INITIAL STUDY REPORT

FOR

Gile Flowage Storage Project (FERC Project No. 15055) Minimum Flow Habitat Evaluation Study and Shoreline Stability Assessment

Prepared for:

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INTRODUCTION

Project Information and Background

Great Lakes Environmental Center, Inc. (GLEC) conducted a Minimum Flow Habitat Evaluation Study and Shoreline Stability Assessment for the Gile Flowage Project (FERC No. 15055) in August 2022. The purpose of the habitat study was to determine if the current minimum flow is sufficient to protect aquatic resources in the West Fork of the Montreal River downstream of the Gile Dam. The stability assessment was conducted along the reservoir shoreline and the tailwater area downstream of the Gile Dam following the methods outlined in the Request for Proposal (RFP) and in accordance with Wisconsin Administrative Code NR 328.08 to identify and inventory erosion sites.

Description of the Study Area

The Gile Flowage (Flowage) is located within the northern highland area of northern Wisconsin which is widely known for its forests, lakes, and wetlands. The Flowage is an approximately 3,200-acre reservoir formed by the impounding of the west branch of the Montreal River (FIGURE 1). The Flowage and the west branch of the Montreal River are located in the vicinity of the Gogebic and Trap Ranges (Wisconsin Geological & Natural History Survey (WGNHS) 2022) which form two conspicuous ridges in Iron and Ashland Counties in northern Wisconsin. Both ridges are composed of rock types that are more resistant to erosion than the rock that underlies the valley separating them. A thin layer of sediment deposited during the most recent glaciation covers the valley and parts of the ridges. This thin layer of sediment is exposed along the Flowage shoreline where erosion is present. The Flowage is situated on the southern ridge of the Gogebic Range and contains iron-rich rock that is approximately 1.9 billion years old. Bare rock faces and boulders are common along the shoreline of the flowage. Most, if not all, of the natural beaches on the flowage are made up of gravel and cobble. Swimming beaches, when present, appear to be man-made and represent a very small portion of the overall shoreline. The West Branch of the Montreal River flows through the northern ridge, (Trap Range) which is distinctly different in composition from the southern ridge; it is composed of younger volcanic rock, consisting primarily of basaltic-lava flows that are approximately 1.1 billion years old.

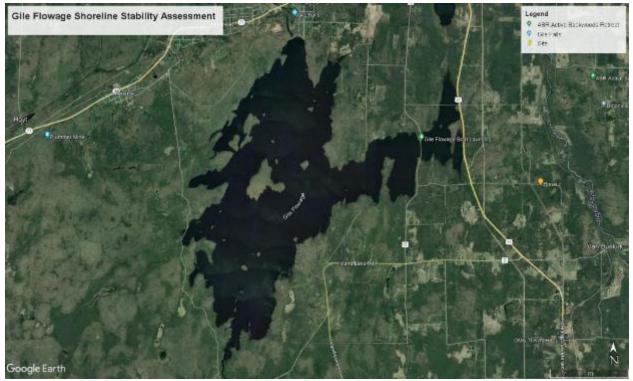


FIGURE 1. GILE FLOWAGE STUDY AREA

A survey of the littoral zone was conducted on the Flowage in 2005 by Friends of the Gile Flowage (www.friendsofthegile.org/home/flowage-publications). The study analyzed the substrates in the littoral zone in areas up to six feet below the full pool elevation of 1,490 feet. The report indicated that substrates within the upper 6 feet consisted of: 20.3% bedrock, boulder, or cobble; 26.9% gravel, gravel with cobble, or gravel with boulders; 39.8% sand, muck or detritus; and 13% sand with gravel, cobble, and/or boulders (FOG, 2005).

METHODS

Gile Flowage Shoreline Stability Assessment

The Shoreline Stability Assessment (stability assessment) was conducted on August 9 and 29, 2022. The entire shoreline of the Flowage, including the islands, was assessed via boat by slowly cruising along the shoreline. The backwater areas east of County Hwy C were assessed from the shoreline along County Hwy C, Knights Road and U.S. Hwy 51 (Map sheets 01 and 02). The field crew assessed only those areas that appeared to have exposed eroded soil along the shoreline. Erosion or bank instability was defined as evidence of soil movement or slumping. Bare rock areas or gravel areas were not assessed (using the data sheet) but were observed. Areas of erosion, when identified, were described by number and zone (e.g., Zone 10; site Number 1). An outline of Gile Flowage and the 10 grid (zone) patterns (Map Sheets) are shown in FIGURE 2. Raw field data scoresheets are shown in Appendix A.

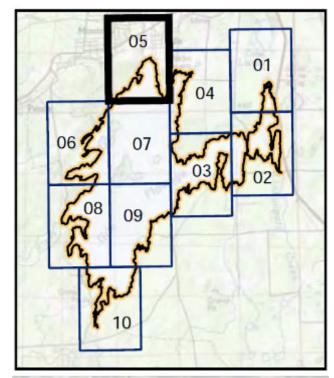


FIGURE 2. GILE FLOWAGE OUTLINE AND GRID PATTERN USED IN THE SHORELINE STABILITY ASSESSMENT (MAP SHEETS 1 THROUGH 10)



FIGURE 3. PROJECT AREA DOWNSTREAM OF THE GILE DAM INCLUDED IN THE SHORELINE STABILITY ASSESSMENT.

The stability assessment also included a survey of the project area downstream of Gile Dam (FIGURE 3). When erosion was identified, the location was photographed and recorded with a handheld GPS. Each erosion site was assigned an intensity score that was recorded on a field form. A single form was completed for each erosion site as shown in FIGURE 4.

SHORELINE VARIABLES	Erosion	Intensity V		ESCRI Located					f Each C	atego	ery Box	ASSIGNED EI
AVERAGE FETCH ¹ -, average distance (miles), across the open water to the opposite shore measure 45 ^{°°} other side of the perpendicular to the shoreline.	(0) <1/10 (2) 1/10 –1/3	(4) 1/3	3-1	(7) 1	-3	(10) 3-	-10	(13) 10-	-30	(16) >30	
DEPTH AT 20 FEET, depth of water (feet) 20 feet from shoreline	(1) <1	(2) 1-3		C	3) 3-6		(4) (5-12		(5) >	12	
DEPTH AT 100 FEET, depth of water (feet) 100 feet from shoreline	(1) <1	(2) 1-3		C	3) 3–6		(4) (5-12		(5) >	12	
BANK HEIGHT ² , height of bank (feet), measure from toe of the bank to top of the bank-lip.	(1)<1	(2) 1-5			3) 5-10			10-20		(5) >		
BANK COMPOSITION composition and degree of cementa- tion of the sediments	(0) rock, marl, cemented sand pick)	(dig with a	0	7) soft cl emented	(easily	dug wi	ith a kni	fe)	peat (eas hand)	sily di	ited sands or ug with your	
INFLUENCE OF ADJA- CENT STRUCTURES, likeli- hood that adjacent stractures are causing flank erosion at the site	(0) no hard armoring on either adjacent property	 hard and ing on one adjacent pr erty 	b	2) hard a oth adjac rties		p- on pr m) hard a one adj operty v easurabl cession	acent vith	both a with m	djacer ieasur ljacer	noring on nt properties rable reces- nt to both	
AQUATIC VEGETATION ³ type and abundance of vegetation occurring in the water off the shoreline	(0) rocky subst unable to supp vegetation	ort emerg		abundant ating or tation	sub-	emerge	ttered or nt, float it vegeta	ing or	sub- flo	ating	of emergent, or submer- getation	
BANK VEGETATION, type and abundance of the vegetation occurring on the bank face and immediately on top of the bank lip	(0) bank comp rocky outeropp unable to supp tation	oing up	land tr	vegetati ees, shru neluding	bs and	tion a	umps of lternatir lacking	ig with	(clea		f vegetation crop or agri- and	
BANK STABILITY, The degree to which bank and adjacent area (within 10 feet of the bank-lip) is stabilized by natu- ral ground, shrub, and canopy vegetation (outside a 10° pier access corridor). Human disturbance is typified by tree removal, brushing, mowing, and lawn establishment.	(0) established lawn with few canopy trees	(1) establis lawn with ate to dens opy trees	noder-	vegeta shrub few ca	tion and layer su	d canop ibstanti ees wit	e natura oy trees ally redu h moden ayer.	with aced; o	or erate shru natu vent	py tro to de b laye ral fea	ate to dense ees with mod- ense natural er; or other atures pre- blishment of n.	
SHORELINE GEOMETRY general shape of the shoreline at the point of interest plus 200 yards on either side.	(1) coves or ba	ys			rregula ght sho		line or		(8) head island	land,	point, or	
SHORE ORIENTATION ⁴ geographic direction the shoreline faces	(0) < 1/3 mile fetch	(1) north to east (349°-				south	outh to w west ~-258°)	est-			o north–north °–349°)	
BOAT WAKES ⁵ proximity to and use of boat channels	 no channels yards, broad op constricted sha or channels wit zones 	pen water bo llow water b	ody;	(6) thore yards ca thorough mile off- traffic	rrying l nfare 10	limited)0 yard	traffic, o s to ½	or yard (uni	ds carryi	ng int	e within 100 tensive traffic ting activity)	
EROSION INTENSITY SCOL	RE (EI)											

FIGURE 4. EROSION INTENSITY (EI) SCORE WORKSHEET (Wisconsin Administrative Code: NR 328.08)

Minimum Flow Habitat Evaluation Study

The primary objective of the Minimum Flow Habitat Evaluation Study (habitat study) was to evaluate whether the existing minimum flow (12 cfs) at the Project is sufficient to provide suitable habitat for aquatic resources in the West Fork downstream of the Gile Dam. Additional study flows of 24 and 36 cfs were also planned to assess how the suitability of available habitat may change with increases in flow. The habitat study included a survey of two representative reaches (stations) downstream of the Gile Dam. The reaches were determined after reviewing the 2017 WDNR fishery data and WDNR's Guidelines for Evaluating Habitat of Wadable Streams (WDNR Guidelines). Water depth and velocity information were collected at both stations at baseflow conditions reported as 12 cfs. The water depth information was collected by hand measurements and point velocity measurements were collected with an electromagnetic flow meter mounted to a top-setting wading rod. The sampling methodology for each station followed the general sampling procedures outlined in WDNR Guidelines. GLEC incorporated improved/current methodology with the field data collection and interpretation such as habitat suitability curves, weighted usable area and current instream flow methodologies. The data recommended by the WDNR Guidelines was collected for each of 12 transects within each of the two study reaches.

During the course of collecting the first set of habitat data, GLEC used a SonTek River Surveyor to verify the 12 cfs minimum flow from the dam when the sluice gate was closed as far as possible¹. Flow measurements just below the dam, as well as 0.44 miles downstream (FIGURE 5), revealed that the discharge was actually much closer to the anticipated highest study flow of 36 cfs. The average of the measured flows equaled 35.25 cfs. As such, the full suite of habitat data was collected only at the high study flow (36 cfs) until such a time when lower flows can be produced.



FIGURE 5. LOCATIONS OF STREAM FLOW MEASUREMENTS DURING GILE HABITAT STUDY

¹Two metal tabs are fastened to the bottom plate of the sluice gate preventing it from fully closing and thus ensuring the minimum flow is discharged at all times.

Habitat Study Reaches

Wisconsin DNR staff previously collected fisheries data in the West Fork of the Montreal River during backpack and/or stream shocking surveys from 2007-2018 (WDNR fisheries survey data provided to Northern States Power of Wisconsin (NSPW) April 28, 2021). During these surveys, fish were collected from five different locations downstream of the Gile Flowage (FIGURE 6). A total of 15 fish species were collected across all years and sampling areas.

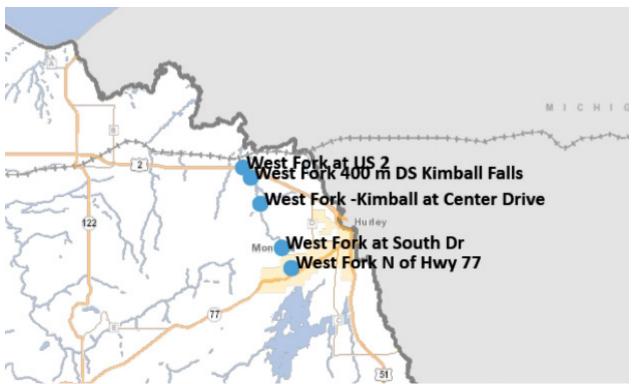


FIGURE 6. WDNR FISH SAMPLING LOCATIONS IN THE WEST FORK OF THE MONTREAL RIVER (2007-2018)

After reviewing the fish data provided by WDNR, two study reaches were selected for the Minimum Flow Habitat Evaluation Study that corresponded to two of the WDNR fish sampling locations. The upper study reach (Reach A) began just downstream of the US Highway 77 bridge and the lower study reach (Reach B) included areas both upstream and downstream of South Drive. Results of the WDNR fish surveys from these two locations included all 15 species of fish collected throughout the surveys. Numbers of each species collected and percent abundance of each species is displayed in TABLE 1.

Species Common Name	Species Scientific Name	Number of Fish Collected	Percent Abundance
LONGNOSE DACE	Rhinichthys cataractae	329	42.56%
CREEK CHUB	Semotilus atromaculatus	84	10.87%
PUMPKINSEED	Lepomis gibbosus	81	10.48%
SMALLMOUTH BASS	Micropterus dolomieu	70	9.06%
HORNYHEAD CHUB	Nocomis biguttatus	52	6.73%
WHITE SUCKER	Catostomus commersonii	49	6.34%
YELLOW PERCH	Perca flavescens	29	3.75%
COMMON SHINER	Luxilus cornutus	24	3.10%
BLACKNOSE SHINER	Notropis heterolepis	23	2.98%
WALLEYE	Sander vitreus	13	1.68%
MOTTLED SCULPIN	Cottus bairdii	9	1.16%
ROCK BASS	Ambloplites rupestris	4	0.52%
WESTERN BLACKNOSE DACE	Rhinichthys obtusus	3	0.39%
BROOK TROUT	Salvelinus fontinalis	2	0.26%
CENTRAL MUDMINNOW	Umbra limi	1	0.13%

TABLE 1. LIST OF FISH SPECIES COLLECTED BY WDNR FROM THE GILE FLOWAGE MINIMUM FLOW HABITAT EVALUATION STUDY REACHES

Habitat sampling at each reach was conducted following WI DNR Guidelines for Evaluating Habitat of Wadable Streams (2002). At each study reach, the mean stream width (MSW) was determined and the reach length was calculated as 35 times the MSW. Within each reach, 12 transects were established (FIGURE 7 and FIGURE 8). The first (most upstream) transect was established 1 MSW from the upstream end of the study reach and subsequent transects were spaced 3 MSW apart (approximately 45 meters in both reaches). At each transect, the following data was collected:

- Distance from start of study reach
- Wetted width
- Habitat type
- Depth at deepest point along transect (thalweg)
- Length of each transect containing various types of cover for adult fish
- Amount of bank erosion
- Riparian land use within 5 meters of stream edge
- Riparian buffer width

Along each transect, four equally spaced sampling points were established, effectively dividing each transect into five equal segments. Within a 0.3m x 0.3m quadrate on the stream bottom centered on the transect point, the following data was collected:

- Water depth (if a boulder was directly on the transect point, depth was measured next to the boulder)
- Depth of fines and water
- Embeddedness of coarse gravel and rubble/cobble
- Percent of the stream bottom covered by various substrate types, algae, and macrophytes
- Percent of the transect shaded by canopy
- Water velocity (from a location equal to 0.6 times the water depth at the point)

The available habitat (in square meters) of each sub-reach segment was calculated by multiplying the width of each segment by the sub-reach length. To calculate the weighted useable area (WUA) of each segment, habitat suitability formulas (Aadland and Kuitunen, 2006) were applied to the depth and velocity values at each sampling point for the 10 most common fish species collected and then summed to create a single WUA index for each species and in each study reach. Collectively, these 10 species accounted for over 97.5 percent of the fish collected from the two study reaches. The habitat suitability formula for pumpkinseed was not available, so the formula for bluegill was used as a surrogate. Pumpkinseeds are generally considered very similar to bluegill, and are often found in the same habitat.

