

## **Wood Bison Population Monitoring**

### **Aline Lake/Liard River Herd**

*July 22, 2004*

The late-morning and afternoon of July 22, 2004 was spent attempting to locate the free-ranging herd of wood bison that was reintroduced into the Aline Lake area near Liard River in 1995. From personal correspondence with individuals who had recently travelled the Alaska Highway along its northern most sections in BC, it was suggested that the majority of the animals were currently located near the highway in the vicinity of Coal River.

The Muskwa-Kechika designated access road just south of Liard Hotsprings was travelled in the morning of July 22 in attempts to view the original site of reintroduction near Aline Lake. Poor road conditions prevented access to the site and I was forced to turn around near the guide outfitter camp along the road.

From about 12:00PM to 1:00PM I attempted to locate the herd by driving north on the Alaska Highway from Liard Hotsprings to the localities of Coal River and Fireside.

#### **Lone Male Sighting**

Approximately 10.8km north of the Coal River bridge a lone bull was located on the East side of the Alaska Highway (See figures 1 and 2).



**Figure 1.** Lone bull spotted on east side of Alaska Highway, 10.8km north of Coal River bridge.



**Figure 2.** Closer view of lone bull spotted on east side of Alaska Highway, 10.8km north of Coal River bridge.

The lone male was observed bedded-down in the grasses adjacent to the highway and then walking away from the highway further north-east up a nearby rocky slope. This mature male was quite large compared to most other bison observed on this date.



### **Main Herd Sighting**

The main herd of wood bison was found further north-west along the highway at approximately 88.3km distance from the turnoff to Liard Hotspring provincial park (north of Fireside). This was further north on the highway than the herd was previously thought to occupy. Individuals occurred on both sides of the highway and in the lanes of traffic and they did not seem to be disturbed by the high volume of vehicles passing by (with many vehicles stopping in the middle of the herd to take photographs). The herd was relatively widespread in the area and continually moving in and out of the adjacent trees, making a population count difficult. Three counts were made and each time the number of individuals counted was different. In the first count 40 individuals were classified, in counts two and three 38 and 34 individuals were counted respectively.

The most accurate count was probably the second count. On this count many of the individuals were in locations easily viewed (not obscured in the trees as in the third count) and it was easier to determine males from females and juveniles from adults. The demographic breakdown as determined visually for the second count is listed below in Table 1.

**Table 1.** Counted number of wood bison on July 22, 2004 near Alaska Highway 88.3km north of Liard Hotsprings (second of three counts).

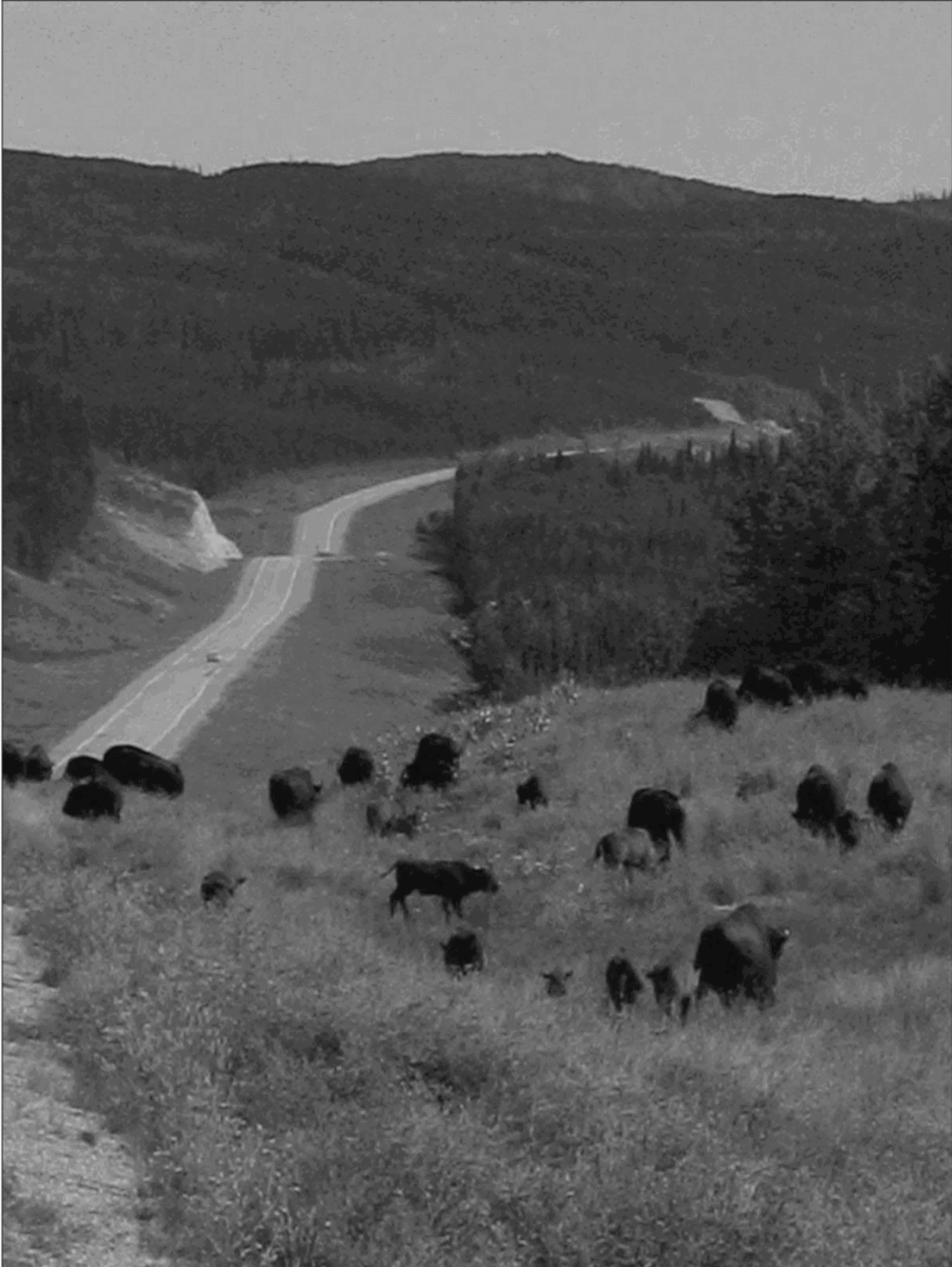
	Counted Number of Individuals
Juvenile Males	3
Adult Males	4
Juvenile Females	12
Adult Females	7
Newborn Calves	12
<b>TOTAL</b>	<b>38</b>

There was one very large male in the herd (figure 3) and a number of smaller males (both adult and juvenile).



**Figure 3.** The large male of the main herd seen on July 22, 2004.





**Figure 4.** Individuals of the wood bison herd as seen on the south side of the Alaska Highway on July 22, 2004





**Figure 5.** Individuals of the wood bison herd on both sides of the Alaska Highway as observed on July 22, 2004 at a location approximately 88.3km north of the Liard Hotsprings turnoff.



## Liard Wood Bison/Hotwater Physid Data Collection

Date: June 25-27, 2005

Location: Liard River Hotsprings (south to Muncho Lake, north to Fireside)

Contact:

s.22 (Liard Park Ranger)  
Box 42, Muncho Lake, BC V0C 1Z0  
Phone: 250-776-7343

He has been classifying bison within the Alaska Hwy corridor between Muncho Lake and Fireside for the past ~month. His classifications consisted of; adult male, adult female, subadult male, subadult female, calf of the year. He will try to narrow the classification down for the remainder of the summer. He will be writing a report describing habitat use and movement of the Nordquist herd to be submitted in September).

### Wood Bison

Observations (June 26, 2005)

South of Liard River Hotsprings:

- At 0720hrs we headed south from the hotsprings toward Muncho Lake.
- At 0745hrs we spotted a lone bull within the hwy right of way
  - Location: UTM 09 V 0666994, 6587621
  - South of Liard River bridge
  - Approximate age: 6 to 8 years
- At 0815hrs we spotted a lone bull within the hwy right of way
  - Location: UTM 10 V 0331907, 6583232
  - Further south of Liard bridge
  - Approximate age: 4 to 6 years
- The most southerly extent of the wood bison range (during June 2005, as observed by s.22 ) occurs along the hwy at approximately 10 V 0331963, 6566744
- A hwy's sign has been erected to warn motorists of bison within the hwy right of way. This sign is located at 10 V 0331987, 6582965



North of Liard River Hotsprings:

- At 1020hrs we spotted a group of 17 wood bison on the hwy right of way (in an area of heavy activity with hwy construction)
  - Location: 09V 0663630, 6591387
  - 4 calves of the year
  - 1 yearling calf (sex unverified)
  - 1 male two year old
  - 9 adult females (ages > 3 years)
  - 2 adult males (ages > 3 years)
  - 1 unknown adult
- One of the adult cows had a yellow ear tag; number 29.
- At 1047 we spotted a group of 5 wood bison
  - Location: 09 V 0662733, 6592053
  - 3 calves of the year
  - 2 adults female (age > 3 years)
- At 1130 we spotted a group of 10 wood bison (very close to the previous group... calves with previous group probably belonged to some of the cows in this group)
  - Location: 09V 0662616, 6592112
  - 1 calf of the year
  - 1 yearling calf (sex unknown)
  - 5 adult females (age > 3 years)
  - 2 adult males (age > 3 years)
  - 1 unknown adult
- 2 of the adults had yellow eartags (numbers 10 and 37)

South of Liard Hotsprings (evening observation)

- At 1937hrs I spotted a herd of 18 individuals
  - Location: 10 V 0331608, 6584273
  - 7 calves of the year
  - 2 yearling calves (one male, one female)
  - 8 adult females (age > 3 years)
  - 1 adult male (prime bull, age > 7 years)
- One adult cow had a yellow eartag; number 20.



## Hotwater Physid

### Temperature Loggers installed:

- Unit #6027069 logger installed in alpha stream
  - attached to log in the stream
  - located approximately 60m downstream from the outlet dam of the lower alpha pool
- 6027070 logger installed in beta pool
  - attached to the staircase most distant from the boardwalk
  - locked to the 3<sup>rd</sup> step from the bottom

Loggers programmed to begin recording temperatures at 1200hrs on June 26, 2005.

Loggers are set to record temperature at hourly intervals (24 points per day)

Logger battery life is estimated at approximately 800 days.

Loggers should be offloaded in June 2006 at the latest (early offload to ensure data is available).



obs	date	time	easting	northing	number
Obs 1	2005-06-03	1034	330818	6567870	2
Obs 2	2005-06-03	1539	332062	6566621	2
Obs 3	2005-06-04	1000	607744	6611407	2
Obs 4	2005-06-04	1340	332186	6566312	2
Obs 5	2005-06-06	1225	331856	6583414	2
Obs 6	2005-06-06	2200	664855	6590439	1
Obs 7	2005-06-07	2039	664793	6590550	2
Obs 8	13/06/205	1638	664854	6589989	2
Obs 9	2005-06-15	1502	662542	6592200	2
Obs 10	2005-06-19	1827	653493	6595375	32
Obs 11	2005-06-19	1837	651664	6597926	1
Obs 12	2005-06-19	1844	651055	6598862	2
Obs 13	2005-06-19	2005	651054	6598864	2
Obs 14	2005-06-19	2013	653492	6595384	27
Obs 15	2005-06-19	2051	667925	6587510	1
Obs 16	2005-06-21	1000	652059	6597221	1
Obs 17	2005-06-21	1212	669797	6587427	1
Obs 18	2005-06-24	1752	661848	6592459	15
Obs 19	2005-06-24	1823	659071	6592797	1
Obs 20	2005-06-24	1832	656422	6593615	1
Obs 21	2005-06-24	2029	656561	6593586	1
Obs 22	2005-06-24	2040	658814	6592872	1
Obs 23	2005-06-24	2051	661631	6592502	15
Obs 24	2005-06-24	2107	664825	6590522	8
Obs 25	2005-06-24	2135	331903	6583248	1
Obs 26	2005-06-24	2210	331906	6583286	1
Obs 27	2005-06-26	755	667029	6587627	1
Obs 28	2005-06-26	812	331910	6583230	1
Obs 29	2005-06-26	922	331912	6583223	1
Obs 30	2005-06-26	1016	663595	6591407	17
Obs 31	2005-06-26	1050	662733	6592054	5
Obs 32	2005-06-26	1105	662613	6592111	10
Obs 33	2005-06-26	1400	662614	6592113	12
Obs 34	2005-07-03	1338	332433	6576597	40
Obs 35	2005-07-03	1344	332431	6575902	2
Obs 36	2005-07-03	1515	332461	6577080	28
Obs 37	2005-07-07	1819	330057	6571037	1
Obs 38	2005-07-11	910	647076	6602977	40
Obs 39	2005-07-11	951	616227	6615103	17
Obs 40	2005-07-11	1102	615457	6615183	17
Obs 41	2005-07-14	1907	599226	6620347	33
Obs 42	2005-07-14	2035	630126	6608862	45
Obs 43	2005-07-14	2210	666809	6587675	8
Obs 44	2005-07-17	1205	612843	6614026	4
Obs 45	2005-07-20	1855	654426	6594270	16
Obs 46	2005-07-20	1932	630946	6608870	18
Obs 47	2005-07-20	2007	612777	6613968	3
Obs 48	2005-07-20	2024	610912	6612326	31
Obs 49	2005-07-20	2118	611733	6613032	31
Obs 50	2005-07-20	2125	612812	6613994	3
Obs 51	2005-07-20	2149	632072	6608860	19



Obs 52	2005-07-20	2215	661951	6592406	1
Obs 53	2005-07-20	2253	670295	6587274	1
Obs 54	2005-07-25	927	637255	6608156	20
Obs 55	2005-07-25	1053	638280	6607725	37
Obs 56	2005-07-25	1144	643917	6600619	47
Obs 57	2005-07-25	1203	652619	6596201	1
Obs 58	2005-07-30	1124	640758	6605816	1
Obs 59	2005-07-30	1140	627620	6609232	46
Obs 60	2005-07-30	1226	620164	6614263	1
Obs 61	2005-07-30	1320	622194	6612387	1
Obs 62	2005-07-30	1332	627230	6609333	50
Obs 63	2005-08-03	909	640932	6605693	1
Obs 65	2005-08-10	1109	640533	6605967	1
Obs 67	2005-08-18	950	604199	6616509	20
Obs 68	2005-08-18	1635	603999	6616623	1
Obs 69	2005-08-18	1716	604832	6613208	27
Obs 70	2005-08-21	1849	639835	6606426	29
Obs 71	2005-08-21	1957	620011	6614340	38
Obs 72	2005-08-21	2048	621671	6612988	38
Obs 73	2005-08-21	2129	641548	6605201	29



## Conservation Framework Project Application Template - 08/09

**Note:** This project application format has been developed to expedite the effective use of funds in fiscal 08/09. It will be reviewed and modified as needed for longer term use.

CF Funds can be used for aircraft costs, travel costs, and service contracts, but not for payroll.

**MOE Region:** Peace

**Project Lead** (MoE staff): Conrad Thiessen

**Budget Request:** \$35,000.00

**Estimated Total Budget:** \$85,000.00

**Project Title:** Wood Bison monitoring and recovery

### Objectives:

The main objective of this project is to ensure self-sustaining and increasing populations to contribute to Wood Bison recovery and ultimately allow herds to increase sufficiently to permit consumptive and increased non-consumptive use opportunities in the future.

There are four goals for the first year of the project:

Goal 1: To increase knowledge of wood bison habitat use and seasonal movements; Goal

2: To reduce conflict between wood bison and people/agriculture and plains bison; Goal

3: To reduce mortality of bison from management actions or vehicle collisions; Goal 4:

To encourage community and First Nation involvement in wood bison management.

Funding would be used to pay for GPS collar purchase, and infrastructure costs associated with habitat tools to be implemented.

Linkage to species tool output:

Species / group of species (list)	CF Goal (1-3)	Species Tool priority (1-6)	CF Action Group
Wood Bison	1 & 3	1	HT, WA

Key activities to be undertaken and timing: (include any seasonal / weather related constraints)

Activity	Timing
GPS collar bison	Fall 2008
Install drift fence and cattle guard	Fall/winter 2008

**What top-level considerations (e.g. legal obligation, existing commitment) or species-level considerations (e.g. efficiencies), if any, are also relevant to the importance of this project?**

Free-ranging, wild wood bison in British Columbia exist only in the Peace Region, and the herds here are essential to the national recovery of Wood Bison. Wood bison are listed as Threatened by COSEWIC and a national recovery plan has been written and is being implemented. Provincially wood bison are red listed.



