

**MULE DEER BUCK MIGRATIONS AND HABITAT USE IN THE BRIDGE  
RIVER, BRITISH COLUMBIA**  
(FWCP Project # 13.W.BRG.02)



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## **EXECUTIVE SUMMARY**

In recent years, both the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) and the St'at'imc First Nation have become concerned with the status of the mule deer population west of the Fraser in southcentral British Columbia. These concerns provided the impetus for the recently completed two years of research on the female components of the deer population in the St'at'imc territory. This project seeks to build and expand on that data set by investigating habitat use and migration ecology of mule deer bucks in the area to provide further information on this population that can be applied to deer management.

The primary purpose of this report is to report results achieved in the third year of the project. During April and May 2013, 8 mule deer bucks were captured and collared in the study area through free-range chemical immobilization. Collared deer were monitored throughout the year to assess survival status and distribution via the Iridium satellite network and aerial monitoring flights. Collars will be retrieved in mid to late April and early May when deer return to their low elevation spring ranges.

Four mortalities were recorded since spring 2013. Monitoring generally revealed similar patterns as last year such that 6 (75% ) bucks migrated from winter/spring range to distant summer range and 2 (25%) bucks were considered resident deer in the Tyaughton burn. Most migrators migrated west and summered in the vicinity of Goldbridge, the upper Bridge River and lower reaches of several drainages in the area.

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## **1. INTRODUCTION**

The management of Mule deer populations is listed as a high priority by the Fish and Wildlife Compensation Program's Bridge River Seton River Action Plan (FWCP 2011). The maintenance of healthy deer populations is also of significant concern for resident hunters, guide-outfitters and First Nation groups. In recent years, the St'at'imc Nation has become concerned that deer within their traditional territory, west of the Fraser River in south central British Columbia, are experiencing a negative population trend. Unpublished data from the Fish, Wildlife and Habitat Management Branch (FWHMB), Ministry of Forests, Lands & Natural Resource Operations (MFLNRO), supports the notion that deer have experienced a decline since the early 1990's in the area. Overall, although deer numbers have rebounded from earlier declines, they continue to remain below levels seen in the 1960s and 1970s (Hatter et al. 1989). While causes for these declines are not known with certainty and are likely the result of several different factors relating to habitat and direct mortality, broad scale landscape changes from timber harvests and hydroelectric development have contributed, and in some cases, are likely still contributing. These concerns provided the impetus for the recently completed two years of research on the female components of the deer population in the St'at'imc territory (i.e., Poole and Wright 2010). This project seeks to build and expand on that data set by examining the buck component of this mule deer population. Information on habitat use and migration ecology of mule deer bucks is essential to ensure sound management (Brown 1992; Kie et al. 2002; Walter et al. 2009; Sawyer et al. 2009). This report summarizes our fieldwork activities for the fiscal year of 2013/14.

## **2. GOALS & OBJECTIVES**

The overall goal of this project, over a 4 year period, is to investigate mule deer buck habitat use and migration ecology to provide information to enhance harvest and habitat management of the deer population in the Bridge River drainage. This will be accomplished through 8 long-term objectives:

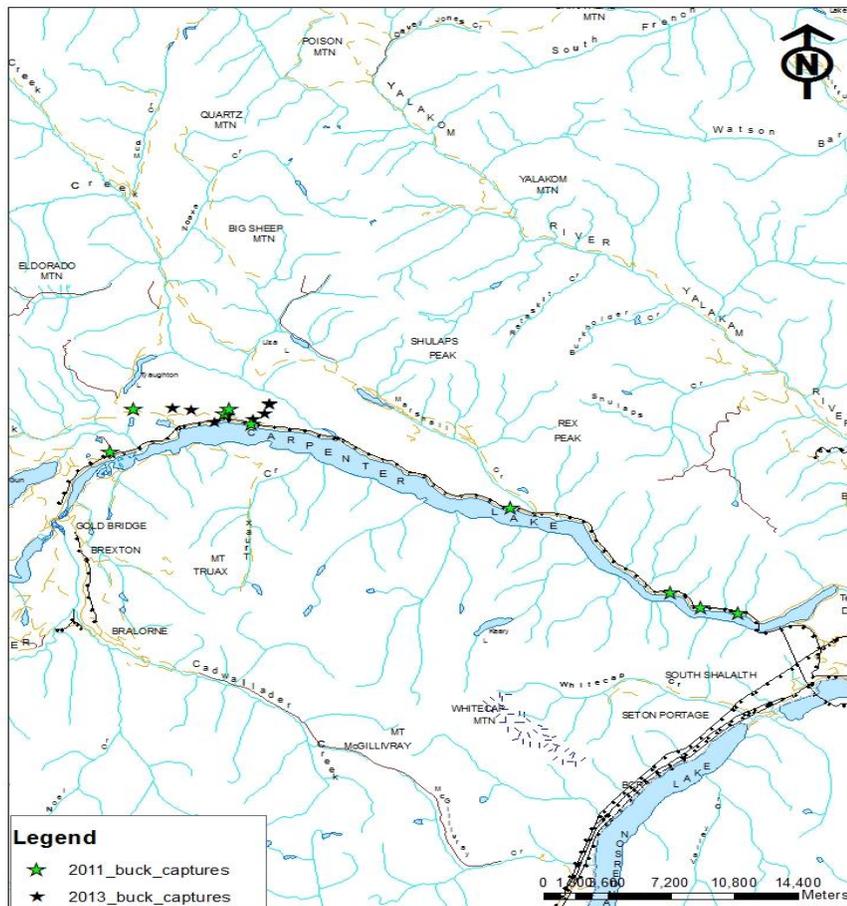
1. Assess residency patterns (i.e., resident vs. migratory) of bucks.
2. Describe habitat characteristics of mule deer buck seasonal ranges (summer, fall, rut, winter and spring).
3. For migratory bucks, describe mule deer buck migration patterns, including timing and movement routes between seasonal ranges.
4. For migratory bucks, describe habitat selection during spring and fall migrations and understand why bucks selected those habitats.
5. Describe daily habitat use and movement patterns of bucks and does during November 10 to December 31.
6. Compare winter ranges utilized by bucks with model-predicted winter ranges to test the model
7. Assess how these variables might vary between years and understand why they might have varied.
8. Understand how this knowledge could influence deer management and generate practical recommendations for managing deer harvests and habitats and designing post-hunt composition surveys.

