2001 Forest Renewal BC Funded

ENHANCING ENVIRONMENTAL VALUES PROGRAM ROAD DEACTIVATION PRESCRIPTIONS

(Torkelson and Babine Watersheds)

Prepared for:
Pacific Inland Resources
(A Division of West Fraser Mills Ltd.)

Prepared by:

Ed Withers, AScT, Silvicon Services Inc.
Watershed Restoration Supervisor
for
Pacific Inland Resources
August 2001

Table of Contents and List of Schedules

Table 2 TSEZAKWA SUB-BASIN / TORKELSON WATERSHED ROAD DEACTIVATION Contract Number

Associated Cutting Permit	Main Road System	Road Name	Road Length (km)	# Of Cross Ditches	# Of Culverts for Removal	Recommended Equipment	Other Required Construction	Level Of Deactivation	Post deactivation Vehicle Access
CP 518-1	441 Road	518	2.247	0	1	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 518-2	441 Road	518A	.579	0	0	N/A	N/A	N/A	ATV
Notes:		No Deactivation Required							
CP 522-2	441 Road	522A	1.372	2	2	Mid sized (200) excavator	N/A	Permanent	4x4
Notes:									
CP 522-2	441 Road	522B	.297	1	1	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 522-2	441 Road	522C	1.110	4	2	Mid sized (200) excavator	N/A	Permanent	4x4
Notes:									
N/A	Km 4044	French Peak Tr.	8.971	6	4	Mid sized (200) excavator	N/A	Permanent	4x4
Notes:		Recreational use trail							
Total length of prescribed roads		14.576km							

Additional Notes:
Average depth of fill over metal culverts is **1.0m**
Maximum depth of fill over metal culverts is **1.5m**
Where possible, culverts will be salvaged, destroyed culverts will be buried at a nearby site
Contractor will be required to place a warning sign, provided by PIR, at the beginning of each road system
Contractor will be required to grass seed all disturbed ground at deactivated sites

Table 3 NILKITKWA LAKE SUB-BASIN / BABINE WATERSHED ROAD DEACTIVATION Contract Number

Associated Cutting Permit	Main Road System	Road Name	Road Length (km)	# Of Cross Ditches	# Of Culverts for Removal	Recommended Equipment	Other Required Construction	Level Of Deactivation	Post deactivation Vehicle Access
CP 523-2	444	523 2A	2.724	9	2	Mid sized (200) excavator	N/A	Permanent	4x4
Notes:									
CP 523-2	444	523 2B	.409	2	0	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 523-3	444	523 3A	1.661	5	4	Mid sized (200) excavator	1 Bury metal debris	Permanent	ATV
Notes:									
CP 523-3	444	523 3B	.240	0	1	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 523-3	444	523 3C	.341	2	1	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 571-8	448	571 8A	.650	3	1	Mid sized (200) excavator	N/A	Permanent	4x4
Notes:									
CP 571-8	448	571 8B	.770	1	3	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 571-6	448	571 6A	.287	0	0	N/A	N/A	N/A	4x4
Notes:		No Deactivation Required							
CP 571-6	448	571 6B	.379	2	0	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 519-1	448	519 1A	.603	2	0	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 519-1	448	519 1B	.402	1	0	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 571-5	Km 4052	452	1.220	0	0	N/A	N/A	N/A	ATV
Notes:		No Deactivation Required							
Total length of prescribed roads		9.686km							

Additional Notes:
Average depth of fill over metal culverts is **0.8m**
Maximum depth of fill over metal culverts is **1.5m**
Where possible, culverts will be salvaged, destroyed culverts will be buried at a nearby site
Contractor will be required to place a warning sign, provided by PIR, at the beginning of each road system
Contractor will be required to grass seed all disturbed ground at deactivated sites

Table 4 NICHYESKWA SUB-BASIN / BABINE WATERSHED ROAD DEACTIVATION Contract Number

Associated Cutting Permit	Main Road System	Road Name	Road Length (km)	# Of Cross Ditches	# Of Culverts for Removal	Recommended Equipment	Other Required Construction	Level Of Deactivation	Post deactivation Vehicle Access
CP 520-1	455	520 1	.764	1	0	Mid sized (200) excavator	N/A	Permanent	4x4
Notes:									
CP 521-1	455	521 1	.487	0	0	N/A	N/A	N/A	ATV
Notes:		No Deactivation Required							
CP 520-2	455	520 2	.418	0	0	N/A	N/A	N/A	ATV
Notes:		No Deactivation Required							
CP 521-2	455	521 2	.114	0	0	N/A	N/A	N/A	No access
Notes:		No Deactivation Required							
CP 521-3	455	521 3	2.051	1	7	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
CP 521-4	455	521 4	.441	0	0	N/A	N/A	N/A	ATV
Notes:		No Deactivation Required							
CP 520-4	455	520 4	.780	0	1	Mid sized (200) excavator	N/A	Permanent	ATV
Notes:									
Total length of prescribed roads			5.055km						

Additional Notes:
Average depth of fill over metal culverts is **1.0m**
Maximum depth of fill over metal culverts is **2.5m**
Where possible, culverts will be salvaged, destroyed culverts will be buried at a nearby site
Contractor will be required to place a warning sign, provided by PIR, at the beginning of each road system
Contractor will be required to grass seed all disturbed ground at deactivated sites

DATE: July 30, 2001

WATERSHED NAME OR OPERATING AREA: Torkelson Watershed - Tsezakwa Sub-basin

MAIN ROAD NAME: 441 ROAD

LEVEL OF DEACTIVATION: PERMANENT

ROAD NAME	ROAD LENGTH (km)	PRESCRIPTION SYMBOL AND #	DESCRIPTION OF SITE TREATMENT	RECOMMENDED OPERATIONS	DEPTH OF FILL(m)	SUPERVISION SAFETY ISSUES	Current Level of Access	Final level of Access	EST. TIME (min)
518	2.247	518RWC1	Remove wood culvert	See construction notes	1.5	Inferred S4	ATV	ATV	120
522A	1.372	CMP1	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
		CMP2	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
		522A RMC1	Remove 500mm cmp	See construction notes	1.5	NCD	4x4	4x4	90
		522A RMC2	Remove 500mm cmp		1.0		4x4	4x4	60
522B	.297	CMP3	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
		522B RMC1	Remove 500mm cmp	See construction notes	1.2	Inferred S4	ATV	ATV	45
522C	1.110	CMP4	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
		CMP5	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
		CMP6	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
		522C XD1	Shallow crossditch				4x4	4x4	15
		522C RMC2	Remove 500mm cmp		1.2		4x4	4x4	90
		522C RMC3	Remove 900mm cmp	See construction notes	1.5	Inferred S4	4x4	4x4	150
Total	5.026km							Total	660

CONSTRUCTION NOTES

DESCRIPTION: Tsezakwa Sub-Basin within the Torkelson Watershed

WRP SITE: 441 Road System

CONTRACT NUMBER: _____

518RWC1

- Remove wood culvert
- Remove woody debris from the stream
- Slope approaches for ATV access
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- This crossing is roughly 600m from this streams confluence with Tsezakwa Creek
- This stream is classified as an Inferred S4 class stream, use silt fences during construction
- Possible fish species within this stream are Dolly Varden, rainbow trout and coho salmon
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Skeena Region Works Windows for coho salmon are from June 1 to August 15
- Crush and spread any large woody debris

check coho timing.

So where will it be important?

June 1 - Aug 15

522A RMC1

- Deposit one truck load of clean rock at the site prior to construction
- Remove 500 cmp
- Slope approaches for 4x4 access
- Accumulated ditch water creates an NCD class stream, use silt fences due to the proximity to inferred S4 stream
- Use stockpiled material to armor bottom of ditch to support 4x4 traffic
- Reduce the height of the existing ditch block so that the top of the ditch block is lower than the road surface

522B RMC1

- Remove 500 cmp
- Slope approaches for ATV access
- This stream is classified as an Inferred S4 class stream, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- This stream branches off the same stream as 518RWC1, therefore timing windows should be the same
- Possible fish species within this stream are Dolly Varden, rainbow trout and coho salmon
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Skeena Region Works Windows for coho salmon are from June 1 to August 15
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

522C RMC3

- Deposit two truck loads of clean rock at the site prior to construction
- Remove 900 cmp
- Slope approaches for 4x4 access
- This stream is classified as an Inferred S4 class stream, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- This is the same stream as 518RWC1, therefore timing windows should be the same
- Possible fish species within this stream are Dolly Varden, rainbow trout and coho salmon
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Skeena Region Works Windows for coho salmon are from June 1 to August 15
- Use stockpiled material to armor approaches to reduce sedimentation into the stream prior to revegetation
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

WILL THIS BE DONE? WHAT WILL BE USED?

- In all cases, where a berm exists at the outlet of a cross ditch, the berm must be breached to allow for proper drainage
- Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
- Culverts should be salvaged if possible and brought to the beginning of the deactivated road
- Metal debris should be crushed and buried at nearest site

DATE: July 30, 2001

WATERSHED NAME OR OPERATING AREA: Torkelson Watershed - Tsezakwa Sub-basin

MAIN ROAD NAME: French Peak Trail at 4044FSR

LEVEL OF DEACTIVATION: PERMANENT

ROAD NAME	ROAD LENGTH (km)	PRESCRIPTION SYMBOL AND #	DESCRIPTION OF SITE TREATMENT	RECOMMENDED OPERATIONS	DEPTH OF FILL(m)	SUPERVISION SAFETY ISSUES	Current Level of Access	Final level of Access	EST. TIME (min)
French Peak Trail	8.971	FP RMC1	Remove 300mm cmp	See construction notes	0.5	Inferred S6	4x4	4x4	60
		FP RMC2	Remove 300mm cmp	See construction notes	1.0	Inferred S6	4x4	4x4	60
		FP RWC3	Remove wood culvert	See construction notes	1.0	Inferred S6	4x4	4x4	90
		CMP1	Backup 300mm cmp with shallow crossditch				4x4	4x4	15
		CMP2	Backup 300mm cmp with shallow crossditch				4x4	4x4	15
		FP RWC4	Remove wood culvert	See construction notes	1.5	Inferred S6	4x4	4x4	90
		FP XD5	crossditch	See construction notes		Inferred S4	4x4	4x4	45
		FP XD6	shallow crossditch				4x4	4x4	30
		CMP3	Backup 300mm cmp with shallow crossditch				4x4	4x4	15
		CMP4	Backup 300mm cmp with shallow crossditch				4x4	4x4	15
Total	8.971km							Total	435

CONSTRUCTION NOTES

DESCRIPTION: Tsezakwa Sub-basin within the Torkelson Watershed

WRP SITE: French Peak Trail Road System

CONTRACT NUMBER: _____

This road is a recreational use trail that is intended to be open for 4x4 access. This trail has been mentioned within the Bulkley LRMP as an area of significance. The Babine Landscape Unit Plan (LUP) also mentions the trail and gives direction for it's preservation. The LUP directs that the trail should be maintained and when activities in the area cease the trail can be semi-permanently deactivated to allow drive through by pick-ups or equivalent type vehicles. It is felt that the same objective can be better met through permanent deactivation. Semi-permanent deactivation would still require some level of maintenance where permanent deactivation removes the risk of culvert failures and can still meet the objective of allowing access. Comments from an Access Management Plan public review meeting for the area indicated concerns that the access on the French Peak Trail be maintained and a caution that too large of cross-ditches could be dangerous for snowmobilers.

Extra care will be taken on this road during construction to ensure the cross-ditches that are put in place are adequate for 4x4 traffic as well as restricting the depth or increasing the width to ensure the safety of snowmobilers.