**How will this project contribute to the achievement of the CF performance measures?**

The project will directly benefit the two populations of wood bison in British Columbia, thereby playing an essential role in recovery of wood bison at a national level. These herds are key to changing provincial and national ranking of wood bison. Results generated from this project will address actions outlined in the wood bison recovery plan, as well as provide new data that can be used to update the plan in the future.

As the herds increase in number the provincial ranking of wood bison on the CF outputs would decrease.

The implementation of habitat tools in association with monitoring of these herds will very likely lead to a positive change toward the goals for the species provincially and federally.

**How will this project promote the development or operationalization of the CF (e.g. develop key partnerships, increase in-house capacity, provide better understanding of Actions, develop IT functions)?**

We have had difficulty securing funding for wood bison recovery projects. As wood bison are among the highest ranked species in the CF receiving funding to work on this species would be a tremendous positive sign that the CF is functioning properly, and achieving conservation goals that are not linked to other values, such as hunting.

**What products will result? How will you ensure that information is collected to standard and directed to the appropriate data repository for use in future CF priority setting?**

**Wood Bison Collaring:** GPS collar 5 bison from each of the Nordquist and Etthithun Lake herds in fall of 2008. Locate herds monthly and classify according to sex and age. The collars will facilitate the continued monitoring of population size, habitat use, survival rates, and response to conflict mitigation strategies.

**Conflict Mitigation Strategies:** Fence and cattle guard will be installed in fall/winter of 2008 along the Fontas Road, which is used by the Etthithun herd. The effectiveness of the eastern and western ends of the drift fencing will be enhanced by the presence of wetlands that may present travel barriers to bison.

**Vehicle-related mortality mitigation:** Bison collars will be fitted with reflective plates to increase visibility of bison herds to on-coming vehicles travelling at night. Location data from the GPS collars would be linked to a web site to provide motorists with current locations of bison herds.

Results of wood bison habitat movement and selection as determined from GPS collars will be summarized in a technical report. Location information will be uploaded to the SPI database.



Results of the efficacy of habitat management efforts will be reported in a technical report.

**Who are your partners?**

Funding for wood bison recovery has been requested from the Ministry of Energy, Mines, and Petroleum Resourced Environmental Stewardship Program.

MoE Wildlife Branch staff would conduct the majority of the work in-kind.

**Will CF funds be used to leverage additional resources? From whom? How much?**

Yes, the funds will be used to leverage resources from industry working in the area (oil & gas companies). (

s.13,s.17



[HCTF to complete] Project File #: \_\_\_\_\_

**PROPONENT INFORMATION**

Project Leader & Title: Conrad Thiessen

Author of Proposal (if different from Project Leader):

Organization Name: Ministry of Environment

Address: 400-10003-110Ave

City: Fort St John

Province: British Columbia

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Phone: 250.787.3287

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**AMOUNT REQUESTED FROM HCTF FOR FUNDING CYCLE 2010-2011: \$37,786**

Will this be a multi-year project? **Yes**

Have you ever received HCTF funding for this project/location/species before? **Yes**

If yes, please list the HCTF Project #: **7-352**

For continuing projects: Year **2 of 3**

Did this project receive SEED funding from HCTF? **No**

**PROJECT INFORMATION**

**Project Name:** Wood Bison recovery, monitoring, and management planning

**Project Location:** Peace Region

**Project Description:** To collect information on wood bison habitat use and seasonal movements, measure the effectiveness of management efforts and develop management plans for the Nordquist and Etthithun bison herds. The overall goal is to reduce human/bison conflicts and aid recovery of wood bison.

**UTM Coordinates:** 120°15'/57°30'

**Project Type:** PM/PA

**Species to be enhanced:** M-BIBIW



## DETAILED PROJECT PROPOSAL OUTLINE

### 1. EXECUTIVE SUMMARY (~500 words or less)

The Ministry of Environment (MoE) is requesting funding from HCTF to continue a wood bison project initially started in 2008/09 with MoE Conservation Framework funding and supported by HCTF funds in 2009/10 (Year 1 of HCTF funding). Wood bison were extirpated from BC in the early 1900's and MoE is now trying to return them to their historic range as part of a national recovery effort (Gates et al. 2001). Wood bison are federally threatened and red-listed by BC. Since their re-introduction, little monitoring has occurred and new challenges are emerging, such as lack of First Nations engagement, compromised public safety on roads and in traditional hunting areas, wild bison interacting with domestic bison, and bison road mortality. All of these factors are contributing to the relatively slow increase in population size and compromise the viability of the populations. A better understanding of the ecology of the animals is necessary to ensure the correct management decisions are made. Many of the issues mentioned can be addressed now through adaptive management, and it is important to monitor the effectiveness of those treatments.

The main goal of wood bison management is to ensure self-sustaining, disease-free, herds of wood bison that can contribute to the national recovery of bison (Gates et al. 2001). This process was started when in BC the Nordquist and Etthithun herds were reintroduced to within historic wood bison range by MoE in 1995 and 2002, respectively. The objectives of this project are to 1) delineate wood bison home ranges, habitat use and seasonal movements, 2) reduce conflict between bison and people, 3) improve public safety and reduce mortality of bison, and 4) encourage community and First Nation involvement in wood bison management. Through partnerships of MoE with the Conservation Framework funding (\$35,000 for 2008/09 fiscal), in-kind support from MoE and MFR (staff time, equipment, veterinary supplies totalling >\$25,000), synergies with other HCTF proposals (Peace Region Prescribed Burn Project, #712), collaboration with First Nations, and in-kind assistance from industry and Department of Transportation (DoT) we will address the stated objectives. To meet our objectives we will continue to monitor the 5 GPS collars on adult females in each of the Nordquist and Etthithun herds. The collars will collect location data which will be used to determine habitat use and seasonal range movements. First Nations community members will collect on the ground data to corroborate GPS data and collect demographic information on the herds. DoT began two years ago to plow snow parallel to the Alaska Highway to provide movement corridors for bison, in order to reduce the amount of time they spend on the highway. The ground monitors will record information on the effectiveness of these treatments. The project will also initiate the development of herd specific management plans.

The funding requested from HCTF (\$37,786.00) will be used to fund First Nation and community involvement in wood bison monitoring, study of the ecological patterns and behavioural responses to management actions, and to conduct workshops that will help develop management plans for each herd.

### 2. ISSUE (~250 words or less)

Wood bison were extirpated from British Columbia in the early 1900s (Harper et al. 2000) and reintroduced in BC in the 1990's: the Nordquist herd and the Etthithun herd. Wood bison are red listed in BC, are priority 1 in the BC Conservation Framework, and categorized as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The two BC herds do not appear to be declining, but conflict with human activities and contact with domestic bison continue to challenge recovery. The Etthithun and Nordquist herds have minimums of 156 and 117 animals, respectively (Thiessen 2009) with a goal of 200 in each. High snow-pack years, habituation to roadways, the use of seeded road right of ways, and the reduction of favoured grassland due to fire suppression (Rowe 2007, Harper 2000) are contributing factors





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that hold the herds on transportation corridors. Public safety on roads and in First Nations traditional hunting areas has been compromised and bison road mortality (17 bison killed from the Liard herd due to motor vehicle collisions in 2008/09) has contributed to the slow increase in population size. Bison move long distances (Harper 2000), suggesting the herds may further expand their range into agricultural areas (3 bison from the Etthithun herd had to be destroyed after mixing with domestic bison in 2006). Successful recovery of these herds requires an understanding of habitat use, range, seasonal movement patterns, and behaviour of the wood bison. The knowledge gained will be used in management plans.

### 3. PROJECT OBJECTIVES

The goal of this project is to collect ecological and behavioural information on the two wood bison herds to inform the development of management plans that will lead to self-sustaining and increasing populations. The herds would then contribute to National Wood Bison Recovery, and ultimately allow herds to increase sufficiently to permit consumptive and increased non-consumptive use opportunities in the future. We will address the following objectives with this project:

- 1) Investigate wood bison distribution, habitat use and seasonal movements
  - a. Road based monthly classified counts following set transects
  - b. Using GPS collar data to assess habitat and bison response to burning
  - c. Vegetation monitoring in burned vs. unburned areas using exclosures
- 2) Reduce conflict between wood bison and people/agriculture,
  - a. Investigate location to put drift fence to eliminate seasonal southward migrations of bison
  - b. Investigate other means to reduce conflict through discussions with communities
- 3) Improve public safety and reduce mortality of bison from human causes,
  - a. Reflective plates on collars to increase visibility of collared bison
  - b. Plow travel corridors in highway right of ways along the Alaska Highway
  - c. Conduct prescribed burning at original release site to improve habitat away from highway
- 4) Encourage community and First Nation involvement in wood bison management,
  - a. Employ First Nations community members to monitor bison herds
  - b. Conduct workshops to discuss bison management and create framework for management planning
- 5) Develop management plans for the Nordquist and Etthithun wood bison herds
  - a. Working with communities to develop management plans

### 4. ACTIVITIES/METHODOLOGY

Five female bison from the Etthithun herd and five from the Nordquist herd were fitted with GPS (global positioning system) collars in February and March of 2009. Blood and fecal samples were collected to monitor the herd for disease. The GPS collars collect hourly fixes for two years. Hourly fixes were chosen to allow the quantification of time spent in or adjacent to burns, road right of ways, and using the plowed sections of the right of ways. The collars include a high visibility sheathing and reflective material to make the collared bison more visible to motorists driving at night. During the course of observations over the last year many of the collars were observed to be in an upside down position with the antenna pointing to the ground. This orientation likely will result in poor fix rate and reduced battery life. We intend to recapture the collared females to replace the batteries and add additional weight to the lower portion of the collar or remove the high visibility sheathing to return the original balance to the collars.

The current Peace Region prescribed burning project (HCTF project 712) will continue to focus prescribed burning in areas away from the Alaska highway to draw bison into suitable habitat in low conflict areas for the Nordquist herd. The Department of Transportation will use machinery to plow travel





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routes for bison through deep snow parallel to the Alaska Highway in the Nordquist herd territory during winter months. In winter of 2008/09 50 km of right of way were plowed and anecdotal observations suggest the technique was successful, however the data collected from the GPS collars and ground-based observations will provide a more rigorous evaluation of the program (Bruggeman et al. 2007).

Community workshops in Doig, Lower Post, and Fort Nelson will be held to develop herd specific management plans by MoE in collaboration with First Nations and stakeholders. Funds will be used to cover facility costs for the event and travel costs that may be incurred by participants. Participants may include First Nations members from the Yukon that have a longer contemporary history of bison co-existence and could provide valuable insight into the pros and cons of different bison management strategies.

Road-based counts will be conducted on a monthly basis, and consist of driving a specified route (300 km of the Alaska Highway for the Nordquist herd, and 150 km of private industry road for the Etthithun herd) to map the location of bison and record the number and classification (male, female, young) of bison seen. The road observations will be used to ground truth the GPS collar locations as well as providing updates on the location of the herds. If the Etthithun herd moves south into the agricultural lands it is necessary to move them north or issue permits for the destruction of individuals that come in contact with domestic bison. Having people on the ground to alert MoE of these movements is imperative.

The funding request for the final year of the project in 2011/2012 will focus on analysis of the GPS collar data and report writing.

Project Objective	Activities/Methods	Timeline
1. Habitat use and seasonal movements	Deploy 10 GPS collars (Conservation Framework funding); conduct road based classified counts; analyse collar location data	Collars to be deployed in winter 2008/09; road based counts to be conducted November 2010 to March 2011; vegetation sampling summer 2010 and 2011; collar recovery March 2011; GPS data analysis completed by October 2011
2. Reduce conflict	Identify suitable options to prevent bison movement using local knowledge and bison movement patterns (may include fencing and cattle guards;	Investigate suitable locations for fencing during monitoring trips
3. Improve public safety, reduce bison mortality	Increase visibility of bison with reflective plates on GPS collars; conduct prescribed burns for Liard herd away from highway; plow travel corridors along highway right of way; continue to educate public on wildlife-vehicle collisions	Collar bison winter 08/09; prescribed burning spring 2009 and spring 2010; plow travel corridors in all winter seasons;
4. Increase community involvement	Create herd specific management plans; employ First Nations observers to conduct road counts and assist with captures; collaborate with oil & gas companies in the area	Management plans to be completed by end of 11/12; road-based counts monthly for 09/10, 10/11 fiscals; collaborate with industry 09/10, 10/11
5. Develop management plans	Conduct 1 workshop in Ft Nelson, Doig, and Lower Post to develop management plans for each herd	Fall/winter 2009, fall/winter 2010

### 5. BENEFITS/RISK



To reduce the risk complications from immobilization and handling of bison an experienced wildlife crew will dart the wood bison from the ground. Dr. Helen Schwantje, the provincial wildlife veterinarian, local wildlife staff and members of the First Nations and specialist staff from other agencies will be present. Given the massive size of bison, they will not be adversely affected by the mass of the collar and reflective plates. The immobilization methods will include reversal from immobilization drugs. Staff will notify local communities and industry and road traffic control will be used to avoid conflict with motorists during capture.

This project will encourage community involvement and interest. Community support is expected to lead to more collaborative effort among MoE, First Nations communities, and oil and gas industry. Effective wood bison management in the Peace is contingent on local support for the project. Future management goals include hunting opportunities for First Nation. The increased visibility of the bison, a larger bison-free stretch of road, and fewer bison on the roadways and right-of-ways would all contribute to safer roads. Effective management of this population will contribute to the success of the Canadian Wood Bison Recovery Program.

## 6. EVALUATION/MEASURES OF SUCCESS

This is a multi-year project that will be evaluated annually. The evaluation and measures of success for each of the objectives is outlined below:

Investigation of wood bison habitat use and seasonal movements will be successful if:

a) road-based counts are carried out on a monthly basis throughout the 2010/11 fiscal and data are summarized in a report prior to February 2011 for location, composition, and number of animals; b) all data that becomes available from recovered collars is analysed for seasonal movements, habitat use, and use of burned areas

Reduction of conflict between wood bison and people/agriculture is an ongoing objective, but for the 2010/11 fiscal will be successful if:

a) optimal locations for fences to act as movement barriers are identified from the road-based observations, b) the effectiveness of mitigation measures (such as snow plowing in the highway right of ways) can be evaluated using the road-based observations. Bison response to the management actions will be recorded.

Improved public safety and reduction of bison mortality will be successful if:

a) 50% fewer bison-vehicle collisions occur (currently there are approximately 10 collisions per year); b) 50% fewer bison are killed in motor vehicle collisions (currently there are 8 bison killed per year)

Increased community and First Nation involvement in wood bison management will be successful if:

a) members of local First Nation communities are employed to collect road-based count data; b) herd specific management plans are developed with First Nations and stakeholders; c) partnerships are created with industry in wood bison areas.

## 7. COMMUNICATION/OUTREACH

Community meetings with extension and education about bison and their management in BC will be held in each of the Doig River First Nation (close to the Etthithun herd) and in Fort Nelson First Nation and Kaska Dena (close to the Nordquist herd). These meetings are intended to discuss the project and develop management plans with First Nations and stakeholders. A technical report will be produced and made available on the Ministry of Environment website outlining the results of the project and contributions to wood bison management, providing information for managers involved in wood bison recovery elsewhere in Canada. This project also presents opportunities to collaborate with wildlife managers in other provinces, namely Alberta, where wood bison recovery efforts are also a priority. In all cases HCTF will be recognized





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## Enhancement Project Application Funding Cycle 2010-2011

for making this project possible. HCTF will be acknowledged in any presentations of information and result collected with HCTF funds.

