Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV I	Crew:	BK + DG
HWY CL STA:	186	Date:	9/9/02
Plan Sheet:	Area A	Time:	1215

Field Inspection Summary				Comments:
Migration Barrier:	yes	no	uncertain	
Maintenance:	yes	no	uncertain	
Repair:	yes	no	uncertain	
Retrofit:	yes	no	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	yes	no	Lack of flow + connection to Klehini R.
Photographs:	yes	no	This is unchanged from last year. Photo
Photo Log:	yes	no	log only
Velocity Measurements:	yes	no	
Flow Depth Measurements:	yes	no	
Pebble Counts:	yes	no	

Culvert Inlet and Upstream Channel	
1	Sediment deposition
2	Debris accumulation
3	Percent area of inlet blocked
4	Pebble count in channel
5	Inlet crown to bed height
6	Inlet bed elevation
7	Inlet drop height
8	High water marks
9	Resting pools
10	Condition of inlet
11	Condition of wing walls
12	Condition of embankment
13	Condition of riprap
14	Condition of streambed
15	Condition of stream banks
15	Approach channel flow depth
16	Flow depth at inlet
17	Approach channel velocity
18	Velocity at inlet
19	Streambed width

Comments:

standing water in channel, no flow

CV1

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment	
20	Sediment deposition
21	Sediment size
22	Bed forms
23	Resting pools
24	Crown to bed height
25	% change from as-builts
26	Flow depth
27	Velocity, trial 1
28	Velocity, trial 2
29	High water marks
30	Debris accumulation
31	Condition of barrel
32	Condition of culvert baffles/weirs

Comments:

2 inches sediment in culvert. Standing water 2' of inlet, rest dry

Culvert Outlet and Downstream Channel	
33	Outlet velocity
34	High water mark elevations
35	Scour hole length
36	Scour hole width
37	Maximum pool depth
38	Distance from culvert outlet to maximum pool depth
39	Culvert invert elevation
40	Pool tail crest elevation
41	Invert-to-pool drop height
42	Condition of outlet
43	Condition of embankment
44	Condition of pipe bedding
45	Condition of riprap
46	Condition of downstream weir
47	Condition of stream banks
48	Condition of streambed

Comments:

no flow

Fish	
49	Presence/Absence of Fish

Comments: no flow or evidence of fish present

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID: CV2		Crew: BK + DG	
HWY CL STA: 216+00		Date: 9/9/02	
Plan Sheet:		Time: 1240	

Field Inspection Summary				Comments:
Migration Barrier:	yes	no	(uncertain)	14C water temp
Maintenance:	yes	no	(uncertain)	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	water too low for velocity measurements
Photographs:	(yes)	no	channel survey not completed because of
Photo Log:	(yes)	no	lack channel forming flows
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	yes	no	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	0
2	Debris accumulation	wood debris accumulating @ inlet
3	Percent area of inlet blocked	100%
4	Pebble count in channel	[illegible]
5	Inlet crown to bed height	48"
6	Inlet bed elevation	
7	Inlet drop height	2 cm
8	High water marks	
9	Resting pools	pool provides resting area
10	Condition of inlet	good
11	Condition of wing walls	n/a
12	Condition of embankment	veg becoming established
13	Condition of riprap	good
14	Condition of streambed	aquatic veg choking channel
15	Condition of stream banks	vegetated
15	Approach channel flow depth	~0
16	Flow depth at inlet	~1cm
17	Approach channel velocity	0
18	Velocity at inlet	
19	Streambed width	1.5 m

Comments:

culvert acting as control structure for pool, as designed. Aquatic veg accumulating. Need to check DO

CV2

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	none, [illegible] very [illegible] [illegible]
21	Sediment size	
22	Bed forms	none
23	Resting pools	largest 20' at culvert
24	Crown to bed height	4ft
25	% change from as-builts	bed [illegible]?
26	Flow depth	2 cm
27	Velocity, trial 1	
28	Velocity, trial 2	
29	High water marks	
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	bottle @ outlet fine

Comments: no material @ inlet, some gravel + aquatic vegetation @ outlet

Culvert Outlet and Downstream Channel		
33	Outlet velocity	[illegible]
34	High water mark elevations	[illegible]
35	Scour hole length	about [illegible]
36	Scour hole width	[illegible]
37	Maximum pool depth	2.2'
38	Distance from culvert outlet to maximum pool depth	
39	Culvert invert elevation	3.5 from culvert crown
40	Pool tail crest elevation	3.8' " culvert crown
41	Invert-to-pool drop height	
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	
45	Condition of riprap	good
46	Condition of downstream weir	poor fish passage @ low flow
47	Condition of stream banks	good
48	Condition of streambed	[illegible] can trap fish @ low flow