FP RMC1

- Remove 300 cmp
- Slope approaches for 4x4 access
- This stream has not been classified and does not appear on 1:20 000 forest cover maps. The proximity to streams classified as non-fish bearing indicates that this stream is also non-fish bearing. This stream will be treated as an S6 class stream, use silt fences during construction
- Use local coarse rock to embed into the bottom of the ditch to support 4x4 traffic
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches

FP RMC2

- Remove 300 cmp
- Slope approaches for 4x4 access
- This stream has not been classified and does not appear on 1:20 000 forest cover maps. The proximity to streams classified as non-fish bearing indicates that this is also non-fish bearing. This stream will be treated as an S6 class stream, use silt fences during construction
- Use local coarse rock to embed into the bottom of the ditch to support 4x4 traffic
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches

FP RWC3

- Remove wood culvert
- Slope approaches for 4x4 access
- This stream has not been classified and does not appear on 1:20 000 forest cover maps. The proximity to streams classified as non-fish bearing indicates that this is also non-fish bearing. This stream will be treated as an S6 class stream, use silt fences during construction
- Use local coarse rock to embed into the bottom of the ditch to support 4x4 traffic
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches

FP RWC4

- Remove wood culvert
- Slope approaches for 4x4 access
- This stream has not been classified and does not appear on 1:20 000 forest cover maps. The proximity to streams classified as non-fish bearing indicates that this is also non-fish bearing. This stream will be treated as an S6 class stream, use silt fences during construction
- Use local coarse rock to embed into the bottom of the ditch to support 4x4 traffic
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches

FP XD5

- Construct cross ditch
- Dig outlet of cross ditch well away from road
- Slope approaches for 4x4 access
- This stream is flowing down the road at this point
- This stream does not appear on 1:20 000 forest cover maps, but a nearby stream that is possibly connected to this stream has been labeled as inferred S4, therefore this stream may be fish bearing, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Possible fish species within this stream are Dolly Varden, rainbow trout and coho salmon
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Skeena Region Works Windows for coho salmon are from June 1 to August 15
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

- In all cases, where a berm exists at the outlet of a cross ditch, the berm must be breached to allow for proper drainage
- Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
- Culverts should be salvaged if possible and brought to the beginning of the road
- Metal debris should be crushed and buried at nearest site

DATE: July 30, 2001

WATERSHED NAME OR OPERATING AREA: Babine Watershed - Nilkitkwa Lake Sub-basin

MAIN ROAD NAME: 444 Road

LEVEL OF DEACTIVATION: PERMANENT

ROAD NAME	ROAD LENGTH	PRESCRIPTION SYMBOL AND #	DESCRIPTION OF SITE TREATMENT	RECOMMENDED OPERATIONS	DEPTH OF FILL(m)	SUPERVISION SAFETY ISSUES	Current Level of Access	Final level of Access	EST. TIME (min)
523 2A	2.724	CMP3	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
		CMP3A	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
		5232 XD1	Cross ditch				4x4	4x4	30
		CMP4	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
		CMP5	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
		5232 XD2	Cross ditch				4x4	4x4	30
		CMP6	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
		5232 RMC3	Remove 500mm cmp	See construction notes	.5	Inferred S4	4x4	4x4	60
		5232 RMC4	Remove 500mm cmp	See construction notes	.5	Inferred S4	4x4	4x4	60
		CMP9	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
		CMP10	Backup 500mm cmp with shallow crossditch				4X4	4X4	15
523 2B	.409	CMP1	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
		CMP2	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
Total	3.133							Total	315

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February 6, 2002

Jeff Lough
Ministry of Water, Land and Air Protection
Skeena Region
Bag 5000
Smithers, BC
V0J 2N0

Re: Road Deactivation Prescriptions for Torkelson and Babine Watershed, Activity No. 723977

Dear Jeff:

These deactivation prescriptions have been prepared over the 2001 field season for the Tsezakwa, Nilkitkwa Lake and Nichyeskwa Sub-basins of the Torkelson and Babine Watersheds. These prescriptions are identified within the PIRs restoration plan budget and are scheduled for work in the 2002-2003 fiscal. Please review these prescriptions and send me your comment and concerns. There are numerous fish bearing or inferred fish bearing streams within the areas of deactivation and your comments regarding the deactivation of roads crossing these streams would be appreciated. Of special concern are the work windows for these fish bearing streams. Please respond by March 1st so I can attach your comments to the prescriptions for submittal to the MOF for approval by March 8th.

Thank you for your input. Please contact me at (250) 847-3680 if you have any questions or concerns.

Yours truly,

Ed Withers, AScT, Silvicon Services Inc.
Watershed Restoration Supervisor
for West Fraser Mills Ltd., Pacific Inland Resources

Encl.

CONSTRUCTION NOTES

DESCRIPTION: Nilkitkwa Lake Sub-basin within the Babine Watershed

WRP SITE: 444 Road System

CONTRACT NUMBER: _____

5232 RMC3

- Deposit two truck loads of clean rock at the site prior to construction
- Remove 500 cmp
- Slope approaches for 4x4 access
- This stream is classified as an Inferred S4 class stream, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- This crossing is located roughly 200m upstream of an S2 class stream, the only fish species sampled within this S2 stream is Dolly Varden
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use stockpiled material to armor approaches to reduce sedimentation into the stream prior to revegetation
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

5232 RMC4

- Deposit two truck loads of clean rock at the site prior to construction
- Remove 500 cmp
- Slope approaches for 4x4 access
- This stream is not classified and is likely only an accumulation of ditchwater but due to its proximity (roughly 200m) to an S2 class stream and the apparent lack of barriers, it will be treated as an Inferred S4 class stream, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- This crossing is located roughly 200m upstream of an S2 class stream, the only fish species sampled within this S2 stream is Dolly Varden
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use stockpiled material to armor approaches to reduce sedimentation into the stream prior to revegetation
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

- In all cases, where a berm exists at the outlet of a cross ditch, the berm must be breached to allow for proper drainage
- Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
- Culverts should be salvaged if possible and brought to the beginning of the road
- Metal debris should be crushed and buried at nearest site

DATE: July 30, 2001

WATERSHED NAME OR OPERATING AREA: Babine Watershed - Nilkitkwa Lake Sub-basin

MAIN ROAD NAME: 444 Road

LEVEL OF DEACTIVATION: PERMANENT

ROAD NAME	ROAD LENGTH	PRESCRIPTION SYMBOL AND #	DESCRIPTION OF SITE TREATMENT	RECOMMENDED OPERATIONS	DEPTH OF FILL(m)	SUPERVISION SAFETY ISSUES	Current Level of Access	Final level of Access	EST. TIME (min)
523 3A	1.661	CMP3	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
		CMP4	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
		CMP5	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
		CMP6	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
		523 3A BMD1	Bury old culvert	See construction notes					30
		CMP7	Backup 500mm cmp with shallow crossditch				4X4	ATV	15
		523 3A RMC2	Remove 500mm cmp		1.0		4X4	ATV	60
		523 3A RMC3	Remove 500mm cmp		1.0		4x4	ATV	90
		523 3A RMC4	Remove 500mm cmp	See construction notes	1.0		4x4	ATV	90
		523 3A RMC5	Remove 600mm cmp	See construction notes	1.0		4x4	ATV	90
523 3B	.240	5233B RMC1	Remove 500mm cmp		.5		ATV	ATV	30
523 3C	.341	CMP1	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
		CMP2	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
		5233C RMC1	Remove 500mm cmp		.5		ATV	ATV	30
Total	2.242							Total	525

CONSTRUCTION NOTES

DESCRIPTION: Nilkitkwa Lake Sub-basin within the Babine Watershed

WRP SITE: 444 Road System

CONTRACT NUMBER: _____

523 3A BMD1
- Bury old culvert
- Located roughly 20m off the road

523 3A RMC4
- Remove 600 cmp
- Slope approaches for ATV access
- This stream is not classified and is likely an NCD, but due to its proximity (roughly 50m) to an inferred S4 class stream and the apparent lack of barriers, it will be treated as an Inferred S4 class stream, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Coho salmon and rainbow trout have been sampled within an S3 stream roughly 3km downstream of the inferred S4.
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Skeena Region Works Windows for coho salmon are from June 1 to August 15
- Use any local material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

523 3A RMC5

- Remove 600 cmp
- Slope approaches for ATV access
- This stream is not classified, but due to its proximity (roughly 50m) to an inferred S4 class stream and the apparent lack of barriers, it will be treated as an Inferred S4 class stream, use silt fences during construction
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Coho salmon and rainbow trout have been sampled within an S3 stream roughly 3km downstream of the inferred S4.
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Skeena Region Works Windows for coho salmon are from June 1 to August 15
- Use any local material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

- In all cases, where a berm exists at the outlet of a cross ditch, the berm must be breached to allow for proper drainage
- Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
- Culverts should be salvaged if possible and brought to the beginning of the road
- Metal debris should be crushed and buried at nearest site

DATE: July 30, 2001

WATERSHED NAME OR OPERATING AREA: Babine Watershed - Nilkitkwa Lake Sub-basin

MAIN ROAD NAME: 448 Road

LEVEL OF DEACTIVATION: PERMANENT

ROAD NAME	ROAD LENGTH	PRESCRIPTION SYMBOL AND #	DESCRIPTION OF SITE TREATMENT	RECOMMENDED OPERATIONS	DEPTH OF FILL(m)	SUPERVISION SAFETY ISSUES	Current Level of Access	Final level of Access	EST. TIME (min)
571 8A	.650	5718A XD1	Cross ditch	Breech berm			4x4	4x4	30
		5718A RMC2	Remove 500mm cmp		1.0		4x4	4x4	45
		5718A XD3	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
		5718A XD4	Shallow cross ditch				4x4	4x4	15
571 8B	.770	CMP1	Remove 500mm cmp		.5		4x4	ATV	30
		5718B RMC1	Remove 500mm cmp		1.0		4x4	ATV	60
		5718B RMC2	Remove 500mm cmp		1.0		4x4	ATV	60
		5718B XD3	Cross ditch w/ ditch block				4x4	ATV	30
		5718B RMC4	Remove 500mm cmp		.5		4x4	ATV	40
571 6B	.379	CMP1	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
		CMP2	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
519 1A	.603	CMP1	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
		CMP2	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
519 1B	.402	CMP1	Backup 500mm cmp with shallow crossditch				ATV	ATV	15
Total	2.804							Total	400

CONSTRUCTION NOTES

DESCRIPTION: Nilkitkwa Lake Sub-basin within the Babine Watershed

WRP SITE: 448 Road System

CONTRACT NUMBER:_____

- In all cases, where a berm exists at the outlet of a cross ditch, the berm must be breached to allow for proper drainage
- Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
- Culverts should be salvaged if possible and brought to the beginning of the road
- Metal debris should be crushed and buried at nearest site

DATE: July 30, 2001

WATERSHED NAME OR OPERATING AREA: Babine Watershed - Nichyeskwa Sub-basin

MAIN ROAD NAME: 455 Road

LEVEL OF DEACTIVATION: PERMANENT

ROAD NAME	ROAD LENGTH	PRESCRIPTION SYMBOL AND #	DESCRIPTION OF SITE TREATMENT	RECOMMENDED OPERATIONS	DEPTH OF FILL(m)	SUPERVISION SAFETY ISSUES	Current Level of Access	Final level of Access	EST. TIME (min)
520-1	.764	CMP1	Backup 500mm cmp with shallow crossditch				4x4	4x4	15
520-4	.780	5204 RMC1	Remove 500mm cmp	See construction notes	1.0	Inferred S4	4x4	ATV	60
521-3	2.051	5213 RMC1	Remove 900mm cmp	See construction notes	1.0	S4 stream	ATV	ATV	90
		5213 RMC2	Remove 600mm cmp	See construction notes	2.5	Inferred S4	ATV	ATV	90
		CMP1	Remove 500mm cmp		1.0		ATV	ATV	90
		5213 RMC3	Remove 900mm cmp	See construction notes	0.5	Inferred S4	ATV	ATV	90
		5213 RMC4	Remove 500mm cmp		0.5		ATV	ATV	90
		CMP2	Remove 600mm cmp		.5		ATV	ATV	90
		5213 RMC5	Remove 900mm cmp	See construction notes	0.5	Inferred S4	ATV	ATV	90
		5213 RMC6	Remove 600mm cmp	See construction notes	1.5	S4 stream	ATV	ATV	90
		5213 RMC7	Remove 500mm cmp		1.0		ATV	ATV	90
Total	3.595							Total	885

