APPENDIX B: SEGMENT, CREEK & WETLAND ASSESSMENTS



SEGMENT ASSESSMENTS



Segment Length (m)	Shore Type	Shore	Type Modification	Slope		Land Use	Level of	Impact	Distu	rbed		Natural		Class	Comment	
521	Stream	Doc	k, Retaining Wall	Low		Park	Hig	h	90	%		10%		Sloca	an River	
Shore Type (%)		1			1				1							
Cliff/Bluff	Gravel Beau	h	Rocky Shore	San	d Beach	Stre	am Mouth	1	Wetland		Other	s				
0	30				10		60									
Land Use																
Commercial	Forestry		Natural Area	Р	ark	Rec	reation		Rural	S	ingle Far	nily	Indus	strial	Urban Park	
							х									
Substrate (%)				1												_
Marl M	ud Org	anic	Fines	Sand	Grave	el/Fine	Gravel/Cobble	C	obble	Cobble	e/Fine	Cobble/Co	barse	Boulder	Berdrock	
				60	20	2	0									
Shoreline Vegetation	n Band1									Sho	reline Ve	getation Ba	and2			
Category	Stage		Shrub Cover (%)	Tree cov	er (%)	Bandwidth	(m) Over	hanging (%)	Ca	tegory		Stag	Э	Veteran Trees	Wildlife Trees
andscape	Sparse		Sparse <10	Sparse <	:10	50	0			La	ndscaped		Span	se	No	No
Aquatic Vegetation(%)							Littora	l Zone	L						
Aquatic vegetation	Submergent	Eme	rgent	Floating			Littoral Zor	ne (m)	Juvenile Re	earing	Staging]	Migrat	ion	Large Woody	7
0							Wide >50r	n	High		Yes		Yes		No	1





Segment Length (m) Shore Type	Shore Type Modificati	on Slope	Lai	nd Use	Level of Impac	ct Distur	bed	Natur	al	Class C	omment	
302	Gravel	Dock, Retaining Wa	ll Low	Inc	dustrial	High	100	%	0%				
Shore Type (%)													
Cliff/Bluff	Gravel Beau	ch Rocky Shore	e Sand	Beach	Stream	Mouth	Wetland		Others				
	99				2	2							
and Use	-			-									
Commercial	Forestry	Natural Area	Pa	rk	Recrea	ition	Rura	S	ingle Family	Ir	dustrial	Urban Park	
											х		
Substrate(%)													
Marl	Mud Org	janic Fines	Sand	Gravel/F	ine Gra	avel/Cobble	Cobble	Cobble	e/Fine Co	bble/Coarse	Boulder	Berdrock	
				40	40	1	0				10		
Shoreline Vegetat	ion Band1						Shoreline Ve	getatio	n Band2				
Category	Stage	Shrub Cover (%) Tree Cove	r (%)	Bandwidth	(m) Ove	erhanging (%)	7	Category		Stage	Veteran Trees	Wildlife Trees
andscape	Sparse	Sparse <10	Sparse <1	0	50	0			Landscaped		Sparse	No	No
	n (%)				_	Litte	oral Zone						•
Aquatic Vegetatio	Submergent	Emergent	Floating			Littoral Zone (m)) Juvenile Rea	aring	Staging	Mi	gration	Large Woody	
Aquatic Vegetatio Aquatic vegetation	Submergent	5	-										





General Segmer									-			-		1			
Segment Length	(m)	Shore Type	Shore Type Modi	ication	Slope	La	nd Use	Level of	Impact	Distur	rbed	N	latural		Class (Comment	
589		Cliff/Bluff	Retaining Wall	Trail	Very Steep) N	atural	Medi	um	409	%		60%				
Shore Type (%)					-												
Cliff/Bluff		Gravel Beach	Rocky S	hore	Sand I	Beach	Strea	m Mouth	١	Netland		Others					
100																	
Land Use																	
Commercial		Forestry	Natural	Irea	Par	k	Recr	reation	I	Rural		Single Famil	у	Indus	trial	Urban Park	
								х									
Substrate(%)								1									
Marl	Mud	d Organ	nic Fines		Sand	Gravel/F	ine (Gravel/Cobble	С	obble	Cobbl	le/Fine	Cobble/Coa	rse	Boulder	Berdrock	
															20	80	
Shoreline Veget	ation E	Band1										Shoreline \	/egetation E	Band2			
Category		Stage	Shrub Cov	er (%)	Tree Cov	/er (%)	Bandv	vidth (m)	Overh	anging (%)		Ca	tegory		Stage	Veteran Trees	Wildlife Trees
Coniferous forest	`	Young forest	Sparse <10		Moderate 1	0-50	50		0			Coniferous	forest	Yo	oung	No	No
Aquatic Vegetat	ion (%	6)							Littora	l Zone							•
Aquatic vegetation	ו Su	ubmergent	Emergent	Flo	pating			Littoral Zon	ie (m)	Juvenile Re	aring	Staging		Migrat	ion	Large Woody	
								NA				Yes		Yes		Yes	





General Segment Classification Shore Type Modification Segment Length (m) Shore Type Slope Land Use Level of Impact Disturbed Natural Class Comment 749 Cliff/Bluff None Very Steep Natural None 0% 100% Shore Type (%) Cliff/Bluff Gravel Beach Rocky Shore Sand Beach Stream Mouth Wetland Others 100 Land Use Forestry Natural Area Park Recreation Rural Single Family Industrial Urban Park Commercial х Substrate(%) Marl Mud Organic Fines Sand Gravel/Fine Gravel/Cobble Cobble Cobble/Fine Cobble/Coarse Boulder Berdrock 5 95 Shoreline Vegetation Band1 Shoreline Vegetation Band2 Bandwidth (m) Veteran Trees Wildlife Trees Category Stage Shrub Cover (%) Tree Cover (%) Overhanging (%) Category Stage Mature forest 50 Coniferous forest Moderate 10-50 Abundant >50 0 Coniferous forest Mature No Yes Littoral Zone Aquatic Vegetation(%) Aquatic vegetation Submergent Emergent Floating Littoral Zone (m) Juvenile Rearing Migration Large Woody Staging 0 Wide >50m Low Yes Yes No





Segment Len	igth (m)	Shore Type	Shore Type Mod	ication	Slope	Lan	d Use	Level of I	mpact	Disturb	ed	Na	tural	Cla	ss Con	mment	
1521		Rock	None		Steep	Na	tural	Low	1	1%		9	9%				
Shore Type	(%)													1			
Cliff/Blu	ıff	Gravel Beac	h Rocky	hore	Sand E	Beach	Stream	m Mouth	V	Vetland		Others					
			10)													
Land Use																	
Commerc	cial	Forestry	Natural	Area	Parl	k	Recre	eation	F	Rural	S	ingle Family		Industrial		Urban Park	
			x														
Substrate(%	6)				•												
Marl	M	ud Org	anic Fines		0												
all					Sand	Gravel/Fir	ne Gr	ravel/Cobble	C	obble	Cobble	/Fine	Cobble/Coa	rse Bould	er	Berdrock	
man					Sand	Gravel/Fir	ne Gr	ravel/Cobble	20	obble	Cobble	/Fine	Cobble/Coa	rse Bould 50	ler	Berdrock 30	
					Sand	Gravel/Fir	ne Gr	ravel/Cobble		obble		/Fine Shoreline \		50	ler		
Shoreline Ve			Shrub Cove	• (%)	Tree Cover		ne Gr Bandwidtl		20	nging (%)				50	ler		Wildlife Trees
Shoreline Ve Category Coniferous for	egetatior	n Band1		. ,		(%)			20			Shoreline \	legetation	50 Band2	ler	30	Wildlife Trees Yes
Shoreline Ve Category Coniferous for	egetatior rest	Band1 Stage Young forest	Shrub Cove	. ,	Tree Cover	(%)	Bandwidtl	h (m)	20 Overha	nging (%)		Shoreline V Category	legetation	50 Band2 Stage	ler	30 Veteran Trees	
Shoreline Ve Category	egetation rest	Band1 Stage Young forest	Shrub Cove)-50	Tree Cover	(%)	Bandwidtl	h (m)	20 Overha 0 Littoral	nging (%)		Shoreline V Category	legetation	50 Band2 Stage		30 Veteran Trees	





Segment Length (n	n) Shore	е Туре	Shore Type Modification	n Slope	Land	d Use Level of	Impact D	sturbed	Natura	I	Class C	Comment	
5905	Cliff/	'Bluff	None	Very Steep	Nat	tural Non	e	0%	100%				
Shore Type (%)													
Cliff/Bluff	Grav	vel Beach	Rocky Shore	Sand B	Beach	Stream Mouth	Wetland		Others				
99						1							
Land Use													
Commercial	Fo	orestry	Natural Area	Park	< Contract of the second secon	Recreation	Rural	S	ingle Family	Inc	dustrial	Urban Park	
			х										
Substrate(%)													
Substrate(%) Marl	Mud	Organ	ic Fines	Sand	Gravel/Fin	e Gravel/Cobble	Cobble	Cobble	/Fine Cob	ble/Coarse	Boulder	Berdrock	
	Mud	Organ	ic Fines	Sand	Gravel/Fin	e Gravel/Cobble	Cobble	Cobble	/Fine Cob	ble/Coarse	Boulder 5	Berdrock 95	
Marl		Organ	ic Fines	Sand	Gravel/Fin	e Gravel/Cobble	Cobble		/Fine Cob		5		
Marl		Organ	ic Fines Shrub Cover (%)	Sand Tree Cover		e Gravel/Cobble Bandwidth (m)	Cobble Overhanging (%	<u> </u>			5		Wildlife Tr
Substrate(%) Marl Shoreline Vegeta Category Coniferous forest	tion Band1				(%)			<u> </u>	Shoreline Vege	etation Bar	5 nd2	95	Wildlife Tr No
Marl Shoreline Vegeta Category Coniferous forest	tion Band1 Stage Young f		Shrub Cover (%)	Tree Cover	(%)	Bandwidth (m)	Overhanging (%	<u> </u>	Shoreline Vege Category	etation Bar	5 nd2 Stage	95 Veteran Trees	
Marl Shoreline Vegeta Category	tion Band1 Stage Young f	forest	Shrub Cover (%) Moderate 10-50	Tree Cover	(%)	Bandwidth (m)	Overhanging (% 0 Littoral Zone	<u> </u>	Shoreline Vege Category	etation Bar	5 nd2 Stage	95 Veteran Trees	





