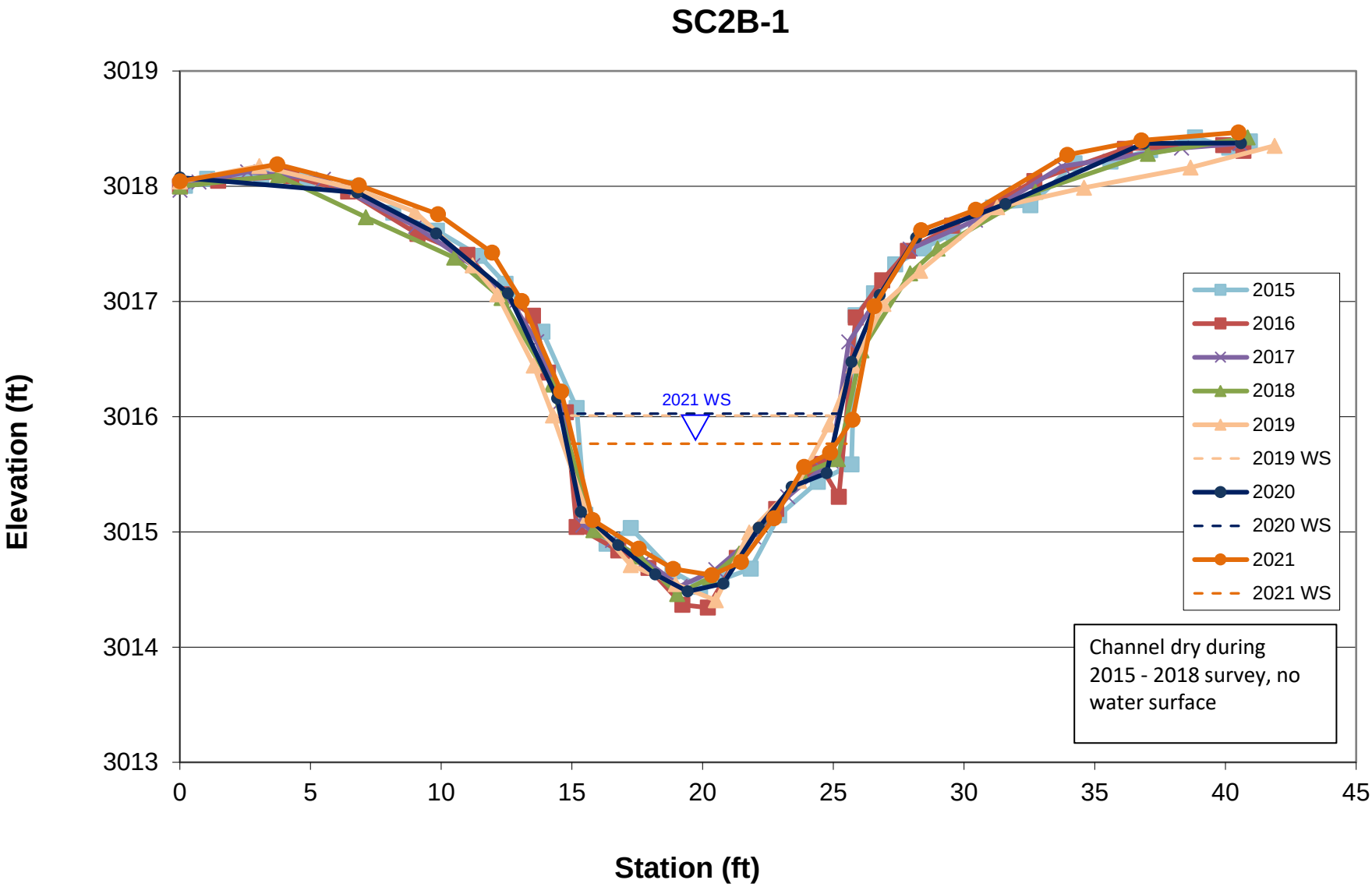
MDT Wetland Mitigation Monitoring
Schrieber Lake
Lincoln County, Montana