CONSTRUCTION NOTES

DESCRIPTION: Nichyeskwa Sub-basin within the Babine Watershed

WRP SITE: 455 Road System

CONTRACT NUMBER: _____

5204 RMC1

- Remove 500 cmp
- Slope approaches for ATV access
- This stream is not classified, but all streams below this crossing are identified as fish bearing or are inferred fish bearing, therefore it will be treated as an Inferred S4 class stream, use silt fences during construction
- As indicated by the stream sampling efforts in nearby streams, the most likely fish species to be found in this stream would be Dolly Varden and rainbow trout
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Skeena Region Works Windows for rainbow trout are from January 1 to April 30 and from September 15 to December 30
- Use any local material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

5213 RMC1

- Remove 900 cmp
- Slope approaches for ATV access
- This stream is classified as an S4 class stream, use silt fences during construction
- The only fish species sampled within this stream is Dolly Varden
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

5213 RMC2

- Remove 600 cmp
- Slope approaches for ATV access
- This stream is not classified, but all streams surrounding this crossing are identified as fish bearing, therefore it will be treated as an Inferred S4 class stream, even though it has a very minimal flow at high water, use silt fences during construction
- As indicated by the stream sampling efforts in nearby streams, the most likely fish species to be found in this stream would be Dolly Varden
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use any local material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

5213 RMC3

- Remove 900 cmp
- Slope approaches for ATV access
- This stream is not classified, but all streams surrounding this crossing are identified as fish bearing, therefore it will be treated as an Inferred S4 class stream, use silt fences during construction
- As indicated by the stream sampling efforts in nearby streams, the most likely fish species to be found in this stream would be Dolly Varden
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

5213 RMC5

- Remove 500 cmp
- Slope approaches for ATV access
- This stream is not classified, but all streams surrounding this crossing are identified as fish bearing, therefore it will be treated as an Inferred S4 class stream, use silt fences during construction
- As indicated by the stream sampling efforts in nearby streams, the most likely fish species to be found in this stream would be Dolly Varden
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

5213 RMC6

- Remove 600 cmp
- Slope approaches for ATV access
- This stream is classified as an S4 class stream, use silt fences during construction
- The only fish species sampled within this stream is Dolly Varden
- Construction should occur within timing windows as set out in the Skeena Region Works Windows and Measures or as recommended by DFO and WLAP.
- Skeena Region Works Windows for Dolly Varden are from June 1 to November 15
- Use any local coarse material or road surfacing on approaches to reduce sedimentation into the stream prior to revegetation
- If coarse material is not readily available then alternate methods of sediment control should be considered. Alternate methods of sediment control may include placing a log at the edge of the stream as a catchment for sediment or imbedding large rocks into the approaches
- The finished cross ditch width and depth should resemble the natural stream bed up stream and down stream of the crossing

- In all cases, where a berm exists at the outlet of a cross ditch, the berm must be breached to allow for proper drainage
- Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
- Culverts should be salvaged if possible and brought to the beginning of the road
- Metal debris should be crushed and buried at nearest site

West Fraser

SCHEDULE B

WATERSHED RESTORATION PROGRAM

1:50 000 LOCATOR MAP (Torkelson and Babine Watersheds)

Initials	Initials
(Province)	(Contractor)

West Fraser

SCHEDULE C

WATERSHED RESTORATION PROGRAM

IN-STREAM WORK WINDOWS And MEASURES

Initials	Initials
(Province)	(Contractor)

BRITISH COLUMBIA

July 20, 1999

MELP File: 76900-20

District Manager, Bulkley/Cassiar Forest District
Small Business Forest Enterprise Program
Bulkley/Cassiar Licensees

Dear Sir/Madam:

Re: Skeena Region Work Windows and Measures

I submit the attached document to meet our legal obligations under the Forest Practices Code, as Designated Environment Official for Sections 21(3) of the Timber Harvesting Practices Regulation (temporary stream crossings and other operations in a fish stream) and Sections 13(h) and 19 of the Forest Road Regulation (crossings in fish streams, road deactivation). These measures and timing or "work" windows must be used by operational planners and forest industry operators for all fish stream crossings.

District Management Teams and Industry staff are encouraged to review these measures and work windows with us to ensure appropriate interpretation and to expedite implementation. We expect immediate implementation of these measures, because the legal requirement to apply such measures and windows was effective June 15, 1998.

Our intent is to implement this document until April 30, 2000, and to incorporate any changes during March and April. This is a living document and suggestions are welcome.

Yours truly,

James Cuell
Forest Ecosystem Specialist
Ministry of Environment, Lands and Parks
Bulkley/Cassiar Forest District

/ADdeL

cc: Dionys de Leeuw, Senior Habitat Protection Biologist, Skeena Region

Ministry of Environment, Lands and Parks
Environment and Lands Skeena Region
Mailing/Location Address: Bag 6000, 3333 Tatlow Road, Smithers BC V0J 2N0
Telephone: (250) 847-6333
Facsimile: (250) 847-6353

ACKNOWLEDGMENTS

Numerous persons provided valuable information and comments for development of these in-stream work windows and measures. Specifically we would like to thank: Dana Atagi (MOELP, Fisheries Branch) and Jason Hwang (DFO, Habitat), for our initial meeting and the invaluable input they provided; Paul Giroux (MOELP, Fisheries Branch) and Mark Beere (MOELP, Fisheries Branch) for window information and input; Richard Thompson and Greg Mckinnon for their legislative input; Chris Richie, Roger Stewart, and Charlotte Kurta for providing examples from other regions; Peter Tschaplinski for his knowledgeable input; Bill Quinn, Dave Rebagliatti and Don Gosnell for their review to ensure our words made sense and were understandable; Alvin Cober, Dan Bate and James Cuell for their considerable editorial expertise; and to Pacific Inland Resources for the suggested procedures 8.1 to 8.7.

We are grateful for all the invaluable input and hope this will be a useful document.

Table of Contents

1. DISCLAIMER

These Work Windows and Measures are not approvals for activities that impact fish or fish habitat, including introduction of deleterious substances into fish bearing waters. Such concerns fall within the statutory authority of the *Canada Fisheries Act.*

2. INTRODUCTION

This document provides direction to those involved in the forest industry regarding implementation of timing windows and measures to adequately manage and conserve aquatic resources in Forest Districts of Skeena Region. The direction herein applies to all works in and about fish bearing waters which fall under the *Forest Act, Range Act, Forest Practices Code of BC Act* (FPC or Code) and all works performed under the auspices of *Forest Renewal BC* (FRBC). Works conducted in accordance with the *Forest Practices Code of BC Act* do not require *Water Act* referrals to Water Management Branch. However, the *Canada Fisheries Act* remains fully in effect for the protection of fish and fish habitat.

These measures and timing windows do not authorize anyone to conduct or participate in activities that are contrary to any statute (e.g. Land, Waste, Water, Wildlife, Forest Practices Code, Industrial Health and Safety, or Canada Fisheries Acts). Any contract between a forest licensee or tenure holder and the Ministry of Forests does not affect MELP's mandate to monitor, investigate and when necessary, investigate apparent violations involving land, fish, wildlife or their habitats.

This document has been prepared by Skeena Region Habitat Section staff in consultation with the MELP Fisheries Branch and the Department of Fisheries and Oceans using the best information available. These measures and timing windows will be revised from time to time as new information becomes available.

3. DESIGNATED ENVIRONMENT OFFICIAL (DEO) RESPONSIBILITY

The Minister of Environment, Lands and Parks has designated Forest Ecosystem Specialists, Habitat Protection Officers and Water Resource Specialists as Designated Environment Officials(DEOs). It is the DEO's responsibility to establish timing windows and measures, a legal obligation under: the *Timber Harvesting Practices Regulation, Section 21(3)* (temporary stream crossings and other operations in a fish stream), and the *Forest Road Regulation, Sections 13(1)(h)* (crossing in fish streams) and *19, 20(1)(h)* (stream crossings and other operations to adequately manage and conserve aquatic resources). This document fulfills these obligations.

4. DEFINITIONS

"Stream" Includes any natural watercourse or source of water supply, whether usually containing water or not, ground water, and a lake, river, creek, spring, ravine, swamp and gulch.

"Changes in and about a stream"[1] Means any modification to the nature of the stream including the land, vegetation, natural environment or flow of water within the stream, or any activity or construction within the stream channel that has had or may have an impact on the stream.

"Stream channel" Means the bed of a stream and the banks of a stream, whether above or below the natural boundary and whether usually containing water or not, including side channels.

"Works" Means anything capable of or useful for:

(a) diverting, storing, measuring, conserving, conveying, retarding, confining or using water, or

(b) producing, measuring, transmitting or using electricity, or

(c) collecting, conveying or disposing of sewage or garbage or for preventing or extinguishing fires.

In addition, *"works"* means booms and piles placed in a stream; obstructions placed in or removed from streams or the banks or beds of streams; and changes in and about a stream, and includes access roads to undertake any of these works.

5. REFERRAL PROCESS.

Measures and work windows described here provide advice to proponents of forest operations on appropriate practices to protect fish and fish habitat. It is the responsibility of the proponent to ensure compliance with these work windows and measures which are legally required to be applied in all forestry and FRBC operations. In-stream activities that are consistent with the identified work windows and measures do not require referral to the MELP unless specifically requested by the DEO. Works conducted in accordance with the *Forest Practices Code of BC Act* do not require *Water Act* referrals to Water Management Branch. When, in a special case, a site specific variance is required, alternative measures and work windows must be referred to the DEO for agreement before commencing operations.

Proponents are reminded that it is their responsibility to correctly classify streams being crossed and to determine the species of fish present in order to comply with the in-stream work windows and measures. Stream classification must be conducted as described in the *Fish Stream Identification Guidebook* or as varied by a Local Area Agreement (LAA). All streams with gradients less than 20% must be considered as fish streams unless Code definitions, standard sampling techniques prove fish absence, or Local Area Agreements allow otherwise. Planning and construction costs may be reduced by strategic and timely stream assessments and riparian classifications.

The proponent must consider licensed water users (no list is provided here), fish species of forestry related concern, additional rare species or species of special concern, areas of specific fisheries concern, and classified waters in Skeena Region. Steps to follow are identified below, and correspond to Figure 1, In-stream Work Windows and Measures Flow Chart.

[1] In this document, *"changes in and about a stream"* equate to *"in-stream"*

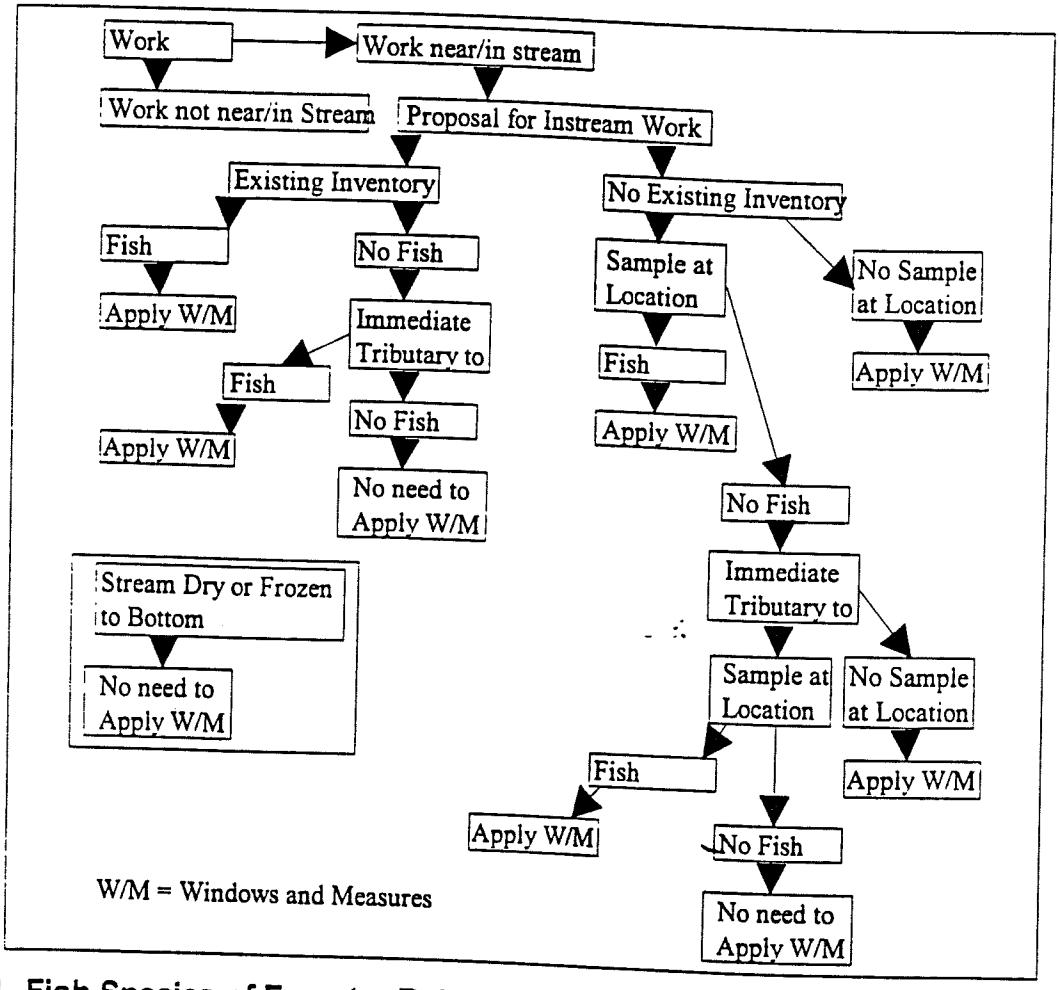
Step 1. Identify the project, or "works," such as type of work, intent, location and so on, and determine if the project is likely to affect a stream or other water body (Proposal for In-stream Work, on flow chart).