Segment Length (m) Shore Typ	e Sl	nore Type Modification	Slope	Land	d Use	Level of Im	npact	Distur	bed		Vatural		Class (Comment	
406	Rock		Dock, Groyne	Low	Single	Family	Mediun	n	40%	6		60%				
Shore Type (%)																
Cliff/Bluff	Gravel	each	Rocky Shore	Sand	Beach	Stream	Mouth	Wet	land		Others					
	50		50													
Land Use																
Commercial	Fores	ry	Natural Area	Pa	ırk	Recrea	ation	Rura	al		Single Fam	ily	Indus	strial	Urban Park	
											х					
Substrate(%)																
Marl	Mud	Organic	Fines	Sand	Gravel/Fir	ne Gra	avel/Cobble	Cobb	le	Cobb	le/Fine	Cobble/Co	arse	Boulder	Berdrock	
			10		10	10		15						45	10	
Shoreline Vegetat	ion Band1										Shoreline	Vegetation	Band2	2		
Category	Stage		Shrub Cover (%)	Tree Cove	er (%)	Bandwidth	(m)	Overhangi	ng (%)		Category		5	Stage	Veteran Trees	Wildlife Tree
Coniferous forest	Mature fore	st	Moderate 10-50	Moderate	10-50	50		0			Conifero	us forest	S	Sparse	No	No
Aquatic Vegetatio	n (%)			•				Littoral Zo	ne							•
Aquatic vegetation	Submergent		Emergent	Floating			Littoral Zone	(m) Ju	ivenile Rea	aring	Staging		Migra	tion	Large Woody	
5	100					F	Wide >50m	Lo	w		No		No		No	





Segment Length (n	n) Shor	е Туре	Shore Type Mod	fication	Slope	Lan	d Use	Level of I	mpact	Distur	bed	1	Natural		Class	Com	iment	
10785	Cliff	Bluff	Dock		Very Steep	Na	tural	Non	e	0%			100%		Enterp	orise	Creek	
Shore Type (%)																		
Cliff/Bluff	Gra	avel Beach	Rocky	Shore	Sand B	each	Stream	n Mouth	١	Vetland		Others	5					
95							:	2										
Land Use					-													
Commercial	I	orestry	Natura	Area	Park		Recrea	ation	I	Rural		Single Fam	ily	Indu	ustrial		Urban Park	
			x															
Substrate(%)																		
Marl	Mud	Organi	c Fine		Sand	Gravel/Fir	ne Gr	avel/Cobble	С	obble	Cobbl	le/Fine	Cobble/Co	oarse	Boulder		Berdrock	
															50		50	
Shoreline Vegeta	tion Band1										S	horeline V	egetation	Band2				
Category	Stage		Shrub Cove	r (%)	Tree Cover	(%)	Bandwidth	n (m)	Overha	inging (%)		Category			Stage		Veteran Trees	Wildlife Tree
Coniferous forest	Mature	e forest	Moderate ?	0-50	Abundant >	50	50		0			Coniferou	us forest		Mature		No	Yes
Aquatic Vegetation	on (%)		•		•				Littora	Zone								•
Aquatic vegetation	Submerg	ent	Emergent	Flo	bating		Γ	Littoral Zone	e (m)	Juvenile Rea	iring	Staging		Migra	ation	L	arge Woody	
0								Wide >50m		Moderate		Yes		Yes		N	lo	







Segment Length (m) Shore Typ	e Sl	nore Type Modification	n	Slope	Land	d Use	Level of I	mpact	Disturb	ed	Na	tural		Class	Com	ment	
3050	Rock		None		Low	Nat	tural	Low		1%		9	9%					
Shore Type (%)	•							•										
Cliff/Bluff	Gravel	Beach	Rocky Shore		Sand Be	each	Strean	n Mouth	V	Vetland		Others						
50	49							1										
Land Use																		
Commercial	Fores	try	Natural Area		Park		Recre	ation	F	Rural	Si	ngle Family		Indus	trial		Urban Park	
			х															
Substrate(%)			•															
Marl	Mud	Organic	Fines	Sa	and	Gravel/Fir	ne Gr	avel/Cobble	C	obble	Cobble	/Fine	Cobble/Co	arse	Boulder		Berdrock	
				5	2	20	25		45						5			
Shoreline Vegetat	ion Band1									•	S	horeline V	egetation	Band2				
Category	Stage		Shrub Cover (%)		Tree Cover ((%)	Bandwidtl	h (m)	Overha	nging (%)		Category		S	tage		Veteran Trees	Wildlife Tree
Coniferous forest	Mature fore	st	Moderate 10-50		Abundant >	50	50		0		7	Coniferous	forest	N	ature	Ī	No	No
Aquatic Vegetatio	n (%)								Littoral	Zone						-		
Aquatic vegetation	Submergent		Emergent	Floatin	ng	7		Littoral Zon	e (m)	Juvenile Rea	ring	Staging		Migrat	ion	L	arge Woody	
20	100							Wide >50m		High		Yes		No		Ň	/es	





Segment Length	m)	Shore Type	Sho	re Type Modification	Slo	ре	Lar	nd Use	Level of I	mpact	Distur	bed	N	atural		Class C	omment	
1699		Gravel	Re	taining Wall, Dock,	Mod	erate	Singl	e Family	High	ı	1009	%		0%		Silverto	on Creek	
Shore Type (%)				<u>^</u>											-			
Cliff/Bluff		Gravel Beach		Rocky Shore		Sand Be	ach	Stream	n Mouth		Wetland		Others					
		85							15									
Land Use																		
Commercial		Forestry		Natural Area		Park		Recre	ation		Rural		Single Famil	y	Ind	ustrial	Urban Park	
													х					
Substrate(%)																		
Marl	Mud	Orga	nic	Fines	Sand		Gravel/Fi	ne Gr	avel/Cobble	C	obble	Cobbl	le/Fine	Cobble/C	oarse	Boulder	Berdrock	
						1	0	50		30						10		
Shoreline Veget	ation B	and1											Shoreline	/egetatio	n Banc	12		
Category	S	Stage		Shrub Cover (%)	Tree	Cover (%)	Bandwidth	h (m)	Overha	anging (%)		Category			Stage	Veteran Trees	Wildlife Trees
Coniferous forest	Y	oung forest		Moderate 10-50	Spars	se <10		50		0			Mixed fore	est		Sparse	No	No
Aquatic Vegetat	ion(%))			•		_	-		Littora	l Zone	_						•
Aquatic vegetatior	Sub	omergent	En	nergent	Floating				Littoral Zone	e (m)	Juvenile Rea	ring	Staging		Migr	ation	Large Woody	
40	100	า					1	1	Wide >50m		High		Yest		Yes		No	





Segment Length	ר (m)	Shore Type	Shor	e Type Modification	Slop	e La	ind Use	Level of I	mpact	Disturb	ed	Natu	ıral	Class	Comment	
3161		Gravel		Dock, Groyne	Low	1	latural	Mediu	ım	10%		90	%			
Shore Type (%	6)															
Cliff/Bluff		Gravel Beach		Rocky Shore	Sa	nd Beach	Stre	am Mouth	١	Vetland		Others				
		99						1								
Land Use																
Commercial		Forestry		Natural Area		Park	Red	creation	I	Rural	\$	Single Family		Industrial	Urban Park	
				х												
Substrate(%)														ľ		
Marl	Mu	d Orga	nic	Fines	Sand	Gravel/	Fine	Gravel/Cobble	С	obble	Cobbl	e/Fine C	obble/Coa	rse Boulder	Berdrock	
						15	1	5	25					40	5	
Shoreline Vege	etation	Band1				•				•		Shoreline Ve	getation I	Band2		
Category		Stage		Shrub Cover (%)	Tree C	over (%)	Bandwi	dth (m)	Overha	nging (%)	ר ר	Category		Stage	Veteran Trees	Wildlife Trees
Coniferous fores	st	Young forest		Moderate 10-50	Abunda	int >50	50		0		11	Coniferous for	orest	Mature	No	No
Aquatic Vegeta	ation(%	6)							Littora	Zone						•
Aquatic vegetatio	on S	ubmergent	Em	ergent F	Floating			Littoral Zon	e (m)	Juvenile Rea	ring	Staging		Migration	Large Woody	
iquallo rogolali														No		





Segment Length (n	n) Shore	е Туре	Shore Type N	odification	Slope	Lan	d Use	Level of Ir	mpact	Disturb	bed	Natu	ıral	Class	Comment	
2519	Ro	ock	Retaining W	all, Dock,	Low	Single	e Family	High	1	70%	>	30	%	Carpe	nter Creek	
Shore Type (%)			<u>^</u>		_											
Cliff/Bluff	Gra	avel Beach	Roc	ky Shore	Sand	Beach	Stream	n Mouth	V	Vetland		Others				
		50			4	10	,	10								
Land Use																
Commercial	F	orestry	Natu	ral Area	Pa	rk	Recre	ation	F	Rural	1	Single Family		Industrial	Urban Park	
											1	Х				
Substrate(%)																
Marl	Mud	Organ	ic Fi	nes	Sand	Gravel/Fi	ne Gr	ravel/Cobble	Co	obble	Cobbl	ole/Fine C	obble/Coar	se Boulder	Berdrock	
						20	20		30					30		
Shoreline Vegeta	tion Band1											Shoreline Ve	getation E	Band2		
Category	Stage		Shrub C	over (%)	Tree Cove	r (%)	Bandwidth	h (m)	Overha	nging (%)		Category		Stage	Veteran Trees	Wildlife Trees
Coniferous forest	Mature	forest	Moderat	e 10-50	Moderate	10-50	50		0			Coniferous for	orest	Sparse	No	No
Aquatic Vegetatio	n(%)				•				Littoral	Zone				•		
Aquatic vegetation	Submerg	ent	Emergent	FI	oating			Littoral Zone	e (m)	Juvenile Rea	aring	Staging		Migration	Large Woody	
	70		30				ł	Wide >50m		High		Yes		Yes	No	