As flows change within the West Fork of the Montreal River, depth and velocity will change accordingly. Other parameters, such as substrate type, cover for fish, canopy cover, percent embeddedness, etc. are expected to remain relatively consistent. For this reason, habitat suitability indices used in the calculation of weighted usable area were restricted to depth and velocity. When lower flows (i.e., 12 cfs) are able to be discharged and verified below the dam, similar calculations will be made to allow a direct comparison of weighted usable areas for each species at each study flow.

Using the habitat data collected, and the Fish Habitat Rating system (TABLE 2) developed by WDNR (Simonson, Lyons, and Kanehl, 1993.), an overall fish habitat score was developed for each reach. This score, which ranges from zero to 100, is designed to provide a qualitative rating of fish habitat that ranges from poor to excellent using the following scoring ranks.

- Excellent ≥ 80
- Good 60-80
- Fair 20-60
- Poor < 20



FIGURE 7. APPROXIMATE LOCATION OF TRANSECTS A1-A12 DOWNSTREAM OF HIGHWAY 77 ON THE WEST BRANCH OF THE MONTREAL RIVER



FIGURE 8. APPROXIMATE LOCATION OF TRANSECTS B1-B12 IN THE VICINITY OF SOUTH ROAD ON THE WEST BRANCH OF THE MONTREAL RIVER

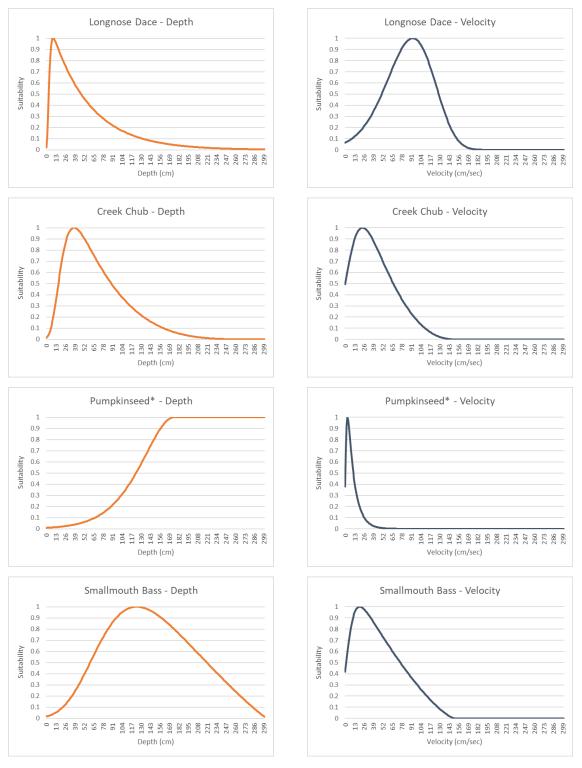


FIGURE 9. HABITAT SUITABILITY CURVES FOR DEPTH AND VELOCITY OF THE 10 MOST COMMON SPECIES IN THE GILE FLOWAGE MINIMUM FLOW HABITAT EVALUATION STUDY REACHES.

* Habitat suitability curves for pumpkinseed were not available, so the curves for bluegill were used instead

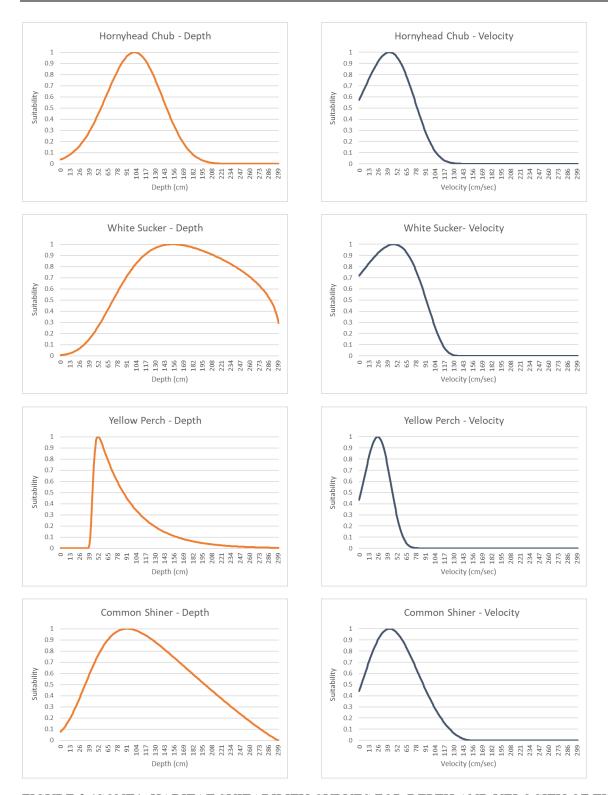


FIGURE 9 (CONT.). HABITAT SUITABILITY CURVES FOR DEPTH AND VELOCITY OF THE 10 MOST COMMON SPECIES IN THE GILE FLOWAGE MINIMUM FLOW HABITAT EVALUATION STUDY REACHES.

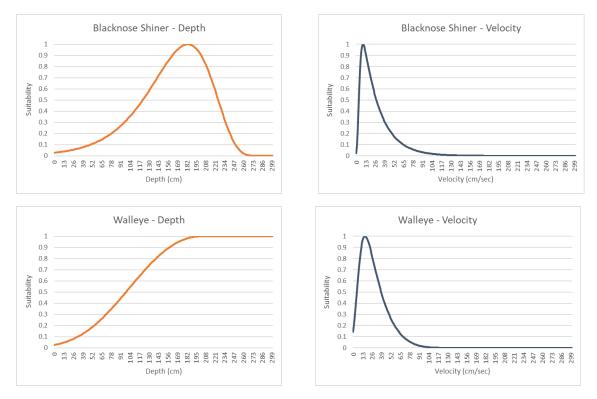


FIGURE 9 (CONT.). HABITAT SUITABILITY CURVES FOR DEPTH AND VELOCITY OF THE 10 MOST COMMON SPECIES IN THE GILE FLOWAGE MINIMUM FLOW HABITAT EVALUATION STUDY REACHES.

RATING ITEM	EXCELLENT	GOOD	FAIR	POOR
Bank Stability	No significant	Limited erosion;	Moderate erosion;	Extensive erosion;
(% of bank	bank erosion; \geq	70 to 90% of bank	50 to 60% of bank	< 50% of bank
protected by rock	90% of bank	protected; 10 to	protected; 10 to	protected; > 50%
or vegetation)	protected; $\leq 10\%$	30% bare soil	30% bare soil	bare soil
	bare soil			
	(12)	(8)	(4)	(0)
Maximum	Stream very deep;	Stream relatively	Stream	Stream relatively
Thalweg Depth	\geq 1.5 meters	deep; 1 to 1.5	moderately deep;	shallow; < 0.6
(average of the		meters	0.6 to 0.9 meters	meters
four deepest				
depths recorded)	(25)	(16)	(8)	(0)
Riffle:Riffle or	Diverse habitats;	Diverse	Habitat diversity	Habitat
Bend:Bend Ratio	meandering	habitats; bends and	low; occasional	monotonous;
(average distance	stream with deep	riffles present but	riffles or bends;	riffles or bends
between riffles or	bends and riffles	not abundant;	ration 15 to 25	rare; generally
bends divided by	common; ratio \leq	ratio 10 to 14		continuous run
average stream	10			habitat; ratio > 25
width)	(12)	(8)	(4)	(0)
Rocky Substrate	Extensive rocky	Moderate rocky	Limited rocky	Rocky substrate
(% of the	substrate; $\geq 65\%$	substrate; 45 to	substrate; 15 to	uncommon; <
substrate, by area,	of stream bed	65% of stream	44% of stream	15% of stream
that is bedrock,		bed	bed	bed
boulder,				
rubble/cobble, or				
gravel)				
	(25)	(16)	(8)	(0)
Cover for Fish	Cover/shelter for	Cover common,	Occasional cover,	Cover rare or
(% of the stream	fish abundant; \geq	but not extensive;	limited to one or	absent; limited to,
area with cover)	12% of stream	7 to 12% of	two areas; 2 to 6%	2% of stream
		stream	of stream	
	(25)	(16)	(8)	(0)

TABLE 2. FISH HABITAT RATING SYSTEM (FHR) DEVELOPED BY WDNR (SIMONSON, LYONS, AND KANEHL, 1993.)

STUDY RESULTS

Shoreline Stability Study

Seven shoreline sites and the downstream project area were scored using the Wisconsin Erosion Intensity Score worksheet. Six sites located on the Flowage appeared to have significant active erosion with evidence of soil movement or slumping (Sites 1, 2, 4, 5, 6 and 7). Site #3 was assessed to evaluate the worksheet scoring at a non-erosional site for comparison. In addition, specific attention was given to the assessment of roadsides, manmade beaches, docks or otherwise developed shorelines for evidence of soil movement or slumping. On the Flowage, none of the developed shorelines showed any evidence of erosion. A list of the sites assessed using the Erosion Intensity Score worksheet is provided in TABLE 3 and their locations are shown in FIGURE 10. Photographs of each site are provided in FIGURE 13 through FIGURE 19. The field data worksheets are included in Appendix A.

Five of the six sites identified with erosion were located on small islands within the Flowage (Sites 1, 2, 4, 6 and 7). One site (Site #5) was located along the northwest shoreline near the dam. In each instance, the erosion features appeared to be above the waterline.

There was one small area with evidence of shoreline erosion in the tailrace. That area is located on the west bank at the toe of the water control structure, adjacent to the west wingwall downstream of the dam gatehouse. It appears that human traffic, and possibly high springtime flows, have scoured the bank and exposed the soil adjacent to the concrete wingwall (FIGURE 11). Given the location of the area of interest, an Erosion Intensity work sheet was not completed. There were no other erosion sites identified in the project area downstream of the dam. A typical depiction of the downstream project area is shown in FIGURE 12.

Site # (Map Sheet Location)	Coordinates	Erosion Intensity Score
Site #1 (Map Sheet 7)	N46.41403; W90.22038	36
Site #2 (Map Sheet 7)	N46.4133, W90.2205	36
Site #3 (Map Sheet 10)	N46.369216, W90.244506	27 [@]
Site #4 (Map Sheet 9)	N46.378467, W90.24095	42
Site #5 (Map Sheet 5)	N46.424921, W90.228208	39
Site #6 (Map Sheet 4)	N46.415217, W90.217717	39
Site #7 (Map Sheet 7)	N46.411840, W90.22258	33

TABLE 3. GILE FLOWAGE SHORELINE STABILITY ASSESSMENT SITES AND THE RESULTING EROSON INTENSITY SCORE.

^(a) Site #3 was not an area of concern nor an erosional site.

The Wisconsin Administrative Code NR 328.08 categorizes erosion intensity into three groups; low energy, with a score of 47 or less, moderate energy with a score of 48-67, and high energy with a score of greater than 67. Each site assessed in the Gile Flowage shoreline stability study ranked in the low energy category.

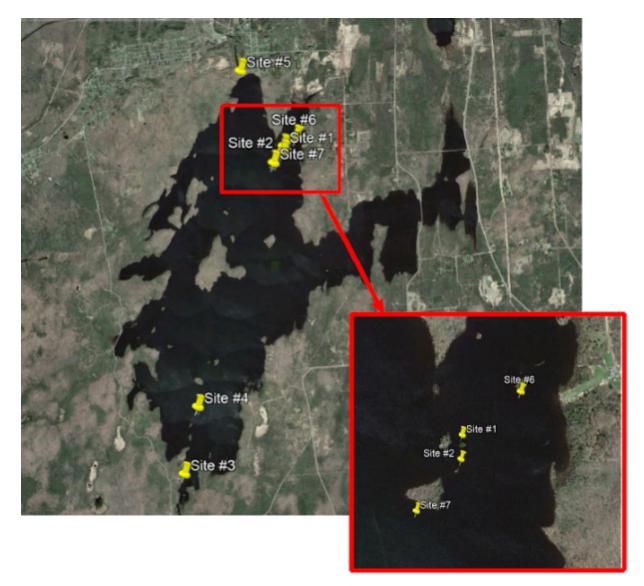


FIGURE 10. SHORELINE STABILITY ASSESSMENT SITES IN THE GILE FLOWAGE.



FIGURE 11. AREA OF INTEREST ON THE LEFT EMBANKMENT (WEST WINGWALL) FACING DOWNSTREAM AT THE TOW OF THE EMBANKMENT (August 30, 2022).



FIGURE 12. WEST BRANCH OF THE MONTREAL RIVER IMMDIATELY DOWNSTREAM OF THE GILE FLOWAGE (AUGUST 9, 2022)





FIGURE 13. SITE #1 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.



FIGURE 14. SITE #2 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.



FIGURE 15. SITE #3 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.



FIGURE 16. SITE #4 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.



FIGURE 17. SITE #5 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.



FIGURE 18. SITE #6 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.



FIGURE 19. SITE #7 FROM THE 2022 GILE FLOWAGE SHORELINE STABILITY ASSESSMENT.

ANALYSIS AND DISCUSSION

Shoreline Stability Study

The Wisconsin Administrative Code NR 328.08 categorizes erosion intensity into three groups; low energy, moderate energy, and high energy. Each site assessed in the stability study ranked in the low energy category (TABLE 3). Five of the six sites identified with erosion were located on small islands within the flowage (Sites 1, 2, 4, 6 and 7). One site (Site #5) was located along northwest shoreline of the flowage near the dam. In each instance, the erosion features appeared to be above the waterline; the area between the water line and the eroded embankment was covered with cobble or sandy beach. In the downstream tailrace and riverine area downstream of the dam within the project boundary, there was one instance of shoreline erosion or instability. All shorelines along the roadways, including culverts and small bridges showed no signs of erosion. An inventory of each erosion site is provided in TABLE 4.

The bedrock in Iron and Ashland Counties in northern Wisconsin is resistant to erosion. The thin layer of sediment that is exposed in erosional areas around the Flowage lays atop the bedrock. Bare rock faces and boulders are common along the flowage shoreline. Most, if not all, of the natural beaches on the flowage are composed of gravel and cobble. Swim beaches, if present, appear to be man-made and represent a very small portion of the Flowage shoreline. Developed shorelines within the project boundary did not appear to have significant erosion.

Previous work completed by the Friends of the Gile (FOG 2005) included an analysis of the substrates in the littoral zone in areas up to six feet below the full pool elevation of 1,490 feet. That report indicated that substrates within the upper 6 feet consisted of: 20.3% bedrock, boulder, or cobble; 26.9% gravel, gravel with cobble, or gravel with boulders; 39.8% sand, muck or detritus; and 13% sand with gravel, cobble, and/or boulders (FOG, 2005). FOG's information, when combined with the observations and erosion intensity assessments from this study, indicate that there is very little risk of erosion on the Flowage primarily due to the surrounding geology.

