

Churn Creek Protected Area 2010 Photo-point Monitoring

prepared for

**Cariboo-Chilcotin Ecosystem Restoration Steering Committee,
Grasslands Conservation Council of British Columbia**

and

BC Parks, Cariboo Region

by

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INTRODUCTION

The Management Plan for Churn Creek Protected Area (BC Parks 2000) specifies that grasslands of the Protected Area will be monitored for degree of vegetation recovery following application of the management plan. Monitoring is to be based on periodic reassessments, including detailed plot remeasurements and repeat photographs at established or new photo-points. Grassland monitoring is to build on monitoring initiated by the Ministry of Forests and Range.

A monitoring plan was developed for BC Parks by Iverson and McIntosh (2001). It incorporates plots and photo-points established by the B.C. Ministry of Forests and Range as well as several additional plots and photo points established by Iverson and McIntosh in 2000. Monitoring frequencies for photo-points are 3, 5 or 10 years, depending on whether photos are of riparian areas (3 years), water hole developments (3 years), are associated with detailed assessment plots (5 years), or are on general upland areas not associated with detailed assessment plots (10 years). Forty-four photo-points were assigned a 10 year monitoring frequency. They included 37 initially established in 1986 by the Ministry of Forests and Range and rephotographed by Iverson and McIntosh in 2000 and seven new photo-points established in 2000 by Iverson and McIntosh (2001). At most of the photo-points established by the Ministry of Forests, one or more new photo directions were added in 2000 by Iverson and McIntosh (2001). Precise locations of photo-points were permanently marked in 1986 or 2000 by driving into the ground a rebar pin with a plate (approximately 15 x 15 cm) welded on top and painted blue.

Friends of Churn Creek Protected Area Society (FCCPAS) was requested by BC Parks to repeat all photographs taken in 2000 or 2001 at photo points scheduled for photo monitoring in 2010 (10 year monitoring frequency) (Table 1). Partial funding to complete the photo monitoring was provided by the Cariboo-Chilcotin Ecosystems Restoration Steering Committee through the Grasslands Conservation Council of B.C.

The purposes of this report are to 1) describe the methodology used to repeat the photographs, 2) document the grassland seral stage and predominant plant species at each of the photo-points, and 3) document pertinent observations regarding grassland condition or factors affecting photo-monitoring at each of the photo-points.

METHODS

Photo-monitoring

Photo-monitoring methods used in this project duplicate those used by Iverson and McIntosh (2001) based on information in their report and discussions with K. Iverson. They are based on taking one or more photographs in specified directions and camera angles from a single point at each specified photo-point.

Table 1 lists the locations of the 44 photo-points that were assigned a 10 year monitoring frequency and were scheduled for monitoring in 2010 (Iverson and McIntosh 2001). One of the photo-points (6243-25) established by the Ministry of Forests in 1986 could not be relocated in 2000 (Iverson and McIntosh 2001) or during this project.

Each of the photo-points was approximately relocated in this project from the GPS coordinates listed by Iverson and McIntosh (2001) and by pin holes they placed in aerial photographs. The precise location of photo-points was determined by finding the rebar pin placed in 1986 or 2000 to permanently mark the point. At three photo-points (6241-18, 6241-18A, and 6243-32) no pin

Table 1. Photo-points scheduled for 10th year monitoring in 2010 (from Iverson and McIntosh¹).

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo direction	View ²	Comments (from Iverson and McIntosh ¹)
			Easting	Northing				
3027	2	Hartman	552085	5684169	1	268	H	establ. 2000
3027	3	Hartman	551954	5684288	1	98	H	establ. 2000
					2	183	D	
					3	144	H	
6241	3	Churn Flats	540152	5705104	1	76	H	
					2	76	D	
6241	4	Churn Flats	540542	5705510	1	135	H	
					2	135	D	added 2000
					3	90	H	added 2000
					4	330	H	Same as 6241-16
6241	9	Churn Flats	538157	5703091	1	111	H	
					2	166	H	added 2000
					3	238	H	added 2000
					4	238	D	added 2000
					5	309	H	added 2000
6241	10	Churn Flats	538454	5703794	1	124	H	
					2	55	H	added 2000
					3	55	D	added 2000
6241	11	Churn Flats	538772	5704068	1	135	H	
					2	62	H	added 2000
					3	62	D	added 2000
6241	13	Churn Flats	539273	5704188	1	155	H	
					2	184	H	added 2000
					3	80	H	added 2000
					4	80	D	added 2000
6241	14	Churn Flats	539576	5704339	1	330	H	
					2	248	H	added 2000
6241	15	Churn Flats	540097	5705085	1	81	H	
					2			now 6241-21 photo 4

