

**Appendix A      Riparian Vegetation Community and  
Water Course Characteristics at  
Water Crossings of Preferred Route**



Tributary of Pine Creek – Preliminary Preferred Route Crossing 1 (September 18, 2012)

North Bank (Shore)

100m Upstream				Crossing Location				100m Downstream			
GPS Location	N 50.5832 W -96.1564	Water Depth (m)	0 (Dry)	GPS Location	N 50.5829 W -961552	Water Depth (m)	0.22	GPS Location	N 50.5826 W -96.1539	Water Depth (m)	1.50
Flow Regime	Ephemeral	Stage	Dry	Flow Regime	Ephemeral	Stage	Low	Flow Regime	Intermittent	Stage	Low
Wetted Width (m)	0 (Dry)	Bank Slope (degrees)	10	Wetted Width (m)	1.7	Bank Slope (degrees)	10	Wetted Width (m)	8.0	Bank Slope (degrees)	3
Bankfull Width (m)	2.6	Bank Stability	Moderate	Bankfull Width (m)	2.6	Bank Stability	Moderate	Bankfull Width (m)	13.0	Bank Stability (degrees)	Moderate
Floodplain (m)	NA	In-Stream Cover	OC (willow, balsam poplar)	Floodplain Width (m)	N/A	In-Stream Cover	LWD, AM	Floodplain Width (m)	Same as bankfull	In-Stream Cover	AM, LWD, OC (ash, elm)
				Discharge (m <sup>3</sup> /sec)	Not Determined	Water Temp (°C)	10.8				
				Diss. Oxygen (mg/L)	7.2	TSS (mg/L)					
				pH		Turbidity (NTU)					
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-2.6	S/G	75-100%	-	0-4.6	S/G	75-100	-	0-9.0	S/G	75-100	-
2.6 – 50	HF	75-100%	Balsam poplar, willow, high bush cranberry hazel	4.6-50	HF	50-75	Ash, oak, aspen, high bush cranberry	9.0-50	HF	50-75	Ash, aspen, hazel, high bush cranberry
Additional Comments				Additional Comments				Additional Comments			
Water course dry at 100m upstream				Additional Comments				Additional Comments			

Water flow direction indicated by yellow arrow



South Bank (Shore)

100m Upstream				Crossing Location				100m Downstream			
GPS Location	N 50.5831 W -96.1565	Water Depth (m)	0 (Dry)	GPS Location	N 50.2829 W -96.1551	Water Depth (m)	0.22	GPS Location	N 50.5824 W -96.1539	Water Depth (m)	1.50
Flow Regime	Ephemeral	Stage	Dry	Flow Regime	Ephemeral	Stage	L	Flow Regime	Intermittent	Stage	Low
Wetted Width (m)	0 (Dry)	Bank Slope (degrees)	10	Wetted Width (m)	1.7	Bank Slope (degrees)	40	Wetted Width (m)	8.0	Bank Slope (degrees)	10
Bankfull Width (m)	2.8	Bank Stability	Moderate	Bankfull Width (m)	1.7	Bank Stability	High	Bankfull Width (m)	8.0	Bank Stability	Moderate
Floodplain (m)	NA	In-Stream Cover	OC (willow)	Floodplain Width (m)	N/A	In-Stream Cover	AM, OC (dead ash trees)	Floodplain Width (m)	NA	In-Stream Cover	LWD, OC (elm, ash, dogwood, chokecherry)
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-4.6	SH	50-75%	Alder, willow, hawthorne	0-3.4	S/G	75-100	-	0-11.4	HF	25-50	Ash, elm, dogwood, chokecherry
4.6 – 50	AG	75-100%	Soybeans	3.4-50	AG	75-100	Soybeans	11.4-50	AG	75-100	Soybeans
Additional Comments				Additional Comments				Additional Comments			
Water course dry at 100m upstream				Significant amount of bear scat along edge of field				Additional Comments			



**Preliminary Preferred Route Crossing 2**

**North Bank (Shore)**

100m Upstream		Crossing Location		100m Downstream							
GPS Location	NA	Water Course Type	NA	GPS Location	N 50.6991 W -96.1189	Water Course Type	Highway Drainage Channel	GPS Location	N 50.6993 W -96.117	Water Course Type	Highway Drainage Channel
Flow Regime	NA	Riparian Vegetation (GIS-based Data)		Flow Regime	Perennial	Riparian Vegetation (GIS-based Data)		Flow Regime	Perennial	Riparian Vegetation (GIS-based Data)	
Distance from Water (m)		Stand Type	Age (Years)	Distance from Water (m)	0-50	Stand Type	Age (Years)	Distance from Water (m)	0-50	Stand Type	Age (Years)
						Willow/Ald	-			Willow/Ald	-
Additional Comments		Highway ditch does not exist at this location		Additional Comments				Additional Comments			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Upstream		Crossing Location		100m Downstream							
GPS Location	NA	Water Course Type	NA	GPS Location	N 50.6991 W -96.1189	Water Course Type	Highway Drainage Channel	GPS Location	N 50.6993 W -96.117	Water Course Type	Highway Drainage Channel
Flow Regime	NA	Riparian Vegetation (GIS-based Data)		Flow Regime	Perennial	Riparian Vegetation (GIS-based Data)		Flow Regime	Perennial	Riparian Vegetation (GIS-based Data)	
Distance from Water (m)		Stand Type	Age (Years)	Distance from Water (m)	0-50	Stand Type	Age (Years)	Distance from Water (m)	0-50	Stand Type	Age (Years)
						Willow/Ald	-			Willow/Ald	-
Additional Comments		Highway ditch does not exist at this location		Additional Comments				Additional Comments			



**Preliminary Preferred Route Crossing 3**

**North Bank (Shore)**

100m Upstream		Crossing Location		100m Downstream							
GPS Location	N 50.7142 W -96.1329	Water Course Type	Beaver Flood	GPS Location	N 50.7143 W -96.1314	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7150 W -96.1303	Water Course Type	Highway Drainage Channel
Flow Regime	Perennial			Flow Regime	Perennial			Flow Regime	Perennial		
<b>Riparian Vegetation (GIS-based Data)</b>			<b>Riparian Vegetation (GIS-based Data)</b>			<b>Riparian Vegetation (GIS-based Data)</b>			<b>Riparian Vegetation (GIS-based Data)</b>		
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-44	Will/Ald	-	Willow, alder Trembling aspen, balsam poplar
Additional Comments			Additional Comments			Additional Comments			Additional Comments		

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Upstream		Crossing Location		100m Downstream							
GPS Location	N 50.7142 W -96.1329	Water Course Type	Beaver Flood	GPS Location	N 50.7143 W -96.1314	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7150 W -96.1303	Water Course Type	Highway Drainage Channel
Flow Regime	Perennial			Flow Regime	Perennial			Flow Regime	Perennial		
<b>Riparian Vegetation (GIS-based Data)</b>			<b>Riparian Vegetation (GIS-based Data)</b>			<b>Riparian Vegetation (GIS-based Data)</b>			<b>Riparian Vegetation (GIS-based Data)</b>		
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	BS	12	Black spruce	0-50	BS	12	Black spruce
Additional Comments			Additional Comments			Additional Comments			Additional Comments		





**Preliminary Preferred Route Crossing 4**

**North Bank (Shore)**

100m Upstream		Crossing Location		100m Downstream			
GPS Location	N 50.7470 W -96.1600	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7470 W -96.1570	Water Course Type	Highway Drainage Channel
Flow Regime	Ephemeral	Flow Regime	Perennial	Flow Regime	Perennial		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TL	40	Tamarack, black spruce	0-50	TL	40	Tamarack, black spruce
Additional Comments				Additional Comments			
Water course may not exist at this location							

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Upstream		Crossing Location		100m Downstream			
GPS Location	N 50.7470 W -96.1600	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7470 W -96.1570	Water Course Type	Highway Drainage Channel
Flow Regime	Perennial	Flow Regime	Perennial	Flow Regime	Perennial		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TL	40	Tamarack	0-50	TL	40	Tamarack
Additional Comments				Additional Comments			
Water course may not exist at this location							

