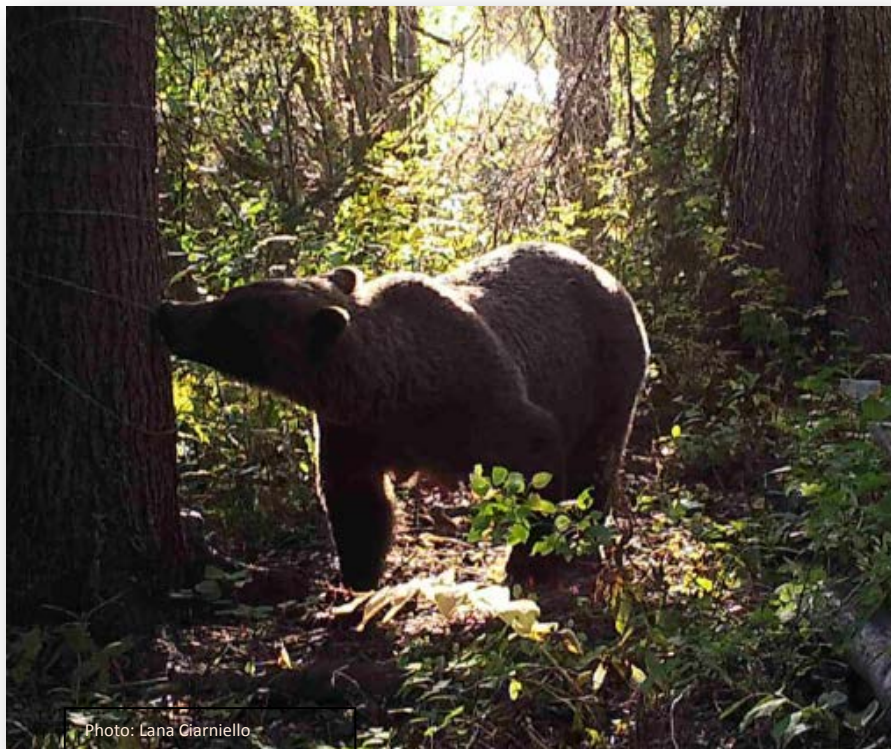


WILDLIFE HABITAT AREA SUMMARY

**For Two Proposed Grizzly Bear (*Ursus arctos*) WHAs in the Stuart
Nechako Natural Resource District (WHAs 7-001 and 7-002)**



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1.0 Introduction

These two Wildlife Habitat Area (WHA) proposals are recommended for decision under the *Forest and Range Practices Act (FRPA)* and the *Oil and Gas Activities Act (OGAA)*. WHAs are spatial habitat designations that have corresponding General Wildlife Measures (GWMs) or Objectives that provide legal management direction. GWMs may specify different forest activities such as no harvest, specific road or silviculture management, or specific timing on certain forest activities. GWMs may apply to identified critical core habitat, as well as an adjacent management zone.

The Wildlife Habitat Area designation tool does not address overall species needs or management, but is instead a “fine-filter” tool for managing species at risk that are affected by forest and range practices, particularly in a more localised area where certain high value habitats exist.

The development of WHAs 7-001 and 7-002 are consistent with existing policies and directives for the establishment of WHAs. They also are consistent with direction provided within the Fort St. James Land and Resource Management Plan (LRMP)¹, and the provincial Identified Wildlife Management Strategy (IWMS) for Grizzly Bear². Additionally, the areas encompassed by these proposed WHAs are identified within Tl'azt'en Nation's Land Use Plan developed in 2015³, and specific management measures were developed to reflect the land use goals identified within that Plan.

2.0 Background

“Tl'o Ba” is a Tl'azt'en word meaning ‘meadow over there.’ The proposed WHA 7-001 is characterised by a large and unique grassland habitat type adjacent to the Kuzkwa (K'uzkoh⁴) River and downstream from Tezzeron Lake. The grassland was identified in the late 1990's as a sensitive area during the development of the Fort St. James LRMP. A number of further site investigations revealed evidence of significant Grizzly Bear use, characterised by mark trees, trails, beds and evidence of foraging on a variety of foods, including salmon. Mowat and Fear (2004) documented Grizzly Bear use of the Tl'o Ba area through mark recapture DNA analysis. The K'uzkoh River supports a salmon run that the Tl'azt'en Nation know to be utilized by Grizzly Bears. In 2014, Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) Landbase Stewardship staff partnered with the Tl'azt'en Nation, the Society for Ecosystem Restoration in Northcentral BC (SERNBC) and Conifex Timber Inc. to undertake the development of a detailed species account, Grizzly Bear Habitat Suitability Ratings, and ecosystem restoration recommendations for the core habitat surrounding the Tl'o Ba grassland.

¹ Province of British Columbia. 1999. Fort St. James Land and Resource Management Plan.
www.for.gov.bc.ca/tasb/slrp/plan33.html

² Gyug L., T. Hamilton and M Austin. 2004. *Grizzly Bear*. Accounts and Measures for Managing Identified Wildlife – Accounts V. http://www.env.gov.bc.ca/wld/frpa/iwms/documents/Mammals/m_grizzlybear.pdf

³ Tl'azt'en Natural Resource Department. 2015. *Tl'azt'en Nation Land Use Plan. Neyun Huwuts'inli – Taking Care of our Land*. Report prepared by Renel Mitchell for Tl'azt'en Nation. 27 pp.

⁴ K'uzkoh is the traditional Tl'azt'en name for the Kuzkwa River and will be used within this document.