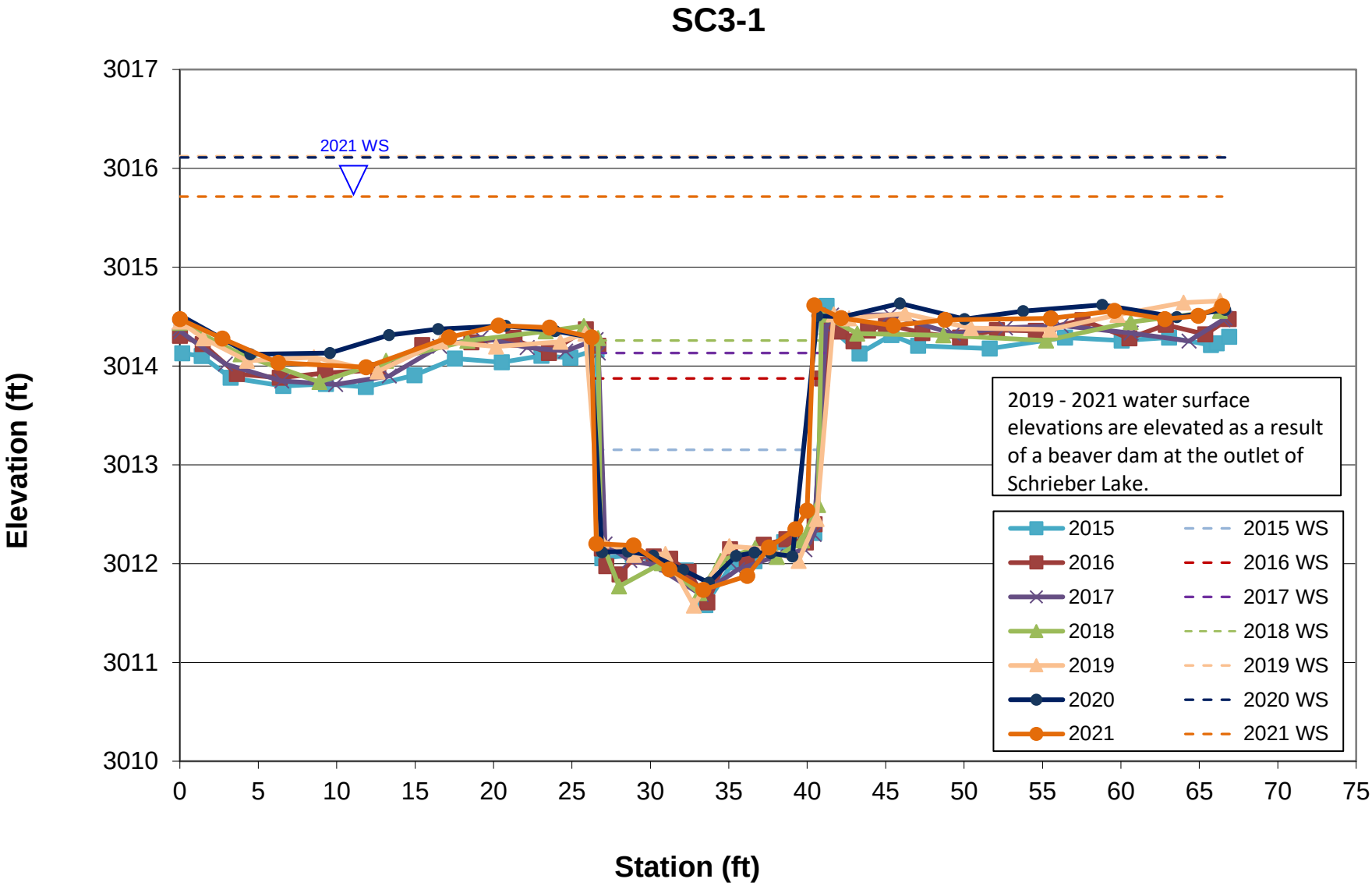

SC1-1
Elevation (ft)
3031
3030
3029
3028
3027
3026
3025
3024
0
5
10
15
20
25
30
35
40
45
50
Station (ft)
2015
2016
2017
2018
2019
2020
2021
Channel dry during 2015 - 2021 survey, no water surface