Five of the six erosion sites identified were located on small islands within the flowage where the erosion was limited to the thin soil layer atop the bedrock. One site (Site #5) was located along the northwest shoreline of the flowage near the dam. Although located away from the dam and in a wooded area, this site did exhibit significant soil movement and warrants further investigation. The small area of interest in the tailrace also deserves further attention due to its proximity to the dam structures.

Erosion Site #	Length of Eroded Area (ft)	Coordinates (lat/lon)
Site #1	74	N46.41403, W-90.22038
Site #2	26	N46.41330, W-90.22055
Site #4	24	N46.37847, W-90.24095
Site #5	75	N46.42492, W-90.22831
Site #6	54	N46.41522, W-90.21772
Site #7	210	N46.411840, W90.22258
Downstream Embankment	21	N46.42571, W-90.22692

TABLE 4. INVENTORY OF POSSIBLE ERODABLE SITES IN THE GILE FLOWAGE (AUGUST 2022)

Minimum Flow Habitat Evaluation Study

Both study reaches contained a mix of riffle, run, and pool habitat dominated by a hard substrate (boulder, cobble and gravel). Maximum transect depths typically ranged from 35 to 60 cm, with shallow water and soft substrates rarely encountered. Average water velocities ranged from 30 cm/sec to 36 cm/sec. Slack water areas were rarely observed. Field worksheets are included in Appendix B.

Habitat suitability formulas for depth and velocity were applied to each of the ten most common fish species observed during the study to calculate an overall suitability value (TABLE 5 and TABLE 6.).

Reach A	Depth	Vel	Depth and Velocity
LONGNOSE DACE	65.2%	36.1%	50.7%
CREEK CHUB	76.5%	80.9%	71.1%
PUMPKINSEED	4.0%	10.5%	6.6%
SMALLMOUTH BASS	22.4%	81.8%	47.1%
HORNYHEAD CHUB	26.6%	89.5%	52.5%
WHITE SUCKER	14.3%	93.3%	48.7%
YELLOW PERCH	22.8%	61.8%	38.3%
COMMON SHINER	49.3%	88.7%	62.3%
BLACKNOSE SHINER	7.5%	35.9%	19.6%
WALLEYE	12.0%	51.1%	28.5%
Average	30.1%	63.0%	42.5%

TABLE 5. HABITAT SUITABILITY FOR THE 10 MOST COMMON FISH SPECIES IN STUDY REACH A

Reach B	Depth	Vel	Depth and Velocity
LONGNOSE DACE	63.1%	27.7%	45.39%
CREEK CHUB	91.8%	89.2%	90.50%
PUMPKINSEED	3.7%	15.0%	9.39%
SMALLMOUTH BASS	21.9%	89.8%	55.86%
HORNYHEAD CHUB	26.0%	89.0%	57.53%
WHITE SUCKER	13.4%	91.9%	52.62%
YELLOW PERCH	17.1%	77.9%	47.49%
COMMON SHINER	52.7%	87.3%	70.02%
BLACKNOSE SHINER	7.4%	50.3%	28.83%
WALLEYE	11.8%	68.8%	40.31%
Average	30.9%	68.7%	49.80%

TABLE 6. HABITAT SUITABILITY FOR THE 10 MOST COMMON FISH SPECIES IN STUDY REACH B

Overall, the 36 cfs study flow provided a relatively high depth and velocity suitability for the ten most common fish species present. Overall suitability values for 9 of the 10 species exceeded 40%. The highest overall suitability was for the creek chub (90.5%) and the lowest was for the pumpkinseed (9.39%).

Estimating how the amount of available habitat of the weighted useable area may change with lower study flows (12 cfs and 24 cfs) is not possible at this time.

Fish Habitat Rating Score

When the habitat data was entered into the WDNR fish habitat scoring worksheet for streams greater than 10 meters wide, both study reaches scored in the "good" range. Study reach A received a score of 69 and study reach B received a score of 61. Deductions from the top score of 100 were due primarily to shallow depths and a lack of bends or other stream complexes which add to the overall diversity of the stream structure.

Agency Consultation

GLEC had no direct consultation with the resource agencies regarding either the erosion or habitat studies at Gile Flowage.

Literature Cited

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Wisconsin Administrative Code: NR 328.08. Erosion Intensity (Ei) Score Worksheet.

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Wisconsin Geological & Natural History Survey. 2022. <u>https://wgnhs.wisc.edu/wisconsin-geology/ice-age/</u>. 817 Mineral Point Road, Madison, Wisconsin 53705, (608) 262-1705, info@wgnhs.wisc.edu.

APPENDIX A – EROSION DATA SHEETS

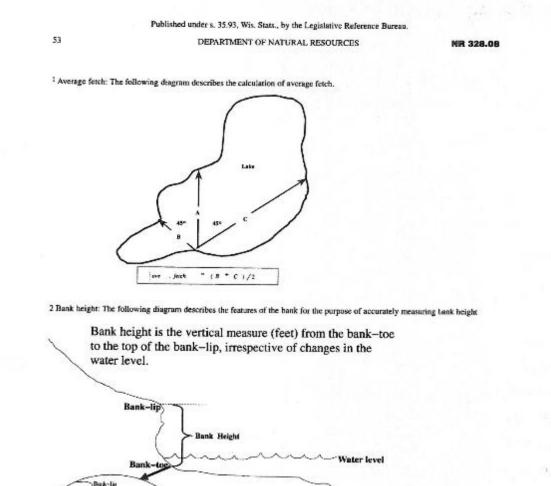
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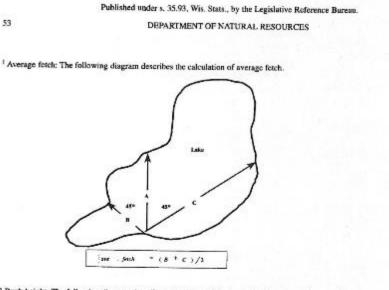
³ Aquistic vegetation: Dense or abundant means that on average 50–100% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Scattered or patchy means that on average 1–49% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15.</p>

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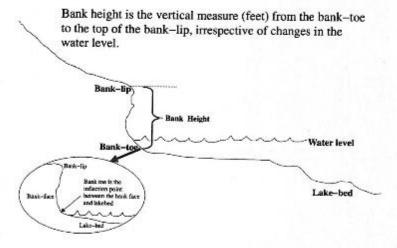
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2 Bank height: The following diagram describes the features of the bank for the purpose of accurately measuring bank height

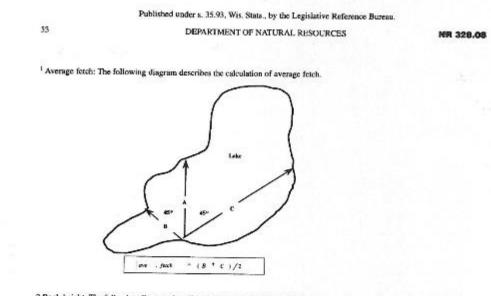


³ Aquatic vegetation: Dense or abundant means that on average 50–100% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Scattered or patchy means that on average 1–49% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15.</p>

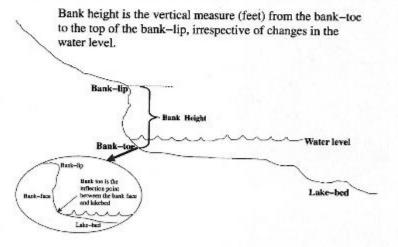
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	BANK COMPOSITION composition and degree of cements- ton of the sediments	(0) rock, mar cemented san pick)			(7) soft cement	clay, cla ed (easily	yey sand, dug with	a knife)		nented sands or y dug with you	
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	AQUATIC VEGETATION ³ type and abundance of vegetation occurring in the water off the shoreline	(0) rocky sub- unable to sup vegetation	pon o	1) dense o morgent, s aorged ves	floating o	or sub-	(4) scatte emergent	red or patchy	(7) la sub- floati	ick of emergent	10
	BANK VEGETATION. 1709 and abundance of the vegetation occurring on the bank face and introdistely on top of the bank hip	(0) bank comp rocky outerop unable to supp tation	posed of ping	(1) den upland	se vegeta	tion, uts and	(4) clun tion alte	aps of vegeta mating with cking vegeta	- (7) lack (cleared	vegetation k of vegetation d), crop or agri- l land	8
	BANK STABILITY, The degree to which benk and adjacent area (within 10 fact of the beak-lip) in startized by easy int groups, beak and canopy wageration (rebute a 10° pier occess counder). Remark distributions in typiffed by tree removed, beaking, movering, and Jawg establishment.	(0) established lawn with few canopy trees	lawn v	vith mode dense can-	f- veget shrub few c	lation and layer su anopy to	d canopy ibstantiall	natural groun trees with y reduced; of moderate to er.	canopy erate to ahrub la ostural	derate to dense trees with mod dense natural ayer; or other features pro- stablishment of ion.	4
	SHORELINE GEOMETRY present chape of the shareline of the point of interast play 200 yards are either eide.	(1) coves or ba	iys			imegular ight show	shoreline		8) headland	d, point, or	8
	SHORE ORIENTATION ⁴	(0) < 1/3 mile fetch		th to east i 49°-360°			(4) south southwe (169°-2			to north-aorth 59°-349°)	
	BOAT WAKES ³ proximity to and use of boat chargels	(1) no channels yards, broad op constricted sha or channels wit zones	en wate llow wat	r body, or ier body;	yards ca thoroug	arrying li hfare 10	within 1 mited trai 0 yards to rtying int	00 (12) fflc, or yards 1/2 (unre	carrying in	re within 100 mensive traffic sting activity)	-
	EROSION INTENSITY SCOR			1	- and the				100		0

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2 Bank height: The following diagram describes the features of the bank for the purpose of accurately measuring bank height



³ Aquatic vegetation: Dense or abundant means that on average 50–100% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Scattered or patchy means that on average 1–49% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15.</p>

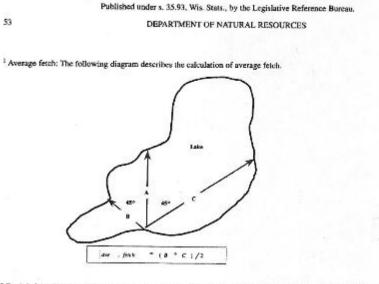
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		Published unde	er s. 35.5	93, Wis. St	ats., by	the Legis	lative Ref	trence Burea	81.		
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MARMIN S	1+ # 261		Ó	Ing 22 Mela	nle	-					
1 #11	Island)		-	Intereste	Table	4					
ine ri le	Applicants and depar	touent staff sha	ll use th	Intensity is workste	et to ca	Score We alculate er	pricebeet	niile meruon		0.00.001	
6.41403			_				united and	sary pursuan	110 S. INK 32	8.08 (2).	
0, 22038								221202000			le
	SHORELINE VARIABLES	Eros	ion Later	nsity Value	is Loc	ated in Pa	VE CATE	GORIES on Left Side /	of Each Categ	IODI Pos	ASSIGNED
les. 45JM									in Linka Calley	for A POR	ASS
-	AVERAGE FETCH1-, average	(0) <1/10	(2) 1/1	0 -1/3 (4	1/3-1	0	1-3	(10) 3-10	(13) 10-30	(16) >30	-
miger	distance (miles), access the open wat	a	1				6481	,,	(10)10-50	(10) >30	
les. 453M [mage2 G. 1240	the second secon				X						ħ
1241	DEPTH AT 20 FEET, dapth of	(1) <1	0	2) 1-3	~	(3) 3-4	5	(4) 6-12	(5)	>12	+
1242	water (feet) 20 feet from shorehase DEPTH AT 100 FEET, depth of	0) <1	-		X	-				2.99 7	12
1260	water (inst) 100 Seet from describes.	E	6	2) 1-3		(3) 3-4	×	(4) 6-12	(5)	>12	3
1.00	BANK HEIGHT ² , height of bank	(1)<1	C	2) 1-5		(3) 5-1		(4) 10-20	(5)	>20	1
	Hent), measure from too of the bank to top of the hank-lips	2			×			1			2
/	BANK COMPOSITION	(0) rock, mar	l, tight c	lay, well	(7) so	ft clay, cla	vev sand	moderately	(15) uncerner	ted and to be	1.1
	composition and degree of cemeura- tion of the sodiments	cemented sag pick)	d (dig v	vith a	cemer	oted (easil	y dug with	a knife)	peat (easily d	log with your	17
	INFLUENCE OF ADJA-	(0) no hard	(1) h	ard armor-	(2) ha	rd armorie	IR on (3) F		hand) g (4) hard arn		1
	CENT STRUCTURES. likel- bred that adjocent structures are cousing	armoring on either adjaces	ing or	n one	both a erties	djacent pr	rop- on o	ne adjacent	both adjaces	of properties	11
	flank erotion at the size	property V	erty	and hands.	erues.		meas	erty with surable	with measur sion adjacer	t to both	12
	AQUATIC VEGETATION ³	(0) rocky sub	strates 1/	1) dense a		A	rece	115 C	structures	014120225	
	type and abandance of vegetation	mable to sup	port, a	mergent, i	lioating	tor sub-	emergent,	red or patchy floating or s		of emergent, or submer-	
	occurring in the water off the shroetling BANK VEGETATION, type and	(0) bank com		nerged ver		-	mergent v		gent veg	etation	ø
	abundance of the vegetation occurring on	rocky outerop	ping	upland	trees, sl	hrubs and	tion alte	ps of vegeta- tuating with		rop or agri-	1.
	the bank face and interediately on top of the bank tip	unable to supp tation	port veg	e- grasses,	includ	ing lawns	areas lac tion	king vegeta-	cultural la	nd	1
	BANK STABILITY, The degree to	(0) established lawn with few	(1) est	ablished	(4)	moderate	to dense n	atural ground	d (7) moden	ate to dense	+
	feet of the bank-lip) is stabilized by name	canopy trees		with modes dense can-	- veg	ub layer su	d canopy t ubstantially	rees with	canopy tre	es with mod- use natural	
	rel ground, shrub, and canopy vegetation (nemistr a 10' pier access corridor).		opy to	DES	few	canopy tr	ees with n shrub lays	noderate to	shrub laye	r, or other	4
	Namas distubance is typified by tree	1.1	1		Gen	so nacina;	stant Style	- V	natural fea	lures pre-	1
	removal, brushing, mowing, and lown establishment							X	vegetation		
	SHORELINE GEOMETRY	(1) coves or he	iy's				r shoreline	or Ja	8) headland, p	point or	-
	general shape of the shoreline at the point of interest pins 200 yards on either side.				st	raight sho	reline	(is	dand	×	8
	SHORE ORIENTATION ⁴	(0) < 1/3 mile	(1) nor	th to east t	o south	-south-	(4) south	to west-	(S) west to	north-sorth-	
	geographic direction the shoreline faces	fetch	cast (3-	49°-360°,	1"-16	i8°)	southwes (169°-25	t ,	west (259"	-349")	14
	BOAT WAKES	(1) no channels	within	100	(6) the	oroughfare	within 10		boroughfare v	within 100	-
i i	proximity to and use of boat changels	yards, broad or constricted sha	low we	r body, or er body:	yurds	carrying li	imited traf	fic, or yards	carrying inte	osive traffic	1.
		or channels with	hin no-	wake	mile a	iffshore ca	0 yards to rrying inte	nsive	gulated boatir	ig activity)	1
-	EROSION INTENSITY SCOR	topes		X	traffic						10

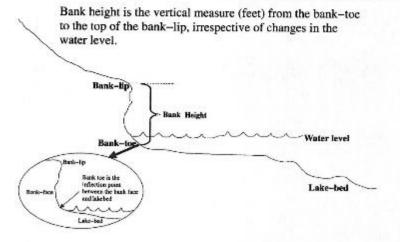
Dedged Matorial Sizes, "Dredging Operations Technical Support Program Technical Report D=90-13,U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 19180, 35 pp.