Step 2. If the project does affect a stream or water body, determine if fish are present (Existing and No Existing inventory, on flow chart) and what species (see below).

Step 3. If any of the fish species listed below are identified in the stream to be affected (Apply W/M, on flow chart), refer first to the in-stream work window charts for the forest district in which the stream is located to determine the time of least risk and then to the measures to determine what measures are required to do the work.

Step 4. If a variance to the "Work Windows" and/or the "Measures" are required, contact the DEO in the District Forest Office for approval of the variance.

Figure 1. In-stream Work Windows and Measures Flow Chart.



5.1 Fish Species of Forestry Related Concern in Skeena Region

A number of fish species that are likely to be impacted by forestry related activities have been identified in Skeena Region. Some of these species do not have work windows established for them at this time, but if encountered, special provisions for their protection may be required.

(a) Chinook salmon (*Oncorhyncus tshawytscha*)
(b) Coho salmon (*Oncorhyncus kisutch*)
(c) Chum salmon (*Oncorhyncus keta*)
(d) Sokeye salmon (*Oncorhyncus nerka*)
(e) Kokanee salmon (*Oncorhyncus nerka*)
(f) Pink salmon (*Oncorhyncus gorbuscha*)
(g) Steelhead trout (*Oncorhyncus mykiss*)
(h) Rainbow trout (*Oncorhyncus mykiss*)
(i) Cutthroat trout (*Oncorhyncus clarki*)
(j) Dolly Varden char (*Salvalinus malma*)
(k) Lake char (*Salvalinus namacush*)
(l) Bull trout (*Salvalinus confluentis*)
(m) Brook trout (*Salvalinus fontinalis*)
(n) Arctic grayling (*Thymallus arcticus*)
(o) Mountain whitefish (*Prosopium williamsoni*)
(p) Round whitefish (*Prosopium cylindraceam*)
(q) Lake whitefish (*Coregonus clupeaformis*)
(r) Eulachon (*Thaleichthys pacificus*)
(s) Burbot (*Lota lota*)
(t) Longnose dace (*Rhinichthys cataractae*)
(u) Pacific / Western brook / river lamprey (*Lampetra tridentata / richardsoni / ayresi*)
(v) Coastrange sculpin (*Cottus aleuticus*)
(w) Prickly sculpin (*Cottus asper*)
(x) Slimy sculpin (*Cottus cognatus*)
(y) Pike (*Esox lucius*)
(z) Walleye (*Stizostedion vitreum*)

5.2 Other Fish Species/Populations of Special Concern, Skeena Region

A number of fish species or populations have been identified as rare or of special concern. These species do not have work windows established for them at this time, but if encountered, special provisions for their protection may be required.

(a) Green sturgeon (*Acipenser medirostris*) - Skeena and Nass rivers (and elsewhere?)
(b) Chinook salmon (*Oncorhynchus tshawytscha*) - Yukon River (Teslin Lake)
(c) Chum salmon (*Oncorhynchus keta*) - Yukon River (Teslin Lake)
(d) Sockeye salmon (*Oncorhynchus nerka*) - Iskut/Stikine/Taku rivers (river spawning and rearing populations)
(e) Pacific salmon/trout (*Oncorhynchus spp.*) - native, small, isolated and/or unique populations
(f) Eulachon (*Thaleichthys pacificus*) - Yakoun River (only known island population is B.C.)
(g) Rainbow smelt (*Osmerus mordax*) - found only once in Stikine River
(h) Inconnu (*Stenodus leucichthys*) - Teslin Lake (Yukon River drainage)
(i) Squanga (*Coregonus spp.*) - Alsek River region and Yukon River drainage (but in B.C.?)

(j) Pygmy whitefish (*Prosopium coulteri*) - isolated populations in Dease and Swan lakes (and elsewhere?)
(k) Round whitefish (*Prosopium cylindraceum*) - Alsek, Taku and Yukon river drainages
(l) Broad whitefish (*Coregonus nasus*) - only in Teslin Lake in B.C. (and in interesting sympatry with lake whitefish)
(m) Least cisco (*Coregonus sardinella*) - only in Atlin, Swan and Teslin lakes in B.C.
(n) Pike (*Esox lucius*) - Alsek/Taku (Pacific) and Yukon drainages-only B.C. populations are here and in region 7
(o) Unarmoured stickleback (*Gasterosteus spp.*) - Boulton, Rouge and Serendipity (and possibly (less so) in Branta, Laurel and Solstice) lakes
(p) Giant black stickleback (*Gasterosteus spp.*) - Drizzle and Mayer (and possibly Ain) lakes
(q) Slimy sculpin (*Cottus cognatus*)-Stikine, Taku, Alsek and Yukon river drainages (disjunct biogeographic group)
(r) Lake chub (*Couesius plumbeus*) - no collection records exist for the Nass River drainage which may make western populations north of it here a distinct biogeographic group from those south of the Nass River and east of the Continental Divide
(s) Pond smelt (*Hypomesus olidus*) (?) - perhaps conceivable that these may occur in very northern areas but have not yet been found there to the best of my knowledge.

5.3 Areas/Drainages of Fisheries Concern, Skeena Region

A number of watersheds have been identified in Skeena Region that contain, or are likely to contain, fish populations of special fisheries concern[2]. These include the following:

Alsek River

(a) may contain an undescribed whitefish species-Squanga (category 2[3])
(b) may be a somewhat unique biogeographic zone
(c) one of only three B.C. river systems to have round whitefish (category 2)
(d) one of only three B.C. Pacific river drainage systems to have grayling (category 1 and 2)
(e) one of only two B.C. Pacific river drainages to contain pike (category 2)
(f) slimy sculpin found here are part of a disjunct northern group found only in three other B.C. drainages (category 1 and 2)

[2] any of these sites should also be considered in light of preserving other species present and/or their distinct biogeographic or ecological groups not explicitly mentioned, particularly from category 1 (special forestry considerations) or category 2 (regional significance/future conservation consideration).

[3] Category 1: Special Forestry Considerations
Category 2: Regional Significance/for Future Conservation Data Centre (CDC) consideration
Category 3: Potential locality/fish community/other hotspots
Category 4: Highest CDC risk
Category 5H: High CDC risk
Category 5M: Medium CDC risk
Category 6: Lowest CDC risk

Canoona/Triumph Rivers

(a) most northerly know stocks of coastal summer run steelhead (category 1)

Charlotte Unarmoured Stickleback Lakes

(a) only lakes anywhere in B.C. where unarmoured threespine sticklebacks are known (category 2)
(b) each occurrence may be a distinct species which evolved independently

Giant Black Stickleback Lakes

(a) only B.C. lakes (except on, and still isolated from, northern Vancouver Island) where giant black sticklebacks are know to occur (category 4)
(b) each occurrence may be a distinct species which evolved independently

Kispiox River

(a) stock of world recognized exceptionally large steelhead trout (category 1)
(b) contains bull trout (category 6) and likely Dolly Varden (category 1)

Queen Charlotte (Haida Gwaii) Island region

(a) may have been a distinct glacial refugium (category 2)

Taku River

(a) some steppe regions (eg. Mammoth Steppe) on its Sheslay tributary were apparently unglaciated in the last Wisconsin period (the impact and significance of this to aquatic species is not known)
(b) drainage contains most northerly know interior summer run steelhead trout stock (category 1)
(c) one of a few B.C. rivers known to have river spawning and rearing sockeye salmon (category 2)
(d) one of only three B.C. river systems to have round whitefish (category 2)
(e) one of only three B.C. Pacific river drainage systems to have grayling (category 1 and 2),
(f) only one of two B.C. Pacific river drainages to contain pike (category 2)
(g) slimy sculpin found here are part of a disjunct northern group found only in three other B.C.drainages (category 1 and 2)

Teslin Lake

(a) only known place in B.C. where broad whitefish (category 5M) and Yukon River chinook/chum salmon occur (category 2)
(b) broad whitefish also exist here in a potentially unusual relationship with lake whitefish
(c) one of two systems in B.C. known to have inconnu (category 1 and 2), and the only system known from the Yukon River drainage
(d) one of three lakes in B.C. known to contain least cisco (category 5M)
(e) its drainage basin contains bull trout (category 6)
(f) Yukon River drainage in this area has a biogeographically unique fish fauna in B.C.

Tyhee Lake

(a) one of two known B.C. lakes where giant pygmy whitefish (category 4) occur, and the only system known from the Skeena River drainage

5.4 Classified waters in Skeena Region

The following waters have been classified because of their unique and exceptional angling qualities. Subsequently these waters may require special treatment with regards to forest harvesting practices.

(a) ***Babine River*** Class 1 water from DFO fish counting weir located downstream of Nilkitkwa Lake to the confluence of the Babine and Skeena rivers, Sept. 1 - Oct. 31.
(b) ***Bulkley River*** Class 2 water, Sept. 1 - Oct. 31.
(c) ***Copper Creek*** (Queen Charlotte Islands) Class 2 water, Sept 1 - Apr. 30.
(d) ***Damdochax Creek*** Class 2 water, Sept. 1 - Oct. 31.
(e) ***Dataman Creek*** Class 2 water, Sept. 1 - Apr. 30.
(f) ***Deena Creek*** Class 2 water, Sept. 1 - Apr. 30.
(g) ***Ecstall River*** Class 2 water, all year.
(h) ***Gitnadoix River*** Class 2 water, all year.
(i) ***Honna River*** Class 2 water, Sept. 1 - Apr. 30.
(j) ***Kispiox River*** Class 2 water, Sept. 1 - Oct. 31.
(k) ***Kitseguecla River*** Class 2 water, all year.
(l) ***Kitsumkalum (Kalum) River*** Class 2 water, all year.
(m) ***Kitwanga River*** Class 2 water, all year.
(n) ***Kluatantan River*** Class 2 water, all year.
(o) ***Kwinageese River*** Class 2 water, Sept. 1 - Oct. 31.
(p) ***Kwinamass River*** Class 2 water, Apr. 1 - Sept. 30.
(q) ***Lakelse River*** Class 2 water, all year.
(r) ***Mamin River*** Class 2 water, Sept 1 - Apr. 30.
(s) ***Morice River*** Class 2 water, Sept. 1 - Oct. 31.
(t) ***Pallant Creek*** Class 2 water, Sept. 1 - Apr. 30.
(u) ***Skeena River (main stem only)*** Class 2 water a) from 1.5 above Kitsumkalum River to Exchamsics, July 1 - Sept. 30 and b) upstream of 1.5 km above Zymoetz River , July 1 - Oct 31.
(v) ***Suskwa (Bear) River*** Class 2 water, all year.
(w) ***Sustut River*** Class 2 water, Sept. 1 - Oct. 31.
(x) ***Tlell River*** Class 2 water, Sept. 1 - Apr. 30.
(y) ***Yakoun River*** Class 2 water, Sept. 1 - Apr. 30.
(z) ***Zymoetz (Copper) River*** Class 1 water above Limonite creek, Sept. 1 - Oct 31. Class 2 water below Limonite Creek , Sept 1 - Oct. 31.