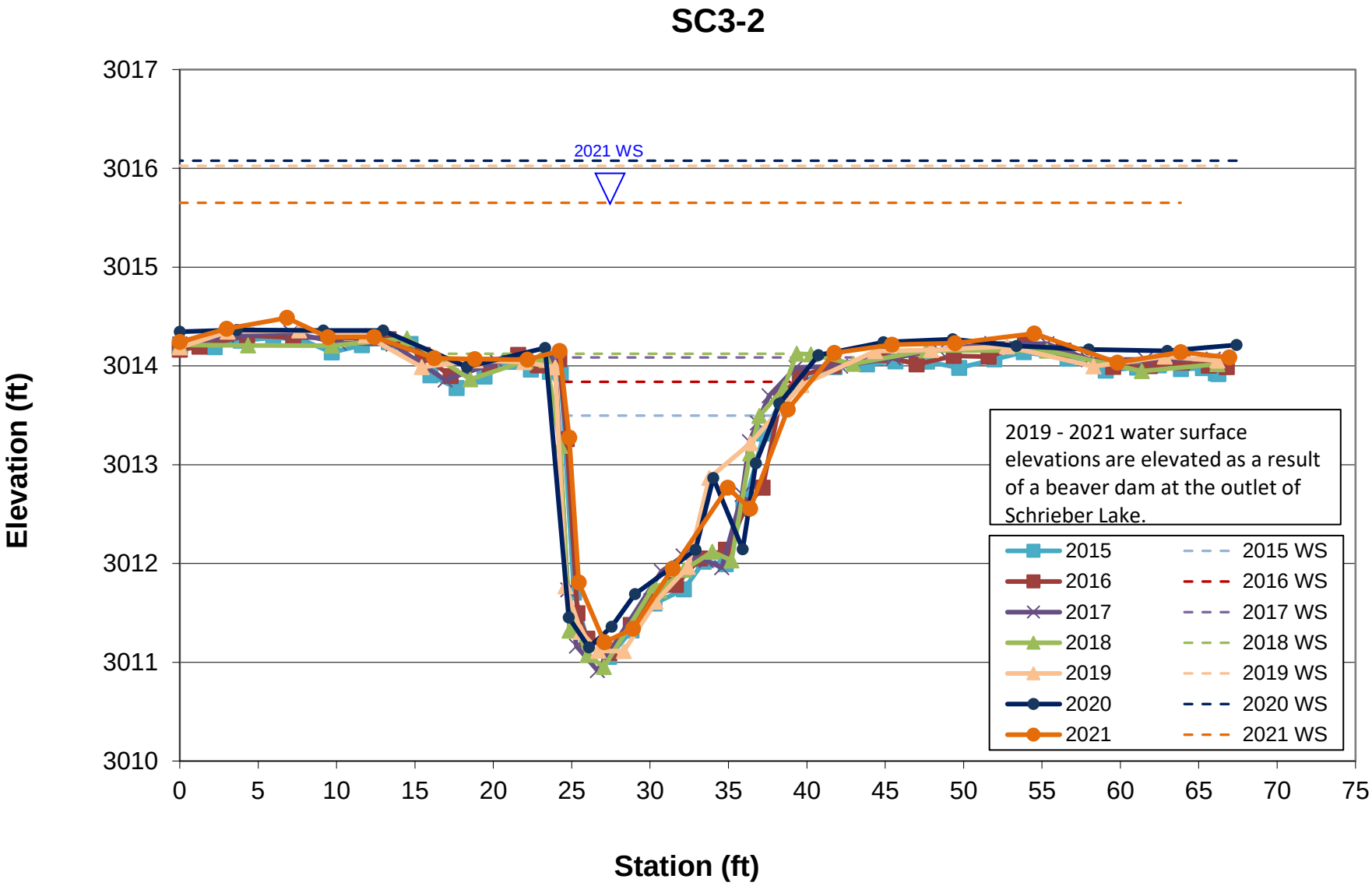

SC1-2
Elevation (ft)
3028
3027
3026
3025
3024
3023
3022
0
5
10
15
20
25
30
35
40
45
50
55
Station (ft)
2015
2016
2017
2018
2019
2020
2021
Channel dry during 2015 - 2021 survey, no water surface

