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Observations and collections of sooty and dusky blue grouse and Canada and Franklin spruce grouse in central and northeastern British Columbia in 2010, a progress report

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Introduction

Here we summarize observations and collections of sooty (*Dendragapus fuliginosus*) and dusky (*D. obscurus*) blue grouse and Canada (*Falcipennis canadensis canadensis*) and Franklin (*F. c. franklinii*) spruce grouse in central and northern British Columbia in 2010, a cooperative study with George F. Barrowclough (GFB) and Jonas E. Lai (JEL), both of the American Museum of Natural History (AMNH). Objectives were to collect specimens of sooty and dusky blue grouse and Canada and Franklin spruce grouse for DNA analysis and to document selected phenotypic characteristics of the 4 groups. This is a continuation of studies begun in this region in 2005.

Specific objectives this year were to: 1) supplement a sample of 4 sooty blue grouse collected in the Bella Coola area in 2008 and obtain a northern sample of dusky blue grouse that is allopatric to sooty populations, and 2) observe and collect samples of Canada and Franklin spruce grouse in central BC (a region where the 2 subspecies appear to meet) for DNA analyses. Tissues and voucher specimens for all birds sampled will be processed in GFB's laboratory at the AMNH.

Results

Sooty/dusky blue grouse – Tissue samples were obtained from 5 sooty males and 1 female in the Bella Coola area (Table 1) bringing the total sample from this region to 10 (the minimum desired sample size for DNA analyses). One other male was observed. Tissue samples were obtained from 8 dusky males and 3 females at Pink Mountain (Table 1). Eight others were observed there. These birds represent the northeastern allopatric population.

Canada/Franklin spruce grouse – Tissue samples were obtained from 10 male and 5 female Franklin spruce grouse in the Kamloops area (Table 2). Three others were seen. Four male and 5 female Canada spruce grouse were collected in the Tumbler Ridge area (Table 2). One other female was seen there but not sampled. Two males were seen but not sampled in the Pink Mountain area (Table 2).

Discussion

Five sooty males collected in the Bella Coola area, plus 3 in 2008, all exhibited phenotypic characteristics of coastal birds to the south: yellow cervical apteria, 18 or fewer (17) rectrices, and distinct light gray tail bands (Table 1, Figure 1). Those that sang had loud, 6 (or 6 and 7) note songs and sang from trees. Two not collected (1 in 2008, 1 in 2010) also had distinct light gray tail bands. Two females (1 in 2008 and 1 in 2010) each had 18 rectrices and distinct light

gray tail bands. All phenotypic characteristics noted for males and females are consistent with expectations for sooty blue grouse. Previous research has shown that sooty blue grouse usually have distinct light grey tail bands, usually 18 or fewer rectrices, loud 6 or 6+ note songs, and song posts are usually in trees.

Pink Mountain was chosen as a suitable area for sampling a northern allopatric population of dusky blue grouse. This mountain is on the eastern edge of the range, and of the northern Rocky Mountains. It is >400 km west to eastern foothills of the coast range at this latitude. Seven adult males that were collected, plus 1 noosed and released, had red cervical apteria (example in Figure 1), as did 2 others seen in display (Table 1). All males for which data were recorded had weak, or no, tail bands, sang soft, 5-note songs, from the ground, and all but 1 had 20 rectrices. Three collected females had 20 rectrices but tail band data were not recorded. All phenotypic data were as expected in dusky blue grouse, except that 1 male had 18 rectrices. Previous research has shown that northern dusky blue grouse have indistinct blackish, or no, tail bands, usually 20 or more rectrices, and soft 5 note songs, almost always sung from the ground.

We can now report that we have seen no adult male sooty blue grouse with yellow cervical apteria on the coastal mainland near the Terrace/Kitimat area or northward, or on islands of the Alexander Archipelago. All have had red (or 'red or orange', n=4, all in the Terrace/Kitimat area) cervical apteria, as in dusky blue grouse. Among these birds other phenotypic characteristics have been as in sooty blue grouse to the south, as contrasted to those of northern dusky blue grouse. The northernmost record of a sooty blue grouse male with red cervical apteria of which we are aware is documented in a photo taken approximately 27 km north of Pleasant Camp in NW British Columbia (sent to us by Gus van Vliet). That bird had a light grey sooty-like tail band, as expected. Thus, sooty blue grouse with red apteria extend at least from the Terrace/Kitimat area to north of Pleasant Camp.

Fifteen Franklin spruce grouse were sampled for DNA in the Kamloops area (Table 2). Seven were collected and 8 noosed, sampled, and released. All males had black rectrices without orange-brown tail bands (as in Figure 2). They also had distinctly white-tipped upper tail coverts. All responded to playbacks of the spruce grouse cantus with wing-claps at the end of short flights. Four females responded to playbacks of the cantus with their own cantus, and 1 flew off with a short cluck. All birds handled had 16 rectrices and females had no tail bands. These reactions and morphological characteristics are consistent with those of published research on the Franklin's spruce grouse. Three spruce grouse were collected in the Horsefly area in 2009 and their phenotypic characteristics were also consistent, as noted in our 2009 progress report.