Comments: I don't [illegible] found in channel below

DOT did fill old channel, photo #215 photo #3 post replaced

Fish		
49	Presence/Absence of Fish	

Comments: no fish noted [illegible] at culvert

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CU3	Crew:	BK + DG
HWY CL STA:	379	Date:	9/9
Plan Sheet:		Time:	1335

Field Inspection Summary				Comments:
Migration Barrier:	yes	(no)	uncertain	
Maintenance:	yes	(no)	uncertain	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	(yes)	no	
Flow Depth Measurements:	(yes)	no	
Pebble Counts:	(yes)	no	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	no
2	Debris accumulation	no
3	Percent area of inlet blocked	none
4	Pebble count in channel	
5	Inlet crown to bed height	6.3
6	Inlet bed elevation	
7	Inlet drop height	none
8	High water marks	none
9	Resting pools	channel over widened, pool on river left
10	Condition of inlet	good
11	Condition of wing walls	n/a
12	Condition of embankment	good / veg
13	Condition of riprap	good
14	Condition of streambed	significant silt accumulation
15	Condition of stream banks	over widened but well vegetated
15	Approach channel flow depth	0.7'
16	Flow depth at inlet	0.7'
17	Approach channel velocity	44 fpm, 51 fpm, 50' - 52 fpm
18	Velocity at inlet	
19	Streambed width	11'

Comments:

natural channel width 50' + culvert

over widened stream bank photo # 216 silt appears to be dropping out

page 1 of 2

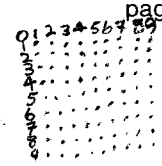
UPSTREAM PROFILE SURVEY

0 6.6
20 5.85
40 6.4
50 6.8
60 6.75
70 7.3
80 6.35
100 6.4

2 ||||
2.8
4 ||||
5.6
8 ||||
11.4 |
16 ||||

22 ||
32 ||||
48 ||||
64 ||||
91 ||||
128 ||
180 ||

256



CV3

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	
21	Sediment size	
22	Bed forms	
23	Resting pools	100' from outlet ~ 6" silt 110' ~ 1' silt 115' 1.5' silt
24	Crown to bed height	6.8'
25	% change from as-builts	
26	Flow depth	0.8'
27	Velocity, trial 1	
28	Velocity, trial 2	
29	High water marks	
30	Debris accumulation	
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments:

deep accumulation silt in culvert starting ~25' from inlet, @ 50' ~ 1' deep

outlet pool 218, inlet 219, 50' 220

Culvert Outlet and Downstream Channel		
33	Outlet velocity	44 rpms
34	High water mark elevations	~~none~~ 6.2'
35	Scour hole length	no scour pool
36	Scour hole width	"
37	Maximum pool depth	"
38	Distance from culvert outlet to maximum pool depth	"
39	Culvert invert elevation	
40	Pool tail crest elevation	1.1' depth 30 rpm
41	Invert-to-pool drop height	n/a
42	Condition of outlet	good
43	Condition of embankment	good, riprapped
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	n/a
47	Condition of stream banks	good, here & there over widened
48	Condition of streambed	good

Comments:

over widen stream channel, no outlet pool, fast second velocity

Fish	
49	Presence/Absence of Fish

Comments:

adult chum noted just below culvert

CULVERT BARREL PEBBLE COUNT

2 ||||| ||||| ||||| ||||| 22 ||||| ||||| ||||| |||||

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV4	Crew:	BK + DG
HWY CL STA:	406	Date:	9/9/02
Plan Sheet:		Time:	1440

Field Inspection Summary				Comments:
Migration Barrier:	(yes)	no	uncertain	
Maintenance:	yes	no	(uncertain)	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	water did not flow through culvert
Photographs:	(yes)	no	did back up + reach inlet
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	photo monitoring only
Flow Depth Measurements:	yes	(no)	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	silt has accumulated
2	Debris accumulation	
3	Percent area of inlet blocked	
4	Pebble count in channel	
5	Inlet crown to bed height	
6	Inlet bed elevation	
7	Inlet drop height	
8	High water marks	
9	Resting pools	
10	Condition of inlet	
11	Condition of wing walls	
12	Condition of embankment	
13	Condition of riprap	
14	Condition of streambed	
15	Condition of stream banks	
15	Approach channel flow depth	
16	Flow depth at inlet	
17	Approach channel velocity	
18	Velocity at inlet	
19	Streambed width	