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo direction	View ²	Comments (from Iverson and McIntosh ¹)	
			Easting	Northing					
6241	17	Churn Flats	541098	5705731	1	40	H	(6241- 5 and 17 combined in 2000)	
					2	40	D		added in 2000
					3	130	H		formerly 6241-5
6241	18	Churn Flats	541720	5706168	1	75	H	18A	
					2	225	H		
					3	225	D		added 2000
6241	21	Churn Flats	539602	5704336	1	50	H		
					2	130	H		
					3	130	D		
					4	332	H		formerly 6241-15 photo 2
6243	1	Fraser North (Clyde Mt)	553831	5697090	1	44	H		
					2	44	LD		added 2000
					3	112	H		added 2000
6243	2	Fraser North (Clyde Mt)	553844	5696671	1	80	H		
					2	80	D		added 2000
					3	200	H		added 2000
6243	4	Fraser North (Clyde Mt)	553796	5697253	1	42	H		
					2	108	H		
					3	108	D		
6243	8	Fraser North (Clyde Mt)	552948	5698396	1	61	H		
					2	61	D		
					3	316	H		
					4	132	H		

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo direction	View ²	Comments (from Iverson and McIntosh ¹)
			Easting	Northing				
6243	9	Fraser North (Clyde Mt)	553070	5698175	1	129	H	
					2	144	H	added 2000
6243	11	Fraser North (Clyde Mt)	552308	5699033	1	200	H	
					2	80	H	added 2000
					3	360	H	formerly 6243-12
					4	360	D	added 2000
6243	13	Fraser North (Clyde Mt)	552198	5699194	1	55	H	
					2	55		
6243	14	Fraser North (Clyde Mt)	552198	5699194	1	60	H	
					2	60	D	added 2000
6243	15	Fraser South	548763	5688012	1	260	H	
					2	331	H	added 2000
6243	17	Fraser South	549873	5687608	1	203	H	
					2	203	D	added 2000
6243	19	Fraser South	550070	5686625	1	77	H	
					2	149	H	
					3	149	D	added 2000
6243	20	Fraser South	550591	5686255	1	130	H	
					2	202	H	added 2000
6243	21	Fraser South	550404	5686482	1	197	H	
					2	93	H	added 2000
6243	22	Coal Pit	546962	5707441	1	164	H	
					2	247	H	

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo direction	View ²	Comments (from Iverson and McIntosh ¹)
			Easting	Northing				
6243	23	Coal Pit	546845	5707587	1	182	H	
					2	182	D	
					3	118	D	
					4	118	H	
6243	24	Coal Pit	546788	5707601	1	260	H	
					2	260	D	added 2000
					3	333	H	added 2000
6243	25	Coal Pit	?	?	1	90	H	Not relocated
6243	32	Fraser South	550007	5689694	1	55	H	establ. 2000
					2	353	H	
					3	278	H	
6243	41	Clyde	550718	5697425	1	150	H	establ. 2000
					2	150	D	
					3	47	H	
6243	42	Clyde	551425	5696084	1	196	H	establ. 2000
					2	196	D	
					3	124	H	
					4	36	H	
6243	49	Fraser North	545881	5706727	1	305	H	establ. 2000
					2	72	H	
6243	71	Specialty Pastures	544433	5699391	1	112	H	establ. 2000
					2	190	H	
					3	261	H	
6287	4	Wycott	536105	5704951	1	92	H	
					2	272	H	added 2000
					3	272	D	added 2000
6287	5	Wycott	535910	5704531	1	260	H	
					2	210	H	added 2000
					3	210	D	added 2000