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NR 328.08



2 Bank height: The following diagram describes the features of the bank for the purpose of accurately necessaring back height



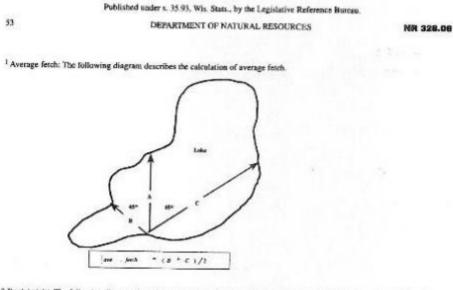
³ Aquatic vegetation: Dense or abundant means that on average 50–100% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Scattered or patchy means that on average 1–49% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Afternt means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Afternt means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15.</p>

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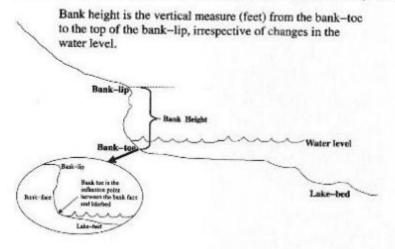
itul 70	10 NR 328.08		WISCONSIN A	DMINISTR	ATIVE COD	Е		1	52
#2	9 Ang 22 DMcCande								
	OMª Cande	u,		Table 1					
(ava)		1 E	rosion Intensi	ty (Ei) Sco	re Workshe	set			
-51	Applicants and depar	tment staff sha	ll use this works	heet to calcu	late crosion is	ntensity pursuar	11 to s. NR 328	.08 (2).	
798	SHORELINE VARIABLES	Erosi	ion Intensity Val	DESCR ue is Located	IPTIVE CA	FEGORIES is on Left Side	of Each Catego	ory Box	1 Martinet
3	AVERAGE FETCH1-, average	(0) <1/10	(2) 1/10 -1/3	0 1/2 1	(7)1-3	1000 0 10	Lan as	1	-
5 ed	distance (miles), arrow the open was to the opposite share measure 45" other side of the perpendicula to the shoreline.	a		X	0,1-5	(10) 3-10	(13) 10-30	(16) >30	
lec	water (fast) 20 feet from shoreling	(1) <1	(2) 1-3	X	(3) 3-6	(4) 6-12	(5) >	-12	1
>	DEPTH AT 100 FEET, depth of water (feet) 100 feet then sharehine		(2) 1-3		(3) 3-6	(4) 6-12	(5) >	-12	
4	BANK HEIGHT ² , bright of bank (feet), measure from toe of the bank to to of the bank-tip.	(1)<1 P	(2) 1-5	X	3) 5-10	(4) 10-20	(5) >	20	
composition at tion of the pedi-	BANK COMPOSITION comjustion and degree of contents, tion of the rediments	(0) rock, mar comented san pick)), tight clay, we] d (dig with a		ay, clayey sa (easily dug v	nd, moderately with a knife)	(15) uncement pcat (easily du hand)	ted sands or ig with your	
	INFLUENCE OF ADJA- CENT STRUCTURES, likele head that adjacent structures are carriag thank errories at the site	(0) no hard armoring on either adjacer property	(1) hard armo ing on one edjacent prop enty	locus adia	prop- o	 hard armoria none adjacent roperty with nessurable ccession 		able reces-	t
	AQUATIC VEGETATION ³ lype and abandance of vegetation occurring in the water off the abandance	(0) rocky sub unable to supp vegetation	port/ cmergen	e or abundant t, floating or regetation	sub emerg	attered or patch ent, floating or nt vegetation	y (7) lack a	of omergent, or submer-	4
	BANK VEGETATION. type and abandance of the vegetation ecounting on the bank face and immunitative on top of the bank lip	(0) bank comp rocky outcrop unable to supp tation	ping uplan	trees, shruites, including	on, (4) c tion tion	lumps of vegeta alternating with alternating vegeta	- (7) lack of (cleared), o	vegetation rop or agri-	
	BANK STABILITY, the dagage to which bank and adjuscet area (writen 10 feet of the bank-ships or arbitrare in sour- ral promet, shorth, and cancer contribut). Returns dotarbance in typeffed by tree warrowd, braching, mowing, and lown semblishment.	(0) established lawn with few canopy trees	i (1) established lawn with mor ate to dense ca opy trees	der- w- few ca	ion and canor	te natural groun py trees with ially reduced; o th moderate to layer.	canopy tree erate to der shrub layer natural feat	; or other	4
	SHORELINE GEOMETRY graced daps of the abserdance of the point of interest plus 200 yords on either note.	(1) coves or bo	уя		regular shore ht shoreline		8) headland, p	oint, or	8
	SHORE ORIENTATION ⁴ geographic direction the shoreline faces	(0) < 1/3 mile fetch	(1) north to east east (349*-360		south	west -258°)	(8) west to a west (259°-	north-north- -349°)	4
		(1) no channels yards, broad or	within 100 on water body,		ghfare within ying limited	n 100 (12)	thoroughfare w s carrying inter	vithin 100	
		constricted sha or channels wit zones	llow water body	; thorough	fare 100 yards tore carrying	\$ to 52 (unre	gulated boatin	g activity)	1

Freedra Marcial Sites, "Dredging Operations Technical Support Program Technical Report D=90–13,U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180, 35 pp.

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2 Bank height: The following diagram describes the features of the bank for the purpose of accurately measuring bank height

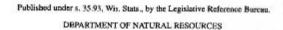


³ Aquatic vegetation: Dense or abundant means that on average 50–100% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Sentered or patchy means that on average 1–49% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Abtent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Abtent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15.</p>

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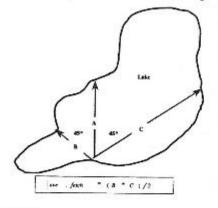
-/ NR 328.08 -/ <u>N 444 22 114</u> -> <u>O 40° 44 . 6</u> Applicants and depa	A 48 48 urtment staff sha	WISCONSIN A 	3 Table 1 v (Ei) Score V	Vorksheet	won site	134	100 tor 1 328.08 (2).	
SHORELINE VARIABLE	Eros	ion Intensity Valu	DESCRIPT e is Located in 1	IVE CATES	GORIES na Left Side	of Each C	stegory Box	ASSIGNED
AVERAGE FETCH ¹ -, average distance (miles), across the open we to the opposite side measure 45° other side of the perpendical to the absentine.		(2) 1/10 -1/3 (4	0 1/3-1 (7)1-3	(10) 3–10	(13) 10-;	30 (16) >30	0
DEPTH AT 20 FEET, depth of water (fur) 20 feet from therefore	(1) <1	(2) 1-3	V (3) 3	-6	(4) 6-12	1	(5) >12	
DEPTH AT 100 FEET, depth of	r (1) <1	(2) 1-3	(3) 3	6 1	(4) 6-12		(5) >12	-
water (700) 100 feet from shoreline BANK HEIGHT ² , bright of bars	k (1)<1	(2) 1-5		X				1
Over), measure from use of the bank to n of the bank-lip.	op	X	(3) 5	-10	(4) 10-20		(5) >20	12
BANK COMPOSITION composition and degree of competer- don of the sedments	(0) rock, mar cemented sar pick)	I, tight clay, well of (dig with a	(7) soft clay, o cemented (eas	layey sand, ily dug with	i moderately a knife)	(15) uncer prat (easil band)	mented sands or y dug with your	+
INFLUENCE OF ADJA- CENT STRUCTURES, like5- boot that adjacent structures are causing flunk cruster with the site AQUATIC VEGETATION ³	property X	(1) hard armor ing on one adjacent prop- erty	both adjacent erties	prop- on or prop- meas reces	ne adjacent erty with surable ssion	both adja with mea sion adja structure	acent properties asurable reces- cent to both	1
type and abundance of vegetation occurring in the water off the shorelin	vegetation	strates (1) dense port emergent, merged w	floating or sub-	(4) scatter emergent, mergent v	ed or patchy floating or egetation	sub- float	ick of emergent, ing or submer- vegetation	7
BANK VEGETATION, type and obtinizance of the wegetation occurring out the bank face and incondincity on top of the bank tip	rocky outcrop unable to supp tation	ping jupland	trees, shrubs an including laws	d tion alter	ps of vegets mating with king vegeta	(cleare	k of vegetation d), crop or agri- l land	T
BANK STABILITY, The sugree of which bunk and adjoined area (within 10 m) proved, with, and encopy regention (which a 107 pix scores conduct.) Hennas distarbanes is synificit by tree removal, broking, meeting, and have enablithoreat.	lawn with few canopy trees	ate to dense car opy trees	 vegetation s shrub layer few canopy dense natur 	e to dense m nd canopy t substantially trees with n d shrub laye	rees with reduced; o ooderate to r.	canopy crate to shrub li iiatural	derate to dense trees with mod- dense natural ayer, or other features pre- stabilishment of ion.	0
general shape of the shorehine at the point, of interest plan 200 yards on either side. SHORE ORIENTATION ⁴	(1) coves or ba	Texts.	straight sh	/	<	8) beadlan sland	d, point, ar	4
grographic direction the shorehoe faces	X	(1) north to east east (349°-360°	to south-south- , 1°-168*)	(4) south southwest (169°-25	t	(8) west west (2;	to north-north- 59°-349°)	8
BOAT WAKES ⁵ proximity in and use of boat champels	 no channels yards, broad op constricted shal or channels wit zones 	en water body, or llow water body;	(6) thoroughfa yards carrying thoroughfare) mile offshore traffic	limited traff 00 yards to	fic, or yards	carrying i	te within 100 ntensive traffic ating activity)	1
EROSION INTENSITY SCORE	E (EI)	<u> </u>	1		-			-
Note: Table 1 is adapted from Knutso Designed Material Sites "Designed O	n, P. L., H. H. Alle	en, and J. W. Webb, J N Support Program	990. "Guidelines (Technical Report F	or Vegetative I	Erosion Contr	ol on Wave-	Impacted Coastal s Experiment Sta-	2

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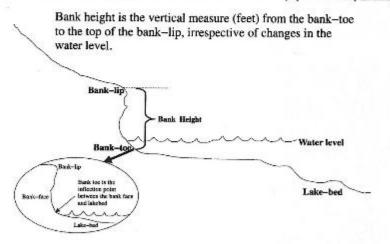


NR 328.08

¹ Average fetch: 'The following diagram describes the calculation of average fetch.



2 Bank height: The following diagram describes the features of the bank for the purpose of accurately measuring beak height



³ Aquatic vegetation: Dense or abundant means that on average 50–100% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Scattered or patchy means that on average 1–49% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15. Absent means that on average < 1% of the bottom is visually obstructed by plants during the growing season, defined by the dates June 1 through September 15.</p>

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NR 328.08		WISCONSIN AD	MINISTR.	ATTVE CO	DE		
2022 N46,2 N-90,	41184 22258				CALY	anter	9/6/20
7 2010.		5	Table 1			1	
	E	rosion Intensity	r (Ki) Scor	re Works	heet		
Applicants and depart	ment staff alial)	use this workshe	es to calcul	late crosice	intensity pursua	ant to s. NR	328.08 (2).
11	1						
SHORELINE VARIABLES	Ernsi	on Intensity Value	DESCR is Located	IPTIVE C in Parenil	ATEGORIES tesis on Loft Sid	e of Each (lategory Box
AVERAGE FETCHI-, MELAN	(0) <1/10	(2) 1/10 -1/3 (4	1.70-1	(7)1 3	(10) 7 10	1.105.10	m. Inc.
distance (miles), access the open years to the opposite share measure 45° other side of the perpendicular to the almoeting.	-	X	9 AGE 1	101-3	(10) 3–10	(13) 10-	-30 (16) >:
DEPTH AT 20 PEET, depth of water (See) 20 lett loca attention	(1) <1	(2) 1-3	x	(3) 3-6	(4) 6 13	-	(5)>12
DEPTH AT 100 FFEET, applied, water (here) 100 foot four shoreline		(2) 1-3	X	(3) 3-6	(4) 6 - 12		(5)≻12
BANK HEIGHT ² , height of back that it, reward four for of the back so my of the back-Ip	(1)<1	(2) 1-5	ľ	(3) S-10 X	(4) 10-2	0	(5) >20
BANK COMPOSITION	(0) rock, marl	, tight clay, well	0.00	low classes	saul, moderately		
composition and degree of commity; COL of the sediments	cemented sam pick)	1 (dig wirh a	ownented	i (ensily du	salu, modernici; g wilh a knife)	pcat (ens (hand)	ally dug with
	1200 min brend						
INFLUENCE OF ADDA- CENT STRUCTURES, (w)- boot that adjacent emergence are coming	 (0) no hard numoting on oither adjacent 	 hard armor- ing on one t_adjacent prop- 		urmoving or court prop-	 (3) hard armonion on one adjacent more ty with 	it both as	ijacent proper
CENT STRUCTURES. 1043-	numotine on	ing on one	buth adja	urnoring of cert prop-	ion one adjacen property with measurable	it both as with m sion of	ijacent proper casurable rec ljacent to hori
CENT STRUCTURES, 1007- bood that adjacent structures are counting flack ensists of the Grg	ether adjacen	ing on one adjacent prop- ecty	bath adja erties	cert prop-	on one adjacan property with measurable recession	it both as with m sinn ad structur	ijacent prope casurable rec jacent to hori res
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Note: Table 1 is subjeted from Krutson P L., H. H. Allen, and J. W. Webb. 1990. "Kinidelines for Vegetative Ecosion Construtor. Wave: Impacted Constant Developed Material Stes, "Dissigning Operations Technical Support Program Technical Report D-90–12, U.S. Anny Engineer Waterways Experiment Statian, Vackaburg, MS 39180, 55 pp.