### 8. LITERATURE CITED

1) Bruggeman, J.E., Garrott, R.A., White, P.J., Watson, F.G.R., Wallen, R. 2007. Covariates affecting spatial variability in bison travel behaviour in Yellowstone National Park. *Ecological Applications* 17: 1411-1423; 2) Harper, W.L., Elliott, J.P., Hatter, I., and Schwatje, H. 2000. Management Plan for Wood Bison in British Columbia. Ministry of Environment, Lands and Parks; 3) Harper, W.L., and Gates, C.C. 2000. Recovery of Wood Bison in British Columbia. *Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk*. Ministry of Environment, Lands and Parks. 2: 915-924; 4) Gates, C.C., Stephenson, R.O., Reynolds, H.W., van Zyll de Jong, C.G., Schwantje, J., Hoefs, M., Nisihi, J., Cool, J., Chisholm, J.A., Koonz, B. 2001. National Recovery Plan for the Wood Bison (*Bison bison athabasca*). National Recovery Plan No.21. Recovery of Nationally Endangered Wildlife (RENEW). Ottawa, Ontario. 50 pp.; 5) Rowe, M.R. 2007. 2007 Nordquist Wood Bison Inventory. Peace Regional Technical Report. Ministry of Environment; 6) Rowe, M., and Backmeyer, R. 2006. Etthithun Wood Bison Inventory. British Columbia Ministry of Environment. Fort St. John, BC; 7) Thiessen, C. 2009. Peace wood bison project: Annual report 2008/09. Ministry of Environment. Fort St. John, BC.

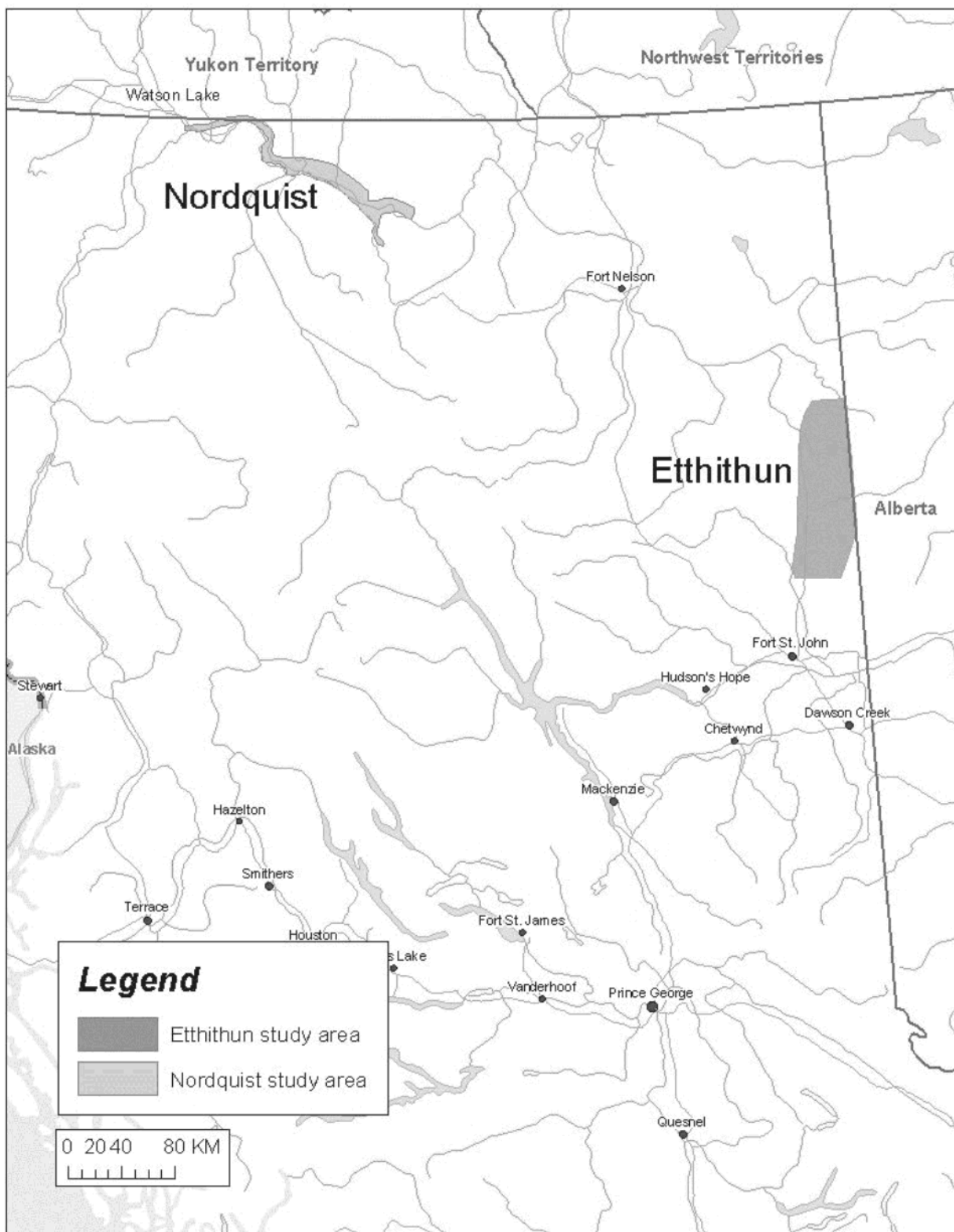




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## 9. MAP

# Enhancement Project Application Funding Cycle 2010-2011







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## Enhancement Project Application Funding Cycle 2010-2011

### 10. BUDGET

#### SECTION 1: HCTF FUNDING ONLY

<b>A. Labour Costs</b>		
<b>i. Human Resources: Wages &amp; Salaries</b>		
<b>Position</b>	<b>Person Days</b>	<b>Rate / Day</b>
First Nations bison monitors	48	250
<b>ii. Subcontractors / Consultants</b>		
<b>Contractor &amp; Proposed Services</b>		
Vegetation monitoring	17	150
Data analysis	25	150
<b>A. Sub-total Labour Costs</b>		<b>\$18,250.00</b>
<b>B. Site / Project Costs<sup>1</sup></b>		<b>Details</b>
Travel	13,200 km @0.48/km Accommodations 15 days x \$80/day Wildlife Veterinarian travel to Fort St John (\$1500)	9,036.00
Capital Expenditures / Equipment Purchase <sup>2,3</sup>	9 batteries for GPS collars (\$6000); immobilization drugs (\$500)	6,500.00
Site Supplies & Materials <sup>3, 4</sup>		
Rentals (equipment, vehicle, helicopter)	3 workshops (Lower Post, Ft Nelson, Doig River)	4,000.00
Work & Safety Supplies		
Repairs & Maintenance		
Other Site Costs:		
<b>B. Sub-total Site / Project Costs</b>		<b>\$19,536.00</b>
<b>C. Overhead / Administration<sup>5</sup></b>		<b>Details</b>
<b>C. Sub-total Overhead / Admin Costs</b>		<b>\$0</b>

<sup>1</sup> Will there be costs to maintain this investment? If yes, how do you propose to pay for them? Provide details in the text of the proposal (Section 5, Benefits & Risks).

<sup>2</sup> Administration fees cannot be charged on equipment / capital purchases

<sup>3</sup> Any capital expenditures, equipment purchases, site supplies and materials greater than \$1000 must be itemized in the text of the proposal. (Section 10.4).

<sup>4</sup> Signs – if an HCTF sign is to be placed at the project site, include the cost of the sign in the budget details.

<sup>5</sup> Administration fees – a maximum of 5% for government proposals. All other proposals must show detailed overhead expenses.





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### SECTION 2: BUDGET SUMMARY FOR ALL PROJECT SUPPORTERS

This section should summarize the total budget for the project from all sources for the year, reconcile to Budget Section 1 for HCTF Amount Requested; and reconcile to Budget Section 5 for other funding.

	HCTF Amount	Other Funding		Total
	Requested (from Section 1)	In-kind Amounts	Cash	
A. Labour Costs	18,250	17,000		35,250
B. Project / Site Costs	19,536	10,000	750	28,036
C. Overhead Costs	0	5,000		5,000
<b>TOTALS</b>	<b>\$37,786</b>	<b>\$32,000</b>	<b>\$750</b>	<b>\$70,536</b>

### SECTION 3: ADMINISTRATION FEES

If you've included an Administration fee in your budget request, this section should include an explanation of how the amount was calculated.

### SECTION 4: CAPITAL EXPENDITURES/EQUIPMENT PURCHASES, SITE SUPPLIES AND MATERIALS > \$1000

Describe and list any anticipated capital and materials costs >\$1000 as indicated in Budget Section 10.1. List ONLY non-expendable items (e.g. GPS units), NOT expendable items (e.g. fuel, groceries).

### SECTION 5: OTHER FUNDING PARTNERS

Other Funding Sources (Name of Organization/Agency/Funder)	In-Kind Amounts	Cash (Amount Requested)	Cash Confirmed (Yes/No)
Ministry of Environment	17,000	750	yes
Ministry of Forest & Range	10,000		
Federal Dept of Transportation	5,000		
<b>TOTALS</b>	<b>\$32,000</b>	<b>\$750</b>	<b>\$750</b>

Are the unconfirmed partnerships (check one box only): ☐ Duplicate / replacement of HCTF funding OR ☒ Supplementary to HCTF funding?

If the unconfirmed partnership funding is not available, will the project (check one box only):  
☒ proceed at a reduced level OR ☐ not proceed?



### SECTION 6: SUMMARY FOR MULTI-YEAR PROJECTS ONLY

Please note multi-year projects are not guaranteed funding each year. Projects must submit a proposal each year. In the table below, provide a historical record of the project, starting with the first year of HCTF approved funding, on a 5 Year cycle.

Year of Project	Funding Cycle (e.g. 2010-2011)	HCTF \$ Requested	HCTF \$ Approved	Total Other Funding	Total \$
1	2009-10	22,336	22,336	28,000	50,336
2	2010-11	37,786		32,750	70,536
3	2011-12	25,000		5,000	25,000
4					
5					
<b>Totals</b>		<b>\$85,122</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>

Multi-year projects in Years 2-5 must demonstrate the same 5 year budget plan as indicated in the Year 1 approved budget. Any proposed variances must be supported by a detailed rationale. Insert rationale here if applicable:

The original proposal that was funded for 2009/10 requested \$20,000 for year 2, however we are requesting an additional \$16,286 in funds for year 2 following the addition of a graduate student to the research program and an unforeseen complication with the collars. The additional funds will be used to complete vegetation monitoring to determine how fire affects the grazing behaviour and distribution of bison (this is consistent with the original objectives of determining the effectiveness of prescribed fire to modify the range of bison). The graduate student, Sonja Leverkus (Ministry of Forests and Range, Fort Nelson), will be focussing her research on the bison response to the prescribed burning and wildfires in the Nordquist area. She will also analyse the data from the Etthithun bison collars. The relatively small amount of additional funds requested are being bolstered by an additional minimum \$4,000 of in-kind contribution, plus countless hours of time spent developing the research as a graduate student. Sonja will be attending the University of Oklahoma under the supervision of Dr. Sam Fuhlendorf.

We are also requesting additional funds to replace batteries on the collars following the issue described in the methodology section of the collars flipping upside down. We originally planned for the collars to last two years, but the increased fix time may reduce battery life by half, and it is possible that the collars will not be collecting a full set of data. When the batteries are replaced the collars will be downloaded, providing some preliminary data to be analysed by the graduate student. There are increased travel costs associated with recollaring the bison as the preferred immobilization drug, carfentanil, is a controlled substance and must be handled by permitted specialists only.



## 11. CONTINUING PROJECT SUMMARY

### a) Project Update

The project is progressing as planned. We have included a masters student in the research program which will provide an enormous benefit to the project, and result in a far superior end product. Unfortunately, there was one unforeseen issue that arose: the GPS collars flipping upside down on the bison, potentially reducing battery life and fix rate.

Ground-based population monitoring of both herds was conducted by First Nations community members from the Kaska Dena and Doig River First Nation. Pre-determined transects were driven on established roads and highways through the known bison ranges and information on the number of animals, sex, and age were collected. To collect more detailed information on herd movements we deployed ten GPS (global positioning system) collars on female bison; five on the Etthithun herd and five on the Nordquist herd. The collars were fitted with reflective plating to make them more visible to motorists at night to increase human safety and reduce bison mortality. During the collaring effort for the Etthithun herd an attempt was made to enumerate as many bison as possible while searching for suitable individuals for collaring. Management actions completed over the last year included plowing travel corridors through the snow in the highway right of way adjacent to the Alaska Highway through a portion of the Nordquist herd's range.

In 2008/09 ground based surveys were conducted. During the six monitoring surveys of the Nordquist herd the maximum number of bison observed was 117 during the November 2008 trip. Percentage of calves in the herd declined from a high of 19.8 in October to 4.5 in March 2009. The Etthithun herd was surveyed by road four times. At the time of the surveys bison appeared to be using the habitats away from the Fontas road as no bison were seen on two of the trips and the maximum number seen was 14 on the January trip. Sample sizes for the Etthithun herd were too small to examine demographic parameters. In February and March the ten collars were deployed without incident. During the collaring effort for the Etthithun herd we counted 156 bison, of which 14.7% were calves. During the course of the year 17 bison were known to have been killed in motor vehicle collisions along the Alaska Highway. Between 27 and 45% of bison groups observed during road surveys in the winter months were in plowed sections of the highway.

During the Nordquist population monitoring surveys bison groups were classified as being within the plowed section of the highway right of way or outside of the plowed area. In January 25% (n = 8 groups) of the bison groups were observed in the plowed section of the highway, in February 27% (n = 11 groups), and in March 44% (n = 9 groups). 17 bison were known to have died from the Nordquist herd due to collisions with motor vehicles (s.22 personal communication).

In early May 2009 we conducted prescribed burning (HCTF project #7-12) amounting to >580 hectares in the Nordquist Lake area where the original release of the Nordquist herd occurred. The cost of this light up and monitoring was >\$3,000. The burns reduced the amount of aspen forest and early seral shrub layers, providing additional open rangeland for the bison. Anecdotal reports showed the bison using these burned areas soon after the burn. In addition to the prescribed burning there was a wildfire that covered 24,000 hectares in the Smith River area which is partially within the range of the Nordquist herd. The response of the bison to these two burns will be captured through the data collected by the GPS collars and vegetation monitoring. Within the Smith River fire we erected 5 exclosures from 12m<sup>2</sup> to 20m<sup>2</sup>. The exclosures excluded all large mammalian herbivores. The vegetation inside and outside the exclosures





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was sampled from August 25th - 29th, 2009 using 1m<sup>2</sup> plots. Data collected included percent cover of all species within the plots. We used a paired design, one open to large mammalian herbivores and one excluded (ie. the exclosures).

Due to difficulties in developing contracts for the ground-based monitoring in 2009/10 surveys will occur later than planned from October - March as the contracts have been signed as of October 1. Community meetings to develop management plans are scheduled to occur in the fall/early winter of 2009.



