

Wood Bison Monitoring and Recovery in North East British Columbia



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Wood Bison Monitoring in North East British Columbia Sonja Leverkus P.Ag. and Charles Dickie

Wood Bison (*Bison bison athabasca*) are a keystone species of the Boreal forest. They were extirpated in British Columbia in 1906. In 1995 and 2002, the BC Ministry of Environment reintroduced 2 herds of genetic stock from the Nyarling River in the North West Territories: the Etthithun/Fontas herd and the Nordquist herd, both located within the Treaty 8 Territory. Wood Bison are threatened federally under the *Species at Risk Act* and are red-listed provincially in British Columbia. Over the past 15 years, the herds have struggled in their population growth due to deadly interactions ie. collisions with vehicles and illegal harvesting on the Alaska Highway and the resource roads in the Fontas area.

The potential habitat for recovery in the Nordquist area is estimated at approximately 20,000 ha. It is currently unknown about the Fontas/Etthithun area as there is limited documentation and inventory. The Nordquist herd spends the majority of its time along the 350km stretch of the Alaska Highway right of way whereas the original release site is within the proposed 20,000 ha for recovery. The Fontas herd spends the majority of their time along the resource roads north and east of Fort St. John towards the Fontas River. The two areas are similar in that the bison utilize the highway corridors, however, in the Liard area, there is no natural resource extraction to date. In the Fontas area, there is an immense amount of natural resource extraction and interactions between the bison and the developments constructed for that particular industry.

Monitoring the Wood Bison populations will provide critical information to the management team for their use in the strategic burn plan process for both the Nordquist and Fontas herds. Prescribed fire has been used to promote habitat in the Nordquist herd's range since 2008, however, with a severe lack of fire and habitat maintenance, it will require more time to ensure that their habitat requirements and forage capacity are met. In 2009, 10 GPS collars were deployed on 5 cows per herd (5 cows in the Etthithun/Fontas herd and 5 cows in the Nordquist herd). The GPS collars and on the ground monitoring personnel collect resource selection and behavioural data that is incorporated in the Recovery Strategy for Wood Bison and the burn plan process for habitat improvement in North East, British Columbia.



Figure 1 GPS collared Wood Bison cow - Nordquist herd, November 2010

Although the GPS collars allow us to track 5 individual cows per herd, it has been observed that often times, one collar may represent more than one animal. In collaboration with the Habitat Conservation Trust Foundation, Conrad Thiessen of the Ministry of Environment has lead the Wood Bison Monitoring project for the past 2 years (HCTF project # 7-352) and has involved 3 First Nations communities who provide monitors (Fort Nelson First Nation, Kaska Daylu and Doig River First Nation) that record the locations of the bison along transects of the road systems. This information is used to demonstrate that although our sample may appear small, one GPS collar can actually represent up to 60 animals herded together. Knowing the movements of the bison is important so that we are able to know how much time they spend on the highway in the presence and/or absence of fire.

The expected results of the project are that the bison will spend less time on the highway and roadways and more time in suitable habitat that meets their dietary and resource requirements. The ultimate, long term result of what we will be undertaking is to reduce the amount of time that the bison spend on the roads and road right of ways and to increase the amount of time they spend in suitable habitat such as open rangelands and open forests free of potential fatalities due to collisions with vehicles on the highways and roadways.

During the week of November 2nd – 6th, 2010, a co-ordinated team went to the Liard River to re-capture and tranquilize the collared cows of the Nordquist herd and to re-deploy the GPS collars with an additional 2 cows collared with a newer style of VHF collar fixed with a GPS pod. Staffing of this portion of the project included: Sonja Leverkus (PhD candidate, OSU and Range Agrologist, MFR); Conrad Thiessen, Ranger Al Hansen, Conservation Officer Jeff Scott and Dr. Helen Schwantje (Ministry of Environment); Charles Dickie (Fort Nelson First Nation), Tyler Mattheis (Northern Rockies Regional Municipality) and Armand (Liard River Hotsprings Provincial Park). Additional volunteers include Cheyenne and Malea Corcoran.



Figure 2a. Charles Dickie & Tyler Mattheis; Figure 2b. Dr. Schwantje loading tranquilizer darts with Charles Dickie

In total, 4 GPS collars were recovered, however, there were all broken and unable to be re-deployed. One collared cow was not located until the mission had already completed. 4 of the new VHF collars were deployed with the GPS pods attached to the top of the collars. The GPS collars were so severely damaged that the original plan of replacing the batteries in them and re-deploying them was not feasible. Only one collar had been recovered from the Fontas/Ethithun herd the day before and the data is unable to be downloaded due to the damage to the collar. Of the 5 cows that were worked with on Thursday, November 4th, only 4 of them received a new collar. One of the cows is new to the

sampling population and it is possible that she (now tagged as bison #3) could have been one of the originally released cows in 1995/1996.