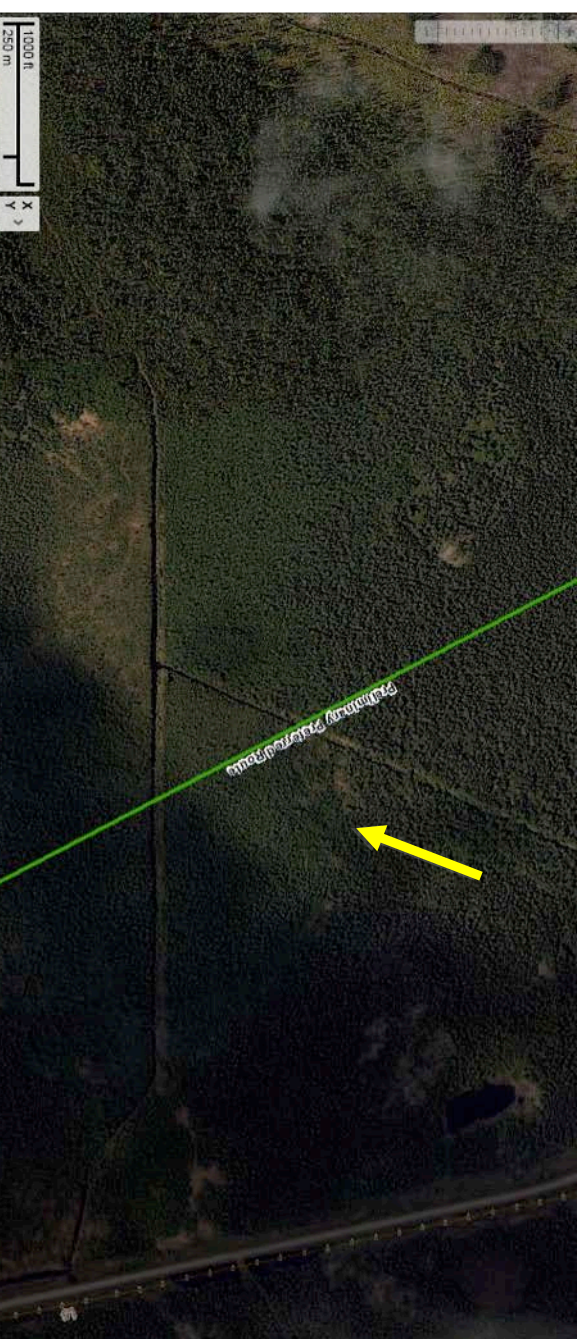


**Preliminary Preferred Route Crossing 5**

**North Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7477 W -96.1606	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7486 W -96.15.99	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7495 W -96.1592	Water Course Type	Highway Drainage Channel
Flow Regime	Ephemeral			Flow Regime	Ephemeral			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	BS	99	Black Spruce, tamarack	0-50	BS	10	Black spruce	0-50	BS	99	Black spruce, tamarack
Additional Comments				Additional Comments				Additional Comments			
Water course may not exist at this location				Water course may not exist at this location				Water course may not exist at this location			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7477 W -96.1606	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7486 W -96.15.99	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7495 W -96.1592	Water Course Type	Highway Drainage Channel
Flow Regime	Ephemeral			Flow Regime	Ephemeral			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TL	40	Tamarack	0-50	TL	40	Tamarack	0-50	TL	40	Tamarack
Additional Comments				Additional Comments				Additional Comments			
Water course may not exist at this location				Water course may not exist at this location				Water course may not exist at this location			



**Preliminary Preferred Route Crossing 6**

**North Bank (Shore)**

100m Upstream				Crossing Location				100m Downstream			
GPS Location	N 50.7577 W -96.1703	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7580 W -96.1689	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7579 W -96.1673	Water Course Type	Highway Drainage Channel
Flow Regime	Ephemeral			Flow Regime	Ephemeral			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TL	90	Tamarack	0-50	TL	90	Tamarack	0-50	TL	15	Tamarack
Additional Comments				Additional Comments				Additional Comments			
Water course may not exist at this location				Water course may not exist at this location				Water course may not exist at this location			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Upstream				Crossing Location				100m Downstream			
GPS Location	N 50.7577 W -96.1703	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7580 W -96.1689	Water Course Type	Highway Drainage Channel	GPS Location	N 50.7579 W -96.1673	Water Course Type	Highway Drainage Channel
Flow Regime	Ephemeral			Flow Regime	Ephemeral			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	BS	132	Black spruce, tamarack	0-50	BS	132	Black Spruce, tamarack	0-50	BS	45	Black spruce, balsam fir
Additional Comments				Additional Comments				Additional Comments			
Water course may not exist at this location				Water course may not exist at this location				Water course may not exist at this location			



O'Hanly River - Preliminary Preferred Route Crossing 7 (September 19, 2012)

North Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7877 W -96.2186	Water Depth (m)	Not Determined	GPS Location	N 50.7871 W -96.2176	Water Depth (m)	Not Determined	GPS Location	N 50.7878 W -96.2165	Water Depth (m)	Not Determined
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate
Wetted Width (m)	24	Bank Slope (degrees)	1%	Wetted Width (m)	18	Bank Slope (degrees)	5	Wetted Width (m)	22	Bank Slope (degrees)	3
Bankfull Width (m)	24	Bank Stability	Moderate	Bankfull Width (m)	18	Bank Stability	Moderate	Bankfull Width (m)	22	Bank Stability	High-Moderate
Floodplain (m)	23.5	In-Stream Cover	AM, LWD, OC (dead ash)	Floodplain Width (m)	N/A	In-Stream Cover	LWD, OC (balsam fir, ash)	Floodplain Width (m)	4.3	In-Stream Cover	AM, LWD
				Discharge (m <sup>3</sup> /sec)	0.67	Water Temp (°C)	11.3				
				Dis. Oxygen (mg/L)	9.4	TSS (mg/L)					
				pH		Turbidity (NTU)					
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-23.5	S/G, HF	75-100%	standing dead ash trees	0-5.0	S/G, SH	75-100	Hazel, ash, balsam fir	0-4.3	S/G, SH	50-75	Ash, arrow wood, willow, balsam fir
23.5-50	MF	25-50	Aspen, balsam fir, white birch, jack pine	5.0-25.5	S	75-100	Ash, balsam fir	4.3-50	MF	25-50	Jack pine, aspen
				25.5-50	MF	75-100	Balsam fir, ash, aspen, hazel				
Additional Comments			At 30m from water's edge there is a rapid rise in slope (to 30°)	Additional Comments			Mature forest (82 years) from 5.0 to 50m	Additional Comments			At 9m from water's edge there is a steep slope (45°), 4 m high

Water flow direction indicated by yellow arrow



South Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7876 W -96.2188	Water Depth (m)	Not Determined	GPS Location	N 50.7869 W -96.2176	Water Depth (m)	Not Determined	GPS Location	N 50.7876 W -96.2164	Water Depth (m)	Not Determined
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate
Wetted Width (m)	24	Bank Slope (degrees)	90 (1m high vertical bank)	Wetted Width (m)	18	Bank Slope (degrees)	90 (vertical bank 1m high)	Wetted Width (m)	22	Bank Slope (degrees)	3
Bankfull Width (m)	24	Bank Stability	Moderate	Bankfull Width (m)	18	Bank Stability	High	Bankfull Width (m)	22	Bank Stability	Moderate
Floodplain (m)	NA	In-Stream Cover	LWD	Floodplain Width (m)	N/A	In-Stream Cover	LWD, BOULD	Floodplain Width (m)	3	In-Stream Cover	AM, LWD, OC (Ash)
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-50	MF	0-25	Balsam fir, white birch, hazel	0-18	MF	0-25	White birch, black spruce, hazel	0-3.0	S/G	75-100	-
	AG			18-50	MF	75-100	Aspen, white birch, jack pine, black spruce	3.0-50	MF	0-25	Balsam fir (many dead)
Additional Comments			Large number of downed (dead) balsam fir, due to budworm	Additional Comments			Mature forest (75 years) from 0 to 50m	Additional Comments			Significant amount of downed (dead) balsam fir