Terrestrial Ecosystem Mapping (TEM) was completed for the proposed WHA⁵, which at that time, included approximately 800 hectares in and around the grassland habitat. The resulting TEM product, field work, and an extensive literature review were used to develop a site-specific Grizzly Bear species account as well as an assessment of Grizzly Bear habitat suitability for the proposed Tl'ó ba WHA. The work was consistent with the provincial standard as outlined in the steps for establishing a WHA⁶. The following products were produced:

- TEM mapping at 1:15,000 - a detailed stratification of the area into map units used to spatially identify the quality and quantity of bear habitat.
- Grizzly Bear species account - specific to BC interior bears and focused on local Grizzly Bear ecology and a regional perspective.
- Grizzly Bear habitat suitability ratings for 4 seasons: spring, summer, fall and denning to allow for the identification of critical Grizzly Bear habitat (i.e., feeding, security, thermal, connectivity, and denning habitat based on the TEM and species account).
- Recommendations for management, including ecological restoration measures where applicable.

Based on this work, and as a result of the development and approval of a Tl'azt'en Land Use Plan recognising and emphasizing the value of the Tl'ó Ba grassland and associated riverine habitat, the proposed WHA area was expanded to include the entire length of the K'uzkoh River, from the outlet at Tezzeron Lake to its confluence with the Tachie River.

Proposed WHA 7-002 consists of three areas of rare, rugged limestone ridgeline, which is predicted to provide high capability denning habitat⁷. The limestone in this area supports numerous small cave features, as well as larger diameter Douglas-fir (*Pseudotsuga menziesii*) forest. These habitats are characterised by drier ecosystems that can provide early spring and late fall Grizzly Bear forage opportunities in the form of kinnikinnick (*Arctostaphylos uva-ursi*), as well as ant forage potential. The juxtaposition of WHAs 7-001 and 7-002 provides critical Grizzly Bear habitat that can meet life requisites for foraging, security and denning, that is rare throughout the rest of the Nation Grizzly Bear Population Unit.

3.0 Conservation Status / Priority

- **Provincial / Federal Conservation Status:** BC list: Blue-listed/ COSEWIC ranking: Special Concern (2002)
- **BC Conservation Framework Highest Score / Goal:** Priority 2 for Goal 2: Prevent species and ecosystems from becoming at risk
- **Grizzly Bear Population Unit (GBPU) Status:** Nation GBPU, Viable⁸
- **Estimated Population Density:** 10 grizzly bears/1,000 km².⁹
- **DNA Mark-Recapture Population Estimation:** 5.7 grizzly bears/1000 km² (95% CI 5.0-7.1)¹⁰

⁵ Ciarniello, L. M. and A. de Groot. 2014. *Decision-making support for the proposed Tl'ó ba Wildlife Habitat Area*. Final report prepared for the Ministry of Forest, Lands and Natural Resource Operations, Fort St. James, British Columbia. 90 pp.

⁶ B.C. Ministry of Water, Land and Air Protection. 2004. *Procedures for Managing Identified Wildlife – V*. 2004. B.C. Ministry of Water, Land and Air Protection, Victoria, B.C. Available at: <http://www.env.gov.bc.ca/wld/frpa/iwms/procedures.html>

⁷ Hodder, D.P., C.J. Johnson, R.V. Rea and A. Zedrosser. 2014. *Application of a species distribution model to identify and manage bear den habitat in central British Columbia, Canada*. *Wildlife Biology* 20: 238-245.

⁸ B.C. Ministry of Forests, Lands and Natural Resource Operations. 2012. *British Columbia Grizzly Bear Population Estimate for 2012*. Available at: http://www.env.gov.bc.ca/fw/wildlife/docs/Grizzly_Bear_Pop_Est_Report_Final_2012.pdf

⁹ B.C. Ministry of Forests, Lands and Natural Resource Operations. 2012. *British Columbia Grizzly Bear Population Estimate for 2012*. Available at: http://www.env.gov.bc.ca/fw/wildlife/docs/Grizzly_Bear_Pop_Est_Report_Final_2012.pdf

FLNRORD Landbase Stewardship staff within the Omineca Region have periodically reassessed and updated regional rankings of habitat designations under *FRPA*, including additional assessments of local risks, government commitments, consideration of regional capacity and expertise, as well as acknowledgment of prior investment in the WHA development and the strong First Nation priority. As a result of this exercise, the Tl'ó Ba Grizzly Bear WHA 7-001 was identified as a #1 regional priority for WHA establishment. 7-002 was identified at the same time to complete the full provision of suitable life requisites for Grizzly Bear within this landscape. There are no other existing habitat designations for Grizzly Bears within the Omineca Region.

4.0 Expected Conservation Achievements /Outcome

The Identified Wildlife Management Strategy¹¹ (IWMS) goals for establishing a WHA for grizzly bears are to:

- Protect known areas of concentrated seasonal use by Grizzly Bears
- Maintain the ecological integrity of important seasonal habitats
- Ensure the security of the bears using these habitats.

Tl'ó Ba WHA 7-001 provides critical habitat in the form of grassland, riparian wetlands, natural gaps in mature and deciduous forests, thermal cover, access to spawning salmon, Douglas-fir stands for denning habitat, and landscape connectivity along a river system. WHA 7-002, in close proximity, additionally provides critical denning habitat as well as access to late fall/early spring forage.