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo direction	View ²	Comments (from Iverson and McIntosh ¹)
			Easting	Northing				
6287	6	Wycott	535385	5704251	1	155	H	
					2	155	D	added 2000
					3	46	H	added 2000
6287	13	Wycott	532063	5706860	1	295	H	
					2	295	D	added 2000
					3	232	H	added 2000
6287	14	Wycott	532303	5706354	1	44	H	
					2	84	H	added 2000
					3	84	D	added 2000
6287	15	Wycott	532459	5706277	1	350	H	
6287	16	Wycott	532421	5706327	1	5	H	
6287	22	Wycott	534697	5701516	1	292	H	
					2	292	D	added 2000
					3	210	H	added 2000
					4	116	H	added 2000
					5	30	H	added 2000
6287	23	Wycott	532767	5705739	1	200	H	
					2	300	H	
					3	25	H	
					4	25	D	

¹Iverson, K. and T. McIntosh. 2001. Churn Creek Protected Area Monitoring Plan. Unpubl. Report prepared for BC Parks, Cariboo District, Williams Lake, B.C. (updated 2002)

²H = camera lens horizontal; D=lens pointing downward into vegetation near pin.

could be found after 30 minutes or more of searching. However, reasonably precise locations of these photo-points was determined by triangulation, using several near and far objects (trees, rocks, landforms, etc) on the photos taken in 1986 or 2000. In one case for which no GPS coordinates were provided by Iverson and McIntosh (2001) (photo-point 6241-18A), GPS coordinates were determined at the triangulated point.

At each photo-point, a camera tripod was set directly over the photo-point pin and photographs were taken using a lens height of 170 cm and effective lens focal length of 50 mm. Effective focal length was determined considering camera digital sensor factor. The direction of each photo at the photo-point was determined from lens directions listed by Iverson and McIntosh (2001) (Table 1) and by comparison with photos taken in 2000 or 2001. In practice, each lens

direction and focal length was fine-tuned to duplicate the photos taken in 2000. In a few cases, the lens direction listed in Iverson and McIntosh (2001) was obviously not that used to take the 2000 photo and the 2010 photo was taken to duplicate the 2000 photo. The change was recorded on field data sheets.

In some cases, one or more photos listed by Iverson and McIntosh (2001) for a photo-point were taken in 2000 at a different photo-point location. That is, two or more photos listed for a photo-point were taken from two different photo-points in 2000. In these cases, photos were taken in 2010 at both photo-points using listed photo directions and camera angles.

All photos taken during this 2010 project are digital images. No paper prints were made.

Vegetation

Range type and principal grass, forb, and shrub species were recorded at each photo-point. Range type was described as grassland seral stage followed by two leading species. Seral stage was listed as early, mid, late, or PNC (potential natural community) based on vegetation composition similarity to the potential plant and lichen community that would likely develop on the site given no further livestock grazing or other human-related disturbance (early = < 25% similarity, mid = 26 – 50% similarity, late = 51 – 75% similarity, PNC = > 75% similarity). Seral stage was sometimes described in greater detail as a class within a seral stage such as “late Mid Seral” meaning an advanced Mid Seral stage. Percent similarity is a subjective estimate based on previous experience and detailed plot assessments in similar grasslands. No quantitative data were collected. Leading species generally included the estimated most abundant grass and most abundant forb species.

Principal species listed for each photo-point were the first dominant (highest estimated ground cover) and second dominant (second highest estimated ground cover) grass species, first and second dominant forb species, and first and second dominant shrub species. Shrubs were absent from many photo-points.

Site and Soils

Site and soil characteristics were not recorded at any of the photo-points because they are described by Iverson and McIntosh (2001).

RESULTS

All photo-points and photos listed in Table 1 (except 6243-25) were rephotographed during late August through September 2010. Locations and directions of all photos taken in 2010 are given in Table 2. This table also describes a few corrections to photo-point locations and photo directions given by Iverson and McIntosh (2001). One photo-point GPS location (18A) was newly identified.

All photographic images were placed on CD's for submission to BC Parks and the Cariboo-Chilcotin Ecosystem Restoration Steering Committee.