**Preliminary Preferred Route Crossing 8**

**North Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7935 W -96.2205	Water Course Type	Creek	GPS Location	N 50.7938 W -96.2197	Water Course Type	Creek	GPS Location	N 50.7936 W -96.2188	Water Course Type	Creek
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
Additional Comments				Additional Comments				Additional Comments			
								Water course may not exist at this location			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7935 W -96.2205	Water Course Type	Creek	GPS Location	N 50.7938 W -96.2197	Water Course Type	Creek	GPS Location	N 50.7936 W -96.2188	Water Course Type	Creek
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
Additional Comments				Additional Comments				Additional Comments			
								Water course may not exist at this location			



**Preliminary Preferred Route Crossing 9**

**North Bank (Shore)**

100m Downstream		Crossing Location		100m Upstream							
GPS Location	N 50.7967 W -96.2223	Water Course Type	NA	GPS Location	N 50.7966 W -96.2207	Water Course Type	Beaver Pond	GPS Location	N 50.7965 W -96.2191	Water Course Type	Beaver Pond
Flow Regime	NA	Riparian Vegetation (GIS-based Data)		Flow Regime	Intermittent	Riparian Vegetation (GIS-based Data)		Flow Regime	Ephemeral	Riparian Vegetation (GIS-based Data)	
Distance from Water (m)		Stand Type		Distance from Water (m)	0-50	Stand Type	TA	Distance from Water (m)	0-50	Stand Type	TA
		Age (Years)				Age (Years)	35			Age (Years)	35
		Dominant Species				Dominant Species	Trembling aspen			Dominant Species	Trembling aspen
Additional Comments		Water course does not exist at this location		Additional Comments				Additional Comments		Water course may not exist at this location	



**South Bank (Shore)**

100m Downstream		Crossing Location		100m Upstream							
GPS Location	N 50.7967 W -96.2223	Water Course Type	NA	GPS Location	N 50.7966 W -96.2207	Water Course Type	Beaver Pond	GPS Location	N 50.7965 W -96.2191	Water Course Type	Beaver Pond
Flow Regime	NA	Riparian Vegetation (GIS-based Data)		Flow Regime	Intermittent	Riparian Vegetation (GIS-based Data)		Flow Regime	Ephemeral	Riparian Vegetation (GIS-based Data)	
Distance from Water (m)		Stand Type		Distance from Water (m)	0-50	Stand Type	Beaver	Distance from Water (m)	0-50	Stand Type	TA
		Age (Years)				Age (Years)	-			Age (Years)	26
		Dominant Species				Dominant Species	Beaver flood (aquatic macrophytes)			Dominant Species	Trembling aspen, jack pine
Additional Comments		Water course does not exist at this location		Additional Comments				Additional Comments		Water course may not exist at this location	

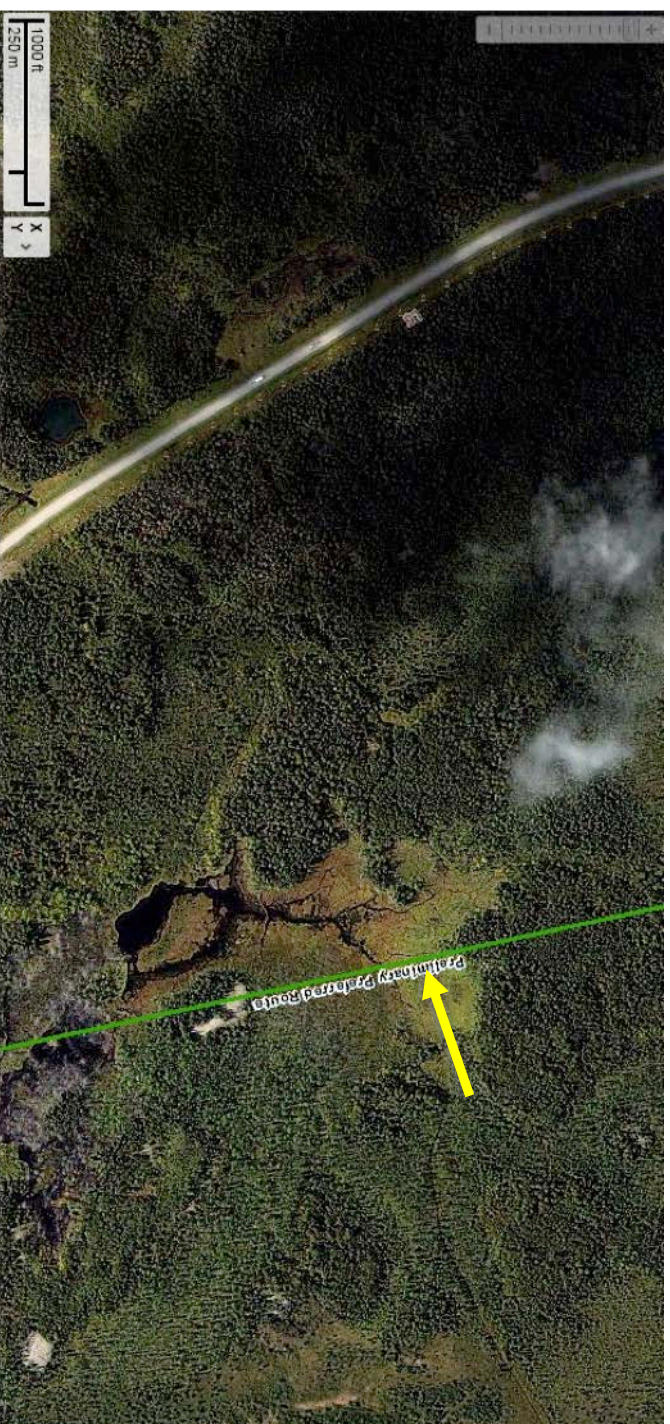


**Preliminary Preferred Route Crossing 10**

**North Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7997 W -96.2232	Water Course Type	Creek	GPS Location	N 50.7999 W -96.2218	Water Course Type	Creek	GPS Location	N 50.7999 W -96.2203	Water Course Type	Creek
Flow Regime	Ephemeral			Flow Regime	Ephemeral			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	TA	35	Trembling aspen	0-50	TA	35	Trembling aspen
Additional Comments				Additional Comments				Additional Comments			
This creek could be an old logging road				This creek could be an old logging road				The creek could be an old logging road			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.7967 W -96.2223	Water Course Type	NA	GPS Location	N 50.7999 W -96.2218	Water Course Type	Creek	GPS Location	N 50.7999 W -96.2203	Water Course Type	Creek
Flow Regime	NA			Flow Regime	Ephemeral			Flow Regime	Ephemeral		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
Additional Comments				Additional Comments				Additional Comments			
This creek could be an old logging road				This creek could be an old logging road				This creek could be an old logging road			