Both WHAs are intended to maintain and protect the ecological integrity of these important habitats. Within WHA 7-001, the core area of grassland and surrounding habitat, as well as a 250 metre reserve on either side of the entire length of the K'uzkoh River, is proposed for reserve from any new harvesting or road construction. Within the management zone of 7-001, new forest harvesting is intended to maintain suitable grizzly bear forage, security and denning values throughout the harvest rotation. Alternative silviculture stocking standards, specific access management which includes replanting of roads, visual screening of existing permanent roads, management of Douglas-fir denning habitat potential and improved riparian treatment of small tributary streams will maintain the ecological integrity of these habitats.

As it is understood that a road density greater than 0.6 km/km² is a recognized threshold of concern for grizzly bear populations in British Columbia^{12,13}, treatment of new roads such that they are deactivated and replanted will be important to ensure the security of bears using these habitats. A timing window for operations is intended to ensure security for bears during the critical season of use.

¹⁰ Mowat, G. and D. Fear. 2004. *Grizzly bear density in the Nation River area of British Columbia*. B.C. Ministry of Water, Land and Air Protection. Prince George, BC. 13 pp.

¹¹ B.C. Ministry of Water, Land and Air Protection. 2004. *Procedures for Managing Identified Wildlife – V*. 2004. B.C. Ministry of Water, Land and Air Protection, Victoria, B.C. Available at: <http://www.env.gov.bc.ca/wld/frpa/iwms/procedures.html>

¹² Boulanger, J. and G.B. Stenhouse. 2014. *The Impact of Roads on the Demography of Grizzly Bears in Alberta*. PLoS ONE 9(12):e115535. doi:10.1371/journal.pone.0115535.

¹³ Auditor General of British Columbia. 2017. *An Independent Audit of Grizzly Bear Management*. http://www.bcauditor.com/sites/default/files/publications/reports/FINAL_Grizzly_Bear_Management.pdf

WHA 7-002 is specifically identified to protect and maintain the security of Grizzly Bears during their most vulnerable denning period. Bear dens will be identified and protected; timing of operations in this area will be restricted to the window of least risk, during summer months. Management of access, as well as Douglas-fir habitat for denning potential is also proposed.

To date, no WHAs or other specific legal habitat protection measures for Grizzly Bears have been established within the Omineca Region. The proposed Tl'o Ba WHAs collectively encompass approximately 70 km²; given that the average daily movement rates for female grizzly bears is approximately 10km², this area could support up to 5 or 6 females at any given time if adequate forage availability exists¹⁴.

5.0 Description of WHA Proposals

Both WHAs occur within the SBSdw3 biogeoclimatic zone. Mature forests consist of a mixture of lodgepole pine (*Pinus contorta*), white spruce (*Picea glauca*) and Douglas-fir. Harvesting has occurred within the 7-001 management zone, in response to the recent mountain pine beetle outbreak. WHA 7-002 has undergone little harvesting, due in part to inoperable ground and leading Douglas-fir stand types.

WHA 7-001 encompasses the entire length of the K'uzkoh River from the outlet of Tezzeron Lake to its confluence with the Tachie River, within the Fort St. James portion of the Stuart Nechako Natural Resource District. The K'uzkoh River is recognised by the Tl'azt'en people as an area of important habitat for Grizzly Bears. This area provides seasonally important foraging habitat in the form of a significant grassland habitat type, salmon (both sockeye (*Oncorhynchus nerka*) and small numbers of chinook (*O. tshawytscha*)), kokanee (*Hemerobius kokaneeanus*), natural forest openings with preferred Grizzly Bear food, riparian meadow/wetland complexes, young cutblocks, and drier habitats in association with Douglas-fir stands. The large meadow/grassland complex adjacent to the river is unique and provides critical core spring and summer forage habitat. This grassland was recognized for its unique values during development of the Fort St. James LRMP. Such ecosystems are rare not only within the Stuart Nechako Natural Resource District but the Omineca Region as well. Numerous site features such as grizzly bear mark trees, trails, well-used wildlife trails, bedding and den sites have been identified during fieldwork, and indicate critical habitat values. A portion of this grassland lies within IR 22, and is excluded from the WHA proposal.

WHA 7-002 crosses the K'uzkoh River, roughly perpendicular, and is characterised by rare and significant limestone ridges. 7-002 provides significant denning capability in close proximity to 7-001, both in the form of small natural cave openings, steep northeast-facing slopes and large diameter Douglas-fir. Habitats associated with this denning zone are very dry and can supply a source of ants, as well as important late fall and early spring kinninnick feeding opportunities. WHA 7-002 is co-located with two existing mule deer Ungulate Winter Range Units (U-7-002 Units 12 and 14).

Table 1 summarises the area included within each proposed WHA. Much of the core area within 7-001 is unharvested, although the Leo FSR and Leo-Tarnezell FSR do cross a portion of this core. Most harvest has occurred in the 7-001 management zone; mainly in response to the recent mountain pine beetle outbreak. Appendix 1 includes maps and photos of the proposed WHAs.

¹⁴ Shelley Marshall, Sr. Wildlife Biologist, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Omineca Region. Personal communication.

Table 1. Summary of hectares for each WHA proposed including an approximation of the area currently disturbed and undisturbed.

Area (hectares)	WHA 7-001 core	WHA 7-001 management zone	WHA 7-002
Total area	2,065.5	4,274.5	664.8
	6,340 (Total)		
Total harvested area	338.8	1,843.6	63.5
Undisturbed area (Does not include cleared RoWs or gravel pits)	1,708.9	2,248.2	576.6
Road lengths (km)	8.4	80.2	0.98

6.0 General Wildlife Measures

The proposed General Wildlife Measures (GWMs) were developed to be consistent with IWMS goals and were based on extensive site investigations, Terrestrial Ecosystem Mapping work¹⁵ and a camera use study¹⁶. Tl'azt'en Nation's Land Use Plan¹⁷, best management practices,^{18, 19} Tree and Stand Simulator (TASS) modelling, and professional advice from a number of forest management and wildlife subject matter experts all contributed to the development of the associated GWMs.