Comments:

channel excavated in spring. Water fill channel, sides slumped + partially refilled channel

CV4

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment	
20	Sediment deposition silt deposited in culvert
21	Sediment size
22	Bed forms
23	Resting pools
24	Crown to bed height
25	% change from as-builts
26	Flow depth
27	Velocity, trial 1
28	Velocity, trial 2
29	High water marks
30	Debris accumulation
31	Condition of barrel
32	Condition of culvert baffles/weirs

Comments:
silt was redistributed in culvert when water backed into it

Culvert Outlet and Downstream Channel	
33	Outlet velocity
34	High water mark elevations
35	Scour hole length
36	Scour hole width
37	Maximum pool depth
38	Distance from culvert outlet to maximum pool depth
39	Culvert invert elevation
40	Pool tail crest elevation
41	Invert-to-pool drop height
42	Condition of outlet
43	Condition of embankment
44	Condition of pipe bedding
45	Condition of riprap
46	Condition of downstream weir
47	Condition of stream banks
48	Condition of streambed

Comments:
no water flow has occurred in this channel yet

Fish	
49	Presence/Absence of Fish

Comments:

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID: CV5		Crew: BK + DG	
HWY CL STA: 431		Date: 9/9/07	
Plan Sheet:		Time: 1450	

Field Inspection Summary				Comments:
Migration Barrier:	(yes)	no	uncertain	
Maintenance:	yes	no	(uncertain)	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	no	(uncertain)	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	Kletsini River has entered channel at culvert outlet. Disturbed fish habitat at outlet channel. Photo monitoring only
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	yes	(no)	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel	
1	Sediment deposition
2	Debris accumulation
3	Percent area of inlet blocked
4	Pebble count in channel
5	Inlet crown to bed height
6	Inlet bed elevation
7	Inlet drop height
8	High water marks
9	Resting pools
10	Condition of inlet
11	Condition of wing walls
12	Condition of embankment
13	Condition of riprap
14	Condition of streambed
15	Condition of stream banks
15	Approach channel flow depth
16	Flow depth at inlet
17	Approach channel velocity
18	Velocity at inlet
19	Streambed width

Comments:

Woody debris remains suspended in steep channel above inlet.

CV5

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment	
20	Sediment deposition
21	Sediment size
22	Bed forms
23	Resting pools
24	Crown to bed height
25	% change from as-builts
26	Flow depth
27	Velocity, trial 1
28	Velocity, trial 2
29	High water marks
30	Debris accumulation
31	Condition of barrel
32	Condition of culvert baffles/weirs

Comments:

water backed up through most of culvert

Culvert Outlet and Downstream Channel	
33	Outlet velocity
34	High water mark elevations
35	Scour hole length
36	Scour hole width
37	Maximum pool depth
38	Distance from culvert outlet to maximum pool depth
39	Culvert invert elevation
40	Pool tail crest elevation
41	Invert-to-pool drop height
42	Condition of outlet
43	Condition of embankment
44	Condition of pipe bedding
45	Condition of riprap
46	Condition of downstream weir
47	Condition of stream banks
48	Condition of streambed

Comments:

outlet channel obliterated by Klehini R. inflow. Culvert mostly submerged

Fish	
49	Presence/Absence of Fish

Comments:

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV6	Crew:	BK + DG
HWY CL STA:	6.91	Date:	9/9/02
Plan Sheet:		Time:	1500

Field Inspection Summary				Comments:
Migration Barrier:	yes	(no)	uncertain	
Maintenance:	yes	(no)	uncertain	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	yes	(no)	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	silt accumulation above inlet
2	Debris accumulation	none
3	Percent area of inlet blocked	none
4	Pebble count in channel	
5	Inlet crown to bed height	3.1'
6	Inlet bed elevation	
7	Inlet drop height	none
8	High water marks	none
9	Resting pools	shallow pool above culvert
10	Condition of inlet	good
11	Condition of wing walls	n/a
12	Condition of embankment	good
13	Condition of riprap	none
14	Condition of streambed	silt accumulation
15	Condition of stream banks	over widened / vegetated
15	Approach channel flow depth	0.1'
16	Flow depth at inlet	< 0.1'
17	Approach channel velocity	≈ 0
18	Velocity at inlet	very slow
19	Streambed width	3.5'

Comments: no channel forming flows, no pebble count. Over widened near culvert inlet