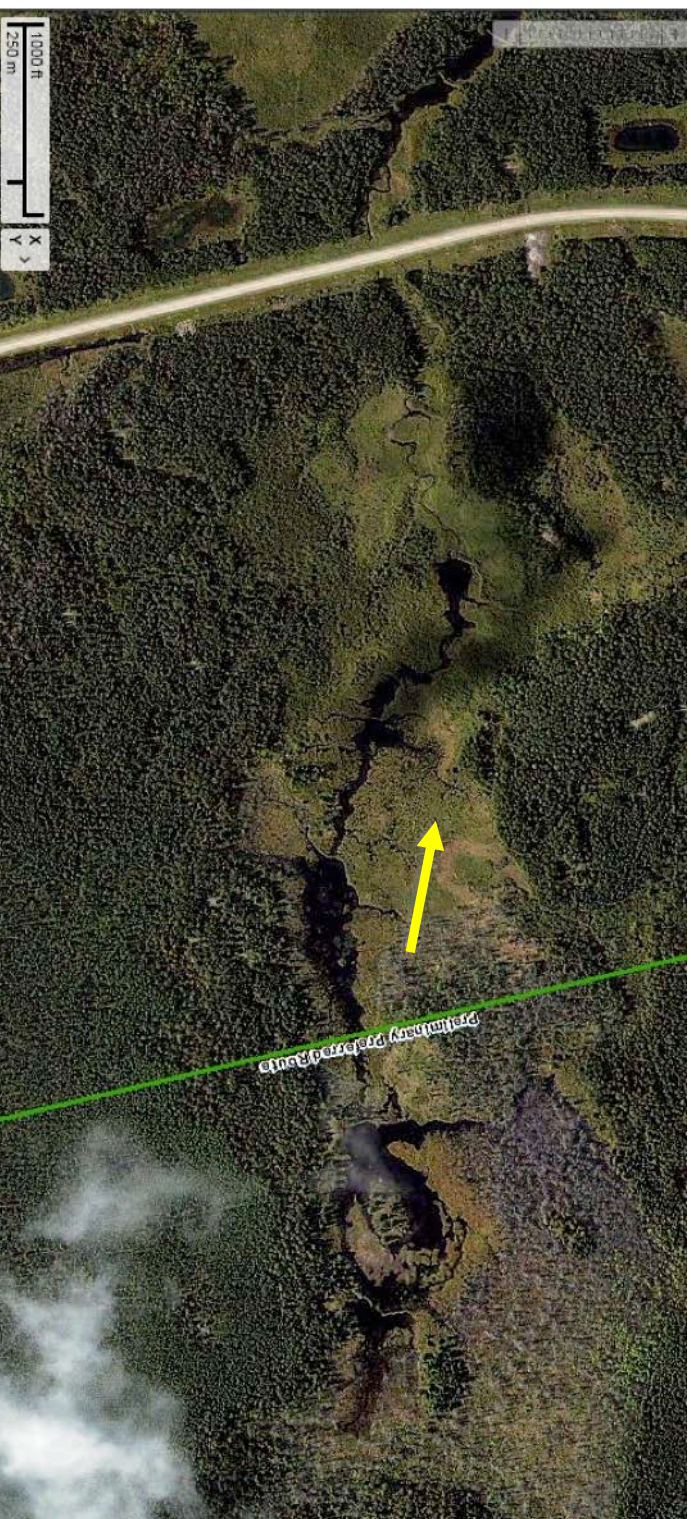


O'Hanly Mid Tributary - Preliminary Preferred Route Crossing 11

North Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.8104 W -96.2271	Water Course Type	Creek	GPS Location	N 50.8107 W -96.2257	Water Course Type	Creek	GPS Location	N 50.8107 W -96.2241	Water Course Type	Creek
Flow Regime	Intermittent			Flow Regime	Intermittent	Discharge (m <sup>3</sup> /sec)	0.09	Flow Regime	Intermittent		
Riparian Vegetation (GIS-based Data)				Riparian Vegetation (GIS-based Data)				Riparian Vegetation (GIS-based Data)			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-38	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
				38-50	TA	35	Trembling aspen, Trembling aspen,				
Additional Comments				Additional Comments				Additional Comments			

Water flow direction indicated by yellow arrow



South Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.8104 W -96.2271	Water Course Type	Creek	GPS Location	N 50.8107 W -96.2257	Water Course Type	Creek	GPS Location	N 50.8107 W -96.2241	Water Course Type	Creek
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Intermittent		
Riparian Vegetation (GIS-based Data)				Riparian Vegetation (GIS-based Data)				Riparian Vegetation (GIS-based Data)			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-42	Beaver	-	Beaver flood (aquatic macrophyte)	0-38	Beaver	-	Beaver flood (aquatic macrophytes)	0-31	Beaver	-	Beaver flood (aquatic macrophytes)
42-50	TA	70	Trembling aspen	38-50	TA	70	Trembling aspen	31-50	TA	70	Trembling aspen
Additional Comments				Additional Comments				Additional Comments			



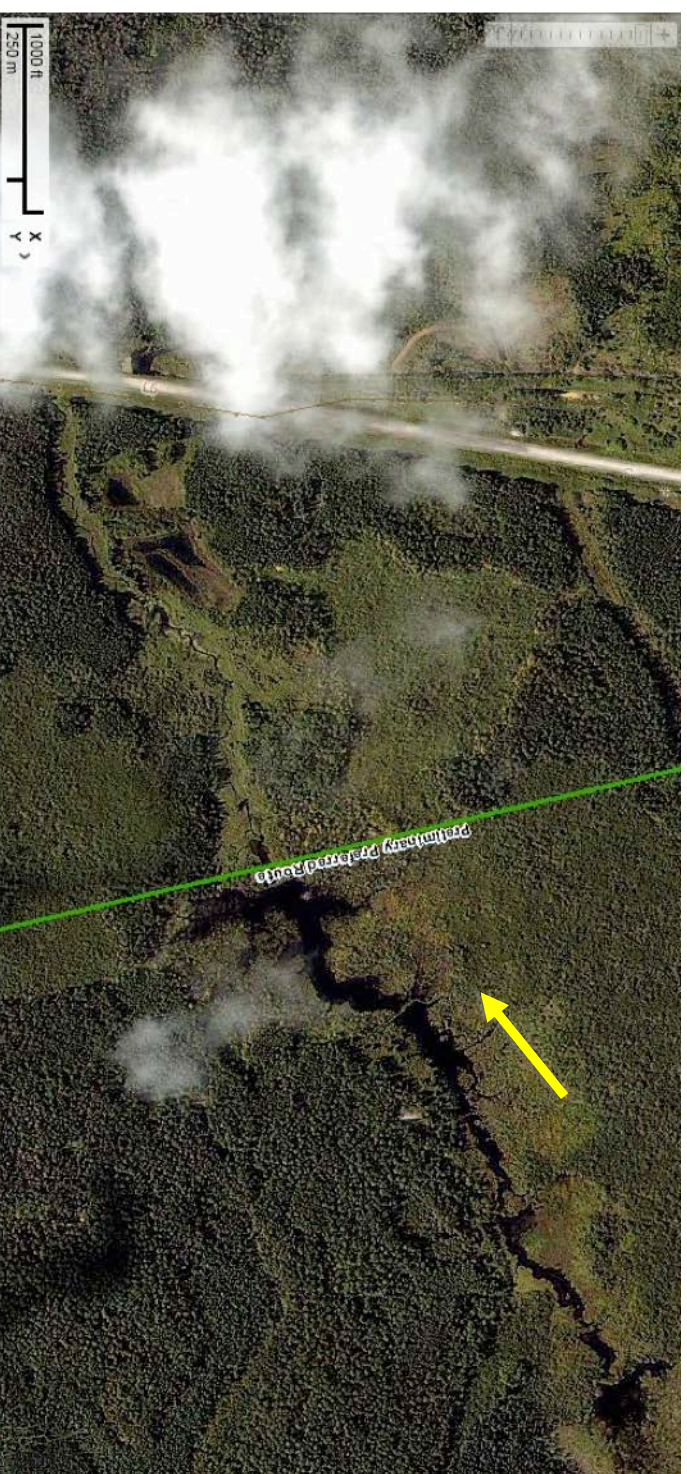


**Kapukwaywetwunk Creek - Preliminary Preferred Route Crossing 12**

**North Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.8206 W -96.2310	Water Course Type	Creek	GPS Location	N 50.8214 W -96.2297	Water Course Type	Creek	GPS Location	N 50.8218 W -96.2284	Water Course Type	Creek
Flow Regime	Intermittent			Flow Regime	Intermittent	Discharge (m <sup>3</sup> /sec)	0.19	Flow Regime	Intermittent		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-34	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
34-50	TA	35	Trembling aspen								
Additional Comments				Additional Comments				Additional Comments			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.8206 W -96.2310	Water Course Type	Creek	GPS Location	N 50.8214 W -96.2297	Water Course Type	Creek	GPS Location	N 50.8218 W -96.2284	Water Course Type	Creek
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Intermittent		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-34	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
34-50	Will/Ald	-	Willow, alder								
Additional Comments				Additional Comments				Additional Comments			



