

Supplementary Appendix 1. Beetles collected from emergence (e) and flight intercept (f) traps on subalpine whitebark pine (WBP) and lodgepole pine (LPP). Beetles were collected from two regions of Alberta, the northern Willmore Wilderness Park (N) and the southern Crowsnest Pass (S). Three ages of snags were sampled, yellow fader (F), red kill (RK), and grey kill (GK). The superscript ^r indicates a new provincial record, while ^R indicates a new provincial record with substantial range expansion for the species (*e.g.*, not from British Columbia). The superscript ^{MPB} indicates inclusion into a subset of known and probable mountain pine beetle associates, and [?] indicates tentative identification.

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
Agyrtidae							
<i>Ipelates latus</i> (Mannerheim)	4			1	3	F _f /RK _f	N
Cantharidae							
<i>Cantharidae</i> species 1	1	1				GK _e	S
<i>Dichelotarsus extremus</i> LeConte	1			1		RK _f	S
<i>Dichelotarsus ochocensis</i> Fend ^{r, MPB}	1		1			F _e	N
<i>Dichelotarsus piniphilus</i> (Eschscholtz) ^{MPB}	1	1				RK _e	N
<i>Dichelotarsus</i> species 1	2	2				RK _e	N,S
Carabidae							
<i>Calathus advena</i> (LeConte) ^{MPB}	31	13	10	2	6	F _{ef} ,RK _{ef} ,GK _e	N,S
Cerambycidae							
<i>Acmaeops proteus proteus</i> (Kirby)	6		2		4	F _e ,RK _e ,GK _f	N,S
<i>Asemum striatum</i> (Linnaeus)	1	1				F _e	N
<i>Cortodera coniferae</i> Hopping and Hopping	1	1				GK _e	S
<i>Gnathacmaeops pratensis</i> (Laicharting)	1		1			F _e	N
<i>Judolia montivagans montivagans</i> (Couper)	1				1	RK _f	S
<i>Monochamus scutellatus</i> (Say)	1		1			GK _e	S
<i>Neospondylis upiformis</i> (Mannerheim)	1			1		RK _e	N
<i>Phymatodes dimidiatus</i> (Kirby)	1				1	RK _f	S
<i>Pygoleptura nigrella nigrella</i> (Say)	1				1	RK _f	S
<i>Rhagium inquisitor</i> (Linnaeus)	2		1		1	GK _{ef}	S

Appendix 1 *Continued*

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
Chrysomelidae							
<i>Syneta carinata</i> Mannerheim	2		1	1		RK _f , GK _e	N,S
<i>Syneta pilosa</i> Brown	4	1	1	1	1	F _e , RK _f , GK _{ef}	N,S
Ciidae							
<i>Dolichocis manitoba</i> Dury	5	3	1	1		RK _e	N,S
<i>Orthocis punctatus</i> (Mellie)	1	1				GK _e	S
Clambidae							
<i>Calyptomerus oblongulus</i> (Mannerheim)	2		1		1	RK _e , GK _f	S
Cleridae							
<i>Thanasimus undatulus</i> (Say) ^{MPB}	34	5	22	1	6	All	N,S
Coccinellidae							
<i>Didion longulum</i> Casey ^{MPB}	1		1			RK _e	S
Colydiidae							
<i>Lasconotus intricatus</i> Kraus	4		1	2	1	F _f , GK _e	N,S
Corylophidae							
<i>Clypastraea obesa</i> (Casey) ^r	2		1	1		F _e , GK _f	N,S
<i>Microstagetus parvulus</i> Wollaston ^R	1		1			GK _e	S
Cryptophagidae							
<i>Atomaria</i> species 1	6		3	3		F _e , RK _{ef} , GK _e	N,S
<i>Caenoscelis ferruginea</i> (Sahlberg)	4		1		3	F _f , GK _{ef}	N,S
<i>Cryptophagus laticollis</i> Lucas	2		1		1	RK _e , GK _f	S
<i>Cryptophagus peregrinus</i> Woodroffe and Coombs ^r	5	1	1	3		RK _{ef} , GK _{ef}	S
<i>Cryptophagus pilosus</i> Gyllenhal ^f	1			1		GK _f	S
<i>Cryptophagus tuberculosus</i> Mäklin	7			3	4	F _f , RK _f , GK _f	N,S
<i>Cryptophagus varus</i> Woodroffe and Coombs	2	1	1			RK _e , GK _e	S
<i>Henotiderus</i> species 1	1		1			RK _e	S
<i>Salebius octodentatus</i> Mäklin ^f	74	24	19	28	3	All	N,S