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## INTERIM ACTION PLAN – Follow-up from December Bison and Road Workshop

### WORKSHOP VISION:

*Bison herds on the Alaska Highway are managed in such a way as to ensure the health of both people and bison.*

STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
<b>APPROACH: ADDRESS PROBLEM OF BISON/VEHICLE COLLISIONS BY FOCUSING ON INFLUENCING PEOPLE'S BEHAVIOUR (PUBLIC AWARENESS / EDUCATION PROGRAMS)</b>			
<b>STRATEGY:</b> Increase the awareness of the problem among those traveling the highways through improved signage	<ul style="list-style-type: none"> <li>Establish and get agreement on "best" design of "Bison" warning signs for roads so travelers can easily recognize no matter what jurisdiction they are in.</li> <li>Seek concurrence / protocol from participating jurisdictions, regulatory bodies <i>within first six months of 2007.</i></li> </ul>	PWGSC, ICBC, DOT, jurisdictions, Gayle Hesse, s.22	A
	<ul style="list-style-type: none"> <li>Pursue signage standards with Public Works Canada, partnership with ICBC, <i>placement in 2007</i></li> </ul>		L / A
	<ul style="list-style-type: none"> <li>Look at <i>immediate aids</i> – current daily road condition reports, enhance other aids: ie. Web based Drive BC link to bison location info, Mile Post notification, more radio ads/info, installation of movable signs</li> </ul>	s.22	
	<ul style="list-style-type: none"> <li>Share info with jurisdictions with regards to site-specific effective signage with jurisdictions and authorities responsible <i>in 2007</i></li> </ul>		A
<b>STRATEGY:</b> Seek greater involvement from commercial truckers	<ul style="list-style-type: none"> <li>Seek buy-in from company owners / operators</li> <li>Part of ongoing management strategy with contact with individual or governing bodies/association within <i>first quarter of 2007</i></li> </ul>	s.22	

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
	<ul style="list-style-type: none"> <li>Expand, measure, and share information on BC wide "Project Inform" make it "Bison Aware"?</li> <li>Expand to other jurisdictions and share info in the <i>first quarter of 2007</i></li> </ul>	s.22	L / A
	<ul style="list-style-type: none"> <li>Confirm perceptions around cost impacts with speed / collision costs – long term examination of motivating factors that could influence behaviour (speeding), use of big bumpers - develop business case to motivate change in industry.</li> </ul>	s.22	L / A
	<ul style="list-style-type: none"> <li>Identify associations or trade organizations that could be engaged and make contact (i.e. Truck Loggers Association, Oil &amp; Gas Commission, etc.) – target groups</li> <li>Determine reps for commercial truck operators and bring into discussion within the <i>first quarter of 2007</i></li> </ul>		
	<ul style="list-style-type: none"> <li>Improve reporting of fatal and nonfatal collisions – esp. truckers.</li> <li>Reporting protocol from Nic Larter on workshop disc</li> <li>Potential agenda item for industry meeting – incentive program??</li> </ul>		
		s.22	
STRATEGY: Increase general awareness/education – develop local Outreach/Stewardship Program through partnerships	<ul style="list-style-type: none"> <li>Be specific and informative in messaging:               <ul style="list-style-type: none"> <li>Promote the Workshop Vision through messages to the public - the conservation value of Wood Bison, include bison behaviour and human safety issues of bison collisions, societal costs.</li> <li>Immediately develop short fact sheet – Q's and A's</li> <li>Interpretive centre in Ft Nelson</li> </ul> </li> </ul>		L / A
	<ul style="list-style-type: none"> <li>Complete review of specific audiences to be reached including tourists, industries, local residents, those traveling on public and resource roads, military transport officials.</li> </ul>		A
	<ul style="list-style-type: none"> <li>Explore options for direct communication/advertising at Mile Posts</li> </ul>		L
	<ul style="list-style-type: none"> <li>Determine best locations and solicit cooperation within first quarter 2007</li> </ul>		

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
	<ul style="list-style-type: none"> <li>Review specific messaging in material to ensure it is on-target to produce desired results/action. (Does "cute" or "gory" work?)</li> <li>Define "best practices" model within first half of 2007</li> </ul>		A
	<ul style="list-style-type: none"> <li>Identify current communication vehicles that can be adapted (low cost) and circulated to point of contact for travelers, ie. Posters, placemats, etc. to be located at campgrounds, info kiosks, Tourism Marketing Association offices, local government offices, etc.</li> <li>Implement easy communication initiatives that can convey the problem and key messages to tourists prior to the start of the major summer tourism season. Perhaps with a tourism focus so as to advise "best ways to view with respect".</li> </ul>		A
	<ul style="list-style-type: none"> <li>Form a multi-stakeholder team to assist in ensuring awareness of the seriousness of the problem is conveyed to all drivers, decision makers, and general public.</li> <li>Team to be charged with developing awareness / outreach program within the first quarter of 2007. Could examine all possible communication strategies including media relations.</li> </ul>		L / A
	<ul style="list-style-type: none"> <li>Engage First Nation communities in all above plus harvesting bison as a means to strengthen the bond between bison and local communities thus raising awareness of issues</li> </ul>		L
<b>STRATEGY:</b> Use enforcement as a tool to change behaviour.	<ul style="list-style-type: none"> <li>Determine enforcement opportunities to get traffic to slow (speed limit) in bison hot spots. CVE contact</li> </ul>	s.22	
	<ul style="list-style-type: none"> <li>Explore the option of targeted enforcement as a mechanism to get drivers to adhere to speed limits. This includes both the location and time of enforcement (high risk times/location). "Double the fine in bison zones"</li> </ul>		L

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
	<ul style="list-style-type: none"><li>Review current consequences for offenders and discuss the option of increased penalties as a potential tool to influence behaviour. Determine if this is viable within the first quarter of 2007</li></ul>		A
STRATEGY: Develop framework for reward program	<ul style="list-style-type: none"><li>Determine if there are incentive or rewards programs that could encourage compliance (Reduction in speed, reporting, etc.) as part of long term focus.</li></ul>	s.22	A
	<ul style="list-style-type: none"><li>Complete review of other possible initiatives that have a "carrot" focus and determine validity as part of long-term focus.</li><li>Explore concept of compliance acknowledgement/award from ICBC – trucking industry</li><li>Potential agenda item for industry meeting – as an incentive program??</li></ul>		A
APPROACH: ADDRESS PROBLEM BY FOCUSING ON INFLUENCING BISON BEHAVIOUR			
STRATEGY: Consider options to influence location / travel patterns of Bison (behavioural modifications / physical alterations) using an adaptive management framework	<ul style="list-style-type: none"><li>Perform a literature review on options – failures/successes?</li><li>Examine the option of changing browse spp. on right of way</li><li>Review current approach and approach of other jurisdictions to quantify the viability/costs of this initiative within the <i>first half of 2007</i></li></ul>	Helen/s.2 MOE, PW	A
	<ul style="list-style-type: none"><li>Determine maintenance changes (cutting practices?) that could assist in encouraging Bison to move without having other negative consequences within the <i>first quarter of 2007</i></li></ul>	MOE, PW	A
	<ul style="list-style-type: none"><li>Consider option to create "cat trails" along hwy r/w and possibly trails into back country</li><li>Examine the viability of this option in <i>mid Jan</i></li></ul>	MOE, PW	A

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
	<ul style="list-style-type: none"> <li>Determine the viability of intercept/diversionary baiting with salt, high quality feed – part of lit. review, has been successful with Pink Mtn</li> <li>Use care - no hay on highway!!</li> <li>Explore option and applicability for Alaska highway herds within first quarter of 2007, concern for invasive/nonendemic spp</li> </ul>	Helen, MOE, PW s.22	L / A
	<ul style="list-style-type: none"> <li>Consider government cull - engage appropriate parties and discuss initiative for the Alaska hwy herd</li> <li>If option, develop action plan/protocol with other jurisdictions.</li> </ul>	MOE, jurisdictions	L
	<ul style="list-style-type: none"> <li>Examine Nordquist &amp; Barney Lake Fire - would additional clearing leave pockets of browse for moose but provide grass to hold bison</li> </ul>	MOE, s.22	L
	<ul style="list-style-type: none"> <li>Consider logging a series of areas away from the highway to provide browse.</li> </ul>	MOE	L / A
<b>STRATEGY:</b> Explore moving the bison	<ul style="list-style-type: none"> <li>Examine the option to move bison to more remote areas</li> </ul>	MOE, Yukon	L / A
<b>APPROACH: ADDRESS PROBLEM BY GAINING KNOWLEDGE / INCREASING COLLABORATION / BUILDING BETTER PROCESSES</b>			
<b>STRATEGY:</b> Encourage collaborative research	<ul style="list-style-type: none"> <li>Maintain information flow between jurisdictions/agencies</li> </ul>	All	A
Encourage greater collaboration between jurisdictions	<ul style="list-style-type: none"> <li>Improve (standardize) system of tracking Bison road collision locations and dates within BC herds, use new tools (GPS units)</li> <li>Follow NWT example of data collection</li> </ul>	MOE, jurisdictions, s.22	A

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
	<ul style="list-style-type: none"> <li>Identify why and what these bison do and scope potential research projects, approach potential research partners (Post Secondary Institutions) and potential funding partners.</li> <li>Include research into changing vegetation. Long term issue that will help guide development / evolution of management plan.</li> </ul>	s.22 ... with Helen/(s.2	A
	<ul style="list-style-type: none"> <li>Identify needs (knowledge gaps) and acquire information with respect to:               <ul style="list-style-type: none"> <li>Immediate and long term inventories of bison &amp; range</li> <li>Collision data collection</li> <li>Set up GPS locations w/km points</li> <li>Expand s.22 location study</li> <li>Manure mapping / habitat mapping &amp; use</li> <li>GIS mapping</li> <li>Goal to determine hot spots - where bison will be spatially &amp; temporarily</li> </ul> </li> </ul>	s.22	L / A
	<ul style="list-style-type: none"> <li>Look at new technology/innovative approaches – web cam, others – lit. review.</li> <li>Revisit driving light experiments. Pencil beam setting on Lightforce lights must extend visible effect. (refer to s.22 paper with moose)</li> </ul>	s.22 S. : to provide for workshop	A

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
STRATEGY: Create Multi-jurisdictional Mgmt Group for Nordquist Herd	<ul style="list-style-type: none"> <li>Form multi-jurisdictional/agency working group – steering/core working group – regular conference calls, share &amp; inform</li> <li>Develop interim Nordquist Bison Management Plan with immediate and long term objectives and actions, complete exercise within the <i>first quarter of 2007</i></li> <li>Determine potential and required participants and draft discussion paper</li> <li>Ensure communications strategy is part of overall mgmt plan</li> <li>Develop protocols for:               <ul style="list-style-type: none"> <li>Bison and road issues</li> <li>Biological sampling protocol – include permitting for non-MOE personnel</li> </ul> </li> <li>Seek Sr. Mgt and political support for implementing mgt actions, mitigation efforts and additional research</li> <li>Consider establishment of Inter-jurisdictional WB Tech-Advisory Team (TBAG) for all bison herds – role of National recovery Team</li> <li>Develop Inter-jurisdictional MOU to outline common goals</li> </ul>	MOE, all	L

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STRATEGY / TACTIC	ACTION & TIMELINE	LEAD	APPLIES TO
NEXT STEPS	<ul style="list-style-type: none"> <li>Next meetings: <ul style="list-style-type: none"> <li>Alces meeting in PG – June 2 – 6</li> <li>WBRT meeting?</li> </ul> </li> </ul>		
	<ul style="list-style-type: none"> <li>Other participants, what partners are missing (local communities, Northern Health)?</li> </ul>		
	<ul style="list-style-type: none"> <li>Prioritize actions</li> </ul>		
	<ul style="list-style-type: none"> <li>Identify funding – inform group of funding requirements</li> </ul>		
	<ul style="list-style-type: none"> <li>Media – local/jurisdictions - news stories – spokespeople, simple messaging: <ul style="list-style-type: none"> <li>We met – multiple public groups/agencies/jurisdictions invited</li> <li>Shared problem &amp; experiences – initiated by BC</li> <li>First steps taken – state vision – ensure safety for people and bison, immediate actions to reduce risk (inventory, signage, habitat modification) &amp; long term management options</li> <li>Continue collaboration with communities and road users</li> </ul> </li> </ul>	s.22	

**Potential funding sources:** HCTF, NE Wildlife Fund, Environment Canada Habitat Stewardship Program (under SARA), Commercial Vehicle Enforcement, local government/municipalities, Northern Health

Keeper of the records:

Reporting out date:

Dec 20, 2006



# Habitat Conservation Trust Foundation

## Project Proposal Application Funding Cycle 2009-2010

HCTF to complete **Project File #:**

### PROPONENT INFORMATION

Contact / Project Leader: Conrad Thiessen / Helen Schwantje / Gerry Kuzyk

Organization Name: Ministry of Environment

Address: #400 10003-110 Ave

City: Fort St John

Province: British Columbia

Postal Code: V1J 6M7

Email Address: Conrad.thiessen@gov.bc.ca

Phone: (250)787-3287

Cell:

Fax: (250)787-3490

**AMOUNT REQUESTED FROM HCTF FOR FUNDING CYCLE 2009-2010: \$22,336.00**

Will this be a multi-year project? ☒ Yes ☐ No If yes, please complete Budget (Section 6)

Have you ever received HCTF funding for this project/location/species before? ☐ Yes ☒ No  
If yes, please list the HCTF Project #:

For continuing projects: Year \_\_\_ of Year \_\_\_ (e.g. 2 of 5 years)

Did this project receive SEED funding from HCTF? ☐ Yes ☒ No  
If yes, please list the HCTF Project #:

### PROJECT INFORMATION

Project Name: Wood Bison recovery, monitoring, and management planning

Project Location: Peace Region

Project Description:

The project will collect information on wood bison habitat use and seasonal movements, measure the effectiveness of management efforts and develop management plans for the Nordquist and Etthithun bison herds. The overall goal is to reduce human/bison conflicts and aid recovery of wood bison.

Longitude/Latitude: 120°15'/57°30'

Project Type: PM/PA

Species to be enhanced: M-BIBIW

### DETAILED PROJECT PROPOSAL OUTLINE



# Habitat Conservation Trust Foundation

## Project Proposal Application Funding Cycle 2009-2010

### 1. EXECUTIVE SUMMARY

The Ministry of Environment (MoE) is requesting funding from HCTF to continue a wood bison project initially started in 2008/09 with MoE Conservation Framework funding. Wood bison were extirpated from BC in the early 1900's and MoE is now trying to return them to their historic range as part of a national recovery effort (Gates et al. 2001). Wood bison are federally threatened and red-listed by BC. Since their re-introduction in 1995 and 2002, little monitoring has occurred and new challenges are emerging, such as lack of First Nations engagement, compromised public safety on roads and in traditional hunting areas, wild bison interacting with domestic bison, and bison road mortality contributing to the relatively slow increase in population size, that require a better understanding of the ecology of the animals. Some of the problems mentioned can be addressed now through adaptive management, and it is important to monitor the effectiveness of those treatments.

The main goal of wood bison management is to ensure self-sustaining, disease-free, herds of wood bison that can contribute to the national recovery of bison (Gates et al. 2001). This process was started when in BC the Nordquist and Etthithun herds were reintroduced to within historic wood bison range by MoE in 1995 and 2002, respectively. The objectives of this project are to 1) delineate wood bison home ranges, habitat use and seasonal movements, 2) reduce conflict between bison and people, 3) improve public safety and reduce mortality of bison, and 4) encourage community and First Nation involvement in wood bison management. Through partnerships of MoE with the Conservation Framework funding (\$35,000 for 2008/09 fiscal), in-kind support from MoE (staff time, equipment, veterinary supplies totalling \$25,000), synergies with other HCTF proposals (Peace Region Prescribed Burn Project, #712), collaboration with First Nations, and in-kind assistance from industry and Department of Transportation (DoT) we will address the stated objectives. To meet our objectives we will immobilize and deploy 5 GPS collars on adult females in separate groups in each of the Nordquist and Etthithun herds. The collars will collect location data which will be used to determine habitat use and seasonal range movements. First Nations community members will collect on the ground data to corroborate GPS data and collect demographic information on the herds. DoT began two years ago to plow snow parallel to the Alaska Highway provide movement corridors for bison, in order to reduce the amount of time they spend on the highway. The ground monitors will record information on the effectiveness of these treatments. The project will also initiate the development of herd specific management plans.

The funding requested from HCTF (**\$22,336.00**) will be used entirely to fund First Nation and community involvement in wood bison monitoring and management planning. The majority of funds will be used to hire First Nations community members to continue the road-based monitoring initiated in 2008/09. The additional funds will be used to facilitate the development of herd specific management planning for the Nordquist and Etthithun herds.

### 2. ISSUE

Wood bison were extirpated from British Columbia in the early 1900s (Harper et al. 2000). Two herds were reintroduced in BC in the 1990's: the Nordquist herd and the Etthithun herd. Wood bison are red listed in BC, are priority 1 in the BC Conservation Framework, and categorized as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The two BC herds do not appear to be declining, but conflict with human activities and contact with domestic and plains bison continue to challenge current recovery strategies. High snow-pack years, habituation to roadways, the use of seeded road right of ways (Rowe 2007), and the reduction of historically favoured grassland due to fire suppression (Rowe 2007, Harper 2000) are suspected to be contributing factors that hold the herds on transportation corridors. Subsequently, public safety on roads and in First Nations traditional hunting areas has been compromised and bison road mortality has contributed to the relatively slow increase in population size (Rowe 2007). Bison are known to be able to move hundreds of kilometres in a relatively short period of time (Harper 2000), suggesting the herds could further expand their range into areas of conflict with agriculture. Successful recovery of these herds requires an understanding of habitat use, range, seasonal movements patterns, and



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behaviour of the wood bison. This proposed study will investigate these issues, and utilize the knowledge to mitigate conflict between wood bison and humans, plains bison, and domestic bison.