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APPENDIX B – HABITAT DATA SHEETS

Lecending

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Transect Da Stream Nam	ie W. Foi		ontrea				ady ID Ga		08	30 7	r) Transect No 2022 A-1
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Silt (0.004 - 0.061 mm)		/		/	/	/		
Clay		1		/	/	/		
Detritus		/		/	1	/		
Other - Specify: Velocity	Cm/4_	44,9	171	6.0	54.3	20.8		
Percent (nearest 10%) of Stream	Bottom Covered	States and States						
Algae (atlached & fila,)		<u> </u>		Ø	D	ø		
Macrophyles	de la companya de la	D		Ø	0	9		
Canopy / Shading/ (circle one)		50		er	0	30		
Cover for Adult Gamefish: Le	A CONTRACTOR OF THE OWNER.	i) of transect within	0,15 m upstrea	am or downstream	A DECK STREET,			
Undercut Overhanging Veg Banks at least 0.20 m ov		Other Debris	Boulder	Submerged Macrophytes	Emergent Maproj at least 0.20 m (
Ø D.	5 012	14	0.5	×	Ø			

Riparian Buffer Width: Length (neerest 1.0 m) of Undisturbed Land Usas along transact, within 10 m of stream

Ø

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 $Loft _ \underbrace{[0]}_{(m)} = \operatorname{Sight} \underbrace{[0]}_{(m)} (m)$

Transect Da Stream Nam	-	heal RI			1	Vateroody ID	Code		MDDYYYY 30/2022) Transect No
			th (m) Habita	t Type:		lankfull Depth	(m) (opligr			idth (m) (optional
190		15.5			Run					
		1	Deepest	- 17	Channe	Position (Fi	fiths of Curr		m Width)	
Mater Darit	()		Point 0.38	1/5	-	0.24		3/5		415 0,35
Nater Depth			JUD					2111		0.35
Pepth of Fin				0.09		5.24		2119		000
SALAR PROPERTY AND	CONTRACTOR OF STREET, ST.	Rubble/Cobb	Sector Sector Sector	02		40	and the second second	30		30
ercent (near	est 5%) of Si	tream Bottom	Covered	No. of Concession, Name	Sur Sur	~	CLASS SHITS	12	Section 1	otal Must = 1009
Bedrock (soli	d slab)			ø		ø		ø		Ø
Boulder (261	mm - 4,1 m	1)		2		D	(<u>1997</u>	ø	-	Ø
Rubble / Cob	ble (65 - 26	0 mm)		60		70		70		60
Gravel (2 - 64	vel (2 - 64 mm)			40			_	30		20
Sand (0.062	d (0.062 - 1.9 mm)			/		/				/
SiH (0.004 - 0	(0.004 - 0.061 mm)			/		/		1		/
Clay				/	-	/		/		/
Detritus				/		/		/		/
)ther - Speci	ry: Voln	ril cm	15	46.9	3	40.2		55.0	2	76.6
ercent (neare	et 10%) of S	Stream Bottom	Covered	p ^{art} ne state		케니니				
lgae (attach	ed & fila.)			Ð		ø		Ø		ø
Aacrophytes				ø		ÿ		ø		Ø
anopy (Sha	ding (circl	e one)		40		40		50		100 90
over for Ad	ult Gamefi	sh: Length (ne	arest 0.01 m) o	f transect within	n 0.15 m ups	tream or down	nstream in 1	water at le	ast 0.20 m in	depth
Uncercut Banks		ng Vegetation 0 m overhang	Woody Debris	Other Debris	Boulde				Macrophytes	Other - Specify
0.9	50.0580.0.2		(D)	Ø		P Macro	ophytes K	at least 0	.20 m deep	
	n: Length	af Cantinuous B	lara Sol (neare	st 0.01 m) withi	n 1 m of stre	am Mof Ero	ded Bank	to the cras	t or within 5	n of stream edge
	Left:	Ø (m)	Rgh.	(m)		La	n	(95)	Right	<u>Ø(%)</u>
iparian Lan	Service Inc.		0%) of Bank wit		am edge, alo	U.A. Wright also Phil		1.41	151000	otal Must = 1005
Cropland	Pasture	Barnyard	Developed	Meadow	Shrube	Woodland	Wetlan	nd Even		Other - Specify:
17	n d	Ø	d	2X	KO.	Weddiarie	Q A		Ø	20 LANS

Transect Data Stream Name	hugt Rive		Waterbody ID ((MMDDYYYY) Transect)				
Distance from Start (m) Stre		C	Bankful Depth (n) (optional) Bankful Widt						
105	9,9 m E		the second s		on that phy (option				
	Deepest			hs of Current Stream Width	<u></u>				
	Point	1/5	2/5	3/5	4/5				
Water Depth (m)	040	0,36	0.59	0.60	0.(9				
Depth of Fines and Water (n		0.36	6159	0,60	0,19				
Embeddedness (nearest 10 ⁴ of Course Gravel and Rubbl		50	30	50	60				
Percent (nearest 5%) of Stream	A REAL PROPERTY AND A REAL	A State	and the second se	Sect	ion Total Must = 100				
Bedrock (solid slab)		Ø	Ø	X	a				
Boulder (281 mm - 4,1 m)		20	20	a	R				
Rubble / Cobble (65 - 280 mm	a	60	60	7.0	0				
Gravel (2 - 64 mm)	,	20	20	70	30				
Sand (0.052 - 1.9 mm)		/	/	00	10				
Silt (0.004 - 0.061 mm)		/	17						
Clay		/	/	/	/				
Delrilus		/	//	/	/				
Other-Specify: 1/0/001	CEW/3	24.4	67.4	41.0	17				
Percent (nearest 10%) of Stream			61.1		6.3				
Algse (attached & fila.)		Ø	B	Ø	Ø				
Macrophyles		D	Ø	Ø	Ø				
Canopy (Shading) (circle one)	80	30	20	60				
Cover for Adult Gamefish: Le	and the second se	i) of transect within (1.15 m upstream or downs	tream in water at least 0.20	m in depth				
Undercut Overhanging Vog	petation Woody	Other	Subme	rged Emergent Macroph	ylea Other - Specify				
Banks at least 0.20 m ov	verhang Debris	Debris	Boulder Macro;	hyles at least 0.20 m de	60				
Banks at least 0.20 m ov	0	Ø	44		Ø				

Riparlan Buffer Width: Longth (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

Left: 10 (m) Rave 10 (m)

						ole Stream 0-228 (R 8/07)		titative H	labitat	Evaluation Page 5 of 5
Transect Da Stream Nan	10	MRI	n		•	Veterbody ID C		Date (MM	DDYYYY 30 /21	Transect No
Distance fro + 180	om Start (m)	Stream Wid			I 🗌 Run	Sankfull Depth (mit (alticor	el) B	anktuli W	dth (m) (optional
			Deepest	1/5	Channe	2/5	hs of Curr	ent Stream V 3/5	Victh)	4/5
Water Dept	h (m)	Č	>,45	0,45	-	0.40		6.19		0,10
Depth of Fli	nes and Wa	ter (m)		0.45		0.40		0,19		0.10
mbeddedr	ness (neare:			20		20		30		110
Carefold (Carefold)	NOV REAL STREET	tream Bottom	TO DESCRIPTION OF THE OWNER.			NO STREET	a the second	NAME AND ADDRESS OF	Section T	otal Must = 100
Bedrock (sol	id slab)			ø		ø		ø		ø
Boulder (261		1)		40		30		40		Ø
Rubble / Col	bble / Cobble (65 - 250 mm)			40		50		40		76
Gravel (2 - 6	avel (2 - 64 mm)					20		20		30
Sand (0.082	nd (0.082 - 1.9 mm)			/		ø	8 .			1
Sill (0.004 - 1	0.081 mm)			/		/		/		/
Clay				/		/		/		/
Detritus				/		/		/		/
Other - Spec	ity: <u>Nol</u>	acity the	15	56.8		59.6		32,5		25.6
Percent (near	est 10%) of 5	Stream Bottom	Covered	公司 (1) (1)						
Algae (atlacl	hed & fila.)			10		Ø	_	ø	_	Ø
Macrophytes	0			ø		Ø		Ø	-	Ø
Canopy (Sh	THE OWNER WATCHING &	and the second se		40		26		20		60
Contraction of the local division of the loc	of the second second	sh: Length (ne			n 0.15 m ups	STATUTE OF TAXABLE	Contraction of the local division of the loc	The second second		
Undercu: Banks		ng Vegetation 0 m overhang	Woody Debris	Other Debris	Bould	Submo er Mapro;		Emergent Ma al least 0.20		Other - Specify
ø	L	NY	Inn	Ø	3M	9	1	þ		Ø
Bank Erosid	on: Langth o	Continuous B	are Scil (neere	st 0.01 m) with	n 1 m of stre	am % of Eroc	lad Bank 1	o the crest or	within 5 m	n of stream edge
	Left:	<u>2_(m)</u>	Right	(m)	55 Julio - 66	Lei	1_0		Right 2	(%)
Riparlan La	nd Use: Per	oant (nearest 1	0%) of Bank wi	thin 5 m of stre	am edge, alc	ing transect			and the second second	otal Must = 100 Other - Specify:
Cropland	Pasture	Barnyard	Developed	Meadow	Shubs	Woodland	Wetar	nd Expose		onter appendy:
0	0	D	Ø	0	50	50	Ø	2	3	

Left:_____(m) Bight:_____(m)

40

LANN

10%

50

	atual Ru			rbody ID Code	08)	DDYYYY) Transect No 20/22 AG
Distance from Start (m) St	ream Width (m) Ha	bitat Type:	100 C 20	ull Depth (m) (optiona")	Sankfull Width (m) (optional
<i>LF3</i>	Deepest			sition (Fifths o	f Current Stream	Width)
	Point	1/5		2/5	3/5	4/5
Water Depth (m)	0.55	0.51	C	,39	021	0.16
Depth of Fines and Water		0.51	6	239	6.21	0.16
Embeddedness (nearest 1 of Course Gravel and Rub		40		40	50	50
Percent (nearest 5%) of Strea	Contraction of the local division of the loc			And Street		Section Total Must = 100
Bedrock (solid slab)		ø		ø	ø	ø
Boulder (281 mm - 4,1 m)		40	2	-6	ø	ø
ibble / Cobble (65 - 260 mm)		40	6	0	80	70
Gravel (2 - 64 mm)			2	0	20	.30
Sand (0.062 - 1.9 mm)		/	/	/	/	1
Silt (0.004 - 0.061 mm)		/	/	~	/	/
Clay		/	/	/	/	/
Detritus		1	/	0	/	/
Other - Specify: Value	the Chy's	27.3	4	1.3	38.5	25.9
Percent (nearest 10%) of Stre	am Bottom Covered		Francis Date		- 13 - 13 - 10 (M)	
Algae (attached & fila.)		30	\$	8	S	Ø
Macrophytes		Ø	é	3	D	ø
Canopy Shading (circle o	ne)	20	20	2	50	80
Cover for Adult Gamefish:	Length (nearest 0.01	m) of transect within	0.15 m upstream	n or downstrea	im in water at leas	t 0.20 m in depth
Undercut Overhanging V Banks at least 0.20 m			Boulder	Submerge Macrophyte		
ex 1	A () IS	Ø	3m	()	A CLASSIC.2	- Ø

Riparian Buffer Width: Longth (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

5 Right ______ (m) Left. _(m)

decending

30

Transect Da Stream Nam	*	al River				Watert	ody ID C	ode	Date (M	IMDDYYYY) 70 Juce 2	Transect No
		Stream Wid	th (m) Habitat	ГТуре:		Bankfu	li Depth (r	n) (eption			lth (m) (optional
t270		13.0		iffle 🗌 Poel							
		1	Deepest		Chan		****	is of Cun	rent Stream 3/5	n Width)	4/5
			Point 3.36	0.34		0.		-	0.36		5.25
Vater Depth			1.56		-		~	-			
Depth of Fin Embeddedn				0.34		0,.	<u>s</u>	0	>.30	0	1.25
		ubble/Cobb	le	40	_	3	0		40		40
ercent (nean	est 5%) of St	ream Bottom	Covered							Section To	tal Must = 100'
Bedrock (soli	id slab)			ø		ß	f		ø	1	ø
Boulder (261	mm - 4.1 m	0		XII	D	10	}		10		ø
Rubble / Cob	ble (65 - 26	0 mm)	1	70		70		70		11	70
Gravel (2 - 6	avel (2 - 64 mm)			20		20		20		3	0
Sand (0.062	nd (0.062 - 1.9 mm)			/		/			/		/
	t (0.004 - 0.061 mm)			/		/			/		/
Clay				/		1			/		/
Delritus				1		/			/		/
Other - Spec	in Vol	t. CA	1/5	42.5		49	7		62.1	2	0.3
CONTRACTOR OF THE OWNER, OR OTHER	ny	itream Bottom			94		14482	CHIER C		A STATE	
Algae (attach	ed & file)			82	5	0	-		1~		Ø
Macrophyles				Ø		ø			0		ø
/	1			10		DA		-	10		10
Canopy (Sha Cover for Ad	a constant of the	Statistics to be and	arest 0.01 m) o	State Street and	n 0.15 m u	netreem	or downs	dream in	and the second	est 0.20 m in a	tech
Undercut	and a second second	ng Vegetation	Woody	Other			Subme	- Barris	Sector Streams	and a state of the second second	Other - Specify:
Banks		0 m overhang	Dobris	Debris	Baul	der	Macrop			20 m deep	
Ø		0			01	2.	Ø	n:		3	
ank Erosio	n: Length (Continuous E	Sare Soll (nears:	st 0.01 m) with	in 1 m of sl	ream "	% of Ered	ed Bank	to the cres	t or within 5 m	of stream edge
	Left:	(m)	Rig≈t:	<u>_ (m)</u>	Contraction (18		Left	_0	(%)	Right:	5(8)
Riparlan Lar	nd Use: Per	cent (nearest 1	0%) of Bank wit	thin 5 m of stre	am edge, a	long tra	nsect	Service		and the second	tal Must = 1003
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	W	codland	Wetla	ind Exp	csed Rock	Other - Specify:
0	0	0	10	Ð	50		10	Or			40 L

...