**Black River – Preliminary Preferred Route Crossing 13 (September 17, 2012)**

**North Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.8652 W -96.2475	Water Depth (m)	3.0	GPS Location	N 50.8656 W -96.2460	Water Depth (m)	3.0	GPS Location	N 50.8662 W -96.2445	Water Depth (m)	3.7
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate
Wetted Width (m)	26	Bank Slope (degrees)	3-4	Wetted Width (m)	26	Bank Slope (degrees)	1-2	Wetted Width (m)	36	Bank Slope (degrees)	12
Bankfull Width (m)	34	Bank Stability	Low	Bankfull Width (m)	36.2	Bank Stability	Low	Bankfull Width (m)	43.3	Bank Stability	Low
Floodplain (m)	NA	In-Stream Cover	AM, BD	Floodplain Width (m)	28.7	In-Stream Cover	None	Floodplain Width (m)	NA	In-Stream Cover	
				Discharge (m <sup>3</sup> /sec)	3.59	Water Temp (°C)	12.9				
				Diss. Oxygen (mg/L)	7.8	TSS (mg/L)					
				pH		Turbidity (NTU)					
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-8.0	S/G	50-75	-	0-7.2	S/G	75-100	-	0-7.3	S/G	75-100	-
8.0-23.0	SH	25-50	Dogwood, alder, Saskatoon, willow	7.2-42.0	HF	50-75	Ash	7.3-21.0	SH	50-75	Ash, dogwood
23.0-50	HF	50-75	Aspen, oak	42.0-50	HF	75-100	Aspen	21.0-50	HF	75-100	Ash, aspen
Additional Comments				Additional Comments				Additional Comments			
Wildlife: wood frog, deer tracks, beaver runways. Shore burned in 1999				Shore burned in 1999				Shore burned in 1999			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.8648 W -96.2473	Water Depth (m)	3.0	GPS Location	N 50.8654 W -96.2456	Water Depth (m)	3.0	GPS Location	N 50.8660 W -96.2442	Water Depth (m)	3.7
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate
Wetted Width (m)	26	Bank Slope (degrees)	1	Wetted Width (m)	26	Bank Slope (degrees)	13	Wetted Width (m)	36	Bank Slope (degrees)	3
Bankfull Width (m)	29.3	Bank Stability	Low	Bankfull Width (m)	38	Bank Stability	Low	Bankfull Width (m)	41	Bank Stability	Unstable
Floodplain (m)	NA	In-Stream Cover	LWD, AM	Floodplain Width (m)	N/A	In-Stream Cover	AM, LWD, BH	Floodplain Width (m)	NA	In-Stream Cover	AM, BH
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-3.3	S/G	75-100	-	0-12.0	S/G	75-100	-	0-15.0	S/G	75-100	-
3.3-26.0	SH	75-100	Willow, alder	12.0-26.0	SH	25-50	Dogwood, hazel, willow, aspen	15.0-31.0	HF	75-100	Aspen, alder, dogwood, ash
26.0-50	HF	75-100	Aspen	26.0-50	HF	75-100	Aspen	31.0-50	HF	75-100	Aspen
Additional Comments				Additional Comments				Additional Comments			
Shore burned in 1999				Wildlife: wolf tracks. Shore burned in 1999				Shore burned in 1999			

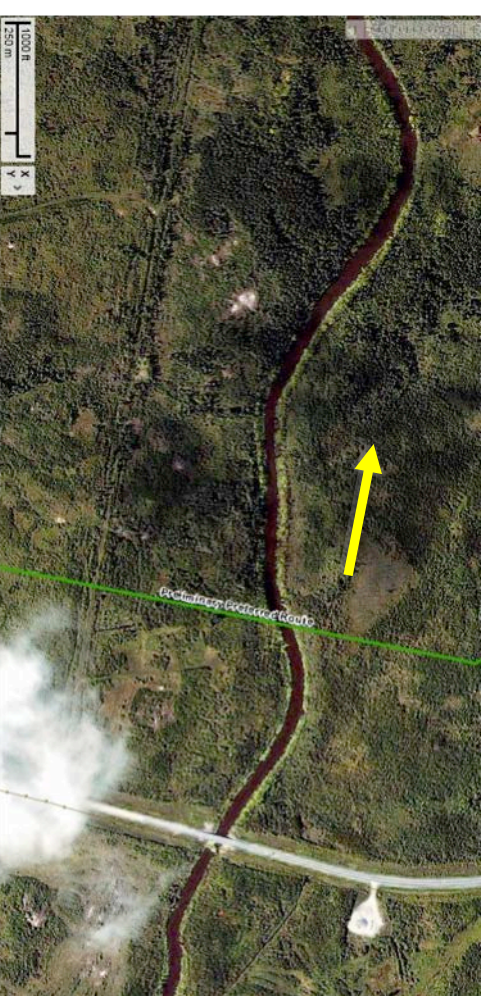


**Sandy River – Preliminary Preferred Route Crossing 14 (September 17, 2012)**

**North Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream							
GPS Location	N 50.9765 W -96.2269	Water Depth (m)	1.7	GPS Location	N 50.9765 W -96.2254	Water Depth (m)	1.6	GPS Location	N 50.9768 W -96.2238	Water Depth (m)	1.75				
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate				
Wetted Width (m)	32	Bank Slope (degrees)	1	Wetted Width (m)	30	Bank Slope (degrees)	15	Wetted Width (m)	26	Bank Slope (degrees)	16				
Bankfull Width (m)	41	Bank Stability	Moderate	Bankfull Width (m)	31	Bank Stability	Low	Bankfull Width (m)	28	Bank Stability	Moderate				
Floodplain (m)	NA	In-Stream Cover	AM, LWD	Floodplain Width (m)	NA	In-Stream Cover	AM, LWD, OC	Floodplain Width (m)	NA	In-Stream Cover	LWD, AM				
				Discharge (m <sup>3</sup> /sec)	Not Determined	Water Temp (°C)	14.2								
				Diss. Oxygen (mg/L)	6.3	TSS (mg/L)									
				pH		Turbidity (NTU)									
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)							
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species				
0-4.0	S/G	75-100	-	0-25.0	SH	0-25	Ash, dogwood, hazel	0-16.0	SH	0-25	Ash, alder				
4.0-9.0	HF	25-50	Ash (dead standing)	25.0-50	HF	50-75	Aspen, white birch	16.0-50	HF	50-75	Aspen				
9.0-33.0	SH	0-25	Willow, hazel, high bush cranberry, aspen												
33.0-50	HF	25-50	Aspen, white birch												
Additional Comments				Shore burned in 1999				Additional Comments				Shore burned in 1999			

Water flow direction indicated by yellow arrow



**South Bank (Shore)**

100m Downstream				Crossing Location				100m Upstream							
GPS Location	N 50.9762 W -96.2267	Water Depth (m)	1.7	GPS Location	N 50.9762 W -96.2254	Water Depth (m)	1.6	GPS Location	N 50.9765 W -96.2240	Water Depth (m)	1.75				
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate				
Wetted Width (m)	32	Bank Slope (degrees)	15	Wetted Width (m)	30	Bank Slope (degrees)	5	Wetted Width (m)	26	Bank Slope (degrees)	3				
Bankfull Width (m)	34	Bank Stability	Moderate	Bankfull Width (m)	44	Bank Stability	Moderate	Bankfull Width (m)	26	Bank Stability	Moderate				
Floodplain (m)	NA	In-Stream Cover	LWD, AM, OC (Ash)	Floodplain Width (m)	N/A	In-Stream Cover	AM, LWD, OC (Ash)	Floodplain Width (m)	NA	In-Stream Cover	AM, LWD, OC (Ash)				
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)							
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species				
0-2.0	MF	50-75	Ash, black spruce	0-14.0	HF	75-100	Ash (mature)	0-19.0	SH	0-25	Willow, aspen				
2.0-20.0	CF	50-75	Balsam fir	14.0-34.0	HF	75-100	Ash, aspen (mature)	19.0-50	HF	75-100	Aspen, ash (young, regenerating)				
20.0-50	HF	50-75	Aspen, white birch	34.0-50	HF	50-75	Aspen (young, regenerating)								
Additional Comments				This location has mature forest (escaped the 1999 fire)				Additional Comments				Fire (1999 burn) did not burn crossing location (burned east of crossing)			
												Shore burned in 1999			