Segment Length (n			Shore Type Modificatio	n Slope	Lan	d Use	Level of In	nnact	Disturb	ed	Nat	iral		Class Cr	omment	
• • ·		51	51		_			npact						01233 00	omment	
4522	Rock	(Retaining Wall, Trail	Low	Na	tural	Low		1%		99	%				
Shore Type (%)	•						•				•		•			
Cliff/Bluff	Grave	el Beach	Rocky Shore	Sand E	leach	Stream	n Mouth	V	Wetland		Others					
10	:	35	54				1									
Land Use																
Commercial	For	estry	Natural Area	Parl	(Recre	ation	F	Rural	<i>v</i> ,	Single Family		Industrial		Urban Park	
			х													
Substrate(%)																
Marl	Mud	Organio	: Fines	Sand	Gravel/Fi	ne Gr	avel/Cobble	C	obble	Cobble	e/Fine (obble/Co	arse Bo	ulder	Berdrock	
					20	15		35					20		10	
Shoreline Vegeta	tion Band1								•	S	Shoreline Ve	getation	Band2			
Category	Stage		Shrub Cover (%)	Tree Cover	(%)	Bandwidt	h (m)	Overha	inging (%)		Category		Stage		Veteran Trees	Wildlife Trees
Coniferous forest	Mature fo	orest	Moderate 10-50	Abundant >	>50	50		0			Coniferous f	orest	Mature		No	Yes
Aquatic Vegetatio	on (%)							Littoral	Zone							
Aquatic vegetation	Submergen	t	Emergent	Floating			Littoral Zone	(m)	Juvenile Rea	ring	Staging		Migration		Large Woody	
2	100						Wide >50m		Moderate		Yes		No		No	





0 11 11	ent Class				· ·							01 0		
Segment Length	h (m)	Shore Type	Shore Type Modification	on Slope	La	nd Use	Level of Impac	ct Disturi	bed	Natu	al	Class C	Comment	
239		Gravel	None	Low	Inc	dustrial	High	90%	6	10%	, D			
Shore Type (%	6)													
Cliff/Bluff		Gravel Beach	Rocky Shore	San	d Beach	Stream M	Mouth	Wetland		Others				
		100												
Land Use														
Commercial	l	Forestry	Natural Area	Р	ark	Recreati	ion	Rural	Si	ngle Family	Ir	ndustrial	Urban Park	
												х		
Substrate(%)							•							
Marl	Mud	l Orgai	- In Electron											
		o.gu	nic Fines	Sand	Gravel/F	ine Grav	/el/Cobble	Cobble	Cobble/	/Fine Co	bble/Coarse	Boulder	Berdrock	
		. orga	10 Fines	Sand	Gravel/F 35	ine Grav	vel/Cobble 2		Cobble	/Fine Co	bble/Coarse	Boulder 2	Berdrock	
Shoreline Vege	etation B			Sand						/Fine Co		2	Berdrock	
					35		2		Sł			2	Berdrock Veteran Trees	Wildlife Trees
Category	S	Band1	10		35 ver (%)	33	2	20	Sł	noreline Veg	etation Bar	2 nd2		Wildlife Trees
Category Coniferous fores	st Y	Band1 Stage Young forest	10 Shrub Cover (%)	Tree Cov	35 ver (%)	33 Bandwidth ((m) Ove 0	20	Sł	noreline Veg Category	etation Bar	2 nd2 Stage	Veteran Trees	
Shoreline Vege Category Coniferous fores Aquatic Vegetati Aquatic vegetati	st Y ation(%)	Band1 Stage Young forest	10 Shrub Cover (%)	Tree Cov	35 ver (%)	33 Bandwidth (50	(m) Ove 0	erhanging (%) oral Zone	sr	noreline Veg Category	etation Ban	2 nd2 Stage	Veteran Trees	





General Segment	Classification														
Segment Length (m) Shore Type	Sh	nore Type Modification	n Slope	Lar	nd Use	Level of Im	npact Di	sturbed		Natural		Class C	Comment	
246	Gravel		Retaining Wall	Low	Ind	ustrial	High		100%		0%				
Shore Type (%)															
Cliff/Bluff	Gravel Be	ach	Rocky Shore	Sand	Beach	Stream	m Mouth	Wetland		Other	s				
	100														
Land Use			-				1								
Commercial	Forest	у	Natural Area	Pa	ark	Recre	eation	Rural		Single Farr	nily	Industrial		Urban Park	
												х			
Substrate(%)			•												
Marl	Mud 0	rganic	Fines	Sand	Gravel/Fi	ne Gi	ravel/Cobble	Cobble	Cobb	ole/Fine	Cobble/Co	barse	Boulder	Berdrock	
			90									10			
Shoreline Vegetat	ion Band1								·	Shoreline	e Vegetatior	n Band2			
Category	Stage		Shrub Cover (%)	Tree Cove	er (%)	Bandwidt	h (m)	Overhanging (%)	Category	ý	Stage		Veteran Trees	Wildlife Trees
Herb/Grass	Herb/Grass		Sparse <10	Sparse <	10	50		0		None		None		No	No
Aquatic Vegetatio	n (%)						L.	ittoral Zone				•			
Aquatic vegetation	Submergent	1	Emergent	Floating			Littoral Zone	(m) Juvenile	Rearing	Staging)	Migration		Large Woody	
20	100						NA	Low		No		No		Yes	





Segment Length (I	n) Shoi	ге Туре	Shore	Type Modification	n Sl	ре	Land	Use	Level of Ir	npact	Disturb	bed		Natural		Class C	omment		
721	G	ravel	Retai	ning Wall, Dock,	L	w	Single	Family	High		100%	6		0%					
Shore Type (%)				<u>^</u>							•								
Cliff/Bluff	Gi	ravel Beach		Rocky Shore		Sand Be	ach	Strean	n Mouth	١	Vetland		Other	s					
		100																	
Land Use							///////		I			- <u>-</u>							
Commercial		Forestry		Natural Area		Park		Recre	ation		Rural		Single Fan	nily	Indu	istrial	Urbar	Park	
													х						
Substrate(%)																			
Marl	Mud	Organ	nic	Fines	Sand		Gravel/Fin	e Gr	ravel/Cobble	С	obble	Cobb	ole/Fine	Cobble/Co	barse	Boulder	В	erdrock	
				20		2	5	25		20						10			
Shoreline Vegeta	tion Band	1											Shoreline	e Vegetation	n Band	2			
Category	Stage		S	Shrub Cover (%)	Tree	Cover (%)	Bandwidth	h (m)	Overha	nging (%)		Categor	/		Stage	Vete	eran Trees	Wildlife Trees
Herb/Grass	Grass	/herb	N	Noderate 10-50	Spar	se <10		50		0			Conifero	us forest		Mature	No		No
Aquatic Vegetati	on(%)						_	_		Littora	Zone								•
Aquatic vegetation	Submer	gent	Emer	rgent	Floating				Littoral Zone	e (m)	Juvenile Rea	ring	Stagin	9	Migra	ation	Large V	/oody	
25	100		1						Wide >50m		Moderate		Yes		No		No		





Segment Len	gth (m)	Shore Type	Sho	ore Type Modification	Slope	Lai	nd Use	Level of I	mpact	Distur	bed	Nat	tural		Class C	omment	
522		Stream		Dock	Low	I	Park	None	e	0%	5	10	0%		Wilso	n Creek	
Shore Type	(%)	1			I												
Cliff/Blu	ff	Gravel Beac	h	Rocky Shore	Sand	Beach	Strea	m Mouth	V	/etland		Others					
								100									
and Use																	
Commerc	cial	Forestry		Natural Area	Par	rk	Recr	eation	F	ural		Single Family		Industr	ial	Urban Park	
					х												
Substrate(%	6)																
Marl	Mu	ud Org	anic	Fines	Sand	Gravel/F	ine G	Gravel/Cobble	Co	obble	Cobb	le/Fine	Cobble/Coa	rse	Boulder	Berdrock	
				10		20	20)	40						10		
Shoreline Ve	egetation	n Band1										Shoreline Ve	getation E	Band2			
Category		Stage		Shrub Cover (%)	Tree Cove	r (%)	Bandwid	th (m)	Overha	nging (%)		Category		Sta	ige	Veteran Trees	Wildlife Tr
Coniferous for	rest	Mature forest		Moderate 10-50	Sparse <1	0	50		0			Coniferous	forest	Ma	ture	No	No
001111010000101	etation ((%)			•				Littoral	Zone							•
Aquatic Veg		Colore and a set	En	nergent Fl	oating			Littoral Zone	e (m)	Juvenile Rea	aring	Staging		Migratio	n	Large Woody	
	ation S	Submergent	-	norgoni	9						-						





Segment Lengt	:h (m)	Shore Type	Shore 1	Type Modification	Slope	Lan	d Use Level of	Impact	Disturb	bed	Natu	ral	Class (Comment	
316		Gravel	Retainin	ng Wall, Dock, Trail	Moderate	P	ark Hi	gh	70%	b	309	6			
Shore Type (%	%)						•				•				
Cliff/Bluff		Gravel Beac	ı	Rocky Shore	Sand	Beach	Stream Mouth	W	/etland		Others				
		100													
Land Use					1			1		<u> </u>					
Commercia	ıl	Forestry		Natural Area	Par	ĸ	Recreation	R	ural		Single Family		Industrial	Urban Park	
					х										
Substrate(%))														
Marl	Muc	d Org	anic	Fines	Sand	Gravel/Fin	e Gravel/Cobble	Co	bble	Cobb	le/Fine C	obble/Coar	se Boulder	Berdrock	
				20		20	20	20					20		
	etation I	Band1			•				•		Shoreline Veg	etation B	and2	- I	
Shoreline Veg		Store	S	hrub Cover (%)	Tree Cover	r (%)	Bandwidth (m)	Overhar	nging (%)		Category		Stage	Veteran Trees	Wildlife Trees
		Stage									Mixed forest		Mature	No	Yes
Shoreline Veg Category Coniferous fore:		Young forest		Noderate 10-50	Moderate 7	10-50	50	0			mintod renost		Wature		
Category Coniferous fore:	st	Young forest		Noderate 10-50	Moderate	10-50	50	0 Littoral	Zone		linkou forost		Wature		
Category	st tation (%	Young forest			Moderate *	10-50	50 Littoral Zo	Littoral	Zone Juvenile Rea	ring	Staging	1	Migration	Large Woody	