### 3. PROJECT OBJECTIVES

The goal of this project is to develop appropriate management plans that will lead to self-sustaining and increasing populations that will contribute to national Wood Bison recovery and ultimately allow herds to increase sufficiently to permit consumptive and increased non-consumptive use opportunities in the future. We will address the following objectives with this project:

- 1) Investigate wood bison distribution, habitat use and seasonal movements
- 2) Reduce conflict between wood bison and people/agriculture,
- 3) Improve public safety and reduce mortality of bison from human causes,
- 4) Encourage community and First Nation involvement in wood bison management.

### 4. ACTIVITIES/METHODOLOGY

Five female bison in the Etthithun herd and five female bison in the Nordquist herd will be chosen at random from separate groups of bison to be immobilized and fitted with GPS (global positioning system) collars. Each animal will be sampled to monitor herd health. The GPS collars will be set to collect hourly fixes for two years, after which time they will automatically drop-off. Hourly fixes were chosen to allow the quantification of time spent in road right of ways and using the plowed sections of the right of ways. The collars will include a high visibility sheathing and reflective material to make the collared bison more visible to motorists driving at night.

The current Peace Region prescribed burning project (HCTF project 712) will focus prescribed burning in areas away from the Alaska highway to draw bison into suitable habitat in low conflict areas for the Nordquist herd. The Department of Transportation uses heavy machinery to plow travel routes for bison through deep snow parallel to the Alaska Highway in the Nordquist herd territory during winter months. In previous years a total of 8 km of routes were plowed and anecdotal observations suggest the technique was successful, however the data collected from the GPS collars and ground-based observations will provide a more rigorous evaluation of the program (Bruggeman et al. 2007).

A consultant will be hired to facilitate the creation of herd specific management plans by MoE in collaboration with First Nations and stakeholders. The consultant will be tasked with summarizing the history of re-introduction for both herds and facilitating dialog and development of the plan with MoE, First Nations, and interested stake holders.

Road-based counts will be conducted on a monthly basis, and consist of driving a specified route (300 km of the Alaska Highway for the Nordquist herd, and 150 km of private industry road for the Etthithun herd) to map the location of bison and record the number and classification (male, female, young) of bison seen. The road observations can be used to ground truth the GPS collar locations as well as providing updates on the location of the herds. If the Etthithun herd moves south into the agricultural lands it is necessary to move them north or issue permits for the destruction of individuals that come in contact with domestic bison.

Having people on the ground to alert MoE of these movements is imperative.

Funding requests for 2010/2011 will focus on continuing monitoring and possibly construction of barriers (cattle guards and bison proof fencing) to restrict southward movements of the herds. Funding requests for 2011/2012 will focus on hiring a consultant to analyse the GPS collar data.

Project Objective	Activities/Methods	Timeline
1. Habitat use and seasonal movements	Immobilize 5 adult females in spatially separate groups in each herd and deploy GPS collars (Conservation Framework funding); conduct road based classified counts; analyse collar	Collars to be deployed in winter 2008/09; road based counts to be conducted November 2009 to March 2010; location analysis



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	location data	completed by October 2011
2. Reduce conflict	Identify suitable options to prevent bison movement using local knowledge and bison movement patterns (may include fencing and cattle guards;	To be included in herd specific management plans (see #4)
3. Improve public safety, reduce bison mortality	Increase visibility of bison with reflective plates on GPS collars; conduct prescribed burns for Liard herd away from highway; plow travel corridors along highway right of way; continue to educate public on wildlife-vehicle collisions	Collar bison winter 08/09; prescribed burning spring 2009; plow travel corridors winter 08/09 and 09/10;
4. Increase community involvement	Create herd specific management plans; employ First Nations observers to conduct road counts and assist with captures; collaborate with oil & gas companies in the area	Management plans to be completed by end of 09/10; road-based counts monthly for 09/10 fiscal; secure funding from industry within 09/10

### 5. BENEFITS/RISK

To reduce the risk complications from immobilization and handling of bison an experienced wildlife crew will dart the wood bison from the ground. Dr. Helen Schwantje, the provincial wildlife veterinarian, local wildlife staff and members of the First Nations and specialist staff from other agencies will be present. Given the massive size of bison, they will not be adversely affected by the mass of the collar and reflective plates. The immobilization methods will include reversal from immobilization drugs. Staff will notify local communities and industry and road traffic control will be used to avoid conflict with motorists during capture.

This project will encourage community involvement and interest. Community support is expected to lead to more collaborative effort among MoE, First Nations communities, and oil and gas industry. Effective wood bison management in the Peace is contingent on local support for the project. Future management goals include hunting opportunities for First Nation. The increased visibility of the bison, a larger bison-free stretch of road, and fewer bison on the roadways and right-of-ways would all contribute to safer roads. Effective management of this population will contribute to the success of the Canadian Wood Bison recovery program.

### 6. EVALUATION/MEASURES OF SUCCESS

This is a multi-year project that will be evaluated annually. The evaluation and measures of success for each of the objectives is outlined below:

Investigation of wood bison habitat use and seasonal movements will be successful if:

- operational GPS collars are deployed prior to the start of 2009/10 fiscal;
  - road-based counts are carried out on a monthly basis throughout the 2009/10 fiscal and data are summarized in a report prior to February 2010 for location, composition, and number of animals
- Reduction of conflict between wood bison and people/agriculture is an ongoing objective, but for the 2009/10 fiscal will be successful if:

- optimal locations for fences to act as movement barriers are identified from the road-based observations,
- the effectiveness of mitigation measures (such as snow plowing in the highway right of ways) can be evaluated using the road-based observations. Bison response to the management actions will be recorded.

Improved public safety and reduction of bison mortality of will be successful if:



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- a) 50% fewer bison-vehicle collisions occur (currently there are approximately 10 collisions on average per year);
- b) 50% fewer bison are killed in motor vehicle collisions (currently there are 8 bison killed on average per year)

Increased community and First Nation involvement in wood bison management will be successful if:

- a) members of local First Nation communities are employed to collect road-based count data;
- b) herd specific management plans are developed with First Nations and stakeholders;
- c) partnerships are created with industry in wood bison areas.

### **7. COMMUNICATION/OUTREACH**

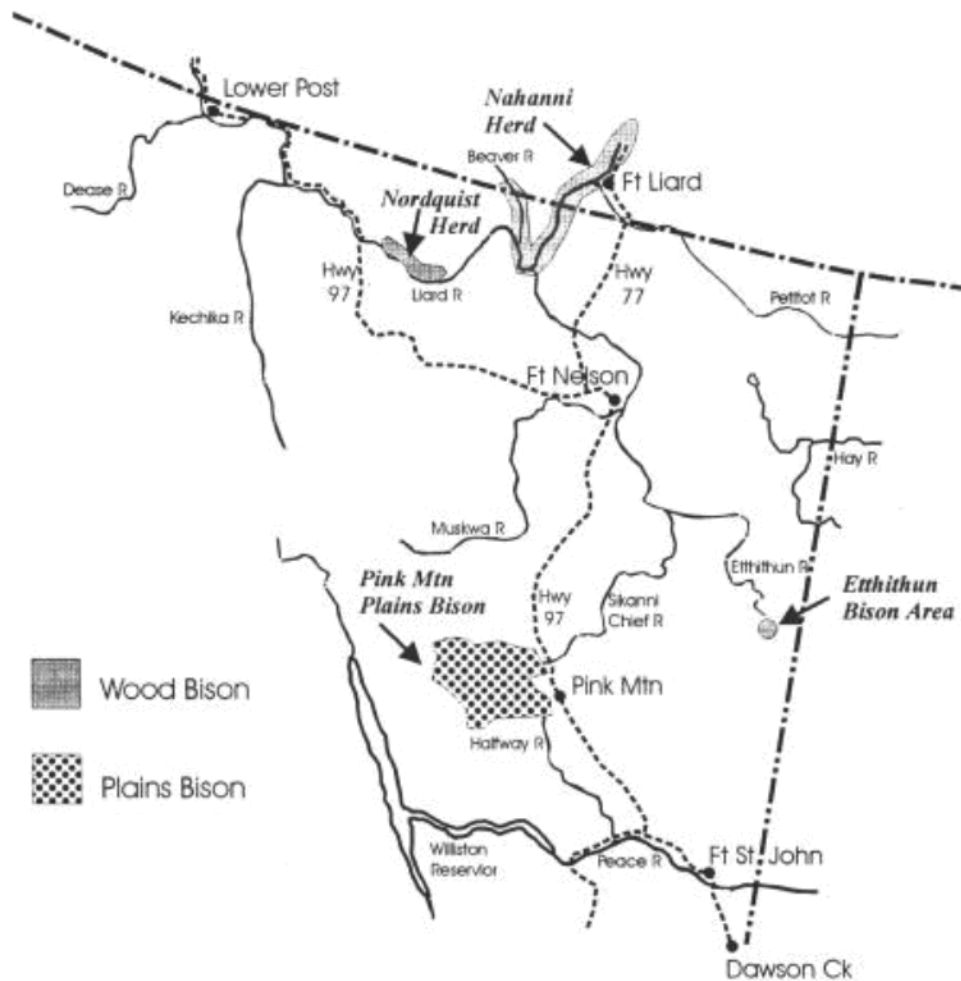
Two community meetings with extension and education about bison and their management in BC will be held in each of the Doig River First Nation (close to the Etthithun herd) and in Fort Nelson or Lower Post (close to the Nordquist herd). These meetings are intended to discuss the project and develop management plans with First Nations and stakeholders.

A technical report will be produced and made available on the Ministry of Environment website outlining the results of the project and contributions to wood bison management, providing information for managers involved in wood bison recovery elsewhere in Canada. This project also presents opportunities to collaborate with wildlife managers in other provinces, namely Alberta, where wood bison recovery efforts are also a priority. In all cases HCTF will be recognized for making this project possible. HCTF will be acknowledged in any presentations of information and result collected with HCTF funds.



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**Figure 1.** Location of Etthithun and Nordquist wood bison herds in north east BC.

## 8. LITERATURE CITED

- Bruggeman, J.E., Garrott, R.A., White, P.J., Watson, F.G.R., Wallen, R. 2007. Covariates affecting spatial variability in bison travel behaviour in Yellowstone National Park. *Ecological Applications* 17: 1411-1423.
- Harper, W.L., Elliott, J.P., Hatter, I., and Schwatje, H. 2000. Management Plan for Wood Bison in British Columbia. Ministry of Environment, Lands and Parks.
- Harper, W.L., and Gates, C.C. 2000. Recovery of Wood Bison in British Columbia. Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk. Ministry of Environment, Lands and Parks. 2: 915-924.
- Gates, C.C., Stephenson, R.O., Reynolds, H.W., van Zyll de Jong, C.G., Schwantje, J., Hoefs, M., Nisihi, J., Cool, J., Chisholm, J.A., Koonz, B. 2001. National Recovery Plan for the Wood Bison (*Bison bison athabasca*). National Recovery Plan No.21. Recovery of Nationally Endangered Wildlife (RENEW). Ottawa, Ontario. 50 pp.
- Rowe, M.R. 2007. 2007 Nordquist Wood Bison Inventory. Peace Regional Technical Report. Ministry of Environment
- Rowe, M., and Backmeyer, R. 2006. Etthithun Wood Bison Inventory. British Columbia Ministry of Environment. Available from BC Wildlife Species inventory website:



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## Project Proposal Application Funding Cycle 2009-2010

### 10. BUDGET

#### SECTION 1: HCTF FUNDING ONLY

<b>A. Labour Costs</b>			
<b>i. Human Resources: Wages &amp; Salaries</b>			
<b>Position</b>	<b>Person Days</b>	<b>Rate / Day</b>	<b>Total HCTF Amount</b>
Road count observers (4)	48	\$250/day	\$12,000.00
<b>ii. Subcontractors / Consultants</b>			
<b>Contractor &amp; Proposed Services</b>			
Management plan facilitation	8	\$500/day	\$4,000
<b>A. Sub-total Labour Costs</b>			<b>\$16,000.00</b>
<b>B. Site / Project Costs<sup>1</sup></b>		<b>Details</b>	
Travel	13,200 km @ \$0.48/km		\$6336.00
Capital Expenditures / Equipment Purchase <sup>2</sup>			
Site Supplies & Materials <sup>3, 4</sup>			
Rentals (equipment, vehicle, helicopter)			
Work & Safety Supplies			
Repairs & Maintenance			
Other Site Costs:			
<b>B. Sub-total Site / Project Costs</b>			<b>\$6336.00</b>
<b>C. Overhead / Administration<sup>5</sup></b>		<b>Details</b>	
Office space, utilities (incl. telephone), etc.			
Office supplies			
Printing / photocopying			
Administration fee			
Sub-contractor admin fee (if not included in Sub-section A - Labour)			
Other overhead costs:			
<b>C. Sub-total Overhead / Admin Costs</b>			<b>\$0</b>

#### SECTION 2: BUDGET SUMMARY FOR ALL PROJECT SUPPORTERS

This section should summarize the total budget for the project from all sources for the year, reconcile to Budget Section 1 for HCTF Amount Requested; and reconcile to Budget Section 5 for other funding.

<sup>1</sup> Will there be costs to maintain this investment? If yes, how do you propose to pay for them? Provide details in the text of the proposal.

<sup>2</sup> **Administration fees cannot be charged on equipment / capital purchases**

<sup>3</sup> Any equipment purchases and equipment rentals, vehicle rentals, materials and supplies, and miscellaneous expenses greater than \$1000 MUST BE ITEMIZED IN THE TEXT OF THE PROPOSAL.

<sup>4</sup> Signs – if an HCTF sign is to be placed at the project site, include the cost of the sign in the budget details.

<sup>5</sup> Administration fees – a maximum of 5% for government proposals. All other proposals must show detailed overhead expenses.



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	HCTF Amount	Other Funding		Total
	Requested (from Section 1)	In-kind Amounts	Cash	
A. Labour Costs	\$16,000	\$15,000		\$31,000
B. Project / Site Costs	\$6,336	\$8,000		\$14,336
C. Overhead Costs	\$0	\$5,000		\$5,000
<b>TOTALS</b>	\$22,336	\$28,000		\$50,336

### SECTION 3: ADMINISTRATION FEES

### SECTION 4: CAPITAL AND MATERIALS > \$1000

### SECTION 5: OTHER FUNDING PARTNERS

Other Funding Sources (Name of Organization/Agency/Funder)	In-Kind Amounts	Cash (Amount Requested)	Cash Confirmed (Yes/No)
Conservation Framework (2008/09)		\$35,000	\$35,000
Ministry of Environment	\$23,000		
ConocoPhillips		\$30,000	
Department of Transportation	\$5,000		
<b>TOTALS</b>	\$28,000	\$65,000	\$35,000

Are the unconfirmed partnerships (check one box only): ☐ Duplicate / replacement of HCTF funding OR ☒ Supplementary to HCTF funding?

If the unconfirmed partnership funding is not available, will the project (check one box only): ☒ proceed at a reduced level OR ☐ not proceed?

### SECTION 6: SUMMARY FOR MULTI-YEAR PROJECTS ONLY

Please note multi-year projects are not guaranteed funding each year. Projects must submit a proposal each year.