Nine Canada spruce grouse were collected in the Tumbler Ridge area, 4 males and 5 females (Table 2). Three males had clear orange-brown tail bands, and 1 (a yearling) a weak orange-brown band. They also had indistinct upper tail coverts (Figure 2). Two adult females had weak orange-brown tail bands but those of other females were not noted in our records. Flutter flights of males that flew in response to playbacks lacked the wing-clap of male Franklin's spruce grouse. These characteristics are consistent with those of the Canada spruce grouse and suggest that the 2 subspecies separate somewhere between Kamloops/Horsefly and Tumbler Ridge.

Other tetraonids observed in 2010 include 5 ruffed grouse (1 male, 1 female, and 3 unknown sex) and 1 male rock ptarmigan, all in the Pink Mountain area.

Table 1. Itemized list of the sooty and dusky blue grouse observed and/or collected in British Columbia between 13 May and 19 May 2010. Locations are all in NAD 83, elevations are in meters, and mass is in grams.

Number	Sex	Age	Date	Time	Zone	UTM-E	UTM-N	Elevation	Mass	Apteria	Tail	Notes	Hoot	Rectrices	Location	Behavior
Pink Mountain dusky blue grouse - DNA collected																
JEL179	Male	Adult	13-May	2002	10	509019	6322321	1478	1130	Red	Indistinct		Quiet	20	Ground	Flutter jump response
JEL180	Female	Adult	13-May	2020	10	508813	6322085	1520	1070		Indistinct			20	Ground	Cackle response
JEL181	Male	Adult	13-May	2031	10	508747	6322106	1541	1120	Red	Indistinct	5	Quiet	20	Ground	Flutter jump response
JEL182	Male	Adult	13-May	2055	10	508437	6322156	1599	1220	Red	Indistinct	5	Quiet	20	Ground	Flutter jump response
JEL183	Male	Adult	13-May	2103	10	508432	6322319	1627	1240	Red	Indistinct	5	Quiet	18	Ground	Flutter jump response
JEL184	Female	Adult	13-May	2129	10	508131	6322334	1651	920		Indistinct			20	Ground	Visual, no sound
JEL185	Male	Adult	13-May	2136	10	508115	6322248	1624	1270	Red	Indistinct		Quiet	20	Ground	Hooting
JEL186	Male	Adult	14-May	1856	10	507458	6322866	1594	1230	Red		5	Quiet	20	Ground	Whoop call
JEL187	Female	Adult	14-May	1913	10	507492	6322870	1607	1050					20	Ground	Cackle response
JEL188	Male	Adult	14-May	1927	10	507522	6322899	1618	1340	Red		5	Quiet	20	Ground	Hooting
JEL189	Male	Adult	14-May	1944	10	507439	6323008	1594	1140	Red	Indistinct	5	Quiet	20	Ground	Flutter jump response
Bella Coola sooty blue grouse - DNA collected																
JEL190	Female	Yearling	19-May	938	9	683360	5790848	900	660		Distinct			18	Ground	Nothing noted
JEL191	Male	Adult	19-May	1137	9	683497	5790263	1162	1290	Yellow	Distinct	6	Loud	18	Tree	Landing on loud wing
JEL192	Male	Yearling	19-May	1149	9	683501	5790274	1157	1070	Yellow	Distinct		Loud	17	Ground	Hooting
JEL193	Male	Yearling	19-May	1327	9	683696	5790407	1215	980	Yellow	Distinct		Loud	18	Tree	Hooting
JEL194	Male	Adult	19-May	1342	9	683701	5790415	1201	1250	Yellow	Distinct	6	Loud	18	Tree	Hooting
JEL195	Male	Adult	19-May	1432	9	683587	5790544	1110	1120	Yellow	Distinct	6	Loud	18	Tree	Hooting
Pink Mountain dusky blue grouse - No DNA collected																
0	Male	Breeding	13-May	2155	10	508619	6322797								Ground	Flutter jump response
0	Female	Breeding	14-May	504	10	507736	6322793								Ground	Cantus response
0	Male	Breeding	14-May	525	10	507671	6322894			Red	Indistinct		Quiet		Ground	Flutter jump response
0	Female	Breeding	14-May	525	10	507710	6322950								Ground	Cantus response
0	Male	Breeding	14-May	525	10	507680	6323080						Quiet		Ground	Flutter jump response
0	Male	Breeding	14-May	525	10	507690	6323300						Quiet		Ground	Flutter jump response
0	Male	Breeding	14-May	701	10	507895	6322454			Red	Indistinct		Quiet		Ground	Flutter jump response
0	Male	Breeding	14-May	2100	10	508620	6322800						Quiet			Flutter jump response
Bella Coola sooty blue grouse - No DNA collected																
0	Male	Adult	19-May	1120	9	683313	5790113				Distinct					Dead or close call

Table 2. Itemized list of the Franklin's and Canada spruce grouse observed and/or collected in British Columbia between 10 May and 17 May 2010. Locations are all in NAD 83, elevations are in meters, and mass is in grams.