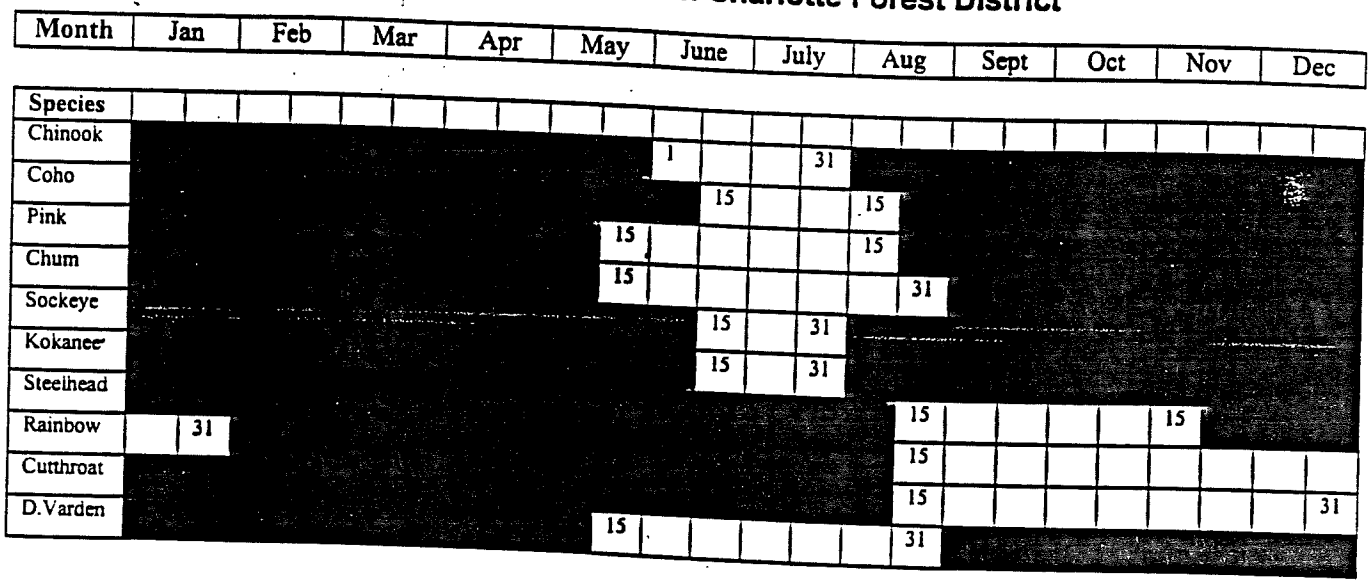
6. IN-STREAM WORK WINDOWS

An "In-stream work window" is a time period when there is a the lower risk from work activities to aquatic resources, fish and their habitats. It is not to be considered a time period during which there is no risk. The charts below identify work windows for selected species and their dates for each Forest District in Skeena Region.

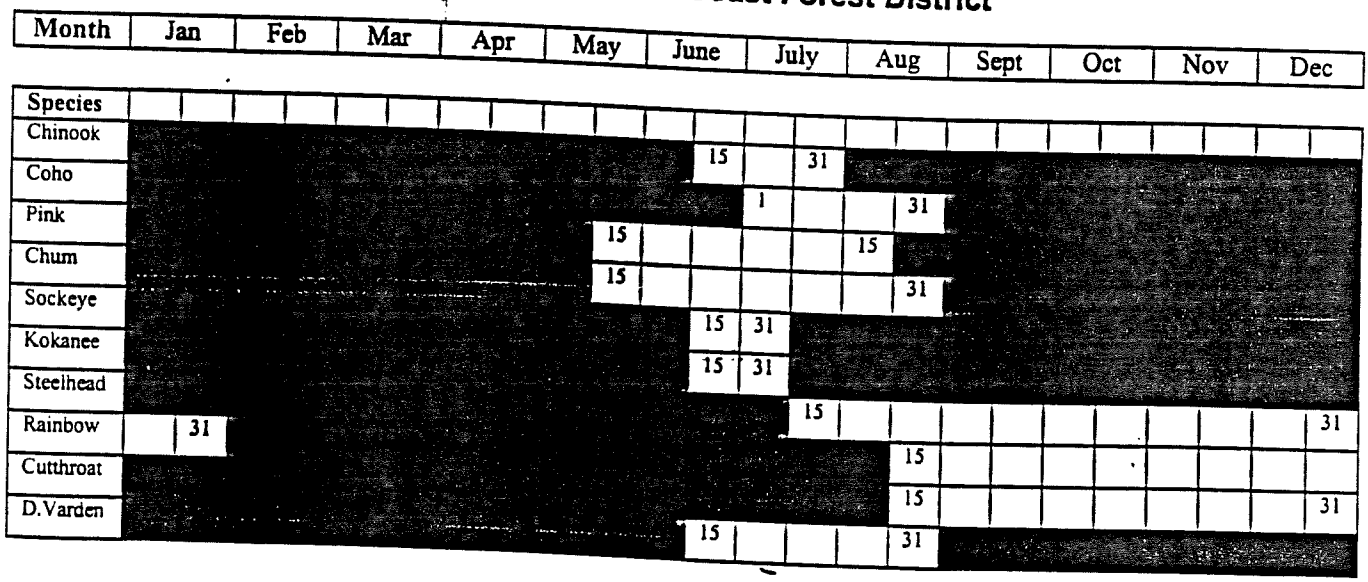
If a proponent wants to work in or about a stream outside of these "Work Windows," approval must be obtained from the DEO.

For some individual drainages or streams, Work Windows for those species that are different from the district wide Work Windows are also included.

6.1 In-stream Work Windows for the Queen Charlotte Forest District[4]



6.2 In-stream Work Windows for the North Coast Forest District



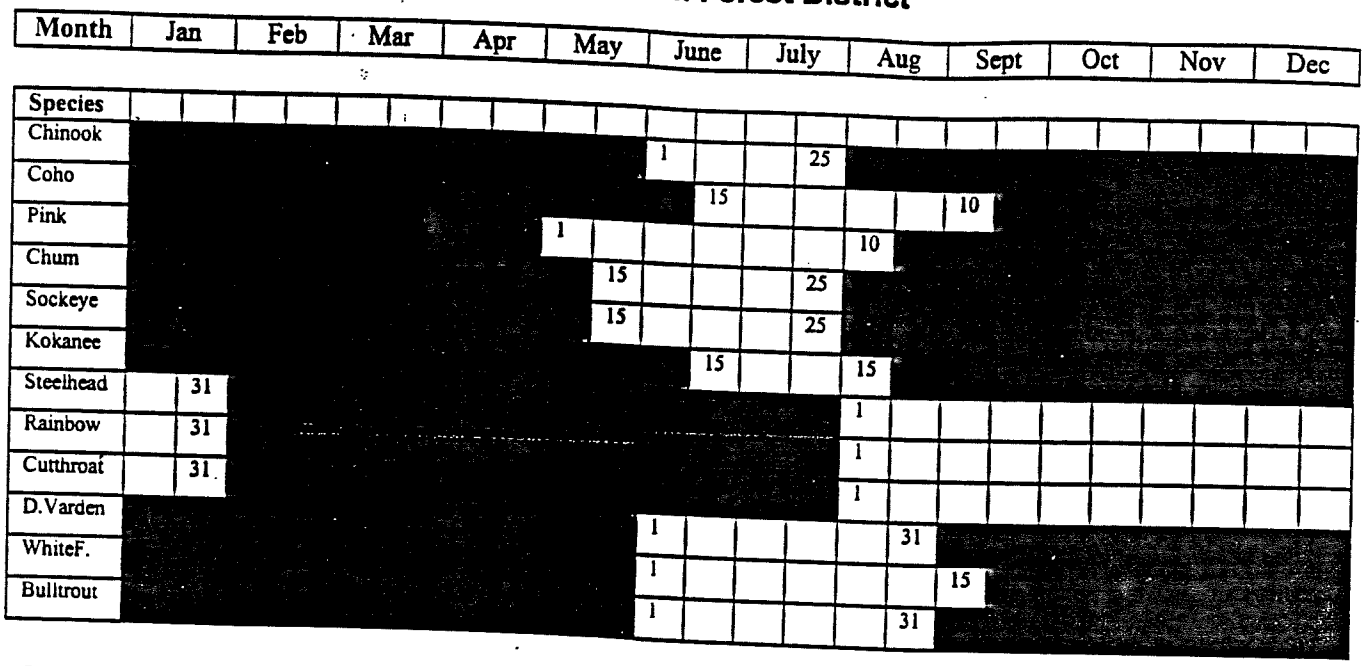
[4]

Eggs/alevins in the gravel, greatest risk for in-stream work

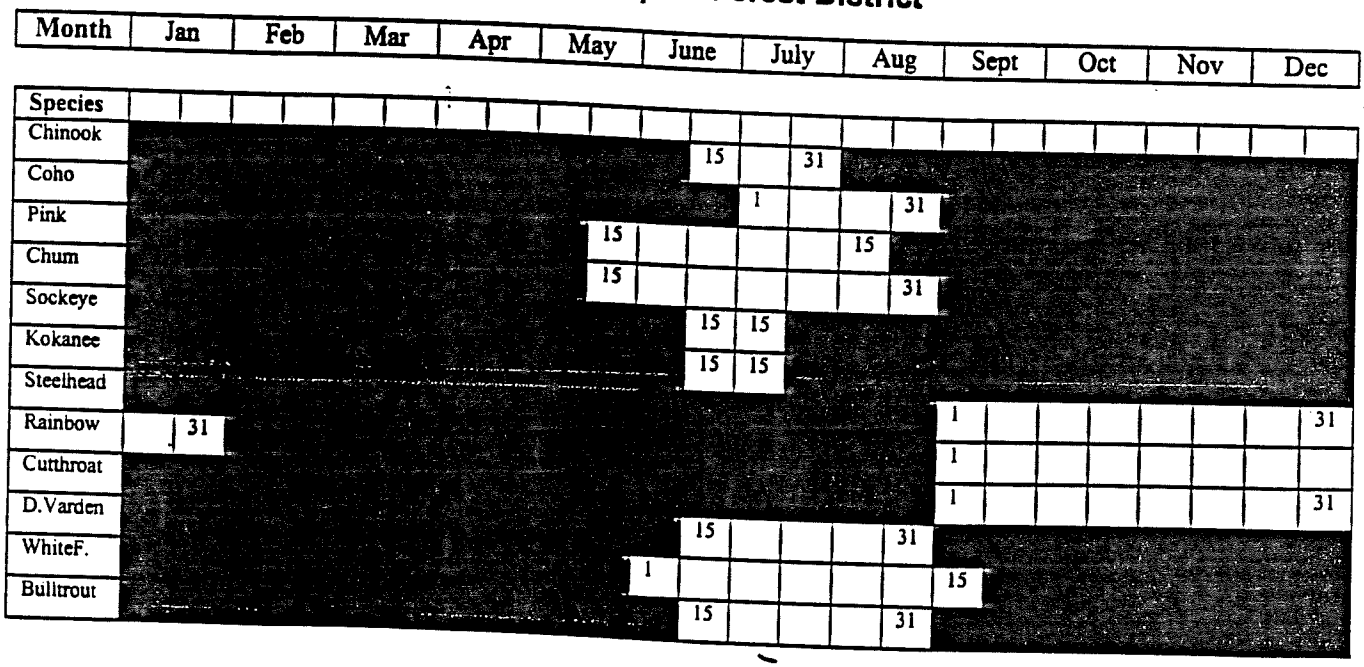
1		15

Start and finish date of least risk period for in-stream work, fish free swimming