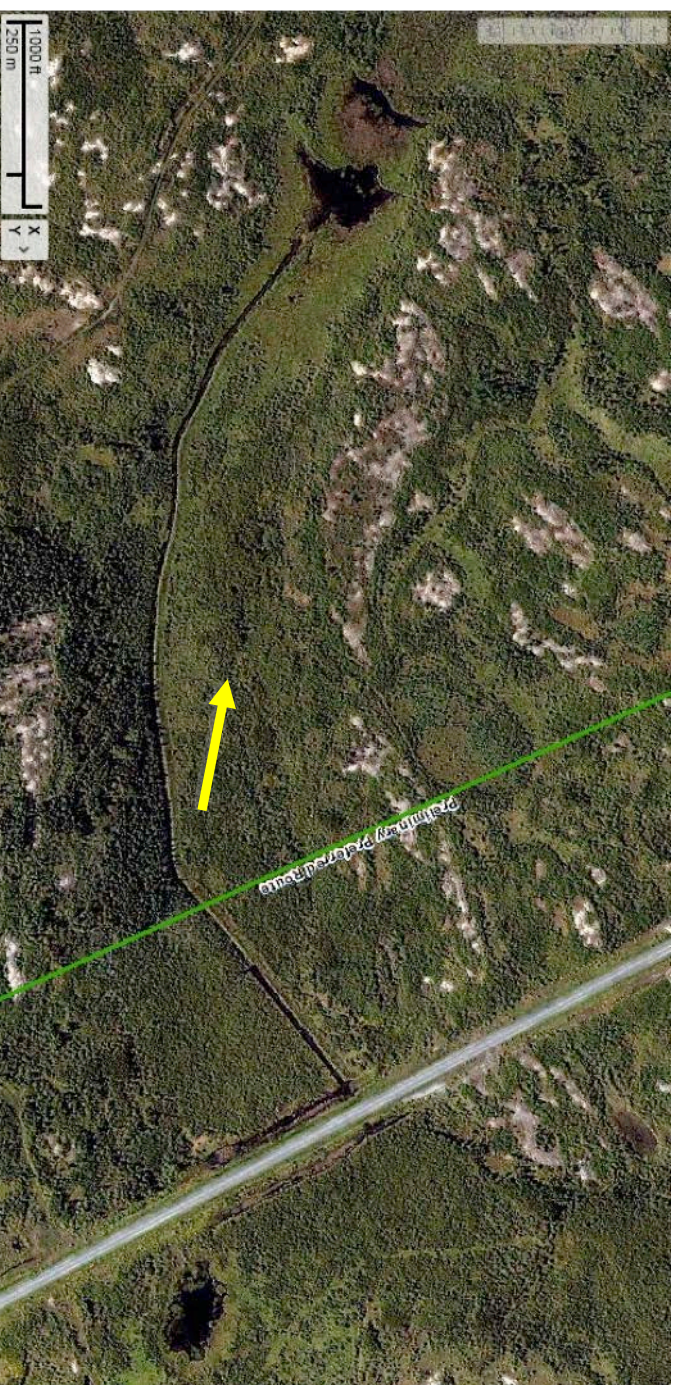


Preliminary Preferred Route Crossing 15

North Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.9866 W -96.2311	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9869 W -96.2297	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9874 W -96.2285	Water Course Type	Highway Drainage Channel
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Intermittent		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	Beaver	-	Beaver flood (aquatic macrophyte)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)	0-50	Beaver	-	Beaver flood (aquatic macrophytes)
Additional Comments				Additional Comments				Additional Comments			

Water flow direction indicated by yellow arrow



South Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 50.9866 W -96.2311	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9869 W -96.2297	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9874 W -96.2285	Water Course Type	Highway Drainage Channel
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Intermittent		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	BF	15	Balsam fir, trembling aspen	0-50	BF	15	Balsam fir, trembling aspen	0-50	BS	15	Black spruce
Additional Comments				Additional Comments				Additional Comments			





Preliminary Preferred Route Crossing 16

North Bank (Shore)

100m Upstream				Crossing Location				100m Downstream			
GPS Location	N 50.9961 W -96.2378	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9961 W -96.2363	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9961 W -96.2349	Water Course Type	Highway Drainage Channel
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Intermittent		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TA	15	Trembling aspen, jack pine	0-50	Will/Ald	-	Willow, alder	0-50	Will/Ald	-	Willow, alder
Additional Comments				Additional Comments				Additional Comments			

Water flow direction indicated by yellow arrow



South Bank (Shore)

100m Upstream				Crossing Location				100m Downstream			
GPS Location	N 50.9961 W -96.2378	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9961 W -96.2363	Water Course Type	Highway Drainage Channel	GPS Location	N 50.9961 W -96.2349	Water Course Type	Highway Drainage Channel
Flow Regime	Intermittent			Flow Regime	Intermittent			Flow Regime	Intermittent		
<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>				<b>Riparian Vegetation (GIS-based Data)</b>			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species	Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TA	15	Trembling aspen	0-50	TA	15	Trembling aspen	0-50	TA	15	Trembling aspen
Additional Comments				Additional Comments				Additional Comments			



Duncan Creek – Preliminary Preferred Route Crossing 17 (September 17, 2012)

North Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 51.0259 W -96.2593	Water Depth (m)	>2	GPS Location	N 51.0258 W -96.2579	Water Depth (m)	>2	GPS Location	N 51.0257 W -96.2564	Water Depth (m)	>2
Flow Regime	Perennial	Stage	Flood	Flow Regime	Perennial	Stage	Flood	Flow Regime	Perennial	Stage	Flood
Wetted Width (m)	>50	Bank Slope (degrees)	0	Wetted Width (m)	>50	Bank Slope (degrees)	0	Wetted Width (m)	>50	Bank Slope (degrees)	0
Bankfull Width (m)	10	Bank Stability	No bank	Bankfull Width (m)	4	Bank Stability	No bank	Bankfull Width (m)	3.5	Bank Stability (degrees)	No bank
Floodplain (m)	>50	In-Stream Cover	AM, BD	Floodplain Width (m)	>50	In-Stream Cover	AM, LWD	Floodplain Width (m)	>50	In-Stream Cover	AM
				Discharge (m <sup>3</sup> /sec)	0.52	Water Temp (°C)	9.6				
				Diss. Oxygen (mg/L)	5.2	TSS (mg/L)					
				pH		Turbidity (NTU)					
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-50	S/G	75-100	Aquatic macrophytes	0-50	S/G	75-100	Aquatic macrophytes	0-50	S/G	75-100	Aquatic macrophytes
Additional Comments				Beaver dam at location. Very wide beaver flood				Additional Comments			
								Very wide beaver flood. Actual channel width = 4.0m			

Water flow direction indicated by yellow arrow



South Bank (Shore)