Year of Project	Funding Cycle (e.g. 2008-2009)	HCTF \$ Requested	HCTF \$ Approved	Total Other Funding	Total \$
1	2008/09	\$67,700	0	\$45,000	\$45,000
2	2009/10	\$22,336	0	\$28,000	\$50,336



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3	2010/2011	\$20,000	0	\$28,000	\$48,000
4	2011/2012	\$10,000	0	\$5,000	\$15,000
5					
<b>Totals</b>		\$120,360	\$0	\$106,000	\$158,336



Survey Area		Survey Type		Month	Year	Density (hectares)	Estimated Area (km²)	Estimated Bison	SD	Calf Ratio	SD	Bull Ratio	SD	Notes	Total Bison	SD	Total Cows	SD	Total Calf	SD	Total Bulls	SD	Comments
Eitlthun	population growth model			1999				43							19				14		5		Yrig Males = 5
Eitlthun	population growth model			2000				54				85.7			43		14		17		12		Yrig Males = 7 Yrig Fem = 14
Eitlthun	population growth model			2001				69				38.7			43		31		8.4		12		Yrig Fem = 17
Eitlthun	population growth model			2002				9		27.1		38.7			51.4		31		8.4		12		
Eitlthun	population growth model			2003				110		52.2		44.3			88.6		35.62		18.6		15.78		Yrig males = 3.78 Yrig fem = 4.62
Eitlthun	population growth model			2004				138		46.6		52.7			109.9		45.82		21.4		24.15		Yrig males = 8.37 Yrig fem = 10.23
Eitlthun	population growth model			2005				175		34.3		31.3			68		67		23		21		Yrigs = 13
Eitlthun	moose inventory			February				175		49.1		56.0			124		56.08		27.51		32.52		Yrig males = 9.62 Yrig fem = 11.75
Eitlthun	population growth model			March				175		127.8		77.8			137.5		18		23		14		Un adult = 93 Yrigs = 8
Eitlthun (captures & monitoring)	Transect			March				175		33.3		300			156		3		1		9		Unclassified adults = 4
Eitlthun (captures & monitoring)	Transect			Oct-Mar				399	0.3						102		2		1		7		Adult bison = 101
Nasanni	Transect			March						50.0		350.0			72		19		12		7		Unknown age/sex = 62
BC Parks-Lund-Nordquay Springs	Observations			July						63.2		56.8			67		83		15		7		Unknown adult = 52
BC Parks-Nordquay	Observations			summer						69.9		124.1			338		83		58		103		Adult bison = 6 missed the majority of the herd
BC Parks-Nordquay	Observations			March													2		0		10		Unknown age/sex = 83 Yrigs = 2
Nordquay	Transect			2007						0.0		500.0			97		2		0		207		Un yrig = 62 Un adult = 35
Nordquay (captures & monitoring)	Transect			2008-09						32.3		111.3			569		186		60		17		3 calves road killed, 83 unclassified
Nordquay herd	Observations			2008-2009											76		0		6				









## Enhancement Project Application Funding Cycle 2011-2012

[HCTF to complete] Project File #: \_\_\_\_\_

**Project Name:** Wood bison recovery, monitoring and management planning.

### PROPONENT INFORMATION

Project Leader & Title: Conrad Thiessen

Author of Proposal (if different from Project Leader):

Organization Name: Ministry of Environment

Legal Name: Conrad Douglas Thiessen

Mailing Address: #400 10003-110 Ave

City: Fort St John

Province: British Columbia

Postal Code: V1J 6M7

Email Address: Conrad.thiessen@gov.bc.ca

Phone: 250.787.3287

Cell:

Fax: 250.787.3490

**AMOUNT REQUESTED FROM HCTF FOR FUNDING CYCLE 2011-2012: \$ 25,000**

Will this be a multi-year project? **YES**

Have you ever received HCTF funding for this project/location/species before? **YES**

If yes, please list the HCTF Project #: **7-352**

For continuing projects: Year **3 of 3**

Did this project receive SEED funding from HCTF? **No**

### PROJECT INFORMATION

Project Description

To collect information on Wood bison habitat use and seasonal movements, measure the effectiveness of management efforts and develop management plans for the Nordquist and Etthithun bison herds. The overall goal is to aid recovery of wood bison.

**Have you discussed this project with the Regional Manager of the Ministry of Environment? YES**

Project Location: Peace Region

UTM Coordinates: 120°15'/57°30'

Project Type: PM/PA

Species to be enhanced: M-BIBIW

### DETAILED PROJECT PROPOSAL OUTLINE

#### 1. EXECUTIVE SUMMARY



The Ministry of Environment (MoE) is requesting funding from HCTF to continue a Wood bison project initially started in 2008/09 with MoE Conservation Framework funding and supported by HCTF funds in 2009 – 2010 (year 1 and 2). Wood bison were extirpated from BC in the early 1900's and MoE is now trying to return them to their historic range as part of a national recovery effort (Gates et al. 2001). Wood bison are federally threatened and red-listed by BC. Since their re-introduction, little monitoring has occurred and new challenges are emerging, such as lack of First Nations engagement, compromised public safety on roads and in traditional hunting areas, wild bison interacting with domestic bison, and bison road mortality. All of these factors are contributing to the relatively slow increase in population size and compromise the viability of the populations. A better understanding of the ecology of the animals is necessary to ensure the correct management decisions are made. Many of the issues mentioned above can be addressed now through adaptive management. It is important to monitor the effectiveness of those treatments and to change the management accordingly.

The main goal of Wood bison management is to ensure self-sustaining, disease-free, herds of Wood bison that can contribute to the national recovery of bison (Gates et al. 2001). This process was started when the Nordquist and Etthithun herds were reintroduced within historic Wood bison range in BC by MoE in 1995 and 2002, respectively. The objectives of this project are to 1) delineate Wood bison home ranges, habitat use and seasonal movements, 2) reduce conflict between bison and people, 3) improve public safety and reduce mortality of bison, and 4) encourage community and First Nation involvement in Wood bison management. Through partnerships of MoE with the Conservation Framework funding (\$35,000 for 2008/09 fiscal), in-kind support from MoE and MFR (staff time, equipment, veterinary supplies totalling >\$25,000), synergies with other HCTF proposals (Peace Region Prescribed Burn Project #712), collaboration with First Nations, and in-kind assistance from industry and Public Works and Government Services Canada (PWGSC) ) we will address the stated objectives.

To meet our objectives we will continue to monitor the 5 GPS collars on adult females in each of the Nordquist and Etthithun herds. The collars are collecting location data which will be used to determine habitat use and seasonal range movements. Two years ago, PWGSC began to plow snow parallel to the Alaska Highway to provide movement corridors for bison, in order to reduce the amount of time they spend on the highway. In addition, the project will also initiate the development of herd specific management plans. The funding requested from HCTF (\$25,000.00) will be used to fund First Nation and community involvement in Wood bison management, to study the ecological patterns and behavioural responses to management actions, and to conduct workshops that will help develop management plans for each herd.

## 2. ISSUE

Wood bison were extirpated from British Columbia in the early 1900s (Harper et al. 2000) and reintroduced in BC in the 1990's: the Nordquist herd and the Etthithun herd. Wood bison are red listed in BC, are priority 1 in the BC Conservation Framework, and categorized as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The two BC herds do not appear to be declining, but conflict with human activities and contact with domestic bison continue to challenge recovery. The Etthithun and Nordquist herds have minimums of 156 and 193 animals, respectively (MoE unpublished data) with a goal of 200 or more in each. High snow-pack years, habituation to roadways and the use of agronomically seeded road right of ways, and the reduction of favoured grassland due to fire suppression (Rowe 2007, Harper 2000) are contributing factors that hold the herds on transportation corridors. Public safety on roads and in First Nations traditional hunting areas has been compromised and bison road mortality (17 bison killed from the Liard herd due to motor vehicle collisions in 2008/09) has contributed to the slow increase in population size. Bison move long distances (Harper 2000), suggesting the herds may further expand their range into agricultural areas (3 bison from the Etthithun herd had to be destroyed after mixing with domestic bison in 2006). Successful recovery of these herds requires an understanding of habitat use, range, seasonal



movement patterns, and behaviour of the wood bison. The knowledge gained will be used in management plans.

### 3. PROJECT OBJECTIVES

The goal of this project is to collect ecological and behavioural information on the two Wood bison herds to inform the development of management plans that will lead to self-sustaining and increasing populations. The herds would then contribute to National Wood Bison Recovery, and ultimately allow herds to increase sufficiently to permit consumptive and increased non-consumptive use opportunities in the future. We will address the following objectives in 2011-2012:

- 1) Investigate Wood bison distribution, habitat use and seasonal movements
  - a. Using GPS collar data to assess habitat and bison response to burning (ongoing)
  - b. Vegetation monitoring in burned vs. unburned areas using exclosures (ongoing)
- 2) Reduce conflict between Wood bison and people/agriculture,
  - a. Investigate bison containment fence locations (ongoing)
  - b. Investigate other means to reduce conflict with communities (ongoing)
- 3) Improve public safety and reduce mortality of bison from human causes,
  - a. Reflective plates on collars to increase visibility of collared bison (ongoing)
  - b. Plow travel corridors in highway right of ways along the Alaska Highway (ongoing)
  - c. Conduct prescribed burning at original release site of Nordquist herd to improve habitat away from highway (ongoing)
- 4) Encourage community and First Nation involvement in Wood bison management,
  - a. Conduct workshops to discuss bison management and create framework for management planning (ongoing)
- 5) Develop management plans for the Nordquist and Etthithun Wood bison herds
  - a. Working with communities to develop management plans (ongoing)

### 4. ACTIVITIES/METHODOLOGY

This is the final year of project 7-352 and activities will focus on data analysis, report writing, and the drafting of herd specific management plans. The road-based surveys were completed in 2010/11 and will not be continued in 2011/12 with HCTF funding. The data collected will be examined for trends in late winter calf recruitment between years and to calculate a finite rate of population increase ( $\lambda$ ) with the survival data from the collared adult females (Hatter & Bergerud 1991).

Spatial and vegetation analysis will be conducted by PhD candidate Sonja Leverkus under the direction of Dr. Sam Fuhlendorf (a leader in the field of pyric-herbivory) at Oklahoma State University and with the assistance of Conrad Thiessen. Spatial locations from GPS collars will be examined on individual and herd levels. For herd analyses we will combine all locations for the 5 collared individuals in each herd. We will classify location data into 4 periods: annual, peak rut (July 15 – September 15), extended rut (June 1 – October 31), and winter (November 1 – May 31) (Olexa & Gogan 2007). We will define the study area by mapping the GPS locations from the 5 bison in each herd over 1.5 years and creating boundary based on a minimum convex polygon (MCP) from those points. Seasonal ranges will be calculated for peak rut, extended rut, and winter using MCPs and kernel home range estimators (Boulanger et al. 2000).

We will examine habitat use of bison using resource selection functions (RSF) for each of the identified temporal periods using generalized linear models (Boyce et al. 2002). Vegetative and topographical covariates in resource selection model sets for bison will be 25-m resolution raster Geographic Information System (GIS) data. We will use a digital elevation model (DEM) from the 1:20,000 British Columbia Terrain and Resource Inventory Management program (British Columbia Ministry of Crown Lands, 1990) to create slope and aspect layers. We will not assign an aspect to pixels with slope  $\leq 1^\circ$ . We will calculate aspect as 2 continuous variables (i.e., northness and eastness; Roberts 1986) to minimize issues of perfect separation



between used and available data sets. We will investigate the influence of other habitat variables (burned vs. unburned, distance to oil & gas facilities (Etthithun herd), deciduous vs. coniferous vs. open canopy covers) on habitat use. Where the Alaska Highway crosses through the Nordquist range we will map the highway surface and highway right of way using the most current ortho-photographs to ensure accurate representation of the highway and its surroundings. All other roads will be polylines rasterized and buffered by 10 meters to address locational error. We will create a distance to linear features layer using the most current Oil and Gas Commission layers and historic linear features stored in the provincial layer library (LRDW). We will base the distance-to-linear features surface (25 meter pixel size) for the study area on the perpendicular distance from each pixel to the edge of the closest linear feature (Gustine et al. 2006).

For the Nordquist herd 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 BC Wildfire Management Branch, BC Range Program, Oklahoma State, Liard River Adventures and Northern Interior Forest Region provided the majority of the labour for the construction of the exclosures. 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 1mx1m quadrats spaced out evenly throughout the exclosures and for the treatment 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.

We will convene small working groups composed of MoE wildlife biologist, BC's representative on the federal Wood bison recovery team (Helen Schwantje), 2 people from each of the First Nations with traditional territories in the two bison herd ranges (Nordquist: Ft Nelson FN and Kaska Daylu Council, Etthithun: Doig River FN) to draft herd specific management plans. The draft plans will be sent to stakeholders (federal highways, resident hunter groups, guide/outfitters, local businesses) to review and then we would re-convene the Bison and Roads working group (composed of provincial, territorial, and federal government reps, First Nations reps, ICBC, hunting organisations) to review and edit the plans. Once that review process is complete the plans would be presented to each of the three First Nations in a session open to all community members for final review and approval. Funds will be used to cover facility costs for the event and travel costs that may be incurred by participants.

The current Peace Region prescribed burning project (HCTF project 712) will continue to focus prescribed burning in areas away from the Alaska highway to draw bison into suitable habitat in low conflict areas for the Nordquist herd. The PWGSC will use machinery to plow travel routes for bison through deep snow parallel to the Alaska Highway in the Nordquist herd territory during winter months.

Project Objective	Activities/Methods	Timeline
1. Habitat use and seasonal movements	Use data from 1.5 years of GPS collar data to create seasonal range maps and analyze habitat selection for each herd.	GPS data analysis completed by November 2011
2. Reduce conflict	Identify suitable options to prevent bison movement using local knowledge and bison movement patterns (may include fencing and cattle guards);	Locations to be ranked spring/summer 2011
3. Improve public safety, reduce bison mortality	Conduct prescribed burns for Liard herd away from highway; continue to educate public on wildlife-vehicle collisions	Prescribed burning spring 2011; community meetings with First Nations fall 2011
4. Increase community	Create working groups to create herd specific management plans	Management plans to be completed by end of 11/12



involvement		
5. Develop management plans	Conduct 1 workshop in Ft Nelson, Doig, and Lower Post review draft and approve draft management plans	Fall 2011

## 5. BENEFITS/RISK

This project will encourage community involvement and interest. Community support is expected to lead to more collaborative effort among MoE, First Nations communities, and the oil and gas industry. Effective Wood bison management in the Peace is contingent on local support for the project. Future management goals include hunting opportunities for First Nations. The increased visibility of the bison, a larger bison-free stretch of road, and fewer bison on the roadways and right-of-ways would all contribute to safer roads. Effective management of this population will contribute to the success of the Canadian Wood Bison Recovery Program. This project will also provide additional information on the effectiveness of the MoE Prescribed burn program (HCTF 7-12) in conjunction with Kathy Parker's project looking at prescribed fire and ungulate response in the Besa-Prophet area (HCTF 7-354). These three projects in combination will produce the best science to date on prescribed burning in north east BC.

## 6. EVALUATION/MEASURES OF SUCCESS

This is a multi-year project that will be evaluated annually. The evaluation and measures of success for each of the objectives for 2011-2012 are outlined below:

**1)** Investigation of Wood bison habitat use and seasonal movements will be successful if:

- a) road-based counts are carried out on a monthly basis throughout the 2010/11 fiscal and data are summarized in a report prior to February 2011 for location, composition, and number of animals; b) all data that becomes available from recovered collars is analysed for seasonal movements, habitat use, and use of burned areas.

**2)** Reduction of conflict between Wood bison and people/agriculture is an ongoing objective, but for the 2011/12 fiscal will be successful if:

- a) optimal locations for fences to act as movement barriers are identified from the road-based observations, b) the effectiveness of mitigation measures (such as snow plowing in the highway right of ways) can be evaluated using the road-based observations.

**3)** Improved public safety and reduction of bison mortality will be successful if:

- a) 50% fewer bison-vehicle collisions occur (currently there are approximately 10 collisions per year); b) 50% fewer bison are killed in motor vehicle collisions (currently there are 8 bison killed per year).

**4)** Increased community and First Nation involvement in Wood bison management will be successful if:

- a) members of local First Nation communities are employed to collect road-based count data; b) herd specific management plans are developed with First Nations and stakeholders; c) partnerships are created with industry in Wood bison areas.

## 7. COMMUNICATION/OUTREACH

Community meetings with extension and education about bison and their management in BC will be held in each of the Doig River First Nation (close to the Etthithun herd) and in Fort Nelson First Nation and Kaska Dena (close to the Nordquist herd). These meetings are intended to discuss the project and develop management plans with First Nations and stakeholders. A technical report will be produced and made available on the Ministry of Environment website outlining the results of the project and contributions to Wood bison management, providing information for managers involved in Wood bison recovery elsewhere in Canada. This project also presents opportunities to collaborate with wildlife managers in other provinces, namely Alberta and the North West Territories, where Wood bison recovery efforts are also a priority. In all cases HCTF will be recognized for making this project possible. HCTF will be acknowledged in any presentations of information and results collected with HCTF funds.