CV6

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	none
21	Sediment size	place gravel
22	Bed forms	none
23	Resting pools	water backed up from Klehini R
24	Crown to bed height	
25	% change from as-builts	
26	Flow depth	~ 0.1'
27	Velocity, trial 1	very slow
28	Velocity, trial 2	
29	High water marks	none
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments:
bed material missing from lower portion of culvert, otherwise looks good

Culvert Outlet and Downstream Channel	
33	Outlet velocity
34	High water mark elevations
35	Scour hole length
36	Scour hole width
37	Maximum pool depth
38	Distance from culvert outlet to maximum pool depth
39	Culvert invert elevation
40	Pool tail crest elevation
41	Invert-to-pool drop height
42	Condition of outlet
43	Condition of embankment
44	Condition of pipe bedding
45	Condition of riprap
46	Condition of downstream weir
47	Condition of stream banks
48	Condition of streambed

Comments: Klehini R is above culvert invert, no outlet channel

Fish	
49	Presence/Absence of Fish

Comments:
2 juvenile fish noted above culvert inlet

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV 7	Crew:	BK + DG
HWY CL STA:	706	Date:	9/9/02
Plan Sheet:		Time:	1505

Field Inspection Summary				Comments:
Migration Barrier:	yes	(no)	uncertain	
Maintenance:	yes	(no)	uncertain	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	(yes)	no	
Flow Depth Measurements:	(yes)	no	
Pebble Counts:	(yes)	no	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	none
2	Debris accumulation	none
3	Percent area of inlet blocked	0%
4	Pebble count in channel	
5	Inlet crown to bed height	7.65
6	Inlet bed elevation	
7	Inlet drop height	none
8	High water marks	none
9	Resting pools	small pools on east side of channel patch 219
10	Condition of inlet	good
11	Condition of wing walls	good
12	Condition of embankment	good
13	Condition of riprap	good
14	Condition of streambed	good
15	Condition of stream banks	gravel/cobble on West side, good east side
15	Approach channel flow depth	0.75'
16	Flow depth at inlet	0.9'
17	Approach channel velocity	1.43 rpm
18	Velocity at inlet	91 rpm
19	Streambed width	29'

Comments:

Inlet channel seems as built + designed

Patch of Bare culvert with no sediment ~ 25' Downstream of inlet

UPSTREAM PROFILE
0 - 7.65
10
20 - 7.0
40 - 7.7
60 - 7.9
80 - 8.5
100 - 8.7

2 ||||
2.8
4 |
5.6
8
11.4 |||
16 |||

22 ||||
32 ||||
48 ||||
64 ||||
91 ||||
128 |||
180 |||
256

0 1 2 3 4 5 6 7 8 9 100

CV7

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	very minimal
21	Sediment size	gravel, cobbles, placed boulders
22	Bed forms	
23	Resting pools	behind placed boulders
24	Crown to bed height	7.65'
25	% change from as-builts	
26	Flow depth	1.3'
27	Velocity, trial 1	98 rpm mid ~~chan~~ culvert
28	Velocity, trial 2	
29	High water marks	0.5' above water level
30	Debris accumulation	very minimal
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments: fish passage provided inlet photo # 220

Culvert Outlet and Downstream Channel		
33	Outlet velocity	99 rpm
34	High water mark elevations	6.3'
35	Scour hole length	31'
36	Scour hole width	33'
37	Maximum pool depth	2.7'
38	Distance from culvert outlet to maximum pool depth	14'
39	Culvert invert elevation	
40	Pool tail crest elevation	
41	Invert-to-pool drop height	
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	good
47	Condition of stream banks	n/a
48	Condition of streambed	as constructed

Comments: DOWNSTREAM PROFILE

0 - 8.0
10 - 8.15
30 - 9.2 (Tailcrest)
35 - 8.5
40 - 9.35
45 - 9.45
50 - 9.7
55 - 10.1
60 - 10.7
70 - 11.3
80 - 12.0
90 - 11.8
100 - 11.8

Fish		
49	Presence/Absence of Fish	

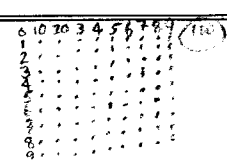
Comments: several adult DVs noted in outlet pool

2 |||
2.8
4 |
5.6 |
8
11.4
16 ||

22 |||
32 ~~||||~~ ||||
48 ~~||||~~ ~~||||~~ ~~||||~~ ||
64 ~~||||~~ ~~||||~~ ~~||||~~
91 ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~
128 ~~||||~~ ~~||||~~ ~~||||~~ |||
180 ~~||||~~ |||