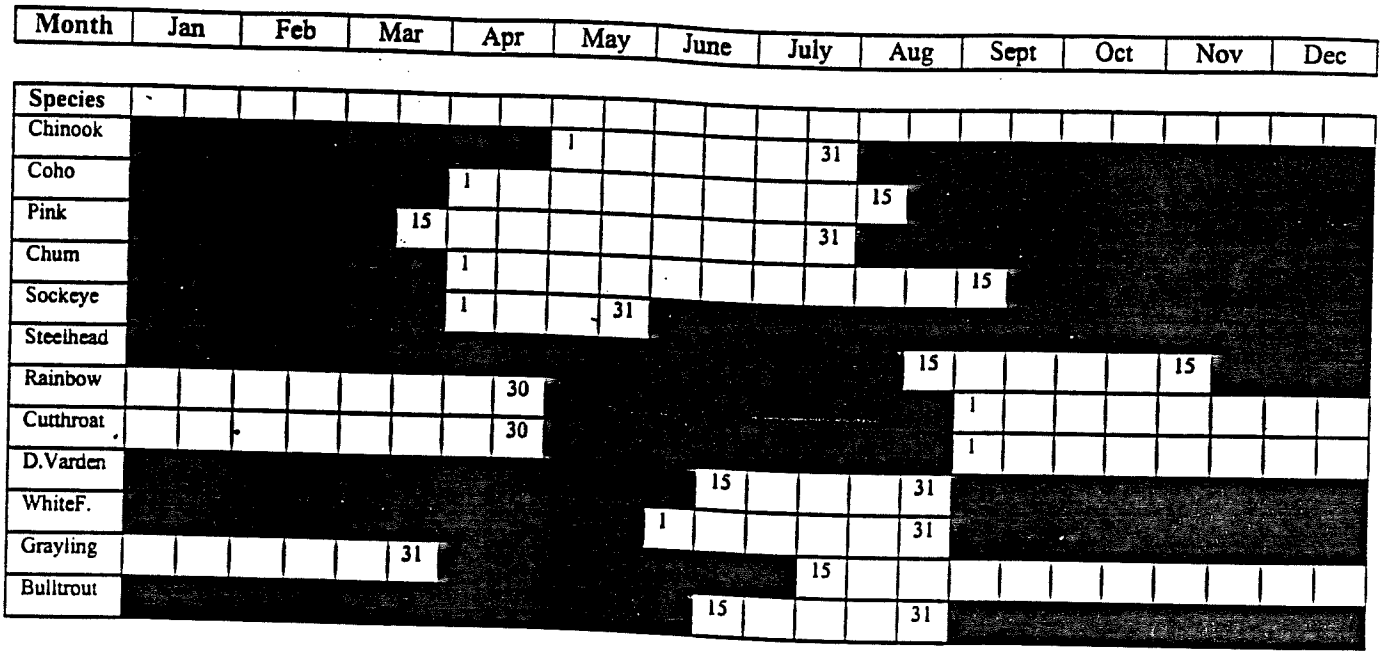
6.3 In-stream Work Windows for the Kalum Forest District



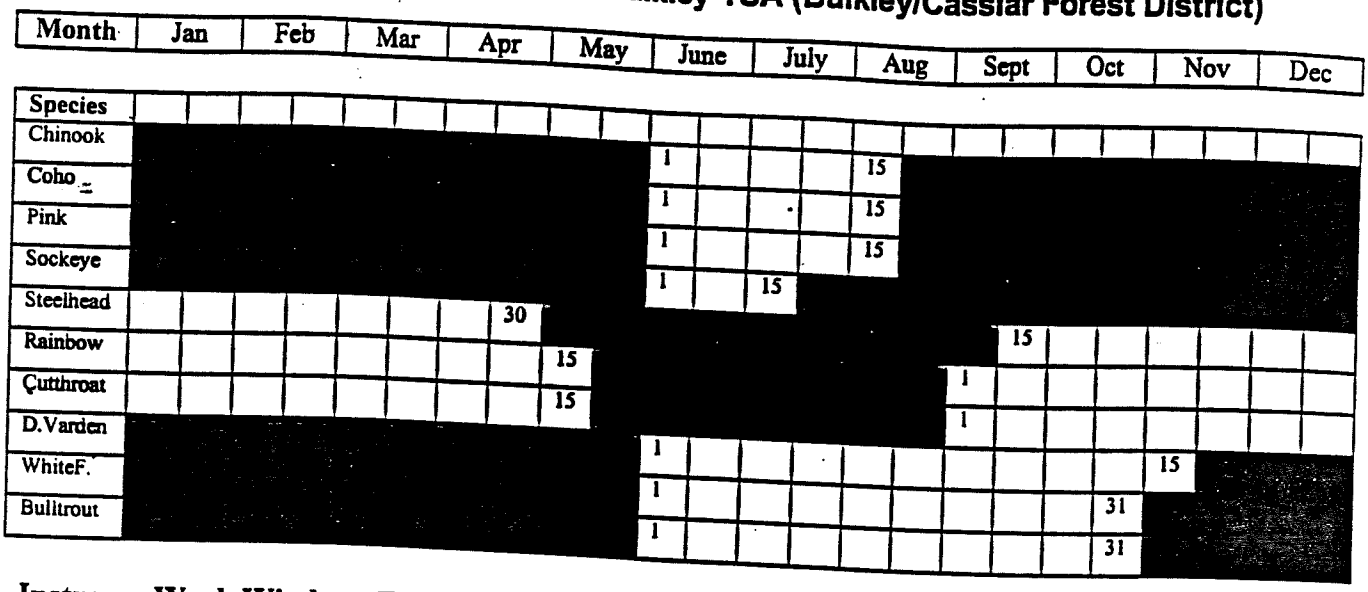
6.4 In-stream Work Windows for the Kispiox Forest District



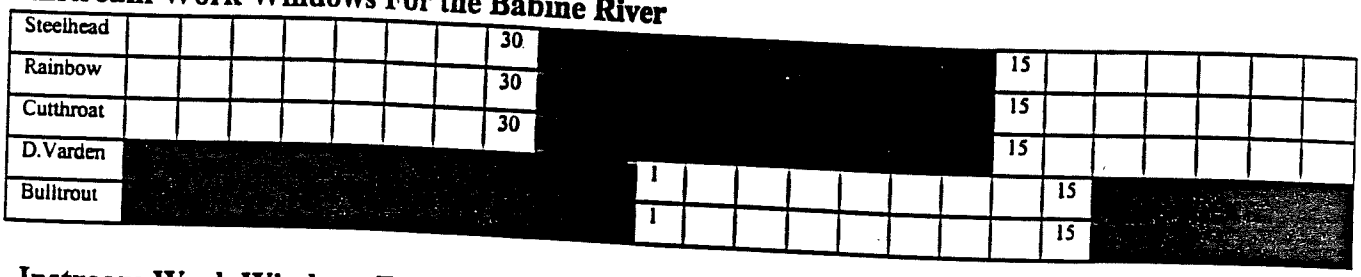
6.5 In-stream Work Windows for the Cassiar TSA (Bulkley/Cassiar Forest District)



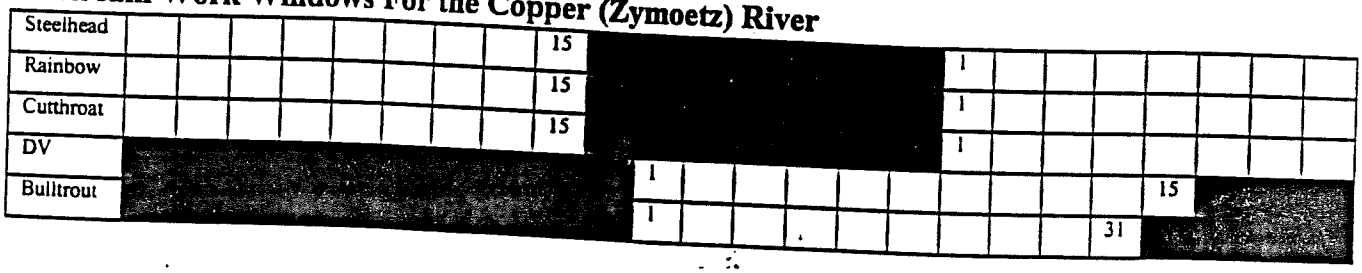
6.6 In-stream Work Windows for the Bulkley TSA (Bulkley/Cassiar Forest District)



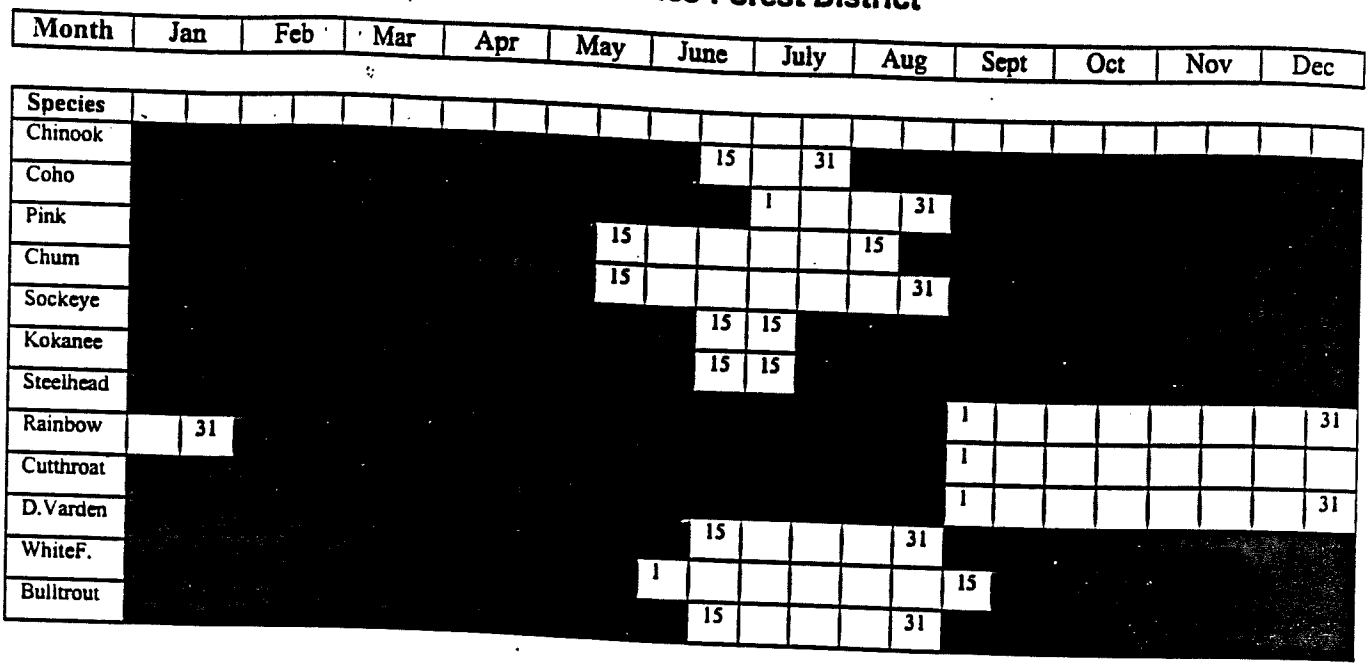
Instream Work Windows For the Babine River