Range type (seral stage and leading species) and principal species at each photo-point are listed in Table 3. All seral stages were represented, including 19% PNC, 16% Late Seral, 44% Mid Seral, and 21% Early Seral. Early seral was more prevalent near Blackwater Lake and on Wycott flats than on south side of Churn Creek. No comparisons with seral stage estimates in Iverson and McIntosh (2001) were done.

Table 2. Photos taken in 2010. (“2000” and “2001” under Comments refer to Iverson and McIntosh (2001) images and report).

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo bearing	View ²	Comments 2010
			Easting	Northing				
3027	2	Hartman	552085	5684169	1	268	H	
3027	3	Hartman	551954	5684288	1	98	H	
					2	183	D	
					3	324	H	Direction corrected (given as 144 in 2001)
6241	3	Churn Flats	540152	5705104	1	76	H	
					2	76	D	
6241	4 (+16)	Churn Flats	540542	5705510	1	135	H	(Points 4 and 16 combined in 2000
					2	135	D	UTM is for original point 4)
					3	90	H	
					4	330	H	
6241	9	Churn Flats	538157	5703091	1	111	H	
					2	166	H	
					3	238	H	
					4	238	D	
					5	309	H	
6241	10	Churn Flats	538454	5703794	1	124	H	
					2	55	H	
					3	55	D	
6241	11	Churn Flats	538772	5704068	1	135	H	
					2	62	H	
					3	62	D	
6241	13	Churn Flats	539273	5704188	1	155	H	
					2	184	H	
					3	80	H	
					4	80	D	
6241	14	Churn Flats	539576	5704339	1	330	H	
					2	248	H	

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo bearing	View ²	Comments 2010
			Easting	Northing				
6241	15	Churn Flats	540097	5705085	1	81	H	6241-15 photo 1 in 2001 not from this point (rather from 6241-21)
					2	50	H	Matches 6241-21 photo 1 of 2001
					3	130	H	Photo towards rock cliff
					4	130	D	Photo irrelevant and not taken
					5	332	H	6241-15 photo 5 in 2001 not from this point (rather from 6241-21); was photo 2 in 1986 set for this point
6241	(5+) 17	Churn Flats	541098	5705731	1	130	H	Matches 2001 photo 1 incorrectly reported as 40°
					2	130	D	Matches 2001 photo 2 incorrectly reported as 40°
					3	40	H	Matches 2001 photo 3 incorrectly reported as 130°
					4	40	D	Added 2010
6241	18	Churn Flats	541720	5706168	1	75	H	New photo from this point; in 2001 photo 1 was taken from 18A
					2	225	H	No pin found at this point; small cairn built
					3	225	D	
6241	18A	Churn Flats	541577	5705868	1	35	H	Same as 6241-18 photo 1 taken in 2001; no pin placed at point
6241	21	Churn Flats	539602	5704336	1	50	H	Matches 2001 6241-15 photo 2
					2	130	H	
					3	130	D	
					4	332	H	Matches 2001 6241-15 photo 5
6243	1	Fraser North (Clyde Mt)	553831	5697090	1	44	H	
					2	44	LD	
					3	112	H	
6243	2	Fraser North (Clyde Mt)	553844	5696671	1	80	H	
					2	80	D	
					3	200	H	

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo bearing	View ²	Comments 2010
			Easting	Northing				
6243	4	Fraser North (Clyde Mt)	553796	5697253	1	42	H	
					2	108	H	
					3	108	D	
6243	8	Fraser North (Clyde Mt)	552948	5698396	1	241	H	2001 direction off 180°: corrected to 241
					2	241	D	2001 direction off 180°: corrected
					3	316	H	
					4	132	H	
6243	9	Fraser North (Clyde Mt)	553070	5698175	1	129	H	
					2	144	H	
6243	11	Fraser North (Clyde Mt)	552308	5699033	1	200	H	
					2	80	H	
					3	360	H	
					4	360	D	
6243	13	Fraser North (Clyde Mt)	552198	5699194	1	55	H	GPS off about 12 m – corrected to: 5699200 N, 0552201 E Pin on trail in small rock cairn
					2	55		
6243	14	Fraser North (Clyde Mt)	552198	5699194	1	60	H	Same point as 6243-13; no other pin found
					2	60	D	
6243	15	Fraser South	548763	5688012	1	260	H	(Pin under juniper branches)
					2	331	H	
6243	17	Fraser South	549873	5687608	1	203	H	
					2	203	D	
6243	19	Fraser South	550070	5686625	1	77	H	
					2	149	H	
					3	149	D	
6243	20	Fraser South	550591	5686255	1	130	H	(pin laying on ground)
					2	202	H	