Each proposed GAR Order includes a number of GWMs, as well as one Objective. While GWMs are a practice requirement that must be met when undertaking a primary forest activity, the Objective is included to recognize uncertainty in the operational identification of suitably spatially-arranged Douglas-fir trees. In this case, a result or strategy would need to be identified within the forest licensee's Forest Stewardship Plan to address this proposed Objective. Non-legal information is included in Appendices within each Order, which provides additional background with respect to applying for an Order exemption, as well as background intent and guidance specific to each GWM.

¹⁵ Ciarniello, L.M. and A. de Groot. 2014. *Decision-making support for management of the proposed Tl'o ba Wildlife Habitat Area*. Report prepared for Min. of Forests, Lands and Natural Resource Operations and Society for Ecosystem Restoration in North Central British Columbia. 63pp.

¹⁶ Ciarniello, L.M. and C. Morrison. 2016. *Tl'azt'en Grizzly Bear Monitoring Project on Kazchek Creek and Kuzkwa River*. Report prepared for Min. of Forests, Lands and Natural Resource Operations and Tl'azt'en Nation. 51pp.

¹⁷ Tl'azt'en Natural Resource Department. 2015. *Tl'azt'en Nation Land Use Plan. Neyun Huwuts'inli – Taking Care of our Land*. Report prepared by Renel Mitchell for Tl'azt'en Nation. 27 pp.

¹⁸ Manning, Cooper and Associates. 2002. *Silviculture guidelines and practices for maintaining or recruiting key habitat objectives*. Report prep. for Min. Water, Land and Air Protection, Biodiversity Br., Victoria, BC. Draft June 2002. 107 pp

¹⁹ Beaudry, L., M. Martin and J. Paczkowski. 2001. *Using silviculture to maintain and enhance Grizzly Bear habitat in six variants of the Prince George Forest Region*. BC Min. Environ., Lands and Parks, Habitat Br., Victoria, BC. 58 pp.

The proposed Wildlife Measures for each WHA are as follows:

WHA 7-001 Draft GAR Order:

Definitions:

Anting habitat: consists of a mix of coarse woody debris and/or stumps (excluding Douglas-fir) with a constant minimum diameter of 22.5 centimeters and a coarse woody debris length or stump height of 50.0 centimeters.

Clump: consists of a minimum of 4 Douglas-fir greater than 22.5 centimeters at diameter breast height (dbh) where the spacing between individual trees is not more than 10 metres between any two trees.

Deconstruct: refers to the treatment of access structures such that the area is deactivated and treated in accordance with the stocking standards outlined in GWM 9.

Gap: non-riparian natural or man-made forest opening of 0.1 to 2.0 hectares in size and containing ≥ 20 percent cover of preferred forage species.

Livestock attractant: means a substance or structure that draws livestock, including salt/minerals, supplements, water developments and cattle oilers.

Preferred forage species: includes but is not limited to, black huckleberry (*Vaccinium membranaceum*), black twinberry (*Lonicera involucrata*), common dandelion (*Taraxacum officinale*), cow-parsnip (*Heracleum maximum*), fireweed (*Epilobium angustifolium*), saskatoon (*Amelanchier alnifolia*), thimbleberry (*Rubus parviflorus*), soopolallie (*Shepherdia canadensis*), common horsetail (*Equisetum arvense*), highbush-cranberry (*Viburnum edule*), currants and gooseberries (*Ribes* spp.), red raspberry (*Rubus idaeus*), red osier dogwood (*Cornus stolonifera*), lady-fern (*Athyria felix-femina*), pea-vine (*Lathyrus* spp.) or kinnikinnick (*Arctostaphylos uva-ursi*).

Visual screening: refers to windfirm vegetation and/or terrain features that prevent displacement or disturbance behaviour in Grizzly Bears, despite adjacent activities that might otherwise elicit these behaviours. Visual screening is measured when a 1 metre x 1.5 metre dark surface area, at 30 metres perpendicular distance from road centreline (or 50 metres perpendicular distance from road centreline on the Leo Creek Forest Service Road), has no area larger than 0.4 square meters visible during April 15th – October 15th.

Schedule 1 – General Wildlife Measures (GWMs):

Access –

1. Do not construct roads or trails in the **core** area, except as provided in GWM 2,
2. GWM 1 does not apply where road maintenance activities required to address safety or environmental damage must be completed immediately,
3. Within the **management zone**, all access structures must be deconstructed.
4. Visual screening will be maintained adjacent to the cleared right-of-way of existing permanent roads.

Harvesting – Core

5. Primary forest activities must not result in the removal of forest cover within the **core**, except as provided in GWM 2.

Harvesting – Management Zone

6. Primary forest activities within each cutblock will:
 - a) maintain a minimum of 1 gap per 4 hectares, averaged over the cutblock,

- b) leave a minimum of 4.0 cubic meters per hectare (excluding Douglas-fir) of anting habitat in the SBSdw3 02, 03 or 04 site series,
 - c) outside of roads and roadside processing and decking areas, retain all Douglas-fir greater than 52.5 centimeters at diameter breast height,
 - d) retain all trees within 10 metres of the streambank of S4 streams and/or S6 streams flowing into fish-bearing streams, except as provided in GWM 7, and
 - e) restrict harvesting and road or access construction to the period between November 16th and April 14th, except as provided in GWM 8.
7. GWM 6d) does not apply where a road is required as part of a stream crossing.
8. GWM 6e) does not apply where road maintenance activities required to address safety or environmental damage must be completed immediately.