Bigger ||
~~||||~~
256

256 |||



Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV8	Crew:	BK+JG
HWY CL STA:	790+00	Date:	9/11/02
Plan Sheet:		Time:	1315

Field Inspection Summary				Comments:
Migration Barrier:	yes	no	uncertain	
Maintenance:	yes	no	uncertain	
Repair:	yes	no	uncertain	
Retrofit:	yes	no	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	(yes)	no	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	silt near inlet
2	Debris accumulation	some small woody debris
3	Percent area of inlet blocked	0%
4	Pebble count in channel	
5	Inlet crown to bed height	3.4'
6	Inlet bed elevation	
7	Inlet drop height	0
8	High water marks	
9	Resting pools	some resting pools above inlet
10	Condition of inlet	good
11	Condition of wing walls	n/a
12	Condition of embankment	good
13	Condition of riprap	good
14	Condition of streambed	gravel/cobble w/ silt accumulation
15	Condition of stream banks	vegetated
15	Approach channel flow depth	0.2'
16	Flow depth at inlet	0.2'
17	Approach channel velocity	very slow
18	Velocity at inlet	
19	Streambed width	11'

Comments: Very slow current, oversized channel for flow, lots of small wood debris

No fish noted

UPSTREAM PROFILE
0 - 3.6
20 - 3.3
40 - 2.7
60 - 2.0
80 - 1.95
100 - 2.05

CV8

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	silt accumulation
21	Sediment size	gravel / cobble that was placed
22	Bed forms	none
23	Resting pools	flat gradient, standing water
24	Crown to bed height	3.6'
25	% change from as-builts	0
26	Flow depth	0.2'
27	Velocity, trial 1	very slow
28	Velocity, trial 2	
29	High water marks	none
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments: very little current, standing water

Culvert Outlet and Downstream Channel		
33	Outlet velocity	basically 0
34	High water mark elevations	2.6' & crown
35	Scour hole length	n/a
36	Scour hole width	n/a
37	Maximum pool depth	n/a
38	Distance from culvert outlet to maximum pool depth	n/a
39	Culvert invert elevation	
40	Pool tail crest elevation	n/a
41	Invert-to-pool drop height	n/a
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	n/a
47	Condition of stream banks	vegetated
48	Condition of streambed	good

Comments: little flow, standing water

downstream profile
0 - 3.4' 60 - 3.1
20' - 3.5' 80 - 3.9
40' - 3.1' 100 - 3.8

juvenile fish noted

Fish	
49	Presence/Absence of Fish

Comments: few fish in outlet channel

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV9	Crew:	BK+DG
HWY CL STA:	793+00	Date:	9/11/02
Plan Sheet:		Time:	1350

Field Inspection Summary				Comments:
Migration Barrier:	yes	no	uncertain	
Maintenance:	yes	no	uncertain	
Repair:	yes	no	uncertain	
Retrofit:	yes	no	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	yes	no	
Photographs:	yes	no	
Photo Log:	yes	no	
Velocity Measurements:	yes	no	
Flow Depth Measurements:	yes	no	
Pebble Counts:	yes	no	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	none
2	Debris accumulation	none
3	Percent area of inlet blocked	0%
4	Pebble count in channel	
5	Inlet crown to bed height	7.8'
6	Inlet bed elevation	
7	Inlet drop height	none
8	High water marks	none
9	Resting pools	constructed pool ~ 50'↑, small side pool river left 20'↑
10	Condition of inlet	good
11	Condition of wing walls	n/a
12	Condition of embankment	good
13	Condition of riprap	good, some has fallen into channel
14	Condition of streambed	good
15	Condition of stream banks	riprap on rr, veg starting rl
15	Approach channel flow depth	0.8'
16	Flow depth at inlet	0.8'
17	Approach channel velocity	117 rpm
18	Velocity at inlet	144
19	Streambed width	19.7'

Comments: channel looks good, rock lined bank on river right increases approach velocity thalweg is against revetment + scouring channel. An additional log weir would help channel channel profile

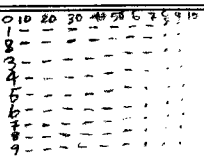
photo of weir structure

0'- 7.8'
20'- 7.0'
40'- 7.7'
60'- 6.6'
70 (sed. backed up against deflector log) - 6.1'
80 - 6.7'
100'- 8.3'

2 ~~||||~~ |||
2.8
4 ||||
5.6 |
8 ~~||||~~ |
11.4 ~~||||~~
16 |||

22 ~~||||~~ ||||
32 ~~||||~~ ~~||||~~ ~~||||~~ |
48 ~~||||~~ ~~||||~~
64 ~~||||~~ ~~||||~~ |
91 ~~||||~~ ~~||||~~ ~~||||~~ ||
128 ~~||||~~ |
180 ~~||||~~