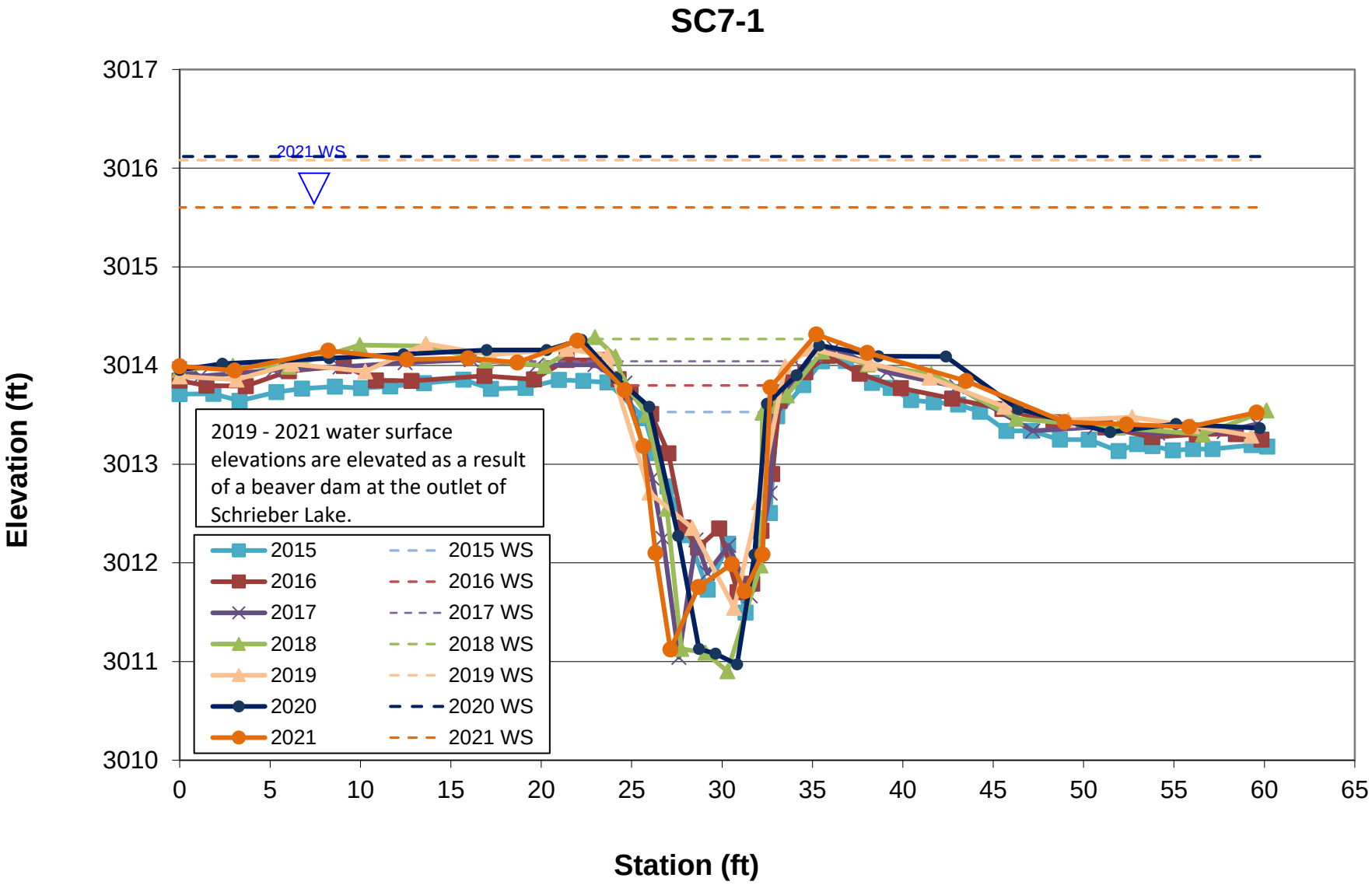

SC2A-1
Elevation (ft)
3023
3022
3021
3020
3019
3018
3017
0
5
10
15
20
25
30
35
Station (ft)
2015
2016
2017
2018
2019
2020
2021
Channel dry during 2015 - 2021 survey, no water surface