General Segme																
Segment Length	ר (m)	Shore Type	Sho	re Type Modification	Slope	L	and Use	Level of I	mpact	Disturb	ed	Na	tural	Class	Comment	
7317		Rock	R	etaining Wall, Trail	Moderat	e I	Vatural	Non	е	0%		1(0%			
Shore Type (%	6)		1													
Cliff/Bluff		Gravel Beau	:h	Rocky Shore	San	d Beach	Strea	m Mouth	V	Vetland		Others				
				99				1								
Land Use																
Commercial		Forestry		Natural Area	Р	ark	Recr	eation	F	Rural		Single Family		Industrial	Urban Park	
				х												
Substrate(%)																
Marl	Mu	ud Org	anic	Fines	Sand	Gravel/	Fine C	Gravel/Cobble	C	obble	Cobb	le/Fine	Cobble/Coa	rse Boulder	Berdrock	
						3	2		10					85		
Shoreline Vege	etation	n Band1		т. – т.								Shoreline V	egetation l	Band2		
Category		Stage		Shrub Cover (%)	Tree Cov	/er (%)	Bandwid	th (m)	Overha	nging (%)		Category		Stage	Veteran Trees	Wildlife Tree
Coniferous forest	t	Young forest		Moderate 10-50	Abundan	nt >50	50		0		1	Coniferous	forest	Mature	No	No
Aquatic Vegeta	ation ((%)			•				Littoral	Zone	_					
Aquatic vegetatio	on S	Submergent	E	mergent	Floating			Littoral Zone	e (m)	Juvenile Rea	ring	Staging		Migration	Large Woody	
2	1	100						Narrow		Low		No		No	No	





Segment Length (m)	Shore Type	Shore Type Modific	ation Slope	Lan	d Use Level of I	mpact Distur	bed	Natural	Class C	Comment	
873	Stream	Trail	Low	Na	tural Low	ı 5%		95%	Bonan	za Creek	
Shore Type (%)											
Cliff/Bluff	Gravel Bea	h Rocky Sh	ore San	d Beach	Stream Mouth	Wetland	C	thers			
	50				50						
Land Use											
Commercial	Forestry	Natural A	ea P	ark	Recreation	Rural	Single	Family	Industrial	Urban Park	
		х									
Substrate(%)				1							
Marl	Mud Org	janic Fines	Sand	Gravel/Fir	ne Gravel/Cobble	Cobble	Cobble/Fine	cobble/C	oarse Boulder	Berdrock	
				90	9				1		
						1	Shor	eline Vegetatio	n Band2		
Shoreline Vegetati	on Band1										
	on Band1 Stage	Shrub Cover	%) Tree Cov	ver (%)	Bandwidth (m)	Overhanging (%)		gory	Stage	Veteran Trees	Wildlife Trees
Shoreline Vegetati Category Coniferous forest		Shrub Cover Abundant >5	· ·	· ,	Bandwidth (m) 50	Overhanging (%) 0	Cate			Veteran Trees No	Wildlife Trees Yes
Category Coniferous forest	Stage Mature forest		· ·	· ,	.,	0 0	Cate	egory	Stage		
Category	Stage Mature forest		· ·	· ,	.,	0 Littoral Zone	Cate	egory	Stage		





Segment Length (r	n) Shore Type	Shore Type M	odification	Slope	Lar	nd Use	Level of Ir	npact	Disturb	bed	Natur	al	Class	Comment	
493	Sand	Retaining W	III, Dock	Moderate	Singl	e Family	High	I	100%	6	0%				
Shore Type (%)															
Cliff/Bluff	Gravel Bea	h Roci	y Shore	Sand I	Beach	Stream	n Mouth	W	etland		Others				
				10	00										
Land Use															
Commercial	Forestry	Natu	al Area	Par	k	Recrea	ation	R	ural	Si	ngle Family	I	ndustrial	Urban Park	
											Х				
Substrate(%)															
Marl	Mud Or	anic Fi	es	Sand	Gravel/Fi	ne Gr	avel/Cobble	Co	bble	Cobble	/Fine Co	bble/Coars	e Boulder	Berdrock	
			1	00											
	tion Band1	•								S	horeline Veg	etation Ba	nd2		
Shoreline Vegeta	Stage	Shrub C	ver (%)	Tree Cover	· (%)	Bandwidth	n (m)	Overhan	ging (%)		Category		Stage	Veteran Trees	Wildlife Trees
				C	ı	50		0		7	Landscaped		Sparse	No	No
Shoreline Vegeta Category Herb/Grass	Herb/Grass	Sparse -	10	Sparse <10	5										
Category Herb/Grass		Sparse «	10	Sparse < It	, 			Littoral	Zone						
Category		Emergent		bating			Littoral Zone		Zone Juvenile Rea	ring	Staging	N	ligration	Large Woody	





General Segment Classification Segment Length (m) Shore Type Shore Type Modification Slope Land Use Level of Impact Disturbed Natural Class Comment 3426 Rock Retaining Wall, Dock, Steep Natural None 0% 100% Shore Type (%) Cliff/Bluff Gravel Beach Rocky Shore Sand Beach Stream Mouth Wetland Others 95 4 1 Land Use Commercial Forestry Natural Area Park Recreation Rural Single Family Industrial Urban Park х Substrate(%) Marl Mud Organic Fines Sand Gravel/Fine Gravel/Cobble Cobble Cobble/Fine Cobble/Coarse Boulder Berdrock 5 10 15 5 3 60 Shoreline Vegetation Band1 Shoreline Vegetation Band2 Category Stage Shrub Cover (%) Tree Cover (%) Bandwidth (m) Overhanging (%) Category Stage Veteran Trees Wildlife Trees Coniferous forest Mature forest Moderate 10-50 Abundant >50 Coniferous forest No 50 0 Mature Yes Aquatic Vegetation (%) Littoral Zone Floating Migration Large Woody Aquatic vegetation Submergent Emergent Littoral Zone (m) Juvenile Rearing Staging Dehr 100 25 Narrow High Yes Yes No





Segment Leng	gth (m)	Shore Type	Sho	ore Type Modificatio	n Slope	Li	and Use	Level of	Impact	Distur	bed	Nat	ural	Class	Comment	
2216		Gravel		Dock	Moderat	e l	Vatural	Nor	ne	0%	, D	10	0%	Shan	non Creek	
Shore Type ((%)				•									•		
Cliff/Bluf	f	Gravel Beau	:h	Rocky Shore	San	d Beach	Strea	m Mouth	١	Wetland		Others				
		79		20				1								
Land Use																
Commerci	ial	Forestry		Natural Area	Р	ark	Recr	eation	I	Rural	S	ingle Family		Industrial	Urban Park	
				x												
Substrate(%))															
Marl	M	ud Orç	anic	Fines	Sand	Gravel/	ine (Gravel/Cobble	С	obble	Cobble	e/Fine (Cobble/Co	arse Boulder	Berdrock	
					15		35	5	35					10	5	
Shoreline Ve	getation	n Band1			1						S	horeline Ve	getation	Band2		
Category		Stage		Shrub Cover (%)	Tree Cov	er (%)	Bandwid	lth (m)	Overha	inging (%)		Category		Stage	Veteran Trees	Wildlife Trees
Coniferous for	est	Mature forest		Moderate 10-50	Abundan	t >50	50		0			Coniferous f	orest	Mature	No	No
Aquatic Vege	etation	(%)			•				Littora	Zone						
Aquatic vegeta	ation	Submergent	E	mergent	Floating			Littoral Zon	e (m)	Juvenile Rea	aring	Staging		Migration	Large Woody	
60		100						Wide >50m	ı	High		Yes		Yes	No	





quatic vegetation	Submergent	E	mergent F	oating			Littoral Zone Wide >50m	. ,	Juvenile Rea Moderate	aring	Staging Yes		Migration No	Large Woody	
Aquatic Vegetatio				tim -			Littered Zerr	Littora			Cto ala a		Al	Lanna Marada	
Coniferous forest	Mature fores		Moderate 10-50	Abundant :	>50	50		0			Coniferous for	est	Mature	No	No
Category	Stage		Shrub Cover (%)	Tree Cover	· (%)	Bandwid	th (m)	Overha	inging (%)		Category		Stage	Veteran Trees	Wildlife Tre
Shoreline Vegetat	ion Band1										Shoreline Vege	etation B	and2		
						5		5					60	30	
Marl	Mud (rganic	Fines	Sand	Gravel/Fi	ne G	Gravel/Cobble	С	obble	Cobbl	e/Fine Co	bble/Coar	se Boulder	Berdrock	
Substrate(%)	•		•	•											
			х												
Commercial	Forestr	/	Natural Area	Par	k	Recr	eation	I	Rural	1	Single Family		Industrial	Urban Park	
and Use			99				I								
oiiii/bidii	Glaver be		99	Sund L	beach	5000	1		i ciuna		others				
Shore Type (%) Cliff/Bluff	Gravel Be	ach	Rocky Shore	Sand E	Beach	Stroa	m Mouth	١	Wetland		Others				
4327	Rock		Dock	Steep	Na	tural	Non	e	0%	•	100%	6			
Segment Length (m	51	Sh	ore Type Modification	Slope		d Use	Level of I	·	Distur		Natur		Class (Comment	





)		submerger		Emergent		louting			Wide >50m	.,	Low	ung	Yes	, ,	Yes	011	No	
Aquatic Vege Aquatic vegeta		%) Submerger	ht	Emergent	F	loating			Littoral Zon	Littora	Zone Juvenile Re	aring	Stagin	n	Migrati	on	Large Woody	
Coniferous fore	st	Mature fo	orest	Moderat	9 10-50	Abundant	>50	50		0			Conifere	ous forest	Ma	ature	No	No
Category		Stage		Shrub C	ver (%)	Tree Cove	er (%)	Bandwidt	h (m)	Overha	nging (%)		Categor	у	St	age	Veteran Trees	Wildlife Tree
Shoreline Veg	getatior	n Band1					-						Shorelin	e Vegetation I	Band2			
							5	5								10	80	
Marl	Mu	bu	Organic	Fi	es	Sand	Gravel/Fir	ne G	ravel/Cobble	C	obble	Cobb	ole/Fine	Cobble/Coa	rse	Boulder	Berdrock	
Substrate(%))						I											
					х													
Commercia	al	Foi	restry	Natu	al Area	Pa	ark	Recre	eation	I	Rural		Single Far	nily	Indust	rial	Urban Park	
Land Use																		
100					-													
Cliff/Bluff		Grave	el Beach	Roc	y Shore	Sand	Beach	Strear	m Mouth	١	Vetland		Othe	'S				
Shore Type (%)						1				1							
1256		Cliff/B	luff	Nor	Э	Steep	Na	itural	Non	ie	0%	6		100%		Wragg	e Creek	
Segment Leng	th (m)	Shore -	Гуре	Shore Type N	odification	Slope	Lan	d Use	Level of	Impact	Distu	rbed		Natural		Class C	omment	