V	heat Rive	-		Vaterbody ID Cod	08/104		
Distance from Start (m) Stream	1 m			lankfull Depth (m)	(optional) Bani	kfull Width (m) (optional)	
	Deepest Point	1/5	Channe	d Position (Fifthe 2/5	of Current Stream Wid 3/5	0h) 4/5	
Water Depth (m)	6.70	7) 24	1	0.49	315	0.63	
Depth of Fines and Water (m)	0110	0.34		6.49	0.61	0.63	
Embeddedness (nearest 10%)	labble	50	5	-10	40	40	
of Course Gravel and Rubble/C Percent (nearest 5%) of Stream Bot	and the second se	50	New Oct	50	Sec	tion Total Must = 100%	
Bedrock (solid slab)		ø		Ø	ø	ø	
Boulder (261 mm - 4,1 m)		Ø		ø	8	Ø	
Rubble / Cobble (65 - 260 mm)		50		70	76	70	
Gravel (2 - 64 mm)		40		3020	30	30	
Sand (0.052 - 1.9 mm)		10		/10	/	/	
Silt (0.004 - 0.081 mm)		/		/	/	/	
Clay		/		/	1	/	
Detritus		/		/	/	/	
Other - Specify: 1/2 Ur, ta	con/s	2014	4	27.1	2412	24.6	
Percent (nearest 10%) of Stream Bo	ntom Covered		n de s		Addinisation (sa)		
Algae (attached & fila.)		0		0	Ø	ø	
Macrophytes		0		0	ø	9	
Canopy / Shading (circle one)		10		10	20	50	
Cover for Adult Gamefish: Leng	th (nearest 0.01 m) (of transect withi	n 0.15 m ups	tream or downstn			
Undercut Overhanging Vegeta Banks at least 0.20 m over		Other Debris	Boulds	ar Macrophy	od Emergent Mecro ytes st least 0.20 m	phytes Other - Specify: deep	
1,0	0.2		0,5	5			
Bank Erosion; Length of Continu	ous Bare Soil (near	est 0.01 m) with	in 1 m of stre	am % of Erodec	Bank to the crest or wi	thin 5 m of stream edge	

Riparian Buffer Width: Length (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

Left: 410 (m) Right 410 (m)

itream Nam	20			River	M	eterbody ID C		(MMDDYYYY /30/2022) Transect No
Distance fro	om Start (m	Stream Widt		t Type: iffle 🔲 Pool		ankfull Depth (m) (optional)	Bankfull Wi	dth (m) (optional
			Deepest	×	Channe	Position (Fift)	ns of Gurrent Stre	tam Width)	
			Point	1/5		2/5	3/5		4/5
Vater Dept	h (m)	1	2.37	0.39		0.23	033	5	0,27
Depth of Fir	nes and Wa	ter (m)		0.39	19	0.23	0.35	-	0.27
	ness (neare Gravel and f	st 10%) Rubble/Cobbl	Ð	50		40	40)	50
ercent (near	rest 5%) of S	tream Bottom (Covered		in in the			Section T	otal Must = 1009
Bedrock (sol	lid slab)			X		ø	0		ø
Boulder (251	l mm - 4.1 n	n)		ø		ø	ø		ø
Rubble / Col	oble (65 - 26	0 mm)		60		70	70	>	80
Gravel (2 - 6	4 mm)			30		30	30		20
Band (0.062	- 1.9 mm)			10		/	/		/
Silt (0.004 - 1	0.061 mm)			0		/	/		/
Clay				/		/	/		/
Detritus				/		/	/		/
Other - Spec	iny: Dela	nte c	ms	15,6		11.9	55%	5	41.1
		Stream Bottom	Covered					加出学习到100	PANG 10 11
Algae (attaci	hed & fila.)			10		5	Ø		Ø
dacrophytes				Ø		ø	. 0		Ø
Canopy / Sh	ading (circi	le one)		40		20	10		20
Cover for Ac	dult Gamefi	sh: Length (ne	arest 0.01 m) o	f transect withi	n 0.15 m upsl	ream or downs	stream in water al	least 0.20 m in	depth
Undercut Banks		ng Vegetation 10 m overhang	Woody Debris	Other Debris	Boulde	r Macrop		nt Macrophyles a 9.20 m deep	Other - Specify
ð	4,0	0	0.2		0,3	A	8	ø	
	Left:	of Continuous B Ø(m) cont (neerest 1	Right	(m)		Lef	2) Right:	n of stream edge <u> </u>
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland	Welland E	xposed Rock	Other - Specify:
					in	TERAD			

Wadable Stream Quantitative Habitat Evaluation Form 3630 228 (R 8/07) Page 5 of 5

Left + 10 (m) Hart + 10 (m)

Transect Data Stream Name W	9 Mont	heard &	-iver	W	aterbody ID C	Cade	Date (MMDD)	(YYY) Transect No.	
Distance from Start (m) Stream Wid /5,2		8 Y 1 Y 1 Y 1 Y 1 Y 1 Y 1 Y 1 Y 1 Y 1 Y	Ba Run	nkfull Depth (m) (option			
		Despest			Position (Fill)	hs of Cur	rent Stream Width	4	
		Point	1/5	0.80	2/5	-	3/5	4/5	
Vater Depth (m)		2.82	00		0,80	0.0	QESIM	0.21	
)epth of Fines and V	Vater (m)		0.50	0	080	06	655 EM	0.21	
Embeddedness (nea of Course Gravel and		le	20		40		60	80	
ercent (nearest 5%) of	No. of Concession, Name	Contraction of the local division of the loc		- addition	the se		Sect	ion Total Must = 100%	
Sedrock (solid slab)			ø		K	1	ø	ø	
3oulder (261 mm - 4.1	m)		60	Walter .	\$ 20		ø	ø	
Rubble / Cobble (85 -	280 mm)		20		70	S. Pr	742.60	4501	
Gravel (2 - 64 mm)			10		10		30	40	
Sand (0.062 - 1.9 mm)			10		/	Car)	90,10	20	
Silt (0.004 - 0.061 mm)		/		/		/	20	
Clay			/		/		/	/	
Detritus			/	/	/		/	10	
)ther - Specify: <u>Ve</u>	lorde cm	15	233	2	3.0		18.4	7.0	
ercent (nearest 10%) o		Covered	Maked in the			Auss		RDUS HERBER	
ligae (atlached & fila.			Ø		ø		ø	ø	
facrophytes	in a starter		Ø		9		0	ø	
anopy (Shading)(ci	rcle ane)		40		20		20	40	
over for Adult Game	Charles and the second	anest 0.01 m)	of transect within	0.15 m upstr	eam or downs	stream in	water at least 0.20) m in depth	
	ging Vegetation).20 m overhang	Woody Debris	Other Dabria	Boulder	Subme		Emergent Macropi st least 0.20 m d		
0,5	2.0	1.0		3.0					
Sank Erosion: Lengt Left, Siparian Land Use: F Cropland Pasture	(m) Percent (noarest 1	Right	est 0.01 m) within	()	Left		<u>(*)</u> Right Secti	ion Total Must = 100% Cther - Specify:	

Lot's of Bernar Activity

Stream Nam	D.G	Mart	eal R	i.t.			Wata	rbody ID C	ode			DDYYY	Y) Transect No
Distance fro		Stream W	dth (m)	Habita	t Type:	_	Banki	tul Depth (r	n) (optic				Addn (m) (optional
		19	1.3	R R	utte Pool								
			Deepest Point		1/5	Chan		sition (Fifth 2/5	IS DE CU		Stream 3/5	Widen)	4/5
Water Depth	1 (m)		032	3	0,19		Ó	112		0	05	-	0.30
Depth of Fin	es and Wa	ter (m)			0.19		0	12		3,	05		0.30
Embeddedn of Course G			ble		20			20		7	0		60
Percent (near	In the second second	Contribution of the local division of the lo	Statut Land	Ú.					il and			Section	Fotal Must = 1001
Bedrock (soli	id slab)				ø		4	ð		G	7		ø
Boulder (261	mm - 4.1 n	n)			ø		×	8		Q	3		,93°
Rubble / Cob	ole (65 - 26	10 mm)			90		6	0		30)		40
Gravel (2 - 6	4 mm)				10		3	0		50	0		40
Sand (0.062	- 1.9 mm)				/		1 (2		10)		20
Sill (0.004 - 0					/		/	/		10)		/
Clay					/		/			/	-		/
Detritus					/		/			/	1		/
Diher - Spec	ily: Del	rate c	mls		50.0		51	1,6		01	5		63.9
Percent (near	est 10%) of \$	Stream Botto	m Covere	d		Walio di				ця			
Algae (attach	ned & fila.)				Ø		X	3		9	8		ø
Macrophyles					ø		e	z		R	5		50
Canopy/Sha	ading)(circl	le one)			90	÷	5	0		3	O		50
Cover for Ad	iult Gamefi	sh: Length (nearest 0.1)1 m) c	of transact within	0.15 m u	pstrea	m or downs	tream in	wate	er at lea	st 0.20 m i	n depth
Undercut Banks		ng Vegetation 10 m overnan			Other Debris	Boul	der	Subme Macrop				acrophytes 0 m deep	Olher - Specify:
1,0	0	5	1.1		1.4	2	5	3.0)		Ø	5	
Bank Erosio	n: Length	of Continuous	Bare Soll	(neere	st 0,01 m) within	1 m of st	raam	% of Erod	ad Bank	to th	e crest	or within 5	m of stream odge
	Leit:	<u>Ø_(m)</u>	Right	R	<u>5(m)</u>			Left	2	0	(%)	Right	<u>@(%)</u>
liparian Lan	nd Use: Per	cent (nearest	10%) of B	ank wi	thin 5 m of strea	m ədgə, s	long t	ansect				Section 1	fotal Must = 100
Cropland	Pasture	Barnyard	Devel	oped	Meadow	Shruba	V	Voodland	Wetk	and	Екрое	ed Rock	Other - Specify:
						50		50					

Wadable Stream Quantitative Habitat Evaluation Form 3800-228 (R 6/07) Page 5 of 5

Transect Da Stream Nan	N.D.	Montre	14 M	iver	incar gi Van	Waterbody ID (Date (MMDD OS/30/	
Distance fro	om Start (m	Stream Wid	th (m) Ha		ioi 🛛 Run	Bankfull Depth	(m) (optio	nsi) Bari	dull Width (m) (optional
		-	Deepest			nel Position (Fif	ths of Cu	rent Stream Wid	n)
	States -		Point	1/5		2/5	-	3/5	4/5
Water Dept	h (m)	Ć	.60	0.36		0.48		0.60	0.42
Contraction of the local division of the loc	nes and Wa	the second s		0.36		0.48		0.60	0.42
	ness (neare Gravel and F	st 10%) Rubble/Cobb	le	50		60		40	50
² ercent (near	rest 5%) of S	tream Bottom	Covered	i je stanov ga	A your		11169	Sec	tion Total Must = 100
Bedrock (ao	lid sisb)			ø		ø		ø	ø
Boulder (281	1 mm - 4,1 m	n)		Ø		ø	2	01 20	ø
Rubble / Col	bble (65 - 28	50 mm)		50		80		60	EO
Gravel (2 - 6	94 mm)			30		20		10	30
Sand (0.062	- 1.9 mm)			20		/		10	10
Silt (0.004 -				/		/		/	/
Clay				/		/		/	/
Detritus				1		/		10	/
	ity: Dela	rate CM	15	19.8		27.4		49.2	37.8
		Stream Bottom	Covered	Standard	Information .			1212	
Algae (atlaci	hed & fila.)			ø		a		Ø	ø
Macrophytes				ø		R		ar	ø
1		le one\		20		50		20	40
Contraction of the	Contraction of the	No. of Concession, name	arest 0.01	COLUMN TWO IS NOT	hin 0.15 m u	pstream or down	stream in	water at least 0.2	10 m in depth
Undercut Banks		ng Vegetation. 0 m overhang	Woody Debris		Boul		ergec phytes	Emergent Macrop at least 0.20 m	ohytes Other - Specify:
Ø	51		-		0,				
Riparian La	Left: Left: nd Use: Per	of Continuous E	Fight: _ 0%) of Ban	carest 0.01 m) wi	ream edge, a	Le long transect	n: <u>@</u>	(%) Rol Sec	tion Total Must = 1009 Other - Specify:
Cropland	Pasture	Bernyard	Develop	ad Meadow	Shrubs 40	Woodland 60	Wette	Ind Exposed R	lock

tehenen enne menn halle henne samt a strander hand som and annast a strandered

 $Left: \frac{1}{2} \frac{1}{2} (m) \qquad \text{Blant:} \frac{1}{2} \frac{1}{2} O_{-}(m)$

Contraction of Street, or other	Non-	, Mean	Ley		Form 3800	-228 (R 6/07) Touth R	i.			Page 5 of 5 1 Jec 15
Transect Da Stream Nan ()e	10	uch Man	treal Riv	rez.	W	aterbody ID C	iode		0/2022	Transect No
Distance fro	om Start (m)	Stream Wid			Ba Run	ankfull Depth (i	m) (optiona	0 8	Bankfull Width (m) (option	
			Deepest		Channel	Position (Fifth	ns of Curre		Width)	
			Point	1/5	_	2/5	-	3/5	-	4/5
Vater Dept	h (m)	0	,60	0.5/		0.58		2,43	-	0.31
	nes and Wa			0.51	C	5.58	0	1.43	0	15:0
	iess (neare: Gravel and F	st 10%) tubble/Cobb	e	60		40	1	36		30
ercent (near	rest 5%) of SI	ream Bottom	Covered	Service -	SHE IN			Waaning	Section To	tal Must = 100
edrock (sol	lid slab)			ø		ø	L	9		Ø
Soulder (281	l mm - 4.1 n	9		30		20	2	5		10
ubble / Col	oble (65 - 26	0 mm)		40		70	8	0	7	20
Gravel (2 - 6	i4 mm)			20		10	10	2		0
and (0.062	- 1.9 mm)			10		-	10	2	1	0
ilt (0.004 -)	0.061 mm)			~		/	/			-
lay				-			/		/	~
etritus				/	1.1	/	1			
Other - Spec	sty: <u>Volan</u>	the enels		26	3	3.0	6	3.6	2	79
And the second se		itream Bottom	Covered	80 (D. 0) (S.	de Linus					
lgae (attaci	hed & fils.)			ø		تعر		Ø		ø
Aacrophytes	1			ø		ø		ø		Ø
	ading (circl	e one)		40		10		20		50
A COLUMN TWO IS NOT	A CONTRACTOR OF A	sh: Length (ne	arest 0.01 m) o	of transect within	n ().15 m upst	ream or downs	stream in w	ater at leas	t 0.20 m in a	lapöh
Undercut Banks		ng Vegetation 0 m overhang	Woody Debris	Other Debris	Boulder	r Macrop		mergent Ma at Jeast 0.21	and when it seems 1	Other - Specif
ø	3.0	and the second	/	/	2.00		/	/		
	Left:	of Continuous E (m) cent (nearest 1	Right:	<u>D_(m)</u>		Let	1	_(%)	Row	of stream edg <u>Ø</u> (%) tal Must = 100
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland	Wetland	t Expose	ed Rock	Other - Specify
1	1	1	1	/	15	90	/		/	

Lett: <u>+10</u> (m) Right <u>+10</u> (m)

(m) Habits spest sint 46	iffla 🗌 Pool 🕅	Banktull Depth (m) Run Channel Position (FiRhs 2/5 0+38 0+38 30	~	iniciali Width (m) (optiona (ddn) 4/5 0 - 35 0 - 35
apest oint 46	1/5 0134 0134 20	Channel Position (Fifthe 2/5 0+38 0+38	3/5 0 (34 0 (34	4/5 0 · 35
oint 46	0134 0134 20	0,38	6 34 6 34	0.35
	0,34 20	0.38	6.34	
vered	20			0.35
wered		30	30	
wered	estimate and	al history and the		50
	Ø		5	ection Total Must = 100
	P	Ø	ø	ø
	10	ø	2.0	ø
	60	80	60	70
	20	20	10	10
	10	1	10	20
	/	/	/	/
	1	/	1	/
	/	1	/	/
	20.4	56.2	24,4	24.2
overed		LIST ASUCO	NAME OF TAXABLE	
	ø	ø	ø	D
	ø	ø	ø	ø
	40	40	20	20
est 0.01 m) o	of transect within 0.16	5 m upstream or downstr	eam in water at least (0.20 m in depth
Woody Debris	Other Debris			
0,1		LOM		
		11		
	est 0.01 m) o Woody Debris	wered	Worked	Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø

Riparian Buffer Width: Length (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

Laft_<u>+\()</u> (m) Ruty <u>+\()</u> (m)