Silviculture

9. Stocking within the management zone will meet the following:

Preferred species		Acceptable species		
Consistent with the <i>Reference Guide for FDP Stocking Standards</i>		Consistent with the <i>Reference Guide for FDP Stocking Standards</i>		
Well-spaced trees/hectare ¹				
Site Series	Target preferred and acceptable	Minimum preferred and acceptable	Minimum preferred	Minimum horizontal inter-tree distance
01, 03, 04, 05, 06, 07, 08	800	450	400	1.0 metre
02, 09	700	300	250	1.0 metre

¹Cluster plant with a minimum of 30 conifer seedlings per cluster

10. Do not use domestic sheep, goats or cattle for vegetation management.

Range

11. No new range tenures within the WHA.
12. Do not place livestock attractants within the WHA.

Recreation

13. Do not enhance or develop new recreational trails, facilities, or structures within the WHA.

Schedule 2 – Objective:

1. Primary forest activities within each cutblock will, where available and practicable, outside of roadside processing and decking areas, retain Douglas-fir greater than 22.5 centimeters and less than 52.5 centimeters at diameter breast height in a clump.

WHA 7-002 Draft GAR Order:

Definitions:

Anting habitat: consists of a mix of coarse woody debris and/or stumps (excluding Douglas-fir) with a constant minimum diameter of 22.5 centimeters and a coarse woody debris length or stump height of 50.0 centimeters.

Clump: consists of a minimum of 4 Douglas-fir greater than 22.5 centimeters at diameter breast height (dbh) where the spacing between individual trees is not more than 10 metres between any two trees.

Deconstruct: refers to the treatment of access structures such that the area is deactivated and treated in accordance with the stocking standards specific to the relevant biogeoclimatic zone and sub-zone. Where site series information is not available stocking is to be consistent with a 01 site series.

Schedule 1 – General Wildlife Measures (GWMs):

Access –

1. All access structures must be deconstructed.

Harvesting –

2. Bear dens will be identified and included within wildlife tree patches or other retention area, with a minimum reserve of 60 metres around the den opening.
3. Primary forest activities must not occur between November 15th – April 15th, except if road maintenance activities are required immediately to address safety or environmental damage.
4. GWM 3 does not apply if a qualified professional knowledgeable in Grizzly Bear ecology determines that bear den(s) within an area of proposed primary forest activity are unoccupied at the time of the activity.
5. Primary forest activities within each cutblock will:
 - a) leave a minimum of 4.0 cubic meters per hectare (excluding Douglas-fir) of anting habitat in the SBSdw3 02, 03 or 04 site series, and
 - b) outside of roads and roadside processing and decking areas, retain all Douglas-fir greater than 52.5 centimeters at diameter breast height (dbh).

Silviculture

6. Do not use domestic sheep, goats or cattle for vegetation management.

Recreation

7. Do not enhance or develop new recreational trails, facilities, or structures within the WHA.

Schedule 2 – Objective:

1. Primary forest activities within each cutblock will, where available and operationally feasible, outside of roadside processing and decking areas, retain Douglas-fir greater than 22.5 centimeters and clumps less than 52.5 centimeters at diameter breast height in a clump.


A pre-assessment was conducted by FLNORD staff on the Delivered Wood Costs for the existing forest agreement holder. Delivered Wood Costs is defined as “the costs associated with accessing and harvesting timber and delivering it to a timber processing facility”. The results of the pre-assessment are detailed within the a separate document (Preliminary Qualitative Assessment of Potential Impacts to Delivered Wood Costs from Proposed Designation of Tl’o ba Grizzly Bear Wildlife Habitat Areas 7-001 and 7-002 in the Stuart Nechako Natural Resource District). It was concluded that potential impacts to delivered wood costs resulting from the proposed Tl’o ba WHA was estimated to be Negligible and Will Not have a material adverse impacts to delivered wood costs for the Forest Agreement Holder.

9.0 Acknowledgements

The development of WHAs 7-001 and 7-002 was a significant undertaking over a period of years, and the following people were instrumental in the development of these WHA proposals. Renel Mitchel and Bev John of Tl’azt’en Natural Resource Department provided significant support, both in-kind and monetary, and embraced the vision of different conservation management for grizzly bears and the special habitats associated with the K’uzkoh system. John DeGagne of SERNbc provided support for the investigation and development of ecosystem restoration measures to maintain or recover grizzly bear habitat values within the area. Initial TEM work and associated management recommendations was well done by Lana Ciarniello and Adrian de Groot. Tanya Kruisselbrink of Conifex Timber provided field support and Conifex also provided monetary assistance. Dexter Hodder from the John Prince Research Forest assisted in the development of the denning zone. Field investigations included support from Sandra Sulyma, Garth Mowat, Cris Guppy, Kevin Astridge, Annette Constabel, Veronica and Don Cadden, Doug Heard, Bill Arthur, Chris Ritchie, Kyle Pierre, Eugene (Duncan) Joseph, and Darren Haskell. Kevin Astridge assisted in the development of stocking standards and GIS support was provided by Sean Barry. Shelley Marshall, Tony Hamilton, John Marchal, Tanya Kruisselbrink and Bruce Rogers provided initial thoughts and advice with respect to the GWM development. We thank them all.