256 |



0 10 20 30 40 50 6 7 8 9 10
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CV9

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	none
21	Sediment size	gravel / small cobble
22	Bed forms	wide flat channel
23	Resting pools	none
24	Crown to bed height	7.7'
25	% change from as-builts	0%
26	Flow depth	0.5'
27	Velocity, trial 1	132 rpm
28	Velocity, trial 2	
29	High water marks	
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments: wide flat channel, no bed forms. Large rock would help fish passage

Culvert Outlet and Downstream Channel		
33	Outlet velocity	104 rpm 0.7
34	High water mark elevations	6.6' ↓ crown
35	Scour hole length	18.0'
36	Scour hole width	19.7'
37	Maximum pool depth	2.2'
38	Distance from culvert outlet to maximum pool depth	11'
39	Culvert invert elevation	
40	Pool tail crest elevation	9.1'
41	Invert-to-pool drop height	n/a
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	as built
47	Condition of stream banks	vegetated below riprap wells
48	Condition of streambed	good

Comments:
Downstream profile
0'-8.0'
20'-8.1' (Tailcrest)
40'-8.6'
60'-8.1'
80'-8.1'
100'-8.4'

weir is not holding back water at this flow

Fish		
49	Presence/Absence of Fish	

Comments: none noted

CULVERT BARREL PEBBLE COUNT

2 22 ~~||||~~ |
2.8 32 ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||||
4 48 ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||||
5.6 64 ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||
8 91 ~~||||~~ ~~||||~~ ~~||||~~ |||
11.4 128
16 | 180 | 256

0 10 2 3 4 5 6 7 8 9 100
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Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID: CV10		Crew: BK-DG	
HWY CL STA: 832		Date: 9/11/02	
Plan Sheet:		Time: 1500	

Field Inspection Summary				Comments:
Migration Barrier:	yes	no	uncertain	
Maintenance:	yes	no	uncertain	
Repair:	yes	no	uncertain	
Retrofit:	yes	no	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	yes	(no)	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	none
2	Debris accumulation	none
3	Percent area of inlet blocked	none
4	Pebble count in channel	no
5	Inlet crown to bed height	3.1'
6	Inlet bed elevation	
7	Inlet drop height	none
8	High water marks	none
9	Resting pools	none
10	Condition of inlet	as built
11	Condition of wing walls	n/a
12	Condition of embankment	good
13	Condition of riprap	good
14	Condition of streambed	good
15	Condition of stream banks	vegetation becoming established
15	Approach channel flow depth	very shallow
16	Flow depth at inlet	"
17	Approach channel velocity	trickle
18	Velocity at inlet	"
19	Streambed width	3.4'

Comments:

UPSTREAM PROFILE very little flow, shallow water

0'-3.1'
20'-2.1'
40'-2.5'
50'-3.4'

comes out of backed up pool

CV10

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	
21	Sediment size	gravel
22	Bed forms	none, flat bottom
23	Resting pools	water, backed up near outlet
24	Crown to bed height	3'
25	% change from as-builts	—
26	Flow depth	< 0.1'
27	Velocity, trial 1	trickle
28	Velocity, trial 2	
29	High water marks	none
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments: flat wide channel, no bed forming flows apparently

Culvert Outlet and Downstream Channel		
33	Outlet velocity	0
34	High water mark elevations	
35	Scour hole length	none
36	Scour hole width	n/a
37	Maximum pool depth	none
38	Distance from culvert outlet to maximum pool depth	n/a
39	Culvert invert elevation	
40	Pool tail crest elevation	n/a
41	Invert-to-pool drop height	
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	n/a
47	Condition of stream banks	vegetated except near outlet
48	Condition of streambed	excess material for flow, pb.b #006

Comments: low flow, too low for [illegible]

0
20'-3.4'
40'-4.05'
60'-4.2
80'-4.6'
100'-4.6'

Fish	
49	Presence/Absence of Fish

Comments: none

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV11	Crew:	BK + DG
HWY CL STA:	872	Date:	9/11/02
Plan Sheet:		Time:	1530