Number	Sex	Age	Date	Time	Zone	UTM-E	UTM-N	Elevation	Mass	Tail	Rectrices	Location	Behavior
Kamloops Franklin's spruce grouse - DNA collected													
GFB3604	Female	Yearling	11-May	706	11	291859	5629833	1215	536		16	Ground	Cantus response
GFB3605	Male	Adult	11-May	738	11	290232	5631152	1292	484	Black	16	Tree	Wing-clap response
GFB3606	Male	Adult	11-May	839	11	290387	5630766	1273	488	Black	16	Tree	Wing-clap response
GFB3607	Male	Adult	11-May	915	11	290141	5630603	1298	529	Black	16	Tree	Wing-clap response
GFB3608	Male	Adult	11-May	1002	11	290486	5631039	1280	508	Black	16	Tree	Wing-clap response
GFB3609	Female	Yearling	11-May	1058	11	291418	5629077	1240	529		16	Ground	Cantus response
GFB3610	Male	Adult	11-May	1336	10	707733	5630488	1442	537	Black	16	Tree	Wing-clap response
GFB3611	Male	Adult	11-May	1405	10	707731	5630230	1416	548	Black	16	Tree	Wing-clap response
GFB3612	Male	Adult	11-May	1425	10	707797	5630121	1414		Black	16	Tree	Wing-clap response
GFB3613	Male	Adult	12-May	457	10	707606	5629287	1370	497	Black	16	Tree	Wing-clap
GFB3614	Male	Adult	12-May	524	10	707528	5629310	1375	514	Black	16	Tree	Wing-clap
GFB3615	Female	Yearling	12-May	549	10	707620	5629479	1370	563		16	Tree	Cantus response
GFB3616	Male	Adult	12-May	609	10	707608	5629450	1370	483	Black	16	Tree	Wing-clap response
GFB3617	Female	Adult	12-May	731	10	707499	5629084	1370	572		16	Tree	Flushed-vocal response
GFB3618	Female	Adult	12-May	811	10	707715	5630287	1420	533		16	Tree	Cantus response
Tumbler Ridge Canada spruce grouse - DNA collected													
GFB3619	Female	Adult	15-May	2042	10	607969	6120756	990	710	Weak band	16	Ground	Walking across road
GFB3620	Male	Yearling	15-May	2042	10	607969	6120756	990	430	Weak band	16	Tree	Displaying to female
GFB3621	Female	Adult	16-May	604	10	610871	6123559	1062	610	Weak band		Tree	Cantus response
GFB3622	Male	Yearling	16-May	658	10	611453	6123888	1049	520	Strong band	16	Tree	Small flutter response
GFB3623	Female	Adult	17-May	528	10	616451	6126401	1100	570		16	Tree	Cantus response
GFB3624	Female	Adult	17-May	531	10	616454	6126412	1100	595		16	Tree	Quiet
GFB3625	Female	Yearling	17-May	734	10	617741	6126537	1090	580		16	Tree	Cantus response
GFB3626	Male	Adult	17-May	750	10	617161	6125936	1152	550	Strong band	16	Ground	Small flutter response
GFB3627	Male	Yearling	17-May	902	10	617261	6125667	1156	440	Strong band	16	Ground	Small flutter response
Kamloops Franklin's spruce grouse - No DNA collected													
0	Female	Breeding	10-May	2015	10	707388	5630602						Cantus response
0	Female	Breeding	12-May	629	10	707675	5629517				16		Cantus response
0	Male	Breeding	12-May	656	10	707486	5629210				16		Wing-clap response
Pink Mountain Canada spruce grouse - No DNA collected													
0	Male	Breeding	15-May	515	10	523806	6326483			Strong band			Flutter flight response
0	Male	Breeding	15-May	515	10	523806	6326483			Weak band			Flutter flight response
Tumbler Ridge Canada spruce grouse - No DNA collected													
0	Female	Adult	15-May	1942	10	610888	6123536						Cantus response



Figure 1. Male sooty blue grouse (top) observed near Bella Coola on 19 May 2010. Note the yellow apteria and distinct tail band. Male dusky blue grouse (bottom) observed on Pink Mountain on 14 May 2010. Note the red apteria and lack of a distinct tail band.



Figure 1. Male Franklin's spruce grouse (top) observed near Kamloops on 11 May 2010. Note the solid black tail and white-tipped upper tail coverts. Male Canada spruce grouse (bottom) observed near Tumbler Ridge on 17 May 2010. Note the brown-tipped tail feathers and the indistinct upper tail coverts.

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