For the 2013/14 project year, the short-term objectives were to:

1. Collar 12 mule deer bucks
2. Monitor buck survival and retrieve collars as necessary

### 3. STUDY AREA

The project area is situated within the northern St'at'imc Nation Territory in southwestern British Columbia, and represents portions of Wildlife Management Unit (MU) 3-32. Specifically, the study area is situated in the area immediately north of Carpenter Lake, namely 5 Mile and Marshall Ridges and the southern slopes of the Shulaps Range (Figure 1). This area is prime mule deer winter and spring range. The Central Interior and Southern Chilcotin Ecosections are represented within the project area. Average mean temperatures at Lillooet were -3.6 and 21.4 degrees Celsius for January and July (Environment Canada 2005). The project area is situated within the xeric rain-shadow of the southern coastal mountains of the Cascades Forest District (BCWRP 2004) and as result vegetation tends to be those trees and plants adapted to dry conditions. Predominant forest cover includes interior Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa pine (*Pinus ponderosa*) and localized patches of bunchgrass grasslands are interspersed throughout. The area overlaps the BC Hydro Bridge River complex, namely the La Joie and Terzaghi Dams which impound Downton and Carpenter Lakes (BCWRP 2004).



**FIGURE 1.** Map of Bridge River study area in Management Unit 3-32. Stars represent capture locations for 9 mule deer bucks during spring 2011 and 8 bucks captured during spring 2013.

## **4. METHODS**

### ***Buck captures***

During April and May 2013, when deer were congregating on lower elevation spring ranges, bucks were captured by ground-based chemical immobilization with XZT (i.e., Telazol/Xylazine cocktail). Drugs were administered via darts fired from a specialized rifle. Xylazine was reversed with Tolazoline 30 minutes after induction occurred. Biologists stayed with immobilized deer until deer were mobile to monitor recovery and ensure recovery occurred.

Captured bucks were fitted with Advanced Telemetry Systems (ATS) G2110E GPS Iridium collars. Collars had specialized expandable/retractable inserts, manufactured by ATS, so they could expand when bucks' necks swelled during the fall rut and retract again afterwards. Collars were programmed to collect location data for approximately 12 months. To meet objectives, collars were programmed to collect locations every 3 ½ hours from January 1 –April 30, when deer are on winter and spring ranges, and July 1 to August 31, when deer are on summer ranges and every 45 minutes May 1 – June 30, when deer are migrating to summer range and September 16 to December 31 when deer are migrating back to winter range and are on fall and early winter ranges.

### ***Monitoring***

From the time of capture deer were monitored via the Iridium satellite network and through 2 aerial flights. Because the collars relay data via email, very little effort was made to pinpoint buck locations during monitoring flights, unless necessary, as the cost didn't justify collection of that data point.

## **5. RESULTS & DISCUSSION**

### ***Buck captures***

During April and May 2013, 8 bucks were captured and collared in the study area (Figure 1; Table 1). All 8 bucks were caught by free range darting. We experienced significant challenges capturing deer during spring 2013, largely due to the presence of a large wolf pack on deer spring ranges north of Carpenter Lake. Deer were simply not using their typical areas and they were extremely wary and difficult to approach for capture. To successfully capture deer by ground darting, we need to approach within 50 yards and preferably closer and in the majority of cases, this was not possible. We also had issues with malfunctioning darts used to capture deer, which unfortunately caused several darted deer to escape. Because of these issues and due to quick snow melt and apparently earlier migration, most deer were captured in the vicinity of Tyaughton and Gun Creek and several had already initiated their spring migration from eastern portions of the study area. Estimated ages of captured bucks ranged from 2-5 years. In total, 17 bucks have been captured and monitored in the study area.