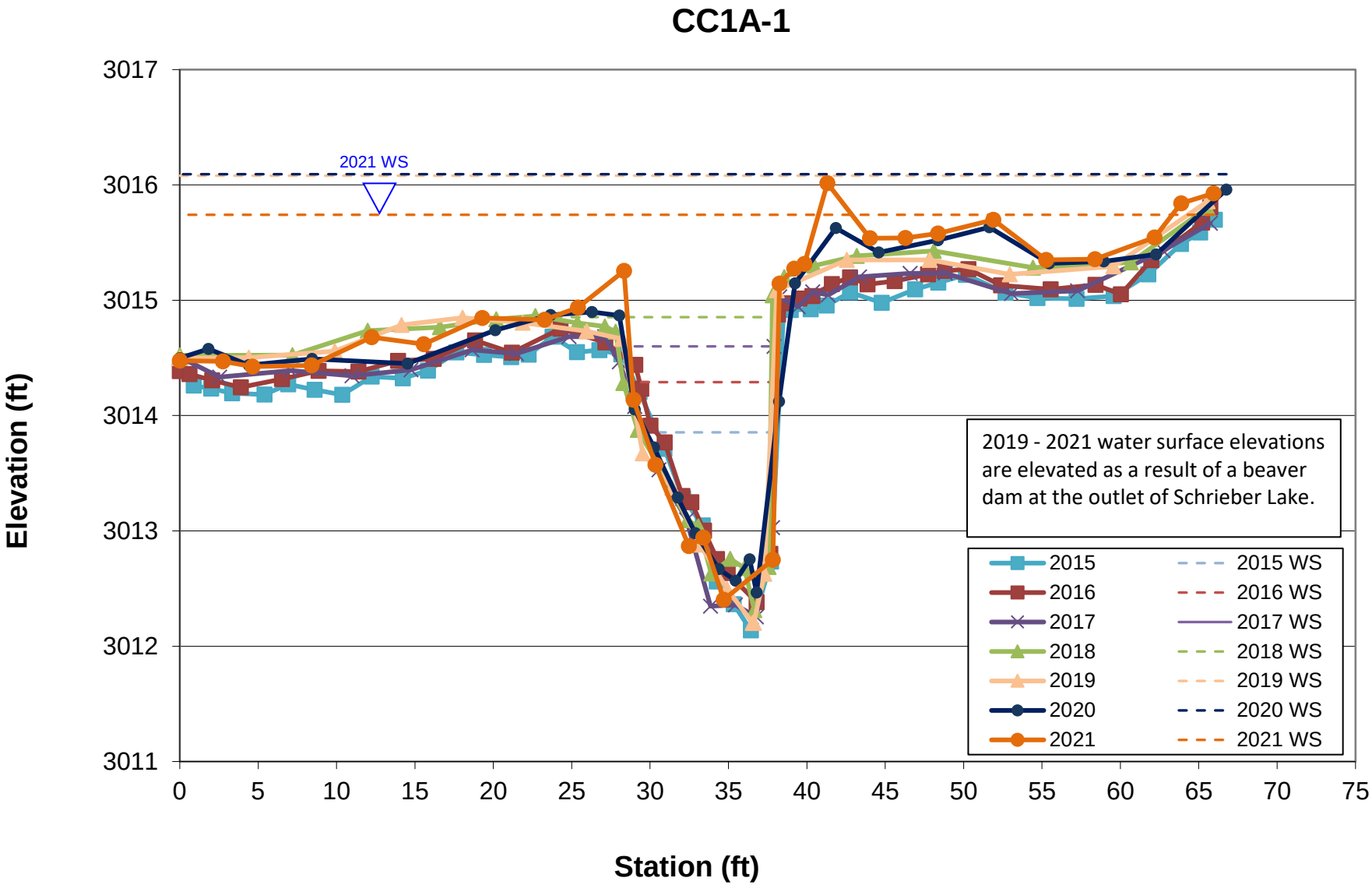

SC2A-2
Elevation (ft)
3021
3020
3019
3018
3017
3016
3015
0
5
10
15
20
25
30
35
Station (ft)
2015
2016
2017
2018
2019
2020
2021
Channel dry during 2015 - 2021 survey, no water surface