Field Inspection Summary				Comments:
Migration Barrier:	(yes)	no	uncertain	
Maintenance:	yes	(no)	uncertain	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	no flowing water. Channel appears
Photographs:	(yes)	no	higher than wetland on RR near inlet
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	yes	(no)	
Pebble Counts:	yes	no	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	no
2	Debris accumulation	no
3	Percent area of inlet blocked	0
4	Pebble count in channel	
5	Inlet crown to bed height	6.5'
6	Inlet bed elevation	
7	Inlet drop height	0
8	High water marks	no
9	Resting pools	no
10	Condition of inlet	good
11	Condition of wing walls	n/a
12	Condition of embankment	good
13	Condition of riprap	good
14	Condition of streambed	good
15	Condition of stream banks	very little vegetation
15	Approach channel flow depth	0
16	Flow depth at inlet	0
17	Approach channel velocity	—
18	Velocity at inlet	—
19	Streambed width	8'

Comments: no flow w/, 90' of culvert. Constructed channel is encouraging subsurface flow during low flow conditions

channel profile

0-6.5 60'-3.2'
80'-3.8'
20'-5.55' 100'-4.4'
40'-4.4'

CVII

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	none
21	Sediment size	gravel/cobble
22	Bed forms	none
23	Resting pools	none
24	Crown to bed height	6.3'
25	% change from as-builts	–
26	Flow depth	0
27	Velocity, trial 1	
28	Velocity, trial 2	
29	High water marks	none
30	Debris accumulation	no
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments: no flow thru culvert - no channel forms, flat wide

Culvert Outlet and Downstream Channel		
33	Outlet velocity	no water
34	High water mark elevations	6.7' ↓ crown
35	Scour hole length	n/a
36	Scour hole width	n/a
37	Maximum pool depth	n/a
38	Distance from culvert outlet to maximum pool depth	n/a
39	Culvert invert elevation	
40	Pool tail crest elevation	n/a
41	Invert-to-pool drop height	
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	n/a
47	Condition of stream banks	riprap both banks
48	Condition of streambed	good

Comments: surface water 80' ↓ culvert
backed up water, no real flow

It appears there was flow earlier

DOWNSTREAM PROFILE
0'-6.6'
20-6.85'
40-7.5'
60'-~~5.75~~' 7.75'
80'-~~6.6~~' 8.6'
100'-~~7.7~~' 9.7'

6.7
4.7

Fish	
49	Presence/Absence of Fish

Comments: no water, no fish

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID: CV12		Crew: BK + DG	
HWY CL STA: 888		Date: 7/11/02	
Plan Sheet:		Time: 1615	

Field Inspection Summary				Comments:
Migration Barrier:	yes	(no)	uncertain	embankment above culvert is falling into stream. Needs retrofit
Maintenance:	yes	(no)	uncertain	
Repair:	yes	(no)	uncertain	
Retrofit:	(yes)	no	uncertain	photos taken

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	yes	no	
Velocity Measurements:	(yes)	no	
Flow Depth Measurements:	(yes)	no	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	no
2	Debris accumulation	no
3	Percent area of inlet blocked	0
4	Pebble count in channel	
5	Inlet crown to bed height	6.1
6	Inlet bed elevation	
7	Inlet drop height	0
8	High water marks	no
9	Resting pools	on either side of inlet, channel over widened
10	Condition of inlet	as built
11	Condition of wing walls	one support member in inlet not attached
12	Condition of embankment	road bed entering stream
13	Condition of riprap	good
14	Condition of streambed	good
15	Condition of stream banks	more vegetation on RR
15	Approach channel flow depth	0.4'
16	Flow depth at inlet	0.4'
17	Approach channel velocity	1.04 rpm
18	Velocity at inlet	1.6 rpm
19	Streambed width	9'

Comments:

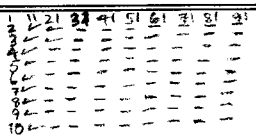
over widened @ inlet, more vegetation would be helpful, headwall not retaining roadbed

Stream profile

0-6.1' 49-5.4' 80'-3.6'
20-5.9' 50-3.9' 100-3.4'
40-5.7' 60'-3.7'

2 ||||
2.8
4 ||||
5.6
8 |||
11.4 ||||
16 ||

22 ||||
32 ||||
48 ||||
64 ||||
91 ||||
128 ||||
180 ||||
256 |



CV12

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	
21	Sediment size	gravel/cobble
22	Bed forms	none, sheet flow
23	Resting pools	none
24	Crown to bed height	5.6'
25	% change from as-builts	0
26	Flow depth	0.2
27	Velocity, trial 1	72 rpm
28	Velocity, trial 2	
29	High water marks	
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	n/a