**TABLE 1.** Statistics for mule deer bucks captured in the study area spring 2011 & 2013.

Species	Year	Capture Date	Est. Weight (lbs.)	Est. Age (yrs.)	Collar Frequency	Capture Location
Mule deer	2011	April 14	180	4-5	148.147	Sebring Creek
Mule deer	2011	April 16	140-50	2	150.315	5 Mile Ridge
Mule deer	2011	April 16	190	6+	150.676	Viera Creek
Mule deer	2011	April 20	150-60	4+	150.000	5 Mile Ridge
Mule deer	2011	April 20	140	2-3	148.290	5 Mile Ridge
Mule deer	2011	April 27	110	1	150.420	Tyaughton Lake
Mule deer	2011	April 27	140	2-3	150.708	Sebring Creek
Mule deer	2011	April 28	140-50	3-4	150.049	Marshall Ridge
Mule x Black-tailed deer	2011	May 12	150-60	4	150.833	Slim Creek
Mule deer	2013	April 16	180	5	150.462	5 Mile Ridge
Mule deer	2013	April 19	150	2-3	150.483	5 Mile Ridge
Mule deer	2013	April 15	140	3	150.423	5 Mile Ridge
Mule deer	2013	April 10	120	2	150.473	5 Mile Ridge
Mule deer	2013	April 10	160	3-4	150.573	5 Mile Ridge
Mule deer	2013	May 1	170	4	150.523	Mowson's Pond
Mule deer	2013	April 26	190	4-5	152.082	Mowson's Pond
Mule deer	2013	April 25	150	2	152.063	5 Mile Ridge

**Monitoring**

Six of eight bucks (75%) migrated to a distant summer range, which is a similar proportion as observed in 2011 (78%; Procter & Iredale 2012), and two were considered resident in the Tyaughton burn in the vicinity of Tyaughton Creek. The general pattern of migration to summer range was once again to the west, as seen in previous years, with most bucks summering in the vicinity of Goldbridge, the upper Bridge River and the lower reaches of several drainages in the area. One migratory buck summered on the south slopes of the Shulaps Range generally north of his capture location.

At the time of this report, four bucks have died (50%), which is a higher mortality rate than observed in 2011 (33%; Procter & Iredale 2012). Two were killed by resident hunters in September and November, one was suspected predation by an unknown predator, but likely either cougar or wolf, and the fourth has not yet been investigated but given the mortality location, it is expected to be a natural event (i.e., not human caused). To meet project objectives in 2013/14 we have received migration, fall and winter data from six (75%), five (63%) and four (50%) bucks, respectively. In total over 2 years we have received migration, fall and winter data from 14 (82%), 12 (71%) and 11 (65%) bucks, respectively.

**6. ACKNOWLEDGEMENTS**

Provision of project funding was attained through the Fish and Wildlife Compensation Program on behalf of its program partners BC Hydro, the Province of B.C. and Fisheries and Oceans Canada who work together to conserve and enhance fish and wildlife impacted by the construction of BC Hydro dams. Thanks to Bob Butcher (COS), Andrew Walker (MFLNRO) and Gilbert Redan (St'at'imc First Nation) for assisting with capturing, collaring and monitoring bucks. Thanks also to CC Helicopters and Frontline Helicopters for providing safe and efficient helicopter services.

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## 8.APPENDIX 1. Financial Statement

	<b>BUDGET</b>		<b>ACTUAL</b>	
	<b>FWCP</b>	<b>Other</b>	<b>FWCP</b>	<b>Other</b>
<b>Total Income by Source</b>	29,680.00	74,550.00	29,680.00	74,550.00
<b>Grand Total Income (FWCP + other)</b>	<b>\$104,230.00</b>		<b>\$104,230.00</b>	
<b>EXPENSES</b>				
<b>Project Personnel</b>				
State Technician	3000.00	0.00	0.00	0.00
Contract Biologist	4,480.00	0.00	0.00	0.00
MOE Biologists	0.00	37,500.00	0.00	25,000
<b>Materials &amp; Equipment</b>				
Field Equipment	800.00	0.00	703.41	0.00
Helicopter & Fuel	10,000.00	0.00	7,838.00	0.00
Radio-collars	0.00	30,000.00	0.00	20,000.00
MFLNRO Equipment	0.00	2,250.00	0.00	2,250.00
Iridium Satellite & Data Fees	8,400.00	0.00	8,570.56	0.00
Food/Per Diem/Accommodation	3000.00	4,800.00	2,156.40	4,343.60
<b>Administration</b>				
Office Supplies				
Photocopies & printing				
Postage/customs fees				
Computer costs				
Communications				
<b>Total Expenses</b>	<b>29,680.00</b>	<b>74,550.00</b>	<b>19,268.37</b>	<b>54,343.60</b>
<b>Grand Total Expenses (FWCP + other)</b>	<b>\$104,230.00</b>		<b>\$83,611.97</b>	
<b>BALANCE</b>	<i>The actual balance might not equal \$0*</i>			
(Grand Total Income – Grand Total Expenses)	<b>\$20,618.03</b>			