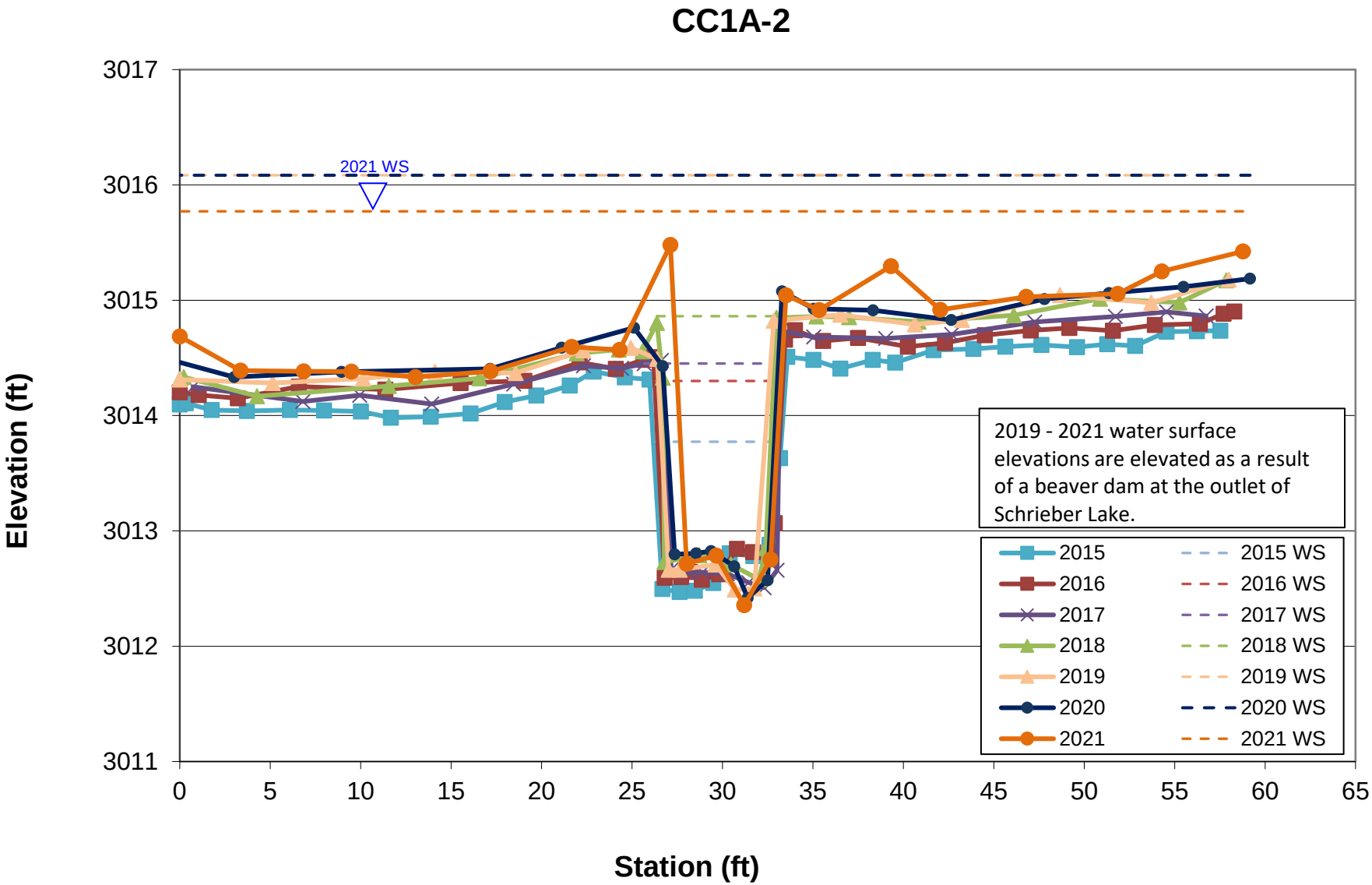

SC2B-1
Elevation (ft)
3019
3018
3017
3016
3015
3014
3013
0
5
10
15
20
25
30
35
40
45
Station (ft)
2021 WS
2015
2016
2017
2018
2019
2019 WS
2020
2020 WS
2021
2021 WS
Channel dry during 2015 - 2018 survey, no water surface