## 8. LITERATURE CITED



1) Boyce, M.S., Vernier, P.R., Nielsen, S.E., Schmiegelow, F.A. 2002. Evaluating resource selection functions. *Ecological Modelling* 157: 281-300. 2) Bruggeman, J.E., Garrott, R.A., White, P.J., Watson, F.G.R., Wallen, R. 2007. Covariates affecting spatial variability in bison travel behaviour in Yellowstone National Park. *Ecological Applications* 17: 1411-1423; 3) Harper, W.L., Elliott, J.P., Hatter, I., and Schwatje, H. 2000. Management Plan for Wood Bison in British Columbia. Ministry of Environment, Lands and Parks; 4) Harper, W.L., and Gates, C.C. 2000. Recovery of Wood Bison in British Columbia. Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk. Ministry of Environment, Lands and Parks. 2: 915-924; 5) Gates, C.C., Stephenson, R.O., Reynolds, H.W., van Zyll de Jong, C.G., Schwantje, J., Hoefs, M., Nisihi, J., Cool, J., Chisholm, J.A., Koonz, B. 2001. National Recovery Plan for the Wood Bison (*Bison bison athabasca*). National Recovery Plan No.21. Recovery of Nationally Endangered Wildlife (RENEW). Ottawa, Ontario. 50 pp.; 6) Gustine, D., Parker, K.L., Lay, R.J., Gillingham, M.P., Heard, D.C. 2006. *Journal of Wildlife Management* 70:1601-1614. 7) Hatter, I. W., Bergerud, W.A. 1991. Moose recruitment, adult mortality and rate of change. *Alces* 27:65-73. 8) Olexa, E.M., Gogan, P.J.P. 2007. Spatial population structure of Yellowstone bison. *Journal of Wildlife Management* 71:1531-1538. 9) Rowe, M.R. 2007. 2007 Nordquist Wood Bison Inventory. Peace Regional Technical Report. Ministry of Environment; 10) Rowe, M., and Backmeyer, R. 2006. Etthithun Wood Bison Inventory. British Columbia Ministry of Environment. Fort St. John, BC; 11) Thiessen, C. 2009. Peace wood bison project: Annual report 2008/09. Ministry of Environment. Fort St. John, BC.

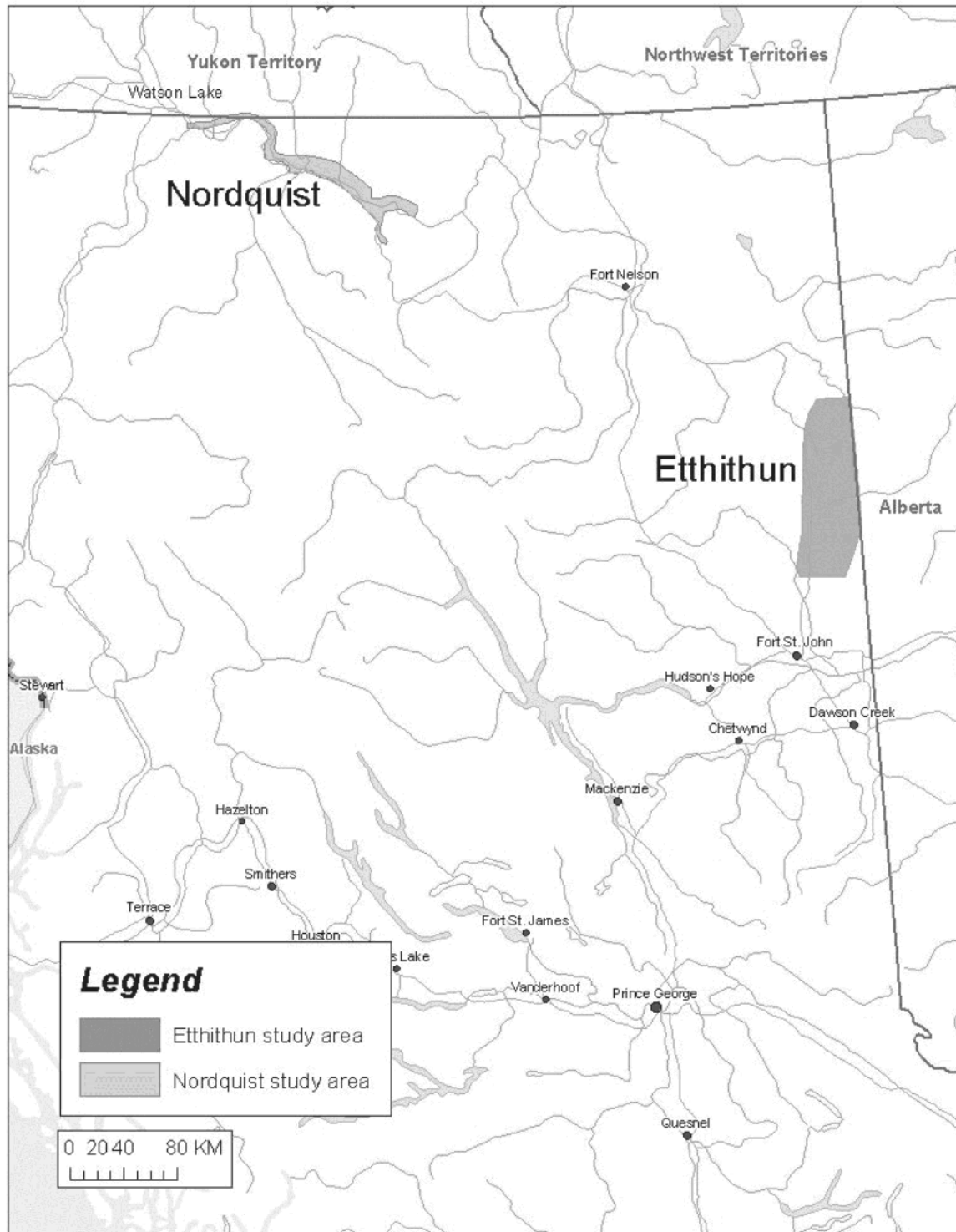
## 9. MAP





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## Enhancement Project Application Funding Cycle 2011-2012





**10. BUDGET**  
**SECTION 1: HCTF FUNDING ONLY**

A. Labour Costs			
i. Human Resources: Wages & Salaries			
Position	Person Days	Rate / Day	Total HCTF Amount
ii. Subcontractors / Consultants			
Contractor & Proposed Services			
Data analysis (PhD candidate S. Leverkus)	30	200	6,000.00
Report writing (PhD candidate S. Leverkus)	10	200	2,000.00
Management plan drafting (First Nations community members: Kaska Dena, Doig, Ft Nelson)	12	400	4,800.00
A. Sub-total Labour Costs			12,800.00
B. Site / Project Costs <sup>1</sup>		Details	
Travel <sup>2</sup>		MoE staff and First Nations community members travel for workshops (mileage at \$0.45/km, per diems of \$45/day)	3,750.00
Rentals (equipment, vehicle, helicopter)		3 workshops (Lower Post, Ft Nelson, Doig River)	7,450.00
B. Sub-total Site / Project Costs			11,200.00
C. Overhead / Administration		Details	
Office space, utilities (incl. telephone), etc.			
Office supplies			
Printing / photocopying	Management plan printing		1000.00
Administration fee			
Sub-contractor administration fee (if not included in Sub-section A - Labour)			
Other overhead costs:			
C. Sub-total Overhead / Admin Costs			1,000.00

**SECTION 2: BUDGET SUMMARY FOR ALL PROJECT SUPPORTERS**

<sup>1</sup> Will there be costs to maintain this investment? If yes, how do you propose to pay for them? Provide details in the text of the proposal (Section 5, Benefits & Risks).

<sup>2</sup> Refer to HCTF's website for travel expense guidelines.



	HCTF Amount	Other Funding		Total
	Requested (from Section 1)	In-kind Amounts	Cash	
A. Labour Costs	12,800	30,000		32,800
B. Project / Site Costs	11,200		2,000	13,200
C. Overhead Costs	1,000			1,000
<b>TOTALS</b>	<b>\$25,000</b>	<b>\$30,000</b>	<b>\$2,000</b>	<b>\$57,000</b>

### SECTION 3: ADMINISTRATION FEES

N/A

### SECTION 4: CAPITAL EXPENDITURES/EQUIPMENT PURCHASES, SITE SUPPLIES AND MATERIALS > \$1000

N/A

### SECTION 5: OTHER FUNDING PARTNERS

Other Funding Sources (Name of Organization/Agency/Funder)	In-Kind Amounts	Cash (Amount Requested)	Cash Confirmed (Yes/No)
Ministry of Environment	15,000	2,000	No
Ministry of Forests & Range	10,000		
Public Works & Govt Services Canada – Federal Highways	5,000		
<b>TOTALS</b>	<b>\$30,000</b>	<b>\$2,000</b>	<b>\$</b>

Are the unconfirmed partnerships (check one box only): ☐ Duplicate / replacement of HCTF funding OR ☒ Supplementary to HCTF funding?

If the unconfirmed partnership funding is not available, will the project (check one box only):  
☒ proceed at a reduced level OR ☐ not proceed?

### SECTION 6: SUMMARY FOR MULTI-YEAR PROJECTS ONLY

Year of Project	Funding Cycle	HCTF \$ Requested	HCTF \$ Approved	Total Other Funding	Total \$
1	2009-2010	22,336	22,336	28,000	50,336
2	2010-2011	37,786	37,786	32,750	70,536
3	2011-2012	25,000		32,000	
<b>Totals</b>		<b>\$85,122</b>	<b>\$</b>	<b>\$92,750</b>	<b>\$177,872</b>



## **11. CONTINUING PROJECT SUMMARY**

The project is progressing as planned. We have included a PhD student, Sonja Leverkus, in the research program which will provide an enormous benefit to the project, and result in a far superior end product.

Ground-based population monitoring of both herds was conducted by First Nations community members from the Kaska Dena, Fort Nelson First Nation, and Doig River First Nation in the first and second years of the project. Pre-determined transects were driven on established roads and highways through the known bison ranges and information on the number of animals, sex, and age were collected. The ten GPS (global positioning system) collars on female bison; five on the Etthithun herd and five on the Nordquist herd are still on live animals and functioning as planned. The collars were fitted with reflective plating to make them more visible to motorists at night to increase human safety and reduce bison mortality. An additional 4 collars (2 per herd) will be deployed November 2010 with HCTF funds. Although it is true that the sample size is very small in relation to other studies, it can also be shown that often times, one collared cow represents more than just one animal. Observations have been made that up to 50 – 80 animals surround the cows with the collars on them. This is also a reason why the First Nation monitoring program is important. Not only are First Nations being involved in the management of these herds, they are also imperative to collecting such data as how many animals one collar actually represents. Furthermore, there was funding to purchase 4 new GPS pods from Telemetry Solutions (originally earmarked for new batteries for existing collars, but this funding was secured from other sources freeing up the funds to purchase 4 new collars) which will increase the sample size to 7 per herd. The addition of the 4 GPS pods will increase the sample size to 14, a concern that was mentioned in the past technical committee review that we have worked towards resolving.

In 2009/10 ground based surveys were conducted. During the six monitoring surveys of the Nordquist herd the maximum number of bison observed was 108 during the February 2010 trip. During the late winter survey 11.3% of the population was calves which was more than double the 4.5% in March 2009. The Etthithun herd was surveyed by road six times and the maximum number of bison observed was 138 during the September 2009 survey. Sample sizes were too small during late winter to determine demographic parameters and calf recruitment. During the course of the year 3 bison were known to have died from the Etthithun herd (1 motor vehicle collision, 1 harvested by permit by Doig River First Nation, and 1 euthanized after becoming trapped in a gas plant facility). At least two bison were known to have died due to motor vehicle collisions from the Nordquist herd, however anecdotal reports suggest closer to 10 animals likely died along the highway.

Snow plowing of the Alaska Highway right of way did not occur in winter 2009/10 as snow levels were considered to be low enough that it was not considered useful.

In early May 2010 we conducted prescribed burning (HCTF project #7-12) amounting to approximately 1000 hectares in the Nordquist Lake area where the original release of the Nordquist herd occurred. The cost of this light up and monitoring was >\$3,000. The burns reduced the amount of aspen forest and early seral shrub layers, providing additional open rangeland for the bison. Anecdotal reports showed the bison using these burned areas soon after the burn. The response of the bison to these burns and the 2009 Smith River wildfire will be captured through the data collected by the GPS collars and vegetation monitoring.

In 2009 and 2010, the 5 exclosures and the paired quadrats on the outside were sampled for species percent cover and abundance. Heights of tallest sprouting, resprouting and dead vegetation were recorded in every quadrat (1m x 1m square) as was percent soil exposed. Percent of grazing and resprouting were also captured. This occurred across all 78 quadrats (note, one of the exclosures has only 3 quadrats inside and 3





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quadrats outside due to the logistics of building this enclosure). The data from both years of sampling is being entered into a database that can be easily accessed for statistical analysis next year.

Well-site operators from the oil and gas company ConocoPhillips will be recording bison presence on their facilities during the fall and winter of 2010/11. This information will be used to help identify facilities that receive consistent and intensive use by bison. Mitigation plans, including options such as fencing, for those sites would then be developed to reduce conflict with the bison and industry.



# Habitat Conservation Trust Foundation

## Project Proposal Application Funding Cycle 2008-2009

HCTF to complete **Project File #**: \_\_\_\_\_

### PROPONENT INFORMATION

Contact/Project Leader: Conrad Thiessen

Organization Name: Ministry of Environment

Address: #400 10003-110 Ave

City: Fort St John

Province: British Columbia

Postal Code: V1J 6M7

Email Address: conrad.thiessen@gov.bc.ca

Phone: (250)787-3287

Cell: \_\_\_\_\_

Fax: (250)787-3490

**AMOUNT REQUESTED FROM HCTF FOR FUNDING CYCLE 2008-2009: \$** 67,700.00

Will this be a multi-year project? ☒ Yes ☐ No If yes, please complete Budget Section 6 pg 8

Have you ever received HCTF funding for this project/location/species before? ☐ Yes ☒ No  
If yes, please list the HCTF Project #: \_\_\_\_\_ and \_\_\_\_\_ year of \_\_\_\_\_ year (e.g. 2 of 5 years)

### PROJECT INFORMATION

Project Name: Wood Bison Conservation and Management in North-east British Columbia  
(Maximum 1 line. If previously funded by HCTF, please use the same project name)

Project Location: Omineca/Peace

Longitude/Latitude: 120° 15' / 57°30'

Project Type: PM PA

(Project Type codes can be found on <http://www.hctf.ca>)

Species to be enhanced (max. 4): M-BIBIW

(species codes can be found on the BC Species and Ecosystem Explore website <http://srmapps.gov.bc.ca/apps/eswp/search.do>)

Project Description (Describe what your project will accomplish. Maximum 3 lines):

The project will test the effectiveness of various management actions (snow plowing highway right-of-way, drift fencing, increasing public awareness, diversion feeding) on wood bison distribution and behaviour in an effort to reduce human/bison conflicts and aid recovery of wood bison.

### DETAILED PROJECT PROPOSAL OUTLINE



# Habitat Conservation Trust Foundation

## Project Proposal Application Funding Cycle 2008-2009

This **section (# 1 - 7) must not exceed 5 pages**. Proposals exceeding this length will not be considered. All proposal outlines must be typed with a minimum font size 11.

Please read the following instructions for each section carefully. After reading and understanding the instructions, please **remove them as you fill in each section of your proposal**.

### 1. EXECUTIVE SUMMARY (~500 words or less)

Wood bison (*Bison bison athabasca*) are currently listed by COSEWIC as Threatened due to risk of disease and hybridization with plains bison, and the population decline of some herds (Harper 2000). British Columbia's only two herds of wild, free-ranging wood bison are located in the Peace region, and appear to be stable or increasing in size (Ministry of Environment unpublished data). Previously extirpated from British Columbia, these populations were established in response to a recovery strategy implemented by the Canadian Wood Bison recovery program. One goal of this program was to increase each population size to a minimum of 400 individuals, which has yet to be achieved in the Peace (Harper 2000). The Ministry of Environment (MoE) is responsible for the effective management of these populations, which involves the reduction of conflict between wood bison and humans, and spatial separation of wood bison and domestic and plains bison. The recovery of these two populations of wood bison may present consumptive and non-consumptive opportunities in future management plans.