10. FLNRO Professional Biologist Endorsement

WHA 7-001 and WHA 7-002 meet the tests under the Government Actions Regulation under FRPA and the Environmental Protection and Management Regulation under OGAA . These areas are necessary to protect and conserve habitat requirements for the grizzly bear in the Stuart Nechako Natural Resource District. The WHA(s) meet the requirements outlined in the *WHA Review Checklist* :

Name	Initials	Date
Joanne M. Vinnedge, MSc., RPBio Ecosystem Biologist, RPBio # 332		
Kevin Hoekstra, RPBio		

Appendix 1. Tl'o Ba WHA maps and Photographs

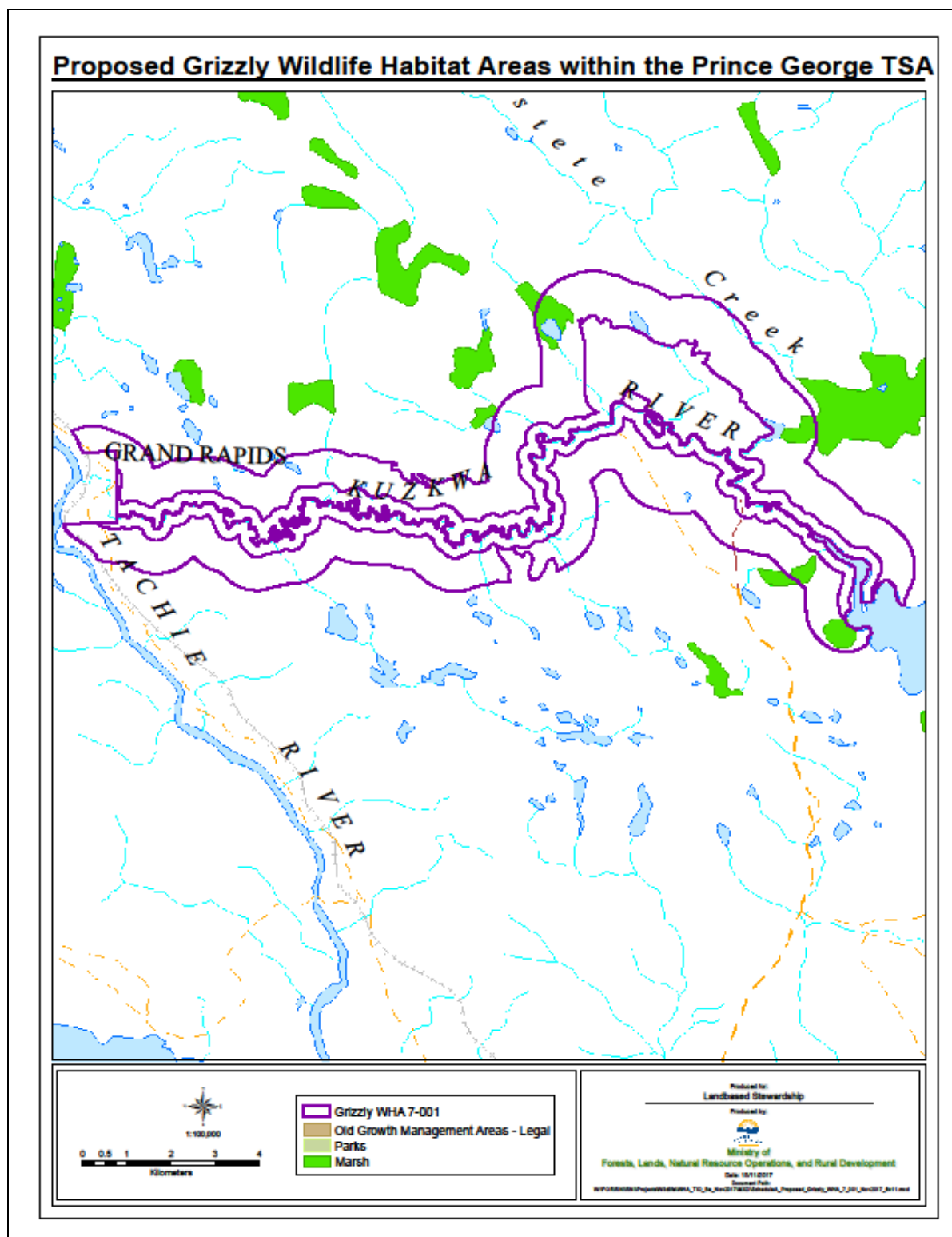


Figure 1. Map of proposed WHA 7-001 along the Kuzkwa River.