Appendix 1 Continued

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
Curculionidae							
<i>Carphonotus testaceus</i> Casey	2	1	1			RK _e , GK _e	S
<i>Pissodes rotundatus</i> LeConte	2	1			1	RK _{ef}	N,S
<i>Rhyncolus brunneus</i> Mannerheim	2	1	1			F _e	N
(Scolytinae)							
<i>Cryphalus ruficollis</i> Hopkins ^{MPB}	5		2	1	2	F _e , RK _{ef} , GK _f	N,S
<i>Crypturgus borealis</i> Swaine	1		1			F _e	N
<i>Dendroctonus ponderosae</i> Hopkins ^{MPB}	49	12	35		2	F _e , RK _{ef} , GK _f	N,S
<i>Dryocoetes autographus</i> (Ratzeburg)	12		5	2	5	F _f , RK _f , GK _{ef}	N,S
<i>Dryocoetes caryi</i> Hopkins ^{MPB}	5		2	1	2	RK _{ef} , GK _{ef}	S
<i>Dryocoetes confusus</i> Swaine	10	2	1	6	1	RK _f , GK _{ef}	S
<i>Hylastes longicollis</i> Swaine ^{MPB}	53	2	6	12	33	All	N,S
<i>Hylastes nigrinus</i> (Mannerheim)	9		1		8	GK _{ef}	S
<i>Hylurgops porosus</i> (LeConte) ^{MPB}	372	34	27	107	204	all	N,S
<i>Hylurgops rugipennis</i> (Mannerheim) ^{MPB}	71	7	12	7	45	F _{ef} , RK _f , GK _{ef}	N,S
<i>Ips pini</i> (Say) ^{MPB}	126	82	6	26	12	F _{ef} , RK _{ef} , GK _e	N,S
<i>Orthotomicus latidens</i> (LeConte) ^{MPB}	145	51	49	3	42	All	N,S
<i>Pityogenes plagiatus knechteli</i> Swaine ^{MPB}	25	7	3	14	1	All	N,S
<i>Pityokteines ornatus</i> (Swaine) ^{r, MPB}	6	1	1	2	2	F _{ef} , RK _e , GK _f	N,S
<i>Pityophthorus murrayanae</i> Blackman ^{MPB}	203	3	177	1	22	RK _{ef} , GK _{ef}	S
<i>Pityophthorus</i> species 1	10		1	4	5	RK _f , GK _{ef}	S
<i>Pityophthorus</i> species 2 ^{MPB}	7		5	2		RK _e , GK _{ef}	S
<i>Pityophthorus</i> species 3	21		1	11	9	F _f , RK _f , GK _{ef}	N,S
<i>Pityophthorus</i> species 4	12		2	1	9	RK _f , GK _{ef}	S
<i>Polygraphus rufipennis</i> (Kirby)	1				1	GK _f	S
<i>Pseudips mexicanus</i> (Hopkins) ^{MPB}	1	1				F _e	N
<i>Scierus pubescens</i> Swaine	12			2	10	RK _f , GK _f	N,S
<i>Trypodendron lineatum</i> (Olivier)	6049	4144	1791	43	71	All	N,S
<i>Xylechinus montanus</i> Blackman	8				8	RK _f , GK _f	S