Segment Length (I	n) Shor	е Туре	Shore	Type Modification	۱	Slope	Lan	d Use	Level of I	mpact	Distur	oed	Na	tural		Class C	Comment		
22964	R	ock	D	Oock, Groyne	Ν	Moderate	Na	itural	Low	/	1%		9	9%					
Shore Type (%)																			
Cliff/Bluff	Gr	avel Beach		Rocky Shore		Sand Be	ach	Stream	n Mouth	١	Wetland		Others						
30		10		59					1										
Land Use																			
Commercial		Forestry		Natural Area		Park		Recre	ation		Rural		Single Family		Industria	I	Urban Park	(
				х															
Substrate(%)																			
Marl	Mud	Orgar	nic	Fines	Sa	ind	Gravel/Fir	ne Gi	avel/Cobble	С	obble	Cobbl	e/Fine	Cobble/Coa	rse	Boulder	Berdro	ck	
					2			5							50)	43		
Shoreline Vegeta	tion Band1										•		Shoreline V	egetation	Band2		•		
Category	Stage		5	Shrub Cover (%)	Т	Free Cover (%)	Bandwidt	h (m)	Overha	nging (%)		Category		Stag	е	Veteran ⁻	Trees	Wildlife Trees
Coniferous forest	Mature	e forest	Ν	Moderate 10-50	A	Abundant >5	0	50		0			Coniferous	forest	Matu	ire	No		No
Aquatic Vegetati	on (%)									Littora	Zone	I							
Aquatic vegetation	Submerg	jent	Emer	rgent	Floating	9			Littoral Zone	e (m)	Juvenile Rea	ring	Staging		Migration		Large Woody	/	
			-						Wide >50m		Moderate		Yes		Yes		No		





General Segment Segment Length (n		be S	Shore Type Modification	on	Slope	Lar	nd Use	Level of I	mpact	Distur	oed	Natu	ural	Class	Comment	
6567	Cliff/Blut	f F	Retaining Wall, Groyn	е	Moderate	N	atural	Low		1%		99	%			
Shore Type (%)								1								
Cliff/Bluff	Gravel	Beach	Rocky Shore		Sand Be	each	Stream	n Mouth	V	Vetland		Others				
99								1								
Land Use																
Commercial	Fores	stry	Natural Area		Park		Recre	ation	F	Rural		Single Family		Industrial	Urban Park	
			х													
Substrate(%)																
Marl	Mud	Organic	Fines		Sand	Gravel/Fir	ne Gr	avel/Cobble	Co	obble	Cobbl	e/Fine C	obble/Coar	se Boulder	Berdrock	
				2										40	58	
Shoreline Vegeta	tion Band1											Shoreline Ve	getation I	Band2		
Category	Stage		Shrub Cover (%)		Tree Cover	(%)	Bandwidth	n (m)	Overha	nging (%)		Category		Stage	Veteran Trees	Wildlife Trees
Coniferous forest	hiferous forest Mature forest		Sparse <10 A		Abundant >50		50		0		Conifer		orest	Mature	No	No
Aquatic Vegetatio	on(%)								Littoral	Zone				•		
Aquatic vegetation	Submergent		Emergent	Floati	ing	7		Littoral Zone	(m)	Juvenile Rea	ring	Staging		Migration	Large Woody	
0							-	Wide >50m		Moderate		Yes		Yes	No	





Segment Length (m) Shore	Туре	Shore T	Type Modification	۱	Slope	Lan	d Use	Level of Impact		Distur	Disturbed		Natural		Class Comment		ent	
711	Stre	am	Retaini	ing Wall, Groyne		Moderate	Natural,Si	ngle Family	Hig	jh	459	%	5	5%					
Shore Type (%)																			
Cliff/Bluff	Grav	vel Beach		Rocky Shore		Sand	Beach	Stream	Mouth	V	Vetland		Others						
				40				60	D										
Land Use						1		l											
Commercial	Fo	orestry		Natural Area		Par	rk	Recrea	tion	F	lural		Single Family		Indus	trial	Ur	ban Park	
													х						
Substrate(%)																•			
Marl	Mud	Organ	ic	Fines		Sand	Gravel/F	ne Gra	vel/Cobble	Co	obble	Cobbl	le/Fine	Cobble/Coa	arse	Boulder		Berdrock	
					5		5	5								55	3	30	
Shoreline Vegeta	tion Band1												Shoreline Ve	getation	Band2				
Category	Stage		S	hrub Cover (%)		Tree Cove	r (%)	Bandwidth	(m)	Overha	nging (%)		Category		St	tage	١	Veteran Trees	Wildlife Trees
Coniferous forest	oniferous forest Mature forest		S	parse <10		Moderate 10-50		50	0				Coniferous forest		Mature		I	No	No
Aquatic Vegetation	n(%)					*				Littoral	Zone		•						*
Aquatic vegetation	Submerge	ent	Emerg	gent	Floa	ating			Littoral Zon	e (m)	Juvenile Rea	ring	Staging		Migrati	on	Larg	je Woody	
30	65		35						Wide >50m		High		Yes		Yes		No		



CREEK ASSESSMENTS

Silverton, Carpenter and Wilson Creeks, located in the most urbanized sections of the Slocan Lake foreshore, have had their downstream sections channelized in the past. These creeks have undergone multiple modifications in the past, including acting as conduits for storm water, extensive riparian clearing and bank stabilization and straightening of their channels to reduce flooding within the towns. However, these streams have sufficient flow and still contain fish and spawning habitat for species like kokanee, rainbow trout and bull trout and likely for fish species such as sculpins and suckers. Whatever their present condition, there remains potential for improvement of fish habitat in all these creeks.

Large streams, such as Silverton, Carpenter, Wilson, Bonanza, Shannon, Wragge, Wee Sandy and Evans creeks, contain the majority of critical habitat for most fish species using riverine habitats in their life cycle (e.g., rainbow trout, westslope cutthroat trout, bull trout, kokanee). Except for Silverton Creek, the lower reaches of these streams are in most part in good condition. Silverton Creek has been influenced by urbanisation, most of its riparian vegetation was removed and replaced by lawns or by zones of exposed soil.

Most of the creeks around Slocan Lake are not likely fish bearing due to natural barriers created by the high gradients on their lower reaches. The lower reaches of the larger creeks such as Enterprise, Evans, Wee Sandy and Silverton may be accessible to fish but high gradients quickly act as fish barriers in the upstream sections. Some of these creeks however are known to support a resident fish population. Many years ago, the headwaters of creeks such as Enterprise, Silverton, Carpenter and Shannon were stocked with fish by local prospectors and trappers. Wilson and Bonanza are the only Slocan Lake tributaries with no known fish barrier in their lower reaches.

Although located in a highly developed area, the Slocan Lake outlet (Segment 1) offers excellent spawning grounds within the margins of the lake outflow. The site has long outwash gravel bars with half-embedded boulders. During the survey, most fish observed were within the tailout of the lake outlet. Fish species of all stages were observed using the area, including schools of YOY and juvenile fish.



Bonanza Creek runs through this wetland. The dense shrub vegetation within the marsh and along the riparian area of the creek provides excellent overhanging cover for fish. Mountain whitefish (Derosa, pers. comm. 2008) and sculpins spp. (Kokanee 1997) are known to utilize the complex wetland channel system. Birds are particularly abundant in the marsh, due to the availability of food and the diversity of habitats for nesting and rearing. The tall grasses of the marsh provide nesting habitat for duck and goose species while several older stands of cottonwood and western red cedar offer potential nesting habitat for raptors and for cavity nesters like wood ducks and pileated woodpeckers and for the blue-listed blue heron.

Various species of reptiles and amphibians are also present in Bonanza Marsh (Kokanee 1997). Juvenile pacific tree frogs (Hyla regilla) are known to inhabit the shrub vegetation of the marsh (Kokanee 1997). The shrub vegetation also provides a rich and diverse habitat, which many mammals use for cover and as migration corridors. Signs of bears and ungulates such as, deer and elk were observed throughout the area. The marsh has a series of stagnant pools and several side channels showing evidence of beaver activity, further increasing the complexity of the habitat (Kokanee 1997, Gebhart 2000).



APPENDIX C: Fish & Wildlife Results



Table 1: Wildlife Obser	vations and	Habitat	Quality
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Segment #	Species Observed	Location	Wildlife Signs	Habitat Quality
1 Slocan			-deer browse on foreshore	RATED POOR: -segment located within town boundary, segment highly utilized by
				pedestrians and as a public beach
				-most shrub vegetation removed
				-some avian habitat but poor potential habitat for mammals, reptiles
				& amphibians
2				RATED POOR:
Slocan				-segment located within the town boundary & industrial zone
				-no riparian area, highly disturbed foreshore
				-presence of 2 creek mouths within industrial foreshore
3	2 American krestrels	In tunnel & cliff	-	RATED MODERATE:
	1 common flicker	Feeding on moths outside tunnel	-	-some riparian area within the northern section of segment -log boom along littoral
	3 common mergansers	Within littoral zone	-	-abandoned tunnel offers nesting potential for avian species
4	2 hawks (spp.)	Perched in riparian area	-5 wildlife trees	RATED EXCELLENT:
4			-3 veteran trees	-highly diversified riparian & upland areas
				-dense mature forest with veteran & wildlife trees
				-nesting potential for avian species
5	1 bald eagle	Perched in a veteran tree	-1 wildlife tree	RATED EXCELLENT:
-	i i che e cigite		-1 veteran tree	-highly diversified riparian & upland areas
				-dense mature forest with veteran & wildlife trees
				-nesting potential for avian species
6	1 black bear	In riparian area	-bear & deer scats	RATED MODERATE:
	2 ospreys	Perched in riparian area		-although the riparian and upland forest offer good wildlife habitat,
				human disturbance from the proximity of the cottages must impact
				wildlife habitat
7			-3 wildlife trees	RATED MODERATE:
			-1 veteran tree	-although the riparian and upland forest offer good wildlife habitat,
				human disturbance from the proximity of the cottages must impact
	1		-6 wildlife trees	wildlife RATED MODERATE:
8	1 osprey	Within riparian area		
	2 mergansers	Within littoral	-6 veteran trees	-habitat wildlife habitat diversity but access difficult due to high bank gradient good wildlife habitat diversity but access difficult due to
	3 Barrow' goldeneyes	Within littoral	-	high bank gradient
	4 bald eagles	Perched on veteran tree within		-dense shrub undercover offers potential habitat for small mammals
		riparian area		-presence of seepages & outcrop faces offer habitat for amphibians
				& small mammals
				-presence of a commercial wharf