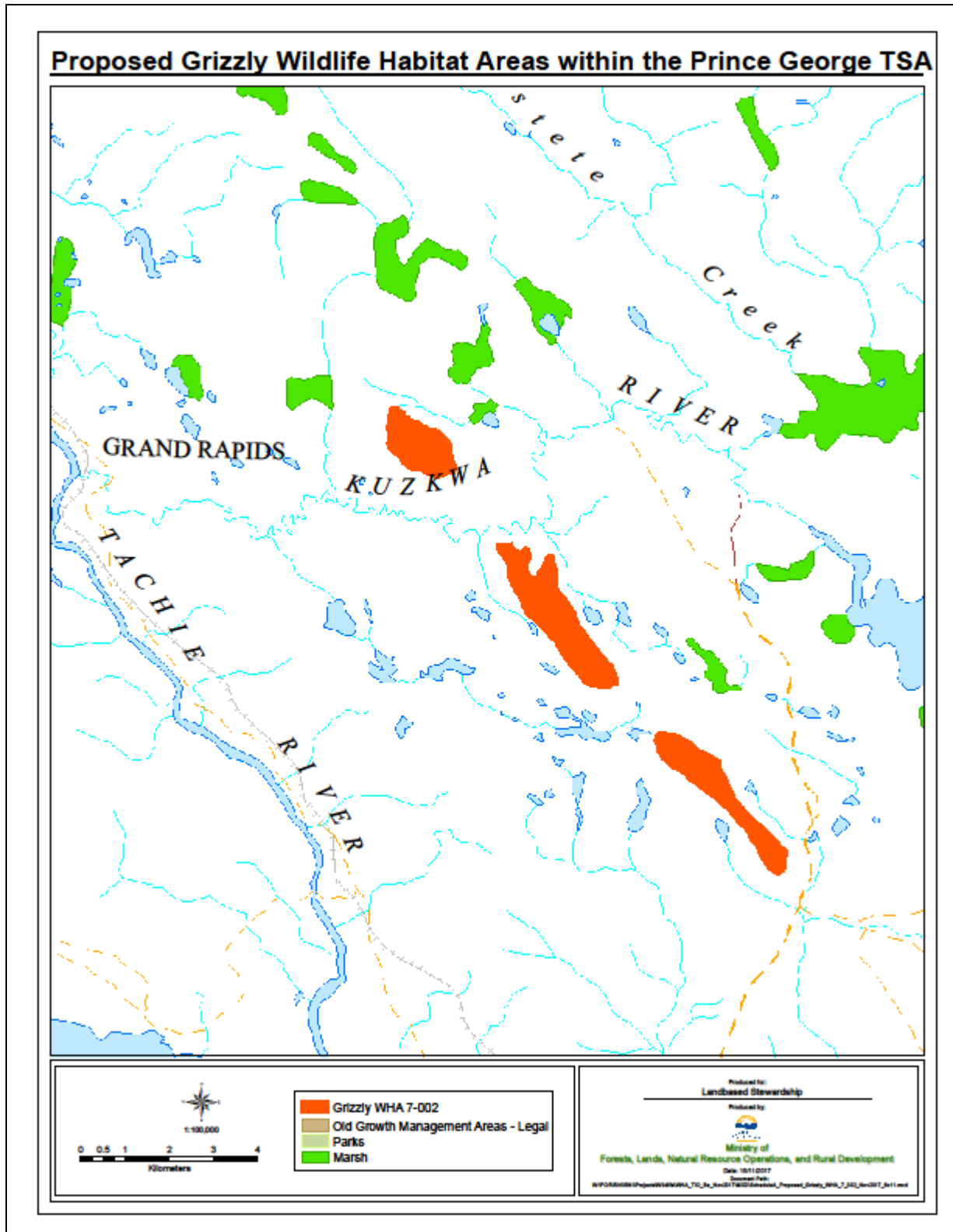


Figure 2. Map of WHA 7-002.

Tl'o Ba WHA photographs



Figure 3. K'uzkoh River looking upstream towards Tezzeron Lake. WHA Core includes 250m riparian reserve on either side of the river. A 750 metre management zone extends out either side, from the core.



Figure 4a) and 4b). Tl'o Ba 7-001 core. Grassland habitat provides critical spring forage values.



Figure 5. Grizzly Bear mark trail and mark tree located within WHA 7-001 core.



Figure 6a) Natural shrubland or gap, with evidence of anting.



Figure 6. Natural gap with suitable forage species including fireweed, thimbleberry and rose.



Figure 7. Adjacent to 7-001 management zone. Plantation has reached a denser crown closure stage which restricts available light and subsequent grizzly bear forage production.



Figure 8. A trio of grizzly bears walks the edge of the upper K'uzkoh River Sept 20, 2015. Grizzly bears focussed on salmon spawning in this area of river August through October.



Figure 9. WHA 7-002 looking south. The limestone feature in the foreground, along with the third hill in the background, partially overlap with two mule deer Ungulate Winter Range U-7-002 units.



Figure 10. WHA 7-002, middle unit looking north. Highest capability denning habitat should be located along the east side of this escarpment.

Appendix 2. Summary of proactive information sharing with First Nations and stakeholders

Action	Stakeholder or First Nations' name	Date	Response or Outcome
Kuzkwa River grassland site identified as valuable habitat within Fort St. James LRMP	LRMP committee	1999	Special management objective and strategy identified within LRMP
Ministry of Water, Land and Air Protection Fish, Wildlife and Habitat staff assess site. Grizzly bear mark trees and trails identified.	N/A	June 2001	Confirmed support for special management
Site assessed as part of Royal BC Museum's Living Landscapes initiative. Specialists collected dragonflies and butterflies. Grizzly bear mark trail found.	N/A	July 2001	Grassland habitat supports southern range limit for some northern (Yukon) butterflies. Co-location possible with other biodiversity values of note.
2003 Nation Grizzly Bear Population Unit mark-recapture Grizzly bear DNA assessment undertaken with sample site at Kuzkwa grassland. Evidence of grizzly use.	Slocan Forest Products and Min. of Water, Land and Air Protection.	Summer 2003	Mowat, G. and D. Fear. 2004. <i>Grizzly Bear Density in the Nation River Area of British Columbia</i> report produced documenting low grizzly bear densities in this GBPU. Need for special management of Kuzkwa site recognised (Garth Mowat, personal communication)
Informal discussions with Tl'azt'en natural resource staff began early 2012 as draft WHA boundary developed. Agreed to collaborate on joint WHA proposal	Tl'azt'en Nation	Early 2012	Partnership developed to take WHA forward as joint proposal
Meeting held with Keith Taite of Carrier Lumber to redirect road access away from WHA and implement wider riparian buffer along CP 444-1 being harvested upstream.	Tl'azt'en Nation, Carrier Lumber	May 2012	Carrier Lumber relocated access to enable effective access removal and wider riparian reserve implemented along upper Kuzkwa River
Conifex proposes Cutting Permit (KUZ 339) within proposed WHA.	Tl'azt'en Nation, Conifex Timber	July 2013	Tl'azt'en and FLNRO staff meet with Conifex and develop agreement to jointly propose WHA
Development of habitat suitability modelling, decision	FLNRO Landbase Stewardship, Tl'azt'en	2 contract phases	Development of decision-making support document to aid in WHA