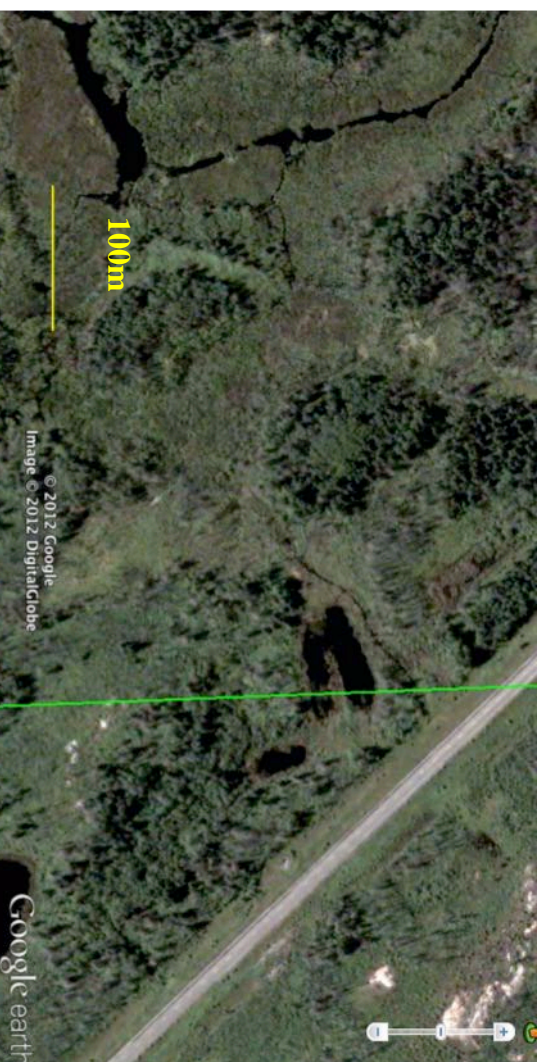
100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 51.0260 W -96.2593	Water Depth (m)	>2	GPS Location	N 51.0258 W -96.2579	Water Depth (m)	>2	GPS Location	N 51.0257 W -96.2564	Water Depth (m)	>2
Flow Regime	Perennial	Stage	Flood	Flow Regime	Perennial	Stage	Flood	Flow Regime	Perennial	Stage	Flood
Wetted Width (m)	>50	Bank Slope (degrees)	0	Wetted Width (m)	>50	Bank Slope (degrees)	0	Wetted Width (m)	>50	Bank Slope (degrees)	0
Bankfull Width (m)	10	Bank Stability	No bank	Bankfull Width (m)	4.0	Bank Stability	No bank	Bankfull Width (m)	3.5	Bank Stability (degrees)	No bank
Floodplain (m)	>50	In-Stream Cover	AM, BD	Floodplain Width (m)	>50	In-Stream Cover	AM, LWD	Floodplain Width (m)	>50	In-Stream Cover	AM
Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)				Riparian Vegetation (Field-based Data)			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-50	S/G	75-100	Aquatic macrophytes	0-25	S/G	75-100	Aquatic macrophytes	0-50	S/G	75-100	Aquatic macrophytes
Additional Comments				Beaver dam at location				Additional Comments			
								Very wide beaver flood. Actual channel width = 4.0 m			



## Preliminary Preferred Route Crossing 18

### North Bank (Shore)

		Crossing Location	
GPS Location	N 51.0359 W -96.2612	Water Course Type	Borrow Pit
Flow Regime	Perennial	Wetted Width (m)	45
		Riparian Vegetation (GIS-based Data)	
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	WS	15	White spruce, Balsam fir, Trembling aspen
Additional Comments Borrow pit does not exist 100m east or west of the crossing location			



### South Bank (Shore)

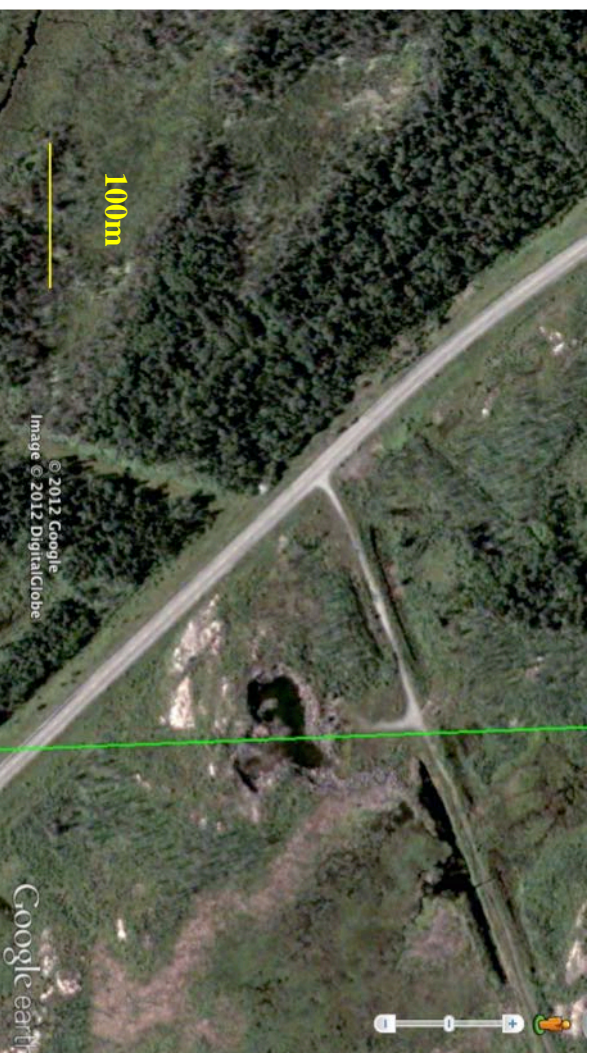
		Crossing Location	
GPS Location	N 51.0355 W -96.2611	Water Course Type	Borrow Pit
Flow Regime	Perennial		
		Riparian Vegetation (GIS-based Data)	
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TA	15	Trembling Aspen
Additional Comments Borrow pit does not exist 100m east or west of the crossing location			



**Preliminary Preferred Route Crossing 19**

**North Bank (Shore)**

		Crossing Location	
GPS Location	N 51.0384 W -96.2614	Water Course Type	Borrow Pit
Flow Regime	Perennial	Wetted Width (m)	25
Riparian Vegetation (GIS-based Data)			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TA	15	Trembling aspen, jack pine
Additional Comments Borrow pit does not exist 100m east or west of the crossing location			



**South Bank (Shore)**

		Crossing Location	
GPS Location	N 51.0382 W -96.2614	Water Course Type	Borrow Pit
Flow Regime	Perennial		
Riparian Vegetation (GIS-based Data)			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-50	TA	15	Trembling aspen, jack pine
Additional Comments Borrow pit does not exist 100m east or west of the crossing location			





Manigotagan River – Preliminary Preferred Route Crossing 20 (September 18, 2012)

North Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 51.1037 W -96.2702	Water Depth (m)	4.3	GPS Location	N 51.1043 W -96.2688	Water Depth (m)	4.4	GPS Location	N 51.1046 W -96.2673	Water Depth (m)	4.4
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate
Wetted Width (m)	38	Bank Slope (degrees)	4	Wetted Width (m)	45	Bank Slope (degrees)	11	Wetted Width (m)	58	Bank Slope (degrees)	13
Bankfull Width (m)	41.5	Bank Stability	Moderate	Bankfull Width (m)	46	Bank Stability	High	Bankfull Width (m)	59	Bank Stability	Moderate
Floodplain (m)	NA	In-Stream Cover	AM, LWD	Floodplain Width (m)	NA	In-Stream Cover	AM, BOULD	Floodplain Width (m)	NA	In-Stream Cover	LWD, AM
				Discharge (m <sup>3</sup> /sec)	Not Determined	Water Temp (°C)	13.0				
				Diss. Oxygen (mg/L)	9.1	TSS (mg/L)					
				pH		Turbidity (NTU)					
<b>Riparian Vegetation (Field-based Data)</b>				<b>Riparian Vegetation (Field-based Data)</b>				<b>Riparian Vegetation (Field-based Data)</b>			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-3.5	S/G, SH	50-75	Ash, willow	0-2.0	S/G	75-100	-	0-3.0	S/G	75-100	-
3.5-50	HF	50-75	Aspen, hazel	2.0-13.0	SH	75-100	Hazel, willow, aspen, dogwood	3.0-9.0	SH	75-100	Hazel, chokecherry, mountain maple
				13.0-32.0	HF	75-100	Aspen, hazel	9.0-27.0	HF	75-100	Aspen, willow
				32.0-38.0	S/G	75-100	ATV trail	27.0-38.0	S/G	75-100	ATV trail
				38.0-50	HF	75-100	Aspen	38.0-50	HF	75-100	Aspen
Additional Comments				Additional Comments				Additional Comments			
				ATV trail parallel to shore				ATV trail parallel to shore. Wildlife: leopard frog. Fresh mink tracks			

Water flow direction indicated by yellow arrow



South Bank (Shore)