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo bearing	View ²	Comments 2010
			Easting	Northing				
6243	21	Fraser South	550404	5686482	1	197	H	
					2	93	H	
6243	22	Coal Pit	546962	5707441	1	164	H	
					2	247	H	
6243	23	Coal Pit	546845	5707587	1	182	H	
					2	182	D	
					3	118	D	
					4	118	H	
					5	258	H	
6243	24	Coal Pit	546788	5707601	1	260	H	Added in 2010 – similar to 6243-24 photo 1 from 1986
					2	260	D	
					3	333	H	
6243	25	Coal Pit	?	?	1	90	H	Not relocated in 2000 or 2010
6243	32	Fraser South	550007	5689694	1	55	H	No pin found; used 2000 photos to estimate point location at fence edge
					2	353	H	
					3	278	H	
6243	41	Clyde	550718	5697425	1	150	H	
					2	150	D	
					3	47	H	
					4	47	D	
6243	42	Clyde	551425	5696084	1	196	H	GPS off about 10m; corrected to: 5696075 N, 0551424 E
					2	196	D	
					3	124	H	
					4	36	H	
6243	49	Fraser North	545881	5706727	1	305	H	
					2	72	H	
6243	71	Specialty Pastures	544433	5699391	1	112	H	Pin about 1m from fence and 5m from gate
					2	190	H	
					3	261	H	

Range Unit	Photo-point	Pasture	Photo-point Location (UTM NAD83)		Photo number	Photo bearing	View ²	Comments 2010
			Easting	Northing				
6287	4	Wycott	536105	5704951	1	92	H	
					2	272	H	
					3	272	D	
6287	5	Wycott	535910	5704531	1	260	H	
					2	210	H	
					3	210	D	
6287	6	Wycott	535385	5704251	1	335	H	2000 direction 180° off; corrected
					2	335	D	2000 direction 180° off; corrected
					3	46	H	
6287	13	Wycott	532063	5706860	1	295	H	
					2	295	D	
					3	232	H	
6287	14	Wycott	532303	5706354	1	44	H	
					2	84	H	
					3	84	D	
6287	15	Wycott	532459	5706277	1	350	H	
					2	350	D	Added 2010
6287	16	Wycott	532421	5706327	1	5	H	
					2	5	D	Added 2010
6287	22	Wycott	534697	5701516	1	292	H	
					2	292	D	
					3	210	H	
					4	116	H	
					5	30	H	
6287	23	Wycott	532767	5705739	1	200	H	
					2	300	H	
					3	25	H	
					4	25	D	

¹H = camera lens horizontal; D=lens pointing downward into vegetation near pin.

Table 3. 2010 photo point vegetation data and comments. Range type includes estimated seral stage (early, mid, late, PNC) and two leading grass, forb or shrub species. Full species names for species codes are listed in Table 4.

Range Unit	Photo-point	Range type	Main Species						Comments
			Grass 1	Grass 2	Forb 1	Forb 2	Shrub 1	Shrub 2	
3027	2	PNC Pseu spi – Arte fri	Pseu spi	-	Arte fri	Ante umb			
3027	3	Late Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Ante dim			
6241	3	Late Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Arte cam	Eric nau		
6241	4	Late Seral Pseu spi – Ante umb	Pseu spi	Koel mac	Ante umb	Arte cam			
6241	9	PNC Pseu spi – Arte fri	Pseu spi	Poa sec jun	Arte fri	Achi mil			
6241	10	Early Seral Arte fri – Koel mac	Koel mac	Pseu spi	Arte fri	Arte cam			
6241	11	late Mid Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Opun fra			
6241	13	Mid Seral Pseu spi – Arte fri	Pseu spi	Hesp com	Arte fri	Ante dim			
6241	14	late Mid Seral Pseu spi – Ante dim	Pseu spi	Koel mac	Ante dim	Arte fri			
6241	15	late Mid Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Ante dim			
6241	17	Mid to late Seral Pseu spi – Arte fri	Pseu spi	Hesp com	Arte fri	Ante dim	Rosa woo		
6241	18	Mid Seral Pseu spi – Arte fri	Pseu spi	Hesp com	Arte fri	-			