Segment #	Species Observed	Location	Wildlife Signs	Habitat Quality
9	1 white-tailed deer	Within riparian area	 -7 wildlife trees -4 veteran trees -several deer trails -several deer browses -1 bear tree with claw marks & fur 	RATED EXCELLENT: -vegetated shore offers feeding grounds for mammals -avian & small mammals habitat potential within the veteran & wildlife trees -dense riparian & upland forest
			-bear scat	-seepages, bedrock & boulders within riparian offer suitable habitat for reptiles & amphibians
10	3 common mergansers	Within littoral zone		RATED POOR:
Silverton	2 gull spp.	At the creek's mouth	7	-some foreshore modifications & thin riparian area
	2 Canada goose	Within the littoral zone		-segment located within the village of Silverton
	3 common ravens	Within the riparian area		-public beach
	2 common mergansers	Within the littoral zone		-pedestrian trails within the segment
	1 American dipper	On a rock, within the creek		-thin riparian vegetation along the creek
	1 mallard	Along foreshore		-creek mouth offers good feeding habitat for fish-eating bird &
		5		mammal species
				-poor nesting potential
11			bear scat	RATED MODERATE:
				-riparian & upland forest offer potential avian habitat
				-some undercover removal with poor habitat potential for small
				mammals
				-mixed forest with suitable undercover for small mammals
40	E se di sustino da	Les manufactures estates de las constallas	harven herveren Orteraler anderslide af	-footprint of a campsite area
12 Navy Damage	5 red squirrels	In mature stands in public	-beaver browses & tracks each side of	RATED POOR:
New Denver	E aadan waxin na	campground	creek & within lake foreshore	-segment located within town boundary -segment highly disturbed by a public marina, parking lot & housing
	5 cedar waxings	In mature stands within riparian	-deer browses within riparian area	-segment nightly disturbed by a public marina, parking lot & housing -small pedestrian trails & Galena Trail within riparian area
		area		-2 groynes
13	5 red squirrels	Within riparian area	-several deer tracks & 5 deer scats within	RATED EXCELLENT:
15	5 red squirreis	Within hpanan area	riparian & on Galena Trail	-mature forest & shrub layer offer habitat to small & large mammals
			-deer browses in riparian undercover	-abundance of berry bushes along the shore
			-6 bear scats within riparian & Galena Trail	-several windfall trees offer habitat to small mammals
				-riparian has no modifications
14			-several bear scats & deer tracks on	RATED POOR:
Rosebery			Galena Trail	-some mature trees but industrial activities (log boom & staging
neeeuorj				area) & highway at proximity
				-outcrop slope mixed with second growth stands offer some reptile
				habitat
15				RATED POOR:
Rosebery				-massive industrial retaining wall
2				-modified foreshore
				-log boom staging covers all segment
				-no riparian vegetation



Segment #	Species Observed	Location	Wildlife Signs	Habitat Quality			
16 Rosebery				RATED POOR: -segment located within housing area & boat launch -presence of several groynes -lawn replacing riparian vegetation			
17 Rosebery			-several coyote, deer and beaver tracks within foreshore & gravel bars -several deer & beaver browses within foreshore	RATED MODERATE: -riparian all removed on creek left bank & foreshore -suitable mammal habitat in Rosebery Parkland			
18 Rosebery	1 bald eagle	Perched in a veteran tree	 -2 veteran trees -1 bald eagle nest in mature cottonwood within riparian -deer & beaver browses within riparian 	RATED MODERATE: -most of Rosebery Parkland includes in segment -large portion of undercover shrubs -portion of riparian disturbed by highway's footprint -potential for avian habitat within the Parkland where mature stands, veteran trees & shrubs may act as nesting area			
19	2 western toads	On foreshore	-10 veteran trees	RATED EXCELLENT:			
	1 river otter	On foreshore	-2 wildlife trees	-potential for wildlife habitat within riparian			
	1 pileated woodpecker	Within riparian	-bear & deer tracks on Galena Trail	-good reptile habitat within seepage zones & angular rocks (blasted			
	1 common raven	Within riparian		rocks from highway construction) along the Galena Trail shoulders -mature forest extends approx. 60m upland with several veteran trees -thick layer of shrubs offers excellent browsing for ungulates & habitat for perching			
20	10 cedar waxings	Within creek's riparian	-several veteran & wildlife trees within	RATED EXCELLENT:			
Hills	2 dark-eyed juncos	Within creek's riparian	Bonanza Marsh	-segment entirely located within Bonanza Marsh			
	2 bald eagles	•	-abundant songbird species nests -3 eagle nests (spp.) in mature trees	-complex wetland system with abundant shrub species -abundant berry shrubs			
	5 gull (spp.)	Along creek bank					
	2 bald eagle	Within littoral	-3 beaver dams on Bonanza Creek	-excellent avian & mammal habitats although segment surrounded			
	1 eagle (spp.)	Within riparian		by private lands & highly utilized as a fishing area & public beach			
	3 eared grebe	Within riparian	- abundant bear, coyote & beaver tracks	-excellent reptile & amphibian habitat			
	1 sandpiper (spp.)	On braided outlet	on foreshore -abundant beaver browses	-good feeding habitat for raptor & duck species -excellent nesting habitat for raptors (veteran & mature trees)			
	7 common raven	Within riparian	-4 bear scats on foreshore	-wetland & fish bearing Bonanza Creek offer excellent weasel, mink			
	4 American crows	Within riparian		& river otter habitat			
	9 common mergansers	Within littoral		-plenty of woodpecker habitat within beaver ponds (hollow trees)			
	7 mallards	Within littoral		[
	1 killdeer	On braided outlet					
	1 mink	On creek's bank					
21 Hills	26 Canada geese	Within foreshore area, on private lands & docks		RATED POOR: -segment highly disturbed by vegetation removal, housing & human activities			
22	1 black-capped chickadee	Within riparian	 -4 wildlife trees -hundreds of deer tracks & browsed patches within riparian 	RATED EXCELLENT: -forest of mature stands up to the high water mark -excellent overhanging vegetation -highly diversified vegetation -excellent mammal & avian habitat			



Segment #	Species Observed	Location	Wildlife Signs	Habitat Quality
23	2 American crows	In riparian	-hundreds of deer tracks & browse	RATED EXCELLENT:
	2 bald eagles		patches within riparian	-forest of mature stands up to the high water mark
	2 Barrow's goldeneyes		7 wildlife trees	-excellent overhanging vegetation
	1 eagle (spp.)		-7 veteran trees	-highly diversified vegetation
			-several deer tracks & browses within	-excellent mammal & avian habitat
			riparian	-excellent riparian vegetation with thick undercover layer
				-presence of several seepage grounds offering herptile habitat
				-good nesting habitat & browsing vegetation
24	4 gull (spp.)	In littoral zone & riparian		RATED EXCELLENT:
	1 hawk (spp.)			-excellent mammal & avian habitat
				-excellent riparian vegetation with thick undercover layer
				-presence of several seepage grounds offering herptile habitat
				-good nesting habitat & browsing vegetation
				-presence of rocky islands with minimal vegetation (2 shrubs)
25	1 salamnder (spp.)	On rocky outcrop on foreshore	-7 wildlife trees	RATED EXCELLENT:
	1 common Gartner snake	In shale formation on foreshore	-12 veteran trees	-forest of mature stands up to the high water mark
	2 Barrow's goldeneyes	In riparian		-good overhanging vegetation
	5 5	'		-shale formations & angular rocks offer excellent habitat for herptiles
				and small mammals
				-presence of several seepage grounds offering herptile habitat
26			-abundant wildlife & veteran trees	RATED EXCELLENT:
Valhalla Park			-abundant raptor and passerine nests	-forest of mature stands up to the high water mark
				-good overhanging vegetation
				-shale formations & angular rocks offer excellent habitat for herptiles
				and small mammals
				-presence of several seepage grounds offering herptile habitat
				-excellent nesting & browsing habitat
27			-abundant wildlife & veteran trees	RATED EXCELLENT:
Valhalla Park			-abundant raptor and passerine nests	-forest of mature stands up to the high water mark
				-good overhanging vegetation
				-shale formations & angular rocks offer excellent habitat for herptiles
				and small mammals
				-presence of several seepage grounds offering herptile habitat
				-excellent nesting & browsing habitat
28	10 cedar waxings	In riparian	-5 perching bird nests	RATED EXCELLENT:
	5 dark-eyed juncos	4	-several deer tracks & browses within	-although riparian & upland areas have some disturbances
	1 common flicker		riparian	(cottages, trails), segment has excellent attributes for wildlife habitat



Segment #	Sampling					Fish S	becies O	bserved					General Observations
0	technique	BB	С	КО	CSU	MW	NSC	RB	RSC	CC	CCG	CRH	
1 Slocan	VO, UC, SK				32	87	3	3	100		4		HIGH FISH QUALITY HABITAT: -High quality fish habitat for all stages & species -Abundant habitat & available spawning substrate -Except for RSC, most species associated with littoral edge
2 Slocan	VO, UC, SK												HIGH FISH QUALITY HABITAT: -Presence of a log boom & segment highly modified with disturbed shoreline -2 creek mouths
3	VO, UC												LOW FISH QUALITY HABITAT: -SK was impossible due to a large log boom
4	VO, UC, SK												LOW FISH QUALITY HABITAT: -steep littoral
5	VO, UC, SK					23			150	3			LOW FISH QUALITY HABITAT: -RSC & MW found in boulder habitat associated with littoral edge -CC found in shallow cobbles -Uniform substrate, poor fish cover
6	VO, UC, SK												LOW FISH QUALITY HABITAT: -steep littoral, poor fish cover
7	VO, UC, SK					4				4			LOW FISH QUALITY HABITAT: -CC found between cobbles, MW observed in boulder habitat on littoral edge -Potential shore spawning habitat for KO -Some large & small woody debris -private beach associated with recreational activities
8	VO, UC, SK		7			108	1	3	722	5	53	13	MODERATE FISH QUALITY HABITAT: -All species observed within littoral edge -Segment with a very steep drop-off -Presence of large woody debris -MW & RB observed in fast water, in large pools in Enterprise Creek -MW also found schooling and cruising the outlet sandy bottom of Vevey & Enterprise creeks
9	VO, UC, SK		4			22				46	878		HIGH FISH QUALITY HABITAT: -CC observed in gravel & round cobbles in shallow areas -MW observed cruising the littoral edge -Potential MW spawning habitat
10 Silverton	VO, UC, SK				10	86			202	10			HIGH FISH QUALITY HABITAT: -RSC observed on boulder-cobble outcrop -Presence of large woody debris -MW schooling & observed feeding from the surface to bottom in creek's outflow -CC were dispersed & larger CC observed using larger substrate
11	VO, UC, SK		50		22	19	2			34			MODERATE FISH QUALTIY HABITAT: -Fish observed between boulders & angular rocks (from highway construction) at the edge of littoral zone
12 New Denver	VO, UC, SK		15	2	20	8	13		36	42			HIGH FISH QUALITY HABITAT: -All fish observed along littoral edge in shallow cobbles and in very steep littoral drop-off in Carpenter Creek's mouth -1 KO carcass