Appendix 1 *Continued*

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
Dermestidae							
<i>Megatoma pubescens</i> (Zetterstedt)	1	1				RK _e	N
Elateridae							
<i>Pseudanostirus nigricollis</i> (Bland)	2			2		F _f , RK _f	N
<i>Liotrichus umbricola</i> (Eschscholtz)	1			1		GK _f	S
<i>Liotrichus volitans</i> (Eschscholtz) ^f	1		1			F _e	N
<i>Eanus albertanus</i> Brown	1	1				F _e	N
<i>Neohypdonus tumescens</i> (LeConte)	1		1			RK _e	S
Endomychidae							
<i>Endomychus limbatus</i> (Horn)	1				1	GK _f	S
<i>Mycetina idahoensis</i> Fall ^f	1		1			GK _e	S
Histeridae							
<i>Paromalus mancus</i> Casey ^{MPB}	4		4			RK _e , GK _e	S
Laemophloeidae							
<i>Leptophloeus</i> species 1	17	7	6	4		F _e , RK _{ef} , GK _e	N,S
Lathridiidae							
<i>Corticaria rubripes</i> ^f	37	15	12	4	6	F _{ef} , RK _{ef} , GK _e	N,S
<i>Corticaria</i> species 1	25	12	7	3	3	All	N,S
<i>Corticaria</i> species 2	2		2			F _e	N
<i>Corticaria</i> species 3	3	1	2			F _e , GK _e	N,S
<i>Corticaria</i> species 4	7	2	5			F _e , RK _e , GK _e	N,S
<i>Corticaria</i> species 5	2	1		1		F _f , RK _e	N
<i>Corticaria</i> species 6	5	1	2		2	RK _{ef} , GK _e	S
<i>Corticaria</i> species 7	3	1	1		1	F _e , RK _e , GK _f	N,S
<i>Corticaria</i> unknown	138	78	45	9	6	All	N,S
<i>Enicmus tenuicornis</i> LeConte	4	2	1	1		RK _e , GK _{ef}	S
Leiodidae							
<i>Agathidium estriatum</i> [?] Horn ^f	2	1	1			F _e , GK _e	N,S
<i>Agathidium fenderi</i> Hatch ^R	3		1		2	RK _e	N,S

Appendix 1 *Continued*

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
<i>Agathidium angulare</i> Mannerheim	1				1	GK _f	S
<i>Catoptrichus frankenhaeuseri</i> (Mannerheim) ^r	1				1	RK _f	N
<i>Liocyrtusa luggeri</i> (Hatch)	2		1		1	GK _{ef}	S
Lycidae							
<i>Dictyoptera aurora</i> (Herbst)	1		1			RK _e	N
Melandryidae							
<i>Xylita laevigata</i> (Hellenius)	29	10	18		1	RK _{ef} , GK _e	N,S
<i>Zilora hispida</i> LeConte	1	1				GK _e	S
Melyridae							
<i>Hoppingiana hudsonica</i> (LeConte)	1			1		RK _f	S
Monotomidae							
<i>Rhizophagus dimidiatus</i> Mannerheim ^{MPB}	73	15	28	8	22	All	N,S
<i>Rhizophagus minutus minutus</i> Mannerheim ^{MPB,r}	2	1	1			F _e , GK _e	N,S
<i>Rhizophagus remotus</i> Leconte	1		1			GK _e	S
Nitidulidae							
<i>Epuraea flavomaculata</i> Mäklin	1				1	GK _f	S
<i>Epuraea linearis</i> Mäklin	254	164	37	21	32	All	N
<i>Epuraea planulata</i> Erichson	12	8	3	1		F _e , RK _{ef}	N
<i>Epuraea rufida</i> (Melsheimer) ^R	5	1		2	2	F _f , RK _{ef} , GK _f	N,S
<i>Epuraea truncatella</i> Mannerheim	386	303	19	14	50	All	N,S
<i>Epuraea</i> species 1	37	33	4			F _e , RK _e	N
<i>Glischrochilus vittatus</i> (Say)	43	11	6	13	13	F _{ef} , RK _{ef} , GK _f	N,S
<i>Pityophagus rufipennis</i> Horn ^r	1				1	GK _f	S
Oedemeridae							
<i>Calopus angustus</i> LeConte	2				2	RK _f	S
Ptiliidae							
<i>Acrotrichis</i> species 1	1				1	RK _f	S