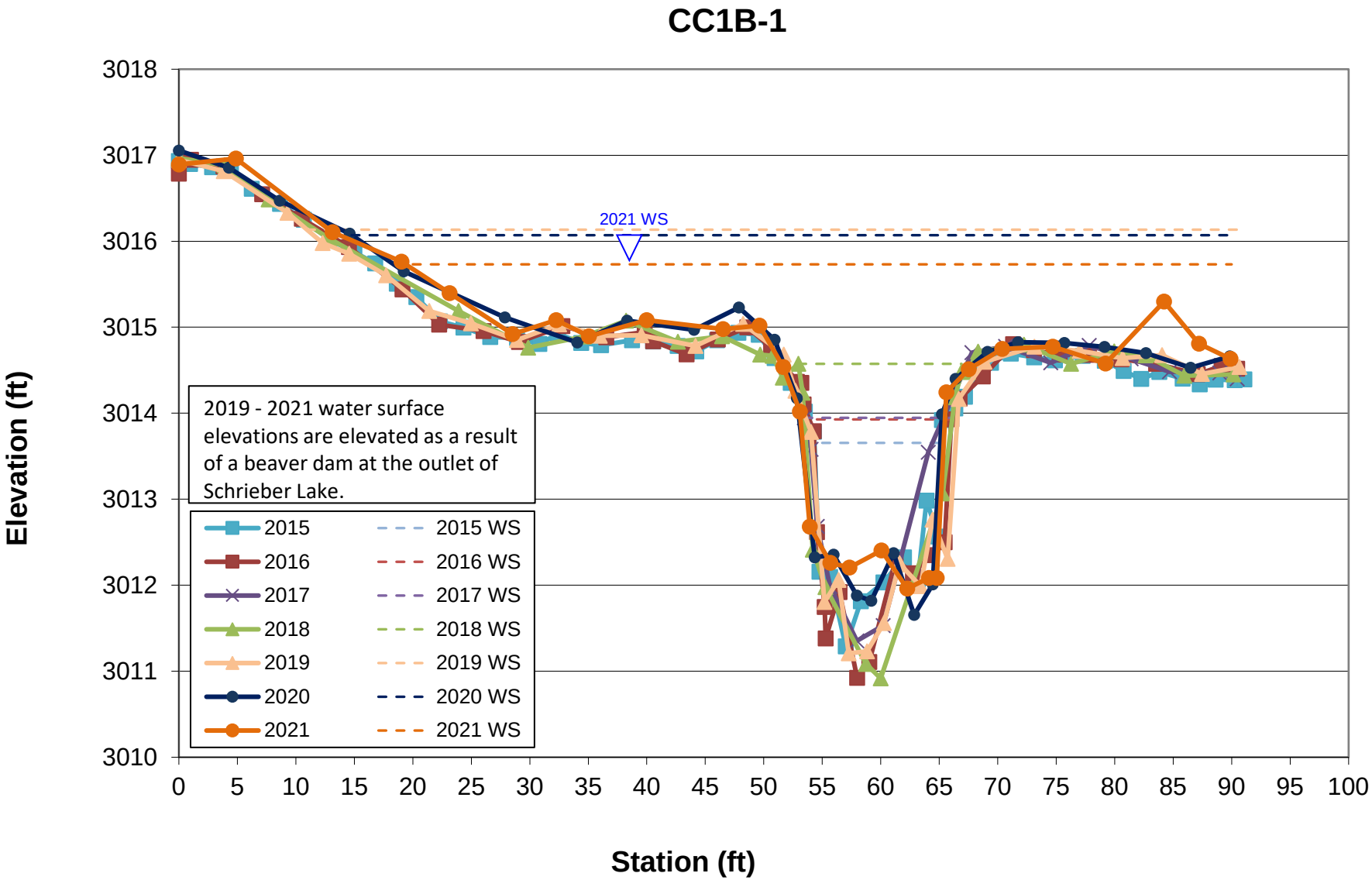

SC3-1
Elevation (ft)
Station (ft)
2021 WS
3017
3016
3015
3014
3013
3012
3011
3010
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
2019 - 2021 water surface elevations are elevated as a result of a beaver dam at the outlet of Schrieber Lake.
2015
2016
2017
2018
2019
2020
2021
2015 WS
2016 WS
2017 WS
2018 WS
2019 WS
2020 WS
2021 WS


SC3-2
Elevation (ft)
Station (ft)
2021 WS
2019 - 2021 water surface elevations are elevated as a result of a beaver dam at the outlet of Schrieber Lake.
2015
2016
2017
2018
2019
2020
2021
2015 WS
2016 WS
2017 WS
2018 WS
2019 WS
2020 WS
2021 WS


SC7-1
Elevation (ft)
Station (ft)
2021 WS
2019 - 2021 water surface elevations are elevated as a result of a beaver dam at the outlet of Schrieber Lake.
2015
2016
2017
2018
2019
2020
2021
2015 WS
2016 WS
2017 WS
2018 WS
2019 WS
2020 WS
2021 WS


CC1A-1
Elevation (ft)
Station (ft)
3017
3016
3015
3014
3013
3012
3011
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
2021 WS
2019 - 2021 water surface elevations are elevated as a result of a beaver dam at the outlet of Schrieber Lake.
2015
2016
2017
2018
2019
2020
2021
2015 WS
2016 WS
2017 WS
2018 WS
2019 WS
2020 WS
2021 WS


CC1A-2
Elevation (ft)
Station (ft)
2021 WS
3017
3016
3015
3014
3013
3012
3011
0
5
10
15
20
25
30
35
40
45
50
55
60
65
2019 - 2021 water surface elevations are elevated as a result of a beaver dam at the outlet of Schrieber Lake.
2015
2016
2017
2018
2019
2020
2021
2015 WS
2016 WS
2017 WS
2018 WS
2019 WS
2020 WS
2021 WS


CC1B-1
Elevation (ft)
Station (ft)
2021 WS
2019 - 2021 water surface elevations are elevated as a result of a beaver dam at the outlet of Schrieber Lake.
2015
2016
2017
2018
2019
2020
2021
2015 WS
2016 WS
2017 WS
2018 WS
2019 WS
2020 WS
2021 WS