Figure 3a. Charles Dickie and Sonja Leverkus putting a new collar on a cow; Figure 3b. New GPS pod on VHF collar

Following the hands-on work with the bison, a transect was driven from Liard River to Watson Lake and back to monitor the bison activity and count the herd size on the north side of the Liard. The next day, Saturday, November 6th a transect was driven from Liard River to Muncho Lake. The monitoring sheet can be viewed in the Appendix and the observations of the transect lines can be seen in the table below:

Date	Observation #	Total	Calf	Yearling	Unknown Adult	Adult bull	Adult cow
Nov 5 2010	1	34	4	unknown	6	5	19
Nov 5 2010	2	2	0	0	1	1	0
Nov 5 2010	3	2	0	0	0	2	0
Nov 5 2010	4	2	0	0	0	2	0
Nov 6 2010	1	69	14	unknown	unknown	12	unknown
Nov 6 2010	2	1	0	0	0	1	0
TOTAL COUNT	-	110	18	0	7	23	19

Table 1 Bison monitoring observations November 5th - 6th, 2010



Figure 4 Charles Dickie completing the bison monitoring form



Figure 5a. Cheyenne Corcoran inside enclosure; Figure 5b. Cheyenne and Malea Corcoran tracking ungulates

After the bison monitoring was completed, work was done on the vegetation exclosures in the research area set to study the fire-grazing interaction of Wood Bison. Five exclosures that exclude large mammalian herbivores were constructed in 2009 within the Smith River wildfire to observe the differences between grazed (treatment) versus ungrazed (control) plant communities. The exclosures were constructed out of residual logs from the fire. The locations of the exclosures were selected randomly along a section of the Old Alaska Highway that is frequently used by the bison. The exclosures are in mixed severity of fire and stands (mainly spruce or aspen). There are 9 1m² quadrats spaced out evenly throughout the exclosures. Within the treatments (fire and grazing) there are also 9 quadrats located randomly 25 meters outside the exclosures. Vegetation composition and abundance will be compared between treatments and controls using analysis of variance (ANOVA), ordination, and multivariate techniques. Exclosure maintenance, repair and general observations were performed on Sunday, November 7th, 2010 with the support of Cheyenne and Malea Corcoran.



Figure 6a. Cheyenne Corcoran repairing enclosure 3; Figure 6b. Charles Dickie recording general observations at enclosure 1

The target species of this proposal is Wood Bison, however, there will be many other species that will benefit from the habitat recovery and scientific research in this area including: Dragonhead mint, Pink corydalis, Bicknell's geranium, Hawkmoth and Morning Cloak butterfly, Sandhill crane, Rabbit, Elk, Moose, Bear (black and grizzly), Wolf and as an extension Marten, Owl, Fisher and Weasel. Not only will the continued use of prescribed fire increase the forage production and accessibility to it by the bison, it will also serve to increase variability across the landscape. The differences in vertical structure that the prescribed fires will create will also increase heterogeneity, thus resulting in an increase in biodiversity in an area that has minimal diversity at the current time.

As we continue to manage rangelands and forests in an ever changing climate, it is integral to set landscape priorities that include natural disturbances such as fire. Not only is fire important for the recovery of Wood Bison in British Columbia and Canada, fire is an important ecosystem driver in the Boreal. The Boreal forest and rangelands are target locations internationally recognized for soil carbon sequestration. In order to maintain a healthy Boreal ecosystem, fire must continue to occur and must be incorporated into land management planning at local, regional and landscape scales. Not only is this a priority for the Range Program in the Fort Nelson Forest District, it is an important consideration for the Boreal ecosystem that is circumpolar across the northern hemisphere. This project is dedicated to the stewardship of a Federally Threatened and Provincially Red-Listed Species at Risk which has a Recovery Strategy in place and involved multiple partners from various Government Agencies, Stakeholders, First Nations and other resource professionals and scientists.



Figure 7 Bison capture crew (L to R missing Armand and CO Jeff Scott): Ranger Al Hansen, Dr. Schwantje, Tyler Mattheis, Charles Dickie, Sonja Leverkus, Conrad Thiessen and Wood Bison cow

There is currently a proposed large scale project on the recovery of Wood Bison in British Columbia. Upon approval of funding, the project will be lead in partnership between Sonja Leverkus and the Fort Nelson First Nation in collaboration with the Ministry of Environment, Ministry of Forests and Range, Oklahoma State University and the Prophet River First Nation. This proposed project will contribute to the recovery of Wood Bison in BC and will document the Dene interaction with fire in North East British Columbia.

APPENDIX

Wood Bison Monitoring Forms (2)



Figure 8 Wood Bison - Nordquist herd, November 2010