Appendix 1 Continued

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
Ptinidae							
<i>Episenrus trapezoideus</i> (Fall) ^f	1			1		RK _f	S
<i>Ernobius gentilis</i> Fall ^f	1				1	RK _f	S
<i>Microbregma emarginatum</i> (Duftschmid)	8		3		5	F _f ,RK _f ,GK _{ef}	N,S
Scraptiidae							
<i>Anaspis rufa</i> Say ^f	3		1		2	GK _{ef}	S
<i>Canifa</i> species 1	1				1	GK _f	S
<i>Pectotoma hoppingi</i> Hatch	2	1			1	RK _f ,GK _e	S
Staphylinidae							
<i>Acidota crenata</i> (Fabricius) ^{MPB}	2		2			F _e ,RK _e	N
Aleocharinae	772	641	62	28	41	All	N,S
Anthophagini species 1	2	2				F _e	N
<i>Atrecus macrocephalus</i> (Nordmann)	1				1	RK _f	S
<i>Bisnius tereus</i> Smetana	2	1	1			RK _e	S
<i>Bryophacis canadensis</i> Campbell	2			1	1	RK _f	N
<i>Eusphalerum fenyessi</i> (Bernhauer)	10	2	1		7	F _e ,RK _f	N
<i>Lordithon fungicola</i> Campbell	1				1	GK _f	S
<i>Phlaeopterus cavicollis</i> (Fauvel)	3	1	2			F _e ,RK _e	N
<i>Phloeonomus suffusus</i> (Casey) ^R	2			1	1	F _f	N
<i>Phloeostiba lapponicus</i> (Zetterstedt)	281	198	61	6	16	All	N,S
Pselaphinae	1			1		GK _f	S
<i>Quedius criddlei</i> (Casey)	1		1			GK _e	S
<i>Quedius plagiatus</i> Mannerheim ^{MPB}	4	3	1			F _e ,RK _e ,GK _e	N,S
<i>Quedius velox</i> Smetana ^{MPB}	82	28	32	13	9	All	N,S
<i>Rabigus laxellus</i> (Casey)	1				1	GK _f	S
<i>Siagonium punctatum</i> (LeConte)	18	3	3	7	5	RK _{ef} ,GK _{ef}	S
<i>Veraphis lacuna</i> Marsh ^f	2	2				F _e ,GK _e	N,S
<i>Xylodromus depressus</i> (Gravenhorst) ^{MPB}	16	2	2	1	11	F _{ef} ,RK _{ef}	N,S

Appendix 1 *Continued*

Family and species	Total	Emergence		Flight intercept		Snag age	Region
		LPP	WBP	LPP	WBP		
Stenotrachelidae							
<i>Cephaloon tenuicorne</i> LeConte	2				2	RK _f	S
Tenebrionidae							
<i>Corticeus praetermissus</i> (Fall) ^{MPB}	364	342	18	2	2	F _e , RK _{ef} , GK _e	N,S
<i>Corticeus tenuis</i> (LeConte) ^{MPB}	2		2			RK _e , GK _e	N,S
<i>Tribolium castaneum</i> (Herbst) ^{MPB}	1		1			F _e	N
Tetratomidae							
<i>Tetratoma concolor</i> LeConte	1				1	F _e	N
<i>Tetratoma variegata</i> Casey ^R	33	12	20		1	F _e , RK _e , GK _e	N,S
Totals	10182	6313	2629	445	795		