Range Unit	Photo-point	Range type	Main Species						Comments
			Grass 1	Grass 2	Forb 1	Forb 2	Shrub 1	Shrub 2	
6241	18A	Late Seral Pseu spi – Ante dim	Pseu spi	Hesp com	Arte fri	Ante dim			
6241	21	PNC Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Ante dim			
6243	1	a) Early Seral Poa sec–Hesp com–Arte fri b) Late Seral Pseu spi – Arte fri	a) Poa sec b) Pseu spi	a) Hesp com b) Hesp com	a) Arte fri b) Lepi den	a) Ante dim b) Opun fra		Two types: a) small patch on ridge and at pin b) surrounding general area in b) lichen cover not as well develed as in PNC	
6243	2	early PNC Hesp com – Arte fri	Hesp com	Pseu spi	Arte fri	Opun fra		Vegetation appears to be the Hesp com PNC community on fine sandy soils near topographic break; scattered Pseu spi	
6243	4	PNC Pseu spi – Arte fri	Pseu spi	Poa sec	Arte fri	Cirsium			
6243	8	PNC Pseu spi – Arte fri	Pseu spi	Hesp com	Arte fri	Ante dim		High Cladonia cover	
6243	9	PNC Pseu spi – Arte fri	Pseu spi	Poa sec	Arte fri	Ante dim			
6243	11	late Mid Seral Pseu spi – Koel mac – Arte fri	Koel mac	Pseu spi	Arte fri	Ante dim		Moderate cover of Cladonia and Diploschistes lichens	
6243	13	Mid Seral Hesp com – Pseu spi – Arte fri	Hesp com	Pseu spi	Arte fri	Ante dim			
6243	14	Mid Seral Hesp com – Pseu spi – Arte fri	Hesp com	Pseu spi	Arte fri	Ante dim		Same point as 6243 - 13	
6243	15	PNC Pseu spi	Pseu spi	Care pet	Achi mil	Ante umb	Eric nau	Juni sco	

Range Unit	Photo-point	Range type	Main Species						Comments
			Grass 1	Grass 2	Forb 1	Forb 2	Shrub 1	Shrub 2	
6243	17	a) Early Seral Koel mac – Ante dim b) late Mid Seral Pseu spi – Arte tri	a) Koel mac b) Pseu spi	a) Pseu spi b) Koel mac	a) Ante dim b) Ante umb	a) Arte fri b) Arte fri	a) Arte tri b) Arte tri	a) Eric nau	Photo-point: Two types: a) is small patch (~10 x 15 m) just downslope of pin; b) is surrounding larger area;
6243	19	Late Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Ante fri	Ante umb			
6243	20	Late Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Trag dub			
6243	21	Early Seral Koel mac – Arte fri	Koel mac	Pseu spi	Arte fri	Ante dim			Pseu spi mostly young plants – condition appears to be improving
6243	22	Mid Seral Hesp com – Arte fri	Hesp com	Pseu spi	Arte fri	Chen alb			
6243	23	Mid Seral Hesp com – Arte fri	Hesp com	Pseu spi	Arte fri	-			
6243	24	early Mid Seral Hesp com – Arte fri	Hesp com	Pseu spi	Arte fri	-			
6243	25	n/a							Not relocated in 2000 or 2010
6243	32	n/a							
6243	41	Mid Seral Koel mac – Pseu spi – Arte fri	Koel mac	Pseu spi	Arte fri	Arte cam	Erim nau		Appears to be improving – young Pseu spi
6243	42	Mid Seral Pseu spi – Arte fri	Pseu spi	Poa sec	Arte fri	Arte cam	Erim nau		Some Agro cri on site – nearby trail seeded to it
6243	49	Mid Seral Arte fri - Hesp com	Hesp com	Pseu spi	Arte fri	Opun frag			
6243	71	Early seral Poa pra – Arte fri	Poa pra	-	Arte fri	Trag dub			Much Tara off; heavily grazed