100m Downstream				Crossing Location				100m Upstream			
GPS Location	N 51.1034 W -96.2699	Water Depth (m)	4.3	GPS Location	N 51.1039 W -96.2685	Water Depth (m)	4.4	GPS Location	N 51.1042 W -96.2670	Water Depth (m)	4.4
Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate	Flow Regime	Perennial	Stage	Moderate
Wetted Width (m)	38	Bank Slope (degrees)	15	Wetted Width (m)	45	Bank Slope (degrees)	15	Wetted Width (m)	58	Bank Slope (degrees)	5
Bankfull Width (m)	62	Bank Stability	High	Bankfull Width (m)	73	Bank Stability	High	Bankfull Width (m)	76	Bank Stability	High
Floodplain (m)	NA	In-Stream Cover	LWD, AM	Floodplain Width (m)	N/A	In-Stream Cover	None	Floodplain Width (m)	NA	In-Stream Cover	None
<b>Riparian Vegetation (Field-based Data)</b>				<b>Riparian Vegetation (Field-based Data)</b>				<b>Riparian Vegetation (Field-based Data)</b>			
Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species	Distance from Water (m)	Community Type	% Cover	Dominant Tree or Shrub Species
0-24.0	Sg/SH	50-75	dead willow	0-28.0	S/G, SH	75-100	Dead willow	0-17.0	S/G, SH	75-100	Dead willow
24.0-50	HF	75-100	Aspen	28.0-36.0	HF	50-75	Aspen	17.0-50	HF	75-100	Aspen, hazel
				36.0-50	MF	75-100	Balsam fir, aspen (mature)				
Additional Comments				Additional Comments				Additional Comments			
Wide floodplain is within bankfull width, with dead willow trees				Wildlife: moose tracks. Wide floodplain is within bankfull width.				Wide floodplain within bankfull width			



**Appendix B      Riparian Vegetation Community and  
Water Course Characteristics of  
Waterbodies Located within 50 m of  
Final Preferred Route**



### Adjacent Water Course 1a

Adjacent Riparian Location		
GPS Location	N 50.5702 W -96.1740	Water Course Type Winnipeg River
Location relative to Final Preferred Route	South	Distance to Water Course (m) 14
Flow Regime	Perennial	
Riparian Vegetation (GIS-based Data)		
Distance from Water (m)	Stand Type Non-Forest	Age (Years) -
Dominant Species -		

### Adjacent Water Course 1b

Adjacent Riparian Location		
GPS Location	N 50.5703 W -96.1703	Water Course Type Winnipeg River
Location relative to Final Preferred Route	South	Distance to Water Course (m) 14
Flow Regime	Perennial	
Riparian Vegetation (GIS-based Data)		
Distance from Water (m)	Stand Type Trembling Aspen	Age (Years) 20
Dominant Species Trembling Aspen		

### Adjacent Water Course 1c

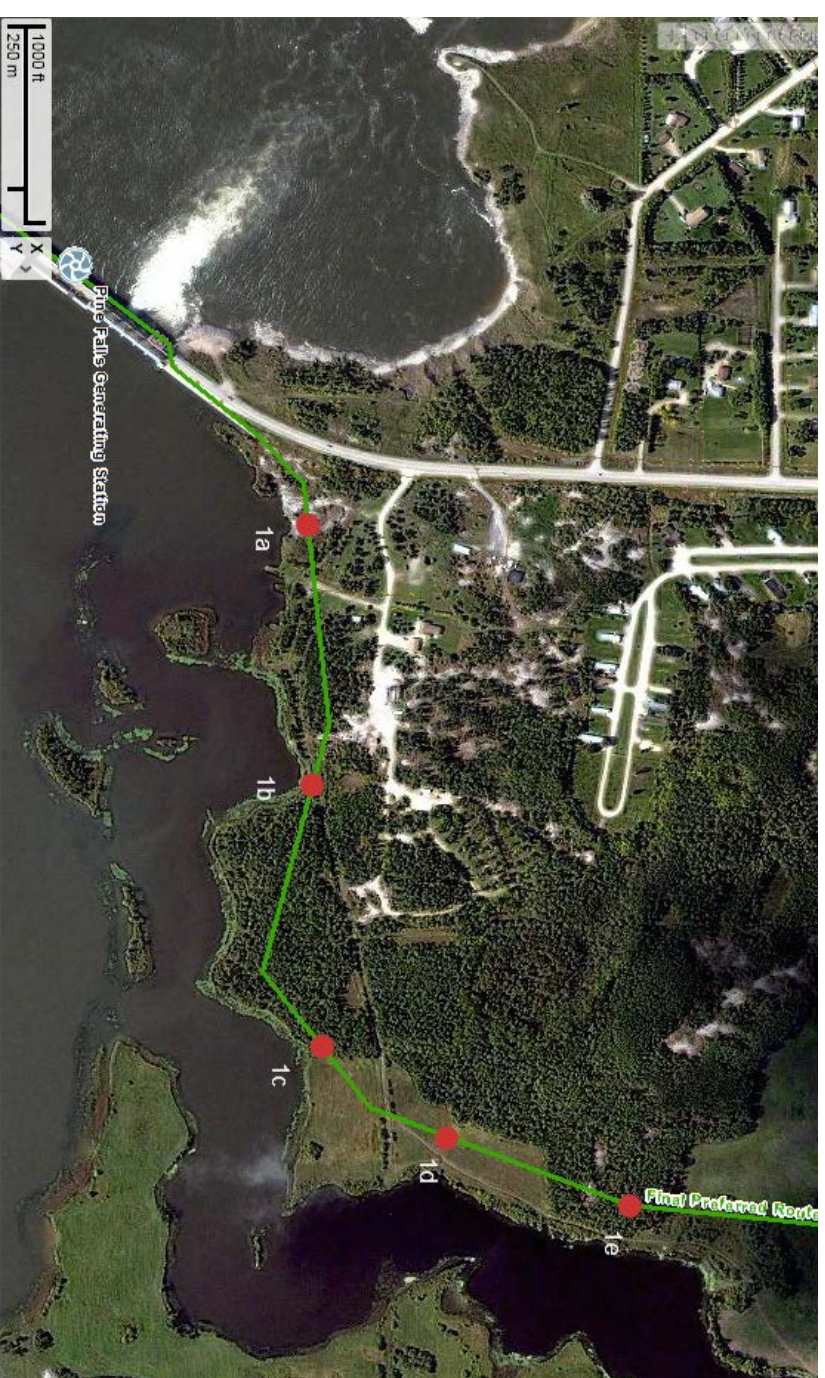
Adjacent Riparian Location		
GPS Location	N 50.5704 W -96.1664	Water Course Type Pine Creek
Location relative to Final Preferred Route	Southeast	Distance to Water Course (m) 22
Flow Regime	Perennial	
Riparian Vegetation (GIS-based Data)		
Distance from Water (m)	Stand Type Trembling Aspen	Age (Years) 45
Dominant Species Trembling Aspen		

### Adjacent Water Course 1d

Adjacent Riparian Location		
GPS Location	N 50.5715 W -96.1652	Water Course Type Pine Creek
Location relative to Final Preferred Route	East	Distance to Water Course (m) 38
Flow Regime	Perennial	
Riparian Vegetation (GIS-based Data)		
Distance from Water (m)	Stand Type Non-Forest	Age (Years) -
Dominant Species -		

### Adjacent Water Course 1e

Adjacent Riparian Location		
GPS Location	N 50.5732 W -96.1641	Water Course Type Pine Creek
Location relative to Final Preferred Route	East	Distance to Water Course (m) 47
Flow Regime	Perennial	
Riparian Vegetation (GIS-based Data)		
Distance from Water (m)	Stand Type Trembling Aspen	Age (Years) 42
Dominant Species Trembling Aspen		





### Adjacent Water Course 2

Adjacent Riparian Location			
GPS Location	N 50.6297 W -96.1247	Water Course Type	Creek
Location relative to Final Preferred Route	East	Distance to Water Course (m)	8
Flow Regime	Intermittent		
Riparian Vegetation (GIS-based Data)			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-8	Beaver	-	Beaver flood (aquatic macrophytes)



### Adjacent Water Course 3

Adjacent Riparian Location			
GPS Location	N 50.7670 W -96.1843	Water Course Type	Highway Drainage Channel
Location relative to Final Preferred Route	East	Distance to Water Course (m)	33
Flow Regime	Intermittent		
Riparian Vegetation (GIS-based Data)			
Distance from Water (m)	Stand Type	Age (Years)	Dominant Species
0-33	BS	45	Black spruce