Oriem, Turner, Transect Data Stream Name		47		N N	South Vaterbody ID C	1 15 34 8		12cts YY) Transact No.
UB Monteur Distance from Start (m) Str		(m) Habitat	Type:		Bankful Depth (m) (opt		07/30/20	22 LSS Width (m) (optional)
stance from start (m) sta	15.0		me Pool		annar e april (n) (opourior)		renne (n) (apinaran)
		eepest		Channe			Stream Width)	
		Point	1/6		2/5	-	3/5	4/5
Water Depth (m)	0,	37	0.31		0.35	-	1.251	0-20-0,2
Depth of Fines and Water (Embeddedness (nearest 10			0.31	(7,25		,24	
of Course Gravel and Rub		8	30		50		30	30
Percent (nearest 5%) of Stream	n Boltom C	overed						n Total Must = 100%
Bedrock (solid slab)			ø		ø		ø	ø
3oulder (261 mm - 4.1 m)			ø		ø	1	0	Ø
Rubble / Cobble (65 - 260 m	m)		80		80	di	0	50
Gravel (2 - 64 mm)			10		10	10	7	30
Sand (0.082 - 1.9 mm)			10		10	10	2	20
Silt (0.004 - 0.051 mm)			/		/		/	1
Clay			/	0.0	/	/	/	/
Detritus			/		-		-	/
Other - Specify: <u>Velacity</u>	CAL	1.	61.8	6	50.1	5	5.5	17.5
Percent (nearest 10%) of Strea	-		0110		COLUMN STATE			No.
			ø		S		3	ø
Algoe (atlached & fila.)			Ø		ß		1	ø
Macrophytes	Start		70		50	3	202 	40
Canopy / Shading (circle on Cover for Adult Gamefish:	Column and the owner	mot 0.01 m) m	Constant and the second second	0.15 m 100	and the survey have	Contraction of the	Concession of the local division of the	Station Grade Automation
Undercut Overhanging W Banks at least 0.20 m	egetation	Woody Debris	Olher Dobris	Boulce	Subme	nged Em	ergent Macrophys least 0.20 m dee	tes Other - Specify:
04m 10								
Bank Erosion: Length of Co	intinuous Ba	re Soil (nearer	st 0.01 m) with	n 1 m of stre	am % of Erec	ed Bank to th	re crest or within	5 m of stream edge
Left:	(m)	iog-t	ð(m)		Left	ø	. (%) - Right: _	Ø(%)
Riparian Land Use: Percent	(nearest 10	%) of Bank wit	hin 6 m of stre	am odge, alo	ng transect		Section	n Total Must = 1005
Cropland Pasture B	amyard	Developed	Meadow	Shruba	Woodland	Wetland	Exposed Rock	Other - Specify:
			-	10	90	-	-	1

					Form 38	ble Stream 00-228 (R 6/07	")		Lawrent L	Page 5 of 5	
Transect Da		and providence	a internet		Sul Report	Section 4					
Stream Nan	BM	mtres	J Rive	-		Waterbody ID (Code		Date (MMDDYYYY) Transect No.		
Distance fro	om Start (n	n) Stream Wi	dth (m) Habit	at Type: RiMe Po:	a 🗌 Bun	Bankfull Depth	(m) (option	-	Bankfull Width (m) (optional)		
			Deepest		Chan	nel Position (Fift	this of Curr		Wicth)		
			Point	0.42		032	-	3/5		4/5	
Water Dept			0.42	***		Sector Sector	-	0.22		0.05	
Depth of Fir Embeddedr				0.42		0.32	1	5.22		0.05 (0.06	
		Rubble/Cobl	ble	40		30	1	40		80	
Percent (near	rest 5%) of S	itream Bottom	Covered			議和這個回答			Section Tot	tal Must = 100%	
Bedrock (sol	id slab)			ø		ø		ø		ø	
Boulder (281	mm - 4.1 r	m}		ø		25		ß		ø	
Rubble / Cob	oble (65 - 21	50 mm)		80		70		70	1	20	
Gravel (2 - 6	4 mm)			20		2.0		2.0	1	ð	
Sand (0.062	and (0.062 - 1.9 mm)			/		10		LA	6	0	
Silt (0.004 - ((0.004 - 0.081 mm)			/		/		10		0	
Clay				/		1		/		/	
Defritus		da da		1		1		/	/	~	
)ther - Spec	in: Velos	al, CN	15	58.9		45.8	1	14.7	6	.4	
ercent (nean	est 10%) of :	Stream Bottor	n Covered		4 V. 20	SULLERA				CONVENSIO	
lgae (attach	ied & fila.)			ø		ø		Ø	5	Ø	
lacrophytes				ø		Ø		ø	1	ø	
aropy (Sha		le one'		60		20		70		c'n	
CONTRACTOR OF LOW	and the local division of the local division	No. of Concession, name	earest 0.01 m) o	of transact within	n 0.15 m up	stream or downs	stream in v		0.20 m in dr	on in the	
Undercut Banks	Overhangi	ng Vegetation 10 m overhang	Woody	Other Debris	Bould	Subme	erged E	imergent Ma at least 0.20	crophytes C	7ther - Specify:	
0.3	2	MO.			01	3					
	Left:	<u> (m</u>)	Bare Soli (neard Righ: 10%) of Bank wi	<u>Ø(m)</u>		Left	~	(%)	Rişht. 🖉	of stream edge (%) al Must = 100%	
Croaland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland			Ot	ther - Specify:	
C-Opiding	Pasture	hariyard	creveroped	MISSIGOW	anfues	woodlang	Wetlan	d Expose	/0 Rock		

Riparian Buffer Width: Longth (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

Left: $\frac{1}{\sqrt{2}}$ (m) Right: $\frac{1}{\sqrt{2}}$ (m)

Turner	BOIEN	Med	A. Le.		South	-228 (R 6/07)			Page 5 of 5
ransect Dat			uney	1.000	JOINTA	NDAC	to the second	Second and A	CALCULATION OF
itream Name	UB A	rontres	1 Run		24	starbody IC C		ate (MMDDY)	121 BS
istance from	n Start (m) S	Stream Wid	S Ri	t Type: Me DPool		ankfull Depth (r	Bankfu	I Width (m) (options	
			Deepest		Channel		and a statistical data and other	Stream Width)	
	/368	.0	Point	1/5	_	2/5	-	3/5	4/5
Vater Depth	(m)	0.6 0	0,620	0.20		0.56	-	.63	0.34
epth of Fine	es and Wate	r (m)		0.20		0156	0	162	0:39
Embeddedne of Course Gr			le	20		30		30	40
ercent (neare	CONTRACTOR OF THE OWNER.	CONTRACTOR OF THE OWNER.	Contract of the local division of the local	ANALASIA.	14 - 20 1 1 2 1	the state of the		Sectio	on Total Must = 100
Bedrock (solid	i slab)			ø		ø		Ø	ø
Boulder (261	mm - 4.1 m)			ø		Ø	3	0	20
Rubble / Cobi	ole (65 - 260	mm)		70		80	G	6	60
Gravel (2 - 64	mm)			20		20		0	20
Sand (0.062 -	1.9 mm)			10		/	/	/	/
silt (0.004 - 0	.061 mm)			/		/	/	-	/
Clay				/		/	1	-	/
Detrilus				/		/	/	/	/
Other - Specif	y: Veloc	Ay CM	15	17.1	4	41.0	1	8.1	41,0
ercent (neare	st 10%) of Str	ream Botton	• Covered						
Ngae (atlachi	ed & fila.)			×	1	0	_	ø	P
acrophytes				ø		Y	-	ø	ø
Carropy/Sha	ding)(circle	ane)		80	6	,0	4	0	60
over for Ad	uit Gamefisi	h: Length (n	earest 0.01 m) o	f fransect within	n 0.15 m upst	tream or downs	dream in wat	er at least 0.20	m In depth
Undercut Banks	Overhanging at least 0.20		Woody Depris	Other Dobris	Baulda	r Submo		ergent Macrophy Jaast 0.20 m de	
Ø	1.0				6.0				
ank Erosion	n: Length of	Continuous I	l Bare Soil (neare	st 0.01 m) with	400100	am % of Ercd	ed Bank to th	e crest or withi	n 5 m of stream edg
	Left:	<u>Ø (m)</u>	Right	<u>7 (n)</u>		Lei	ø	(%) Right:	<u>Ø</u> (%)
tiparian Lan	26.0 0EBT	100	10%) of Bank wit	Contract Contract	am edge, alor	-2.5 million (1958)			on Total Must = 10
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland	Wetland	Exposed Roo	Other - Specify
Subbaild	O	O	O	O	20	80	Ø	B	

rensect Data Stream Name <i>W., B.,</i> M.M.	teed River				Waterbody ID	Code		ADDYYYY) Transect No
Distance from Start (at Type: Rifle D Pool		Bankfull Depth	(m) (opti	onal)	Bankfull W	ista (m) (optional
	Deep	-	unie 🛄 Addi		el Position (Fif	ths of Cu	rrent Stream	Width)	
	Poi		1/5		2/5		3/5		4/5
Vater Depth (m)	0	38	0,25		0.35		0.29		0,32
Pepth of Fines and W	/ater (m)		0.35		0.35		0,29		0.32
Imbeddedness (near of Course Gravel and			50		20		30		40
ercent (nearest 5%) of	the service states and the service states and	red		100	Salah dar		Sec.	Section T	otal Must = 100
Bedrock (solid slab)			Ø		ø		ø		ø
Soulder (261 mm - 4.1	m)		ø		30		30		10
Rubble / Cobble (65 -)	260 mm)		70		40		60		60
Gravel (2 - 64 mm)	4		20		2.0		10		20
iand (0.062 - 1.9 mm)			10		/		/		10
iilt (0.004 - 0.061 mm))		/		/		1		/
Clay			1		1		1		/
Petritus			/	_	.10		1		/
)ther - Specify: <u>/</u> /	lonty cm/s		24.5		29.1		37.6		40.9
ercent (nearest 10%) o	f Stream Bottom Cov	ered	(Cardelland)					and the second	
lgae (attached & fila.)			ø		ø		P		P
lacrophytes			Ø		Ø		P		Ø
anopy / \$hading (cir	rcle one)		20		Ø		10		30
over for Adult Game	fish: Length (nearest	0.01 m)	of transect within	0,15 m up	stream or down	istream ir			
		Voody Debris	Other Debris	Bould		erged phytes	Emergent M at least 0.2	acrophytes '0 m deen	Other - Specify
	ÓM	1,5		3.		ø	J.	8	
	Ó (M h of Continuous Bare 8		ant 5.01 ml within	15	· ·		to the creat	X X	n of stream edge

Riparian Buffer Width: Length (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

Left $\frac{1}{10}$ (m) Rg/c $\frac{1}{10}$ (m)

Deat Browch N			Wate	body ID Code	Date (MMDDYYYY) Transe		
istance from Start (m) Strea		ibitat Type:	S-14-17	ull Depth (m) (optio	nsi) Bani	kfull Width (m) (optiona	
	Deepest			stion (Fifths of Cur	rrant Stream Wid	th)	
	Point	1/5		95	3/5	4/5	
/ater Depth (m)	0.53	0.51	0,		0.50	0.38	
epth of Fines and Water (m)		0.51	0,4	4	0.50	0.38	
mbeddedness (nearest 10% f Course Gravel and Rubble		20	40	2	40	30	
ercent (nearest 5%) of Stream E	Bottom Covered	Rev Anna Sta		alide constants	Sec	tion Total Must = 100	
edrock (solid slab)		Ø	Ø		ø	Ø	
oulder (261 mm - 4.1 m)		ø	10		10	ø	
ubele-/ Cobble (65 - 250 mm)		80	6	0	60	80	
ravel (2 - 64 mm)		10	2	0	20	10	
and (0.062 - 1.9 mm)		10	10	2	10	10	
ilt (0.004 - 0.061 mm)	/	/		/	/		
lay		/	~	~	/	/	
etritus		/	/		/	/	
	cmls	274	24	1.2	20.7	18.5	
ercent (nearest 10%) of Stream	Bottom Covered	England Th	C. C. Starte	, Million (11)	A HILL REAL		
lgae (attached & fila.)		Ø	2		ß	ø	
acrophytes		Ø	ø		705	Ø	
anopy / Shading (circle one)		30	11	0	20	40	
over for Adult Gamefish: Le		STATISTICS.	0.15 m upstream	n or downstream in	Contractor of the local division of the loca	20 m in depth	
Undercut Overhanging Veg				Submerged	Emergent Macro		
Banks st least 0.20 m ov	erhang Debris	a Debris	Boulder	Macrophytes	at least 0.20 m	6660	
122	/	/	1/2m	K of Franked Bank	in the court of a	thin 6 m of stream edge	

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Turnu Anem M	Canley				-228 (R 6/07) En th				Page 5/of 5
Transect Data Stream Name	ch Montre	al Rü	MA.		ataroody ID C	lode	Date (MMDDYYYY) Transect No 08/30/2022 33		
West Brown Distance from Start (m)	Stream Width (m		Type: le Pool	lankfull Depth (m) (option					
	Deep		1/5	Channel	Position (F#8 2/5	hs of Cun	rent Stream Wi 3/5	idth)	4/5
Water Depth (m)	0.4		0,34		0.40		0.30		0.33
Depth of Fines and Wate	er (m)		0.34		0,40		0.30		0.33
Embeddedness (nearest of Course Gravel and Ru	10%)		50		80			-	30
ercent (nearest 5%) of Stre	CONTRACTOR OF STREET, STRE	ed	3864 L			500	No. of Concession, Name	ection Tol	al Must = 100
Bedrock (solid slab)			ø		ø		ø		ø
Boulder (261 mm - 4.1 m)	h		10		Ø		Ø		20
Rubble / Cobble (65 - 260	mm)		60	30			70		70
Gravel (2 - 64 mm)			20		60		20		0
Sand (0.052 - 1.9 mm)		10	10			10		/	
silt (0.004 - 0.061 mm)		1	/			/		/	
Nay			/		/		/		/
Detritus					~		/		/
Other - Specify: <u>Velse</u>	to emis	-	22.7	52.8			15.8	1	29.7
ercent (nearest 10%) of St	ream Bottom Cove	red	inter iso						- Address
Vgae (atlached & fila,)			Ď		ø		Ø		Ø
facrophyles			ø	100	Ø		ø		Ø
Sanopy / Shading (circle	one)		20		ø		10		30
over for Adult Gamefisi	h: Length (nearest	0.01 m) of 1	transect within	0.15 m upst	ream or downs	stream in	water at least 0	.20 m in d	epth
Undercut Overhanging Banks at least 0.20		/oody /ebris	Other Debris	Boulde	Subme Macrop		Emergent Maer at least 0.20 n		Other - Specify:
- 4.0		.5		1.5				-	
ank Erosion: Length of		and the second sec	0.01 (m) within	n 1 m of stree	m % of Erod	ed Bank	to the creat or v	within 5 m	of stream edge
Left:	<u>// (m)</u> 86	shi:	·(m)		Left	2	(%) R	shi	×(%)
Iparlan Land Use: Perce	ant (nearest 10%) o	f Bank with	in 5 m of stree	ım edge, albr	g fransøct		Se	ction Tot	al Must = 100%
	Barnyard Dev	relaped	Meadow	Shrubs	Woodland	Wella		Rock	thar - Specify:

Riparian Buffer Width: Length (nearest 1.0 m) of Undisturbed Land Uses along transact, within 10 m of stream