Range Unit	Photo-point	Range type	Main Species						Comments
			Grass 1	Grass 2	Forb 1	Forb 2	Shrub 1	Shrub 2	
6287	4	Early Achn nel – Poa pra - Antenna	Achn nel	Koel mac	Antenna	Arte fri	Rosa woo	Juni hor	Also Juni com; photo 3D into small patch of Lepi den
6287	5	early Mid Seral Hesp com – Arte fri	Hesp com	Poa pra	Antenna	Arte fri			
6287	6	Early Poa pra – Achn nel - Antenna	Achn nel	Poa pra	Antenna	Arte fri			
6287	13	early Mid Seral Koel mac – Achn nel	Achn nel	Koel mac	Arte fri	Achil mil	Juni com	Rosa woo	
6287	14	late Early Seral Achn nel - Poa pra – Ante umb	Achn nel	Poa pra	Antenna	Pote hip	Rosa woo		Heavily grazed
6287	15	Early Koel mac – Achn nel - Antenna	Koel mac	Pseu spi	Antenna	Arte fri			Few young Pseu spi
6287	16	Early Koel mac – Pseu spi - Antenna	Koel mac	Pseu spi	Antenna	Arte fri	Rosa woo		
6287	22	late Mid Seral Pseu spi – Arte fri	Pseu spi	Koel mac	Arte fri	Ante umb			Little lichen cover – much bare mineral soil
6287	23	Early Koel mac - Antenna	Koel mac	Achn nel	Antenna	Arte fri			

¹ Iverson, K. and T. McIntosh. 2001. Churn Creek Protected Area Monitoring Plan. Unpubl. report prepared for BC Parks, Cariboo Region, Williams Lake, B.C. (updated 2002).

Table 4. Species names for species codes used in Table 2.

Species Code	Species Name	
	Scientific	Colloquial
Achi mil	<i>Achillea millefolium</i>	Yarrow
Achn nel	<i>Achnatherum nelsonii</i>	Columbia needlegrass
Agro cri	<i>Agropyron cristatum</i>	Crested wheatgrass
Antenna	<i>Antennaria</i> spp	Pussytoe species
Ante dim	<i>Antennaria dimorpha</i>	Low pussytoes
Ante umb	<i>Antennaria umbrinella</i>	Umber pussytoes
Arte cam	<i>Artemisia campestris</i>	Northern wormwood
Arte fri	<i>Artemisia frigida</i>	Pasture sage
Arte tri	<i>Artemisia tridentata</i>	Big sagebrush
Care pet	<i>Carex petasata</i>	Pasture sedge
Chen alb	<i>Chenopodium album</i>	Lamb's-quarters
Eric nau	<i>Ericameria nauseosus</i>	Common rabbit-brush
Hesp com	<i>Hesperostipa comata</i>	Needle-and-thread grass
Juni com	<i>Juniperus communis</i>	Common juniper
Juni hor	<i>Juniperus horizontalis</i>	Creeping juniper
Juni sco	<i>Juniperus scopulorum</i>	Rocky Mountain juniper
Koel mac	<i>Koeleria macrantha</i>	Junegrass
Lepi den	<i>Lepidium densiflorum</i>	Prairie peppergrass
Opun fra	<i>Opuntia fragilis</i>	Brittle prickly-pear cactus
Poa pra	<i>Poa pratensis</i>	Kentucky bluegrass
Poa sec jun	<i>Poa secunda</i> var <i>juncifolia</i>	Nevada bluegrass
Pote hip	<i>Potentilla hippiana</i>	Woolly cinquefoil
Pseu spi	<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass
Rosa woo	<i>Rosa woodsii</i>	Prairie rose
Tara off	<i>Taraxacum officianalis</i>	Dandelion
Trag dub	<i>Tragopogon dubius</i>	Yellow salsify

REFERENCES

- BC Parks. 2000. Churn Creek Protected Area management plan. British Columbia Ministry of Environment, Lands, and Parks, BC Parks Division, Victoria, B.C.
- Iverson, K. and T. McIntosh. 2001. Churn Creek Protected Area Monitoring Plan. Unpublished report submitted to BC Parks, Cariboo District, Williams Lake, B.C. Updated January 2002.