Table 2: Fish observations & general fish habitat



Segment #	Sampling					Fish Sp	oecies Ob	oserved	ł			General Observations
	technique							RB				
13	VO, UC, SK		10				1		90	13		MODERATE FISH QUATLIY HABITAT:
												-NSC & CC found in shallow cobbles
												-RSC found in boulder outcrops along littoral drop-off
												-Potential spawning habitat for MW & KO
												-Abundant small woody debris deposit associated with old mining activities
14	VO, UC, SK								30	15		LOW FISH QUALITY HABITAT:
Rosebery												-All fish observed were hiding in substrate
15	VO, UC											LOW FISH QUALITY HABITAT:
Rosebery												-Extensive debris from log boom activities
Reservery												-No SK
16	VO, UC, SK								Ì			MODERATE FISH QUALITY HABITAT:
Rosebery	-,,											-Good mix of gravel/ cobbles & some fish cover
												-Littoral disturbed by several private beaches, groynes, docks, etc.
17	VO, UC, SK		2	1		69		2		14		HIGH FISH QUALITY HABITAT:
Rosebery			_					_				-Very productive segment located within Wilson Creek's mouth
Research												-Plenty of invertebrate, outflow extends 50m offshore
												-MW & RB observed feeding in outflow
18	VO, UC, SK				1	22			40	13		MODERATE FISH QUALITY HABITAT:
Rosebery					-							-Large submerged barge
Research												-MW & RSC observed using the abandoned barge as a feeding area
19	VO, UC, SK	1	1		10	36				9		LOW FISH QUALITY HABITAT:
		-	-							-		-CC & MW observed feeding on littoral drop-off
												-1 dead burbot
												-Potential shore spawning habitat for KO
												-C & CC observed between boulders
												-no diversity in substrate, poor fish cover
20	VO, UC, SK		1	20	2	45						HIGH FISH QUALITY HABITAT:
Hills	-,, -											-segment includes Bonanza Creek's mouth
												-thick layer of aquatic vegetation
												-KO carcasses only
												-C hiding in vegetation
												-MW observed feeding & using sand/silt patches near vegetation
21	VO, UC, SK					36			60	1		HIGH FISH QUALITY HABITAT:
Hills												-Bonanza Creek's alluvial fan overlap this segment
												-thick layer of aquatic vegetation
												-KO carcasses only
												-All fish observed were hiding in vegetation
22	VO, UC, SK								1			HIGH FISH QUALITY HABITAT:
												-diversify substrate with potential for spawning, feeding & sheltering
23	VO, UC, SK											HIGH FISH QUALITY HABITAT:
	,, ok											-diversify substrate with potential for spawning, feeding & sheltering



Segment #	Sampling					Fish S	pecies O	bserved					General Observations
	technique	BB	С	КО	CSU	MW	NSC	RB	RSC	CC	CCG	CRH	
24	VO, UC, SK		1		22		107	1					MODERATE FISH QUALITY HABITAT: -MW observed feeding within steep shoreline -C observed between boulders & abundant large woody debris -Potential shore spawning habitat for KO (outwashed gravel bars, groundwater seepage, angular cobbles) -RB & some CSU observed within Shannon Creek's outlet
25	VO, UC, SK			1		12		1	570			2	LOW FISH QUALITY HABITAT: -Low diversity in substrate, poor fish cover -MW & CRH observed hiding between scarce boulders -RSC schooling along steep shoreline -RB observed along shoreline -KO carcass
26 Valhalla Park	VO, UC												MODERATE FISH QUALITY HABITAT: -some diversity in fish cover -cobble, gravel, boulder, large woody debris -some areas steep littoral drop-off zones -no SK in Park
27 Valhalla Park	VO, UC, SK												MODERATE FISH QUALITY HABITAT: -highly diversified fish habitat -cobble, gravel, boulder, large woody debris -some areas steep littoral drop-off zones -no SK in Park
28	VO, UC, SK				3	8			3	20			HIGH FISH QUALITY HABITAT: -RSC & RB observed on boulder outcrop -CC & CSU observed in shallow cobbles -MW observed cruising the steep shoreline drop-off -aquatic vegetation fish cover -Slocan River outlet overlaps this segment
TOTAL	= 4141	1	91	23	122	585	127	10	2003	229	935	15	

.Sampling technique; VO (visual observation), UC (underwater camera), SK (snorkeling)

.Fish species: BB (burbot), C (cyprinids spp.), KO (kokanee), CSU (largescale sucker), MW (mountain whitefish), NSC (northern pikeminnow), RB (rainbow trout), RSC (redside shiner), CC (sculpin spp.), CCG (slimy sculpin), CRH (torrent sculpin)



Shore type					Fis	h Species	s Observe	ed			
	BB	С	KO	CSU	MW	NSC	RB	RSC	CC	CCG	CRH
ream mouth				32	87	3	3	100		4	
		2			69		2		14		
		1	20	2	45						
				3	8			3	20		
Sub-Total=418		3	20	37	209	3	5	103	34	4	
and					36			60	1		
Sub-Total=97					36			60	1		
avel				10	86			202	10		
		50		22	19	2			34		
								30	15		
				1	22			40	13		
Sub-Total=556		50		33	127	2		272	72		
ocky					23			150	3		
					4				4		
		4			22				46	878	
		15	2	20	8	13		36	42		
		10				1		90	13		
	1	1		10	36				9		
		1		22		107	1				
Sub-Total=1572	1	31	2	52	93	121	1	276	117	878	
iff/Bluff		7			108	1	3	722	5	53	13
			1		12		1	570			2
Sub-Total=1498		7	1		120	1	4	1292	5	53	15
TOTAL FISH	1	91	23	122	585	127	10	2003	229	935	15
TOTAL FISH PECIES=4141	1	91	23	122	585	127	10	2003	229	935	

Table 3: Number of fish species observed per shore type



APPENDIX D:

Rare & Endangered Fish Species



Rare & Endangered Species

White Sturgeon (Acipenser transmontanus)

Most of the information available on the white sturgeon, and outlined briefly here, was compiled by R.L & L. Environmental Services in reports they published in the late 90s (1996, 1998, 2000). Anecdotal reports of white sturgeon sightings, years ago, suggested that remnant populations of white sturgeon may have been trapped behind or between the dams on both the Columbia and Kootenay Rivers and in larger lakes and tributaries of these systems. White sturgeon in Arrow Lake Reservoir were identified as a remnant population isolated from the parent population in the Columbia River by the construction of the Hugh L. Keenleyside Dam.

The presence of white sturgeon in Arrow Reservoir and Slocan Lake was first documented in 1995 when two fish were captured during the survey. To obtain additional information on this population, a second survey was conducted in 1996 and a third in 1997. One of the same fish captured in the 1996 survey. The tagged pre-spawning female was frequently tracked between November 1996 and March 1998. This fish exhibited localized movements in the Wragge Creek islands area and frequently visited Nemo Creek, Wee Sandy and Shannon Creek mouths. The shore of the lake in this area is characterized by large rocky island outcrops with some sand and silt substrates. Depths off these outcrops can be up to 90 m. White sturgeon have previously been observed by anglers in those areas. This high frequency of movement by a female in pre-spawning condition combined with a consistent selection of areas near tributary mouths was interpreted as a search for a spawning site (R.L. & L 1998, 2000). The frequent movements of the pre-spawning female may indicate suitable spawning habitats were not available in the Slocan Lake system. The capture of only two white sturgeon in Slocan Lake during three years of intensive study suggest the population density in the lake is very low and may consist of only a few individuals.

The limited availability of suitable spawning habitats and the absence of juveniles in the catch suggest the population is not reproducing successfully (R.L. & L 1996). The availability and suitability of white sturgeon spawning habitat in Slocan Lake was also examined during these studies. White sturgeon in other areas of the Columbia River drainage typically spawn in fast flowing water. In Slocan Lake, this type of habitat is only available in the lower reaches of some inflowing tributaries and in the Slocan River. Wilson Creek is the largest of the tributaries entering Slocan Lake. Investigations of this area revealed that although the lower reaches of the creek exhibit suitable flow velocities (i.e., greater than 1.0 m/s surface velocities) and substrates (clean cobble/boulder) for spawning, stream depths of less than 1 m in many areas may limit spawner access into the stream. Examination of Carpenter, Enterprise, and Silverton creeks revealed these systems also were too shallow (i.e., depths of less than 1 m) for use by spawning sturgeon. In addition, water temperatures in these tributaries are lower than the 14 to 16°C preferred by white sturgeon that spawn in the Waneta area of the Columbia River (R.L. & L. 1996). The same depth and temperature limitations also apply to all of the other tributaries that enter the lake. The only outflowing tributary, Slocan River, has limited potential to be used as a spawning area. Slocan River has areas with surface velocities greater than 1.0 m/s and clean cobble/boulder substrates, although depths rarely exceed 2 m. Any newly hatched larvae spawned in Slocan River would most likely be transported down into Brilliant Reservoir. To date, sampling in this reservoir has failed to capture white sturgeon.

Sturgeon movements related to feeding activity are influenced by factors such as water temperature and stream discharge that may influence catch-rates (COSEWIC 2003). The mouths of tributaries that supported spawning runs of kokanee were identified as good feeding grounds for white sturgeon (RL&L 2000). In 1995 and 1996, a fish was located in the Wragge Creek confluence area over the fall and winter period which suggested a use of this area for overwintering. The most striking feature of the Slocan Lake white sturgeon is the dark brown, almost black coloration (RL&L 2000).