Domestic bison farms are common in the Peace, raising concern that wood bison from the Etthithun herd may expand their range southward onto agricultural land, risking contact with domestic bison. Conflicts also occur between wood bison and First Nations hunters in their traditional hunting areas, oil and gas traffic, and agricultural producers near the Etthithun herd. The Nordquist herd, located in the northern Peace region, appears to use the right-of-way along the Alaska Highway almost exclusively, creating safety concerns for people and bison.

The project would involve deploying GPS collars on bison from each population to analyse habitat use, seasonal movement patterns, and response to management actions. Continuous monitoring of the location of the Nordquist herd would be facilitated by the use of ARGOS satellite collars linked to a website to allow motorists to access information on the herds location. The herds would be monitored monthly throughout the year by First Nations technicians to gather information on herd movements, behaviour, and demographic composition. The collected data would facilitate the development of habitat management strategies to shift the Nordquist herd away from highway corridors. Methods to reduce the Etthithun herd's southward movements, such as a cattle guard and drift fencing, would also be explored. Local industry are being approached to act as partners in this aspect of the project.

The total project cost of \$78,700.00 (\$67,700.00 requested from HCTF and \$11,000.00 in-kind funding from MoE for year 1) would facilitate a project that, if successful, will increase the population sizes, reduce mortality caused by human activity, reduce the conflict between wood bison and agricultural producers/industry. Success would increase the probability of wood bison recovery thereby meeting provincial and federal objectives and possibly lead to harvesting and ecotourism opportunities.

### 2. ISSUE (~250 words or less)

Wood bison were extirpated from British Columbia in the early 1900s, and assumed to have been driven to extinction by 1940 due to hybridization with plains bison (Harper et al. 2000). After the discovery of a small herd in the early 1960s in the North West Territories, national recovery strategies were implemented in 1975 (Harper et al. 2000). By 1998, six discrete herds of wood bison had been re-established globally, all within Canada (Harper and Gates 2000). Although the two British Columbian herds appear to be stable at the population level, conflict with human activities and contact with domestic and plains bison continue to challenge current recovery strategies. Snow-pack, habituation to roadways (Rowe 2007), and the reduction



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## *Project Proposal Application Funding Cycle 2008-2009*

of historically favoured grassland due to fire suppression (Rowe 2007, Harper 2000) are suspected contributing factors that have been pushing the Nordquist herd onto transportation corridors. Subsequently, road mortality has contributed to the relatively slow increase in population size (Rowe 2007). Bison have been observed travelling hundreds of kilometres in a relatively short period of time (Harper 2000), suggesting the Etthithun herd could expand its range southward until barriers are established or alternative habitat is created. Successful recovery of these herds requires an understanding of habitat use, range, migration patterns, and behaviour of the wood bison. This proposed study will investigate these issues, and utilize the knowledge to mitigate conflict between wood bison and humans, domestic bison, and contact with plains bison.

### **3. PROJECT OBJECTIVES**

The main objective of this project is to ensure self-sustaining and increasing populations to contribute to Wood Bison recovery and ultimately allow herds to increase sufficiently to permit consumptive and increased non-consumptive use opportunities in the future. There are four goals for the first year of the project:

Goal: To increase knowledge of wood bison habitat use and seasonal movements by meeting the following objectives:

1. Deploying remote downloadable GPS collars on 5 Etthithun bison and ARGOS satellite-linked GPS collars on 5 Nordquist bison, and conducting preliminary habitat use analyses; and
2. Conducting road based composition counts and observations of wood bison herd movements.

Goal: To reduce conflict between wood bison and people/agriculture and plains bison by meeting the following objectives:

1. Installing trial barriers to bison movement and investigating their effectiveness;
2. Reducing the threat of disease and hybridization by creating spatial separation with domestic bison;
3. Exploring and comparing strategies that may reduce the risk of vehicle collisions with bison; and
4. Determining the characteristics of the favoured habitat to inform habitat management options away from areas with a high occurrence of conflict between bison and human activity.

Goal: To reduce mortality of bison from management actions or vehicle collisions by meeting the following objectives:

1. Reducing the bison's fidelity to highways as travel corridors (primarily a function of density of animals, traffic volume and traffic speed (Harper 2000)); and
2. Increasing the awareness of drivers travelling along the favoured corridors about the presence and activity of the bison.

Goal: To encourage community and First Nation involvement in wood bison management by meeting the following objectives:

1. Employing First Nations technicians to monitor the activity of each herd monthly; and
2. Collaborating with oil, gas, and forestry operations to manage habitat away from active centres.

### **4. ACTIVITIES/METHODOLOGY**

**Wood Bison Collaring:** Three female and two male mature wood bison from each herd will be captured by dart immobilization in spring of 2008 (Haigh and Gates 1995). A MoE biology technician experienced in capturing and collaring will conduct the captures, and the Provincial Wildlife Veterinarian will monitor their condition. The two herds will be located monthly and classified according to sex and age by First Nations monitors. The radio-collars will facilitate the continued monitoring of population size, habitat use, survival rates, and response to conflict mitigation strategies.

**Conflict Mitigation Strategies:** Fence posts and the cattle guard will be installed in summer of 2008 along the Fontas Road, which is used by the Etthithun herd. Installation of the two kilometres of fencing onto existing posts will be completed in the winter months after the bison have migrated north of the fence line. The



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effectiveness of the eastern and western ends of the drift fencing will be enhanced by the presence of wetlands that may present travel barriers to bison.

Vehicle-related mortality mitigation: Bison collars will be fitted with reflective plates to increase visibility of bison herds to on-coming vehicles travelling at night. Snow will be removed from the Alaska Highway right-of-way within the range of the Nordquist herd to encourage bison travel off the highway. The effectiveness of ploughing snow from the right-of-way will be explored through use-availability analyses of bison locations collected with the GPS collars. Bison are predicted to use these corridors, as their foraging abilities and movement is impeded by deep snow. Location data from the Nordquist herd would be linked to a web site to provide motorists with current locations of bison herds. To encourage the Nordquist herd to re-establish in the Smith River area where suitable bison habitat exists, the animals will be attracted to the area using high quality feed and/or salt during the winter months when food availability and quality is lower along the highway.

### **5. BENEFITS/RISK**

To reduce the risk of mortality and to mitigate stress associated with capture, an experienced biology technician would dart the wood bison from the ground with the support of an additional biologist and wildlife veterinarian. The reflective plates attached to collars may attract the attention of predators; therefore, collars will not be placed on the relatively vulnerable young bison. Because of the massive size of the bison, they will not be sensitive to the collective mass of the collar and reflective plates. As drugged bison in close proximity pose a threat to travellers, signs warning travellers to reduce their speed would be placed prior to the capture, and the bison would be closely monitored. The proposed fencing and cattle guard instalments in response to the migration patterns of the Etthithun herd are unlikely to impede or influence the movement of other ungulates in the area, as they have a lower fidelity to road corridors. To ensure other wildlife will not be impeded by the fence, narrow gaps with height restricting bars will be placed at intervals in the fencing (VerCauteren et al. 2007).

This project would encourage community involvement and interest. Community support could lead to a collaborative effort between the MoE, First Nations communities, and oil and gas industry for wood bison management, which may increase local support for the conservation of this species. Future hunting opportunities may be presented following bison mortality reduction, and the province of BC could benefit from profits generated through fees associated with hunting and ecotourism. Consultation with oil and gas industry is required before fences and cattle guards are installed on their roadways. The increased visibility of the bison, a larger bison-free stretch of road, and fewer bison on the roadways and right-of-ways would all contribute to safer roads. Furthermore, the ARGOS satellite-linked GPS collars may present the opportunity to establish a partnership with a pre-existing website to broadcast the location of individuals of the Nordquist herd. This information would increase the safety of travellers and emphasize the potential for ecotourism possibilities. Effective management of this population will contribute to the success of the Canadian Wood Bison recovery program.

### **6. EVALUATION/MEASURES OF SUCCESS**

The success of the project will be determined by the monthly contribution of data collected by the technicians that indicates the location and behaviour of the wood bison. By December 2008 a positive response to the proposed project would include the following: an increase in population size by about 20%, the observed upper limit of recruitment among wood bison herds (Rowe and Backmeyer 2006); positive response by wood bison to the applied management strategies; and an increased understanding of the favoured habitat and range of the wood bison; decrease in conflicts between the bison and agriculture and motorists. This



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## Project Proposal Application Funding Cycle 2008-2009

information would be vital to wood bison management plans in following years. The final technical report will summarize the effectiveness of the management strategies for future projects.

### 7. COMMUNICATION/OUTREACH

A community meeting will be held in both the Doig reserve (close to the Etthithun herd) and in Fort Nelson (close to the Nordquist herd). These meetings are intended to discuss the outcomes of the project with First Nations and stakeholders.

A technical report will be produced and made available on the Ministry of Environment website outlining the results of the project and contributions to wood bison management, providing information for managers involved in wood bison recovery elsewhere in Canada. This project also presents opportunities to collaborate with wildlife managers in other provinces, namely Alberta, where wood bison recovery efforts are also a priority. In all cases HCTF will be recognized for making this project possible. Signs recognizing the contributions from the HCTF will be placed on roadways where funding is being used to manage the herds and HCTF will be acknowledged in any presentations of information and result collected with HCTF funds.

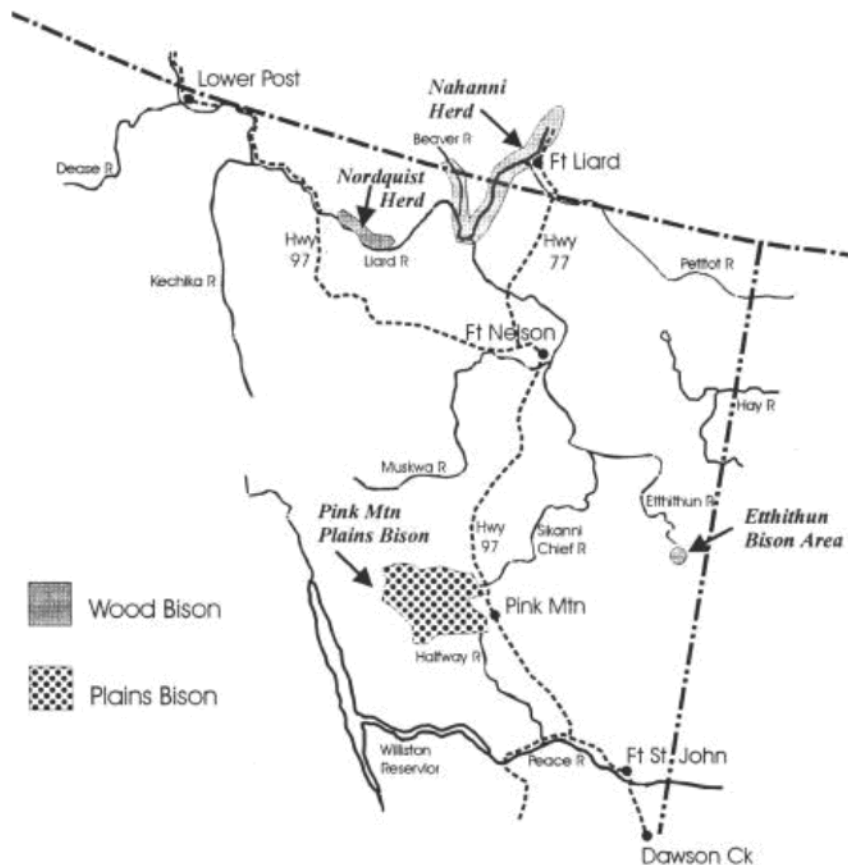


Figure 1. Distribution of free-roaming bison in British Columbia, including the Etthithun and Nordquist wood bison herds (Harper et al. 2000).

### 8. LITERATURE CITED

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Rowe, M.R. 2007. 2007 Nordquist Wood Bison Inventory. Peace Regional Technical Report. Ministry of Environment

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Vercauteren, K.C., Seward, N.W., Lavelle, M.J., Fischer, J.W., Phillips, G.E. 2007. A fence design for excluding elk without impeding other wildlife. Rangeland Ecology & Management 60: 529-532.



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### 9. BUDGET

#### SECTION 1: HCTF FUNDING ONLY

A. Labour Costs			
i. Human Resources: Wages & Salaries			
Position	Person Days	Rate / Day	Total HCTF Amount
Field monitors	24	\$400.00	\$9,600.00
ii. Subcontractors / Consultants			
Contractor & Proposed Services			
A. Sub-total Labour Costs			\$9,600.00
B. Site / Project Costs <sup>1</sup>		Details	
Travel	10,000 km *\$0.48/km		\$4,800.00
Capital Expenditures / Equipment Purchase <sup>2</sup>	10 GPS collars		\$40,000.00
Site Supplies & Materials <sup>3, 4</sup>	Cattle guard, Fencing, Feed		\$9,300.00
Rentals (equipment, vehicle, helicopter)			
Work & Safety Supplies			
Repairs & Maintenance	Fence Repairs		\$1,000.00
Other Site Costs:	2 Community Meetings		\$3,000.00
B. Sub-total Site / Project Costs			\$58,100.00
C. Overhead / Administration <sup>5</sup>		Details	
Office space, utilities (incl. telephone), etc.			
Office supplies			
Printing / photocopying			
Administration fee			
Other overhead costs:			
C. Sub-total Overhead / Admin Costs			

#### SECTION 2: BUDGET SUMMARY FOR ALL PROJECT SUPPORTERS

- <sup>1</sup> Will there be costs to maintain this investment? If yes, how do you propose to pay for them? Provide details in the text of the proposal.
- <sup>2</sup> Any equipment purchased with HCTF funds becomes the property of the Trust Fund. **Administration fees cannot be charged on equipment / capital purchases**
- <sup>3</sup> Any equipment purchases and equipment rentals, vehicle rentals, materials and supplies, and miscellaneous expenses greater than \$1000 **MUST BE ITEMIZED IN THE TEXT OF THE PROPOSAL.**
- <sup>4</sup> Signs – if a Trust Fund sign is to be placed at the project site, include the cost of the sign in the budget details.
- <sup>5</sup> Administration fees – a maximum of 5% for government proposals and the appropriate rate for a non-profit general contractor may be applied to applicable proposals. All other proposals must show detailed overhead expenses.



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This section should summarize the total budget for the project from all sources for the year, reconcile to Budget Section 1 for HCTF Amount Requested; and reconcile to Budget Section 5 for other funding

	HCTF Amount	Other Funding		Total
	Requested (from Section 1)	In-kind Amounts	Cash	
A. Labour Costs	\$9,600.00	\$6,000.00		\$15,600.00
B. Project / Site Costs	\$58,100.00	\$5,000.00		\$63,100.00
C. Overhead Costs				
<b>TOTALS</b>	\$67,700.00	\$11,000.00	\$	\$78,700.00

### SECTION 3: ADMINISTRATION FEES

This section should include an explanation of how the amount was calculated.

### SECTION 4: CAPITAL AND MATERIALS > \$1000

This section should list any anticipated capital and materials costs.

5 GPS collars \* \$3,000.00/collar + 5 ARGOS satellite-linked GPS collars \* \$5,000.00 = \$40,000.00

1 cattle guard = \$2,800.00

Approximately 2 kms of high tensile 6-foot-high drift fencing = \$7,500.00

### SECTION 5: OTHER FUNDING PARTNERS

Other Funding Sources (Name of Organization/Agency/Funder)	In-Kind Amounts	Cash (Amount Requested)*	Cash Confirmed* (Yes/No)
ConocoPhillips		\$40,000.00	No
ICBC		\$10,000.00	No
<b>TOTALS</b>	\$	\$50,000.00	\$

Are the unconfirmed partnerships (check one box only): ☒ Duplicate / replacement of HCTF funding OR ☐ Supplementary to HCTF funding?

If the unconfirmed partnership funding is not available, will the project (check one box only): ☒ proceed at a reduced level OR ☐ not proceed?

### SECTION 6: SUMMARY FOR MULTI-YEAR PROJECTS ONLY

Please note multi-year projects are not guaranteed funding each year. Projects must submit a proposal each year.

Year of Project	Funding Cycle (e.g. 2006-2007)	HCTF \$ Requested	HCTF \$ Approved	Total Other Funding	Total \$
1	2008-2009	\$67,700.00			
2	2009-2010	\$31,200.00			\$31,200.00
3					
4					
5					
<b>Totals</b>		\$98,900.00	\$	\$	\$31,200.00