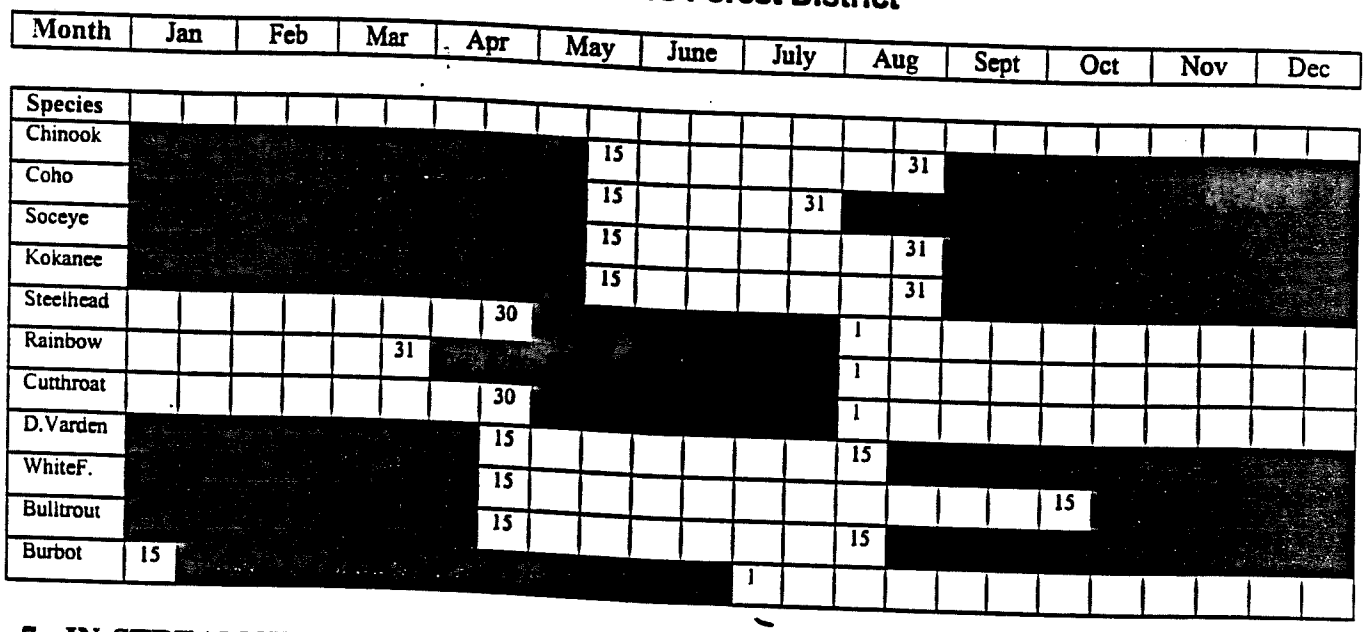
Instream Work Windows For the Copper (Zymoetz) River



6.7 In-stream Work Windows for the Morice Forest District



6.8 In-stream Work Windows for the Lakes Forest District



7. IN-STREAM WORK MEASURES

In-stream work measures are actions that must be taken by proponents conducting in-stream activities to prevent damage to aquatic resources, fish and their habitats. Measures must be implemented during construction, repair or removal of a temporary stream crossing and other operations in a "fish stream," (THPR 21), in fish-bearing waters or in areas that are likely to impact fish habitats. Measures must also be implemented while constructing a crossing in "fish streams" (FRR13) or road deactivation works in and around "stream" crossings (FRR 19 & 20). Included here are planning, construction and emergency measures.

7.1 Planning Measures

Planning measures are descriptions, in planning documents, of the types of issues to which construction measures apply. Proponents must:

(a) document how the works will provide for fish passage, prevent sedimentation, protect fish and maintain fish habitat. Documentation must be available to government agency staff (MOF, DFO, MELP) upon request.
(b) maintain the natural stream channel width and gradient in fish streams.
(c) correctly classify each stream being worked on according to the *Fish Stream Identification Guidebook*, or varied by a Local Area Agreement.
(d) not place culverts at lake outlet streams or at spawning beds.
(e) cross all S1, S2 and large S3 streams with a bridge or other open-bottom structure.
(f) avoid, where possible, crossing of alluvial fans.
(g) obtain a fish collection permit for all fish salvage operations. Such a permit can be obtained from DFO or the Ministry of Environment, Lands and Parks office in Smithers.

7.2 Construction Measures

Construction measures are activities that are implemented in the field before, during and after completion of the work project. Proponents must:

(a) in fish streams with gradients greater than 0.5%, embed culverts into the substrate and have material placed in the culvert large enough to resist movement by the natural stream flow. These materials are to provide resting areas to assist fish passage.
(b) when using rock as rip-rap, ensure that it is durable, clean and not from acid rock quaries.
(c) ensure that all equipment used on site is in good repair and free of any excess oil and grease.
(d) locate machinery on, and work from, the stream bank or naturally dry channel rather than within the wetted perimeter of the stream unless authorized by Ministry of Environment, Lands and Parks or the Department of Fisheries and Oceans.
(e) age wood, if treated with preservatives, for at least 6 months prior to it being used in any stream crossing structure. During the aging process, the wood must be stored at least 100m from a water body. Wood treatment products must meet CSA O80 standards for preservatives and use. Treated wood must not be used below the high water mark.
(f) completely isolate from fish bearing waters all cast-in-place concrete and grouting until fully set.
(g) place sediment control structures well in advance of activities that could result in sediment mobilization.
(h) upon completion of work, remove all temporary bridges, excess fill and other materials, and any culverts, pipe conduits, ditches or other structures that have not been utilized.
(i) restore the channel and banks at the site to approximate the original condition.
(j) stabilized all exposed soils and drainage to prevent erosion and stream sedimentation.

(k) block all ditch lines running into streams or other fish bearing waters. Ditch lines must empty into suitably vegetated overflow areas.
(l) re-contour disturbed areas, and where stream-side vegetation has been damaged, re-vegetate with an ecologically suitable species.
(m) establish site-specific operating standards for some deactivation operations carried out under the Watershed Restoration envelope of FRBC. Such standards must be referred to the appropriate DEO.
(n) clean-up and re-vegetate the work site and associated access after project completion.
(o) limit equipment crossing of streams to one time across and back.
(p) release ponded water in a controlled fashion in order to minimize mobilization of sediments.
(q) ensure that silt fences and hay bales are on-site during construction and are utilized, where and when necessary.
(r) use filter fabric on bridge surfaces (to cover running planks) to minimize loss of fill/capping material and sediment movement.
(s) when constructing winter roads, remove all crossings prior to spring thaw.

7.3 Emergency Measures

In some circumstances emergency actions will be required to protect roads, stream environments and crossing structures from catastrophic damage. Should consultation on conservation measures prove impossible due to an emergency need to prevent damage, the extent of emergency activity must be reported (in writing and with a map) to MELP and the Department of Fisheries and Oceans (DFO) within 72 hours. In such emergency situations the proponent must:

(a) stop operations near or within streams during periods of heavy or prolonged rainfall.
(b) suspend activities and notify BC Environment if spawning fish are observed within the area of the work site.
(c) suspend in-stream work if stream flows exceed the capacity of sediment control measures (settling ponds, silt fence, etc.).
(d) suspend the use of temporary crossings and all road construction or logging operations in the immediate vicinity of the crossing if, for any reason, sediment is introduced into the stream at the temporary crossing at any time during its use. It is the responsibility of the operator to contact the Contract Supervisor/Engineering Officer and MOELP/DFO immediately.

In locations where beaver activity occurs, bridges or over-size culverts should be considered for all streams to reduce maintenance requirements and to reduce downstream habitat damage resulting from dam removal. If culverts are used where signs of recent beaver activity are present, measures should be taken to reduce the chance of beavers damming the culvert. Proponents must:

(a) obtain authorization for removal or modification of beaver dams by written approval issued under the Wildlife Act. Such authorization can be obtained by applying to Ministry of

Environment, Lands and Parks staff water management staff as outlined in section 8.8. below.

8. SUGGESTED PROCEDURES

The above required Work Windows and Measures have application to a number of stream crossing activities. These activities and their suggested procedures are discussed below. They are suggestions only and do not constitute requirements under the Forest Practices Code Act.

8.1 Temporary Streams Crossings for Roads of Less than One Years' Duration

The following steps ensure temporary stream crossings are constructed within the terms of approved Cutting and/or Road Permits and comply with the Forest Practices Code.

(a) Review all documents, in particular, stream-side or riparian management prescriptions.
(b) Review site plan for permanent bridge structure, if it is available.
(c) Discuss any item that may require clarification with the Engineering Officer.
(d) A pre-work conference should be conducted on-site with the Buncher Operator, Road Construction Crew, Contractor, Foreman, and Company or Ministry of Forests representative to discuss site conditions, prescriptions, installation of a temporary portable bridge or log stringer bridge. MOELP/DFO should be invited to attend if the crossing is in a sensitive area.
(e) Prior to construction, the necessary approvals must be received from the Ministry of Forests and MOELP/DFO if required. Construction must comply with the *Forest Practices Code Act* and *Regulations* and Part 7 of Section 9 (regulations) of the Water Act.
(f) A Contract Supervisor or Forest Officer should be available to be on-site during construction, installation, or removal of the temporary bridge.
(g) Silt fences and hay bales must be on-site during construction and removal of the temporary bridge and are to be utilized, where necessary.
(h) Filter fabric must be used on the bridge surface (running planks to cover) to minimize sediment movement.
(i) The maintenance of stream-side vegetation is a priority. Stream banks on approaches should not be stripped or disturbed, if possible.
(j) Sedimentation into streams must be minimized. This may be accomplished by placing brush/limbs or man-made fiber mat over exposed mineral surfaces (cuts, fills, and/or road running surface).
(k) Ideally, the stream will not be crossed with ground based equipment. If required, a designated crossing site will be approved by the Contract Supervisor or Engineering Officer. Other than this crossing, the wheels or tracks of ground based equipment must not be within 5 meters of a stream bank.
(l) Ditches, water bars, culverts, etc., should be constructed in a manner that will carry water and sediment away from the stream, where possible.

(m) Any ditch lines or running water that cannot be directed away from the stream or temporary crossing must utilize one or more of the following: silt fences, hay bales, settling ponds.
(n) The temporary crossing should not be used in wet weather unless absolutely necessary.
(o) If tracked machines must cross a temporary structure during wet weather, machine tracks must be shoveled out before crossing, if the tracks are holding dirt.
(p) If for any reason, sediment is introduced into the stream at the temporary crossing at any time during use, it is the responsibility of the operator to cease use of the crossing and all road construction or logging operations in the immediate vicinity of the crossing and to contact the Contract Supervisor/Engineering Officer and MOELP/DFO immediately.

8.2 Fish Stream Crossing on Winter Roads

The following measures ensure fish stream crossings of winter roads are carried out in accordance with the *Forest Practices Code Act* of British Columbia, *Regulations* and other legislative requirements of Regulatory Agencies.

These measures would only be implemented when streams are not providing fish passage at the crossing site during the time the crossing is in place.

(a) Construct the crossings with snow and logs in a manner that the crossing can be removed without disturbing the stream channel. All sills must be placed outside the stream channel.
(b) Remove all crossings prior to spring thaw.
(c) All removed crossings should be field checked after spring runoff to ensure that safe fish passage can occur.

8.3 Installation of Flat Bottomed Culverts on Fish Streams

The following ensure flat bottomed culverts are installed and removed in accordance with the *Forest Practices Code Act* and *Regulations.*

(a) The maximum average velocity in all culverts must not exceed 0.6 m/s to not impede juvenile fish passage. Baffles should be installed and the largest possible corrugation of culvert should be used. Culvert width must be similar to stream channel width.
(b) Ditches should not drain directly into the stream, but should be diverted onto stable forested vegetation through cross-drains. Where this is not possible, use filters such as hay bales, silt fences or settling ponds. These filters must be maintained on a regular basis to remain at a working capacity.
(c) Before start of installation, an attempt to capture fish at the culvert site will occur and if fish are found, they will be moved downstream
(d) The stream will then be dammed off upstream and water diverted.
(e) A silt fence will be placed downstream of the culvert site.
(f) Bury the culvert below the natural stream bed 20% of the vertical rise, if the culvert is not baffled. If the culvert is baffled, place the culvert at the natural stream bed. In either case, place the culvert at or near the natural stream gradient.

(g) If baffled culverts are not used, fill the culvert bed to the natural stream bed level. If it is not possible to get the material in the culvert, leave it for natural sedimentation to occur.
(h) Ensure that the culvert is of sufficient length to avoid side slope material entering the culvert or flow channel.
(i) Pay attention to bedding and back-filling operations, as they are critical for proper installation of culverts. Fill material must be compacted through the entire back-fill process.
(j) Provide sufficient back-fill over the culvert before any traffic crosses over the culvert.
(k) Protect the inlet and outlet side slopes of the road sub-grade from erosion and sloughing by armoring the fill slopes with rip rap for a distance of 1.5 diameter on each side of the culvert and toeing into the stream bed. Where deep fills are required, extend the rip rap a minimum of the diameter of the culvert above the height of the culvert.
(l) When the culvert is opened to water, watch for the need to add more rock armoring.
(m) Re-vegetate all exposed mineral soil as soon as possible after completing the installation.