Comments:

bed too high compared to natural channel, promoting sheet flow

Culvert Outlet and Downstream Channel		
33	Outlet velocity	20 rpm
34	High water mark elevations	6.1
35	Scour hole length	n/a
36	Scour hole width	n/a
37	Maximum pool depth	n/a
38	Distance from culvert outlet to maximum pool depth	n/a
39	Culvert invert elevation	
40	Pool tail crest elevation	n/a
41	Invert-to-pool drop height	—
42	Condition of outlet	good
43	Condition of embankment	road bed entering stream
44	Condition of pipe bedding	good
45	Condition of riprap	good
46	Condition of downstream weir	n/a
47	Condition of stream banks	wetland stakes survived
48	Condition of streambed	good

Comments:

stream profile
0-5.9' 60-7.6' (5.2)
20-6.5' 80-8.1' (5.7)
40-7.5' 100-8.4 (6.0)

Fish	
49	Presence/Absence of Fish

Comments: none noted

Pebble count in barrel

2 — 22 ||||
2.8 — 32 ||||
4 — 48 ||||
5.6 || — 64 ||||
8 | — 91 ||||
11.4 |||| — 128 ||||
16 |||| — 180 | — 256 ||

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

General Information			
Culvert Site ID:	CV13	Crew:	BK + DG
HWY CL STA:	947	Date:	9/11/02
Plan Sheet:		Time:	1700

Field Inspection Summary				Comments:
Migration Barrier:	(yes)	no	uncertain	
Maintenance:	yes	(no)	uncertain	
Repair:	yes	(no)	uncertain	
Retrofit:	yes	(no)	uncertain	

Check List for Completed Monitoring Tasks			Comments:
Narrative:	(yes)	no	
Photographs:	(yes)	no	
Photo Log:	(yes)	no	
Velocity Measurements:	yes	(no)	
Flow Depth Measurements:	(yes)	no	
Pebble Counts:	yes	(no)	

Culvert Inlet and Upstream Channel		
1	Sediment deposition	gravel bar above inlet.
2	Debris accumulation	no
3	Percent area of inlet blocked	0
4	Pebble count in channel	—
5	Inlet crown to bed height	6.1'
6	Inlet bed elevation	
7	Inlet drop height	n/a
8	High water marks	
9	Resting pools	no
10	Condition of inlet	good
11	Condition of wing walls	good
12	Condition of embankment	good
13	Condition of riprap	good
14	Condition of streambed	good
15	Condition of stream banks	over widened at inlet
15	Approach channel flow depth	0.3'
16	Flow depth at inlet	0.4'
17	Approach channel velocity	—
18	Velocity at inlet	—
19	Streambed width	6'

Comments:

Over widened @ inlet

gravel bar accumulated. 25'L x 7'W x 1'D

1st baffle backing water in front of inlet

2 ||||
2.8
4
5.6 |
8 ||||
11.4 ~~||||~~ ~~||||~~
16 ~~||||~~ ||

22 ~~||||~~ ~~||||~~ |
32 ~~||||~~ ~~||||~~ ~~||||~~
48 ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||||
64 ~~||||~~ ~~||||~~ ~~||||~~ ||
91 ~~||||~~
128
180 |
256

CU13

Haines Highway Mitigation Monitoring

Culvert Evaluation Field Form

Culvert Barrel and Bed Sediment		
20	Sediment deposition	almost none
21	Sediment size	gravel
22	Bed forms	none
23	Resting pools	behind baffles
24	Crown to bed height	as built
25	% change from as-builts	0
26	Flow depth	0.4
27	Velocity, trial 1	—
28	Velocity, trial 2	
29	High water marks	—
30	Debris accumulation	none
31	Condition of barrel	good
32	Condition of culvert baffles/weirs	good

Comments: very little sediment behind baffles

Culvert Outlet and Downstream Channel		
33	Outlet velocity	—
34	High water mark elevations	5.6' (not clearly defined, taken from line of debris @ channel's edge)
35	Scour hole length	10'
36	Scour hole width	5'
37	Maximum pool depth	1.1'
38	Distance from culvert outlet to maximum pool depth	6.5'
39	Culvert invert elevation	
40	Pool tail crest elevation	
41	Invert-to-pool drop height	
42	Condition of outlet	good
43	Condition of embankment	good
44	Condition of pipe bedding	no bedding
45	Condition of riprap	good
46	Condition of downstream weir	partially buried
47	Condition of stream banks	very little vegetation
48	Condition of streambed	excessive bedload

Comments: weir functioning, but over ½ buried

fish passage is improved from pre project condition

Saw fish ~~near~~ in culvert near upstream end (3 dollies)

Fish	
49	Presence/Absence of Fish

Comments: none noted