1

45

Lett:____(m) Right 4 (0 (m)

decending

Transect Da	and the second lines	n Me Qu	ney		1	20	ath 1	CORD.	IRC
Stream Nan	10	WCH MO.	treal F	ND-RA		Vaterbody ID C	Date (MMDDYY		
		Stream Widt	h (m) Habita		Comment of the	iankfull Depth (m) (optional)		Width (m) (opti
		T.	Point	1/5		Postion (Fift) 2/5	ns of Curren	: Stream Width) 3/5	4/5
Water Dept	h (m)	0	0.40	0,30		0.39	C	5.24	0.29
Depth of Fl	nes and Wa	ter (m)		0.30		0,39	0	24	0,29
NAME AND ADDRESS OF	Fravel and F	Rubble/Cobbl	CONTRACTOR OF A	50		10		50	40
BREAK STREET,		tream Bottom C	Covered	Ø	Silvensid	-	the second second	Section	n Total Must =
Bedrock (so				States.		ø	-	Ø Ø	ø
Boulder (26				30		80			40
Rubble / Col		90 mm)			-	10		0	
Gravel (2 - 6	Standard and an			30		10	-	0	20
Sand (0.062				10		1			
Silt (0.004 -	0.061 mm;			1		/	-	/	/
Clay Detritus	-			-		1			-
Other - Spe:	ity Vela	why am	15	39.1		18.9	7	4.7	22.4
and a second		Stream Bottom	Covered					and the second	
Algae (attac	ned & fila.)			R		ø		ø	ø
Macrophytes	5			ø		ø		Ø	ø
Canopy / Sh	ading (circl	le one)		20		ø		10	30
Cover for A	dult Gameli	sh: Lenglin (ne	arest 0.01 m) o	of transect within	n 0.15 m ups	tream or downs	stream in wa	ter at least 0.20 m	i in depth
Undercut Banks		ng Vegetation 0 m overhang	Woody Debris	Other Debris	Bouide	sr Macrop		ergent Macrophyt Lleast 0.20 m dee	
Ð	3,0		ø		OA	- 4	8	ø	-
Bank Erosid	an; Length		are Soil (neare	st 0.01 m) with	in 1 m of stre	am % of Erod	led Bank to I	he crest or within	5 m of stream of
No. of Concession, Name	Left	(m)	Rig%			Left	Ø	_(%) Rigin _	(%)
Riparian La	nd Use: Per	cent (nearest 1)	%) of Bank wi	thin 5 m of stre	am edge, alo	ng transect		Section	n Total Must = Other - Spe
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland	Wetland	Exposed Rock	×
	-	-	-		5	50	-	-	LAWA

	and the second second	antey				-500	ara	ROAD	(1265	
e H Brauc	H Mon	m		Waterbody ID Code		Date (MMDDYYY		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
m Start (m) St						Depth (r	pth (m) (optional)		Bankfull Wid	ith (m) (optional)	
								4/5			
(m)	/							20000	0	0.30	
x 3	/m)	~~~	0.21								
ess (nearest 1	0%)		40				-		2	0.30 50	
CONTRACTOR OF THE	Name and Address of the	COLUMN TWO IS NOT		ASSA	1	and or	-	200	Section To	tal Must = 100%	
d slab)			ø		ø			Ø		ja-	
			ø		Ø Q			ø	ø		
ble (65 - 260 m		60		70			80		60		
mm)		30		30			20		30		
- 1.9 mm)		10		1		/	1 12				
.061 mm)		1		/			/	/			
Clay					/			/		/	
	_	1		/			/		/		
N: Urlood	15	18.1		36.9		1	28.3		29.4		
st 10%) of Stree	am Bottom	Covered	100月1日			à chiến th			Selection of	L.K.S.SANS	
ed & fila.)			ø		ø		ø		ø		
			ø		ø			ø		Ø	
ding (circle of	ne)		10		Ø	F		10		30	
ult Gamefish:	Length (ne	arest 0.01 m) o	f transect withi	in 0.15 m up	stream o	r downs	tream in	waler at k	ast 0.20 m in d	lepth	
		Woody Debris	Other Debris	Bould	ler				mperebulase	Other - Specify:	
3.0	M	/	/	2.6	~	34	/	/	/	/	
Left: d Use: Percent	(m) L (nearest 1	Right: 0%) of Bank wi	2(m) ihin 5 m of stre	in 1 m of sln am edge, al	eam 55 ong trans	Left sect	ø	(%)	Right: Section To	of stream edge (%) tal Must = 100% Diher - Specify:	
Pasture E	samyard	Developed	Meadow				Wetla	nd Exp		newed lat	
	m Start (m) Sti (m) es and Water ess (nearest 1 ravel and Rub est 5%) of Strea d slab) mm - 4.1 m) ble (65 - 260 m 4 mm) - 1.9 mm) .061 mm) fy: () y () of fy: () y () of st 10%) of Strea ed & fila.) fy: () y () of strea d slab) fy: () y () of trea ed & fila.) overhanging V at least 0.20 m 3.0 n; Length of C Left: () d Use: Percent	m Start (m) Stream Wid Provide the start (m) Stream Wide (m) (m) (m) ess and Water (m) ess (nearest 10%) ravel and Rubble/Cobb est 5%) of Stream Bottom (m) d slab) mm - 4.1 m) ble (65 - 260 mm) 4 mm) - 1.9 mm) 0.061 mm) (off mm) (off mm) (off mm) (off stream Bottom (m) (circle one) ult Gamefish: Length (me Overhanging Vegetation at least 0.20 m overhang (circle one) ult Gamefish: Length (me Overhanging Vegetation at least 0.20 m overhang (circle one) ult Gamefish: Length (me (m) (circle one) (circle	m Start (m) Stream Width (m) Habita Peepest Point (m) 0.38 es and Water (m) ess (nearest 10%) ravel and Rubble/Cobble est 5%) of Stream Bottom Covered d slab) mm - 4.1 m) ble (65 - 260 mm) 4 mm) .061 mm .061 mm .061 mm .07 mm .07 mm .07 mm	m Start (m) Stream Width (m) Habitat Type: IT S Rittle Pool Deepest Point 1/5 (m) 0.38 0.21 es and Water (m) 0.21 es and Water (m) 0.21 es and Water (m) 0.21 es and Rubble/Cobble 40 est 5%) of Stream Bottom Covered d slab) 0 mm - 4.1 m) 0 ble (65 - 260 mm) 60 4 mm) 10 -1.9 mm) 10 -1.9 mm) 10 -061 mm) 7 -1.9 mm 7	m Start (m) Stream Width (m) Habitat Type: 17.5 Reffe Pool Run Deepest Chann Polnt 1/5 (m) 0.38 0.21 es and Water (m) 0.21 es and Water (m) 0.21 es (nearest 10%) ravel and Rubble/Cobble 40 est 5%) of Stream Bottom Covered d slab) 0 mm - 4.1 m) 0 ble (65 - 260 mm) 60 - 1.9 mm) 10 .061 mm) 20 .061 mm) 20 .061 mm 20 .061 mm) 20 .061 mm 20 .070 mm 20	m Start (m) Stream Width (m) Habitat Type: Bankfull Point Riffle Pool Run Deepest Channel Positi 2/5 Point 1/5 2/5 i.(m) 0.38 0.21 0.7 es and Water (m) 0.21 0.7 es and Water (m) 0.21 0.7 es and Water (m) 0.21 0.7 ess (nearest 10%) 40 30 ravel and Rubble/Cobble 40 30 est 5%) of Stream Bottom Covered 9 9 d slab) 9 9 mm - 4.1 m) 9 9 ble (65 - 260 mm) 60 70 4 mm) 9 9 -1.9 mm) 10 7 .061 mm) 7 7 .061 mm) 7 7 .061 mm) 7 9 .061 mm) 7 9 .061 mm) 7 9 .061 mm) 7 9 .071 mm 10 9 .081 mm 9 9<	m Start (m) Stream Width (m) Habitat Type: Rifle Bankfull Depth (no. Deepest Point 1/5 Ziff U(m) 0.38 0.21 0.35 es and Water (m) 0.21 0.35 es and Water (m) 0.21 0.35 es and Water (m) 0.21 0.35 es (nearest 10%) ravel and Rubble/Cobble 40 30 est 5%) of Stream Bottom Covered 8 8 d slab) 9 9 mm - 4.1 m) 9 9 ble (65 - 260 mm) 40 30 -1.9 mm) 10 70 4 mm) 10 70 10 mm) 10 70 10 mm) 10 70 10 mm) 10	m Start (m) Stream Width (m) Habitat Type: Bankfull Depth (m) (oplice Image: Deepest Point Channel Position (Fifths of Current Point 1/5 2/5 Image: Deepest Point 1/5 2/5 0.35 Image: Deepest Point 0.38 0.21 0.35 Image: Deepest Point 0.21 0.35 0.35 Image: Deepest Point 0.20 0.35 0.35 Image: Deepest Point 0.30 0.30 0.30 Image: Deepest Point 0.30 0.30 0.30 0.30	m Start (m) Stream Width (m) Habitat Type: Bankfull Depth (m) (optional) Point Rttle Pool Point 1/5 2/5 Point 0/2 0/35 Point 0/2 0/30 Point 0/2 0/2 Point <td>Strart (m) Stream Width (m) Habitat Type: Bankfull Depth (m) (optional) Bankfull Width (W) Deepest Channel Position (Fifths of Current Stream Width) Deepest Channel Position (Fifths of Current Stream Width) Image: Stream Bottom Covered 0.38 0.21 0.35 0.38 es and Water (m) 0.21 0.35 0.38 0.38 es and Water (m) 0.21 0.35 0.38 es and Rubble/Cobble 40 30 30 statt (m) 0 0 0 0 fill 0 0 0 0 statt (m) 0 0 0 0 statt (m) 0</td>	Strart (m) Stream Width (m) Habitat Type: Bankfull Depth (m) (optional) Bankfull Width (W) Deepest Channel Position (Fifths of Current Stream Width) Deepest Channel Position (Fifths of Current Stream Width) Image: Stream Bottom Covered 0.38 0.21 0.35 0.38 es and Water (m) 0.21 0.35 0.38 0.38 es and Water (m) 0.21 0.35 0.38 es and Rubble/Cobble 40 30 30 statt (m) 0 0 0 0 fill 0 0 0 0 statt (m) 0 0 0 0 statt (m) 0	

Riparian Buffer Width: Length (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

__(m) Right ___<u>+ \\D__</u> (m) Left:,

10.00

Transect Da Stream Nan	ita	M Month				Gulk (terbody ID Co	de Date (N	Date (MMDDYYYY) Transect				
Wead Distance fre)Stream Wid		at Type:		ikfull Depth (m	10-2000	Bankfull Widi	th (m) (optiona			
		161	<u>4 D</u> F	Riffle Pool Run Channel Position (Effits of Current Stream Width)								
			Point	1/5	Gnarmel P	2/6	or Current Stream 3/5	n wiain)	4/5			
Water Depti	n (m)		40	0,38	1	9119	0.35		0.17			
Depth of Fir	and and a second se	tor (m)		0.38	0	1.39	0.35	-	5.37			
Embeddedr	ness (neare	st 10%)		1.0		30	46					
COLUMN STREET,	STORE IN COMMON	Rubble/Cobb	COLUMN STREET,	40			190	Saction To				
		usani bouvin	Jovareu	Ø		d	ø	Section To	Ø			
Bedrock (sol Boulder (261	Sugar Star			K		20		\$ 20				
				70	-	50			~			
Rubble / Col	100	so minj		10		20			20			
Gravel (2 - 6	No contractor	1115-1117		10	-			-	10			
Sand (0.052 - 1.9 mm)				10	-				10			
Sill (0,004 -)	0.061 mm)											
Clay					-							
Detritus	11.1	A	1	/		000			1011			
Diher - Spec	CONTRACTOR OF STREET,	Stream Bottom	Contraction of the local division of the loc	29.7	1	2.3	34.5	Sister and the second	15.4			
		Sucan Bolton	Coversa	6		2	16	NING NO.	Ø			
Algae (atlaci				ø		Ø			ø			
Macrophytes	Sec. 10.17			12		Ø			Par.			
Canopy / Sn	ALC: NOT THE OWNER.	STORE STORE STORE		60		0	10	and the second second	20			
Undercut Banks	Overhang	ing Vegetation 20 m overhang	Woody Debris	Other Debris	Boulder	Submerg Macroph		and a descension of	open Other - Spec			
/	1	5	/	/	LOW		5	3	/			
Bank Erosic	n: Length	of Continuous E	are Soil (nears	est 0.01 m) withi	1.4.1	~	d Bank to the cres	st or within 5 m	of stream ed;			
	Leit:	Ø(m)	side	5(m)		Left:	Ø (%)	aida:	Ø(%)			
tiparian La	nd Use: Pe	CONTRACTOR OF STATE	Name of Column 2 is not	ithin S m of stree	am edge, along	CONTRACTOR OF THE OWNER.	Selection of the	Contraction of the local division of the loc	al Must = 10			
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland	Wetland Exp	osed Rock	ther - Specify			

Riparian Buffer Width: Length (nearest 1.0 m) of Undisturbed Land Uses along transect, within 10 m of stream

Left: $\frac{410}{10}$ (m) sign: $\frac{416}{10}$ (m)

Brien	Med	Juley .	Turnen			0-228 (R 6/07	1h Ro	A.D	Page 5 of 5	
Transect D				Salar and Salar		000				
Stream Na		LANCH A	A Ja	10.	20	Vateroody ID	Code	Date (MMDDYYYY) Transect		
)Stream Wie						08/30/2022 5/2 optionel) Bankfull Width (m) (option		
		17.	3 🔲		Ren					
			Deepest	1/5	Channe	Position (Fil 2/5	the of Curre	ant Stream Width)		
Nater Dep	th /m		0.55	0.37		0.50	-	3/5	415 0,96	
	ines and Wa		1.3.5	0.37		0.55		0.46	0.46	
Embedded	iness (neare	ast 10%)		50						
THE REAL PROPERTY.	1012020000	Rubble/Cobb	the second second second	50		50	. We want	40	50	
Service	A STARK	Arcan Bouon	Covered	Ø		ø		Ø	on Total Must = 100 Ø	
Bedrock (s:				Ø		581/A		ø	e d	
	i1 mm - 4.1 r					Ø	-			
	obble (65 - 2)	60 mm)		70		70		60	70	
Gravel (2 -		-		20		20		30	20	
Sand (0.06)	2 - 1.9 mm)			10		10		10	10	
Silt (0.004 - 0.061 mm)				/		/	-	/		
llay				-		/	_	/	/	
Detritus						/		/	1	
Other - Spe	city: <u>Ve</u> /	oaty on	15	13.8		11.3		15.3	29.8	
Percent (nea	rest 10%) of :	Stream Botton	Covered		15 15 12	193		2 dite la prime		
lgae (attac	had & fila.)			ø	_	Ø		Ø	ø	
Aacrophyte	3			Ø		Ø		ø	Ø	
Canopy / Sh	nading (dire	le one)		30		10		20	40	
over for A	duit Gamefi	i sh: Length (m	sarest 0.01 m)	of transect withi	n 0.15 m upsl	lream or down	stream in w	ater at least 0.20 r	n in depth	
Undercut Banks		ng Vegetation 20 m overhang	Woody Debris	Other Debris	Boulds	subre Mscro		mergent Macrophy at least 0.20 m dea		
/		OM	/		0.5		//////	/	/	
ank Erosi			sare Soll (neere	ist 0.01 m) with	in 1 m of stream	im Stof Erac	ded Bank to	the crest or with r	n 5 m of stream edge	
_	Left:	Ø(m)	Right	2(m)		Lef	Ø_	(%) Right: .	Ø (%)	
iparian La	nd Use: Pe	roant (nearest 1	0%) of Bank w	thin 5 m of stre	am edge, alor	25.6		11 Charles	n Total Must = 100	
Cropland	Pasture	Barnyard	Developed	Meadow	Shrubs	Woodland	Wetland	Exposed Roc	Other - Specify:	
		1	/	20	40	40	/		/	

Left: +10 (m) Right +10 (m)