8.4 Installation and Removal of Log Culverts on Fish Streams

The following measures ensure log culverts are properly installed and removed in accordance with the *Forest Practices Code Act* and *Regulations.*

8.4.1 Installation

(a) Place silt fence downstream of the crossing.
(b) Side ditches should not drain directly into the stream, but be diverted where possible onto stable forested vegetation that can filter sediments before reaching the stream, either through cross-drains or settling ponds.
(c) Set up sill logs outside the wetted perimeter of the stream (beyond the top of the bank) to maintain channel width and the natural stream channel. Minimum diameter of sill logs is 50 cm.
(d) Set the sill logs at an elevation to avoid under scouring. Where high soil bearing capacity is not reached, excavate and back-fill with rock and compact it before sill log placement. Ensure that the excavated material is not deposited in the stream.
(e) Set the sill logs at the natural stream gradient.
(f) Make sure the culvert is long enough to support the road fill where the base of road fill just touches the fill containment logs.
(g) Place the stringers.
(h) Place the fill containment logs and drift pin them through to the sill log.
(i) Cover the log stringers and containment logs with a geotextile cloth to prevent fines and road material entering the stream.
(j) Back-fill material over the culvert until desired road grade is reached, paying attention to make sure material is not pushed into the stream or pushed against the fill containment log.
(k) Place rip rap at the inlet and outlet to protect against fill erosion, undermining of the sill logs and the erosion of stream banks.

8.4.2 Removal

(a) Place a silt fence downstream of the crossing, and place geotextile cloth dipper under bridge to capture excess fines.
(b) Carefully pull back the road fill from the culvert down to the geotextile, to prevent material from entering the stream.
(c) Once fill is removed from the geotextile, pull the geotextile away from the culvert minimizing any fines entering the stream.
(d) Carefully remove the stringers to avoid the structure from falling apart and falling into the stream.
(e) Evaluate sill log and leave in place unless they will obstruct fish passage.
(f) Re-slope approaches and re-vegetate all exposed mineral soil soon after removal is complete.

8.5 Temporary Portable or Log Stringer Installation and Removal on Fish Streams

The following ensures temporary portable or log stringer bridges are properly installed and removed in a manner that is consistent with the *Forest Practices Code Act* and *Regulations*. "Portable" refers to a one piece structure with a short term use, while "temporary" means less than five years.

8.5.1 Installation

(a) Review the bridge design drawings/site plans and environmental concerns before construction begins.
(b) Where possible, avoid placing approaches at gradients that slope down to the bridge crossing. Drainage onto the bridge must be avoided. If the road slopes down to the bridge and erosion is expected, place geotextile covered with crush material on the road surface and/or place a cattle guard or similar engineered structure in the roadway to intercept erosion of sediment to the bridge.
(c) Do not allow ditches to drain directly into the stream. Divert ditch water, where possible, onto stable forested vegetation that can filter sediments before reaching the stream either through cross-drains or settling ponds.
(d) Place geotextile under the sill log.
(e) Place bridge.
(f) Place wooden ballast wall on both sides of the bridge.
(g) Back-fill against the ballast wall with compacted granular material.
(h) Place rip rap along the stream bank and upstream and downstream of the bridge where erosion is possible.
(i) Re-vegetate all exposed mineral soil as soon as possible after construction is completed.

8.5.2 Removal

(a) Sweep the deck to remove any gravel material on the deck.
(b) Remove the bridge.
(c) Remove the two sill logs. (It may be desirable to leave these in place to protect stream

banks, depending on the site.)

(d) Re-slope the road fills and re-vegetate as soon as removal is complete.

8.6 Skid Bridges

The following steps outline responsibilities for installing skid bridges, which may be made from culverts or logs, or which may be a portable steel bridge.

The location and installation of any skid bridge must be approved in the Silviculture Prescription, and is removed at completion of logging. Any changes to skid bridge location requires an amendment or written approval from the Ministry of Forests.

Skid bridges are to be located, built (installed) and used in a manner that satisfies Operational Plans and prescriptions. (Pre-Work Conference)

(a) Identify a suitable location(s) for skid bridges which protect stream channels and stream banks immediately above and below the crossing, and ensure that the location(s) chosen is approved.
(b) Stream side vegetation should not be disturbed except at the crossing site.
(c) Ensure that in-stream work, if any, is approved before the work is done.
(d) Slash and debris must be prevented from falling into the stream channel during installation or use of temporary skid bridges. The use of geotextile or terra-mats (made from used tires) on the bridge surface may be used.
(e) Skid bridges should not be used during wet weather in order to reduce the risk of causing sedimentation in a stream.
(f) "Rub trees" should be left standing on the approach to skid bridges so that logs are turned perpendicularly to the stream before skidding over the stream crossing.
(g) If the installation or use of a skid bridge causes sediment to enter a stream, then operations must stop immediately.
(h) A site inspection should be scheduled for snow-free conditions after the skid bridge is removed to check the need for further cleanup, water bars, re-contouring, grass seeding or other work.

8.7 Deactivation of Fish Stream Crossings

The following suggested steps ensure deactivation of fish stream crossings are carried out in accordance with the *Forest Practices Code Act, Regulations* and regulatory agencies.

1. Review the latest 1:20,000 fish inventory maps to identify all possible fish stream crossings to be deactivated.
2. Field review all crossings not found on fish inventory maps and carry out a survey as outlined in the single survey stream classification procedure. Also determine the following:
   (a) if fish bearing, identify the likelihood of fish presence at the time of deactivation.
   (b) identify if spawning grounds are located at/or downstream of the crossing.
   (c) identify terrestrial sediment input hazard at the crossing.

3. On fish streams with different sediment hazard ratings, implement the suggested actions identified in the table below.

Table 1. Actions for different sediment hazard Ratings.

FISH PRESENCE	SPAWNING GROUNDS	SEDIMENT HAZARD[5]	SUGGESTED ACTIONS
Yes	yes	high	stream diversion.
Yes	yes	low	stream diversion
Yes	no	high	stream diversion.
Yes	no	low	normal construction with silt control.
No	no	low	normal construction with silt control.
No	yes	low	stream diversion for salmonids
No	yes	high	stream diversion.
No	no	high	normal construction with silt control.

4. For permanent deactivation with non-vehicle use, apply adequate erosion control materials.
5. For permanent deactivation with vehicle use, protect the stream banks with erosion resistant materials capable of withstanding vehicle use.
6. Before carrying out any deactivation on high-risk streams or spawning beds, contact the Ministry of Environment and/or Department of Fisheries and Oceans.

8.8 Regional Procedures for Nuisance Beaver

A frequent problem associated with forest roads is beaver dams. Although removal of beaver dams is under the purview of the Wildlife Act rather than any forestry related legislation, the procedure is included here because of its application to forestry related activities and streams. Beaver ponds are also often excellent fish habitat.

8.8.1 Authority to Act

The Wildlife Act, Wildlife Act Permit Regulations Part 9, subsection (1) states: "A person commits an offense where he disturbs, molests or destroys a beaver house or den or beaver dam. Subsection (1) does not apply (a) to a licensed trapper, (b) where the action is taken to provide irrigation or drainage under lawful authority for the protection of property, or (c) where the action is authorized by regulation."

The Water Act Section 41 (1) states a person commits an offense who (r)makes changes in and about a stream without lawful authority;

For those situations not covered by Section 9, Subsection (2) (a) and (b) of the Wildlife Act Permit Regulations, the Regional Fish and Wildlife Manager has authority to issue a Sundry

[5] Sediment hazard is calculated using material type stream gradient and flow rate and using surface erosion potential maps.

Permit for the removal of beaver dams. Where action is taken to provide drainage under lawful authority for the protection of property or for other reasons that require beaver dam removal, the Regional Water Manager has authority to issue an approval to grant lawful authority for changes in and about a stream for the purpose of beaver dam removal. The Wildlife Section Head and Conservation Officer have authority to issue a Sundry Permit for removal of beaver.

8.8.2 Regional Procedures

To be consistent in administering complaints regarding nuisance beaver the following procedures shall be applied:

1. Complainants will be required to submit, in writing, an application request for removal of a beaver dam (and beaver) for the protection of life and property, reclamation of riparian lands, passage of fish or other reasons. Applications will be directed to Water Management for attention. The application will contain the following information:
   (a) description of the flooding problem,
   (b) stream name and dam(s) location on the stream,
   (c) who will do the removal,
   (d) when the dam(s) will be removed, and
   (e) number and approximate height of dams involved and an estimate of the area flooded
2. Water Management shall ensure copies of the application are referred to the Conservation Officer, Fish and Wildlife Branch and Department of Fisheries and Oceans, other government agencies, and First Nations, as required, that may have a concern for the proposed dam removal. **Notwithstanding the aforementioned referral requirement, consideration for urgency from threat of dam failure and potential downstream loss of life and property damage shall be given to the application and expediency for permit issuance to reflect the degree of perceived urgency shall always take precedence.**
3. Water Management shall give consideration to riparian land owners and downstream water license users during the process of dealing with the application for dam removal. The removal of dams at the outlet of lakes shall be subject to a consultation process with all lake area residents. The purpose of consultation is to produce a consensus to determine who will assume responsibility for dam removal, how low the water level should be dropped and necessity for removal of beaver.
4. Water Management may incorporate conditions for removal expressed by concerned government agencies or First Nations in the letter of approval. Water Management shall prescribe the method of removal of the beaver dam to the proponent. Under no circumstances shall explosives be permitted for beaver dam removal.
5. When the action (removal of a beaver dam) is taken to provide protection of property, the lawful authority shall be considered the approval by the Regional Water Manager. No Sundry Permit will be required by the Regional Fish and Wildlife Manager under these circumstances.

6. When the action (removal of a beaver dam) is taken to reclaim riparian lands or provide passage for fish, or reasons other than protection of property, then the Regional Fish and Wildlife Manager may issue a Sundry Permit in addition to the approval that may be issued by the Regional Water Manager.
7. If the trapping season is open, the Regional F/W Manager or the Wildlife Section Head may, whenever possible or practical, contact the registered trap-line holder and request removal of nuisance beaver by the trapper prior to beaver dam removal. If required, a Sundry Permit may be issued for removal of beaver by the Regional F/W Manager or the Wildlife Section Head.
8. When necessary, the BCE sundry permit and approval letter, shall be jointly issued to the proponent.
9. In the event there is objection to the removal of the beaver dam by a riparian land owner, water license holder, government agency or First Nation, the objection must be in writing and received by the Regional Water Manager within 15 days of notification of the intent to remove the dam. The Regional Water Manager will make a decision on the objection. The objector has a right of appeal according to Section 38 of the British Columbia Water Act. Such an appeal will not act as a stay of execution to the decision of the Regional Water Manager.

9. SOURCES OF INFORMATION

The following are useful information sources some of which were used to develop these Windows and Measures.

Salmonid Swimming Performance in Relation to Passage Through Culverts. J.C. Wightman and G.D. Taylor, December 1976.

Stream Crossing Guidebook for Fish Streams. A Working Draft for 1997/1998, V.A. Poulin and H.W. Argent.

Culvert Guidelines: Recommendations for the Design & Installation of Culverts in British Columbia to Avoid Conflict with Anadromous Fish. Fisheries & Marine Service Technical Report No. 811, B.G. Dane, 1978.

A Review & Resolution of Fish Passage Problems at Culvert Sites in British Columbia. Fisheries & Marine Service Technical Report No. 810, B.G. Dane, 1978.

Guidelines for Land Development and Protection of the Aquatic Environment. Fisheries & Marine Service Technical Report No. 807. Riparian Audit, Skeena Region.

Influence of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. William R. Meehan Editor.

Indigenous Fish Species Potentially at Risk in BC with Recommendations and Prioritizations for Conservation Forestry/Resource Use, Inventory and Research. Ministry of Fisheries, Fisheries Management Report No. 105, Gordon Haas, 1998.

Rare Freshwater Fish of British Columbia. BC Environment, S.G. Cannings and J. Ptolemy, 1998.

Riparian Management Area Guidebook. BC Environment, BC Forest Service, 1995.

Fish-stream Identification Guidebook. BC Environment, BC Forest Service, 1995.