Action	Stakeholder or First Nations' name	Date	Response or Outcome
support document and field verification. Tl'azt'en and Conifex field staff assist in field work.	Nation, SERNbc and Conifex partnership, with all contributing funds.	through 2013-2014	establishment. Ciarniello, L.M. and A. de Groot. 2014. <i>Decision-making support for management of the proposed Tl'o ba Wildlife Habitat Area.</i>
First meeting held to discuss silviculture tools and WHA management	Tl'azt'en Nation, Conifex Timber, Carrier Lumber, Landbase Stewardship (Wildlife), SERNbc	Dec 17, 2014	General agreement to focus on silvicultural management of high capability bear habitat.
Tl'azt'en grizzly bear monitoring project on Kazchek Creek and Kuzkwa River	Tl'azt'en Nation and FLNRO, Landbase Stewardship	March 2016	Tl'azt'en FN undertook grizzly bear baseline monitoring project in response to Prince Rupert Gas Transmission pipeline route and monitoring support for establishment of Tl'o ba WHA. FLNRO partnered with Tl'azt'en to enable project completion. FLNRO supported development of final report. Hair samples were collected and are in storage pending future DNA analysis funding. Ciarniello L.M. and C. Morrison, 2016. <i>Tl'azt'en Grizzly Bear Monitoring of Kazchek Creek and Kuzkwa River.</i>
Tl'azt'en develops specific Land Use Plan for their traditional territory, including Tl'o Ba site as a proposed grizzly bear WHA. Proposes expanding WHA upstream to Tezzeron Lake to capture critical sockeye spawning habitat and downstream to include riparian management zone along Kuzkwa River	Tl'azt'en Nation	March 2016	Tl'azt'en Natural Resource Department. 2015. <i>Tl'azt'en Nation Land Use Plan. Neyun Huwuts'inli – Taking Care of our Land.</i> Report prepared by Renel Mitchell for Tl'azt'en Nation. WHA boundary amended to include larger management area encompassing entire length of Kuzkwa River.
Meeting with Renel Mitchell	Tl'azt'en Nation	Sept 2016	Updates discussed
Discussion with Tl'azt'en Nation to include high bear denning capability habitat associated with limestone ridges adjacent to proposed WHA.	Tl'azt'en Nation and John Prince Research Forest	October 2016	WHA boundary amended to include two WHAs; 7-001 and a new denning WHA, 7-002.
			Add when FNWL is approved
Tree and Stand Simulator silviculture modelling	Provincial silviculture specialist	May-July 2017	Assessment work to model optimal silviculture stocking to achieve habitat objectives

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Meeting to discuss draft Order GWMs	Tanizul Timber and Conifex Timber	July 16, 2017	Orders reviewed and discussion held. Work was initiated in 2014 in partnership with Tl'azt'en Nation, to undertake the development of the Tl'o Ba WHA. When an initial draft Order was developed for both 7-001 and 7-002, a meeting to review and discuss the proposed Orders was undertaken with Tanizul Timber and Conifex staff. Conifex at that time was still operating within this area, prior to awarding of the First Nations Woodland License.
Response from Tanizul Timber	Tanizul Timber	July 17, 2017	Post meeting, feedback was received from Tanizul Timber staff that outlined concerns with operational implementation of a number of GWMs:
Response to Tanizul Timber, Tl'azt'en Natural Resource Department and Conifex Timber	N/A	Aug 16, 2017	The Orders were amended to reflect Tanizul feedback, with clarification on visual screening and tightening of timing windows, a redefinition of anting habitat, clarification of Douglas-fir retention and redefinition of one GWM as an Objective, and removal of maximum stocking densities.
Email to Tanizul Timber	N/A	October 27, 2017	Further discussion with other reviewers, including Compliance and Enforcement, Silviculture and Revenue staff, led to additional clarification and amendment of GWMs, including a simplification of stocking standards, shortening of visual screening timing windows and deletion of a brushing GWM. Revised Orders were supplied with explanation and a request for further comment.
Meeting	Tl'azt'en Nation council	October 10, 2017	J Vinnedge and K Hoekstra presented WHA proposal to Council members. Provided a general information brochure and discussed monitoring and implementation opportunities, ecosystem restoration opportunities, and benefits of designation to other wildlife species and Tl'azt'en members.
Aerial flight, FLNRORD staff, J	N/A	October 31,	Black bear observed on cliff within 7-

Action	Stakeholder or First Nations' name	Date	Response or Outcome
Vinnedge and P Inden		2017	002 denning unit

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