Bull trout (Salvelinus confluentus)

In the Slocan Lake area, the bull trout is often mistakenly called "Dolly Varden" by local anglers. Bull trout and Dolly Varden look very similar, and were once considered the same species, but taxonomic work, published in 1978 and accepted by the American Fisheries Society in 1980, identified bull trout as distinct from the Dolly Varden. Compared to Dolly Varden, bull trout are generally larger, with a relatively longer and broader head. Bull trout are mainly an inland species, while Dolly Varden are more common in coastal areas. In British Columbia, the Dolly Varden and the bull trout have overlapping habitats along the coast, and both species can be found within the coastal watersheds.

The blue-listed bull trout is not well documented in Slocan Lake and its watershed. The only available data are from several Slocan Lake tributary reports conducted under the former Forest Renewal Inventory Program (Aquatic Resources 1996, Timberland 1999, 2000 & 2003, Kokanee 1997 & 2001). Bull trout presence was confirmed in the lake's main tributaries like Enterprise, Silverton, Carpenter, Wilson, Shannon, Wragge and Bonanza Creeks but no bull trout studies are available for the lake itself. During the tributary inventories, adfluvial bull trout were observed utilizing the lower reaches (Timberland 2000) for spawning or rearing.

According to several surveys, the Slocan Lake tributaries are suspected to support both resident and adfluvial populations of bull trout (Timberland 1999 & 2000, Kokanee 1997 & 2001). During these tributary surveys, bull trout were sampled in higher numbers than the rainbow trout. This may be explained by the fact that bull trout are a predatory species (Scott and Crossman 1990) and are more adapted to higher gradients and high water velocities (Ford *et al* 1995). The adfluvial bull trout share the same Salmonid habitat requirements as the rainbow trout and kokanee and, like them, utilize the entire lake and its foreshore for rearing, feeding, overwintering and migrating. Alluvial fans are important areas for foraging and staging and cliff/bluff shore types provide easy access to prey.

Westslope cutthroat trout (Oncorhynchus clarkia lewisi): Historic stocking of sport fish in Slocan Lake dates back to 1911 when 50,000 westslope cutthroat trout were released in the lake and several thousands more in a few headwater lakes of the watershed (FISS 2010, Timberland 1999 & 2000).

Westslope cutthroat trout are expected to utilize the Slocan Lake and tributary habitat in a similar manner to that of the other sport fish (i.e., kokanee, bull trout). They use the lake as a migratory corridor to gain access to their tributary spawning grounds. Young fish are expected to move into the lake habitat, to feed and seek refuge. The Slocan Lake watershed is suspected to carry both fluvial and adfluvial westsltope cutthroat trout populations. There is no existing data on lacustrine spawning habitat in Slocan Lake. According to Shephard *et al* (1984), except for the summer when water temperatures rise, cutthroat trout, like other salmonid species, will be associated with near-surface water. During the several stream samplings conducted between 1997 and 2003, (Timberland 1999, 2000 & 2003, Kokanee 1997 & 2001) westslope cutthroat trout were found in Enterprise, Shannon, Wilson, Silverton Creeks and the Slocan River. Some of these streams also supported resident westslope cutthroat trout populations within their watershed. No specific data on the adfluvial fish population was found in the literature review. Lake foreshore habitat utilization for westslope cutthroat trout is expected to be similar to that of bull trout, and other cold water salmonid species. As mentioned above, the species would likely be seeking out deep cool waters during the summer. With a maximum depth of 298 m and a mean depth of 171 m (Pieters 2001), cold-water refuge is easily accessed in Slocan Lake.

Creek outlets and lower tributary reaches are the only potential habitat areas for staging/spawning and rearing in Slocan Lake. Cliff/Bluff and Low Rocky shore types are suitable for adults since these areas provide deeper refuge habitat. More rigorous sampling will provide further information about this species' habitat utilization along the foreshore.



APPENDIX E: Aquatic Habitat Index Results



AQUATIC HABITAT INDEX

Level of Impact	Level of Impact (% of Shoreline)	Shore Length (m)
High	8.84%	7770
Moderate	4.73%	4158
Low	44.92%	39500
None	41.52%	36509
	Total SI	hore Length 87936.8

Table1: Total shore length with a High, Moderate and Low Level of Impact

Table 2: Total length of natural and disturbed shorelines and their associated land uses

	Shoreline Length (%)	Shoreline Length (m)	Natural Shore Length (m)	Disturbed Shore Length (m)	Natural (%)	Disturbed (%)
Agriculture	0.0%	0	0	0	0.0%	0.0%
Commercial	0.0%	0	0	0	0.0%	0.0%
Conservation	0.0%	0	0	0	0.0%	0.0%
Forestry	0.0%	0	0	0	0.0%	0,0%
Industrial	0.9%	788	0	788	0.0%	0.0%
Multi Family	0.0%	0	0	0	0.0%	0.0%
Natural Area	89.4%	78654	77600	1053	98.7%	1.3%
Park	2.0%	1772	1103	668	62.3%	37.7%
Recreation	0.7%	590	354	236	60.0%	40.0%
Rural	0.0%	0	0	0	0.0%	0.0%
Single Family	7.8%	6846	1650	5196	24.1%	75.9%
Urban Park	0.0%	0	0	0	0.0%	0.0%
Transportation	0.0%	0	0	0	0.0%	0.0%
Institutional	0.0%	0	0	0	0.0%	0.0%



Shore Type	Description	Percentage of Total Shoreline (%)	Total Shoreline Length (m)
Rocky Shore	Cobble, boulder or bedrock substrate often prevalent along the base of steeper shorelines	41.4%	36441
Cliff / Bluff	Adjacent to steeper slopes, usually indicating a steep-sided lake basin or sudden drop-off	37.5%	32963
	Often associated with low gradient foreshore,		
Gravel Beach	coves with pockets of riparian vegetation among steeper hillsides or alluvial fans	17.4%	15274
Stream Mouth	A segment covered by a stream mouth	2.5%	2212
Sand Beach	Often associated with alluvial fans or other shoreline deposition areas	1.2%	1048
Wetland	A segment covered by a wetland	0.0%	0
Other		0.0%	0
Total		100.00%	87937

Table 3: Total length of shoreline and	associated percentages within	the different shore types
Table 5. Total length of shoreline and	associated percentages within	the unrelent shore types



Segments	Fines	Sand	Gravel Fin	Gravel_Coa	Cobble	Boulder	Bedrock
Jegments 1	0	2.4	<u>01aver_</u> 111 2	0rave_coa 2	91000 0		Dedrock 0
2	0	0	4	4	1.2	0.8	0
3	0	0	0	0	0	1.6	1.6
4	0	0	0	0	0	0.4	1.9
5	0	0	0	0	2.4	4	0.6
6	0	0	0	0	0	0.4	1.9
7	0.8	0	1	1	1.8	3.6	0.2
8	0	0	0	0	0	4	1
9	0	0.2	2	2.5	5.4	0.4	0
10	0	0	1	5	3.6	0.8	0
11	0	0	1.5	1.5	3	3.2	0.1
12	0	0	2	2	3.6	2.4	0
13	0	0	2	1.5	4.2	1.6	0.2
14	0.8	0	3.5	3.3	2.4	0.16	0
15	7.2	0	0	0	0	0.8	0
16	1.6	0	2.5	2.5	2.4	0.8	0
17	0.8	0	2	2	4.8	0.8	0
18	1.6	0	2	2	2.4	1.6	0
19	0	0	0.1	0.2	1.2	6.8	0.04
20	0	0	9	0.9	0	0.08	0
21	0	4	0	0	0	0	0
22	0.24	0.2	0.5	0	1.2	4.96	0.3
23	0	0.6	0	3.5	4.2	0.8	0.1
24	0	0	0	0.5	0.6	4.8	0.6
25	0	0	0.5	0.5	0	0.8	1.6
26	0	0.08	0	0.5	0	3.2	0.86
27	0	0.08	0	0	0	3.2	1.16
28	0	0.2	0.5	0.5	0	4.4	0.6

Table 4: Model value for substrate percentage per segment



Land Uses	% of Shoreline Length	Shoreline Length (m)	Natural Shore Length (m)	Disturbed Shore Length (m)	% Natural	% Disturbed
Agriculture	0.0%	0	0	0	0.0%	0.0%
Commercial	0.0%	0	0	0		
Conservation	0.0%	0	0	0	0.0%	0.0%
Forestry	0.0%	0	0	0		
Industrial	0.9%	788	0	788	0.0%	100.0%
Multi Family	0.0%	0	0	0	0.0%	0.0%
Natural Area	89.4%	78654	77600	1053	98.7%	1.3%
Park	2.0%	1772	1103	668	62.3%	37.7%
Recreation	0.7%	590	354	236	60.0%	40.0%
Rural	0.0%	0	0	0		
Single Family	7.8%	6846	1650	5196	24.1%	75.9%
Urban Park	0.0%	0	0	0		
Transportation	0.0%	0	0	0	0.0%	0.0%
Institutional	0.0%	0	0	0	0.0%	0.0%

Table 5: Summary of Natural & Disturbed Shoreline versus Land Uses

Table 6: Natural versus Disturbed Shorelines per shore type

Shore Type	Natural Shore Length (m)	Disturbed Shore Length (m)	% Natural	% Disturbed
Cliff / Bluff	32589	374.2	98.9%	1.1%
Rocky Shore	34967	1473.9	96.0%	4.0%
Gravel Beach	10833	4440.7	70.9%	29.1%
Sand Beach	179	868.8	17.1%	82.9%
Stream Mouth	1749	463.0	79.1%	20.9%
Wetland	0	0.0	0.0	0.0
Other	0	0.0	0.0%	0.0%



Type of Modifications	Total (#)	# Per km
Docks	38	0.43
Groynes	66	0.75
Boat Launch	0	0.00
Mooring Buoy	0	0.00
Retaining Walls	29	0.33
Marinas	0	0.00
Marine Rails	0	0.00

Table 7:	I otal number and	l density (# per kn	n) of different sl	horeline modifications

Table 8: Shoreline impacted by substrate modification, road and railways, and retaining walls

Category	Shoreline (%)	Shore length (m)
Roadway	3%	2764
Retaining Wall	2%	1607
Railway	11%	9339
Substrate Modification	4%	3120
Total Shore Length		87937

